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INTEGRATION OF BUSINESS, DIGITAL TECHNOLOGIES, AND SOCIAL SCIENCES FOR A SUSTAINABLE ASEAN AND BEYOND (IBTSS 2024)

Editors:

Prof. Yamuna Sithambalam
Dr. Dinesh Elango

Business Tech Social Sciences in Asean

IBTSS TRACKS

Digital Technologies	Business and Economics	Social Sciences
Digital Ethics and Privacy	Impact investing and Social Entrepreneurship for Sustainable Development	Sustainability and ASEAN
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Integration of Business, Digital Technologies, and Social Sciences for A Sustainable ASEAN and Beyond (IBTSS 2024)

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About IBTSS2024

The IBTSS conference is a collaborative effort among the American University of Phnom Penh (AUPP), University of Arizona (UA), Fort Hays State University (FHSU), Unimas University and Primax Foundation.

As we stand at the crossroads of economic growth, technological advancements, and social progress, the need for sustainable development has never been more critical.

Throughout our engaging sessions, thought-provoking panel discussions, insightful case studies, enriching workshops, and the wisdom shared by our distinguished speakers, we aim to explore the potential of integration to drive sustainable development. By examining the interplay of business, digital technologies, and social sciences, we seek to uncover new pathways for inclusive growth, environmental stewardship, and social well-being.

The conference theme underscores our commitment to the ASEAN region and beyond, recognizing the interconnectedness of our global community. We firmly believe that by embracing integration, we can harness the power of collaboration, knowledge exchange, and collective action to overcome challenges and create positive change. Together, we can forge a sustainable future that leaves no one behind.

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Organizer and Partners

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Enhancing Cybersecurity: Innovative Packet Sniffer & AI-driven Network Intrusion Detection Web Application

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ABSTRACT

With the challenge of expanding cyber-attacks going on by the universal cloud computing and networking systems, conventional security measures and techniques are often inadequate. Therefore, this study examines a promising approach that integrates integrating Artificial Intelligence (AI) technique via adapting a pre-trained LLM BERT model into a web application developed by Python to automate and dynamically detect network intrusion behaviors and alert system users. The proposed web application analyzes and classifies live network packet traffics behaviors to normal, and abnormal traffics to securing organizational digital assets, as it allows network administrators to manually allow or block an IP address through the firewall. The proposed system was able to detect the brute force attacks of SSH and FTP Patators effectively for 73,000 captured packets, demonstrating their detection model's capabilities as well.

Keywords: Network Intrusion Detection, Artificial Intelligence, Cybersecurity, BERT Model.

1. Introduction

The significance of cybersecurity has grown extensively in the current era of digital life due to continuous scaling networking systems all over the world. Living with a ubiquitous connectivity world established by the largest network; the internet, every computing gadget is susceptible to a cyber-attack. This connected environment offers communication gates for both normal and malicious traffic. Since organizations and businesses are extensively relying on the internet to broaden their reach, they become vulnerable to digital crimes like malicious, malwares, Distributed Denial of Service (DDoS), etc. Consequently, this disturbs businesses operations and negatively effects organizational growth (Safitra et al., 2023).

One of various security solutions that have been implemented in various systems is Network Intrusion Detection (NID) system. NID represents an impressive integration to various networking and cloud computing systems as they identify unauthorized activities that breach a system's security

policy. The system relies on the premise that an intruder's conduct deviates significantly from a regular user's and that many unauthorized acts are identifiable (Rajasekaran & Nirmala, 2012). Also, (Kumar et al., 2023) has outlined a path towards a safer and more secure digital future, it paved the way for more extensive examination and debate on AI's role in cyber-security. They have highlighted that one of the optimal security solutions is integrating the strengths of AI to digital applications. With this further security feature, the defense against cyber threats will ultimately be enhanced. Also, in a survey study conducted by (Abdallah et al., 2022), they investigated ML methods utilized to build pattern recognition and classification to increase the accuracy of IDSs. Their approach mainly applied to generate a pattern recognition task. It also showed serval systems have achieved satisfactory network activity classification as either normal or abnormal traffic.

Therefore, having a robust cybersecurity solution is an essential need to organizations all over the world to secure their digital systems. However, the dynamic nature of cyber threats necessitates adaptive defense mechanisms, as the conventional systems, while effective to a degree, often struggle to keep pace with the ever-evolving tactics employed by malicious actors (Sanu & Saleem, n.d.). Thus, this research innovatively integrated advanced AI techniques into NID. The proposed system proactively identifies and prevents cybersecurity threats. Basically, it identifies and counteracts potential intrusions, furnishing a resilient defense mechanism against threats as explained below in the implementation section.

2. Related Works

In this section, some of the relevant research studies are reviewed and followed by a comparison to their techniques applied and key findings. A study introduced by (Repalle & Kolluru, 2017) aimed to foster an interruption and intrusion discovery framework that uses AI to distinguish and moderate dangers in an organization system. While the proposed system utilized Active Learning Mechanism, this helped to build a framework that advances over time by learning and working on its capacity to distinguish threats and guard against them by persistently gaining from new input information.

(Dubey & Bhujade, 2020) introduce the application of ML techniques to enhance ID system performance, enabling the system to adapt to new threats autonomously. The system can adjust to new threats without requiring a lot of retraining. In other words, it updates its knowledge to identify attack patterns that were previously undetected. This entails training models on historical data and then utilizing the models to analyze network traffic in real time. Through the use of self-learning, the system becomes more resilient and efficient in real-world applications by enhancing its capacity to identify intricate and dynamic threats.

Also, the Random Forest algorithm was used by (Ajitha et al., 2019) to compare the performance of different ML techniques for detection of network intrusions. To assess the effectiveness of different MLs for detecting intruders, this study has utilized KDDCup99 dataset. Multiple models are trained and tested to compare the overall performance, therefore, their findings showed that, in

terms of detection rate, it was more effective than other techniques and demonstrated its effectiveness as an intruder detection tool.

Additionally, Internet of Things (IoTs) devices expand the danger zone, according to Statista's predictions, around 17 billion IoT devices are expected to be online by the end of 2024, providing a huge opportunity for DDoS botnet recruitment (Lionel Sujay Vailshery, 2023). In the lack of a standardized security protocol in the IoTs, household items like edge devices, hubs, access points, smart bulbs, and TVs can be taken over for malicious use (Tariq et al., 2023). A study carried out by (Altrad, 2023), has utilized IoTs dataset with feature extraction technique to detect and analyze benign and offensive IoT traffics.

Therefore, CICIoT2023 dataset applied in this research, sourced from the Canadian Institute for Cybersecurity, served as the foundation for our analysis. This comprehensive dataset captures a wide range of traffic patterns generated by 105 smart devices interconnected within an IoT laboratory. By extracting key features from this data, we were able to explore its applicability to various machine learning algorithms for classifying IoT traffic. This analysis aimed to gain a deeper understanding of IoT traffic behavior and identify potential security vulnerabilities. The employed algorithms demonstrated promising performance, with Decision Trees achieving the highest F-score of 0.979, followed by K-Nearest Neighbors at 0.973.
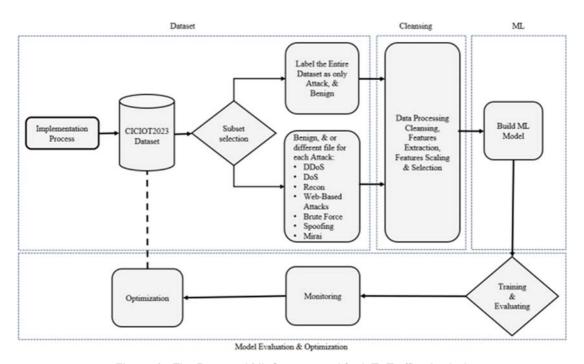
Figure 1 : The Proposed ML System used for IoTs Traffics Analysis

3. System Implementation & Evaluation

This research aimed to leverage the power of AI by employing a pre-trained BERT model from the Hugging Face platform introduced in Github by (Pahalavan Rajkumar Dheivanayahi, 2023). This model is applied to gain unprecedented insights into network traffic patterns. Consequently, the proposed AI-powered approach surpasses existing system model in detecting subtle network data anomalies due to its flexibility with rule sets. With the integration of a pre-trained BERT model, flow information, packet headers, and payloads can be comprehensively analyzed. This examination strengthens the security of systems by revealing subtle deviations indicating potential intrusions.

The research is achieved in mainly two stages where it firstly captures and analyzes a network transmission packet, analyzes them, then visualizes the traffic behaviors for better understanding and penetration test. Since a pre-trained mode is integrated, there is no need to prepare dataset and train model for AI usage algorithm or do Data processing. Generally, the architecture of the proposed system is achieved as follows:

a. A simple Packet Sniffer application is developed using Python code to capture all the network packets and reformat them in a way that the proposed AI system understands and can analyze the packet. This application listens to or captures all network traffic that goes through the targeted network and devices, both sending and receiving traffic.

b. Secondly, the outcome of the first step is processed by decapsulating the data from the Transport Layer to the Application Layer, also reformatting the data in csv file is applied to match the AI model. This helps to spot any suspicious activity in internet traffic and stop it before it causes digital problems.

c. Finally, data visualization process is also developed to visual packets in an appealing way to easily track and analyze traffic by administrator users. This is achieved by integrating the functionality of the whole application *Streamlit* web framework.

The applied model is called "BERT-NETWORK-PACKET-FLOW-HEADER-PAYLOAD" which was introduced by (Pahalavan Rajkumar Dheivanayahi, 2023). The model was trained using the "Network-Packet-Flow-Header-Payload" dataset, which was prepared by the same person. The dataset contained 1,696,831 rows of network packets and was split into train data (1.19M rows) and test data (509K rows). The input data of Transmission Control Protocol/Internet Protocol, (TCP/IP) size and structure are depicted in Figure 2. Also, the author's thesis shows that the model performance of the AI model showed high accuracy for training with three epochs. Specifically, the evaluation applied over 509k rows of data resulted in 99.48% for micro f1-score and 98.46% for macro f1-score.
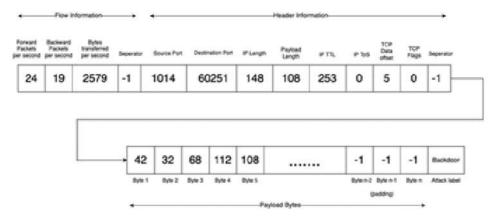
Figure 2 : Network TCP/IP Packet Size and Structure

Packet Sniffer applied decapsulation process designed to extract essential data fields from the network packet. To achieve so, Socket library in Python is applied to leverage the network's connection via its interface card from a host machine. Additionally, it retrieved TCP/IP related data so that they could be applied according to the TCP and IP Data Offset Standard via Struct Python tool. Figure 3 shows a general overview to the proposed system's framework which designed to ensure continuous monitoring and adaptive reaction to possible risks using AI abilities for real-instantaneous NID.

Algorithm: AI-Driven Network Intrusion Detection System
1. Initialize Components
 - *Initialize "PacketSniffer" to capture network packets.*
 - *Initialize "NetworkDetectionModel" to predict the type of network traffic using a pre-trained BERT model.*
2. Setup Log Files
 - *Open log files for appending network traffic data and unique addresses.*
 - *Load existing blocked IP addresses from the unique addresses file.*
3. Continuous Packet Sniffing
 - *Continuously capture packets using the "PacketSniffer".*
 - *For each captured packet:*
  - *Extract formatted data, flow information, and IP details.*
  - *Skip processing for local or previously blocked IP addresses.*
4. Predict Traffic Type
 - *Use "NetworkDetectionModel" to predict the type of network traffic based on formatted data.*
5. Logging and Action Determination
 - *Log the packet information along with its predicted category (ALLOW, ALERT, or BLOCK).*
 - *If the traffic is categorized under ALERT or BLOCK:*
  - *For ALERT, log the event.*
  - *For BLOCK, check if the same source IP has been blocked more than three times in the last hour.*
  - *If conditions for blocking are met, use the utility function to block the IP and log the action.*
6. Handle Unique Addresses
 - *Add new unique addresses to the log for tracking.*
7. End of Process
 - *Continue looping back to packet capture.*

Figure 3 : The Proposed Network Introduction Detection System Framework

For better understanding to the proposed application, behind the scenes, Figure 4 shows flow data calculated by counting the network packets coming in per second, the number of packets sent out per second, and the bytes transferred back and forth per second. With this data, the main driver code invoked both the AI model and Packet Sniffer methods and made them work together to analyse and classify if a packet is any kind of attack three times in the last hour, it will call a firewall to block the IP address on the operating system level as shown in Figure 5.

Figure 4 : Packet Sniffer Extracted Data

Figure 5 : Logged Data Captured by the Application

The following section shows the proposed user interface design with easy of use web application implementation using Python Streamlit. There are three pages to the dashboard Sstreamlit application, Figure 6 depicts the main dashboard, it visualises the network traffic and provides a graph showing overall predictions. While, Figure 6 shows the log pages, which only differs from Figure 5 by allowing to apply filter through the log to find the status and type of attack. Also, the application allows user to change Status page, which is the page where the network admin can manually allow or block IP addresses.

Figure 6 : The Proposed System Dashboard
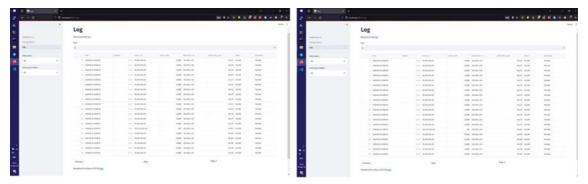
Figure 7 : Log Page User Interface

The overall captured packets in this study were around 73,000 packets collected via a client/ server network established to accomplish the goal of this study. At the server side however, it predicted that there were many of SSH Patator while trying to connect to the server via SSH to configure it. Patator is a multipurpose tool, widely used as brute-force attacks against diverse digital services and communication protocols such as HTTP, SSH, and SMTP. In some scenarios, the high number of captured data caused overfitting in the proposed detection application, this also classified some legitimate SSH data as an attack. SSH Patator tries various username and password combinations until it gains access to the server. These attacks can be automated and are often carried out by malicious actors attempting to gain unauthorized access to systems. As for exploit, the system detects that some connections are exploited as shown Figure 7 in respect to that, our role as a network administrator was to check on the IP to whose it is belong to, where some of them are the service of cloud provider used in this research.

In the same context, Figure 8, the FTP Patator, some of the IP addresses using https://iplocation.io are checked and found with few connections from Tencent, COLT Technology Services Group Limited, Chunghwa Telecom Co., Ltd and CHINANET SiChuan Telecom Internet Data Center. This indicates that these companies are using bots to test our FTP service with some default usernames and passwords. This IP belongs to Tencent Computer Systems Company Limited as the website suggests. With threat level high, many of the IP in the list detected and labelled as any type of attack almost every time when threat has a level high.

This could mean that the network detection model is quite effective in detecting the threat. However, the real implementation for this network detection model may need to do some whitelist for administrator IPs in case this software blocks their IPs. Also, it may need to whitelist some services that are essential to the server, for example, Cloudflare Inc. for DNS and many other networking services.

Figure 8 : Analysis of Network Traffic of the Last 24 Hours.

Finally, in order to create a more robust system this AI detection model could be improved by more analysis tools. There is also a need to create some rules beside additional data to form a decision whether to allow or block traffics. However, this AI model is very useful for initial penetration test stage, as it could give more context and insight about network traffic. To compare and contrast this research with few relevant studies from the perspective of their purposes, technique, and key findings as follows:

1. This research notably integrated Transformers as Sequence classification using BERT, also Active Leaning Technique to continuously observe network packets, classify traffics, and update the list of blocked or allowed IPs from the prediction outputs, therefore this leads to have effective cybersecurity application.

2. Intrusion Detection System using AI and ML introduced by (Repalle & Kolluru, 2017) using Active Learning Mechanism for detecting and defending against threats with satisfactory accuracy rate.

3. (Pham et al., 2018) have improving the Performance of IDS using self-learning algorithm. It also enhanced ability to address complex security issues.

4. Conclusion

The research leveraged a pre-trained BERT model for network traffic analysis, demonstrating a novel approach to network intrusion detection. The system effectively identifies common attacks like SSH and FTP Patator, highlighting its potential for real-world application. Moreover, the web application interface with traffic visualization aids network administrators in analyzing network behavior. As an overall result, this research demonstrated that AI can significantly improve NIDs performance, effectively tackling the evolving cyber threat landscape. Employing a pre-trained BERT model for intricate network traffic analysis leads to an adaptive and efficient cybersecurity solution. Finally, the proposed AI models in this research will be improved in future work to decrease false positives and enhance computational efficiency for quick threat detection and action. As AI integration into traditional security protocols strengthens defense mechanisms, raising security standards and fortifying network systems. On the top of that, evaluating the system's performance on larger networks would be beneficial to assess its suitability for real-world deployments.

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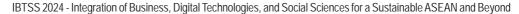
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Enhancing Cybersecurity with Large Language Models (LLMs): A Powered Web Application for Suspicious Detection

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ABSTRACT

In this research, a web application leveraging Large Language Models (LLMs) to detect suspicious data within text, or files is introduced and evaluated. By integrating state-of-the-art machine learning models, specifically designed for sentiment analysis and sequence classification, the web application offers a simplified ease of use solution for analyzing text data across various industries. The paper utilizes a framework for seamless deployment and user interaction using Python. Through the incorporation of advanced LLMs such as Natural Language Processing (NLP) Town's Multilingual Sentiment Classifier and DistilBERT for Sequence Classification, the system provides users with actionable insights into potential threats, inconsistencies, or suspicious patterns in their data. Besides the testing, the application calculates the confidence accuracy ratio of the classification process. The results showed some of the given input as suspicious data with vary accuracy rates, or normal data. For example, in some cases, the accuracy is found 0.90% suspicious data (negative).

Keywords: *Cybersecurity; LLMs; Suspicious Detection, ML, DistilBERT, NLP.*

1. Introduction

As the landscape of cybersecurity threats continues to evolve, individuals and organizations face an ongoing challenge. The conventional security methods frequently lag the ever-growing sophistication of cyberattacks. However, there is hope in the form of LLMs and NLP techniques. These technologies present promising opportunities to bolster cybersecurity efforts by streamlining processes, enhancing threat identification, and offering comprehensive insights into malicious behaviors (Yao et al., 2024).

LLMs are a type of artificial intelligence (AI) trained on massive amounts of text data. This training enables them to understand complex linguistic patterns, generate human-quality text, and perform various NLP tasks. LLMs have recently grabbed significant attention for their potential applications in cybersecurity areas such as Threat Detection & Analysis, Phishing Email Detection, vulnerability Detection, etc. (Charfeddine et al., 2024).

NLP techniques are instrumental in deciphering meaning from the vast amount of unstructured textual data prevalent in the cybersecurity sphere (Montasari, 2024). As cybersecurity continues to evolve, web applications have emerged as indispensable tools for overseeing and maintaining a robust cybersecurity posture. In the following section, the literature review delves into the potential of LLMs and NLP to strengthen cybersecurity, with a particular emphasis on their role within a web application designed for detecting suspicious data. Suspicious data could be from emails, web servers logs suspicious behaviors, records that will contain pernicious code or show anomalous behavior, and antivirus program may consider them a potential risk.

The overall processes of such detection systems are started by collecting timestamped data from various sources, such as cybersecurity incident logs and industrial sensor readings. This is followed by cleaning, preprocessing, and normalizing the data to handle noise, missing values, and inconsistencies. Then extract relevant features and encode the data for analysis. Next is to choose a suitable model for forecasting and anomaly detection tasks, then train models. However, in some cases, LLMs are utilized with timestamped data and is particularly conducive to anomaly detection due to its ability to capture temporal patterns. Finally evaluate the performance of the model in forecasting future data points and detecting anomalies. Assess the accuracy, precision, recall, and other metrics to measure.

The diagram in Figure 1 (Su et al., 2024) provides an overview of leveraging LLMs for forecasting and anomaly detection tasks. Input data typically includes time series or timestamped data in various formats such as text logs, numerical data, structured data, graphical input, and speech recordings. Transformer-based LLMs like BERT, GPT, LLaMA2, and Mixtral are commonly used, employing mechanisms such as input and output embeddings, multi-head attention, and feed-forward neural networks. Forecasting tasks involve predicting future data points based on learned patterns, while anomaly detection aims to identify outliers or unexpected events in the data stream Figure 1.

2. Related Work

In recent years, there has been a growing interest in leveraging LLMs and NLP within the realm of cybersecurity. Various related projects have been introduced aiming to enhance cybersecurity with LLMs and NLP for suspicious data detection, in this section, examples from those research papers are review.

Researchers such as (Salloum et al., 2020) and (Xin et al., 2018) have conducted extensive reviews on the application of machine learning and deep learning techniques for tasks like network analysis and intrusion detection. Their work underscores the pivotal role of data in these methodologies.

However, (Israelsen & Sarkar, 2023) warns against indiscriminate use of LLMs in intelligence and safety-critical contexts, citing unresolved vulnerabilities and limitations. Similarly, (Fayyazi & Yang, 2023) delves into the use of LLMs for deciphering ambiguous cyberattack descriptions,
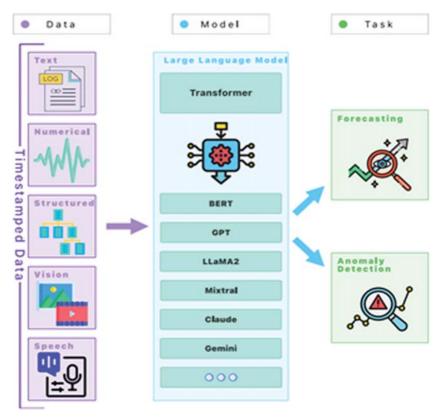
Figure 1 : Overall Process of Suspicious Detection based LLMs.

revealing their potential for broad interpretation but also their constraints stemming from inherent ambiguity. Collectively, these studies underscore the promising prospects of LLMs and NLP in fortifying cybersecurity practices. Nevertheless, they also stress the imperative for further research aimed at addressing the vulnerabilities and limitations inherent in these technologies.

Pre-training of Deep Bidirectional Transformers for Language Understanding is introduced by Dy et al. Devlin (2018). Their model is designed for pretraining deep bidirectional representations from unlabeled text. They also have investigated the foundational concepts of language representation models like BERT. Language Model for Text Analytics in Cybersecurity - SecureBERT was also introduced by (Aghaei et al., 2022). Basically, it is a cybersecurity language model that captures text connotations in the cybersecurity domain in a sense of automating cybersecurity tasks via language models.

Also, Contextualized Embeddings for the Cybersecurity called CyBERT developed by (Wang & Ma, 2022), it discussed models and pipelines that leverage natural language models to address information overload in cybersecurity, also insights into the practical applications of NLP in

cybersecurity. A survey by (Rahman et al., 2023) offers many of the techniques used for cyber threat intelligence extraction from text. The authors reviewed existing studies to identify what kind of threat information researchers are looking for (e.g., indicators of compromise, attacker tactics) and where they find it (e.g., hacker forums, news articles). They also explored the techniques used, like NLP and ML. A key challenge found lack of high-quality data for training these systems. The authors recommend future research focusing on making threat intelligence extraction tools that can help security professionals prioritize threats and learn from past incidents.

(Ranade et al., 2021) have explored the generation of fake cyber threat intelligence using transformer-based models. This sheds the potential security risks associated with language models in cybersecurity. (Qi et al., 2023)showcased the effectiveness of LLMs in identifying threats within social media platforms, examining textual content and user behavior patterns for potential risks.

In (Fayyazi & Yang, 2023) study, they conducted the first comparative analysis of practical applications of LLMs for interpreting Tactics, Techniques, and Procedures (TTP) descriptions in cybersecurity. By reviewing previous works on LLMs in various cybersecurity contexts, we aimed to offer insights into interpreting cybersecurity texts. We presented a thorough comparison between direct LLM usage (specifically GPT-3.5 and Bard) and Small-Scale Fine-Tuning (SFT) of smaller LLMs like BERT and SecureBERT, considering real-world constraints faced by cybersecurity practitioners. TTP descriptions in cybersecurity exhibit significant ambiguity and overlaps, complicating interpretation, and communication of cyberattack tactics.

The research of (Fayyazi & Yang, 2023) suggests that whilst small size of LLMs, particularly SecureBERT-SFT, are better effective resources, also they show stronger classifications of cyber-security approaches related to direct usage of bigger or complicated LLMs. Also, Direct LLM usage provides a broader interpretation of TTP descriptions but lacks accuracy in predicting The Adversarial Tactics, Techniques, and Common Knowledge (ATT&CK). SFT of small-scale LLMs is preferred when labeled training data is available, while state-of-the-art LLMs can serve as reference tools for cybersecurity professionals. Continuous learning of models, emphasis on explainability, and addressing inherent ambiguity are crucial for improving LLM applications in cybersecurity. Future exploration should focus on creating more accurate, reliable, and understandable LLM tools for cybersecurity analysis. The same study highlights the complexity of interpreting ambiguous cybersecurity descriptions and advocates for context-aware applications of generative AI (Mon Divakaran & Teja Peddinti, 2024) Figure 2.

Figure 2 illustrates the overarching procedure for fine-tuning both BERT and SecureBERT models for classification. Initially, the ATT&CK descriptions are tokenized into the desired format for both BERT and SecureBERT, following which both pre-trained models are loaded. Subsequently, a classification layer (DenseNN) is incorporated into the models with a size of 14, corresponding to the number of ATT&CK tactics (Xu et al., 2024). The goal of Xu et al., study was to define cyber-attack classes into 14 groups equivalent to the 14 ATT&CK tactics, the DenseNN layer has 14
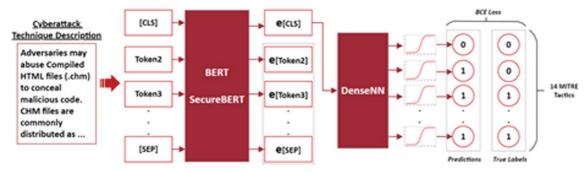
Figure 2 : Processes of Supervised Multi-Label Fine-Tuning of Small Scaled LLMs with Cyberattacks Data (Fayyazi & Yang, 2023).

output neurons. Therefore, it permits the model to forecast one of the 14 tactics to import attack file. To address the multi-label classification challenge, the Sigmoid activation function is applied to obtain the probability of each tactic independently for a given description. This methodology enables effective fine-tuning, even when dealing with a relatively limited quantity of multi-labeled unstructured TTP descriptions.

Consequently, the current research often relies on large datasets to train LLMs and ML models, emphasizing the critical importance of data quality and representativeness. However, there is a notable gap in research regarding the potential of LLM-based systems to simulate the post-breach stage of attacks, particularly human-operated or "hands-on-keyboard" attacks, across various attack techniques and environments. The decision-making processes within complex ML and LLM models can often be ambiguous, underscoring the need to understand how these models reach their conclusions to instill trust in their security applications. Moreover, malicious actors may exploit LLMs and bypass NLP defenses using adversarial text generation techniques, enabling the creation of fake news, dissemination of misinformation, and execution of targeted cyberattacks. Therefore, this research aimed to evaluate Two LLMs models with various suspicious and normal data from spam emails, and data of attacks record from various datasets that are available on HaggingFase and Kaggle.

3. Implementation

The application utilizes the Streamlit framework, a popular choice for building interactive and data-driven web applications with Python. Streamlit's simplicity and efficiency in creating web apps make it an ideal choice for deploying AI-based solutions with minimal web development overhead.

Language Models Employed

There are several options of LLMs that could be utilized for sentiment analysis and other data format evaluation. Table 1 (Motlagh et al., 2024)lists some of the utilized models.

Table - 1: Applications of LLMs in Cybersecurity

Application	Models	Author
LLMs enhance cybersecurity policies.	ChatGPT	(Kereopa-Yorke, 2024)
Using LLMs for secure code development without compromising functionality.	SVEN (GPT-2),(CodeGen) LM	(He & Vechev, 2023)
LLMs investigate software vulnerabilities.	GPT-3.5 Turbo, Gemini, Microsoft Bing	(Pandya & Holia, 2023)
LLMs investigate software vulnerabilities.	GPT-3.5 Turbo	(Charalambous et al., 2023)
Generating honeywords using	LLMs. GPT-3	(Yu & Martin, 2023)
Chatbots assist security experts in identifying open ports.	Rule-based	(Dutta et al., 2018)
CySecBERT for malware detection and alert aggregation.	CySecBERT	(Bayer et al., 2022)

This research has utilized LLMs for suspicious evaluation as follow:

A. BERT (Bidirectional Encoder Representations from Transformers) model pre-trained for sentiment analysis. The model, identified by Bert-base-multilingual-uncased-sentiment, can understand sentiment in multiple languages, making it versatile for international use. It employs Auto Tokenizer and Auto Model for Sequence Classification from the HuggingFace transformers library to interface with this model, enabling it to analyze text sentiment effectively. More specifically, Distilbert-Base-Uncased-Finetuned-SST-2-English (DistilBERT) is chosen and applied as it has a lighter version of BERT that retains most of its predecessor's accuracy while being more resource-efficient, is utilized for sequence classification tasks.

B. Secondly, data analysis via is deployed via NLPTown LLM, this option offers sentiment analysis leveraging the NLPTown model. Like the DistilBERT analysis, users can submit text or files, which are then evaluated for sentiment, providing insights into the data's nature and potential risks.

```
i.    Initialize User_Interaction_Area;
ii.   Model_Tokenizer Setup;
iii.  Load pre-trained models and their corresponding tokenizers for sentiment analysis and sequence classification.
iv.   NLPTown Model:
         a. AutoTokenizer
         b. AutoModelForSequenceClassification for the multilingual sentiment analysis model.
v.    DistilBERT Model:
         a. Load DistilBertTokenizer
         b. and DistilBertForSequenceClassification for sequence classification tasks.
vi.   User_Input Handling:
         a. Present users with a selection for analysis type through the sidebar:
               i.   Finetuned DistilBERT LLM-1
               ii.  Finetuned DistilBERT LLM-2
               iii. Finetuned NLPTOWN LLM
         b. Allow users to input text directly or upload a text file for analysis.
vii.  Analysis_Execution Based on User_Selection;
         a. For Finetuned DistilBERT LLM-1 and LLM-2:
               i.   Tokenize the input text using the selected model's tokenizer.
               ii.  Perform sequence classification on the tokenized text.
               iii. Determine if the text contains suspicious data based on the model's output.
               iv.  Calculate the confidence level of the prediction.
         b. For Finetuned NLPTOWN LLM:
               i.   Use the sentiment analysis pipeline configured with the NLP Town model to analyze the input text.
               ii.  Identify the sentiment and calculate the confidence score.
viii. Display_Analysis_Results;
         a. Show the analysis results, including the detection of suspicious data (if any) and the confidence level of the findings
         b. For sentiment analysis, display the sentiment label and confidence score.
ix.   User_Interaction and Feedback_Loop;
         a. Provide feedback to the user based on the analysis results.
         b. Allow users to perform multiple analyses by re-entering text or uploading different files
```

Figure 3 : The Proposed System Processes

Figure 3 shows the application processes and implementation logic. The system starts by initializing a user webpage for ease-of-use interaction, then it calls the applied LLMs for tokenizing setup as well, this will load pre-trained models and their corresponding tokenizers for sentiment analysis and sequence classification. The models are namely NLPTown, and DistilBERT implemented in two techniques, this followed by user input handling, then it applies analysis based on user selection, finally it displays analysis and evaluation results as positive of negative data. Also, it is important to highlight that the application uses Three data/text analysis methods and they differ in their underlying models and pipelines as follows:

1. **Analyze_text** technique is called by Finetuned Distilbert LLM-1 (model_sentiment) for sequence classification. It tokenizes the input text using the DistilBERT tokenizer, it then feeds the tokenized text into the DistilBERT model to obtain predictions. Finally, the output includes the predicted class and confidence score based on the model's softmax probabilities.

2. **Analyze_text_sentiment** technique is called by Finetuned Distilbert LLM-2. This function also performs sentiment analysis but uses a different approach. It employs the pipeline function from the transformers library to create a sentiment analysis pipeline.The pipeline utilizes the same fine-tuned DistilBERT model and tokenizer but handles the inference process internally. Finally, the output is directly returned from the pipeline, containing the sentiment label and confidence score.

3. **Analyze_text_NLP**: technique, this performs sentiment analysis using a different model and tokenizer. It utilizes a pre-trained model from NLPTown (multilingual model) along with NLP tokenizer. It then creates a sentiment analysis pipeline, and returns the sentiment label and confidence score.

In summary, while all three techniques perform sentiment analysis, they differ in the underlying models the inference handling.

4. Evaluation

This research aimed to evaluate various data formats from different resources using ease-use-webapp. The following figures show the main application page that users can use to either drop suspicious text or files. Users can choose to evaluate their data using 3 LLMs for better evaluation assertion. Figure 4 shows the application with Badrabbit.txt data uploaded for evaluation. The data was evaluated with negative content with 0.90 of accuracy and confidence using fine-tunded Distilbert Model 2. While Figure 5 shows text data evaluation process using Fineturend NLPTown Model. The data was evaluated as normal with almost 0.26% confidence.
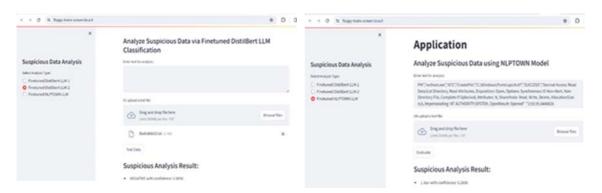
Figure 4 : Analyze Suspicious
Badrabbit Data

Figure 5 : Analyze Suspicious Text Data via
NLPTwon LLM

Another example of evaluation in text format is shown in Figure 6, the text is found with suspicious pattern at 0.90% of confidence. Also, Figure 7 shows very essential evaluation in this research, the used models and techniques are evaluated over 15 text files with suspicious data. Apparently, the highest evaluation performance is achieved by analyze_text_sentiment technique with 0.94 accuracy under DistilBERT Model-2.

Figure 6 : Analyze Suspicious Text Data via Distilbert

Figure 7 : Analysis Confidence Rate

While we have not identified prior research directly applying NLPTwoN with a BERT-like LLM in our specific approach, Table 2 provides a comparison of existing studies utilizing DistilBERT and other Natural Language Processing models for reference.

Table - 2: The Overall BERT LLM Models from Two References

#	Model Name	Overall Accuracy Confidence	Study Reference
1	SecureBERT-SFT	0.97	(Fayyazi & Yang, 2023)
2	BERT-SFT	0.88	
3	SecurityBERT	0.982	(Lestable & Thandi 2024)
4	BERT without PPFLE	0.51%	

Finally, the importance of such an application to cybersecurity analysts is that it could pave the way for enhanced threat detection, inconsistency identification, ensuring your systems stay secure, test industrial control systems documentation, identifying malicious messages, or phishing attempts. It also could empower professionals to make more accurate and predictive risk assessments, setting a new standard in fields like finance, insurance, and cybersecurity.

5. Conclusion

This research aimed to leverage the advanced capabilities of LLMs to detect suspicious data within text or files. It incorporated state-of-the-art machine learning models, specifically designed for sentiment analysis and sequence classification, to examine text for potential threats, inconsistencies, or suspicious patterns. The application's design reflects a simple integration of technologies aimed at enhancing threat detection in various sectors, including but not limited to

finance, insurance, cybersecurity, and industrial control systems documentation. Integrating LLMs for cybersecurity applications represents a significant advancement in the field, enabling more nuanced and sophisticated analyses of text data for threats or anomalies. This application simplified how AI and machine learning can empower professionals across various industries to make more accurate, predictive risk assessments, setting new standards for security and data analysis. By leveraging the collective strengths of DistilBERT and NLP Town's BERT-based models, the application offers a powerful tool for detecting suspicious patterns and sentiments in text, contributing to safer, more secure digital environments. This could also be explored further by integrating these models to more sophisticated systems. Overall, the application could guide to integrate the best LLM models to server as a valuable tool for cybersecurity analysts and network security analysts.

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Classifying Cambodia's Historical Sculpture using Deep Convolutional Neural Network Algorithm for AI application

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ABSTRACT

This research presents a pioneering approach to classifying Cambodia's historical sculptures using a Deep Convolutional Neural Network (DCNN) with Transfer Learning. Due to the absence of a readily available dataset, this study involved manually collecting and preparing over 2000 images from the Cambodia National Museum, categorized into 12 distinct classes. Utilizing the VGG-16 and EfficientNetB3 models, the project demonstrates the effective application of transfer learning to significantly enhance the model's capability to classify intricate sculpture images. This study contributes to the fields of digital cultural heritage and computer vision and provides a framework for leveraging deep learning technologies in the preservation and education of historical artifacts. Initial results are promising, with high accuracy achieved on both training and testing datasets. The findings show that while VGG-16 achieves around 80% accuracy even after fine-tuning, EfficientNetB3 exhibits nearly 99% accuracy before any fine-tuning.

Keywords: Artificial Intelligence, Machine Learning, CNN Algorithm, Cambodia's Sculpture Classification.

Introduction

Convolutional neural networks (CNNs) are deep learning algorithms that specialize in image recognition and analysis. CNNs take advantage of the spatial structure of image data to outperform traditional neural networks. Convolutional layers use filters, also known as kernels, that move through the image to extract basic features such as edges and shapes. As more filters are added, the network learns to recognize more complex patterns. Pooling layers help reduce the size of the data processed by the convolutional layers, thus reducing computational demands and highlighting key features. Max pooling is a technique used to extract the maximum value from a specified data region.

Fully connected layers function similarly to neurons in a traditional neural network. Each layer connects every neuron from one layer to every neuron in the subsequent layer. They utilize the features derived earlier to perform tasks such as classification(Goodfellow et al., 2016). A standard CNN typically consists of one or several blocks, each containing convolutional layers followed by sub-sampling layers. These blocks are followed by one or more fully connected layers, culminating in an output layer as depicted in Figure 1(Sultana et al., 2018).
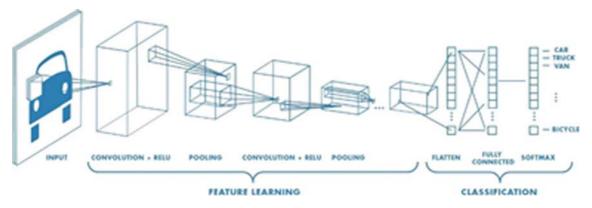
Figure 1 : Structure of CNN Model

After multiple layers of convolution and pooling, the data can then be flattened into a 1-dimensional vector and fed into traditional fully connected neural networks to further learn the weights that describe the data. At the final layer (usually called the output layer), the data is passed through an activation function, which takes the data from the previous layer as input and outputs the prediction.

Neural network classification tasks are split into two types: binary classification, which involves predicting whether data is or is not something, and multi-class classification, which determines which class (label) a piece of data belongs to from a given list of classes. Binary classification makes use of the Sigmoid activation function at the output layer, whereas multi-class classification uses the SoftMax activation function

LeCun et al., 1998, introduced a CNN model called LeNet-5 (see Figure 2) to classify handwritten digits, which consists of 7 trainable layers, Convolutional Layer (C1), C3 Layer (C5), Average Pooling Layer (S2), Fully Connected Layer (F6), Outcome Layer (EFC), and Sigmoid Function (Sigmoid). Before each pooling operation, the model introduces nonlinearity (Sultana et al., 2018).
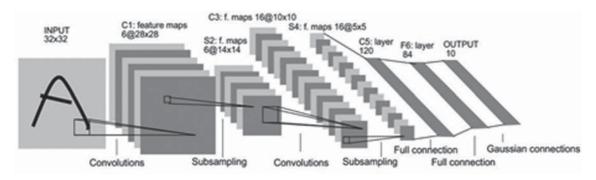
Figure 2 : Architecture of LeNet-5

Historical sculptures are evidence of past eras and provide invaluable information about artistic styles, cultural practices and social values. However, accurately classifying these sculptures according to period, genre or provenance often depends on the expertise of historians and art experts, a time-consuming and subjective process (Ghaleb et al., 2022) (Lecoutre et al., 2017). Traditional image classification tasks such as object recognition are simple, but semantic classification which involves interpreting the meaning or emotion behind an image – remains difficult due to its subjective nature. In art history and computing, the classification of sculpture/art styles has been notoriously difficult due to a semantic gap that reflects the difference between the complexity of art styles and the limitations of traditional methods of analysis (Sevak et al., 2017).

As Cambodia is a country with a very long history with relics and sculptures from centuries in the past as proof as well as serving as a cultural heritage that a lot of Cambodian are proud of; this project aims toward preserving that aspect of Cambodia's cultural inheritance through collecting and preserving those data and using them to potentially create an application that aids in learning more about these sculptures. This project could potentially be developed further and be deployed for museum & historical site visitor to learn more about Cambodia's sculptures.

In recent years, the rapid development of AI and ML has opened new opportunities to understand and interact with cultural heritage. Among the various applications, the classification of historical sculptures by artificial intelligence has emerged as a promising field of research, where the richness of ancient art is combined with the precision of modern technology. Historic sculptures that embody the cultural, religious and social ethos of their time present unique challenges and opportunities for digital classification systems (Fiorucci et al., 2020; Roberts & others, 2020).

This research focuses on the use of Convolutional Neural Networks (CNN), a class of deep neural networks most used for visual image analysis, to classify historical sculptures. Historical sculptures are not only artistic expressions, but also historical documents that provide insight into the past. But the diversity of style, material, decay, and contextual significance of these sculptures makes manual classification a daunting and highly specialized task.

The use of CNNs can help automate this process, making the vast number of historical sculptures more accessible and understandable to both experts and the public. The goal of this research is to develop a robust CNN model that can accurately classify images of historical sculptures. into predefined style categories based on origin, time, and other relevant characteristics. This involves collecting an extensive dataset, preparing this dataset for training, and carefully designing a neural network architecture adapted for this purpose. In addition, this research explores challenges related to the semantic gap—the relationship between isolated low-level features of artificial intelligence and high-level conceptual interpretations by human experts.

Related Work

Research carried out by (Cascone et al., 2023),examines the use of ML and computer vision methods to assist in the reconstruction of artwork at archaeological sites, particularly frescoes, paintings, and sculptures that have been damaged or fragmented. It introduces a dataset called CLEOPATRA, which contains frescoes from eleven different artistic styles ranging from antiquity to Surrealism. This dataset simulates the effects of artworks being fragmented due to disasters. The text explores the classification of these fragments into their correct pictorial styles using two different ML approaches. It also notes that the task of classifying the fragments becomes easier and the system's performance improves when fewer artistic periods are included. This study addresses the challenges and relevance of such technology in archaeological reconstructions **Figure 3.**

Figure 3 gathered by (Bengamra et al., 2024), it shows various images are organized in various datasets from for example, (Gonthier et al., 2022) applied Faster R-CNN is a deep learning model on PeopleArt, IconArt, Watercolor2k, Clipart1k, Comic2k and CASPA paintings. Also, (Smirnov & Eguizabal, 2018) carried out a study on Paintings WikiArt dataset, they applied VGG-19 (19-layer CNN capable of categorizing images into 1,000 different object categories). Their study showed architecture Artistic Style Transfer, Transfer learning, with training CNN models at AP50=82% accuracy.

Although the use of ML and Deep CNNs on classifying statues and sculptures have been introduced by other developers, there unfortunately has not been any other similar project that aims toward classifying Cambodia's sculptures and statues. Interesting research done by (Chatterjee et al., 2021) highlighted ideas like this project; their research aims to classify sculptures, statues, paintings, and other artwork to determine which culture they originated from. They also used Deep CNNs coupled with Transfer Learning for their task like this project does.

System Implementation and Evaluation

The proposed system is implemented primarily after collecting and organizing various images and videos of sculptures from the Cambodia National Museum. This is followed by data cleaning, image augmentation, the training process, and evaluation. Figure 4 illustrates the entire process of
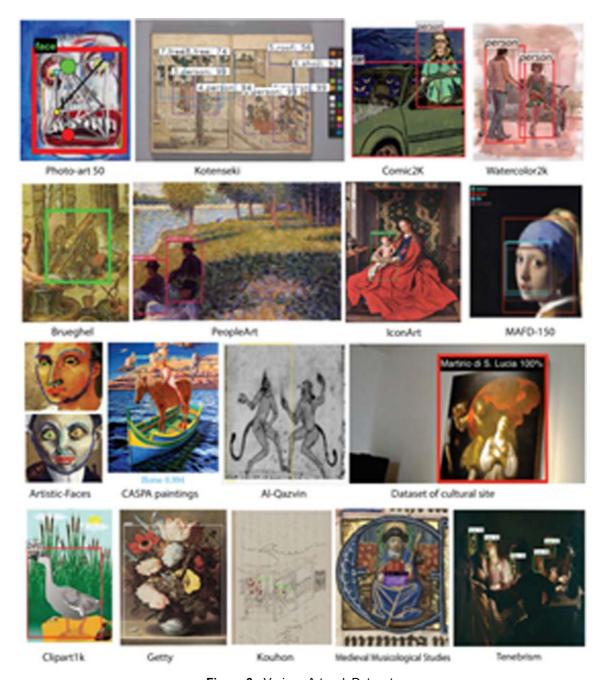
Figure 3 : Various Artwork Datasets
Images Applied into Several Detection and Classification AI Applications.

the proposed model, which explains the algorithms used for sculpture model creation and the main framework of the image classification webpage

Figure 4 : Proposed Model Algorithms

a. Data Collection

As there is virtually no available abundance of Cambodian sculpture dataset, this project would require us to collect all need data. Due to that, the scope of this project is limited to just classifying sculpture in the Cambodia National Museum. As a neural network requires a lot of data, taking hundreds of pictures of each sculpture in the museum is not a viable option. Therefore, taking video of each sculpture while moving around slightly and moving the camera from many different angles was the option. The taken videos are processed by capturing a certain amount of frame per second as images using Python application. By doing this and capturing 3 frames per second (this could be more), over 2000 sculptures images are collected in 11 different classes.

In addition to those 11 classes of data, an additional class was created and called 'unknown class' which contains random images of objects, sculptures, and statues that do not belong to 11 classes of sculptures. By doing this, the network can also learn which image does not belong to any class instead of blindly guessing that it belongs to a random class. As there is virtually no available abundance of Cambodian sculpture dataset, this project would require us the collect every data **Figure : 5**.

After organizing and labeling the images of each sculpture into their rightful class, the process of training the model was started where the dataset splatted into a training set and a hold-out cross validation set (testing). To ensure the quality of the training set data after splitting them as depicted above in Figure 5, Nine random training data taken from the training set.

Figure 5 : Sample of Classes of Sculptures from the Cambodia National Museum.

b. Image Augmentation

To increase the amount of data for training and testing, different techniques of image augmentation will be applied to the dataset to not only increase the variation in the Datas but also is a cheap way of getting more data. The image augmentation techniques used for this current model are Horizontal Flipping, Random Contrast, and Random Brightness **Figure : 6**.

The reason for choosing these 3 specific augmentation techniques is because it reflects the real-world usage where the light and contrast could differ depending on which device the image was captured on. The depict below in Figure 6 are the result of applying the augmentation technique on 1 training data image.
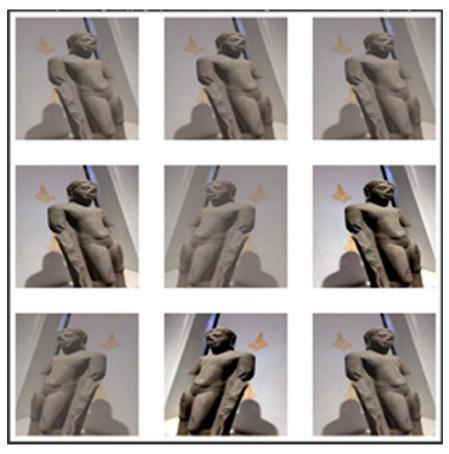
Figure 6 : Sculptures after Augmentation Technique
Applied on 1 Training Dataset Image

c. Result

As shown in depicts below in Figure 7, when using the VGG-16 model for this task, the loss value of both sets does not minimize close to 0 and the accuracy of the model can only achieve around 80% accuracy. Even after we fine tune the model further by unfreezing the earlier layer and training the model for a bit longer, the accuracy still fails to achieve an accuracy higher than 80% as reflected in Figure 8.

By contrast to VGG-16, as shown in Figure 9, the model trained on EfficientnetB3 reach close to 100% accuracy even without fine tuning and we can also see this reflected in the Cross Entropy loss value being slowly minimize close to 0 **Figure 9.**

After fine tuning the model further and training for over additional images and bigger set, the model achieves even better results as shown in **Figure 10.**
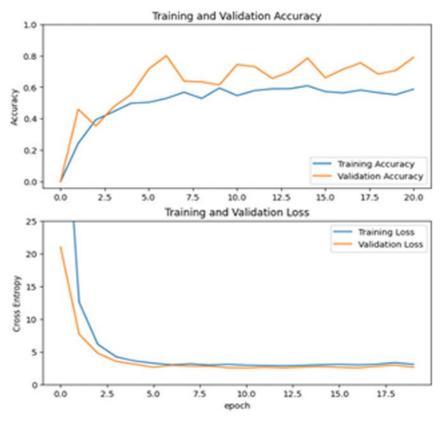
Figure 7 : Accuracy and Cross Entropy Loss value of
model transfer learning on VGG-16

Figure 8 : Accuracy of model transfer learning
on VGG-16 after fine tuning
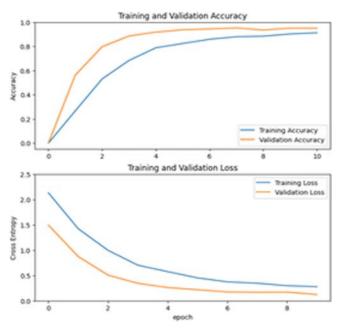
Figure 9: Accuracy and Cross Entropy Loss value of model transfer learning on EfficientnetB3
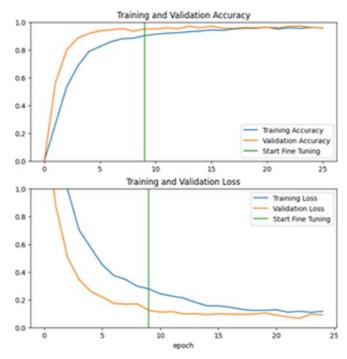
Figure 10 : Accuracy and Cross Entropy Loss value of model transfer learning on EfficientnetB3 after fine tuning

Although the model got a very high accuracy on both the training dataset and testing dataset, it still sometime misclassifies sculptures when the model is used on real world sculpture that the model has not seen yet. This case is more prevalent for sculpture belonging to one of the minority classes in the dataset as some classes have way less data than the other class. This is the current data distribution among all 12 class:

- Vishnu: 372, Shiva: 335, Lakshmi = 302, Buddha = 474, Lokeshvara = 107, Harihara = 94, Ganesha = 125, Brahma = 66, Jayavarman_VII = 77, Hanuman = 50, Monivong = 67, unknown = 225.

The VGG-16 model, despite its reputation in image classification tasks, exhibited limitations in this specific application, achieving only around 80% accuracy. The inability of the loss values to approach zero suggests that VGG-16 might struggle with the complexity or the unique features present in the dataset of historical sculptures. In stark contrast, EfficientNetB3 demonstrated remarkable performance, nearly reaching 100% accuracy without fine-tuning. This superior capability suggests that EfficientNetB3's architecture, known for scaling model dimensions through a compound coefficient, is better suited for handling the variances and intricate details in historical sculpture images. To mitigate the effects of imbalanced data, strategies such as image augmentation and advanced data generation techniques could be employed. These methods would enhance the diversity and volume of training samples for underrepresented classes, aiding in better model generalization. Moreover, this model can be further improving by either collecting more data of the minority class to balance the dataset the model is trained on or use different image augmentation and manipulation technique on the minority class to create a balanced dataset. Overall, the proposed model showed satisfied performance over the labeled sculptures, therefore it could work on real world data outside the dataset; but there could still be a lot of improvement in the compartment of the amount of data as well as the imbalanced distribution.

Conclusion

This paper contributes to the dissemination of these challenges in the field of digital humanities and provides a scalable and efficient solution for cataloging and researching historical artifacts. The implications of such advances extend beyond academic research and can strengthen the curation and education efforts of museums, academic institutions, and online platforms. By integrating CNNs into the rich field of historical sculptures, we aim not only to preserve cultural heritage, but also to enrich our understanding of history through technology.

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AI-Driven Wellness Interventions for Unlocking the Potential of Employee Engagement in the Era of Industrial 4.0

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ABSTRACT

Employee engagement (EE) is a critical global subject that impacts all the firms and, warrants attention due to its impact on corporate results. In the current era of Artificial Intelligence (AI) and Industrial 4.0, integrating human efforts with AI increases productivity and engagement, particularly in industries that have lagged in technological adoption. This study aims to explore the influence of AI-driven (AI) Wellness interventions on Employee Engagement (EE), focusing on the mediation impacts of Employee Well-being (EW) and Psychological Safety (PS), along with the moderating effects of Employee Experience (Exp). The findings demonstrated that AI-driven (AI) Wellness interventions dramatically influence Psychological Safety (PS), which positively improves Employee Engagement (EE). Employees who feel psychologically protected are more engaged, emphasizing the need of a supportive workplace. However, AI-driven programs had a negative direct impact on well-being, maybe due to initial resistance or stress associated with adjusting to new technologies. Despite this, well-being significantly predicted Employee Engagement (EE), emphasizing its importance. Furthermore, experienced employees which is moderating variable, benefited more from Psychological Safety (PS) and well-being interventions, which led to increased engagement. These findings highlight the importance of proper implementation and communication tactics to reduce resistance and enhance the advantages of AI-driven wellness interventions.

Keywords: *AI-Driven Wellness Programme (AI), Employee Engagement (EE), Psychological Safety (PS), Employee Well-Being (WE), Structural Equation Modelling (SEM)*

1. Introduction:

Business world today, is experiencing a profound transformation. Conventional work culture is constantly being redefined due to technological advancements, and rise in the flexible and remote work settings. This paradigm shift is influenced by the multigenerational workforce and growing

diversity (Sood, 2023). Likewise, the economic activities across globe, are greatly shaped by these changes in technologies. During the inception of 19th century, the industrial system, robots replaced human labor in major industries. Accordingly, the third revolution began in the 1970s with the advent of personal computers and the growing use of the internet at the workplace. An evolutionary change that started with the fourth generation made artificial intelligence (AI) the topic of the decade (Wang J, et al., 2023). According to (Shree. V and Krishnan L.R.K, 2023), the widespread use of AI is causing a transformation across various sectors, as we are moving from Industrial 4.0 to Industrial 5.0. This presents various prospects for the development of innovative products and associated disruptive technologies. Artificial Intelligence (AI) bear the capability to have significant impact on the employees' efficiency and overall business performance. IBM defines AI as, "the emulation of human intelligence in computers that are designed to think and behave like people". Artificial Intelligence (AI), a buzzword in current scenario, used across functional areas that enhance productivity at workplace, leading to achieve organizational goals.

Contrary, aligning employee behaviour and their efforts with organizational goals presents a significant challenge. AI-driven interventions at this juncture, are essential to comprehend these behavioural traits associated with Employee Engagement (EE). According to (Kruse, 2012), Employee Engagement (EE) is the phenomena associated with an employee's emotional attachment to the firm and their work, highlighting the significance of highly devoted workers who are interested in achieving organizational objectives. (Britto and Magesh, 2018) claimed, that employees devote a substantial portion of their life-time at workplace, that has an acute impact on their general wellbeing and productivity. In this context, HR-led well-being interventions enable organizations to effectively manage and uplift employee wellbeing, resulting in win-win situation for both employees and employers.

A comprehensive approach to Employee Well-being (EW) put out by (Ryan and Deci 2001), emphasized the importance of meeting fundamental Psychological Safety (PS) needs for both long-term well-being and productivity at work place. This idea motivates organizations to capitalize on the advantages of higher Employee Engagement (EE). (Edmondson 1999) opined that, in a fast-paced and frequently demanding work setting Psychological Safety (PS) allows workers to express themselves freely without worrying about the ramifications for their reputation, standing, or career. However, it reduces stress and anxiety brought on by possible interpersonal threats, this secure environment is crucial for promoting Employee Well-being (EW) and establishes conducive environment at workplace (Dutta, D. and Mishra, S.K. 2023). Psychological Safety (PS) has a direct impact on workers' psychological health by lowering anxiety levels and fostering a sense of belonging and support among team members. Employee burnout, disengagement, and other health issues are among the negative effects of job stress that are less likely to occur when workers feel psychologically safe. High levels of wellbeing require a sense of security, which is fostered by this setting (Carmeli et al. 2009). Thus, it is imperative to concentrate on Employee Well-being (EW)

through AI driven wellness interventions. AI has the potential to revolutionize on how employee approach their physical and mental health when used appropriately (Ryan & Deci, 2001).

Earlier, the evaluation of employee participation in wellness interventions and its outcome depended on self-reported data and manual data collection, which frequently leads to biases and mistakes. Accolades to Artificial Intelligence (AI), that organizations can now leverage sophisticated algorithms to examine data from a range of sources, such as digital platforms, wearables, and health monitors. AI is able to deliver insights in real time by tracking metrics including overall program engagement, target attainment, participation rates, and progress analytics. AI is redefining approaches to Employee Wellbeing (EW), going beyond general strategies to create tailored, data-driven solutions (Britto & Magesh, 2018). (Corporate Wellness Magazine, 2023) argues that AI-driven wellness interventions, provide the information of behavioural changes in employees through personalized health and psychological application platforms using data analytics. These information derived helps the organization to design mechanisms that lead to Employee Well-being (EW), monitoring the concerns of employees' Psychological Safety (PS).

Furthermore, the adoption of AI-powered wellness interventions can influence Psychological Safety (PS) by encouraging a culture of ongoing learning and flexibility. Psychological safety (PS), or the conviction that one can voice thoughts, queries, and worries without worrying about unfavourable outcomes, is essential for encouraging creativity and participation. By offering individualized care, early risk assessment, and mental health support, AI-driven wellness interventions can promote psychological safety and improve overall employee engagement and well-being. Positive AI-driven wellness interventions improve Psychological Safety (PS), and elevate Employee Engagement (EE). It makes psychological endeavours more satisfying and increases involvement and morale. An organization's commitment towards employees are shown by proactive approach to their well-being, which in turn influences Employee Engagement (EE) (Corporate Wellness Magazine). This article shows how AI-driven (AI) Wellness interventions boost Employee Well-being (EW) and Psychological safety (PS) with motto to increase Employee Engagement (EE) with individualised interventions to problems pertaining to Employee Well-being (EW)and Psychological safety (PS). It shows that wellness interventions driven by Artificial Intelligence (AI) increase Employee Engagement (EE).

2. Conceptual Framework and Hypothesis Development

2.1 AI-Driven (AI) Wellness Interventions increases Employee Engagement (EE) through Psychological Safety (PS) and Employee Well-Being (EW): In the context of AI-driven (AI) Wellness interventions, the rising importance of Artificial Intelligence (AI) in improving workplace culture is particularly significant in terms of higher Psychological Security (PS) and Employee Engagement (EE). Psychological safety (PS), defined as a common impression that the workplace is safe for taking interpersonal risks, is a significant element influencing Employee Engagement (EE). AI-driven (AI) Wellness interventions use advanced

algorithms and data analytics to provide real-time stress monitoring, mental health support, and personalised health and wellness suggestions. All of these components meet the Employee Well-being (EW) needs of the employees while at the same time creating an organizational culture that is receptive for the Employees feel Psychologically Safe. As noted by (Lee et al. 2022) AI Wellness interventions enhance the level of Psychological Safety (PS) by granting employees 24/7 company-paid access to councillors or therapist without the need to disclose sensitive information to others within the organization. As found, Employee Engagement (EE) rises when they believe their organisations are supportive and appreciative. Additionally, since the AI-driven (AI) interventions also have the feature of generating trends as well as insights, the managers can make wise decisions regarding the Employee Well-being (EW) during their work tenure. (Zhang et al. 2023) revealed that organisations that implemented AI-Wellness platforms experienced increased Employee Engagement (EE) levels because of improved Psychological Safety (PS) arising from prevention and wellness promotion and targeted support. It is therefore easier to get employees to work to the best of their ability when they are convinced that their employer values their health.

In addition, AI- Driven (AI) Wellness interventions are positively correlated Employee Engagement (EE), a favourable construct or index that quantifies the emotional attachment that employees possess for their organization. (Arora, A. and Rahman, Z 2020) also establishes that, using Artificial Intelligence in the delivery of interventions, it personalises the environment thus enhancing the Employee Engagement (EE). Use of AI-Driven (AI) Wellness interventions implies constant supervision and short response time, thus enabling stress identification as well as response. Moreover, a considerable part concerned the intervention by artificial intelligence in Psychological Safety (PS), stating the extent to which a person can say or express an idea with no consequences. Psychological safety (PS) is crucial to grow competent and enthusiastic employees (Edmondson, A.C., and Lei, Z. 2014). Self-care technologies that are powered by AI Interventions play a crucial role in determining the Employee Well-being (EW) – which encompasses psychological, spiritual, as well as physical well-being. From the study conducted by ((Grawitch, M. J., et al. 2006), it was identified that Employee Well-being (EW) is a strong predictor of engagement. AI Wellness interventions improve EW through offering online Wellness coaching, individualized health consultations an AI-Chatbot mental health support. Thus, the studies show that the levels of self-organised Employee Engagement (EE) with the company and their job are enhanced when personalised therapies guarantee that they get the necessary assistance to preserve their health. In the work of (Wang, S. , & Huang, H. 2020), it was noted that AI-Driven (AI) Wellness Interventions can be used to enhance Well-being by checking on trends in employees' behavior and Health data to address any issues before they occur while at the same time boosting engagement. Altogether, AI-coded (AI) approach to wellness impacts Employee Well-being (EW) and engagement ratio positively. AI technology may significantly enhance Employees' Well-being (EW) by customising support, prevention and early promotion, and timely feedback. According to literature, the following hypothesis were developed.

Hypothesis 1 - AI Driven (AI) Wellness Interventions lead to higher Employee Engagement (EE) via Psychological Safety (PS).

Hypothesis 2 - AI Driven (AI) Wellness Interventions foster higher Employee Engagement (EE) via Psychological Safety (PS) and Employee Well-Being (EW)

Hypothesis 3 - AI Driven (AI) Wellness Interventions influence higher Employee Engagement (EE) through Employee Well-Being (EW)

2.2 AI Driven (AI) Wellness Interventions has direct influence on Employee Engagement (EE):-

AI-driven wellness Interventions are crucial for promoting employee engagement, according to (Core Health Marketing 2023), AI systems are capable of analysing large amounts of data to customize wellness initiatives, demonstrating a company's concern for the welfare of its workers. According to (Chen, I. H., et.al 2019), employees can effectively manage their health with the help of AI's real-time feedback and support. AI-driven timely interventions encourage participation in wellness initiatives and encourage healthier lifestyle choices (Hewitt, Aon 2017). Additionally, proactive approaches that anticipate and meet workers' needs are made possible by AI's predictive capabilities, which lower healthcare expenditures and absenteeism (Sofia, et.al 2023). AI integration into wellness programs has the potential to improve worker engagement through real-time support, intervention personalization, and proactive well-being promotion.

Hypothesis 4 - AI Driven (AI) Wellness Interventions directly increase Employee Engagement (EE)

2.3 Employee Experience as Moderator:-

The notion of Employee Experience (Exp) has been gaining a lot of attention in organizational culture recently, especially as a moderating factor affecting important workplace dimensions viz., Psychological Safety (PS), Employee Well-being (EW) and Employee Engagement (EE). Studies reveal a favorable correlation between enhanced Employee Well-being (EW) and a high degree of Psychological Safety (PS), as it mitigates stress and anxiety while fostering a sense of acceptance and inner tranquillity. However, Employee Experience (Exp) has the potential to dramatically limit the degree to which Psychological Safety (PS) affects Employee Well-being (EW). Experienced employees are more likely to benefit than less experienced, because they understand organizational norms better and have higher levels of self-efficacy to manage any situations and turbulence occurred. Also, due to their superior ability to use a psychologically secure setting to improve their well-being via skilful problem-solving and communication (Edmondson, A. C., and Lei, Z. 2014). Likewise, Taking care of the employee's physical, mental, and, most importantly, emotional aspects is critical to maintain the sustainable level of engagement. To this, it is observed that engaged employees are those, who show the higher level of enthusiasm and energy along with their loyalty to their job. This relationship is rendered even more precise by the moderating variable Employee Experience (Exp). This is so because they are in a better

position to utilise Well-being for upswing and boost of engagement levels by virtue of better ability to cope with stressors, better understanding of the organisational environment and thus foster a firmer sense of organisational calling. On the other hand, the lower level of engagement may be attributed to the fact that less developed savants fail to optimise their Well-being in order to foster engagement due to the fact that they may be still privileges to the dynamics of functioning environment and tasks requirements (Bakker, A. B. , et al. , 2008; Schaufeli et al. , 2002). Generally, Experience greatly moderates the interaction between the variables Psychological Safety (PS) and Employee Well-being (EW), and to a lesser extent, between Employee Well-being (EW) and Employee Engagement (EW). The need for application of the difference in experience on organisational processes is underlined by the complexity of these relations, as a result of which the approach explores the enhancement of Psychological Safety (PS) and health as well as the level of engagement in work. The following hypothesis for the moderating effect was formulated in light of the literature under discussion:

2.3.1 Hypothesis-5. There is a moderating effect of the Employee Experience (Exp) on the path of Psychological Safety (PS) to Employee Well-Being (EW)

2.3.2 Hypothesis-6. There is a moderating effect of the Employee Experience (Exp) on the path of Employee Well-Being (EW) to Employee Engagement (EE)

3. Research Methodology

The research method employed in this study was to examine the relationship between AI-Driven (AI) Wellness interventions towards Employee Engagement (EE) with regards to the role of Psychological Safety (PS) and Employee Well-being (EW) as mediation, while being moderated by Employee Experience (Exp). To test this notion, a quantitative technique was used, combining structural equation modelling (SEM) with SmartPLS 4.0. The current study used a sample size of 400 employees (Wang, J., et al. 2023) chosen from the Pharma clusters in the state of Karnataka, INDIA (from Medium and Large Scale only). Research adopted Purposive sampling to choose individuals, actively involved in the wellness program for last six months (November 2023 to April 2024). Self-administered questionnaires were used to collect data and measure dimensions viz., AI-Driven (AI) Wellness interventions, Employee Well-being (EW), Psychological Safety (PS), Employee Engagement (EE), Employee Experience (Exp) as moderator. Validity and Reliability test were conducted, along with Blind fold analysis that assess the predictive relevance of the model. Additionally, IPMA provides an insight into the significant construct and their performance in relation to Employee Engagement (EE). Lastly, PLS Predict was approached to evaluate the out of sample predict power.

3.1 Study Area:- Table - 1

Table - 1: Pharma Cluster in the State of Karnataka, INDIA

Pharma Cluster	Micro	Small	Medium*	Large*
Bengaluru Rural & Urban	6	10	24	10
Hassan	1	5	8	0
Nanjangud, Mysuru	3	13	27	7
Bidar	0	3	17	5
Yadgir	0	2	8	0
Total	10	33	84	17

Source:- *Survey of Pharma Clusters, Govt of India, Department of Pharmaceuticals. * Clusters covered under study*

3.2 AI-driven wellness initiative platform*:-

Based on the research conducted at different Pharma clusters, following were most prominent AI-Driven Wellness Platforms and activities that were followed to enhance Employee participation and Engagement.

AI designed Wellness Platform- This platform uses cutting-edge AI algorithms (hourly basis and day-wise) through wearables (googles, watch-o-meter) to evaluate each user's health information (fatigue level and understand employees tiredness through frequency of eye blinking and pulse rate/hour) and provide tailored information to councillors and wellness advice to staff members. The program's main objectives are to support physical and mental health, stress reduction, and good lifestyle choices.

AI Fitness Challenge- It makes use of AI technology to create personalized workout tasks premised on the interests, fitness levels of its employees and type of his task at organizations. The software facilitates a sense of solidarity and involvement by providing real-time feedback, tracking participants' progress, and encouraging peer support.

AI Powered Mental Health Program- It offers employees private mental health help using sentiment analysis tools and Chabot's driven by AI. In an effort to lower stress and enhance general wellbeing, the program provides access to expert counsellors, mindfulness exercises, and customized coping mechanisms.

> **AI Designed Nutrition Program-** This platform provides individualized meal planning and dietary recommendations by using AI algorithms to analyse the eating habits and nutritional requirements of its employees. The program's objectives are to battle lifestyle-related disorders including diabetes and obesity and to encourage good eating habits.

> **AI Stress Management –** It uses AI-powered meditation and mindfulness practices to support workers in improving their resilience and stress management. The program offers resources for cognitive-behavioural therapy, stress-relieving exercises, and guided meditation sessions.

* Information of how AI Platforms functions and results arriving out of it. Detailing (Platform name and its mechanism) is subject to Non-Disclosure agreement.

3.3 Questionnaire Structure Summary

- **Demographic Information**
  - Age
  - Gender
  - Education Level
  - Years of Experience
  - Job Roles

- **AI-driven Wellness Interventions**
  - Usage and Awareness
  - Perceived Effectiveness (Ease of Use)
  - Frequency of Use (Degree)
  - Satisfaction with AI-driven (AI) Tools

- **Psychological Safety**
  - Support and Trust in the Workplace
  - Ability to Speak Up Without Fear
  - Perception of Organizational Support

- **Employee Well-being**
  - Physical Health
  - Mental Health
  - Work-Life Balance (WLB)
  - Stress Levels

- **Employee Engagement**
  - Overall Job Satisfaction
  - Commitment towards Organization
  - Enthusiasm and Motivation
  - Recognition and Perceived Value

3.4 Analysis and Interpretation

Table - 2: Demographic variables

Parameter	N	Percentage
Age		
20 to 30 years	100	25.00%
31 to 40 years	140	35.00%
41 to 50 years	100	25.00%
51 to 60 years	60	15.00%
Gender		
Male	256	64.00%
Female	144	36.00%
Education Level		
High School	40	10.00%
Bachelor Degree	200	50.00%
Master Degree	120	30.00%
Doctorate	40	10.00%
Years of Experience		
Less than 5 years	49	12.25%
5-10 years	193	48.25%
More than 10 years	158	39.50%
Job Roles		
Administrative	80	20.00%

Technical (Lab)	160	40.00%
Managerial	120	30.00%
Other*	40	10.00%

*Source: Field Survey. * denotes employees working on data compilation and entries.*

A thorough perspective of the group that was surveyed is provided by the sample for the study that is shown in table 2. This sample exhibits a wide range of demographic characteristics, including gender, age, level of education, years of experience, and work positions. The distribution of ages indicates that the major of the participants are in the age range of 31 to 40 years (35%), followed by those aged 20 to 30 years (25%), and then those aged 41 to 50 years (25%). A smaller segment of participants is in the age range of 51 to 60 years (15%). The sample is significantly skewed in terms of gender representation, with men making up 64% of the sample and females making up 36% of the sample. There is a wide range of educational attainment among the participants, with 50% of them possessing a Bachelor's degree, 30% holding a Master's degree, 10% holding a Doctorate, and 10% holding high school credential. According to the statistics about years of experience, over half of the respondents have between 5 to 10 years of experience (48.25 percent), while those with more than 10 years of experience account for 39.5% of the total, and those with less than 5 years of experience make up 12.25 percent. There is a substantial presence in management (30%) and administrative positions (20%), and a smaller number in other roles (10%). On the other hand, the majority of job roles are technical, which accounts for (40%) of the total. The participants came from a wide range of different backgrounds, as is shown in this full demographic profile. This provides a significant context for analysing the results and implications of the research.

Table - 3: Descriptive statistics

Variable	Mean	Standard Deviation	Minimum	Maximum	Median	Skewness	Kurtosis
AI	2.40	0.60	1	3	2.50	-0.35	-1.20
PS	3.80	0.80	1	5	4.00	-0.45	-0.85
EW	3.50	0.70	1	5	3.60	-0.40	-0.90
EE	3.20	0.90	1	5	3.30	-0.55	-0.75
Exp	2.10	0.50	1	3	2.20	-0.30	-1.10

Source: Data analysis

Table 3 insights on the overview of dispersion and central tendency of gathered data through Descriptive statistics. Although responses vary within a moderate range (1 to 3), the mean score for AI-driven (AI) Wellness interventions is 2.4 (SD = 0.6), indicating a generally good opinion among employees. With a mean score of 3.8 (SD = 0.8) for Psychological Safety (PS), employees usually feel safe in terms of their psychological well-being, however there is some variation (range: 1 to 5). With responses ranging from 1 to 5, Employee Well-being (EW) indicates a mean of 3.5 (SD = 0.7), indicating generally good well-being. The mean score for Employee Engagement (EE) is 3.2 (SD = 0.9), which indicates moderate engagement but notable response variability. Lastly, the mean value of Employee Experience (Exp) is 2.1 (SD = 0.5), indicating that employees have a moderate amount of experience, with responses falling between 1 and 3. These figures show that opinions on AI-driven wellness programs, psychological safety, well-being, and employee engagement are generally favorable but vary, which emphasizes the need for more research to determine the variables affecting these opinions.

Table - 4: Reliability and Validity Analysis

	Cronbach's alpha	Composite reliability(rho_a)	Composite reliability(rho_c)	Average varianceextracted (AVE)
AI	0.83	0.80	0.95	0.58
EE	0.81	0.85	0.96	0.57
PS	0.75	0.79	0.95	0.53
EW	0.78	0.82	0.95	0.55

Source: Data analysis

Table 4 revealed the consistency of the constructs evaluated during the study is evaluated by reliability analysis. With a Composite Reliability (CR) of.87 and a Cronbach's alpha of.83, the AI-Driven (AI) Wellness Intervention construct appears to have good internal consistency. The extent of internal consistency for the measures used in this study can be regarded satisfactory with the Cronbach's alpha amounting to 0.75 and a CR of 0.79, A study has brought out the fact that Psychological Safety (PS) has good reliability. This study has a Cronbach's alpha of 0.78 and a Cronbach's CR of 0.82, Employee Well-being (EW) has been validated for internal reliability and internal consistency. Reliability is supported by Cronbach's alpha (0.81) and Cronbach's ratio (0.85 for EE) of the engagement construct. Thus, these reliability measures corroborating the idea that the study's constructs are adequately and stably measured may serve as a wellspring for future investigation (Nunnally, J. C. , & Bernstein, I. H. 1994). Construct validity assures confirmation that the concept measures in a given study depict the ideas that they are intended to measure. AVE

that stands for Average Variance Extracted method is used for the determination of convergent validity. The AVEs for the AI construct, Psychological Safety (PS), Employee Well-being (EW) and for EE =0.58, 0.53, 0.58, 0.55, and 0.57 respectively.
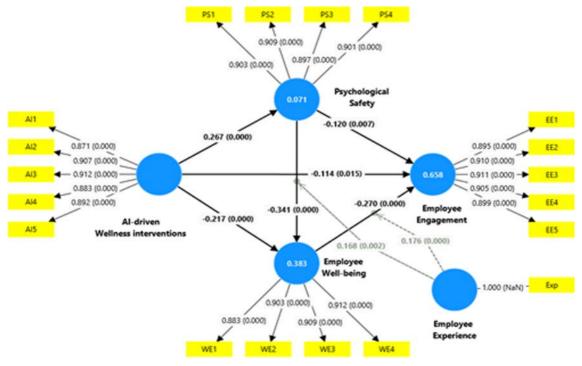
Figure 1 : Path analysis

Source: Data analysis

Table - 5: Fornell & Larcker and HTMT

Construct	AI	PS	WE	EE
AI	0.76	0.58	0.47	0.41
PS	0.65	0.73	0.52	0.49
EW	0.55	0.60	0.74	0.61
EE	0.50	0.57	0.70	0.75
Values below the diagonal are Fornell-Larcker criterion, above the diagonal are HTMT ration and diagonal are square root of AVE values.				

Source: Data analysis

The Heterotrait-Monotrait (HTMT) ratio and the Fornell-Larcker criterion are other tests used in assessing discriminant validity and these are presented in table 5. The findings indicate that the constructs satisfy the HTMT ratios being less than 0.85, which indicates adequate discriminant validity, and that the constructs also match the Fornell-Larcker criterion. These results guarantee the constructs' uniqueness and ensure that they assess the intended constructions effectively (Henseler, Ringle, & Sarstedt, 2015).

Table - 6: Path Coefficients

Path	Path Coefficient (β)	Sample Mean (M)	Standard Deviation (STDEV)	T-Statistic	p-value
AI -> PS	0.267	0.268	0.049	5.465	0.000
PS -> EE	0.071	0.072	0.026	2.445	0.014
PS -> EW	-0.120	-0.121	0.035	3.432	0.001
EW -> EE	0.658	0.659	0.043	15.302	0.000
AI -> EE	-0.114	-0.115	0.047	2.443	0.015
Exp * PS -> EW	0.168	0.169	0.042	3.987	0.002
Exp * EW -> EE	0.176	0.177	0.045	3.911	0.000

Source: Data analysis

The path coefficients derived from the PLS-SEM analysis shed light on the direction and intensity of the correlations between the study's constructs is highlighted in Table 6. Both the path from PS to EE (β =.071, p =.007) and the path from AI to PS (β =.267, p <.001) are significant. Significant connections can be shown in the pathways from AI to PS to EW to EE, suggesting that AI-driven wellness initiatives affect worker engagement by promoting psychological safety and wellbeing. There is a significant but negative direct path (β = -.114, p =.015) from AI to EE. Experience moderates the connections between PS and EW (β =.168, p =.002) and between EW and EE (â =.176, p <.001), according to interaction effects. These findings validate theories and highlight the intricate connections between psychological safety, well-being, experience, employee engagement, and AI-driven wellness programs (Chin, 1998).

4.1 Bootstrapping Results

The path coefficients' significance levels and confidence intervals are provided by the bootstrapping findings. It is established that there is a path from AI to PS (β =.267, t = 5.465, p <.001), and there is also a substantial path from PS to EE (β =.071, t = 2.445, p =.014). Additionally

noteworthy are the routes from PS to EW (β = -.120, t = 3.432, p =.001) and from EW to EE (β =.658, t = 15.302, p <.001). There is a substantial direct path (β = -.114, t = 2.443, p =.015) from AI to EE. Experience has substantial interaction effects on the routes from PS to EW (β =.168, t = 3.987, p =.002) and from EW to EE (β =.176, t = 3.911, p <.001). These findings support the suggested model and the route coefficients' resilience (Hair, Hult, Ringle, & Sarstedt, 2017).

Table - 7: Blindfolding Analysis

Construct	SSO	SSE	Q² (= 1 - SSE/SSO)
AI	2000	2000	0.000
PS	2000	947.4	0.526
EW	1600	1128.2	0.295
EE	2000	947.4	0.526

Source: Data analysis

Using Q^2 values, blindfolding analysis from the Table 7 evaluates the model's predictive significance. PS has a Q² rating of.526—a strong indicator of predictive relevance. With a Q^2 value of.295 for EW, modest predictive significance is indicated. With a Q² value of.526 for EE, substantial predictive significance is indicated. These findings validate the robustness and utility of the model by showing that it has strong predictive relevance for PS, EW and EE (Geisser, 1974; Stone, 1974).

Table - 8 : IPMA Analysis

Construct	Importance (Total Effects)	Performance (Index Values)
AI	0.267	70
PS	0.451	80
EW	0.658	75
Exp	0.176	90

Source: Data analysis

The Importance-Performance Map Analysis (IPMA) offers valuable perspectives on the significance and efficacy of diverse dimensions concerning Employee Engagement (EE) through Table 8. Although the AI construct has a low direct importance (β = -.114), it has a large impact on PS and EW. For increasing engagement, PS has a high value (β =.267), while EW has a high positive importance (β =.658). Experience modifies the effects of PS and EW on EE to a very high

degree (β =.913959). As it was stated by (Hair, J. F. 2017) these findings highlighted those factors more important to focus on in order to enhance EE. In particular, these put an emphasis on the nature of AI-Driven (AI) Wellness interventions, with the focus on PS, EW, and Exp being of critical significance.

Table - 9: PLS Predict/CVPAT Analysis

	Q²predict	**RMSE**	**MAE**
EE	0.628	0.612	0.428
EW	0.299	0.841	0.658
PS	0.065	0.971	0.858

Source: Data analysis

This measure of PLS Predict method indicated in the table 9, assess the performance of prediction of the model to surpass the data sample. It exhibits that it has a good predictive bearing with Employee Engagement (EE) in the Q2 predict value of 0. 628 and RMSE desirability index of 0. 612 and MAE of 0. 428 represents the dependability and accuracy of the model. Employee Well-Being (EW) constructed moderate predictive capability with the Q2 predict value of 0. 299. Also, model has slightly higher RMSE of 0. 841 and MAE of 0. 658, which can be considered medium accuracy. The same is valid for Performance Satisfaction (PS) that has a Q2 predict value of 0 for the selected QS. 065 and was followed by the models with the highest RMSE (0. 971) and MAE (0. 858) values that point to the lower level of accuracy of the projections. In this study, a high accuracy of predicting EE has been demonstrated, a reasonable accuracy in predicting EW while the PS prediction could be improved. (Shmueli, Ray, Estrada, and Chatla 2016).

Table - 10 : Hypothesis analysis

Hypothesis	**Path**	**Path Coefficient (β)**	**Standard Error (SE)**	**T-Value**	**p-Value**	**Result**
H1: AI-driven wellness program -> Psychological Safety -> EE	AI -> PS -> EE	0.019	0.007	2.714	0.007	Supported

Hypothesis	Path	Path Coefficient (β)	Standard Error (SE)	T-Value	p-Value	Result
H2: AI-driven wellness program -> PS -> WE -> EE	AI -> PS -> WE -> EE	0.236	0.031	7.613	0.000	Supported
H3: AI-driven wellness program -> WE -> EE	AI -> WE -> EE	0.367	0.035	10.486	0.000	Supported
H4: AI-driven wellness program -> EE	AI -> EE	-0.114	0.047	2.443	0.015	Supported
H5: Experience moderates PS -> WE	Exp * PS -> WE	0.168	0.042	3.987	0.002	Supported
H6: Experience moderates WE -> EE	Exp * WE -> EE	0.176	0.045	3.911	0.000	Supported

Source: Data analysis

Hypothesis 1: Moreover, in the course of the study, it was possible to find out that there is a moderate positive correlation between the rate of AI- Driven (AI) Wellness interventions and Psychological Safety (PS). The path coefficient from AI to PS was 0 as depicted below 0. 267 with a p < 0. 001. Another indication in favour of the observed substantial positive impact of PS on EE is affirmed by the route coefficient between the two variables, which is 0. 071 with the p- value of the test being 0. 007. Based on the analysis, the implementation of AI-driven (AI) Wellness interventions increases the Employees' Experience of Psychological Safety (PS) by a good margin.

As a result, PS has a relationship that with Employee Engagement (EE) is positive. This means that when people feel safe to engage, due to PS that is as a result of AI Wellness (AI) interventions, then EE goes up. AI Wellness (AI) interventions give a fair, friendly and safe ambiance by forwarding individual help, suitable resources and encourage employees to speak out. Higher level of Psychological Safety (PS) contributes to higher level of participation because people feel that their efforts are valued and they are protected in an organization. EE is positively associated with levels of job commitment, performance and also had an impact of reduction on turnover. (Waardenburg, L. 2024; Vakira, E., et. al (2023).

Hypothesis 2: The indirect effects of Artificial Intelligence (AI) to Psychological Safety (PS), and Employee Well-being (EW) to Employee Engagement (EE) was not found statistically significant. The level of mechanization was 0.267 ($p < 0.001$), -0.120 ($p = 0.007$), and 0.658 ($p < 0.001$), Comparisons of the three subgroups are presented in Table 4. AI-Driven (AI) Wellness (AI) interventions dramatically improve Psychological Safety (PS), which is detrimental to overall Wellbeing. Nonetheless, Employee Engagement (EE) is highly and favourably influenced by Employee Well-being (EW). This suggests a complex relationship in which Psychological Safety (PS) is enhanced by AI-driven (AI) interventions, potentially at the expense of well-being, yet well-being as a whole greatly increases engagement. AI-driven (AI) Wellness interventions boost Psychological Safety (PS), which might occasionally cause a sense of tension because of elevated awareness and altered work environments. However, a key factor in raising Employee Engagement (EE) is general well-being, which may be aided by other wellness interventions components. This emphasizes how crucial it is to strike a balance between the many components of wellness interventions in order to make sure they effectively promote Psychological Safety (PS) and Employee Well-being (EW), which in turn increases participation (Mer, A. and Srivastava, A. 2023; Wang, W., Chen, L., Xiong, M. et al. 2023).

Hypothesis 3: Path coefficients from AI to EW and EW to EE were -0.217 ($p < 0.001$) and 0.658 ($p < 0.001$), respectively. Which indicates that Employee Well-being (EW) has a large and beneficial influence on Employee Engagement (EE), AI-driven (AI) wellness interventions have a considerable detrimental impact on Employee Well-being (EW). This implies that although AI-driven wellness programs may have a negative initial impact on well-being, they will ultimately have a beneficial effect on engagement through well-being. The modifications and alterations brought about by AI-driven systems may be the cause of the first detrimental effect on wellbeing. But when workers adjust and gain from the all-encompassing assistance offered by these programs, their wellbeing increases, which raises engagement levels. This emphasizes how crucial it is for organizations to successfully oversee the transitional period and offer ongoing assistance in order to improve general participation and well-being (Banerjee,.S et.al 2024).

Hypothesis 4: A substantial but negative direct effect was shown by the direct path coefficient from AI to EE, which was -0.114 with a p-value of 0.015. AI-driven (AI) wellness interventions

have a strong but unfavourable direct correlation with employee engagement. This shows that although AI-driven wellness interventions may enhance engagement indirectly through other aspects such as psychological safety and well-being, employees may not see their direct effects favourably. Concerns about data privacy, early resistance to change, or perceived intrusion by AI technologies could all be contributing factors to the negative direct effect. In order to reduce unfavourable opinions and raise employee engagement levels, it emphasizes how crucial it is to address these worries and successfully explain the advantages of AI-driven wellness programs to employees (Balcombe L. 2023).

Hypothesis 5: Path coefficient of 0.168 (p = 0.002) indicates a substantial interaction impact of experience on the path from PS to EW. The relations between Psychological Safety (PS) and Employee Wellbeing (EW) is substantially moderated by Employee Experience (Exp). This suggests that for employees with greater experience, the benefits of PS on EW are amplified. AI offer PS that seasoned employees may be better able to take advantage of, improving overall EW. Experience seems to boost the efficacy of wellness programs, which emphasizes the necessity for focused tactics that take Employee Experience (Exp) levels into account to get the most out of these initiatives (Liu, X.; Huang, Y.; Kim, J.; Na, S. 2023)

Hypothesis 6: With a path coefficient of 0.176 (p < 0.001), experience had a substantial interaction effect on the path from EW to EE. In this study, the rationale is that the any feature of the Employee Experience (Exp) has direct and moderating effects on the Employee Engagement (EE) and the Employee Well-being (EW). This imply by so doing employees with higher levels of skills have better appreciation of their enhanced wellbeing that reflects in their engagement. Other Employees with work experience (Exp) understand the importance of well-being and are likely to endorse the wellness interventions towards higher engagement. This makes the consideration of Employee Experience (Exp) in the design and implementation of Wellness interventions to enhance the optimisation of impact minimal (Nawaz, N. , et. al 2023).

4. Discussion

A wealth of emerging understanding of the relationships between AI Wellness (AI) interventions and the theoretical construct – EE – with EE being dependent on 'Exp, PS, and EW. First, as part of the Wellness interventions aided by Artificial Intelligence (AI), the degree of PS was boosted leading to a positive impact on EE. This shows that employees are more willing to have interest with their work if they experienced Psychological Safety (PS), and thus an importance for Corbett to build a good working environment. On the other hand, positive perceptions were recorded in 'AI-Driven' (AI) with significant negative impacts to 'Employee Wellbeing' (EW) even as it enhanced 'Psychological Safety' (PS). A more probable explanation might be that resistance either was an issue at the beginning of the change process, or that adapting to new technology can create a strain. However, well-being was found to be a substantial predictor of Employee Engagement (EE), indicating the importance of total Employee Well-being (EW) in promoting engagement.

Additionally, it was clear that experience had a moderating effect; more seasoned workers benefited from Psychological Safety (PS) and well-being interventions, which raised engagement levels. The literature that already exists and highlights the significance of PS and EW in the workplace, which is also supported and expanded upon by our findings. Nonetheless, the evident adverse effect of AI- AI-driven (AI) Wellness interventions on participation implies the necessity for cautious execution and effective communication tactics to address possible opposition. Future studies should examine the long-term impacts of AI-driven interventions on engagement and well-being while taking the early adjustment time into account. The aforementioned results offer significant perspectives for establishments seeking to execute AI-based wellness campaigns, stressing the significance of attending to staff grievances and cultivating a nurturing atmosphere to optimize the advantages of those efforts.

The research revealed that Employee Engagement (EE) through Psychological Safety (PS), Employee Well-being (EW), and AI-driven Wellness interventions are linked, with Employee Experience (Exp) moderating the relationship. The findings shed lights on the multifaceted influence of AI-driven (AI) Wellness interventions on Employee Well-being (EW. They consider the moderating effect of Employee Experience (Exp) and emphasise the significance of the Psychological Safety (PS) and Employee Well-being (EW). Effectively implementing and communication, remain the most critical factors necessary for increasing workplace acceptance and the benefits derived through AI-driven (AI) Wellness Interventions. Future studies would then be conducted to analyse and establish these dynamics, especially in using AI technology in wellness programs and their long-term study or longitudinal research effects and early acclimatization.

5. Practical Implication:

AI-Driven (AI) Wellness Interventions have a positive and efficient impact with Psychological Safety (PS) to enhance the organisation's culture. An implementation of these interventions should be able offer more strength to the culture of the work environment and this will call for more trust, more open communication and more risks taking by the employees in their relationships. AI does not directly favour EE, but contributes positively to it by an improvement of PS as well as EW. Such domino effect can be used by organisations to encourage Employee Engagement (EE) aware that it leads to increased productivity not forgetting far better Employee retention rates.

Based on the proposed relationship between Exp, PS, EW, and EE, it is suggested that employers modify their wellness programmes for the purpose of responding to the varied levels of involvement and experience of the employees. Thus, it is important to employ a set of strategies to properly fulfil the demands of employees in different stages of their experience since it can be presupposed that employees with longer service may be provided additional bonuses. AI interventions to be used with intent in particular areas such as wellness initiatives because its impact is concrete and adverse to engagement and well-being of employees. Organisations should pay precedence to clearer and more unambiguous descriptions of the advantages of such endeavours assurances regarding privacy

issues and overwhelming support during the transition phase in order to ensure that resistance at the beginning of such change initiatives is kept to a minimum. This paper supports the integration of health strategies because Employee Well-being (EW) has a favourable impact on the level of Employee Engagement (EE). Instead of having AI interventions as a standalone program, they should redesign and develop the existing wellness approaches thus being able to confront and address multifaceted employee issues, hence producing a holistic and comprehensive interventions towards their health, happiness and overall wellbeing, hence leading to better performance for organisations.

6. Potential Limitations:

The analysis of the results in this research represents that AI-Driven (AI) Wellness interventions has a small negative impact on the EW and EE thus making it clear that there is early boundaries towards the wellness interventions' efficacy. Data indicates that organizations and its mechanism requires adequate resources to effectively manage the employees' during transition phase. In addition, the interconnection of results related to use of AI Interventions, Psychological Safety (PS), Employee Well-being (EW), and Employee Engagement (EE) is intricate, which makes it difficult to forecast and control the results connected with the characteristics of these factors. These interrelated characteristics may be hard for organisations to achieve a balance between, which could harm the initiatives. Moreover, the moderating role of Employee Experience (Exp) seems to show that there may be a blind spot in the effectiveness of the AI-driven (AI) Wellness interventions for various categories of employees. Due to the potential of the variation to create inequities in the benefits, one needs to adopt detailed approaches in order to foster equity.

In addition, issues concerned to security and privacy are a major push back that could potentially mitigate on the positive effects of engagement on the employees. It is important for these difficulties to be met for the program to achieve optimal benefits in addition to retaining the employees' trust and confidence. In the same respect, the generalizability of the study findings to other industries, cultures and structures of organisations is equally limited. Thus, the generalizability of the study's results is restricted because alterations in such environments can a have immense influence on the success of AI-driven (AI) wellness interventions. Lastly, because the study only explored the short-term effects, it is difficult to determine other possible effects AI-driven interventions. However, it's hard to make definitive conclusion towards the program's long-term success and arising consequences, due to a lack of longitudinal data, even if initial unfavourable effects may change with time. These limitations indicate the requirement of thorough preparations, ongoing reviews and feedback, and a strategic adaptation while deploying AI-driven (AI) Wellness interventions. This is to ensure that potential and prominent benefits are maximised while hazards are minimised.

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Participatory Budgeting as an Avenue for Community Engagement and Citizen Empowerment

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ABSTRACT

The increasing demand for transparency in government spending worldwide has become a pressing issue in recent years, and participatory budgeting (PB) has emerged as a powerful tool in response to this demand. By allowing citizens to participate in the decision-making process, PB not only ensures that public funds are allocated according to community needs but also strengthens democratic values. It argues that for government entities to truly serve the public good, citizens must have a meaningful say in how resources are used. Furthermore, the article emphasizes the broader benefits of PB beyond transparency alone. It discusses how PB can enhance community engagement and citizen empowerment, fostering a sense of ownership and responsibility among citizens for their local governance. However, implementing PB effectively requires more than just a willingness to involve citizens; it necessitates a commitment to innovation and transparency from government entities. This involves not only generating ideas but also implementing them and engaging stakeholders, promoting a culture of experimentation and continuous improvement, ultimately better serving the needs of their constituents.

Keywords: Participatory budgeting, community engagement, public administration, fiscal administration

1. Introduction

Across the globe, taxpayers are clamoring for a clearer view of how their governments operate – especially where their tax dollars go – and public budgets have become a major point of scrutiny in recent years. Democracies worldwide face the challenge of making their finances more transparent, and a tool that many government entities are finding particularly effective is participatory budgeting (PB). The rising tide of PB reflects a global shift toward more accountable governance. By directly involving citizens in allocating public funds, PB empowers communities and fosters transparency. This growing movement begs a fundamental question: if government serves the public good, shouldn't the public have a say in how resources are used?

This article examines how PB can be used as a launching pad for community engagement and citizen empowerment by government entities that are ready to embrace innovation and transparency. Stagnation poses a significant threat to the effectiveness and legitimacy of any government entity. Adopting a mindset of innovation is crucial to propel positive change, address evolving challenges, and maintain public trust. While generating new ideas is important, true innovation necessitates actively implementing these ideas and engaging with stakeholders along the way. It demands a shift beyond mere ideation toward an action-oriented culture that encourages experimentation and continuous improvement. By cultivating this innovation ethic, governments of all levels can enhance responsiveness and effectiveness of their services amid a dynamic and demanding environment.

Lerner's (2011) six core benefits of PB serve as a framework to consider how community engagement and citizen empowerment can be bolstered through this collaborative approach to policymaking: Democracy; Community; Social justice; Efficiency; Transparency; and Education (p. 31). Taking each of these benefits in turn, democratic principles allow everyday individuals to wield genuine influence and contribute to tangible political choices. Through deliberate initiatives like PB, constituents can cultivate stronger ties with political leaders, fostering enhanced trust in the public sphere. The community aspect of PB facilitates civic engagement and serves as a platform for neighbors to collaborate and build connectedness. Equitable access to the decision-making process promotes fairness among marginalized groups that have been historically sidelined from political participation. Leveraging citizens' own insights about local concerns can help decision-makers improve their budgetary decisions, and this engagement in the process helps to ensure efficiency and prudent expenditure of public resources. Transparency also helps to build public trust and mitigates negative ramifications that stem from wasteful and unethical behavior. Finally, when the citizenry is better educated through hands-on experience in the public sphere, they are more informed about competing priorities and able to navigate political matters.

2. The Rise of Participatory Budgeting in Southeast Asia and Beyond

As taxpayers increasingly perceive a disconnect between their needs and government actions, PB offers a beacon of hope for local communities. PB welcomes voices from within, actively seeking input and fostering dialogue. Beyond mere lip service to public opinion, PB embodies the core tenets of democracy; this is the first of Lerner's (2011) noted benefits. Justice and McNutt (2013) explained, "Fiscal transparency can generally be understood as one requisite for extending the practice of democracy" (p. 5). Community involvement in decision-making, harking back to the direct democracy framework of ancient Athens, finds its modern expression in PB. As the concept gained traction in Brazil in the late 1980s, PB initially focused on municipal levels due to the logistical challenges of large-scale participation. Similar to direct democracy, effective PB thrives in smaller communities; nevertheless, it has taken root in Brazil and spread globally, flourishing in hotspots across Latin America, Europe, Asia, and Africa. Notably, PB is credited with strengthening democratic principles wherever it's implemented. "The globalization of [participatory budgeting]

may have a lot to do with this democratization of public space and, although the experiment's procedures may vary greatly according to context, PB almost always involves a deepening of democracy in terms of local political history" (Ganuza, Nez, & Morales, 2014, p. 2275).

While Brazil is acclaimed as a forerunner of PB experimentation, the Philippines actually became the first nation-state to incorporate PB across the board in 2012 by inviting all 1,634 cities and municipalities to weigh in on its 2015 budget. This process became known as Bottom-up budgeting (BUB): "BUB's underlying rationale was that by incorporating civil society actors into all aspects of the budget cycle – project selection, implementation, and monitoring – the impact of corruption and patronage politics could be reduced in favor of projects reflecting local needs. Linking popular participation to poverty alleviation in this way, and on such a scale, was unprecedented" (Rodan, 2018, p. 140).

Chowdhury (2018) also reported on the effectiveness of PB among local governments in Bangladesh. "Positive outcomes observed included increased people's participation, identification of socio-economic concerns, increased trust in elected representatives, increased transparency, changes in patterns of service delivery and improved viability of direct fund transfers to local government institutions" (p. 115).

Imagine a government truly embodying the ideals of "of the people, by the people, for the people," where active participation strengthens the very foundation of its existence. PB can help to translate this vision into reality, by empowering everyday citizens across the globe to contribute their unique voices and fresh perspectives to public decision-making. Through inclusive engagement, PB fosters both legitimacy and innovative solutions for the betterment of the community. This ties in with another of Lerner's (2011) aforementioned core benefits. Traditional models of public discourse often relied on select groups and elected officials to represent citizen concerns. However, PB disrupts this dynamic by offering a direct line for individual voices to be heard. No longer relegated to delegating their wishes, citizens gain a platform to articulate their priorities and participate actively in shaping their communities. "The new era of transparency will increasingly expose gaps between governments' rhetoric and reality, empowering domestic and international audiences to hold leaders more accountable for their decisions" (Larkin, 2016, p. 6). This shift in power dynamics sparks a revitalized form of public engagement, fostering a more inclusive and responsive civil society.

3. The Inclusivity of Participatory Budgeting

Traditional representative models often leave decision-making power concentrated with specific groups, potentially excluding valuable perspectives. In contrast, PB fosters an inclusive environment where individual participation thrives. No longer mere spectators, citizens become active co-creators, allowing them to make constructive contributions within the public sphere. "Perhaps most important, PB can help establish government as a valuable public good – an idea that is very much under

attack," explains Lerner (2011, p. 35). This shift empowers previously marginalized voices and disperses decision-making power, strengthening the ties that bind the community.

The deliberative nature of PB further enhances societal relationships and contributes to social justice efforts, another of Lerner's (2011) core benefits. As individuals deeply engage in the process, tolerance and understanding toward diverse viewpoints naturally develop. PB thrives on this inclusivity, recognizing that a tapestry of voices strengthens the decision-making fabric, rather than complicating it.

Scaling PB to the federal level is an enticing vision, offering broader democratic participation in shaping national priorities. However, the logistical hurdles are immense. Engaging a truly representative sample across a vast population requires considerable resources and infrastructure. Additionally, encouraging active participation in national budgeting can be challenging, even when compared to the hurdles faced in local contexts, where voter turnout for elections already struggles. PB's success at the local level thrives on its proximity to the lived experiences of citizens. Community residents directly see the impact of budget decisions, fostering a stronger sense of ownership and motivation to become involved. This local focus might be key to the model's effectiveness.

4. Comprehensive Citizen Engagement through Participatory Budgeting

In its 2005 publication on global participatory planning and budgeting, the United Nations noted five principles of best practices concerning this novel approach to the budgeting process: "(1) accountability and result orientation; (2) professionalism; (3) proportionality; (4) transparency; and (5) independent check and balance, monitoring institution" (p. 44). These principles dovetail with Lerner's key benefits noted above, and the United Nations document also reinforces the value of performance-based budgeting as a means to improving budgeting processes through public accountability. While holding a town hall and inviting some public feedback on a draft budget might seem like participation, it falls short of a truly impactful PB process. "The budgets governments present around the beginning of their fiscal year and the financial statements they publish after the fiscal year has ended are critical tools for legislators and voters. To non-experts, the transparency of these documents matters: from them, readers should be able to understand the government's plans, see how results differed from plans, discern the implications for the government's future capacity to deliver services, and hold the government accountable for its performance" (Robson & Dahir, 2023).

As we've discussed, the core of PB lies in fostering rich dialogue and active citizen engagement. Exemplary PB initiatives go further by ensuring participants are valued and treated professionally. This includes implementing robust accountability and feedback mechanisms, as well as proactively seeking input from a diverse cross-section of the community. This ensures decisions reflect the needs and priorities of all stakeholders, not just a select few. Engaging local citizens through PB unlocks diverse perspectives on crucial budget priorities, enriching performance evaluations, and

by actively participating, citizens gain a deeper understanding of budget execution and contribute valuable insights for future spending decisions. "Budget is a tool of accountability, management, and economic policy" (United Nations, 2005, p. 63). This local layer of accountability brings the budget process closer to home, empowering those directly impacted by its outcomes.

Comprehensive citizen engagement through PB means including marginalized voices, as well, as Rodan (2018) points out: "BUB was designed to link local government development plans more directly to the bud-gets of national agencies, but in such a way as to more effectively incorporate the poor and those -depicted as their representatives into decision making about proj-ect priorities in -those plans" (p. 149).

PB's success at the local level fosters new communication channels between previously siloed community groups. While not without its challenges, this dynamic shift creates opportunities for collaboration and understanding, in that associations historically holding decision-making power may need to adjust to sharing influence with diverse voices. Similarly, elected officials accustomed to established lines of communication must adapt to incorporating new perspectives. However, these necessary adjustments pave the way for a more inclusive and representative decision-making process and streamlined efficiencies, which dovetails with Lerner's (2011) core benefits of PB. Emerging solutions like PB offer the potential for increased electoral accountability, encouraging officials to consider their constituents' financial priorities more actively.

5. Embracing Deliberative Transparency

Diverse perspectives within a community naturally lead to initial discrepancies in budget priorities; however, PB demonstrates a successful approach to bridging these gaps. Through facilitated discussion and a commitment to incorporating diverse voices, municipalities worldwide have proven that consensus can be achieved in allocating budgetary resources. Increasing citizen engagement through PB can demystify the often-complex workings of government, fostering trust and encouraging active participation. True transparency requires more than just providing an executive summary or snapshot of the budget: Information must be comprehensive, easily digestible, and readily accessible to laypersons. Put another way by Kopits and Craig (1998), fiscal transparency must be "reliable, comprehensive, timely, understandable, and internationally comparable information" (p. 1). Simply uploading poorly labeled and difficult to interpret spreadsheets on municipal websites falls short of this standard. Transparency necessitates a multifaceted approach that empowers citizens to gain hands-on civic education as they engage meaningfully with financial decision-making. This educational benefit of PB echoes Lerner (2011), as noted above.

Cultivating a transparent public sphere requires a collaborative effort from both elected officials and the citizenry. Implementing robust transparency protocols undoubtedly opens administrations to the same scrutiny they may have traditionally directed toward their peers. While this vulnerability might invite public critique, it simultaneously fosters trust and engagement, contributing to a more

robust deliberative democracy. This potential for increased scrutiny is ultimately outweighed by the gains for accountability and public participation, representing a necessary evolution toward effective governance. The principle of transparency has transcended partisan divisions, garnering broad support from government watchdog groups and both sides of the political spectrum. This consensus acknowledges transparency's critical role in holding accountable not just political adversaries, but all elected officials. By illuminating the inner workings of government, transparency empowers both the public and political opponents to scrutinize decision-making, thereby strengthening the system of checks and balances.

Shining a light on what's going on behind closed doors, such as through Open Meetings laws, is key to making sure those in power are actually working for the good of the people. Transparency helps move elected officials from campaign promises to real-world action, especially when it comes to spending taxpayers' money wisely. When done right, initiatives like PB and other open government efforts can lead to better policies that reflect what people actually need. Simply put, the growing demand for transparency and citizen engagement necessitates exploring innovative solutions like PB. As local governments grapple with meeting these expectations alongside increased technological literacy among the public, incorporating PB into their budgetary processes emerges as a strategic move. Lerner (2011) notes that "… PB has captured the imagination of people around the world thanks to its core concept: citizens deciding public spending" (p. 32). Citizen participation in PB fosters a deeper understanding of bureaucratic complexities, transforming them into informed and active community members, ultimately leading to a more robust and accountable governance system.

While "transparency" has become a ubiquitous term in public administration, scrutinizing budgeting processes remains paramount. Mere data availability falls short; true transparency necessitates presenting information in a comprehensible and readily accessible format. The very structure of a public budget can either enhance openness and foster accountability or hinder these crucial tenets. For this reason, budget transparency is vital, yet budgetary decisions often take place outside of the formal budget process. Executive meetings with diverse groups, from advisory committees to foreign officials, can hold significant budgetary implications based on the discussions and conclusions reached. Therefore, a comprehensive understanding of budgetary transparency extends beyond mere public access to the official budget document. "Public faith and trust only happens when members of the community are privy to the work of the public sector — both the praiseworthy and the areas that need much improvement — and that transfer of knowledge comes through transparency and accountability" (Pool-Funai and Summers, 2023, p. 22).

6. Accountability through Transparency and Technology

Technological advancements fuel citizen demands for immediate and granular access to financial data. However, another critical element that cannot be understated is the actual engagement of community members. Some studies show that when transparency reveals shortcomings within government entities – or worse, corruption – then the effort can backfire, as community members

become discouraged by the political system and disengage from participation, entirely (Bauhr & Grimes, 2014; De Fine Licht et al., 2014). In fact, Grimmelikhuijsen (2012) described individuals' disillusionment by the realities of government this way: "If people can see all mistakes behind the scenes of government, they may become disenchanted with it thus decreasing both the trust in and legitimacy of governments" (p. 295). Yet, deliberatively engaging initiatives like PB may help to thwart such scenarios by creating opportunities for taxpayers to feel genuinely listened to, rather than simply heard.

Indeed, deliberations on budgetary priorities occur across various bureaucratic settings, involving numerous stakeholders vying for their interests. Recognizing this broader context, many governments make such meetings accessible to the press, if not the general public, fostering a more holistic approach to transparency. While embracing a transparent culture in public and non-profit sectors is crucial, implementing accountability measures alone cannot shield organizations from critiques and external pressures. Effective budgetary decisions require an awareness of the dynamic operating environment surrounding our agencies. Like economies influenced by investor and consumer behavior, our governmental systems respond to the shifting currents of political opinion. Therefore, we must reflect upon factors such as:

- Emerging political changes: Are there upcoming elections, policy shifts, or legislative actions that could impact our organizational climate?

- Economic landscape: What is the current economic climate, and are there any impending fiscal challenges we need to anticipate?

- Competitive landscape: Do competing organizations (private or non-profit) serving similar audiences pose a potential threat to our funding allocations?

Proactively addressing these questions enables informed budgeting that anticipates external influences and strengthens the agency's long-term sustainability.

Public sector leaders can help to offset the potentially detrimental disengagement scenario mentioned above by actively including community members throughout the budget planning process. Ensuring consistent communication across all layers of decision-making fosters trust among stakeholders. Likewise, inviting participation encourages grassroots involvement, enabling individuals and interest groups to contribute ideas and expertise. This engagement aids decision-makers in comprehending the implications of proposed policies and budgetary changes. "Accountability and transparency are key ingredients in public sector leadership. Both are linked to the definition of reflective leadership. Transparency in the public sector cannot happen unless there is access, because it is not an accidental feature. Accountability should not mean simply a search for someone to blame when things go wrong. It is about empowering people to carry out their task, and is based on a shared understanding of what tasks are and how they are to be carried out with an understanding about why they are important, as well as a mutual understanding about what successful outcomes

look like. Transparency and accountability together impact empowerment, and empowered stakeholders are participatory stakeholders." (Pool-Funai & Summers, 2023, p. 23)

Embedding principles of transparency, participation, and collaboration into the analysis of both routine and exceptional budgetary decisions fosters the development of ethical, mission-driven public and non-profit organizations. This holistic approach enables:

- Transparency: Clear and accessible financial information, empowering stakeholders and bolstering public trust.

- Participation: Inclusive decision-making processes involving diverse perspectives, leading to more equitable and responsive outcomes.

- Collaboration: Cross-sector partnerships and knowledge-sharing, maximizing resource allocation and optimizing impact.

Grimmelikhuijsen (2012) described it this way: "Transparency leads to demystification of government, a development that is catalyzed by the rising expectations of citizens" (p. 297). Pool-Funai and Summers (2023) described the linkage by saying, "If transparency is top-down and participation is primarily bottom-up, then collaboration is intertwined between layers of an organization or community" (p. 77).

7. Historical Models of Policymaking Make Way for Participatory Budgeting

"Transparency is supposed to foster accountability and reduce corruption, but if it cannot coexist with efficiency, governments may be forced to choose between productive deliberation out of the public eye and open, responsible governance" (Harden and Kirkland 2021, p. 494).

Historically, the "iron triangle" model of policymaking described a closed-loop system dominated by legislators, bureaucrats, and specific interest groups, all motivated by mutual benefit. However, Hugh Heclo (1978) argued that this model was overly simplistic and dubbed it "disastrously incomplete" (p. 263). The linear, issue-specific flow assumed by the triangle, from constituents to legislators to agencies and back, failed to capture the increasing complexity of policymaking, not to mention the will of the people. Heclo proposed the concept of "issue networks" to reflect this complexity. These networks are intricate web-like structures of interconnected actors with diverse expertise, including legislators, bureaucrats, interest groups, academics, and the media. The lack of shared expertise within these networks hinders the formation of guaranteed consensus, but also expands the scope of policymaking beyond the limited interactions envisioned in the iron triangle model. This evolution acknowledges the influence of expert knowledge, media attention, and a wider range of stakeholders on policy development and implementation, yet it still fails to consider the potential for deliberate engagement with the citizenry.

Understanding these issue networks is crucial for navigating the current, nuanced environment of policymaking. Hugh Heclo's concept of "technocrats" denotes highly specialized experts who,

paradoxically, can both enhance and impede policymaking. While their expertise serves a valuable function and broadens participation, their focus on technical intricacies and ideological leanings can create challenges. Yet, both the iron triangle and issue networks concepts make the assumption that citizens' interests are taken into consideration by representative groups, though not by allowing them a voice in the process, directly. Bauhr & Grimes (2014) describe how "Transparency increases the likelihood that principals will detect malfeasance on the part of agents and will exact punishment, thereby deterring the abuse of public power" (p. 292).

Rodan (2018) explains how understanding citizens' interests also helps to elevate the needs of underrepresented populations, in that "… -control over the institutions and funding meant to facilitate po-liti-cal participation by the marginalized becomes all the more impor-tant in mediating the relative influence of moderate and radical visions of participatory bud-geting. Dif-fer-ent models of participatory bud-geting privilege dif-fer-ent forms of repre-sen-ta-tion through the organ-izations promoted— -either by building capacity to assist policymakers in prob-lem solving, or by building the politi-cal capacity to more effectively define the prob-lems to be solved" (p. 158).

8. Empowering Citizens through Participatory Budgeting

Permitting taxpayers to occupy not only a seat at the table, but also an opportunity to speak resonates with what Wampler (2012) describes as "… the interaction of four core principles— voice, vote, social justice and oversight—that should be central to our analysis of the growing number of PB programs" (p. 1). The first principle, Voice, relates to the inclusivity element noted previously. When citizens are able to actively engage in a political process like public budgeting, they wield influence that they may not previously have known. Wampler's second point concerning Vote is tied to the decision-making power of participants in PB. The Social Justice principle points to concerns and priorities that gain more traction as a result of taxpayers' involvement in the process. Lastly, Oversight directly connects with the push toward transparency that undergirds the entire PB initiative.

Heclo (1978) also explains that a desire to maintain power might lead technocrats to complicate issues unnecessarily, hindering negotiation and prolonging solutions. Their single-issue focus can further exacerbate polarization. In addition, Heclo highlights how technocratic specialization can inadvertently disenfranchise ordinary citizens, creating an intimidating and exclusionary policy environment. This can hamper democratic processes by hindering collaboration and coordination, effectively silencing their voices. He warns against the potential for issue networks to marginalize those who lack expert representation, thereby undermining the democratic principle of equal voice. Heclo also emphasizes the crucial role of equity in upholding democratic ideals. He argues that by actively discussing and addressing the concerns of underrepresented groups, policymakers can strengthen democratic legitimacy and ensure truly inclusive participation. Bauhr & Grimes (2014) reiterate this point: "Institutional trust, political involvement, and political interest are here also

argued to collectively capture the underlying construct spanning from resignation to indignation to satisfaction" (p. 298).

Through inclusive initiatives like PB, decision-makers may be introduced to novel ideas that were not previously on their radar. The rationality of decision-making in public policy has been a long-standing debate. Historically, the "strictly rational" model envisioned perfectly defined problems, comprehensive cost-benefit analyses, and a singular "ideal" solution. While appealing for its certainty, this approach suffers from the unrealistic expectation of predicting and evaluating every possible outcome. Herbert Simon (1982) challenged this ideal with "bounded rationality," acknowledging cognitive limitations, imperfect information, and unpredictable costs. Instead, he proposed that decision-makers seek satisfactory, not necessarily optimal, solutions within realistic parameters.

9. Engaging the Public in Decision-making

Charles Lindblom (1959) further challenged the linear view with the notion of "muddling through," focusing on incremental adjustments and political bargaining rather than grand overhauls. While valuable, this model still implies a methodical process, potentially overlooking the disruptive nature of innovation and diverse opinions. Combining these ideas, Punctuated Equilibrium Theory (Jones & Baumgartner, 2012) posits that periods of stability can be punctuated by sudden, significant changes driven by bounded rationality and human limitations, including emotional responses. This theory acknowledges the complex interplay of cognitive, emotional, and external factors influencing policy decisions. "Despite the irrational and incremental nature of public decision making, it is presented to the public as if it is rational and the model of 'rational choice' is being used," noted Grimmelikhuijsen. "Decision-makers lack the ability and resources to find the optimal solution so they apply their 'rationality' only after having greatly simplified the choices available" (2012, p. 298). PB could be one avenue to allow taxpayers' voices to be acknowledged and to prompt necessary change.

Public Choice Theory (Howlett et al., 2009) seeks to address Simon's limitations by relying on market forces to guide choices. However, its criticism lies in its oversimplification of human behavior and its inability to capture the full spectrum of influences on policy. Understanding the diverse perspectives on rational vs. bounded rationality in decision-making is crucial for navigating the complex reality of public policy and recognizing the need for more transparent processes, such as PB. Public choice theory sees the government through the lens of its constituents. This framework applies economic models to understand decision-making outside of traditional markets. Emerging in the 1960s, public choice theory challenged the prevailing view of public administration, in that public choice shifts the focus from collective entities to individual actors, with public agencies producing "goods" (services) for those individuals. Key assumptions include: 1) self-interest drives decision-making, 2) individuals are rational actors, 3) they seek to maximize personal benefits, and 4) they possess full information about available options. Tied into this framework is the importance of accountability, as noted by Bauhr & Grimes (2014): "Transparency grants political and public

institutions greater insight into one another's operations, thereby increasing their capacity to hold one another accountable" (p. 293). As noted in the following section, the key to community engagement within the public sphere is the ability of the citizenry to participate in the process, itself.

10. Agenda Setting as 'Transparency in Process'

Agenda setting is the process by which policy makers decide what they will do—in other words, priorities that will be implemented. Successful agenda-setting necessitates awareness of emerging issues among decision-makers. However, diverse factors beyond mere awareness influence which issues gain traction and ultimately become policy priorities. Societal and cultural shifts, economic fluctuations, the prevailing political climate, and even the internal structure of government all play a role in filtering issues on the public agenda. Successful agenda-setting necessitates awareness among decision-makers of emerging issues.

Gastil and Broghammer (2021) reason that "… political systems need to spark public motivations …" in order to have lasting impact (p. 13). The authors note that one such motivational category includes addressing affiliative needs, such as cultivating a sense of belonging within one's community, which could enhance empathy among community members (p. 16).

On a related note, "Transparency refers to the degree that information is made available about how and why decisions are produced within a certain institution" (De Fine Licht et al, 2014, p. 112). More specifically, the authors describe two manifestations of transparency: transparency in *rationale*, and transparency in *process*. Agenda setting, in particular, jives with the notion of transparency in *process*. Are citizens actively engaged in the decision-making process, either in real time (such as the case with PB initiatives) or through open documentation afterward? In their study, De Fine Licht et al explain, "The more open the decision-making process, and the more information the participants get concerning the reasoning behind the chosen policy, the higher the procedure acceptance" (p. 124).

As Howlett, Ramesh, and Perl (2009) outline, this awareness is a crucial step in problem recognition. Adolino and Blake (2011, 11) describe the vast array of potential policy issues as a government's "systemic agenda," with only a selected subset advancing to the prioritized "institutional agenda." However, a myriad of factors contribute to which issues ultimately gain traction and become policy priorities. Societal and cultural shifts, economic fluctuations, the prevailing political climate, and even the internal structure of government all play significant roles in filtering issues on the public agenda. From a historical perspective, Walter Lippmann (1925) takes an anti-populist view by arguing that citizens' lack of understanding of democratic processes and limited civil engagement renders them essentially spectators in their own governance. He terms this phenomenon the "phantom public," characterized by silence and reflected in low voter turnout. Lippmann views the notion of popular sovereignty as an elite-constructed fiction, believing education and moral principles insufficient to cultivate ideal democratic citizens. He contends that public affairs ought to

remain the domain of a select few, with the majority participating sporadically, primarily during crises.

11. Transparency Must Be Purposeful

On the other hand, Berliner (2014) puts the onus onto government entities to take the initiative in engaging the public, even when it may be uncomfortable to do so: "Transparency does not just happen; such efforts usually require existing principals to commit to institutional reforms that are costly to themselves" (p. 490). In a similar vein, Jürgen Habermas seeks to facilitate broader comprehension of his theory of the public sphere by revising earlier concepts and introducing a normative standard for critical social theory centered on the public as persons of reason (Flynn, 2004). This concept underscores the central role of communication and rationality in his understanding of modernity and democracy. Habermas envisions public spaces where free and equal citizens could voice their concerns collectively, fostering deliberative democracy and contributing to solutions for societal problems. This transforms the public from mere spectators into active participants in the decision-making process. Differing from the public sphere, Habermas defines civil society as the realm of non-governmental and non-economic relationships that interact with the political public sphere. This distinction emphasizes the multifaceted nature of public engagement and democratic participation.

In a nutshell, "PB concerns the right to be heard in politics" (Ganuza, Nez, & Morales, 2014, p. 2275). This commitment to community engagement can take place as early as setting the policymaking agenda, then continue through a transparent and communicative decision-making process. When taxpayers are left in the dark about budgetary decisions, public trust is at risk. "[A] key point about democracy is that the electorate normally delegates decision-making to representatives, whose job it is to take 'good decisions' that the individual has neither the time nor the competence to make. In this sense, representative democracy presumes a lack of information on the part of the electorate, and this lack can be exploited" (Calmfors & Wren-Lewis, 2011, p. 657).

12. Globalization and Competition

The influence of globalization on both domestic and international policy formulation is undeniable. Specifically, transnational communication serves as a significant external factor shaping the policymaking process, as public sector entities learn best practices from their peers. Competition in the global landscape incentivizes nations to adopt similar policy directions while adapting them to their unique strengths, and this necessitates elected officials to not only acknowledge the value of innovative ideas in the globalized economy but actively seek them out. "PB also requires that politicians, public employees, and citizens adapt to new roles. Politicians need to give up control over some decisions in order to gain community support" (Lerner, 2011, p. 34). The policy landscapes, both domestically and internationally, contribute to how individual countries navigate the complexities of the global economy. Collaboration fosters unity, which can serve as an equalizer within democratic

societies. Kopits and Craig (1998) define fiscal transparency as "… openness toward the public at large about government structure and functions, fiscal policy intentions, public sector accounts, and projections" (p. 1).

Speaking in terms of the collaborative PB experience in the Philippines, Rodan (2018) notes, "Consultative ideologies of repre-sen-ta-tion emphasize the problem--solving utility of incorporating stakeholders, interests, and/or expertise in public policy pro-cesses for effective functioning of economic, social, or po-liti-cal governance. It is an under- lying assumption of consultative ideologies that conflict can be avoided or substantially contained by rational dialogue and deliberation applied to public policy prob-lems in cooperative state–civil society alliances" (p. 148).

To remain abreast of the constantly changing landscape, public sector officials must not only acknowledge the significance of innovative ideas within the global economy – like PB – but also actively embrace them, as feasible. Successfully driving innovation in governance requires embracing the specific complexities and nuances of each system, and in today's digital knowledge economy, where information is readily accessible, transparency is no longer optional. Open and willing transparency by elected officials can significantly enhance their reputation in a field historically susceptible to corruption.

13. Conclusion

In response to demands for transparency in government operations, particularly concerning the allocation of public funds, participatory budgeting (PB) has become an appealing option for many government entities seeking to address this challenge effectively. Heightened scrutiny of public sector spending underscores the challenge democracies face in making their finances more transparent, but the widespread adoption of PB reflects a broader shift toward more accountable governance. PB serves as a catalyst for community engagement and citizen empowerment, particularly for government entities willing to embrace innovation and transparency through more engaged agenda setting practices and policy making processes. Resorting to insulated processes and disconnecting with constituents can undercut the effectiveness and legitimacy of any government entity; therefore, fostering an innovative mindset is crucial for driving positive change, addressing evolving challenges, and maintaining public trust. By cultivating this innovation ethic, governments at all levels can enhance the responsiveness and effectiveness of their services, even in a dynamic and demanding environment.

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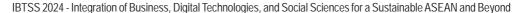
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Does fintech foster economic growth in India?
An empirical analysis

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ABSTRACT

The revolution of financial technology also known as fintech can be defined as the swift innovation and rapid adoption of technology in the realm of finance, typically changing how financial transactions were done. This revolution encompasses a wide range of technology and applications, which includes banking digitally, mobile payments, cryptocurrencies, blockchain and peer-to-peer lending platforms. This study investigates the impact of the FinTech revolution on India's economic growth, The study uses Principal Component Analysis (PCA) to develop a comprehensive FinTech index encompassing various dimensions of fintech development namely Financial Inclusion Index, Volume of financial transactions, Mobile internet users in India, Value of digital lending market in India and estimates and Individuals using the Internet (% of population), the computed index is then used in regression analyses to explore its relation with key macroeconomic indicators: Gross Domestic Product (GDP), GDP per capita, and Foreign Direct Investment (FDI). The findings of this study reveals an influential and positive correlation between the FinTech revolution and economic growth, bringing into light the role of FinTech in enhancing financial inclusion, efficiency, and overall economic performance. The results suggest that regulatory policies for fintech, promoting innovation and adoption could further stimulate economic growth in India. This research contributes to the existing literature by providing empirical evidence on the transformative potential of FinTech in driving economic growth in an emerging market context..

Keywords: Economic growth; Fintech; Fintech revolution.

Introduction:

The word Fintech is the fusion of two terms finance and technology, Fintech deals with the inception of new technologies into the financial sector, and it is now transforming the financial industry, fintech solutions are deeply linked with financial innovations. The ambit of activity in Fintech began with the usage of debit and credit cards, transfer of money, mobile payments, stretching

to the newer world of machine learning, cryptocurrencies, and crowdfunding (Goldstein, Jiang, & Karolyi, 2019). Financial technology, or fintech, represents the intersection of finance and technology, revolutionizing how financial services are delivered and accessed. This dynamic field includes innovations such as mobile banking applications, cryptocurrencies, and robo-advisors that optimize business processes and improve the user's experience. McKinsey's report noted that financial technology or fintech brought significant changes in the realm of finances because of its convenience, transparency, and efficient operation from the side of both consumers and businesses (McKinsey, 2023). In this aspect, fintech firms are integrating progressive innovations such as blockchain and Artificial Intelligence in redesigning payments, credit, and investment systems around the world (World Economic Forum, 2022). This evolution, however, maintains an active influence on digital transformation within the course of financial services, thus ensuring its future disruption and innovation.

Fintech and FDI: FinTech has evolved to become a new revolution in the international financial system which has invested a huge amount of FDI in various countries. Technological advancement in financial services has redefined the field with huge inflow of capital from investors globally. The World Economic Forum (2023) notes that FinTech has emerged as an FDI priority because of its capacity to challenge existing value chains in financial services and generate new prospects for development. FinTech can therefore be described as a wide-ranging concept that addresses the use of technology in the improvement of financial services. Some of the examples of the advanced technology that has significantly transformed the financial transactions include Mobile payment systems, Blockchain technology, Robo-Advisors (Deloitte, 2022). These innovations do not only help to eliminate inefficiencies but also cut the expenses and increase the availability of financial services, including in the regions where the conventional banking system infrastructure may be underdeveloped (McKinsey & Company, 2021). Basically, FinTech is appealing due to its capacity to solve issues that have remained critical in the financial industry. Thus, digital platforms and data analytics become the main components of the Fintech solutions that provide more efficient and convenient banking services for consumers and businesses (PricewaterhouseCoopers, 2023). This disruptive nature has not been well received by investors since they see Fintech firms as very profitable with high returns on investment (International Monetary Fund, 2022). That is why governments are a key to the development of such an environment, in which innovation is combined with the necessary regulation, which will allow FinTech to develop sustainably. Checking the effects of FDI in FinTech, it is imperative to go beyond mere economic indicators. It enhances economic mini-banking by increasing the coverage of the financially excluded groups and thus assists in achieving generic social-economic objectives (World Economic Forum, 2023). Moreover, FDI in FinTech stimulates job creation, influences entrepreneurial activity, and enhances technological capabilities within host countries, reinforcing their competitiveness in the global marketplace.

Fintech and Economic Growth: At present, the structure of the financial industry in India is undergoing a speedy transformation with efficiency that is facilitated by financial technology and

innovation known as fintech; it has changed the mode of accessing a service by the friendliness of the interface in the firms' visual display. To extend the concept of digital payments from mobile banking to many other products, the game of fintech is useful in the reformulation of the financial systems of the nation. FinTech plays a vital role in the economic development of the world and is now used to facilitate the provision of financial services through use of technology. Technological advancements like mobile banking, digital payments, and blockchain have greatly improved and made the processes cheaper within the field of financial transactions (Accenture, 2023). These developments do not only enhance the general financial services' availability but also increase financial inclusion by targeting the unbanked demographics (Boston Consulting Group, 2022). In addition, FinTech enhances economic development by encouraging people to take on entrepreneurship and backing up small businesses by offering more access to funding through crowdfunding and new methods of online lending (McKinsey & Company, 2021). This accessibility does not only drive employment opportunities but also boosts the diversification of the economy in different fields. This also makes the sector to attract huge capital investments in order to support further innovation and growth (Ernst & Young, 2023). As highlighted in this paper, the nations with favourable legal frameworks and developed ICT structures are in a better place to reap these economic returns (International Monetary Fund, 2022). Thus, by supporting innovation and preventing risks to consumers and financial stability, these countries can use FinTech to improve the countries' economic profiles and promote sustainable development of the digital economy (World Bank, 2023).

Review of Literature: The flourishing field of financial technology (FinTech) has kindled remarkable interest in regard to its potential impact on economic growth. FinTech comprises a range of innovations such as peer-to-peer lending, blockchain technology, smart contracts and digital currencies, all of which promise to enhance efficiency and inclusiveness in the financial sector. This literature review will try to amalgamate the conclusions from the diverse studies, and analyze the difference in FinTech and Finance combination and economic growth Goldstein, Jiang, and **Karolyi (2019)** investigated the profound influence of FinTech innovations on financial stability and growth in their paper "To FinTech and beyond". They analyze data from various countries to measure fintech adoption through factors like mobile payment volumes and the number of fintech start-ups using a dynamic panel model, Economic growth is measured using GDP growth rates, and findings suggest a pragmatic relationship between FinTech innovation and economic growth, mainly through enhanced financial inclusion and efficiency. **Gruber (2019)** in "Proposals for a Digital Industrial Policy for Europe", employs an integrated approach using qualitative policy analysis and quantitative regression techniques to examine how digital policies influence economic growth. The level of internet access and knowledge, about technology are factors in evaluating how widely digital tools are used while the economic progress is gauged by the GDP per person. The findings indicate that effective digital regulations significantly boost the opportunity for advancement by creating a setting, for the growth of technology. **Cong, He, and Zheng (2019)** explore the radical implications of blockchain technology in "Blockchain disruption and smart contracts". Applying a

structural vector autoregression (SVAR) model, the paper investigates the influence of blockchain adoption (assessed by the number of blockchain patents and blockchain investments) on economic growth indicators like GDP growth and productivity. The conclusion points to the fact that adopting the blockchain increases the level of economic development since it facilitates the enforcement of contracts and decreases transaction expenses. Based on the DSV method, **Jin, Li, and Liu (2020)** in their paper titled FinTech, Bank Risk and Market Crowding Out Effect use the difference-in-differences (DiD) approach to investigate the effect of FinTech on traditional banking risks and total economic efficiency. The FinTech usage is measured by the number of active FinTech solutions and the volume of digital transactions; The economic development is assessed using the indicators of traditional banks and GDP. The research concludes that while FinTech increases the efficiency of transactions and financial access, it also causes uneven competitive pressures on regulating economic development, conventional banks, and stability in various ways**. Castri and Plaitakis (2017)** in their work "Going Beyond Regulatory Sandboxes to Enable Fintech Innovation in Emerging Markets", focus on the experience of using the qualitative analysis of case studies that allows examining the role of the frameworks in the case of FinTech. They define some basic regulatory factors which include sandboxes and regulators' openness and map these factors on growth factors including the rate of entrepreneurship and financial sector development. The results also stress the significance of dynamic regulatory contexts to the development of the FinTech economy. **Fuster et al (2019)** in "The changing landscape of mortgage credit", employs instrumental variable (IV) to analyze the impact of technological advancements in mortgage granting on economic growth. The extent of FinTech is measured with the Key Performance Indicators (KPIs) of the digital mortgage operation, while the level of economic growth is determined with the help of housing market dynamics and GDP growth rate. The studies used by Stoll and Jindra affirm that innovation in mortgage lending goes a long way in boosting economic security for the people and the level of economic development, through giving easier access to credit and helping in the general improvement of costs of borrowing. **Guo and Shen (2019)** analyze the competitive dynamics between Internet finance and traditional banking in "Internet finance, bank risk-taking and deposit competition ". With the use of a panel data regression model, they examine how internet finance (calculated by online deposit volumes and FinTech lending rates) affects the performance of the bank and economic growth, using variables like bank profitability and GDP growth. The study concludes that Internet finance boosts financial inclusion and competitive efficiency, thereby facilitating economic growth, and posing risks for traditional banks. **Chen, Wu, and Yang (2019)** in "How valuable is FinTech innovation?" employ a generalized method of moments (GMM) estimator to investigate the value creation of FinTech innovations. Some of the variables that they employ to check the FinTech adoption include; FinTech patents, and investment in FinTech start-ups while the degree of economic growth is according to productivity and the GDP growth rate. This paper finds out that FinTech innovations significantly improve economic growth as they bring efficiency and innovations in the provision of financial services. In "Operating Mechanism and Evolution of digital economic

ecosystem" **Meng, Wang, Zhao, and Yao (2020)** utilize both network analysis and econometric modelling to evaluate the correlation between and growth of digital economic activities. In this paper, as an index for the degree of FinTech, the volume of digital transactions and the growth of digital technology are analyzed in a short period. Productivity and growth of GDP per capita are used in the economic development index. The findings presented in this paper suggest that a synthesized digital environment, backed up by FinTech advancement, stimulates the growth of economies around the world. The work of **Lin and Zhou (2020)** titled "The Development of Indonesia's Digital Economy and the Cooperation of China and Indonesia in Digital Economic Investment" mainly applies comparative analysis and econometric modelling to assess the cooperation's impacts. Forward investment and cross-border investments and the use of digital platforms are the indicators of FinTech while economic development is measured through Growth Domestic Product and volume of trade. As illustrated in the study, collaboration in the international arena for digital investments also results in enhanced market access and technology transfer which boosts the economy. **Amuso, Poletti, and Montebello (2020)** in "The Digital Economy: In "Challenges and Opportunities" papers, the analysis of the challenges and opportunities introduced by the digital economy is based on a qualitative approach that is accompanied by the use of basic descriptive statistics. FinTech initiatives are assessed in terms of digital infrastructure and the relevant legal environment, while the country's economic performance is assessed using the rates of entrepreneurship and the indices of innovativeness. The findings indicate that while the digital economy gives immense growth opportunities, it requires a strong regulatory and infrastructure framework to flourish. **Ma, Guo, and Zhang (2019)** in "Policy Analysis and Development Evaluation of Digital Trade: An International Comparison" employ a cross-country regression analysis to evaluate the impact of digital trade policies on economic growth. The metrics used to measure FinTech adoption are digital trade volumes and policy indices, while economic growth was captured by GDP growth and trade balance metrics. Research suggests a strong relationship between progressive digital trade policies and economic prosperity. This is achieved by streamlining trade processes and opening up new markets. Yan Li, **Yan Song & Yang Li's (2020)** study 'FinTech and Enterprise Innovation—Evidence of New three-board Listed Company' examines the effects of FinTech on innovation in enterprises and on economic growth using the event study approach. Innovation indices and volume of investments in digital financial services determine FinTech's usage while enterprise performance and GDP gauging establish economic growth assessment.

The results indicate that FinTech substantially fosters enterprise innovation, which in turn drives economic growth. Yu and Zhu (2019) in "Fiscal, financial and economic growth" uses a time-series analysis to investigate the relationships between fiscal policy, financial development, and economic growth. FinTech adoption is measured through fiscal digitalization and financial inclusion indices, while economic growth is captured by GDP growth and investment rates. The results indicate that digital fiscal policies and financial development, driven by FinTech, play a crucial role in promoting economic growth. Sheng and Fan (2020) in "FinTech, optimal banking market structure and credit

supply for small and micro enterprises" uses structural equation modelling (SEM) approach to explore the impact of FinTech on banking market structures and credit supply. FinTech adoption is measured through digital credit volumes and market structure indices, while economic growth is captured by SME performance metrics and GDP growth. The study highlights that FinTech optimizes banking market structures and enhances credit supply, thereby supporting economic growth. Wen, Zhang, Hou, and Chen (2020) in "The impact of digital finance on the upgrading of industrial structure and total factor productivity" use a panel data regression model to investigate the effect of digital finance on industrial upgrading and productivity. FinTech adoption is measured through digital finance indices and industrial upgrading metrics, while economic growth is assessed using total factor productivity and GDP growth. The study concludes that digital finance significantly contributes to industrial upgrading and productivity growth, thereby driving economic growth. Lin (2020) in "The impact of digital finance on inclusive growth—Empirical research from the perspective of heterogeneous dual economy" uses panel data analysis to analyse the impact of digital finance on inclusive growth in a dual economy context. FinTech adoption is measured through financial inclusion indices and digital finance volumes, whereas economic growth is assessed using inclusive growth metrics and GDP per capita. The study concludes that digital finance significantly promotes inclusive growth by enhancing financial access and reducing economic disparities. Wang, Yang, and Zhang (2020) in "The economic impact of digital financial inclusion" use a panel data analysis to examine the impact of digital financial inclusion on economic growth. FinTech adoption is measured through financial inclusion indices and digital finance volumes. Sethi and Manocha (2023) employ an Autoregressive Distributed Lag (ARDL) approach to examine the impact of FinTech adoption on select macroeconomic variables in India. Their study identifies the variable FinTech adoption proxied by metrics like Automated teller machines (ATMs) (per 100,000 adults; Mobile cellular subscriptions, fixed board bands and economic growth (measured by GDP or related indicators). The results indicated a positive and significant impact of FinTech adoption on economic growth. Bu et al. (2023) delve into the nonlinear impact of FinTech on real economic growth. Their study utilizes econometric techniques to explore how variables such as FinTech development and economic growth interact nonlinearly over time. Employing advanced statistical models like panel data regressions or VAR models, they find evidence supporting a nonlinear relationship, where moderate levels of FinTech adoption stimulate economic growth.

Research Gap: Despite a growing body of literature on the impact of Fintech adoption on markets and banking systems there remains a significant gap in understanding its specific effects in the context of India. Various studies have addressed the general influence of FinTech on economic growth and have also considered exchange rates but not in the context of India. However, they often focus on broader global contexts or other countries. This leaves the Indian scenario underexplored. To date, only one comprehensive research has empirically examined in India on how FinTech adoption influences key macroeconomic variables. Notably, the above mentioned study uses only three variables to calculate the fintech index. This gap highlights the necessity for

detailed investigation tailored to the unique economic and technological environment of India. This study aims to fill this gap. By analysing the impact of FinTech adoption on India's economic growth the analysis incorporates five distinct financial variables. These variables calculate the fintech index over the period 2017–2023. This comprehensive approach will enhance our understanding of how the FinTech revolution affects India's economic growth.

Hypothesis:

- *H*1: Fintech revolution has a positive influence on economic growth (GDP) of India.
  *H*2: Fintech revolution has a positive influence on GDP per capita of India.

- *H*3: Fintech revolution has a positive influence on Foreign direct Investment of India.

Methodology: To examine the influence of fintech development on India's economic factors, Key fintech indicators such as the Financial Inclusion Index, Volume of financial transactions, Mobile internet users in India, Value of digital lending market in India and estimates and Individuals using the Internet (% of population) were used to develop a fintech index via PCA. Further, Regression was performed between the fintech index and the economic parameters namely GDP, GDP per Capita and FDI. Data was collected from the year 2017-2023. The data was tested for normality using the Jarque-Bera test for normality and the results proved that the data is normally distributed (p=0.815).

Data source: The data that has been used for this study has been gathered from various reliable sources, which include the World Bank Database, the International Monetary Fund (IMF) and the official website of the Reserve Bank of India, The data about The Reserve Bank of India's (RBI) official website provided national financial statistics and Indian-specific regulatory information, which was used to compile the data for the Fintech index and Volume of financial transaction. Together, these numerous reliable sources demonstrate the strength of the empirical analysis carried out in this study.

Table - 1

S.No	Variable Name		Source
1	Financial inclusion index	The FI-Index consists of three parameters- Access, Usage and Quality - each carrying different weightage.	Reserve Bank of India
2	Volume of financial transaction	Volumes of ECS/NEFT/RTGS/ MOBILE TRANSACTIONS(Bank wise)	Reserve Bank of India

S.No	Variable Name		Source
3	Mobile internet users in India 2010-2029 (In Millions)	"The values indicate number of persons accessing the internet via a mobile broadband connection. The data is based on surveys as well as regression-based imputations."	Statista
4	Value of digital lending market in India from 2012 to 2023	This consists of total financial worth or size of the digital lending industry in India over the period from 2012 to 2023. It contains the monetary value of loans that have been processed, approved, and distributed through digital platforms and technologies.	Statista
5	Individuals using the Internet (% of population)	"Internet users are individuals who have used the Internet (from any location) in the last 3 months. The Internet can be used via a computer, mobile phone, personal digital assistant, games machine, digital TV etc."	World Bank Group

Data Analysis: Regression has been performed to analyse the data, where the computed Fintech index is used as a proxy for measuring the Financial revolution. Fintech index is computed by performing principal component analysis of five financial variables Financial Inclusion Index, Volume of financial transaction, Mobile internet users in India, Value of digital lending market in India and estimates and Individuals using the Internet (% of population). Regression describes the relationship between a dependent variable (GDP, GDP per capita and FDI) and the independent variable (Fintech revolution). The impact of the independent variable on each dependent variable is analysed. KMO and Bartlett's Test is performed to test for robustness **Table - 2**.

To determine if fintech influences economic growth, we first checked whether our data was suitable for factor analysis by using the Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy and Bartlett's Test of Sphericity. The KMO value helps us understand if our sample size is large enough and if the variables are appropriately interrelated. Our KMO value is .722, indicating that our sample is adequate. Bartlett's Test of Sphericity, which examines if the correlation matrix is an identity matrix (implying no relationships between variables), showed a chi-square value of 74.862

Table - 2

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.722
Bartlett's Test of Sphericity	Approx. Chi-Square	74.862
	df	10
	Sig.	.000

with a significance level of 0.000. This result means that the variables are sufficiently correlated to proceed with factor analysis. These tests confirm that our data is suitable for factor analysis, lending credibility to our study **Table - 3**.

Table - 3

Extraction Method: Principal Component Analysis.

Principal Component Analysis:							
Initial Eigenvalues				**Extraction Sums of Squared Loadings**			
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Factor scores**
Financial inclusion Index	4.892	97.844	97.844	4.892	97.844	97.844	-1.43666
Volume of financial transaction	.095	1.893	99.738				-1.02500
Mobile internet users in India (2010-2029)	.012	.248	99.985				-.37743
Value of digital lending market India from (2012-2023)	.001	.012	99.997				.13969
Individuals using the Internet (% of population)	.000	.003	100.000				.51380

An extensive Principal Component Analysis (PCA) was conducted to examine the manner in which fintech affects economic growth in order to confirm the validity of our findings. Based on PCA results, the Financial Inclusion Index is the most significant component, explaining a mammoth 97.844% of the variance in our data. This shows just how crucial it is to our analysis. In comparison, other variables like the volume of financial transactions, the number of mobile internet users in India, the value of the digital lending market in India, and the percentage of people using the internet contribute much less to the variance, with values of 1.893%, 0.248%, 0.012%, and 0.003%, respectively.. The Financial Inclusion Index continues to be the most important element, as indicated by the extraction sums of squared loadings. The factor scores show the relative influence of each variable, with the Financial Inclusion Index having the highest score (-1.43666), while other variables like Individuals Using the Internet have positive scores (0.51380). These results confirms the reliability of our study, highlighting that financial inclusion is crucial to understanding the impact of fintech on economic growth, with other factors playing smaller but still relevant roles. Thus, with these results, we can confidently proceed to regression analysis, knowing that our data is credible and reliable.

Model 1*:*

GDP=β0 +β1 .fintech revolution

GDP=3.476+0.051 .fintech revolution

***H*1: Fintech revolution has positive influence on economic growth (GDP) of India.**

Table - 4

Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model 1	0.876	0.768	0.721	0.03075741		
ANOVA	**Sum of Squares**		**Df**	**Mean Square**	**F**	**Sig.**
Regression	.016		1	.016	16.524	.010
Residual	.005		5	.001		
Total	.020		6			

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.476	.012		299.045	.000
FINTECH INDEX	.051	.013	.876	4.065	.010

Based on the analysis A positive correlation between (GDP) and Fintech is postulated. As for the regression analysis, the value of R equals to 0. 876, which is considered as an upward trend, showing that as the fintech index increases, the GDP increases as well. This relationship is further supported by the R obtained equal to 0.768, which means that 76% of variation of the variables is explained by the model. The coefficients also show that a 1-point increase in the fintech index is associated with an average increase of 0.08 in the levels of GDP. Thus, based on the regression coefficient of 0. 051, for every unit increase in the fintech index, GDP is expected to increase by 0. 051 units. The significance of the identified relations is supported by the p-value, which equals 0. 010, Therefore, the displayed relations cannot be regarded as random. Thus we fail to reject the hypothesis.

Model 2*:*

GDP Per Capita (Nominal)=β0 +β1 .fintech revolution

GDP Per Capita (Nominal)= 3.331+.043."fintech revolution

***H*2: Fintech revolution has positive influence on GDP per capita of India.**

Table - 5

Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model 2	0.837	0.700	0.640	0.03049436		
ANOVA	**Sum of Squares**		**Df**	**Mean Square**	**F**	**Sig.**
Regression	.011		1	.011	11.686	.019
Residual	.005		5	.001		
Total	.016		6			

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	3.331	.012		289.115	.000
FINTECH INDEX	.043	.012	.837	3.418	.019

The analysis of the fintech development in India proves that it contributes to the GDP per capita. Correlation (R = 0. 837) uncovers a potential pathway: it is evident that a more developed fintech sector (higher index) leads to economic growth. This is further supported by the R-squared value of 0. 700 which means that 70% of the variation in the GDP per capita can be accounted for

by the variation in the fintech index. This effect is captured by the regression coefficient of 0. 043, which means that for every unit increase in the level of fintech development, GDP per capita is expected to increase by 0. 043 units. The statistical significance of the model supports this relationship (F = 11. 686, p-value = 0. 019), implying that these results indicate that developments in fintech are positively related to India's economic outcomes. Thus we fail to reject the hypothesis.

Model 3:

$$FDI = \beta 0 + \beta 1 \text{ .fintech revolution}$$

FDI= 4.846+.050 .fintech revolution

H3: Fintech revolution has positive influence on Foreign direct Investment of India

Table - 6

Model Summary	R	R Square	Adjusted R Square	Std. Error of the Estimate		
Model 3	.807	.652	.582	.04009465		
ANOVA	**Sum of Squares**		**Df**	**Mean Square**	**F**	**Sig.**
Regression	.015		1	.015	9.351	.028
Residual	.008		5	.002		
Total	.023		6			

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	4.846	.015		319.799	.000
FINTECH INDEX	.050	.016	.807	3.058	.028

India's flourishing fintech sector appears to be a magnet for foreign investment. The correlation (R = 0.807) implies a strong relationship: stronger fintech development coincides with rising FDI. This association is further supported by the R-squared value (0.652), which indicates over two-thirds (65.2%) of the variation in FDI can be attributed to changes in the fintech index. Statistically the p-value is significant (0.028) making this relationship stronger as earlier noted. The findings are consistent with the hypotheses, In testing the above hypotheses, The effect of the fintech index on FDI which is 0.050 shows this relationship whereby of every we unit change in the fintech index a one unit change in FDI is forecasted to occur.050 units. Thus, the discussion presented in this paper

points rather convincingly to the fact that the development of fintech is one of the main factors that contribute to the growth in FDI in India. Thus we fail to reject the hypothesis.

Findings and Suggestions: An influential positive relationship between the adoption of fintech and the economic growth of India could prompt the government of India, private entities, and foreign direct investment (FDI) to invest more of its resources in the FinTech sector, which will lead to accelerating the development of innovative solutions(Philippon, 2016). The major focus of FinTech in India is on serving the underbanked populations, typically rural areas and enhancing their status financially, which in turn fosters a favourable investment climate for foreign investors attracted by the expanding customer base(Shukla & Dubey, 2022). The increasing spotlight on financial inclusion also aids in the diversification and development of the structure of the nation's financial system (Sahay et al., 2015). What would position India as a hotspot of financial technology is a powerful and eminent FinTech industry (Arner, Barberis, & Buckley, 2016). The inconstancy in the regulations pertaining to fintech, cybersecurity threats, gaps in digital infrastructure, challenges relating to financial literacy, and limited accessibility capital pose significant hurdles(Prasad, 2020). Addressing these issues is critical for maximizing the positive impact of FinTech on India's economic growth and financial inclusion. (World Bank, 2018). The findings of this study point out that the government of India must shift its focus on implementing FinTech-friendly policies, developing regulatory standards that enable innovation while protecting the privacy of the users, and adopting supportive structures such as sturdy internet infrastructure.

Implications: This paper examines how the fintech revolution affects different dimensions of economic growth in India and the findings carry policy implications for the policymakers and the government. The first hypothesis, H1, postulates that the fintech revolution enhances the India's economic growth (GDP). This is supported by various researches which indicates that fintech solutions facilitate financial access, improve financial operations and increase economic activities leading to increase in GDP (Arner, Barberis, & Buckley, 2016; Lee & Shin, 2018). The above findings from the PCA analysis corroborate this by revealing that the Financial Inclusion Index which is part of the fintech index has a strong positive relationship with economic growth and accounts for nearly 98 percent of the variance in the data. This goes to show that there is need for the government to further support the fintech innovations through policies which may include the easing of laws governing the fintech firms and offering incentives to those starting fintech firms (Gomber, Koch, & Siering, 2017). Regulatory environment and technological advancement of a country are some of the factors that make the country attractive to FDI in FinTech. These environments promote innovation but also protect the consumer and provide stability which is important for investors (World Bank, 2023).

The second hypothesis of the study H2, which states that the fintech revolution enhances GDP per capita, also receives a positive result from the analysis. Studies show that fintech increases the financial inclusion of consumers as well as income per capita by enhancing the provision of financial

services to the general population and firms (Demirgüç-Kunt, Klapper, & Singer, 2017). Since the use of mobile internet and digital lending, individuals in the remote areas can engage in economic activities hence improving their quality of life. The government should, therefore, enhance the digital literacy level as well as the availability of the necessary infrastructure to increase the uptake and usage of the fintech solution to enhance the distribution of the economic gains across the population (Sahay et al. , 2020).

H3, which examines the influence of the fintech revolution on Foreign Direct Investment (FDI), also yields positive implications. Fintech advancements make India an attractive destination for international investors by showcasing the country's innovation capabilities and robust financial ecosystem (Claessens, Frost, Turner, & Zhu, 2018). Our findings indicate that variables like the volume of financial transactions and the value of the digital lending market, while contributing less to the overall variance compared to financial inclusion, still play a crucial role in enhancing the appeal of India's financial market to foreign investors. To capitalize on this, policymakers should focus on creating a transparent and investor-friendly regulatory environment, which includes protecting intellectual property rights and ensuring cybersecurity (Philippon, 2016).

The composite index constructed using PCA of five variables (Financial Inclusion Index, Volume of Financial Transactions, Mobile Internet Users, Value of the Digital Lending Market, and Percentage of Individuals Using the Internet) as the fintech revolution's measure gives a good account of the phenomenon. This approach makes it possible to determine how various elements of fintech are positively related to economic development, GDP per capita, and FDI. This index could be used by the policymakers to assess the level of accomplishment and determine which sectors require attention to achieve a sustainable and harmonized growth path (Vives, 2017).

Therefore, the development of fintech is promising for increasing the economic growth of India, the per capita income and investment appeal to foreign investors. If the government pays attention to financial inclusion, digital infrastructure, and regulatory changes, it will achieve the best results in the financial technology sector for the development of the economy. Therefore, there will be need for constant review of policies from empirical research such as this study to ensure that the momentum for growth is sustained (Beck et al., 2016).

Scope for Further Research: The influential impact of the Financial Inclusion Index, which explains 97.844% of the variance, highlights the need for further research to investigate its key components. Studies shall focus on, the use of financial products, access to banking services and financial literacy to understand their importance in promoting economic growth. Additionally, since variables such as volume of financial transactions, the value of the digital lending market, and percentage of internet users and the number of mobile internet users, contribute less to the variance, there may be other emerging factors within the fintech sector affecting economic growth. Future researchers can examine these characteristics in a more intricate way to determine the dynamics of financial inclusion by applying panel data to the differences within a certain period. Furthermore,

it will be beneficial to explore the effects of new technologies and innovations especially in relation to the financial inclusion and development since the advancement in technology has greatly influenced finance. Additionally, expanding the geographical perspective of the analysis to several territories or countries might allow the comparison and thus add to the generalization of the results for different economic conditions.

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Tourism Policies for Achieving the Sustainable Development Goals in India – An Analysis

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ABSTRACT

Tourism as an developing activity has the potential to contribute to all the 17 Sustainable Development Goals. This study investigates the impact of tourism on Sustainable Development Goals (SDGs) in the Indian context. Tourism contributes significantly to economic growth, interactive cultures and environmental conservation making it an important component of sustainable development initiatives. However, the extent to which tourism contributes in achieving the SDGs and stakeholder decisions that have influenced in achievement of SDGs need to be discussed. To address these needs this study adopts a qualitative research approach. It is examined how various tourism stakeholders in India are making decisions that benefit the achievement of SDGs. Besides, contribution of Indian tourism sector to achieve this agenda is discussed. The findings of the study show various decisions taken by Government bodies and other stakeholders in India that have influenced the Tourism sector to contribute to achieving SDGs.

Keywords: Sustainable Development Goals (SDGs), Sustainable Tourism, UNWTO; tourism policies; initiatives;

1. Introduction

The Sustainable Development Goals (SDGs) are bunch of 17 goals and 169 targets that governments, businesses, and civil society must work together to achieve sustainable way of living. The word Sustainable development means '*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*'. (European Union, n.d.). The objectives involve inclusive development for all without compromising resources for future generations and development without harming the environment. To accomplish this, global policymakers must adopt decisions that promote the equitable development of everyone and every living being.
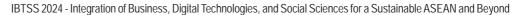
The SDGs play important role to promoting sustainable development by emphasizing the need to monitor natural resource, conservation initiatives, local community empowerment, and sustainable business practices (Rasoolimanesh et al., 2023). The SDGs aim to eradicate poverty, preserve Mother Earth, and ensure that everyone has peace and prosperity. To achieve sustainable development, it is a necessity to align the economic, the environmental, and the social goals across sectors, regions, and generations. It is necessary to eliminate fragmentation, which means bringing together environmental, social, and economic considerations into decision-making processes(Emas, 2015).

Tourism helps achieve SDGs in many ways. Sustainable tourism efforts can be implemented and monitored more successfully if stakeholders, including tourists, are included in decision-making and policy development. This inclusive strategy can result in better tourist behavior, decision-making processes, and overall tourism sustainability (Rasoolimanesh et al., 2023). The proper use of tourism potential will help contribute to all the 17 SDG goals, either directly or indirectly. All sorts of tourism, when managed properly, can contribute to the SDGs. It enables the country's officials to prioritize tourism on the national agenda (Bonilla, n.d.).

Tourism has a great contribution to Indian Economy; it plays an extraordinary role in building nation's Growth and Prosperity (Prakash, 2023). Economic development is a necessary element in SDGs. Tourism either contributes to the fulfillment of SDGs by creating jobs and increasing domestic output, or it can become a barrier to SDG success. The purpose of this study is to discuss the impact of tourism on the SDGs in India.

Tourism in reality has devasting effects on the surrounding environment, people and their cultural identities as it develops depending on people visiting the tourist places. Conservation of natural resources along with protection of biodiversity, respecting and preserving the cultures and fitting into socio economic needs of stake holders is always a challenge. A continuous updated version of sustainability is the need

2. Review of Literature

There are numerous studies on Tourism's contribution to SDGs. Rasoolimanesh et al., (2023) Using the review method as a research tool, examined various papers published on SDGs and tourism. The review emphasizes the importance of connecting tourism practices with the SDGs to improve sustainability as well as contribute to global development initiatives. The study revealed that the achievement of the SDGs required a common yet differentiated strategy from all tourism stakeholders. The authors propose that policymakers and stakeholders use the insights from this review to improve sustainable tourism practices by emphasizing coherent governance frameworks. They propose several possible areas for future investigation into sustainable tourism indicators and how they relate to SDGs. Furthermore, they concluded the lack of Sustainable Tourism Indicators (STIs) research in underdeveloped nations must be addressed, especially in areas like Asia, South

America, and Africa that are targeted by the SDGs. Developing tourist-related (STIs) to improve visitor experiences and support decision-making is an important field for future research.

Fauzi (2023) Investigated the relationship between the sustainable tourism and sustainable development goals. He has used the bibliometric approach to analyze 479 journal papers from the Web of Science database, with an emphasis on previous influential publications, present knowledge structure, and future trends in implementing the SDG in the tourism and hospitality industries. The study demonstrates the interconnection of sustainable tourism with social, economic, and environmental elements, emphasizing the significance of aligning tourism activities with the SDGs to attain universal prosperity by 2030. The study also explores the findings' theoretical and practical consequences, highlighting the importance of stakeholder engagement, governance, and resilience in dealing with global crises.

Adie et al., (2022) highlights the significance of long-term perspectives about tourism partnerships and the Sustainable Development Goals (SDGs), emphasizing the need for ongoing collaboration among many stakeholders to achieve substantial and long-lasting benefits for sustainable development. The paper emphasizes the importance of partnerships in advancing the SDGs, particularly the 17Sustainable Development Goals. It highlights partnerships' critical role in mobilizing and sharing knowledge, expertise, technology, and financial resources to support sustainable development efforts. The study offers helpful suggestions on how to establish and grow partnerships that successfully address the SDGs. It suggests that partnerships should be founded on common principles, a common vision, and objectives that put the welfare of people and the environment first.

Dwyer (2022) Discusses the role of human well-being as essential in achieving the SDGs and the role of Tourism in achieving the SDG 2030 agenda. He has argued that literature should inform a well-being lens to measure the well-being of human beings. And proposes a well-being lens on tourism in assessing the progress of SDGs.

Gao et al., (2021) attempted to evaluate the sustainable development of tourism cities in China and found that there is a considerable gap in sustainable development scores among tourism cities, with none of them reaching a strong sustainable development model. The shortcomings are primarily related to natural and cultural resources and protection systems. The study differentiates between the sustainable development levels of eight different types of tourist cities by identifying the elements that drive those differences.

Many studies are conducted in India on Sustainable development in general and Tourism's role in achievement of SDGs. Rej et al.,(2022) examined the dynamic associations between factors such as carbon dioxide emissions, economic growth, international tourism, education, renewable energy consumption, and gross capital formation. Environmentally friendly tourism development is studied through decarbonization pathways. The hypothesis of the research demonstrates that increased foreign visitor arrivals, renewable energy consumption, and gross capital formation all

have a favorable long-term influence and also reduce current emissions. However, the coefficient of the interaction between tourist arrivals and capital formation is positive, indicating that capital formation has not been beneficial to sustainable tourism practices. On the other hand, the negative coefficient of the interaction between the education index and renewable energy consumption emphasizes the importance of education development in increasing renewable energy penetration for environmental sustainability.

Menon et al., (2021) stated that India is a vibrant culture that offers diverse experiences every 50 kilometers and can provide a different cultural experience for tourists. So, tourism has enormous potential to greatly contribute to economic development, which leads to long-term development. Their study also discovered a similarity in the dimensions of sustainable tourism and religious tourism, as there was no significant difference in feedback on both sustainable tourism and religious tourism. It was additionally found that there is no substantial difference in responses from historical and religious sites. Young people are interested in discovering our country, unlike in the past when primarily older people would go on religious and cultural tours.

Villanthenkodath et al., (2022) examined the long-term relationship between tourism development, economic progress, energy consumption, and CO2 emissions in India. They employed econometric approaches such as DOLS, FMOLS, and CCR to assess the long-term impact of explanatory variables on CO2 emissions. According to this study, there is a long-term relationship between tourism development, economic progress, energy consumption, and CO2 emissions. Structural improvements in the service industry can help mitigate climate change and increase environmental sustainability in India. They have also emphasized the significance of sustainable tourism practices and investment in the service sector in preserving desired environmental quality. They argue that encouraging sustainable tourism practices and investing in the service sector are critical to achieving environmental sustainability in India.

From the above reviews on various literature, we can say that all the studies emphasize how the tourism sector plays its role in achieving sustainable development. All these studies highlight the role of stakeholders of tourism in making the decisions aimed at achieving the SDGs. The role of Government bodies, United Nations agencies, private players, tourists, and industries is highly important in achieving SDGs through Systematic tourism policies. However, there are relatively few studies that describe what is happening in the sector, particularly in India, that is contributing to the achievement of the SDGs. As India benefits from millions of international tourists as well as domestic tourists annually, it is important to know how tourism in India is contributing to the achievement of Sustainable Development Goals.

3. Research Objective

In light of the above-mentioned gap in the literature, this research aims

- to examine how various tourism stakeholders in India are making decisions;

- to study benefits of the achieving Sustainable Development Goals;
- to analyse the Indian tourism sector is contributing to the agenda of achieving SDGs;

4. Methodology

The present research adopts a qualitative research method to answer the questions of what is happening in the Indian tourism sector that contributes to the achievement of SDGs and how policymakers' decisions in India are contributing to the achievement of SDGs. In the next section of this paper, we address how the tourism sector can be employed to achieve each of the 17 sustainable development goals as per the United Nations World Tourism Organisation, and in the subsequent section of the paper, we aim to discuss the Tourism sector in India and its impact on the achievement of SDGs.

5. Tourism and SDGs

The implementation of the SDGs in 2015 made sustainable tourism more feasible and attractive by establishing a planned and methodical set of targets. Sustainable tourism involves social, economic, cultural, ethical, and political sectors, as well as environmental concerns. (Fauzi, M. A. 2023)

United Nations World Tourism Organization (UNWTO) has developed a platform called Tourism for SDGs which aims to create a space where everyone can access information relating to sustainable tourism from experts and tourists across the world, and share events, research, policies, stories that might help in achieving SDGs (UNWTO, 2023)

Table - 1: How tourism can help in achieving SDGs

SL No	Sustainable Development Goals 2030	How tourism can support the SDGs
01	No Poverty	By creating jobs in the tourism sector, promoting tourism entrepreneurship, and sharing tourism profits with locals.
02	Zero hunger	Selling of local products to tourists, Agriculture based -tourism helps in the production of more agricultural goods and also helps farmers.
03	Good health and well-being	Investment of tourism tax revenue in healthcare services
04	Quality education	Skilled jobs requirement in the sector promotes quality education

SL No	Sustainable Development Goals 2030	How tourism can support the SDGs
05	Gender equality	Women can equally be involved in Tourism entrepreneurship and Direct jobs created by the Tourism sector
06	Clean water and sanitation	Efficient and proper use of water in tourism
07	Affordable and clean energy	Tourism being an energy-intensive industry, tourism can promote the use of more renewable energy
08	Decent growth of work and economy	Tourism provides one in ten jobs worldwide besides is one of the top four exports globally in service trade.
09	Industry innovation and infrastructure	With the help of Private-Public Partnerships (PPP), the stakeholders in the Tourism sector can influence the Government policy for promoting innovation
10	Reduced inequalities	Tourism helps in reducing regional inequalities. The development of rural areas as a Tourism destination helps increase the source of income for rural people and thereby it also reduces urban migration.
11	Sustainable cities and communities	Investment in more efficient transport, reduced air pollution green infrastructure that results in smarter and greener cities not only for residents but also tourists.
12	Responsible consumption and production	By Adopting sustainable consumption and production modes in the sector
13	Climate action	By reduction of carbon footprint in the transportation and accommodation sector.
14	Life below water	Marine tourism must be part of Coastal management to make sure that marine biodiversity is not hurt.
15	Life on land	Sustainable Tourism should help conserve biodiversity and also provide income to the locals
16	Peace justice and strong institutions	The sector can foster multicultural and inter-faith tolerance and understanding.
17	Partnerships for the goals	Tourism being cross-sectoral in nature, can bring together different governments, Organizations, and all stakeholders for the benefit of all.

Source: Authors representation using UNWTO (2023) insights

6. TOURISM CONTRIBUTION TO SDGs IN INDIA

The Tourism industry has a lot to contribute in terms of solving social, economic, and environmental problems. It has been proven that the tourism industry is an effective one with the capacity to support all of the Sustainable Development Goals. There are several challenges to integrating tourism into the SDGs framework, such as the need for equitable partnerships at all organizational levels (public, corporate, regional, national, and international) and the demand for significant financial support. Achieving all of the Sustainable Development Goals (SDGs) requires an annual global capital investment of approximately USD 5 to 7 trillion to effect societal transformation across multiple sectors.(Rajani and Boluk, 2022). As Tourism has the potential to contribute to all the SDGs either directly or indirectly, Governments can place tourism high on the national agenda (Bonilla, n.d.). But sometimes it becomes difficult to measure tourism's contribution to SDGs. However, from the present research, we attempted to present how Tourism is contributing to SDG achievement in India.

6.1. No Poverty (SDG-1), Zero Hunger (SDG-2), Decent Work & Economic Growth (SDG-8) and Quality Education (SDG-4)

Achievement of Sustainable Development Goals of No Poverty (SDG-1), Zero Hunger (SDG-2), Decent Work & Economic Growth (SDG-8), and Quality Education (SDG-4) require Employment creation for people which is necessary for them to get disposable income. Income helps them to come out of poverty and help them to earn a decent living. Tourism being a largely labor-intensive sector contributes to the generation of both direct and indirect jobs, which are critical to alleviating poverty. The tourism sector in India contributed a total of 79.86 million jobs in the year 2019-20, which is 15.34% of total jobs in the country that year. (Press Information Bureau, 2022). This figure shows the importance of the tourism sector in a country like India. There has been a significant increase in the hiring in Tourism sector since the COVID-19 pandemic. Hiring in Travel and Tourism increased by 44% as of August 2023 and 14 % growth in demand for job positions in the sector(Kumari, 2023)

Ministry of Tourism gets a major share in budget 2023-24 Rs. 2,400 crore (US$ 289.89 million) as the sector holds huge job opportunities and entrepreneurial challenges for youth. In the coming years, it is expected to create 137 million employments in India. (Indian Brand Equity Foundation, 2024)

Agri-Tourism: Producing and managing food grains is another critical step in reducing hunger. Agri-tourism contributes to increased productivity. Agritourism contributes to sustainable agriculture by providing farmers with additional income. The 2019 Business Economics report states that the agritourism sector in India is growing at a rate of 20% per year. With a predicted value of $42.46 billion globally in 2019 and a compound annual growth rate (CAGR) of 13.4% between 2020 and 2027, the agritourism market is expected to reach $62.98 billion by 2027 (Jyothibhatt, n.d.).

6.2. Good health and well-being (SDG-3).

Sustainable Development Goal 3 is ensuring good health and well-being and it requires investment in the health sector. India has invested Rs 98461 crore in its latest interim budget (KURIAN, 2024). Investing in the healthcare sector, any kind of investment requires revenue, and Tourism is the source of income for the Government. Tourism generates income from foreign exchange receipts, domestic tourism income, and outbound tourism. India has earned 16.93 US Million Dollars in the year 2022, which is more than 90% as compared to 2021s Tourism Revenue. (Statista, 2023).Domestic tourist visits at the end of 2022 were 1731 million. Tourist visits contribute to revenue generation for local people by way of tax and entrance fees to the Government which will be invested in many social welfare schemes and also the health sector.Medical Tourism also contributes to the well-being of people and in India, The Medical Tourism sector is predicted to increase at a CAGR of 21.1% from 2020-27. (Indian Brand Equity Foundation, 2024). Off late, Medical tourism and wellness retreats(mostly ayurveda based) attract 21% of international travelers, leveraging world-class healthcare facilities and traditional healing practices.

The Ministry of Tourism released guidelines for wellness tourism with recommendations to address publicity material, training and capacity building for service providers. The Guideline for Accreditation of wellness centers has been developed by the National Board for Accreditation of Hospitals & Healthcare Services (NABH) in consultation with AYUSH th maintain quality of services. The initiative of accreditation of wellness centers by NABH and AYUSH is driven by the Ministry of Tourism as well as consultation with the Wellness Tourism Service Providers, State Governments, and other stakeholders (Ministry of Tourism, 2017).

6.3. Gender equality (SDG-5)

Tourism provides numerous opportunities for women to take different job roles. The women's ratio in tourism jobs is higher compared to other sectors.As per theMinistry of Tourism (2023), the Government of India to encourage the share of female participation in the workforce, a 50% concession, is given on course fees for Women applicants towards the enrolment of the Incredible India Tourist Facilitator Certification Programme, which is an online learning platform of the Ministry of Tourism aimed at creating a well-trained facilitator across the country. Ministry has also formulated a National Strategy and Roadmapfor the Development of Rural Tourism in India in Consultation with ministries including the Ministry of Women & Child Development.Ministry has also formulated a National Strategy for the Promotion of Rural Homestays which increases the role of Women Self – Help Groups for women in running Rural Homestays.

In 2020, the Ministry signed a Memorandum of Understanding (MOU) with the Travel Agents Association of India (TAAI) and the FICCI Ladies Organisation (FLO) to promote tourism as a long-term economic empowerment model for women. Initiatives of the MoU include Encouraging women toTour guidesand run food stalls, and crafts stalls near Monuments or Tourist landmarks in

each state.Incredible India Tourist Facilitator (IITF) Certification Programme for women and Workshop for women with the help of NGOs to create awareness about the Athithi Devo Bhava initiative(Ministry of Tourism, 2023). All these Initiative encourages women's participation in jobs which will contribute to the SDG of Gender Equality.

6.4. Clean water and sanitation (SDG-6) and Affordable and clean energy (SDG-7)

To ensure these goals Tourism stakeholders, such as the transportation industry should promote the use of renewable resources that will benefit in achieving SDG and Efficient use of water in tourism, pollution control, and technology efficiency. In India people in the Hotel and Transportation Industry are prioritizing this thus we can say that the Indian tourism sector is also working towards the achievement of SDG-6 and SDG-7.

6.5. Industry innovation and infrastructure (SDG-9)

Yadav (2023) in her blog discusses that the government of India has been taking various steps to promote innovation in the country and Innovation in Travel and Tourism. The Tourism Industry in India has 1497 Department for Promotion of Industry and Internal Trade (DPIIT). It has recognized startups in the Travel and Tourism Sector as of 17th April 2023. They are spread across 262 districts across the country. The highest in Delhi- is 222 and About 58% of the startups in the sector are from Tier 2 & Tier 3 cities. Startups such as Param People Infotech Solutions Private Limited and Villotale Technologies Private Limited which are working in the Tourism Industry are recognized National Startup Awards. Yadav (2023) also points out that there are plenty of opportunities for prospective entrepreneurs in India to innovate the Tourism Sector. Such opportunities include conducting virtual safaris, tours of museums and art galleries, and exhibitions through the help of Virtual Technology, creating planning platforms for live streaming of various tourism sites including religious sites and monumental sites, and Developing promotion and advertisement campaigns like 'Incredible India'. Niche Tourism, Sustainable Solutions. Etc. The Ministry of Tourism also through its initiative of "Dekho Apna Desh" provides virtual tours and exhibitions.

6.6. Reducing Inequalities (SDG-10)

India Largely benefits from International Tourism. 81,66,000 Foreigners visited India from January to November in 2023 as per the Ministry of Tourism (Sharma, 2024). They visit different parts of the country and it helps locals to earn income. Domestic tourism in India hasbeen generating revenue of 2 to 3 billion dollars per month (CEIC, 2023). BothInternational Tourism and Domestic tourism help in reducing regional disparity. As they spend that income on places they visit and as per the Ministry of Tourism (2022), Tourism may help to revive cities and rural areas, as well as minimize regional disparities, by allowing communities to make a living in their hometowns.

6.7. Sustainable cities and communities (SDG-11)

More than half of the Ministry of Tourism's budget is channeled for funding the development of destinations, circuits, mega projects as well as rural tourism infrastructure projects. (Kumar, 2023). Tourism ministry with the help of the Ministry of Aviation focusing on improving connectivity to key tourist destinations. (Singh, 2023). The importance of infrastructure development is see in these actions.

6.8. Responsible consumption and production (SDG-12)

India has prioritized Green in its G20 objectives. (Singh, 2023). The program holds tremendous significance for promoting India's G20 priority for Green Tourism under the Tourism Working Group. India is also working towards achieving the Goal of Responsible Consumption and Production(Singh, 2023). Tourism Ministry has The Sustainable Tourism Programme (STP) for 10-Year framework of Programs on Sustainable Consumption and Production Patterns (10YFP) which seeks to promote SCP practices, including resource-efficient attempts that promote economic, social, and environmental outcomes (Ministry of Tourism, 2022).

6.9. Climate action (SDG-13)

Government initiative: The Ministry of Tourism has been organizing various conferences and meetings with a partnership of various stakeholders to make sure their approaches towards responsible tourism. In one such conference in partnership with the United Nations Environment Program (UNEP) and Responsible Tourism Society of India (RTSOI), it discussed various measures to tackle climate change Adopting low-emission technology, optimizing resource use, lowering operating costs, and increasing efficiency would be essential to optimizing environmental performance and tackling climate change. (PIB Delhi, 2022)

6.10. Life on Land (SDG-14) and Life on Water (SDG-15)

India's Initiative: To celebrate World Tourism Day on 27 September 2023, the Ministry of Tourism, Government of India had organized the Global Launch of 'Travel for LiFE. A program for the tourism sector under Mission Life, to create awareness about sustainable tourism and to push the tourists and tourism businesses to adopt sustainable practices in sync with nature. The program aims to encourage large-scale behavioral changes with all people involved and mainstream sustainability in the tourism sector towards developing a sustainable, responsible, and resilient tourism practices. It calls for a transition from a "use-and-dispose" economy to a circular economy characterized by mindful and deliberate utilization of resources instead of mindless and destructive consumption to preserve the resources of the environment. Sustainable tourism plays an important role not only in conserving and preserving biodiversity, but also in protecting terrestrial ecosystems, due to its efforts to reduce waste and consumption, save native flora and fauna, and raise awareness. (Ministry of Tourism, 2022). Ministry of Tourism (2022) in its strategy for sustainable development

specifies that Tourism development must be included in Integrated Coastal Zone Management to help conserve and preserve fragile and unique marine ecosystems and serve to promote a blue economy.

6.11. Peace, justice and strong institutions (SDG-16)

The Tourism Motto of the Indian Government "Atithi devo Bava" itself calls for inclusiveness.

There are various initiatives from tourism-related stakeholders that help create peace among people, and reduce inequality between cast, creed, and language. Such initiative includes Kite festivals which help in bringing communities together.One such initiative organized in Hyderabad by Tourism and Culture Department Secretary Burra Venkatesham says the "events have brought closer families of different languages and culture which have made the city their home since decades. There was a significant interaction between these communities bridging the north and south divide"(The Hindu, 2018). Such festivalsdo happen in various parts of India as a part of the Tourism initiative. In Mumbai festival, organized by the Maharashtra Tourism department which celebrates Ganesh Visarjan and other events helped to bring together different communities (Times of India, 2024).

6.12. Partnership for Goal (SDG-17)

Initiatives of Government towards partnership

- The Ministry of Tourism is working as part of a "whole-of-government approach" with the Ministry of Civil Aviation and other ministries in the country. (Singh, 2023)

- The Ministry of Tourism and Airbnb signed a Memorandum of Understanding to promote India as one of the most sought-after tourism destinations for travelers worldwide. (Outlook Planet Desk, 2023).

- Ministry of Tourism, in collaboration with the Ministry of Environment, Forest & Climate Change has launched an Alternative Livelihood Programme under the Amrit Dharohar Capacity Building Scheme-2023 on 8th December 2023 in Sultanpur National Park, a Ramsar Site in Haryana. Under this initiative, IITTM, an autonomous body under the tourism ministry in collaboration with ministry of environment, forest and climate change will build the capacity of local community members around different Ramsar sites in order to strengthen nature tourism at these sites. This will provide alternative livelihood to the local community(PIB Delhi, 2023).

- Union Budgets has been firmly emphasizing on tourism as a key sector in the spotlight. The Ministry of Tourism is dedicated to promoting the industry through active participation from all States, the convergence of Government Programs, and the establishment of impactful Public-Private Partnerships which os a part of its mission. This visionary approach will facilitate comprehensive development in at least 50 selected destinations through a challenge mode process and consistency. Through 100% Foreign Direct Investment (FDI) in the tourism industry under

the automatic route. Additionally, 100% FDI is permitted for tourism in construction projects, including the development of exquisite hotels, resorts, and unparalleled recreational facilities(Prakash, 2023).

By adopting a long-term view, developing strong partnerships, and aligning efforts with the SDGs, tourism stakeholders can work together to achieve sustainable development outcomes that benefit both current and future generations. (Adie et al., 2022).The industry significantly impacts employment and drives regional development, while also creating a multiplier effect on the performance of related industries.

7. FINDINGS

Achieving the SDGs in tourism requires a good collaborative efforts from the governments, businesses and the individuals as all are stake holders. Some of the strategies to achieve SDGs in tourism include: Implementation of sustainable tourism policies and regulations from the government and strict regulations of the same to achieve the desired goals. The business houses have more investable option in tourism in many ways and there should be a holistic approach to planning and monitoring in tourism development within the backdrop of sustainability. It is also found that many of the goals are relevant and attainable from India's point of view.

8. CONCLUSION

Governments and all the stakeholders should come together to achieve the Global agenda of achieving SDG 2030. Tourism essentially contributes to all of the SDGs, although measuring that impact may be challenging. Governing authorities should take measures to evaluate tourism's impact on employment, GDP, gender equality, inclusiveness, land and water protection, agriculture, regional disparities reduction, and overall contribution to attaining the SDGs. Tourism projects and policy initiatives promoting tourism have great potential to contribute to SDGs. Indian Union Government and several state governments in India have different policies which promote tourism in the country. The promotion of tourism leads to the creation of Jobs Either directly or indirectly. This also helps create revenue for the country by way of foreign exchange income, and domestic tourism income. It also brings inclusiveness, sustainably developing eco-tourism will lead to a reduction of poaching and deforestation. Responsible marine tourism helps in the protection of Marine Life.

India's travel and tourism industry is contributing a lot in contributing SDGs. According to WTTC, the contribution of India's travel and tourism sector to India's economy was worth Rs. 15.9 trillion (US$ 191.25 billion) in 2022(Indian Brand Equity Foundation, 2024). The government plays a pivotal role in making policies related to tourism which aid in achieving SDGs. Effective governance is necessary to ensure the long-term sustainability of tourist growth, which includes economic development, social inclusion, and environmental conservation. (Rasoolimanesh et al., 2023). Indian Government is also taking various measures which are needed for creating sustainable tourism. According to a G20 news release, the roadmap's five objectives for achieving sustainable tourism

are green tourism, digitalization, skills, tourism MSMEs, and destination management. (Singh, 2023).Promoting Sustainable tourism practices that not only benefit the local community and provide economic growth but also contribute to environmental well-being (Rej et al., 2022), therefore stakeholders of tourism need to work together to encash the Tourism potential in achieving SDGs.

9. SUGGESTIONS

Achievement in the road of development is not an individual action. It involves a good and planned collaborative efforts from its stake holders. Few strategies for achieving the goals are: Promoting eco-tourism and responsible travel practices keeping in mind the goal to be achieved. The thought like think global and act local should be done by supporting local communities and small business. Stringent action is required in implementation of sustainable tourism policies and regulations. Government needs to invest more in sustainable infrastructure and transportation as it forms the basis for all other growth. Reduction of waste and emissions should also be monitored. Protecting natural and cultural heritage site are highly important in Indian context. Apart from government initiatives a little education through television and other media on importance of sustainable tourism should given to general public as an awareness. Policies do not work unless stakeholders work towards it. By working together to achieve these SDGs we can ensure that tourism contributes to sustainable development and benefits both people and planet.

10. SCOPE FOR FURTHER RESEARCH

The study showed a wider perspective on policy related aspects. Stakeholders' engagement is the key for any sustainable based development. A depth study on the practical problem in will help the policy makers to make a collaborative efforts. It is useful to suggest the policy makers with the primary study of the existing problems. A case study would be more effective in the process where the actual problem can be matched with actual solution. I would make more efforts to research on the same.

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HEI Empowerment using Multifunctional KPI

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ABSTRACT

KPIs are used to assess academic, administrative, and operational aspects, helping HEIs manage and improve their functions. Stakeholders include students, faculty, staff, parents, alumni, governing bodies, government bodies, and accreditation bodies. Students benefit from quality education, career prospects, campus facilities, and support services, while faculty and staff focus on job security, research opportunities, and financial support. This study identifies stakeholders in Higher Education Institutions (HEIs) and their responsibilities, focusing on KPIs and their influence on accreditation and ranking. The major KPIs are identified from the analysis of the procedures from the accreditation criteria and documents of National Assessment and Accreditation Council (NAAC) India, National Board of Accreditation (NBA) India, Academic Accreditation and Quality Assurance of Education (OAAAQA) Oman,National Center for Academic Accreditation and Evaluation (NCAAA) and Accreditation Board for Engineering and Technology .Three questioners formed with fifty questioner each focuses of rural , urban and semi-urban educational institutions and their performance with in last five years based on their accreditation self-study report from thirty institution across south India . Stakeholders include students, faculty, staff, parents, alumni, administration, industry partners, and local businesses. Students benefit from quality education, career prospects, campus facilities, and financial aid. Faculty members, administrators, alumni, and industry partners contribute to the institution's reputation. The Multifunctional Key Performance Indicators (MKPI) aid in defining strategic goals, selecting relevant KPIs, and monitoring performance for continuous improvement. The MKPIs (Mean,

Graduation, Retention, and Average GPA) are crucial for monitoring student success and identifying areas for academic support. They also help optimize resource utilization, budget planning, and financial management. The top five KPIs for Higher Education Institutions (HEIs) include graduation rate, student retention rate, employment rate post-graduation, student satisfaction, faculty research publications, teaching effectiveness, grant funding received, professional development participation, student-faculty ratio, and community engagement programs. Regular monitoring supports continuous improvement and helps maintain high standards.

Keywords: *Empowerment of HEI, Key Performance Indicator, Multifunctional Key Performance Indicators*

1. Introduction

Key Performance Indicators (KPIs) are essential for higher educational institutions (HEIs) for several reasons. They provide a structured way to measure performance, ensure accountability, and help institutions achieve their strategic goals. Multifunctional Key Performance Indicators (KPIs) are metrics used to assess the performance and efficiency of various functions within an organization. Multifunctional KPIs provide a holistic view of organizational performance, helping organizations make informed decisions and drive continuous improvement across various functions. Multifunctional Key Performance Indicators (KPIs) play a crucial role in Higher Education Institutions (HEIs) by providing a *comprehensive and integrated view of performance across various functions*. These KPIs help HEIs manage and improve their academic, administrative, and operational aspects, ensuring that they meet their educational objectives and serve their stakeholders effectively. The Academic Performance includes Graduation Rate, Students Retention Rate, Student-to-Faculty Ratio and Research Output. The Operational Efficiency will be identified from Class Utilization Rate, Administrative Cost per Student, IT Infrastructure Up-time, Funding and Grants, Tuition Revenue and Operating Margin. Financial factors depends on Funding and Grants, Tuition Revenue and Operating Margin. Student and Staff Satisfaction measured via Student Satisfaction Score, Employee Satisfaction Index and faculty Turnover Rate. Higher educational services are identified using Community and Societal Impact such Community Engagement and Alumni Success.

2. Methodology

This proposed study initially identify the stakeholders in HEI and determine their major responsibilities. As per the stakeholders involvement in HEI , the KPI are determined and mapped. The KPIs are performance and its influences on the accreditation and ranking is evaluated and recommended the MKPI for the empowerment of HEI. This study process start with the evaluation of five accreditation procedures to identify the accreditation stakeholders and functional performance

indicators of students in Academic, Student Engagement, Student Satisfaction and Well-being, Career and Post-Graduation Success, Institutional and Financial Metrics and Student Demographics and Diversity. The major key performance indicator for the faculty includes Academic Performance and Teaching, Research and Scholarly Activity, Professional Development, Service and Community Engagement, Staff Performance and Efficiency, Operational Efficiency, Employee Satisfaction and Retention, Institutional Contribution and Recognition and Institutional and Financial Metrics. The community and societies indicator focused on Community Engagement and Outreach, Economic Impact, Educational Outreach and Accessibility, Health and Wellness, Cultural Events and Programs, Environmental Sustainability, Public Policy and Advocacy, Access and Inclusion, Alumni Engagement and Research and Innovation for Social Good. The major stakeholders and the performance indicator focuses on the HEI survey conducted via google forms. Totally thirty HEI participated and submitted the response.

2.1 Stakeholders:

The higher education stakeholders includes Students Faculty and Staff, Parents and Families, Alumni, Governing Bodies (Boards of Trustees/Regents),Government and Regulatory Agencies, Accreditation Bodies, Employers and Industry Partners, Community and Society, Donors and Sponsors, Current and Prospective Students' Employers, Research Funding Agencies, Local Businesses and Economic Partners, Media and Public Opinion agencies. These stakeholders are identified from the accreditation criteria and documents of National Assessment and Accreditation Council (NAAC) India, National Board of Accreditation (NBA) India , Academic Accreditation and Quality Assurance of Education (OAAAQA) Oman ,National Center for Academic Accreditation and Evaluation (NCAAA) 0and Accreditation Board for Engineering and Technology .

Students are primary beneficiary of the higher educational system and are interested to Quality of education, career prospects, campus facilities, support services, financial aid, and overall student experience. Faculty and staff members are acting as an Educators, researchers, and administrative personnel. They are attracted by Job security, professional development, research opportunities, teaching conditions, compensation, and work environment in the HEI. Parents and Families concentrated on Quality of education, safety and well-being of students, financial investment, and career outcomes for their children in the HEI. Alumni will ensure the Institutional reputation and create networking opportunities, ongoing education, alumni services, and philanthropic contributions to HEI.

The main beneficiaries of Higher Education Institutions (HEIs) are students, who attend classes, participate in extracurricular activities, and utilize campus resources. Faculty members design and deliver course content, foster critical thinking, and mentor students. They also conduct original research, secure research grants, and collaborate with other institutions and industries. Faculty advisors advise students on academic pathways, career options, and personal development, playing a crucial role in student retention and success.

Administration plays a vital role in HEIs, overseeing strategic priorities, managing resources, and ensuring the institution's mission is fulfilled. Board of Trustees/Governors oversee the institution's strategic direction, financial health, and long-term planning, hiring and evaluating top administrators. They set institutional policies, approve budgets, and ensure adherence to the institution's mission, values, and legal obligations.

Alumni promote the institution's reputation through their professional achievements and community involvement. They provide networking opportunities, internships, job placements, and career advice to current students. Donors contribute financially to scholarships, endowments, and infrastructure projects.

Government bodies establish educational policies, standards, and regulations for HEIs, providing financial support through grants, scholarships, student loans, and funding for research projects and infrastructure. Accreditation bodies conduct accreditation processes to ensure institutions meet specific educational standards and continuously improve.

Industry partners partner with HEIs on research projects, provide internships, and create job opportunities for graduates. They offer insights on industry trends and skill requirements, helping to align academic programs with labor market needs. Sponsors provide funding for research, scholarships, and campus events, contributing to the development of specialized facilities and programs. Parents and families offer emotional and financial support, while local communities engage with HEIs through service-learning projects, cultural events, and economic development initiatives. Accreditation bodies evaluate and certify the quality of HEIs and their programs, providing recommendations for continuous improvement.

2.2 Multifunctional Key Performance Indicators

The MKPI aids for defining Strategic Goals and select relevant KPIs, Set the target, Collect the facts and Monitoring and Reporting to the respective Stakeholder and their involvement for Continuous Improvement. The Strategic goals should align KPIs with the strategic objectives of the HEI, such as improving academic excellence, enhancing student experience, and ensuring financial sustainability. While selecting the KPIs that reflect the performance and success in each key area relevant to the institution's mission. The HEI must implement strong systems for accurate and timely data collection, ensuring data integrity and consistency with continuously monitor KPI performance and generate reports to inform decision-making and track progress. The report should be shared with stakeholders, including faculty, staff, students, and governing bodies, in the KPI selection and review process for improvement and implement changes to enhance performance. This study aids to identify the highly influencing MKPI for the empowerment of HEI

a. Multifunctional Key Performance Indicators for Students.

MKPI for students in higher education are metrics designed to assess various aspects of student performance, engagement, satisfaction, and success. As per the analysis of metrics given for the evaluation of program and institution by accreditation criteria / standards and documents/

manuals of National Assessment and Accreditation Council (NAAC) India, National Board of Accreditation (NBA) India , Academic Accreditation and Quality Assurance of Education (OAAAQA) Oman,National Center for Academic Accreditation and Evaluation (NCAAA) and Accreditation Board for Engineering and Technology the major performance indicator of the domains are categorized

The identified and cross functional KPIS related students are tabulated

Table - 1: MKPI for Students in HEI

KPI	Description	Purpose
S1. Academic		
S1.1. Grade Point Average (GPA)	The average of a student's grades over a specific period.	Measures academic achievement and helps identify students who may need academic support.
S1.2. Graduation Rate	The percentage of students who complete their degree within a set time frame (e.g., four or six years for undergraduate programs).	Indicates the institution's ability to support students through to the completion of their studies.
S1.3. Retention Rate	The percentage of students who continue their studies at the institution from one year to the next.	Reflects student satisfaction and institutional effectiveness in maintaining student engagement.
S1.4. Course Completion Rate	The percentage of courses completed successfully by students.	Identifies patterns in course dropouts and highlights courses that may require additional support or redesign.
S2. Student Engagement		
S2.1. Class Attendance Rate	The percentage of classes attended by students.	Measures student engagement and can correlate with academic performance.
S2.2. Participation in Extracurricular Activities	The percentage of students involved in clubs, organizations, sports, and other extracurricular activities.	Indicates overall student engagement and contributes to a well-rounded educational experience.

KPI	Description	Purpose
S2.3. Library Resource Utilization	Frequency of library use and the number of resources (books, journals, etc.) checked out by students.	Reflects students' engagement with academic resources and support services.
S3. Student Satisfaction and Well-being		
S3.1. Student Satisfaction Score	Average score from surveys assessing students' satisfaction with various aspects of their educational experience (e.g., teaching quality, campus facilities, support services).	Measures overall student satisfaction and identifies areas for improvement
S3.2. Counseling and Support Services Usage	The number of students using mental health services, academic counseling, and other support services.	Reflects the accessibility and effectiveness of support services offered by the institution.
S3.3. Student Feedback and Course Evaluations	Results from surveys and evaluations completed by students regarding their courses and instructors	Provides direct feedback on the quality of instruction and course content, helping to improve teaching methods and curriculum design.
S4. Career and Post-Graduation Success		
S4.1. Employment Rate Post-Graduation	The percentage of graduates employed in their field of study within a certain time frame after graduation	Indicates the institution's effectiveness in preparing students for the job market.
S4.2. Graduate School Acceptance Rate	The percentage of graduates who are accepted into graduate or professional schools.	Measures the institution's success in preparing students for advanced studies.
S4.3. Internship and Co-op Participation Rate	The percentage of students participating in internships or cooperative education programs	Reflects the practical experience students gain and their readiness for the workforce.

KPI	Description	Purpose
S5. Institutional and Financial Metrics		
S5.1. Scholarship and Financial Aid Utilization	The percentage of students receiving scholarships or financial aid.	Measures the accessibility of financial support for students and highlights the institution's commitment to affordability.
S5.2. Student Debt at Graduation	The average amount of debt students have at the time of graduation.	Reflects the financial burden on students and can influence decisions related to tuition, financial aid, and support services
S6. Student Demographics and Diversity		
S6.1. Composition of Council	Composition of the student body in terms of ethnicity, gender, age, socioeconomic status, etc.	Measures diversity and inclusivity within the student population, informing policies to promote a diverse and equitable educational environment

b. Multifunctional Key Performance Indicators for Faculty.

MKPI for faculty and staff in higher education institutions are essential metrics that measure various aspects of performance, engagement, productivity, and satisfaction. These KPIs help ensure that faculty and staff are effectively contributing to the institution's goals and that their needs and professional development are adequately addressed.The identified and cross functional KPIS related students are tabulated

Table - 2: MKPI for Faculty

KPI	Description	Purpose
F1. Academic Performance and Teaching		
F1.1. Teaching Effectiveness	Measured through student evaluations, peer reviews, and teaching awards.	Assesses the quality of instruction and the impact on student learning outcomes
F1.2. Course Completion Rate	The percentage of students who successfully complete courses taught by the faculty member.	Reflects teaching effectiveness and student engagement.

KPI	Description	Purpose
F1.3. Student Evaluation Scores	Average ratings from student evaluations of teaching and courses.	Measures teaching effectiveness and helps identify areas for improvement in instructional methods.
F1.4. Pass Rate	Percentage of students passing the courses taught by a faculty member.	Indicates the effectiveness of teaching and the ability to help students meet learning outcomes
F1.5. Student Success Rates	Metrics such as pass rates, retention rates, and graduation rates in courses taught by faculty.	Reflects the impact of teaching on student outcomes.
F1.6. Course Completion Rate	The percentage of students who successfully complete a course.	Indicates the effectiveness of course delivery and faculty support.
F1.7. Curriculum Development	Number and quality of new courses or programs developed by faculty.	Reflects faculty engagement in curriculum innovation and responsiveness to educational needs.
F1.8. Student-Faculty Ratio	The number of students per faculty member.	Indicates workload, class size, and potential for personalized attention to students.
F1.9. Innovative Teaching Practices	Adoption of new teaching methods, technologies, and pedagogical strategies.	Encourages continuous improvement and adaptation to changing educational needs.

F2. Research and Scholarly Activity

KPI	Description	Purpose
F2.1 Research Publications	Number of peer-reviewed articles, books, and conference papers published.	Measures research productivity and contribution to the academic field. Measures research productivity and scholarly impact
F2.2 Research Grants and Funding	Amount of research funding secured through grants and other sources.	Indicates research activity and the ability to attract external funding.

KPI	Description	Purpose
F2.3 Citations and Impact Factor	Number of citations received and the impact factor of journals in which work is published.	Reflects the influence and recognition of research within the academic community
F2.4 Conference Presentations	The number of presentations or papers presented at academic and professional conferences.	Reflects faculty engagement in the academic community and dissemination of research findings.

F3. Professional Development

F3.1 Professional Development Participation	Attendance and participation in workshops, seminars, conferences, and training programs.	Encourages continuous learning and skill enhancement.
F3.2 Professional Development Hours	Number of hours spent on professional development activities, such as workshops, seminars, and conferences	Measures commitment to continuous learning and skill enhancement.
F3.3 Advanced Degrees and Certifications	Number of faculty and staff pursuing or holding advanced degrees or professional certifications.	Measures commitment to professional growth and expertise.

F4. Service and Community Engagement

F4.1 Committee Participation	Number of faculty and staff serving on institutional committees.	Measures engagement in institutional governance and community involvement.
F4.2 Community Service	Hours contributed to community service and outreach activities.	Reflects commitment to civic engagement and societal impact.
F4.3 Service to the Institution	Participation in committees, advisory boards, and other institutional service roles.	Reflects engagement and contribution to the governance and development of the institution.

KPI	Description	Purpose
F4.4 Community Outreach and Engagement	Involvement in community service, public lectures, and outreach programs.	Demonstrates commitment to the institution's community and societal impact.

F5. Staff Performance and Efficiency

KPI	Description	Purpose
F5.1 Administrative Efficiency	Metrics such as processing time for administrative tasks, error rates, and adherence to deadlines	Assesses the efficiency and effectiveness of administrative staff.

F6. Operational Efficiency

KPI	Description	Purpose
F6.1 Administrative Task Completion	Timeliness and accuracy in completing administrative duties and reporting.	Measures efficiency and reliability in administrative responsibilities
F6.2 Utilization of Technology	Adoption and effective use of educational technologies and learning management systems.	Indicates proficiency in utilizing technology to enhance teaching and operational processes.
F6.3 Support Service Usage	Utilization rates of support services provided by staff (e.g., IT helpdesk, counseling services).	Measures the effectiveness and accessibility of support services.

F7. Employee Satisfaction and Retention

KPI	Description	Purpose
F7.1 Job Satisfaction Scores	Average ratings from employee satisfaction surveys.	Measures overall job satisfaction and identifies areas for improving the work environment.
F7.2 Employee Satisfaction	Results from employee satisfaction surveys covering aspects like work environment, support, and job satisfaction.	Identifies areas for improvement in workplace conditions and staff well-being.
F7.3 Staff Retention Rate	Percentage of staff retained over a given period.	Indicates job satisfaction and organizational stability.

KPI	Description	Purpose
F7.4 Absenteeism Rate	The frequency of absences among faculty and staff.	Reflects overall employee well-being and satisfaction
F7.5 Workload Balance	Assessment of workload distribution and balance between teaching, research, and service responsibilities	Ensures sustainable workload and prevents burnout.
F7.6 Work-Life Balance	Employee perceptions and reports on their ability to maintain a healthy work-life balance.	Indicates well-being and potential areas for reducing burnout and stress.
F7.7 Staff Turnover Rate	Percentage of faculty and staff leaving the institution within a given time frame	Reflects employee retention and satisfaction with the work environment.
F7.8 Internal Promotion Rate	Percentage of faculty and staff promoted internally	Measures career growth opportunities and employee development within the institution.
F7.9 Student Advising Load	The number of students assigned to faculty advisors	Measures the faculty's capacity to provide personalized academic advising and mentorship
F7.10 Student Mentorship Programs	Participation in formal mentorship programs and the number of mentees supported.	Reflects the institution's commitment to student development through mentorship

F8. Institutional Contribution and Recognition

KPI	Description	Purpose
F8.1 Awards and Honors	The number of faculty and staff receiving internal and external awards and recognitions.	Acknowledges excellence in teaching, research, and service.
F8.2 Collaboration and Interdisciplinary Work	Participation in interdisciplinary projects and collaborations with other institutions or industry partners.	Encourages a collaborative approach to research and education.

KPI	Description	Purpose
F9. Institutional and Financial Metrics		
F9.1 Cost per Student	The financial cost of faculty and staff per student.	Measures the cost-effectiveness of faculty and staff in delivering education.
F9.2 Revenue from Grants and Contracts	Total revenue generated from research grants, contracts, and partnerships.	Reflects the financial contributions of faculty research to the institution

c. *Multifunctional Key Performance Indicators for* **Communities and Societies**

MKPI for Higher Education Institutions (HEIs) regarding their impact on communities and societies are crucial for assessing the effectiveness and extent of their engagement and contributions. These KPIs help measure how well an HEI is serving its community and contributing to societal development.

Table - 3: MKPI for Communities and Societies

KPI	Description	Purpose
C1. Community Engagement and Outreach		
C1.1 Number of Community Partnerships	The total number of active partnerships with local organizations, schools, and community groups	To measure the HEI's engagement with the community and its ability to collaborate with external entities to enhance community development and support
C1.2 Community Service Hours	The total number of hours contributed by students, faculty, and staff to community service and volunteer activities	To assess the level of community involvement and the HEI's commitment to social responsibility and civic engagement
C1.3 Participation in Community Events	The number of community members attending and participating in events organized by the HEI	To gauge the reach and impact of the HEI's community events and activities, and to identify areas for increasing community engagement.

KPI	Description	Purpose
C2. Economic Impact		
C2.1 Local Economic Contribution	The total economic impact of the HEI on the local economy, including job creation and local spending	To quantify the HEI's role in supporting the local economy and its contributions to economic development
C2.2 Support for Local Businesses	The number of local businesses and startups supported through HEI programs, incubators, and entrepreneurship initiatives.	To evaluate the HEI's effectiveness in fostering local entrepreneurship and economic growth
C.2.3 Research and Development Partnerships	The number of research projects conducted in partnership with local industries and their economic impact.	To measure the HEI's collaboration with industry and the real-world applications of its research efforts.
C3. Educational Outreach and Accessibility		
C3.1 Educational Programs for the Community	The number of educational programs, workshops, and seminars offered to the community	To assess the HEI's efforts in providing educational opportunities and lifelong learning for community members
C3.2 Participation in Lifelong Learning	The enrollment and participation rates of community members in continuing education and lifelong learning programs.	To measure the HEI's impact on promoting lifelong learning and continuous professional development within the community.
C3.3 K-12 Outreach Activities	The number of outreach activities and programs targeting K-12 schools to promote STEM education and college readiness.	To evaluate the HEI's role in supporting early education and preparing students for higher education and STEM careers.
C4. Health and Wellness		
C4.1 Community Health Initiatives	The number of health and wellness initiatives and services provided to the community, such as free clinics and health fairs.	To measure the HEI's contribution to improving community health and well-being.

KPI	Description	Purpose
C4.2 Public Health Research Impact	The impact of public health research and interventions conducted by the HEI on local health outcomes.	To assess the effectiveness of the HEI's public health research and its contributions to improving health standards in the community
C4.3 Mental Health and Counseling Services	The availability and utilization of mental health and counseling services for community members	To gauge the HEI's role in supporting mental health and providing necessary counseling services to the community.

C5. Cultural Events and Programs

C5.1 Cultural and Social Contributions	The number of cultural, artistic, and social events hosted by the HEI that are open to the public	To evaluate the HEI's contribution to cultural enrichment and its role in promoting the arts and social engagement within the community
C5.2 Community Participation in Cultural Events	The attendance and participation rates of community members in cultural and artistic events	To measure the level of community engagement in the HEI's cultural offerings and identify opportunities to increase participation
C.5.3 Promotion of Local Heritage	Initiatives and programs aimed at preserving and promoting local heritage, arts, and culture	To assess the HEI's efforts in maintaining and celebrating local heritage and cultural traditions.

C6. Environmental Sustainability

C6.1 Sustainability Initiatives	The number and impact of sustainability and environmental conservation projects involving the community	To measure the HEI's contribution to environmental sustainability and its efforts to engage the community in sustainable practices
C6.2 Community Engagement in Sustainability	The level of community involvement in sustainability practices and awareness programs.	To assess the effectiveness of the HEI's sustainability initiatives and their impact on community behavior and awareness

KPI	Description	Purpose
C6.3 Research on Environmental Issues	Research contributions to local environmental conservation efforts and their impact	To evaluate the HEI's role in conducting and applying research to address environmental challenges

C7. Public Policy and Advocacy

KPI	Description	Purpose
C7.1 Policy Recommendations	The number of policy recommendations and research contributions made by the HEI on social and public issues	To measure the HEI's influence on public policy and its ability to provide research-based solutions to societal challenges.
C7.2 Public Policy Engagement	The involvement of HEI faculty and staff in public policy discussions and advisory roles.	To assess the HEI's engagement in shaping public policy and contributing to informed decision-making.
C7.3 Impact of Advocacy Efforts	Changes in local, regional, or national policies influenced by the HEI's advocacy efforts.	To measure the effectiveness of the HEI's advocacy efforts in bringing about policy changes.

C8. Access and Inclusion

KPI	Description	Purpose
C8.1 Programs for Underrepresented Groups	The number of outreach and support programs targeting underrepresented and underserved populations.	To evaluate the HEI's efforts in promoting diversity, equity, and inclusion within the community.
C8.2 Scholarships and Financial Aid	The amount and number of scholarships and financial aid programs provided to support community members.	To measure the HEI's commitment to making education accessible and affordable for all.
C8.3 Diversity and Inclusion Initiatives	Initiatives aimed at promoting diversity, equity, and inclusion within the community.	To assess the HEI's efforts in creating an inclusive environment and supporting marginalized groups.

KPI	Description	Purpose
C9. Alumni Engagement		
C9.1 Alumni Involvement in Community Service	The engagement of alumni in community service and development activities.	To measure the continued commitment of alumni to community service and their impact on societal development.
C9.2 Alumni Contributions to Community Development	Contributions of alumni to community leadership, volunteerism, and philanthropy.	To assess the impact of alumni on community development and their role in driving positive change.
C9.3 Alumni-Led Community Initiatives	The number and impact of community initiatives and projects led by alumni.	To measure the influence of alumni in leading community projects and their contributions to societal well-being.
C10. Research and Innovation for Social Good		
C10.1 Social Impact Research Projects	The number of research projects addressing social challenges and community needs	To evaluate the HEI's focus on research that benefits society and addresses critical social issues.
C10.2 Dissemination of Research Findings	Efforts to disseminate research findings to the community and policymakers.	To measure the HEI's effectiveness in communicating research outcomes and influencing public understanding and policy.
C10.3 Impact of Applied Research	The real-world impact of applied research and innovation on improving community well-being	To assess the tangible benefits of the HEI's research activities and their contributions to societal progress.

By implementing and tracking these KPIs, HEIs can better understand and enhance their impact on communities and societies, ensuring that they fulfil their role as drivers of social change and contributors to the public good.

3. Result and Discussion

A survey collected ten point scale for each KPI , over thirty accredited HEI from urban(14), semi urban(8) and rural(8). The grading for each KPI weightage gathered and presented.

Table - 4: Students MKPI Weighted average

Students	Weightage			
	Urban	**Semi-Urban**	**Rural**	**Average**
S1. Academic				
S1.1. Grade Point Average (GPA)	87	99	99	95
S1.2. Graduation Rate	77	88	93	86
S1.3. Retention Rate	92	97	95	95
S1.4. Course Completion Rate	96	99	95	97
S2. Student Engagement				
S2.1. Class Attendance Rate	86	89	90	88
S2.2. Participation in Extracurricular Activities	100	72	96	89
S2.3. Library Resource Utilization	84	88	53	75
S3. Student Satisfaction and Well-being				
S.3.1 Student Satisfaction Score	88	90	89	89
S3.2. Counseling and Support Services Usage	71	95	84	83
S3.3. Student Feedback and Course Evaluations	87	81	81	83
S4. Career and Post-Graduation Success				
S4.1. Employment Rate Post-Graduation	95	89	95	93
S4.2. Graduate School Acceptance Rate	51	94	67	71
S4.3. Internship and Co-op Participation Rate	73	71	88	77

Students	Weightage			
	Urban	Semi-Urban	Rural	Average
S5. Institutional and Financial Metrics				
S5.1. Scholarship and Financial Aid Utilization	83	50	57	63
S5.2. Student Debt at Graduation	76	75	86	79
S6. Student Demographics and Diversity				
S6.1. Composition of Council	87	100	77	88

Table - 5: Faculty MKPI Weighted average

Faculty	Weightage			
	Urban	Semi-Urban	Rural	Average
F1. Academic Performance and Teaching				
F1.1. Teaching Effectiveness	97	88	93	93
F1.2. Course Completion Rate	100	75	94	90
F1.3. Student Evaluation Scores	94	99	96	96
F1.4. Pass Rate	86	90	100	92
F1.5. Student Success Rates	81	81	95	86
F1.6. Course Completion Rate	98	99	98	98
F1.7. Curriculum Development	88	85	92	88
F1.8. Student-Faculty Ratio	93	91	100	95
F1.9. Innovative Teaching Practices	95	99	92	95
F2. Research and Scholarly Activity				
F2.1 Research Publications	100	98	85	94

Faculty	Weightage			
	Urban	Semi-Urban	Rural	Average
F2.2. Research Grants and Funding	78	93	77	83
F2.3. Citations and Impact Factor	96	98	97	97
F2.4. Conference Presentations	86	96	97	93
F3. Professional Development				
F3.1. Professional Development Participation	92	93	93	93
F3.2. Professional Development Hours	94	75	86	85
F3.3. Advanced Degrees and Certifications	81	50	53	61
F4. Service and Community Engagement				
F4.1. Committee Participation	95	88	86	90
F4.2. Community Service	91	89	84	88
F4.3. Service to the Institution	92	98	96	95
F4.4. Community Outreach and Engagement	87	93	91	90
F5. Staff Performance and Efficiency				
F5.1. Administrative Efficiency	76	91	90	86
F6. Operational Efficiency				
F6.1. Administrative Task Completion	99	89	95	94
F6.2. Utilization of Technology	85	81	85	84
F6.6. Support Service Usage	97	94	99	97
F7. Employee Satisfaction and Retention				
F7.1. Job Satisfaction Scores	95	99	87	94
F7.2. Employee Satisfaction	81	90	90	87
F7.3. Staff Retention Rate	97	91	100	96

Faculty	Weightage			
	Urban	Semi-Urban	Rural	Average
F7.4. Absenteeism Rate	91	94	93	93
F7.5. Workload Balance	77	83	76	79
F7.6. Work-Life Balance	98	93	97	96
F7.7 Staff Turnover Rate	96	100	98	98
F7.8 Internal Promotion Rate	98	86	93	92
F7.9 Student Advising Load	91	95	100	95
F7.10 Student Mentorship Programs	100	100	98	99
F8. Institutional Contribution and Recognition				
F8.1 Awards and Honors	76	87	76	80
F8.2 Collaboration and Interdisciplinary Work	96	90	92	93
F9. Institutional and Financial Metrics				
F9.1 Cost per Student	89	77	97	88
F9.2 Revenue from Grants and Contracts	91	91	100	94

Table - 6: Community MKPI Weighted average

Community	Weightage			
	Urban	Semi-Urban	Rural	Average
C1. Community Engagement and Outreach				
C1.1 Number of Community Partnerships	91	98	90	93
C1.2 Community Service Hours	82	87	91	87
C1.3 Participation in Community Events	93	96	98	96

Community	Weightage			
	Urban	Semi-Urban	Rural	Average
C2. Economic Impact				
C2.1 Local Economic Contribution	90	86	91	89
C2.2 Support for Local Businesses	79	76	83	79
C.2.3 Research and Development Partnerships	92	94	96	94
C3. Educational Outreach and Accessibility				
C3.1 Educational Programs for the Community	85	86	88	86
C3.2 Participation in Lifelong Learning	85	92	82	86
C3.3 K-12 Outreach Activities	91	90	92	91
C4. Health and Wellness				
C4.1 Community Health Initiatives	92	97	94	94
C4.2 Public Health Research Impact	100	89	90	93
C4.3 Mental Health and Counseling Services	92	91	91	91
C5. Cultural Events and Programs				
C5.1 Cultural and Social Contributions	88	96	100	95
C5.2 Community Participation in Cultural Events	94	82	85	87
C.5.3 Promotion of Local Heritage	92	97	96	95
C6. Environmental Sustainability				
C6.1 Sustainability Initiatives	90	92	100	94
C6.2 Community Engagement in Sustainability	88	77	88	84
C6.3 Research on Environmental Issues	92	99	93	95
C7. Public Policy and Advocacy				
C7.1 Policy Recommendations	55	45	95	65

Community	Weightage			
	Urban	Semi-Urban	Rural	Average
C7.2 Public Policy Engagement	57	97	46	67
C7.3 Impact of Advocacy Efforts	93	74	45	71
C8. Access and Inclusion				
C8.1 Programs for Underrepresented Groups	73	51	57	60
C8.2 Scholarships and Financial Aid	98	78	100	92
C8.3 Diversity and Inclusion Initiatives	95	47	68	70
C9. Alumni Engagement				
C9.1 Alumni Involvement in Community Service	93	89	83	88
C9.2 Alumni Contributions to Community Development	93	83	60	79
C9.3 Alumni-Led Community Initiatives	85	75	63	74
C10. Research and Innovation for Social Good				
C10.1 Social Impact Research Projects	73	78	55	69
C10.2 Dissemination of Research Findings	53	96	77	75
C10.3 Impact of Applied Research	84	83	72	80

The MKPI of graduation rates, retention rates, and average GPA help in monitoring student success and identifying areas where academic support is needed. Metrics like student-to-faculty ratio, faculty qualifications, and student evaluations of teaching provide insights into the quality of education and areas for faculty development. Classroom utilization, library usage, and IT infrastructure help in optimizing the use of resources and ensuring that facilities meet student needs. The processing time for admissions, financial aid applications, and administrative costs per student help streamline. Cost per student, revenue from tuition fees, and financial aid distribution help in effective budget planning and financial management. Operations and reduce overheads. The amount of external funding received, alumni donations, and grant success rates are critical for ensuring financial health

and funding growth initiatives. KPIs enable institutions to benchmark their performance against peers and competitors, identifying strengths and weaknesses in comparison to other institutions. Strong performance on key KPIs can enhance the institution's reputation, improve rankings, and attract high-quality students and faculty.

The top five KPIs for Higher Education Institutions (HEIs) are graduation rate, student retention rate, employment rate post-graduation, student satisfaction, student engagement, faculty research publications, teaching effectiveness, grant funding received, professional development participation, student-faculty ratio, and community engagement programs. These metrics help measure the effectiveness of the institution in supporting students, retaining them, preparing them for the job market, assessing student satisfaction, and evaluating faculty commitment to continuous learning and improvement.

For faculty, the number of research papers published by faculty members in peer-reviewed journals is used to measure research productivity and scholarly contributions. Teaching effectiveness is assessed through student feedback, peer reviews, and teaching awards. Grant funding received is used to evaluate the institution's success in obtaining financial support for research projects. Professional development participation is measured by the number of faculty members participating in activities, and the student-faculty ratio is used to assess the adequacy of faculty staffing levels and their ability to provide personalized attention and support to students.

Community engagement programs measure the institution's commitment to community engagement and its contributions to local development. Economic impact on the local community is evaluated by evaluating the financial contributions of the institution to the surrounding area. Public participation in campus events assesses the level of community involvement and the institution's role as a cultural and social hub. Collaborative research with community organizations is used to measure the institution's efforts to address local challenges. Community service hours are also evaluated to evaluate the institution's dedication to social responsibility and its direct contributions to community well-being.

4. Conclusion

The planned activities should aligned with the institution's long-term strategic goals, such as enhancing research output, increasing enrolment, or improving international rankings. The MKPIs provide a factual basis for decision-making, helping leaders prioritize initiatives, allocate resources effectively, and assess the impact of changes. KPIs help institutions meet accreditation standards and regulatory requirements by providing measurable evidence of compliance in areas like curriculum quality, faculty qualifications, and student outcomes. Regular monitoring of KPIs supports a culture of continuous improvement, helping institutions maintain high standards and implement best practices. The study to be evaluated with different part of the country and develop a weighted model for higher educational empowerment.

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Evaluation of Back Propagation Neural Network Model Smart Learning System

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ABSTRACT

Smart learning systems is capable of capturing and managing context information as per the demand of learners and will ensure the maximum outcome attainment. Learning models, technologies and concepts are aids to define a smart learning system to enhance learner satisfaction. Smart Learning system is working integration of technology and its compositions. In particular, this paper focused to determine the influencing factors for smart learning model from developed Back Propagation Neural Network (BPNN) algorithm based Smart Learning system Architecture. It aids to ensure the high quality of   learning process for individual learners.

Keywords: *Smart Learning Systems, Back Propagation Neural Network (BPNN) model,   Smart System factors, Quality Learning, Learning outcome attainment.*

1. Introductions

Smart systems are involved in the interaction, inter-connection and inter-process optimized performance of the multiple components to achieve the maximum desired performance on specific domains. The models are developed to fulfill the requirements of the learner to maximize its performance. Smart system are applied in housing [1], design of cities [2][3][4], health care and Hospitals [5], power distribution and educational process[6]. The researchers are attempting to design a models for Smart Learning system. It will ensure the integrated technology for attaining

maximum outcome of the leaner[7].The technology will support to the learner based on the leaner level and provide the learning content[8].This is a continuation of Back Propagation Neural Network based Smart Learning system design process . The paper provides outcome of smart Learning system models helps to identify the influencing factors for maximum outcome. The paper adopt the designed Back Propagation Neural Network based Smart Learning system model and evaluated the outcomes.

The smart system is able to identify and diagnose complicated conditions, the NN model adopted and applied in various educational process [10, 11, 12, 13].

2. Neural Network Model for Smart System

Back Propagation Neural Network based models are created and applied for day-to-day activities [14-21] in multiple domain area. These models can be used to develop intelligent systems that are appropriate for the domain. Thus, Back Propagation Neural Network model adopted to develop smart system [22]

The Learning system model direct factors such as   Institutional Commitment, Support, And Leadership (I1), Teaching And Learning (I2), Evaluation And Assessment (I3), Course Development (I4), Faculty Support (I5), Student Support (I6), Technology Support (I7), Financial Considerations (I8), Course Structure (I9), User Friendliness (I10), Advising (I11), And Government and Regulatory Guidelines (I2) are considered as input layer components based on the design model. The indirect factors such as Allocation of Budget (H1), Assessment Tool (H2), Availability (H3), Awards (H4), Faculty Support (H5), Collaboration with Learning Management System (H6), Content Framework (H7), Counseling (H8), Curriculum Coverage (H9), Design Based on Learning Outcomes (H10), Diversification of Content (H11), Faculty and Learner Interaction (H12), Budget (H13), and Fulfillment of Different Types of Learners (H14) Guidelines(H15), Infrastructure(H16),Instructional Approach (Pedagogy)(H17),   Learner Feedback(H18), Learning Objectives (H19), Licensed Software (H20), Multi Lingual Faculties(H21),Online Support(H22), Periodical Assessment(H23), Training for Faculty (H24), Responses (H25), Sequence as well as on Selection Learning (H26), Simple Interface(H27), Technical Support (H28), Policy(H29), University and Institutional Policy(H30) and Training for Technology Support(H31) identified as a Hidden Layer Components to design Back Propagation Neural Network based Smart Learning system. The optimized learning performance considered as a output layer. The learning system model presented in (Fig. 1).

3. Determination of Frequency and Weight for BPNN Model

As per the survey, the initial weight values are computed and presented below in table 1.

Hidden Layer

(H1) Allocation of Budget

(H2) Assessment Tool

(H3) Availability

(H4) Awards

(H5) Faculty Support

(H6) Collaboration

(H7) Content Frame Work

(H8) Counseling

(H9) Coverage of Curriculum

(H10) Design Based on Learning Outcomes

(H11) Diversification of Content

(H12) Faculty and Learner Interaction

(H13) Budget

(H14) Fulfillment of Different Types of Learners

(H15) Guidelines

(H16) Infrastructure

(H17) Instructional Approach (Pedagogy)

(H18) Learner Feedback

(H19) Learning Objectives

(H20) Licensed Software

(H21) Multi Lingual Faculties

(H22) Online Support

(H23) Periodical Assessment

(H24) Training for Faculty

(H25) Response

(H26) Sequence as well as on Selection Learning

(H27) Simple Interface

(H28) Technical Support

(H29) Policy

(H30) University and Institutional Policy

(H31) Training for Technology Support

Input Layer

(I1) The Institutional Commitment, Support, and Leadership

(I2) Teaching and Learning

(I3) Evaluation and Assessment

(I4) Course Development

(I5) Faculty Support

(I6) Student Support

(I7) Technology Support

(I8) Financial Considerations

(I9) Course Structure

(I10) User Friendliness

(I11) Advising

(I12) Government and Regulatory Guidelines

Output Layer

(O1) Impact of the Smart Learning System

Figure 1 : The Three Layers of the Neural Network Smart Learning System.

Table - 1: User response

Input Layer Weights												
S.No	1	2	3	4	5	6	7	8	9	10	11	12
1	4	4	4	3	5	5	4	2	3	4	5	3
2	4	3	5	4	4	5	3	3	4	3	5	1
3	4	4	4	3	4	4	3	2	3	2	4	4
4	3	4	3	5	4	5	3	3	5	4	4	3
5	3	5	5	4	5	3	5	5	5	2	2	3
6	5	4	3	4	4	4	3	2	5	2	3	1
7	4	5	4	4	5	4	4	4	4	2	2	4
8	4	4	3	3	5	3	2	4	5	5	3	2
9	4	4	4	4	3	5	4	3	5	2	5	4
10	4	5	5	4	3	4	3	5	3	2	3	4
…	…	…	…	…	…	…	…	…	…	…	…	…
200	4	4	4	4	4	4	4	2	3	2	2	1

The network is trained for the optimum value of 85 % , 90% and 95% of the quality learning using Neural Network Back propagation algorithm [15-21]. The final neuron weights for Input to Hidden values are presented in the following table 2.

Table - 2(a): Input response weight 1-6

Input Layer						
HN.no	1	2	3	4	5	6
1	0.94	1.39	1.40	1.28	0.07	0.14
2	1.94	1.06	0.65	0.21	1.22	1.56
3	1.05	0.91	1.75	1.04	1.89	1.28
4	0.14	0.51	0.45	1.34	1.69	0.69
5	0.00	0.92	0.85	0.92	1.54	0.64

Input Layer						
HN.no	1	2	3	4	5	6
6	0.31	0.68	1.21	0.38	1.48	0.49
7	1.15	1.37	1.09	0.85	1.29	1.30
8	0.24	1.21	0.90	0.92	1.32	1.54
9	1.23	1.16	1.08	1.74	0.53	0.64
10	1.29	1.09	1.44	1.04	1.99	0.44
11	1.53	1.26	1.54	1.87	1.95	0.38
12	0.97	0.79	1.34	1.48	1.04	0.70
13	0.88	1.38	0.72	1.47	0.79	1.37
14	0.39	1.64	0.86	1.78	0.78	1.54
15	1.90	0.66	1.34	0.88	1.67	1.54
16	0.31	0.40	0.81	1.50	1.65	1.58
17	0.99	0.38	0.99	0.30	0.11	1.70
18	1.98	0.00	1.73	1.23	1.98	1.06
19	1.69	1.48	1.17	0.49	1.33	0.17
20	1.16	1.86	1.16	0.03	0.24	1.73
21	1.23	0.72	0.10	0.98	0.39	0.25
22	1.08	1.39	1.00	1.07	0.89	0.25
23	1.28	0.83	0.41	1.90	0.16	0.21
24	1.46	1.48	0.13	1.72	1.87	1.97
25	0.06	1.88	0.60	0.59	0.67	0.93
26	0.89	0.11	0.35	1.33	0.66	1.80
27	0.83	0.93	1.53	1.64	0.20	0.36
28	1.81	1.35	0.94	1.82	0.21	1.49
29	0.43	1.79	0.14	0.48	0.11	0.88
30	0.20	1.99	0.66	0.59	0.12	0.60
31	1.55	1.81	1.07	0.22	1.65	0.68

Table - 2(b): Input response weight 7-12

HN.no	7	8	9	10	11	12
1	0.64	1.06	1.31	0.82	1.64	1.44
2	0.85	0.18	0.53	0.31	0.56	0.88
3	1.92	0.48	1.35	0.58	1.34	1.39
4	1.56	1.35	0.01	1.20	0.77	1.83
5	1.57	0.94	0.07	0.35	1.44	0.95
6	1.83	0.54	1.53	0.38	0.57	0.18
7	1.36	1.27	1.89	0.42	1.42	0.47
8	0.70	1.32	0.83	1.68	1.67	0.51
9	0.24	1.88	1.29	0.96	1.28	1.09
10	0.21	0.22	0.13	0.81	0.90	0.73
11	0.28	1.39	0.19	1.05	1.06	1.72
12	0.30	1.17	0.52	0.09	1.51	0.49
13	1.41	0.88	0.04	0.66	0.85	0.54
14	0.79	1.62	1.51	0.75	0.43	1.58
15	0.33	1.72	1.98	1.03	1.77	1.18
16	0.64	1.07	0.18	0.22	0.27	1.36
17	1.12	1.86	1.39	1.17	1.63	1.76
18	0.96	1.60	0.46	1.00	1.80	1.15
19	1.25	1.32	1.46	1.78	1.96	1.54
20	0.97	1.69	0.42	1.10	1.26	0.06
21	0.41	0.29	0.38	0.09	1.27	0.56
22	0.98	1.71	1.75	0.54	0.42	1.13
23	0.28	0.33	1.24	1.15	0.10	1.86
24	1.72	1.57	1.03	0.36	0.80	0.27

Table - 2(b): Input response weight 7-12

HN.no	7	8	9	10	11	12
25	1.30	0.05	1.68	1.12	1.71	0.70
26	0.24	1.98	1.08	1.41	2.00	0.58
27	0.72	0.11	1.04	0.67	0.35	0.42
28	1.47	1.12	0.37	1.19	0.60	0.27
29	0.03	1.79	0.39	0.19	0.61	0.91
30	0.09	1.01	1.52	1.26	0.18	0.16
31	0.59	1.49	0.02	0.10	1.34	1.21

The final neuron weights from Hidden layer to Output layer optimum weights are presented in the following table 3.

Table - 3: Hidden layer to Output layer optimum weights

Neuron	Weight	Neuron	Weight
1	0.53	17	0.49
2	0.73	18	0.89
3	0.71	19	0.8
4	0.78	20	0.73
5	0.29	21	0.05
6	0.69	22	0.07
7	0.56	23	0.09
8	0.4	24	0.8
9	0.06	25	0.94
10	0.78	26	0.68
11	0.34	27	0.13

Input Layer			
Neuron	**Weight**	**Neuron**	**Weight**
12	0.61	28	0.72
13	0.74	29	0.11
14	0.1	30	0.12
15	0.13	31	0.64

For each respondent values, the major indicators are identified and presented.

4. Determination of Influencing factors for SLS

The learning Quality Factors (QF) which have been identified from the frame work analysis are examined with its sub indicators (Hidden Layer). The influences of these factors on quality learning system are computed from trained Back Propagation Neural Network model. The percentage of influence is calculated according to the weighted maximum value determined, see the following graph (Fig. 2).
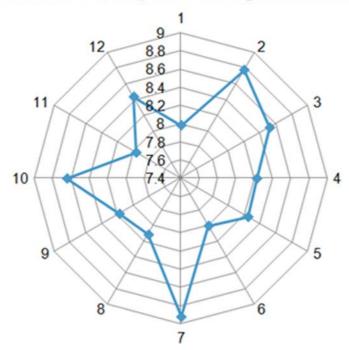
Figure 2 : Influences of Smart Learning System Quality Factors.

The objective of major factors contribution on quality in learning process as per the Back Propagation Neural Network trained weights shows that *technology support indicator* (8.92%) is highly recommended followed by the *evaluation* (8.77%). The *government guidelines and institutional leaders' contribution* are not majorly affected for the enhancement of quality. *Teaching and learning*, *user friendliness and advising* are playing role in the quality of improvement. At the same time all the factors are involved in the quality process therefore the percentage of contribution is from 7.97% as a minimum and the maximum of 8.92 %.

The estimated quality of 90 % and 95 % also trained with the support of BPNN model and weights for the quality indicators are fetched. The weight percentage for the major components is presented below table

Table - 4: Computed Direct QF Weight for SLS influence

QF	85	90	95	C1	C2
I1	7.92	7.92	7.89	0	-0.03
I2	8.81	8.77	8.55	-0.04	-0.22
I3	8.44	8.39	9.45	-0.05	1.06
I4	8.24	8.21	8.29	-0.03	0.08
I5	8.24	8.23	8.29	-0.01	0.06
I6	7.98	8.02	8.58	0.04	0.56
I7	8.94	8.9	8.74	-0.04	-0.16
I8	8.18	8.18	8.16	0	-0.02
I9	8.13	8.16	8.18	0.03	0.02
I10	8.63	8.69	8.52	0.06	-0.17
I11	8.02	8.02	7.56	0	-0.46
I12	8.48	8.52	7.79	0.04	-0.73
QF - Quality Factors					
C1 - Comparison between 85 % and 90 %					
C2 - Comparison between 90 % and 95 %					

According to BPNN trained weight values, if percentage of quality is increased from 85% to 90% then *user friendliness, student support, advising*, and *course structures* were improved. The *institutional support and financial considerations factors* weights are remaining the same.

The remaining weights decreasing show that the effort on these factors is minimized. While when the quality is estimated from 90% to 95% the *teaching and learning* system enhanced at the high level compare other indicators. At the same time, *student support, course development, faculty support and course structures* to be improved. The other factors show the negative value therefore these factors could be retained with the previous status is with minimum level of enhancement.

Table - 5: Computed Indirect QF occurrence for SLS

Sub Indicators (H)	85%	90%	95%	Frequency
1	7	6	8	21
2	4	8	5	17
3	6	5	9	20
4	5	7	12	24
5	6	7	14	27
6	5	5	6	16
7	7	8	4	19
8	5	14	2	21
9	5	7	4	16
10	7	4	6	17
11	7	7	6	20
12	4	5	5	14
13	7	3	7	17
14	7	7	5	19
15	9	6	3	18
16	5	5	6	16
17	8	9	6	23
18	7	5	8	20
19	6	3	9	18
20	6	6	4	16
21	7	7	10	24

Sub Indicators (H)	85%	90%	95%	Frequency
22	12	9	8	29
23	3	9	7	19
24	6	7	3	16
25	8	6	7	21
26	9	5	7	21
27	11	5	2	18
28	7	4	7	18
29	2	4	5	11
30	7	9	9	25
31	5	8	6	19

The supporting quality factors are evaluated based on high impact weight of trained BPNN model. The three level of quality factor occurrence is predicted in the developed model. As per the observation on above influencing factors *Guidelines through Email, Web Site and Online Support and Online Support* are identified as a high impact attributes. The quality is increased from 85 % to 90% than *Instructional Approach (Pedagogy), Online Support, Periodical Assessment and University and Institutional Policy* are considered as influencing factors. The quality is estimated at high level (95%) than *Awards, Faculty Support and Multi Lingual Faculties* are added to the enhancement of smart Learning system.In the overall analysis of sub indicators proved that *Faculty Support, Online Support and University and Institutional Policy* are major components to ehnace technology based educational model in the higher educational system.

5. Conclusion

The smart learning system model is attempted and designed using Back Propagation Neural Network Model. The BPNN model designed with 12 Input nodes, 31 Hidden nodes and 1 output node to model the smart learning system. The entire model is presented according to the learning performance with the controlled weight. The model has three layers as per the BPNN Model and the components are defined based on the analysis of both previous and existing frameworks. As per the evaluation of Back Propagation Neural Network model predication and the primary survey of quality EQAI calculation proven that identified Institutional Commitment, Support, and Leadership (I1), Teaching and Learning (I2), Evaluation and Assessment (I3), Course Development (I4), Faculty Support (I5), Student Support (I6), Technology Support (I7), Financial Considerations (I8), Course Structure (I9), User Friendliness (I10), Advising (I11), and Government and Regulatory Guidelines

(I2) Factors are directly contributed to the enhancement of Quality in Smart Learning System. In the future process, the learning performance factor is to be obtained via training on the BPNN model. The research work leads to enhance the performance of learning to the maximum through the identification of its internal functional complements interconnection and interactions.

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Empowerment of Women Agripreneurs Through Agri Farm Business Model – A Case Study of Rural Mysuru District

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ABSTRACT

The work provides a comprehensive Agri-Farm Business Model with the goal of empowering women farmers and promoting rural development. The recommended strategy recognizes the important role that women play in rural socioeconomic development and agriculture. It also addresses the different challenges faced by female agribusiness owners. Essential components including talent development, market connections, technology integration, resource accessibility, community involvement, and sustainability are all included. Finding more driven women who has the skills, fortitude, and determination to start, grow, and risk-take a business and achieve something meaningful is essential. The findings demonstrated that women in the research area predominantly employed implicit and explicit motivation, including psychological traits and competencies, to support them in accomplishing their business goals and reinforcing their efforts to increase economic wellbeing and the size of the farm sector. For women employed in community development, relationships and attitude driving patterns that predict entrepreneurial conduct had a major influence. Therefore, we should wholeheartedly support initiatives that provide women with more motivation to advance their knowledge, influence, and participation in agriculture. These components strengthened job generation and legitimized their role in the expansion of the agriculture industry.

Keywords: Agri-Farm Business, skill development, women agripreneur, and technology integration.

I. INTRODUCTION

By offering a ground-breaking framework, the Agri Farm Business Model being presented today aims to empower women farmers and promote comprehensive rural development. Many rural economies still rely significantly on agriculture, and women, who make up a sizable share of the agricultural labour, regularly meet impediments that prohibit them from participating fully in the industry or achieving economic emancipation. Despite making up a sizable portion of the labour

force employed in agriculture, women have historically faced discrimination, limited access to resources, and unequal prospects. Empowering women in agriculture not only addresses these discrepancies but also unlocks the potential of a substantial population and fosters inclusive and resilient rural communities (Gohar, M., Sidra, G. R., & Muhammad, A. N. 2019). The Agri Farm Business Model employs a thorough approach that transcends traditional farming practices. It recognizes the need for talent development, resource accessibility, technological integration, market connections, community participation, and sustainability in order to create an ecosystem that supports women Agripreneurs. The core of the approach is the provision of specific training curricula spanning modern farming techniques, environmental practices, and firm management skills. Women who have received education and skill development are better able to make decisions, which benefits rural communities as a whole. The model considers the barriers that women face in their pursuit of technology, financing, and agricultural inputs. By giving access to modern farming tools and technologies, women agribusiness entrepreneurs have the ability to boost production, reduce operating costs, and adopt environmentally sustainable practices. Developing solid market ties is necessary to ensure that agricultural products are priced fairly. The approach strongly emphasizes connecting women farmers with a range of market channels and encourages value addition through processing and packaging in order to boost their income and competitiveness in the market. In order to improve communication, collaboration, and the sharing of best practices, the idea recognizes the importance of community support and promotes the building of networks amongst female agribusiness owners. It also advocates for policies that are gender-neutral in order to ensure fair representation in local decision-making.

Agriculture is the earliest known means of producing food for use by households. Because of the disparities in topographical conditions across the country, farmers have reportedly preferred traditional farming methods. This has led to this business continuing to be low tech, with minimal progress and a sluggish rate of expansion. This business is dominated by numerous small families that use traditional expertise to cultivate crops and produce food, adhering to time-honored traditions instead of embracing new ones. The agriculture industry will continue to feed a sizable population and offer many work opportunities. Farmers can transition from conventional farming to commercial crop production through agribusiness and financial advantages through technology innovations that boost output and raise farmers' incomes. Technical support and skill development can be used to increase both the quantity and quality of farm produce (Isa, F. M., Jaganathan, M., Ahmdon, M. A. S., & Ibrahim, H. M. 2019). Women entrepreneurs may have a big impact in the agriculture industry by staying up to date on the newest farming products and methods as well as how to add value to farm produce. Women's entrepreneurship is essential to the global success of sustainable development. Globally, women hold 66% of the workforce. They supply half of the food on Earth. Women make a substantial contribution to the well-being of society, but because they only account for 10% of the workforce and own 1% of the world's property, they are not given the respect they deserve. Through their physical labour and processing skills, women make important contributions to agricultural

agriculture, which in turn produces a sizable amount of food, cash, and jobs. These days, women who run agribusinesses contribute significantly to the agricultural sector and take part in government-sponsored awareness programmes, training programmes, and other activities. Female entrepreneurs have outperformed their male counterparts in some fields. They are prospering in agriculture in a similar manner. In the agricultural industry, women entrepreneurs have the chance to make history and prove their worth. Women's groups have always been efficient, conscientious, and sage when given the chance (Amran, F. N. F., & Abdul Fatah, F. 2020).

2. LITERATURE REVIEW

Claudia et al.(2018) after going over the study materials, the author suggested that in order to advance gender equality and boost agricultural income, developing nations like Nigeria and India should make it mandatory for women's groups to have easy access to microfinance interventions, vocational training, and marketing training. Studies have also demonstrated how important it is to provide access to entrepreneurial ventures, trainings, and skills for researchers, farmers, and young women employed in the agriculture sector.

Agarwal et al. (2021) used a specially created questionnaire to perform a study on more than 40 entrepreneurs in several cities across India (Bengaluru, Mumbai, Pune, and roughly 11 more cities). Farmers faced many obstacles, including high costs, a shortage of skilled labour, and issues with marketing. The creation of a database that would enable all urban entrepreneurial agricultural projects to track their income and expenses was one of the study's most important recommendations. In order to support large-scale aquaculture development, the paper also suggests shifting land usage through legislative reforms and demonstrating a deeper intent for public-private sector collaboration in research. Encouraging the development of arable gardens and landscape design will also activate the responsibilities of gardeners and architects.

Pardeep et al.(2021) The author claims that rural India, especially in the Himalayan region, has a lot of promise because there is a wide range of fruits, vegetables, flowers, and cash crops in addition to other vegetables and exotic vegetables. Many approaches have been taken to apply agroforestry models to comprehend agricultural productivity in different IHR regions. Inadequate irrigation systems and a dearth of superior infrastructure are highlighted in the author's clear examination of the obstacles confronting the agriculture sector. There are very few choices for cold storage of perishable crops. Bad marketing strategies, a lack of knowledge about funding options, and a lack of technology participation through R&D institutions must be eradicated for the region to prosper sustainably.

Sunitha et al. (2021) the author has looked at the situation of Indian women in rural areas and the chances and obstacles they face while attempting to start their own agriculture. The author suggests a wide range of food processing and cultivation for both domestic and commercial usage in an effort to make money. The adoption of technology and skill development initiatives could ensure food security and the financial progress of female farmers.

III. OBJECTIVES

1. To study the socio-economic background of the rural women Agripreneurs in Rural Mysore district.

2. Todevelop anAgri Farm Business Model for the development of women entrepreneurship.

IV. PROBLEM STATEMENT

Women in rural agricultural contexts frequently encounter a number of obstacles that prevent them from fully engaging in and fulfilling their potential as Agripreneurs, although making up a sizable portion of the agricultural workforce. There are still differences between men and women in terms of market opportunities, financial limitations, and exposure to contemporary farming methods, and resource access. The obstacles faced by women in the agriculture industry are intensified by prevailing social standards and their inadequate representation in roles involving decision-making. This intricate web of barriers not only keeps women from becoming profitable Agripreneurs, but it also obstructs the general progress of rural communities. In order to foster comprehensive rural development and enable women as agri-entrepreneurs, it is imperative to have an efficient agri-farm business model that tackles gender-specific challenges and offers tailored solutions.

V. RESEARCH METHODOLOGY

The study's primary focus was on female farmers who also owned their own businesses. Information gathered from books, journals, newsletters, and other online sources, among other online publications. Used descriptive analysis to identify possible connections between women's empowerment, agriculture, entrepreneurship, and sustainable development. The sample size was then determined by a random sampling procedure. In order to gather primary data for this study, standardized questionnaires were employed. The total of 150 sample of data from the questionnaire survey and the interview were gathered and recorded using an internet platform and the WhatsApp appin Rural Mysore district. A Likert scale in addition to multiple-choice questions were used in the construction of the study instrument. A Likert scale was employed, with 1 denoting a strong disagreement and 5 denoting a strong agreement. The first portion contained demographic information on age, gender, income, and years of experience working in the agricultural industry. It also included information about prior education and entrepreneurial experience. The second section's questions were designed to examine the factors that contribute to women's entrepreneurial growth in the agricultural industry. There was usage of descriptive statistics such as mean, percentage, minimum, and maximum values. Furthermore, to determine the difference between the dependent and independent variables, inferential statistics such as the chi-square and t-test were employed. A two-stage qualitative approach implementation was employed in this investigation. First, we created a model to look into the variables influencing women's success as business owners. The data from the literature review was used to build the model. Second, the model was tested and the entrepreneurial features of agri-farming were assessed using a case study methodology.

Agri Farm Business Model:

The stages of the entrepreneurial process are concept generation, idea appraisal, obtaining sufficient resources, development, maturity, renovation, and expansion. Different types and degrees of support are needed at different stages. Assistance programmes and facilitation help are two types of support that often have an impact on how well palm cattle integration works. Figure 1 provides a visual representation of the women's entrepreneurship performance analysis in the palm cattle integration.
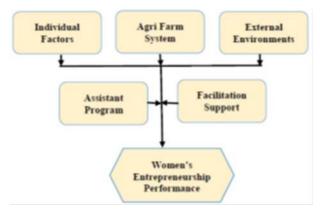
Figure 1 : Women entrepreneurship model in Agri Farm.

Table 1 enumerates the internal and environmental factors that impact women's success in entrepreneurship. The success of female entrepreneurs is influenced by several internal aspects. A few factors that are relevant to the integration of palm cattle are business skills, relationships and personal competences, experience, education level, psychological traits of the entrepreneur, and self-efficacy. Entrepreneurial qualities are determined by the following skill-related factors: inherent ability, people skills, technical proficiency, and communication proficiency. Women will be able to take on leadership roles and manage any kind of firm thanks to their business acumen skills.

Table - 1: Women entrepreneurial factors in Agri Farm.

Aspects	Factors
Individual Factors	Self-efficacy
	Business skills
	Experience
	Education level

Aspects	Factors
	Psychological characteristics
	Personal competencies and relationship
External Factors	Market opportunity
	Social capital
	Operational skills
	Government policy
	Technology applications
	Human resources
	Managerial skills
	Infrastructure
	Entrepreneurial culture

Numerous competencies, such as conceptual, opportunity, relational, learning, and personal competencies, can be used to evaluate an individual's entrepreneurial competency. Women's educational and experiential backgrounds, which are linked to knowledge acquisition, influence their decision-making insights. An entrepreneur's personality encompasses their psychological traits, which include vision, creativity, patience, perseverance, and tenacity. Risk-taking and competitiveness are traits of self-efficacy. External environments and organizational components are two examples of external influences. The palm cattle integrated agricultural system is linked to a number of organizational elements, such as people resources, technological applications, social capital, and management and operational abilities. The market potential, infrastructure, governmental regulations, and entrepreneurial culture are a few examples of the external environment.

Table 2 presents the demographic features of the participants. The largest percentage of respondents (28%) belonged to the age range of 42–51 years old, while the youngest group (15.33%) was under 26 years old. The majority of them (29%) completed Primary level and Diploma, whereas 16% of the respondents were Secondary level certificate holders. A larger percentage of the respondents (34.67%) had only been in business for up to four years, compared to 32% who had been entrepreneurs for five to nine years. Moreover, compared to 27.4% of respondents who earned more than [1] 1,40,000 annually, 25.33 percent of respondents earned less than Rs. 40,000 annually.

Table - 2: Respondents' Demographic and Emporographicscharacteristics of Agripreneurs

Variables	Description	Frequency (n)	Percentage (%)
Age	< 26 years	23	15.33
	27-31 years	34	22.66
	32-41 years	26	17.34
	42-51 years	42	28.00
	>52 years	25	16.67
	Total	150	100
Education Level	Primary level	42	28
	Secondary level	25	16.66
	Diploma	45	30.00
	Graduation	38	25.34
	Total	150	100
Experience in Entrepreneurship	<2 year	39	26.00
	2-6 years	26	17.33
	6-11 years	40	26.67
	>11 years	45	30.00
	Total	150	100
Annual Income	Below ☐40,000	38	25.33
	☐40,001–90,000	31	20.67
	☐90,001–1,40,000	40	26.67
	Above ☐1,40,000	41	27.33
	Total	150	100
	Upto 4	52	34.67

Variables	Description	Frequency (n)	Percentage (%)
Experience in Agriculture (in years)	5–9	48	32.00
	Above 9	50	33.33
	Total	150	100
Farm size (in hectare)	Below 2	62	41.33
	3–5	39	26
	Above 5	49	32.67
	Total	150	100
Land ownership	Own	98	65.33
	Lease	52	34.67
	Total	150	100
Sources of funds	Relatives/ Friends	41	27.34
	Banks	32	21.33
	Moneylenders	77	51.33
	Total	150	100
Intercropping	Cultivated	102	68
	Not cultivated	48	32
	Total	150	100

VI. DATA ANALYSIS AND INTERPRETATIONS

Numerous sources, such as books, journals, theses, websites, publications, and research papers, have been used to collect secondary data. This study used a quantitative research approach or data analysis methodology. The data was specifically analyzed using multiple regression and descriptive analysis. All sociodemographic factors were subjected to descriptive analysis, which produced an overview of the sample and results. Large amounts of data can be meaningfully simplified via descriptive analysis. A lengthy dataset is condensed into a brief synopsis with each description. As a result, descriptive analysis assists the researcher in providing pertinent details in a manner that

facilitates comprehension of the data under study. Simple linear regression is extended into multiple regression. The link between one dependent variable and two or more independent variables can be assessed using linear regression. In this experiment, the regression model denoted by the following equation was estimated using multiple linear regression:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6 X_6 + e \text{ ——————— (1)}$$

Where:

Y = Motivational factor of women entrepreneur, α = Constant, X_1 = Explicit and implicit motivation, X_2 = Competence motivation, X_3 = Attitude motivation, X_4 = Achievement motivation, X_5 = Incentive motivation, X_6 = Power motivation, β_1 - β_6 = Coefficients to be estimated and e = Error Term.

Multiple Regression:

The results of the elements that motivate women to grow their businesses are shown in Table 3. The majority of respondents (33.9%) were adamant that motivation is a necessary condition for success in the professional world. A greater percentage of participants (34.2%) concurred that their business objectives could be compromised by a lack of desire. According to the majority of respondents (42.2%) and those who agreed or strongly agreed (44.8%), inspiring others increases their drive to succeed.

Table - 3: Motivational Factors of Women Entrepreneurs

Statement	Description	Frequency (n)	Percentage (%)	Mean
Did you need motivation to succeed in business?	Strongly Disagree	7	4.66	4.86
	Disagree	9	6	
	Neutral	23	15.34	
	Agree	43	28.67	
	Strongly Agree	68	45.33	
Does not being motivated to achieve a goal can ruin business?	Strongly Disagree	10	6.66	5.35
	Disagree	8	5.33	
	Neutral	34	22.66	
	Agree	46	30.66	
	Strongly Agree	52	34.66	

Statement	Description	Frequency (n)	Percentage (%)	Mean
Does motivation build determination to achieve something?	Strongly Disagree	4	2.66	6.45
	Disagree	6	4	
	Neutral	18	12	
	Agree	66	44	
	Strongly Agree	56	37.34	

Table 4 displays the coefficient of determination (R^2 value), which is 0.602 or 60.02%. This result shows how well the study's independent variables—power, incentive, competence, achievement, and implicit and explicit motivation—can account for the variation in the dependent variable, or the motivational factors of female entrepreneurs.

Table - 4: Multiple Regression Analysis

Factors	Coefficients	Std. Error	t	Sig.(p)
Constant	.183	.278	.654	.335
Explicit and implicit motivation	.194	.038	3.645	.112
Competence motivation	.179	.121	.458	.438
Achievement motivation	-.068	.63	-.762	.379
Attitude motivation	.598	.154	6.462	.101
Incentive motivation	-.070	.124	-2.048	.127
Power motivation	.062	.072	.450	.652
R2	.602			

Note: The dependent variable is women's entrepreneurship motivation

According to the results of the regression analysis, there are only two independent variables that significantly and positively ($p < 0.00$) correlate with the dependent variable. More precisely, it was revealed that attitudes had the biggest influence on women's entrepreneurial motivation. Stated differently, women's drive to seek entrepreneurship in the agriculture industry was mostly influenced by their attitudes.

The correlation, mean (x), and standard deviation (ó) are shown in Table 5. The average values showed that the market was the primary source of happiness for owners of agribusinesses. Farm expansion, income, the perception of the farm, the availability of materials, government backing, cultivation, and output were other highly listed criteria. Significant positive correlations were found between government support and farm expansion, moderate positive correlations between cultivation and production and materials availability, and weak positive correlations between materials availability and perceptions of the farm. Government assistance had a major impact on farm income, market performance, cultivation and production, and public opinion of farms.

Table - 5: Descriptive and correlations

Factors	x−	σ	1	2	3	4	5	6	7
Materials availability	2.861	0.684	1						
Government support	2.937	0.834	0.034	1					
Farm growth	3.453	0.634	0.023	0.432	1				
Farm income	2.345	0.644	0.045	0.284	0.284	1			
Market performance	3.604	0.435	0.432	0.384	0.245	0.185	1		
Cultivation and production	2.203	0.567	0.667	0.183	0.112	0.046	0.202	1	
Perceived farm image	2.346	0.432	0.235	0.195	0.263	0.294	0.217	0.452	1

*Note: ** denotes 1% and * denotes 5% levels of significance*

Effect of demographic and emporographics on agripreneurs' satisfaction:

To find out how the independent variables—demographic characteristics and emporographics—impacted the dependent variable, agripreneur satisfaction, multiple regression analysis was performed. Table 6 illustrates the impact of demography and emporographics on entrepreneurs' satisfaction levels. The results' Adj.R^2 value of 0.372 indicates that the demographic characteristics of the model significantly influenced the entrepreneurs' level of pleasure. The set of demographic characteristics explained 37.2% of the variation in the Agripreneurs' satisfaction, indicating the significant predictive power of the model. The "R" value of 0.593 showed that there was a significant correlation between the demographic traits and the level of happiness among entrepreneurs. The F statistic (15.945) indicated a substantial overall model fit at the 5% level ($p < 0.05$) **Table - 6.**

VII. FINDINGS AND DISCUSSIONS

Findings:

Research on the Agri Farm Business Model, aimed at supporting female Agripreneurs for rural development, reveals a clever strategy that has a substantial impact on the socioeconomic conditions

Table - 6: Regression model summary

Variables Constructs	β	't'	P	R	R²	Adj.R²	F	P
Constant	15.56	25.74	0.000	0.593	0.338	0.372	15.945	0.000
Age	0.284	0.986	0.000					
Gender	0.102	0.325	0.202					
Education level	0.082	2.102	0.002					
Marital status	0.015	0.583	0.064					
Type of family	0.192	0.385	0.286					
Farming experience	0.402	3.862	0.000					
Farm age	0.386	0.896	0.000					
Farm size	0.322	3.029	0.002					
Annual income	0.184	1.753	0.000					
Land ownership	0.026	0.653	0.001					
Sources of funds	0.096	0.426	0.003					
Intercropping	0.280	2.204	0.001					

in rural areas. The execution of skill development and training programmes is essential to improving women's proficiency in contemporary farming methods and business acumen. Due to their greater access to resources, including financial and technological help, the historical barriers to women's engagement in agriculture have been greatly decreased. Women Agripreneurs have higher potential to interact with a range of markets due to the model's emphasis on value addition and market relationships, which boosts their competitiveness and revenue. Gender-inclusive policy advancement and the development of support networks are facilitated by community involvement techniques. The strategy incorporates sustainability by encouraging ecologically friendly farming methods. Even if the results show the benefits of the Agri Farm Business Model, it is still important to monitor contextual issues and make the required changes to ensure the model's ongoing efficacy in empowering women farmers and promoting rural development.

- Women are highly underrepresented in the entrepreneurial field; barely 20% of businesses are owned by women. Ninety percent of women-owned businesses are run entirely by them, without the assistance of paid staff. The agriculture sector does not comprise 70% of women-owned businesses.
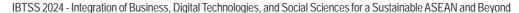
- Tamil Nadu (14 percent), Kerala (12 percent), Andhra Pradesh (11 percent), West Bengal (10 percent), and Maharashtra (8 percent) are the top five states for female entrepreneurs. Agriculture (34.3 percent), manufacturing (30 percent), trade (19 percent), other services (6 percent), and hotel & food services (3 percent) are the top five economic activity in which women entrepreneurs are involved.

- The majority of agricultural establishments (93%) are involved in animal activities. Manufacturing makes up the bulk of enterprises (46%) that are not in the agriculture sector. 14 million people were employed by women-owned businesses.

- Ninety percent of women-owned businesses were seasonal, only two percent were casual. Eighty-two percent of the businesses run by women were self-funded, while sixteen percent relied on funding from donations or transfers from agencies. The government provided just 5% of the support, financial institutions provided 2%, moneylenders or non-institutions provided 1.2% of the loans, and self-help groups provided 0.9%.

- The percentage of women who own micro, small, and medium-sized businesses is quite low. The number of female entrepreneurs is rising in both registered and unregistered enterprises. In order to provide more chances for female entrepreneurs, unregistered women-owned businesses must be brought into the registered sector.

Discussions:

The comprehensive and all-inclusive Agri Farm Business Model seeks to empower women farmers and advance rural development. By taking into consideration significant elements including talent development, resource accessibility, technological integration, market links, community engagement, and sustainability, the concept seeks to have a revolutionary effect on the socioeconomic environment of rural communities. Women are taught the knowledge and skills required to boost agricultural productivity and launch successful companies through specific training programmes. The method emphasises expanding markets and offering value, which helps female agripreneurs increase their revenue. Through the development of cooperative networks and the backing of legislation that include people of all gender identities, community involvement activities help foster compassion. While the model offers a promising approach, its long-term efficacy in advancing the empowerment of women and comprehensive rural development will depend on how well it continues to adapt to local conditions and take into account roadblocks like financial constraints, cultural norms, and market dynamics.

For millennia, Indian soils have been used for crop production, but little attention has been paid to their restoration. Depleted and exhausted soil health from fertiliser application results in low production. Almost all crop yields on average are among the lowest in the world. Increasing the use of fertilisers and manures is one way to address the primary issue of low yield. India is the world's second-largest irrigated country after China, however only roughly one-third of its planted acreage

is underwater. India's food production greatly depends on the Monsoon rains, which are becoming more irregular and unpredictable as a result of climate change. The agricultural industry in India will not grow steadily until about half of the planted area is underwater. Selling commodities is still a difficult task in rural India. Farmers are compelled to rely on local dealers and intermediaries to sell their agricultural produce because of their lack of price awareness, the small market, and their industrial connections. Because there are no close storage facilities, farmers in rural areas are compelled to sell their products before it spoils or crops out of season in order to at least recover their production expenses. One of the things preventing agricultural expansion in India's distant and rural areas is the lack of proper roads and transportation infrastructure. Even with social media's extensive use worldwide, it can still be challenging to offer relevant online advice in isolated and rural areas. This is why incorrect knowledge dissemination is a big problem in India; women's groups usually get their information about the newest technological developments from farmers and middlemen. In order to reduce expenses and improve product development, women's organisations should speak with research and development departments directly.

The results of this study showed that a number of factors, including cultivation and production, government support, perceived farm image, market performance, farm expansion, revenue, and resource availability, significantly influenced the level of happiness among agribusiness owners. There was a direct relationship between farm image and agricultural output. Research has demonstrated a moderately positive link between resource availability and production. Furthermore, a considerable association was established between the following attributes and government support: revenue from the farm, cultivation and production, market performance, and perceived farm image. The study also reveals that Agripreneurs' age has a detrimental effect on their level of satisfaction. The age distribution of farmers and their degree of farming satisfaction show a downward trend, according to the data. Put another way, it seems that the younger generation of agribusiness operators is happier with only producing and selling agricultural products.

Emerging Benefits of Rural Women Agripreneurship:

This means that there will be less migration to urban areas. Rural women's financial circumstances will improve as a result, and the community as a whole will benefit from rural areas gaining more economic influence. Real rural development will be made possible by a rise in rural revenue. Agribusiness can help accomplish growth and development that is both ecologically sustainable and balanced. Encouraging agripreneurship in rural areas can help lower transportation costs and post-harvest losses of perishable crops. In rural communities, Company will improve not only the economy but also the transportation, roads, product availability, and infrastructure. Since rural women are prohibited from leaving their homes to work, it is important to expand their employment alternatives. By focusing their energies on agripreneurship chances, young people from rural areas can reduce social concerns and mischief in their community. It will contribute to women's living standards rising. Women's economic standing will eventually contribute to their

increased social status and empowerment. Underutilized and underexploited natural resources in the area could be productively used to provide income. The resources of both organized and unorganized groups could be directed towards the empowerment of women by choosing the right economic enterprise.

VIII. CHALLENGES AND LIMITATIONS

Challenges:

In the Indian context, agribusiness and agricultural development have faced many obstacles. The biggest challenge faced by Indian women entrepreneurs is that most of them do not own the land they operate on, which makes it difficult for them to obtain bank loans or other forms of capital because they lack the necessary documentation related to their land. For female farmers, the paucity of key inputs like raw materials also poses a problem. Ideally, having the essential market ties is necessary to build a successful business. Having contacts and knowing where to find a steady supply are essential for starting food processing and related businesses. Indian women are burdened with taking care of their families and working under pressure, which limits their capacity to make decisions and do related tasks. Married women need to carefully strike a balance between their personal and work life. The fact that women's literacy rates in India are lower than men's has presented an extra obstacle for female entrepreneurs. Illiteracy has always been the largest hurdle to sustainable progress in India. Inadequate instruction for women the issue of agricultural entrepreneurs has resulted in a lack of understanding of business strategies and advancements in technology. Therefore, it should come as no surprise when ongoing or new business endeavor's fail. A less educated person cannot become financially more secure or independent. The aforementioned circumstances make it harder for Indian women to face the risks and uncertainties associated with being self-sufficient. The majority of female farmers use manual labour and conventional machinery to complete agricultural tasks. Large tracts of agricultural land degrade due to wind and water. To restore this area to its previous fertility, extensive treatment is required.

Limitations:

Despite its encouraging goal of empowering female agribusiness owners for rural development, the Agri Farm Business Model has some significant drawbacks. The effectiveness of the concept may be hampered by cultural and societal conventions that enforce old gender roles, which would prevent women from actively participating in decision-making and from adopting innovative agricultural techniques. Obstacles associated with restricted land ownership, insufficient financial resources, and technology limitations could hinder the ability of female agribusiness operators to completely use the potential of this model. Furthermore, there are substantial dangers to the economic sustainability of women-led agri-businesses due to their susceptibility to environmental conditions, climate change, and market dynamics. Dependency on external support, poor infrastructure, and intersecting issues linked to ethnicity, age, and socioeconomic position further underscore the need

for nuanced ways to overcome the numerous obstacles faced by women in agriculture within the Agri Farm Business Model. To overcome these obstacles and guarantee the model's efficacy in promoting genuine empowerment and rural development, it is imperative to use a continuous adaption and localised approach.

IX. CONCLUSION

The Agri-farm business model is a thorough and effective strategy for empowering female Agripreneurs for rural development. The model's emphasis on market connections, talent development, community involvement, technology integration, resource accessibility, and sustainability shows a nuanced awareness of the different issues faced by women in agriculture. The findings demonstrate how this paradigm has the potential to greatly enhance rural communities' social, economic, and environmental elements. When the concept is implemented well, it not only provides women with the resources they need to run profitable businesses, but it also contributes to the preservation and growth of rural economies in general. In order to preserve the model's long-term efficacy, it is critical to take into consideration cultural norms, financial constraints, and market dynamics in addition to the diverse circumstances of multiple communities. One excellent example of how to advance gender equality, economic empowerment, and sustainable rural development is the Agri Farm Business Model. Its continued success is contingent upon collaboration, adaptability, and commitment.

Future Scope:

The future scope of the Agri Farm Business Model involves leveraging state-of-the-art technologies, promoting climate-resilient practices, implementing inclusive financial solutions, and forming strategic alliances to ensure sustainable rural development, empower women farmers consistently, and grow their market share.

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Repercussion of Work Place Stress on The Psychological & Physical Well-Being and Job Satisfaction of Employees in The it Industry

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ABSTRACT

The occupational stress has a negative impact on the physical and emotional well-being of employees. Occupational Stress has the potential to impact employee satisfaction and performance, either positively or negatively. IT industry employees are susceptible to developing numerous health issues as a result of the ongoing physical and mental strain associated with their profession. The IT sector experiences elevated levels of stress due to the nature of work, unattainable project deadlines, shift-based employment, and excessive workloads. Stress not only affects the physical and emotional well-being of employees but also has a negative impact on employee job satisfaction. The current study aimed to establish a correlation between workplace and personal pressures and their impact on the physical and mental wellbeing, as well as job satisfaction, of employees in the IT business. The primary data gathering utilised a descriptive research design. A well designed questionnaire was distributed to 200 participants employed in different IT firms using the snowball sampling method. Analyses and evaluations were conducted using IBM SPSS 27.0 to investigate the impact of workplace and personal pressures on the physical and mental well-being and job satisfaction of employees. The study's findings indicate that work-related stress has a significant effect on the physical and emotional well-being of employees, as well as their job satisfaction. IT firms should prioritise identifying and addressing factors that contribute to work-related stress, as well as developing effective techniques to manage stress. This is crucial for promoting the physical and mental well-being of IT personnel and ensuring their job satisfaction remains high.

Keywords: Work place and Personal Stressors, Physical & Mental well-being, Job satisfaction.

Introduction

Internationalisation of the Indian economy and supportive government policies have drastically accelerated the growth of the Information Technology (IT) industry in India. IT professionals and others in linked fields under perpetual strain to deliver services with efficiency and cost-effectiveness.

The advent of globalisation and neoliberalism has led to the emergence of novel work dynamics, employment instability, uncertainty over future working circumstances, and quick skill obsolescence, all of which contribute to heightened levels of stress. The IT industry in India has experienced substantial expansion, making it one of the most dynamic sectors in the country. India has experienced significant demand in recent years, making it one of the most rapidly evolving IT markets in the Asia-Pacific region. The rationale for specifically selecting IT and ITES professionals is their more elevated level of stress compared to other employees. Every profession comes with specific objectives, and employees experience stress when they are assigned unattainable targets and struggle to handle specific circumstances.

IT industry employees are susceptible to developing numerous health issues as a result of the ongoing physical and mental strain associated with their profession. Stress can cause, maintain, or worsen diseases. Common health issues resulting from stress include acid peptic disease, alcoholism, asthma, diabetes, exhaustion, tension headache, hypertension, insomnia, irritable bowel syndrome, psychoneurosis, sexual dysfunction, and skin conditions such as psoriasis, lichen planus, urticaria, pruritus, and neurodermatitis. The primary objective of this essay is to highlight the extent of stress experienced by IT personnel and its effects on their physical and mental well-being.

Review of Literature

I. Work Related Stress:

Workplace stress originates from the circumstances and environment in which one carries out their work. This might lead to the emergence of confrontations initially or intensify pre-existing sources of pressure within the work environment. Stress is a multifaceted reaction, encompassing psychological, emotional, moral, and bodily responses, that occurs in response to adverse and detrimental elements present in one's job, workplace, and work organisations. It pertains to the intense emotional state of both joy and sadness that emerges from a sense of being unable to effectively handle the challenges associated with one's job. The European Commission's Directorate General of Employment and Welfare (2005). Hans Selye (1956) posits that stress is not inherently negative; its impact on employees is contingent upon how they perceive and manage it. The strain caused by stimulating, imaginative, and accomplished work is advantageous, but the strain resulting from failure, embarrassment, or infection is harmful.

The United States National Institute of Occupational Safety and Health, Cincinnati, in 1999, asserted that job stress arises as a result of several elements related to both the workplace and the employees. However, it is the attributes of the workplace that are most likely to have the greatest

impact. Job stress is characterised by detrimental physiological and psychological reactions that arise when the demands of a job are incongruent with the abilities, resources, or preferences of the worker. Work-related stress can result in adverse health outcomes and even physical harm.

A Study conducted by a Canadian graduate school recommended that organisations allocate resources towards implementing employee help programmes that are specifically tailored to address IT-related issues. A survey done by Techweb Network Research, on behalf of a top-tier organisation, measured the level of stress experienced by managers. The poll revealed that the primary factors contributing to occupational stress were the intricate nature of firm IT systems and ambiguous objectives. Additionally, insufficient resources, excessive workload, and personal feelings of inadequacy were identified as the major sources of stress.

Cambridge University states that work-related stress has an impact on both employees and organisations. Occupational stress issues are impacting both the physical and mental health of employees, as well as the overall efficiency of corporations. Work-related stress arises when a person's capacity and resilience are surpassed by various work demands and their combinations.

Work place stress in IT Employees

Tiwari & Singh AL in their critical review on Information technology induced stress and human performance highlighted various reasons for IT employees stress as follows:

1. Companies often issue 3-4 upgrades every year for the software packages they utilise as their operating system. The employee must familiarise themselves with these updates on each occasion. Otherwise, they would fall behind their peers, leading to increasing pressure on the employee and a higher chance of job loss if they fail to perform adequately.

2. The training programme authorised by the company is not focused on the needs and development of the employees.

3. Another type of stress is referred to as technostress. There has been a decline in the level of communication and interaction among individuals and their co-workers compared to previous times. This might lead to sentiments of estrangement among colleagues.

4. Employees in the IT sector have to exhibit a high level of precision and accuracy for extended periods of time. Even a minor oversight might have catastrophic consequences for the company. It is necessary for them to have a means of managing their stress.

II. Physical and Psychological (Mental) Well Being Of Employees:

The National Institute for Occupational safety and health(NIOSH) conducted research on Stress in today's work place highlighted Physical wellbeing encompasses more than just the absence of disease and includes multiple facets of overall physical health. It encompasses the decisions individuals make regarding their lifestyle to promote good health, prevent avoidable illnesses and

disorders, and achieve a harmonious state of physical and mental well-being. IT industry employees are susceptible to developing numerous health issues as a result of the ongoing physical and mental strain associated with their profession. Stress can cause, maintain, or worsen diseases. Common health issues resulting from stress include acid peptic disease, alcoholism, asthma, diabetes, exhaustion, tension headache, hypertension, insomnia, irritable bowel syndrome, psychoneurosis, sexual dysfunction, and skin problems.

The publication by Anderson and Durga in 2015 Psychological well-being encompasses an individual's positive emotional and psychological functioning, playing a crucial role in maintaining mental health. Research has demonstrated that occupational stress has a substantial impact on an individual's psychological well-being. IT professionals engage in ongoing interaction with information technology, which has a significant impact on their general well-being. Psychological well-being is a condition that has an impact on multiple areas, such as performance, productivity, job satisfaction, and personal life.

Aryan and Kathuria (2017) asserted that investing in psychological well-being yields benefits for both organisations and individuals. The organisation will gain from improved outcomes and staff productivity, as well as increased loyalty and dedication from the workforce, resulting in fewer employee turnover. The personnel will have enhanced well-being, increased life expectancy, improved quality of life, and heightened contentment. Furthermore, they have documented that numerous studies and research endeavours have systematically investigated the impact of psychological well-being (PWB) on employee performance. These investigations have demonstrated a substantial and positive correlation between the level of PWB in the workplace and the business outcomes achieved by organisations.

III. Relation Between Work Related Stress and Physical & Mental Well Being and Job Satisfaction Of Employees:

As per the American Institute of Stress, workplace stress results in an approximate yearly cost of $300 billion for U.S. corporations due to absenteeism, decreased productivity, and healthcare expenses. Furthermore, workplace stress has the potential to adversely affect the emotional and physical well-being of employees, resulting in a greater probability of employee turnover and reduced levels of job satisfaction. Hence, it is imperative to combat workplace stress in order to enhance employee welfare and foster a favourable work atmosphere.

According to Sengupta (2007), stress can affect an individual's physical, mental, and behavioural well-being. The release of physiological hormones in humans triggers their fight-or-flight response. These hormones may enhance their fighting abilities or increase their running speed. They increase perspiration, elevate blood pressure, and accelerate heart rate. There is a correlation between heart disease and stress. Extended periods of stress elevate arterial tension by increasing both blood pressure and heart rate.

According to Bowing Harvey (2001), stress originates with the interaction between an individual and their surroundings. This emotional burden has a detrimental effect on an individual's physical and mental well-being. Stress is caused by stressors, which are circumstances that disrupt an individual's equilibrium.

Ritchie and Martin (1999) described stress as the outcome of external stimuli acting upon an individual, often involving physical aspects. Subsequently, it was suggested that an individual's perception and response to stimuli or events have a pivotal role in determining their behaviour and whether a situation will be perceived as stressful.

Lu et al. found that employees who experience chronic stress are more likely to experience health issues, which can significantly contribute to job dissatisfaction. This also impacts the employee's personal life, particularly their family, leading to significant conflict within the home. Consequently, this might result in increased stress and discontentment in the workplace.

Lambert et al. discovered that employee satisfaction is directly influenced by the company's lack of commitment. Due to employment obligations, a majority of the company has made commitments that they will be unable to fulfil in the future. This gives rise to several issues in the foreseeable future, as employees experience discontentment and stress due to unfulfilled commitments.

Research Aim

The intent of this study is to explore the correlation between pressures at the workplace and stressors in one's personal life on the psychological and physical health of employees, as well as their level of job satisfaction, specifically within the IT sector. The research need to explore occupational stressors which affects both employee performance and organisational productivity.

Research Objectives

1. To determine the job-related and personal factors that impact the work-related stress experienced by IT workers.

2. To investigate the causes of occupational stress among IT workers.

3. To evaluate the influence of job-related and personal pressures on the physical and emotional well-being of employees.

4. To examine the influence of work-related and personal pressures on employee job satisfaction.

5. To recommend techniques for managing job-related stress.

Hypotheses Testing

$H_0 1$:   Work place stressors do not influence physical well-being of employees in organization.

$H_0 2$:   Work place stressors do not influence mental well-being of employees in organization.

$H_0 3$:   Personal stressors do not impact physical well-being of employees in organization.

$H_0 4$:   Personal stressors do not impact mental well-being of employees in organization.

$H_0 5$:   Employee job satisfaction is independent of work place stressors in organisation.

$H_0 6$:   Personal stressors do not impact employee job satisfaction in organization.

Research Design And Methodology

The current investigation is empirical and applied a descriptive research approach to investigate the correlation between stress-inducing elements and the physical and mental well-being of employees, as well as their job satisfaction. Descriptive research design is utilised to ascertain the perspectives, attitudes, or actions of a certain group of individuals towards a particular subject. The data for this study were obtained using an online survey. The questionnaire was segmented into five distinct components. Section -1 comprises a demographic profile, whereas Section-2 has questions regarding workplace stressors, derived from the workplace stress scale. Section-3 incorporates Personal stressors derived from the social readjustment rating scale. Section-4 encompasses inquiries regarding the physical and mental welfare of employees. Section-5 focuses on inquiries on employee job satisfaction. The research utilised the Likert Five point rating scale to gather responses. The study focused on the workforce employed in the IT sector. The researcher utilised a snowball sampling method to get data from IT personnel employed in diverse IT organisations across multiple geographies. 250 respondents were given the questionnaires. 200 individuals submitted the full questionnaires.

Results And Discussion

Table - 1: Demographic Profile of Respondents

	Option	No. of Respondents	% of Respondents
Age	22-27	60	30
	28-32	50	25
	33-37	40	20
	38-42	20	10
	Above 42	30	15
Gender	**Option**	**No. of Respondents**	**% of Respondents**
	Male	110	55
	Female	90	45

Marital Status	Option	No. of Respondents	% of Respondents
	Married	80	40
	Unmarried	120	60

Designation	Option	No. of Respondents	% of Respondents
	Software Engineer	60	30
	Senior Software Engineer	60	30
	Team leader	40	20
	Senior Team Leader	40	20

Reliability Analysis And Descriptive Statistics of Study Variables

Reliability tests are helpful to examine the appropriate internal consistency of all construct scales. The Cronobach alpha is above 0.5 which indicates high internal consistency. The information given in Table No.2 deals with descriptive statistics of Work place & personal stressors, Physical & mental wellbeing and employee job satisfaction in selected IT companies. The dimensions were measured on scale which consists of 5 items with their values ranging from 1 to 5. The mean values of observed items are higher than 3. It indicates that the employees are expressed their strong agreeable level towards Work place & personal stressors, Physical & mental wellbeing and employee job satisfaction.

The respondents stated that over workload burden with unrealistic deadlines, lack of WLB, ineffective interpersonal relations, lack of role clarity, changes in working hours, job pressure, lack of role clarity, role ambiguity, inadequate rewards , too many job expectations are work place stressors which creates stress on employees in work environment. The personal stressors like financial problems, relationship problems and changing living conditions affect their job performance. The respondents agreed that due to stress in job they are suffering with health disorders like Diabetes, hypertension, depression, nervousness & anxiety, muscular skeletal disorders and obesity due to shift system in work **Table - 2.**

Hypotheses Testing Results:

$H_0 1$: Work place stressors do not influence physical well-being of employees in organization.

$H_0 2$: Work place stressors do not influence mental well-being of employees in organization.

Table - 2: Reliability Analysis and descriptive statistics of Study Variables

S.No	Variable	N	Cronobach-Alfa	Mean	Standard Deviation
1	Work place stressors	200	0.917	4.32	.43268
2	Personal stressors	200	0.753	4.52	.43538
3	Physical well- being	200	0.749	4.28	.41097
4	Mental well- being	200	0.848	4.43	.44486
5	Job satisfaction	200	0.838	4.35	.38403

Both hypotheses investigates the impact of work place stressors on physical and mental well-being of employees with the help of correlation and regression analysis. A positive and significant relationship found to exist between work place stressors and physical well-being with the r value of 0.915 in IT sector. A positive and significant relationship found to exist between work place stressors and mental well-being with the r value of 0.963 in IT sector. Thus, rejecting null hypothesis H_01 & H_02 and accepting alternate hypotheses with respect to relation between work place stressors and Physical & mental well-being of employees

Table - 3: Correlation matrix of Work place stressors and Physical & Mental well-being of employees

		Work place stressors	Physical well being	Mental well being
Work Place Stressors	Pearson Correlation	1	.915**	.963**
	Sig. (2-tailed)		.000	.000
	N	200	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Impact of work place stressors on physical wellbeing and mental well-being using simple linear regression analysis

The study adopted regression analysis to validate the results of correlation. A detailed analysis is made through Simple linear regression analysis. The results of regression analysis indicate that work place stressors influence physical and mental wellbeing. The regression results depicted in Table 4 proves that work place stressors dimension is able to significantly influence 83.7% physical wellbeing (R2=0.837) and 92.8%(R^2= 0.928) mental well-being.

Table - 4: Model Summary of Work place stressors on Physical & Mental well-being

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.915[a]	.837	.836	.16645
2	.963[a]	.928	.928	.11951

a. Predictors: (Constant), work place stressors

b. Dependent variables: physical well-being, mental well being

$H_0 3$: Personal stressors do not impact physical well-being of employees in organization.

$H_0 4$: Personal stressors do not impact mental well-being of employees in organization.

Both hypotheses investigate the impact of personal stressors on physical and mental well-being of employees with the help of correlation and regression analysis. A positive and significant relationship found to exist between personal stressors and physical well-being with the r value of 0.711 in IT sector. A positive and significant relationship found to exist between personal stressors and mental well-being with the r value of 0.806 in IT sector. Thus, rejecting null hypothesis $H_0 3$ & $H_0 4$ and accepting alternate hypotheses with respect to relation between personal stressors and Physical & mental well-being of employees

Table - 5: Correlation matrix of Personal stressors and Physical & Mental well-being of employees

		Personal Stressors	Physical Well- Being	Mental Well- Being
Personal Stressors	Pearson Correlation	1	.711**	.806**
	Sig. (2-tailed)		.000	.000
	N	200	200	200
Physical Well-Being	Pearson Correlation	.711**	1	.869**
	Sig. (2-tailed)	.000		.000
	N	200	200	200
Mental Well-Being	Pearson Correlation	.806**	.869**	1
	Sig. (2-tailed)	.000	.000	
	N	200	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Impact of personal stressors on physical wellbeing and mental well-being using simple linear regression analysis

The study adopted regression analysis to validate the results of correlation. A detailed analysis is made through Simple linear regression analysis. The results of regression analysis indicate that personal stressors influence physical and mental wellbeing. The regression results depicted in table 6 proves that personal stressors dimension is able to significantly influence 50.5% physical wellbeing (R^2=0.505) and 65%(R^2= 0.650) mental well-being.

Table - 6: Model Summary of Personal Stressors on Physical & Mental well-being

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.711ᵃ	..505	.503	.28985
2	.806ᵃ	.650	.648	.26386

a. Predictors: (Constant), personal stressors

b. Dependent variables: physical wellbeing, mental well being

H_05: Employee job satisfaction is independent of work place stressors in organisation.

A positive weak relationship found to exist between Employee job satisfaction and work place stressors with the r value of 0.236 in IT sector.

Table - 7: Correlation Matrix of Employee job satisfaction and Work place stressors

		Job Satisfaction	Work place stressors
Job satisfaction	Pearson Correlation	1	.236**
	Sig. (2-tailed)		.000
	N	200	200
Work place stressors	Pearson Correlation	.236**	1
	Sig. (2-tailed)	.000	
	N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Impact of work place stressors on employee job satisfaction using simple linear regression analysis

The study adopted regression analysis to validate the results of correlation. A detailed analysis is made through Simple linear regression analysis. The results of regression analysis indicate that work place stressors influence employee job satisfaction.

Table - 8: Model Summary of work place stressors and employee job satisfaction

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.236ª	.056	.051	.37409

a. Predictors: (Constant), work place stressors

b. Dependent variable: Employee job satisfaction

The regression results depicted in table proves that work place stressors dimension is able to weakly influence 5.6% Employee job satisfaction ($R2=0.056$) Thus rejecting null hypothesis H_05 and accepting alternate hypothesis with respect to relation between employee job satisfaction dimension and work place stressors in selected IT companies.

H_06: Employee job satisfaction is independent of personal stressors in organisation.

A positive weak relationship found to exist among Employee job satisfaction and personal stressors with the r value of 0.438 in IT sector.

Table - 9: Correlation Matrix of Employee job satisfaction and personal stressors

		Job Satisfaction	Personal stressors
Job satisfaction	Pearson Correlation	1	.438**
	Sig. (2-tailed)		.000
	N	200	200
Personal stressors	Pearson Correlation	.438**	1
	Sig. (2-tailed)	.000	
	N	200	200

**. Correlation is significant at the 0.01 level (2-tailed).

Impact of personal stressors on employee job satisfaction using simple linear regression analysis

The study adopted regression analysis to validate the results of correlation. A detailed analysis is made through Simple linear regression analysis. The results of regression analysis indicate that personal stressors influence employee job satisfaction.

Table - 10: Model Summary of personal stressors and employee job satisfaction

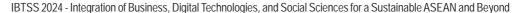| Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.438ª	.192	.188	.34613

a. Predictors: (Constant), Personal stressors

b. Dependent variable: Employee job satisfaction

The regression results depicted in table 8 proves that personal stressors dimension is able to weakly influence 19.2% Employee job satisfaction ($R^2=0.192$) Thus rejecting null hypothesis H_06 and accepting alternate hypothesis with respect to relation between employee job satisfaction dimension and work place stressors in selected IT companies.

Results Discussion

The research findings reveal that work place stressors like quantitative work load, superior relations, lack of work life balance, underutilization of talent, lack of role clarity and role ambiguity, ineffective communication and too many expectations in job affect physical and mental well-being of IT employees. The work place stressors cause so many health disorders like diabetes, hypertension, depression, anxiety, sleep disturbance, muscular pains and obesity. The mental well-being of employees characterised with mood swings, disappointment, lack of confidence, disturbed relations due to stress. The personal stress causative factors like family problems, marital problems, and financial problems have impact on physical and mental well-being of IT employees. Work place stressors and personal stressors weakly impact employee job satisfaction.

Conclusion

Every management need to consider employee work related stress management as a significant health and safety issue. The Strategies to reduce work place stress and promote employee physical and mental well-being includes: Empowering employees with training and information on stress management. It encompasses methods for achieving mental serenity, such as yoga and meditation. Employers should establish a conducive work atmosphere that fosters a sense of worth and gratitude among employees. The set of benefits include adaptable work schedules, incentivizing staff, attainable deadlines, mentorship, positive interpersonal connections, transparent communication between employees and management, including team gatherings, and performance evaluations that aid in addressing potential stressors. Encourage and support employees in achieving a healthy work-life balance. The management has the ability to provide wellness programmes that concentrate on stress management, physical activities, nutrition, and mental health in order to enhance the physical and emotional well-being of employees.

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Education and Capacity Building for Sustainability

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ABSTRACT

Education and capacity building are pivotal for achieving sustainability in various domains, encompassing environmental conservation, economic development, and social equity. This abstract explores the multifaceted role of education in fostering sustainable practices and building the necessary capacities among individuals, communities, and institutions. It highlights the importance of integrating sustainability principles into educational curricula at all levels, from primary schools to higher education, to cultivate a mindset that values environmental stewardship, responsible consumption, and global citizenship. Furthermore, capacity building initiatives empower stakeholders with the knowledge, skills, and resources needed to address complex sustainability challenges effectively. The abstract examines case studies and best practices worldwide, illustrating how education and capacity building initiatives contribute to creating resilient societies capable of navigating the uncertainties of the future while preserving the planet for generations to come.

The methodology for education and capacity building in sustainability involves a structured approach aimed at fostering understanding, skills, and action towards sustainable practices, such as setting clear objectives and goals, designing curriculum and content development, monitoring and evaluation.

This paper tends to foster to the needs of students, professionals, community leaders etc., to sustain in their respective field.

Keywords: *Sustainability education, Capacity building, Sustainable development goals (SDGs), Curriculum integration, Community engagement, Skill development.*

Introduction

In an era marked by escalating environmental challenges and socio-economic disparities, the concept of sustainability has emerged as a crucial framework for addressing global issues. Central to achieving sustainability is the notion of education and capacity building, which play indispensable

roles in shaping individuals, communities, and institutions towards more responsible and resilient practices. This introduction explores how education, at various levels and across diverse disciplines, serves as a catalyst for fostering sustainable mindsets and behaviors. Additionally, it underscores the significance of capacity building initiatives in equipping stakeholders with the requisite knowledge, skills, and resources to tackle complex sustainability challenges effectively. By integrating these elements, societies can aspire towards a future where environmental integrity, economic prosperity, and social equity harmoniously coexist. This introduction sets the stage for delving deeper into the critical intersections of education and capacity building in the pursuit of sustainability goals worldwide.

Literature Review

The literature on education and capacity building for sustainability is rich and varied, reflecting the growing recognition of sustainability as a fundamental pillar for global development. This section synthesizes key themes, theories, and empirical findings from academic and grey literature, providing a foundational understanding of the field.

1. **Theoretical Frameworks:** Scholars have proposed various theoretical frameworks to conceptualize sustainability education, including transformative learning (Mezirow, 1997), systems thinking (Sterling, 2001), and place-based education (Sobel, 2004). These frameworks emphasize the importance of critical reflection, holistic understanding of systems, and connecting learning to real-world contexts.

2. **Integration into Curricula:** There is a consensus on the need to integrate sustainability principles across educational curricula at all levels, from primary to tertiary education. This integration aims to cultivate a sustainability mindset among students and prepare them to address complex environmental, social, and economic challenges (UNESCO, 2014).

3. **Educational Approaches:** Effective educational approaches include interdisciplinary learning, project-based learning, and experiential learning, which allow students to explore sustainability issues in depth and develop practical skills (Wals & Jickling, 2002).

4. **Impact Assessment:** Studies examining the impact of sustainability education indicate positive outcomes such as increased environmental awareness, pro-environmental behaviors, and enhanced critical thinking skills (Dewey, 1938; Rickinson et al., 2004).

5. **Capacity Building Initiatives:** Capacity building efforts focus on enhancing the skills, knowledge, and resources of individuals and organizations to implement sustainable practices effectively. These initiatives often involve training programs, workshops, and collaborative partnerships (UNEP, 2009).

6. **Barriers and Challenges:** Challenges to effective sustainability education and capacity building include lack of institutional support, inadequate teacher training, competing educational priorities, and cultural barriers to change (Leal Filho et al., 2018).

7. **Global Perspectives:** Research highlights diverse global perspectives and practices in sustainability education and capacity building, showcasing regional variations in curriculum development, policy implementation, and community engagement (Gough, 2017).

8. **Policy and Governance:** The role of policies and governance frameworks is crucial in shaping the direction and impact of sustainability education and capacity building initiatives. International agreements such as the Sustainable Development Goals (SDGs) provide a global framework for integrating sustainability into educational policies and practices (UNESCO, 2020).

By synthesizing these diverse strands of literature, this review provides a comprehensive overview of current knowledge and identifies gaps for future research. It underscores the importance of continued research and innovation in advancing education and capacity building for sustainability, ultimately contributing to the development of resilient and sustainable societies worldwide.

The Importance

The importance of education and capacity building for sustainability is paramount in addressing the complex challenges facing our planet today. Here are key reasons why these efforts are crucial:

1. **Creating Awareness and Mindset Shifts:** Education fosters awareness about environmental issues, social inequalities, and economic disparities. It cultivates a mindset that values sustainability, encouraging individuals to adopt behaviors that minimize environmental impact and promote social equity.

2. **Empowering Individuals and Communities:** Capacity building empowers individuals and communities by equipping them with knowledge, skills, and resources to address sustainability challenges effectively. This empowerment enables communities to participate in decision-making processes and implement local solutions.

3. **Promoting Responsible Citizenship:** Sustainability education promotes responsible global citizenship by emphasizing interconnectedness, ethical decision-making, and the importance of collective action. It prepares individuals to engage as informed and active citizens in shaping sustainable futures.

4. **Supporting Sustainable Development Goals (SDGs):** Education and capacity building contribute directly to achieving the SDGs. They provide the foundation for lifelong learning and sustainable practices across sectors.

5. **Building Resilience:** By integrating sustainability principles into education systems and building capacities at all levels, societies become more resilient to environmental, economic, and social shocks.

6. **Driving Innovation and Collaboration:** Education fosters innovation by encouraging critical thinking, creativity, and problem-solving skills needed to develop sustainable technologies and

practices. Capacity building facilitates collaboration among diverse stakeholders, fostering partnerships for sustainable development.

7. **Supporting Policy and Institutional Change:** Educated and skilled individuals are essential for driving policy reforms and institutional changes towards sustainability. They play roles in advocating for policies that promote environmental protection, social justice, and economic stability.

8. **Ensuring Inter-generational Equity:** Sustainability education ensures that future generations inherit a planet capable of supporting life and thriving communities. It instills values of inter-generational equity, urging current generations to make decisions that preserve natural resources and biodiversity.

Framework

Framework for Education and Capacity Building for Sustainability:

1. **Goals and Objectives:** Define clear goals and objectives aligned with sustainability principles, such as promoting environmental stewardship, fostering social equity, and advancing economic resilience.

2. **Curriculum Integration:** Integrate sustainability concepts across educational curricula at all levels, ensuring interdisciplinary approaches and practical applications. This includes embedding sustainability into subjects like science, social studies, and economics.

3. **Pedagogical Approaches:** Employ diverse pedagogical approaches such as experiential learning, problem-based learning, and place-based education to engage learners actively in sustainability issues. Encourage critical thinking, systems thinking, and collaborative learning.

4. **Capacity Building Strategies:** Develop capacity building strategies tailored to diverse stakeholders, including educators, students, community leaders, and policymakers. Offer training programs, workshops, and resources that enhance knowledge, skills, and attitudes towards sustainability.

5. **Community Engagement:** Foster partnerships and collaboration with local communities, businesses, NGOs, and government agencies to address local sustainability challenges. Engage stakeholders in co-creating solutions and implementing sustainable practices.

6. **Monitoring and Evaluation:** Establish mechanisms for monitoring and evaluating the effectiveness of sustainability education and capacity building initiatives. Use indicators such as changes in knowledge, attitudes, behaviors, and sustainability outcomes to assess impact.

7. **Policy Alignment:** Advocate for supportive policies and governance frameworks at local, national, and international levels that promote sustainability education and capacity building. Align initiatives with global frameworks like the Sustainable Development Goals (SDGs).

8. **Innovation and Research:** Encourage innovation and research in sustainability education, exploring new methodologies, technologies, and best practices. Foster collaboration between academia, industry, and civil society to drive continuous improvement.

9. **Ethical Considerations:** Incorporate ethical considerations into education and capacity building efforts, emphasizing values of social justice, equity, and respect for cultural diversity. Promote ethical decision-making in addressing sustainability challenges.

10. **Scaling Impact:** Develop strategies for scaling successful initiatives and replicating best practices across different contexts and regions. Share lessons learned and knowledge through networks, conferences, and publications to inspire global action.

This framework provides a structured approach to integrating sustainability into education systems and building capacities for sustainable development. It emphasizes the interconnectedness of environmental, social, and economic dimensions while empowering individuals and communities to contribute to a sustainable future.

Block Diagram (Kioupi, V., (2019)):

A block diagram illustrating the components and interactions involved in education and capacity building for sustainability:
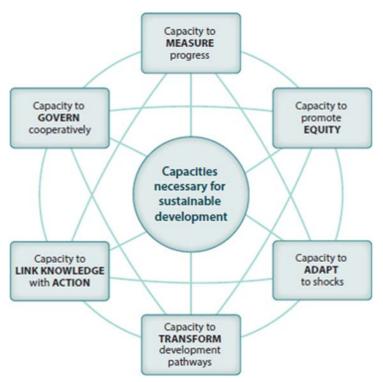

Figure 1

Components:

- **Sustainability:** Central focus area encompassing environmental stewardship, social equity, and economic resilience.

- **Goals/Objectives:** Clear targets for promoting sustainability through education and capacity building initiatives.

- **Curriculum Integration:** Integration of sustainability concepts across educational curricula at various levels.

- **Pedagogical Approaches:** Diverse teaching methodologies that engage learners actively in sustainability issues.

- **Capacity Building Strategies:** Strategies to enhance knowledge, skills, and attitudes towards sustainability among stakeholders.

- **Community Engagement:** Collaborative efforts with local communities and stakeholders to address sustainability challenges.

- **Monitoring and Evaluation:** Mechanisms to assess the effectiveness and impact of sustainability education and capacity building efforts.

- **Policy Alignment:** Advocacy for policies and frameworks that support sustainability education and capacity building.

- **Innovation and Research:** Exploration of innovative approaches and research to advance sustainability goals.

- **Ethical Considerations:** Incorporation of ethical values such as social justice and cultural respect into sustainability initiatives.

- **Scaling Impact:** Strategies to replicate successful initiatives and best practices across different contexts and regions.

This block diagram provides a visual representation of the interconnected components essential for advancing sustainability through education and capacity building, illustrating how each component contributes to a holistic approach towards sustainable development.

Creating effective methodologies for education and capacity building in sustainability involves several key principles and approaches. Here's a structured methodology that can be applied (Davila, D - 2021):

Assessment and Baseline Understanding:

1. **Identify Target Audience:** Determine who needs education and capacity building in sustainability—students, professionals, community leaders, etc.

2. **Assess Current Knowledge:** Gauge the existing understanding of sustainability concepts among the target audience.

3. **Identify Needs:** Pinpoint specific areas where knowledge and skills need enhancement.

Setting Clear Objectives:

1. **Define Learning Outcomes:** Establish what participants should be able to know, do, or change after completing the education or capacity building program.

2. **Align with Sustainability Goals:** Ensure objectives contribute to broader sustainability goals, such as environmental stewardship, social equity, and economic viability.

Designing Curriculum and Content:

1. **Holistic Approach:** Integrate interdisciplinary perspectives to cover environmental, social, and economic dimensions of sustainability.

2. **Experiential Learning:** Use real-world case studies, simulations, and practical exercises to deepen understanding and skill development.

3. **Interactive Methods:** Incorporate workshops, group discussions, and collaborative projects to encourage active participation and peer learning.

4. **Technology Integration:** Leverage online platforms, multimedia resources, and virtual simulations to enhance accessibility and engagement.

Delivery Strategies:

1. **Tailored Approaches:** Customize educational strategies to suit diverse learning styles and backgrounds of participants.

2. **Engagement and Motivation:** Use storytelling, gamification, and incentives to maintain interest and motivation throughout the program.

3. **Community Involvement:** Foster partnerships with local communities, NGOs, and businesses to provide practical insights and opportunities for hands-on learning.

Monitoring and Evaluation:

1. **Continuous Feedback:** Collect feedback from participants and stakeholders to evaluate the effectiveness of the program.

2. **Assessment Tools:** Develop pre- and post-tests, surveys, and qualitative assessments to measure knowledge gain and behavioral changes.

3. **Iterative Improvement:** Use evaluation results to refine and improve future iterations of the education and capacity building initiatives.

Sustainability in Practice:

1. **Application and Implementation:** Encourage participants to apply their learning in real-world contexts, promoting sustainable practices within their communities or workplaces.

2. **Long-term Impact:** Monitor long-term outcomes and behavioral changes to assess the lasting impact of the education and capacity building efforts.

Promotion and Advocacy:

1. **Knowledge Sharing:** Disseminate success stories, case studies, and best practices to inspire broader adoption of sustainable practices.

2. **Advocacy for Policy Change:** Empower participants to advocate for policy changes that support sustainability at local, regional, and national levels.

By following these steps, educators and capacity builders can create comprehensive and impactful programs that empower individuals and communities to contribute effectively to sustainability goals.

Based on current research and practices in education and capacity building for sustainability, here are some key findings and corresponding recommendations:

Findings and recommendations :

Diverse Audience Needs:

1. **Finding:** Different stakeholder groups (students, professionals, community leaders) have varying levels of knowledge and skills related to sustainability.

2. **Recommendation:** Tailor educational programs to the specific needs, backgrounds, and learning styles of different target groups. Offer modular and customizable content to accommodate diverse learning needs.

Integration Challenges:

1. **Finding:** There is a need for better integration of sustainability principles across disciplines and sectors.

2. **Recommendation:** Develop interdisciplinary curriculum frameworks that incorporate environmental, social, and economic dimensions of sustainability. Foster collaboration between academia, industry, and government to promote holistic approaches to sustainability education.

Lack of Practical Application:

1. **Finding:** Participants often struggle to apply theoretical knowledge to real-world sustainability challenges.
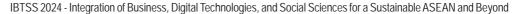
2. Recommendation: Emphasize experiential learning methodologies, such as case studies, simulations, and hands-on projects, that provide opportunities for practical application of sustainability concepts. Foster partnerships with local communities and organizations to facilitate real-world engagement and implementation.

Technology and Innovation Gap:

1. Finding: There is a gap in leveraging technology and innovative teaching methods to enhance sustainability education.

2. Recommendation: Integrate digital tools, online platforms, and virtual reality simulations into educational programs to enhance accessibility, engagement, and learning outcomes. Encourage the development and adoption of educational technologies that support sustainability learning and action.

Evaluation and Impact Assessment:

1. Finding: There is a need for robust evaluation frameworks to measure the effectiveness and long-term impact of sustainability education programs.

2. Recommendation: Develop comprehensive evaluation metrics that assess knowledge gain, attitude changes, behavioral outcomes, and societal impacts. Implement pre- and post-program assessments, feedback mechanisms, and follow-up studies to track participant progress and program effectiveness over time.

Scaling and Sustainability of Initiatives:

1. Finding: Scaling successful sustainability education initiatives and ensuring their long-term sustainability remains a challenge.

2. Recommendation: Foster partnerships and collaborations with diverse stakeholders to scale successful programs (Osher D et.al., 2019). Advocate for institutional support, funding mechanisms, and policy integration to ensure the continuity and sustainability of sustainability education efforts. Empower local champions and build capacity among trainers and facilitators to expand the reach and impact of sustainability education initiatives.

By implementing these findings and recommendations, stakeholders can enhance the effectiveness and impact of education and capacity building for sustainability, contributing to positive environmental, social, and economic outcomes globally.

Implementation

Implementing education and capacity building for sustainability involves several key steps and considerations to ensure effective outcomes (Maki PL 2023):

- **Needs Assessment**: Begin by assessing the current knowledge, skills, and practices related to sustainability among the target audience. Identify gaps and areas where education and capacity building are most needed.

- **Curriculum Development**: Develop a comprehensive curriculum that covers essential aspects of sustainability, including environmental stewardship, social responsibility, and economic viability. (McKeown, R et. al.,2002) . Ensure the curriculum is relevant to the local context and addresses specific challenges and opportunities related to sustainability.

- **Training Programs**: Design and deliver training programs that are interactive, participatory, and tailored to the needs of different stakeholders (e.g., students, educators, professionals, community members). Incorporate case studies, practical exercises, and real-world examples to enhance learning and application.

- **Partnerships and Collaboration**: Collaborate with various stakeholders, including educational institutions, government agencies, and industry partners, to leverage expertise, resources, and networks for effective implementation. Establish partnerships that support long-term sustainability goals and foster innovation.

- **Educator Capacity Building**: Provide training and support for educators to enhance their knowledge and skills in teaching sustainability concepts (Warren, A.et.al.,2014). Offer workshops, seminars, and resources to help educators integrate sustainability into their curriculum and teaching practices effectively.

- **Monitoring and Evaluation**: Implement mechanisms to monitor the effectiveness of education and capacity building efforts. Use qualitative and quantitative indicators to assess changes in knowledge, attitudes, and behaviors related to sustainability. Gather feedback from participants to continuously improve programs.

- **Promotion and Awareness**: Raise awareness about the importance of sustainability and the benefits of education and capacity building initiatives. Use various communication channels, such as social media, workshops, and community events, to engage and inspire broader participation.

- **Institutionalization and Sustainability**: Integrate sustainability education into institutional policies, practices, and governance structures to ensure long-term impact and sustainability. (McFarlane, D. A., et.al., (2011). Foster a culture of sustainability within educational institutions and communities.

By following these steps and considerations, education and capacity building initiatives for sustainability can effectively equip individuals and communities with the knowledge, skills, and motivation to contribute to a more sustainable future Rieckmann, M. (2018).

In conclusion, effective implementation of education and capacity building for sustainability is crucial for fostering a sustainable future. By addressing current knowledge gaps, developing relevant curricula, and delivering tailored training programs, we can empower individuals and communities to adopt sustainable practices. Collaboration with diverse stakeholders, continuous monitoring, and evaluation of outcomes are essential for ensuring the long-term impact of these initiatives. Ultimately, integrating sustainability into education not only enhances environmental stewardship but also promotes social responsibility and economic resilience. Through these efforts, we can collectively work towards a more sustainable and equitable world for present and future generations.

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Internationalization and Its Meaning for Senior International Officers at U.S. Regional Comprehensive Universities

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ABSTRACT

Senior international officers (SIOs) are the catalysts for the comprehensive internationalization of higher education institutions in the United States. The concept of internationalization has often been perceived as a one-size-fits-all, meaning that it is implemented the same way at every single higher education institution. This qualitative study conducted 12 semi-structured interviews with 12 SIOs from five different U.S. regions to make sense of their understanding of internationalization in the context of regional comprehensive universities (RCUs). Findings reveal that internationalization has, at some point in the SIOs' career, been wrongfully limited to study abroad only. Also, internationalization is perceived by SIOs at RCUs as a societal mandate and as a tool to educate good global leaders. The phenomenon also helps develop intercultural competence at RCUs. This article argues that internationalization should always be contextualized. The paper also coined the notion of contextual internationalization suggesting that future researchers investigate higher education internationalization through the lenses of contextual internationalization.

Keywords: Internationalization, senior international officer, higher education, regional comprehensive universities

1. Introduction

The internationalization of higher education is a growing trend in the United States. The country continues to be a major magnet for international students from around the world seeking to further their education. From a total of 564,766 international students in the United States in 2005, the country registered 1,043,839 foreign students in 2015. Since then, the country has successfully attracted over one million international students for five consecutive years from 2015 to 2020 (Opendoors, 2022). In 2020 the Institute of International Education reported that foreign students contributed 44 billion dollars to the U.S. economy. Although the COVID-19 pandemic drastically

reduced internationalization efforts in 2020-2022, the world is opening back and internationalization through the mobility of students, faculty, and staff is going back to its pre-pandemic numbers. In 2021, enrollment for international students was up by 80 percent as compared to the significant drop due to the COVID-19 pandemic in 2020 (Opendoors, 2022). In 2022, international education was incorporated into the U.S. international trade strategy. The U.S. Department of Commerce committed to "increasing investment opportunities for the U.S. educational institutions" (International Trade Administration, 2022) as a way for the country to continue to attract more international talent.

Some researchers have investigated the importance of higher education leaders in successfully implementing internationalization in the United States (Altbach, 2015; Choi & Khamalah, 2017; Tran et al., 2020). Some others have attempted to define the concept of higher education internationalization (Arum & Van de Water, 1992; de Wit et al., 2015; Heleta & Chasi, 2023; Knight, 1993; Knight, 2004). However, research on the SIOs' understanding of internationalization at regional comprehensive universities remains untapped. Scholars and professional organizations have often looked at internationalization as a phenomenon that is implemented the same way regardless of institutional type. There are different types of higher education institutions, and they all do internationalization differently. Regional comprehensive universities are the second largest higher education institutions that put efforts into internationalization after research universities in the United States. They also constitute the second largest attraction for international students after research universities (Opendoors, 2022). It is, therefore, essential to investigate those universities more to generate knowledge that could help professionals from these institutions be more effective.

Although I argue that internationalization should be contextualized, I do not seek to redefine the concept here. The main goal is to determine what kind of citizen institutions – regional comprehensive universities in the United States – try to shape when they engage in internationalization efforts from the perspective of SIOs. Findings from this research will contribute to the existing literature on the internationalization of U.S. higher education institutions. SIOs in regional comprehensive universities can use the findings from this study to sharpen their leadership and understanding of what they should emphasize when they commit to internationalizing the institution type they serve.

2. Review of the Literature

Students, faculty, and staff members from higher education institutions are increasingly moving globally in the pursuit of knowledge, its dissemination, and cultural exchanges. Scholars have referred to such mobility as the internationalization of higher education. The internationalization of higher education "as a concept and strategic agenda is a relatively new but broad and varied phenomenon, driven by a dynamic combination of political, economic, socio-cultural and academic rationales and stakeholders" (de Wit, 2019, p.8). The global village that the world has become has made higher education institutions adapt to meet the requirements of a global society. It is expected for universities to train citizens who can be competitive in a global employment market. Thus, institutions are
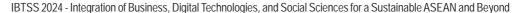
putting in efforts to develop and provide study abroad and study away programs, as well as to recruit international students and faculty.

Researchers have extensively addressed the notion of internationalization in terms of its conceptual framework (Knight, 2004; Qiang, 2003); its rationale, challenges, and strategies (Harari, 1992; Knight, 2004; Qiang, 2003); and its current and future trends (de Wit, 2024; de Wit & Altbach, 2021). However, few scholars have investigated the notion of contextual internationalization focusing specifically on institutional types. The concept has often been dealt with as if all higher education institutions are the same. The purpose of this study is to bridge that gap and understand internationalization from the lens of SIOs at regional comprehensive universities.

History of Internationalization of Higher Education

International education finds its roots in the medieval era when students and professors traveled around the world to gain knowledge. Education during this period was affected by similarities in religion, language, and academic practices (de Wit & Altbach, 2021).

The internationalization of higher education in the 18th and 19th centuries was mainly characterized by "the export of higher education systems; the dissemination of research; and the individual mobility of students and scholars" (Wit & Altbach, 2021, p.30). This period of internationalization was marked by the export of higher education systems from colonial powers to their colonies. Thus, countries in Africa, Asia, the Caribbean, and Latin America have had their higher education systems modeled on the format of their colonizers. Many of these former colonies, despite their independence, are still influenced by their colonizers and other new superpowers (de Wit, 2002). Internationalization of higher education in the eighteenth and nineteenth centuries was also characterized by research and publication of research findings (de Wit, 2002). Through seminars, conferences, and various publications, scholars of that period were able to disseminate their research across borders. The dissemination of knowledge through publications and conferences is still prevalent in academia. For the most part, universities emerged in the 18th and 19th centuries with a national orientation (Altbach & de Wit, 2015). Despite the national orientation and function of those early universities, they attracted students and staff from other countries. The first universities in Europe, Bologna and Paris, for instance, had students from the entire European continent (Altbach & de Wit, 2015; de Wit, 2002). The mobility of students and staff in those centuries was facilitated by the utilization of a common language: Latin. Also, the mobility of students was more from the United States, Australia, and Canada towards Europe (de Wit, 2002). Furthermore, de Wit (2002) argued that the internationalization of higher education in the medieval era and the eighteenth and nineteenth centuries was more incidental than organized. This implies that countries did not have clear strategies and policies to attract international students, faculty, and staff. The general belief in those times was that knowledge is universal. Internationalization of higher education became more organized in the 20th century.

The internationalization of higher education became more organized in the early 20th century. In the United States, the Institute of International Education (IIE) was created in 1919. Germany created the Deutscher Akademischer Austauchdienst (DAAD) in 1925. In the United Kingdom, the British Council was established in 1934. The establishment of those organizations in the U.S., Germany, and the U.K. indicates that countries were giving more attention to international cooperation and exchange (de Wit, 2002). After World War I, the internationalization of higher education was more "driven by political rationales of peace and mutual understanding" (de Wit, 2002, p.10). The founders of IIE, for instance, had the belief that international education could help build a more secure and equitable world (IIE, n.d). World War II also accelerated the understanding that international education could be a wonderful tool to avoid conflicts between nations. The establishment of Fulbright and UNESCO, immediately after the war was a sign that the world was paying serious attention to the internationalization of higher education (de Wit, 2002). The most used rationale for internationalization after World War II was political and cultural. A program such as Fulbright was designed mainly to facilitate better cultural understanding between Americans and people of other countries.

The Cold War had a significant impact on international education. From the idealism of peace and better understanding between nations, ideology, and politics affected internationalization. Capitalism led by the United States and Communism led by the Soviet Union were the two ideologies that infiltrated higher education as a way for both countries to control the rest of the world (Altbach & de Wit, 2015; de Wit, 2002; de Wit & Altbach, 2021). Both the United States and the Soviet Union "had clear political reasons to promote international educational exchange and cooperation: to gain a better understanding of the rest of the world and to maintain and even expand their spheres of influence" (de Wit, 2002, p.11). Thus, because of the competition between the two powers, the Soviet Union emphasized its internationalization efforts towards some friendly developing and newly independent countries. The Soviet Union did not prioritize academic cooperation with Western countries, and some extensive cooperation was even forbidden (Altbach & de Wit, 2015). The competition became even more intense between former colonial powers – France and the United Kingdom – and the Soviet Union as former colonizers strived to maintain their influence on their former colonies by providing scholarships and collaborating with universities (Altbach & de Wit, 2015). The United States also "developed active and far-reaching higher education soft power initiatives" (Altbach & de Wit, 2015). The establishment of the Fulbright program became the most visible and successful internationalization effort as it brought thousands of students and professors to the United States, and also sent Americans around the world (Altbach & de Wit, 2015). The end of the Cold War will give another direction to international education.

After the Cold War, the internationalization of higher education was mainly driven by economic rationales. In the 1980s, international education became more of a tool for countries such as the United States to restore their economic leadership in the world (de Wit, 2002). Universities, at that time, perceived international education and international students as cash cows (Cantwell, 2015).

Indeed, several higher education institutions relied on the recruitment of international students to generate revenues that would help cover some of their operational expenses and contribute to the economic growth of the country. In 2020, for example, it was estimated that international students contributed $44 billion to the U.S. economy (IIE, 2020). This shows that despite the progressive change being observed in some universities, international students still generate significant revenues for their host institutions and countries. In the United States, international students usually pay two to three times the tuition for domestic students.

Some Definitions of Internationalization Over the Years

In the early 90s, scholars spoke of the need to provide a definition to the emerging international education profession. Arum and Van de Water (1992) defined international education as "the multiple activities, programs, and services that fall within international studies, international educational exchange and technical cooperation" (p.202). This definition perceived internationalization exclusively as any type of activity that had some international dimensions into it.

Unlike Arum and Van de Water's (1992) definition of internationalization which focuses on the activity's perspectives, Knight (1993) proposed a different definition that focused solely on the institutional level. Knight (1993) defined internationalization as "the process of integrating the international dimension into the teaching /learning, research and service functions of an institution of higher education."

A largely accepted and used definition of internationalization was provided by Knight (2004) who defined the concept as "the process of integrating an international, intercultural or global dimension into the purpose, functions or delivery of post-secondary education" (p.11). Knight's (2004) definition indicated that internationalization is not a static phenomenon. It is rather a process.

Building on Knight's (2004) definition, de Wit et al. (2015) argued that internationalization is "the intentional process of integrating an international, intercultural or global dimension into the purpose, functions, and delivery of post-secondary education, in order to enhance the quality of education and research for all students and staff, and to make a meaningful contribution to society" (p.29). The important addition that de Wit et al. (2015) brought is the intentionality in the internationalization process.

The above-mentioned definitions of internationalization have often been perceived as exclusive to the Western world. For example, Guo et al. (2021) found that Chinese students perceive the internationalization of higher education as Westernization. The focus is primarily on English as the medium of education, exchange of knowledge, and resources mainly available in Western countries.

However, Heleta and Chasi (2023) proposed a definition of internationalization that better aligns with the realities of the Global South. According to Heleta and Chasi (2023), "internationalization of higher education is a critical and comparative process of the study of the world and its complexities, past and present inequalities and injustices, and possibilities for a more equitable and just future for

all. Through teaching, learning, research, and engagement, internationalization fosters epistemic plurality and integrates critical, anti-racist, and anti-hegemonic learning about the world from diverse global perspectives to enhance the quality and relevance of education" (pp. 269-270).

3. Methodology

This study utilized an interpretive qualitative method, particularly phenomenological research to collect data because its purpose was to understand the concept of internationalization from the perspectives of SIOs at RCUs. Johnson and Christensen (2019) state that in phenomenological research, the researcher tries to make sense of how individuals experience a phenomenon. Informant interviews can be used to conduct phenomenological research. According to Tracy (2020), informant interviews allow researchers to speak with experienced insiders on a specific topic to make sense of their lived experiences.

Sampling and Participants

Participants in this study were purposefully selected among SIOs as defined by the Association of International Education Administrators. I recruited 12 participants on a snowball sampling method upon IRB approval. Participants were selected based on the following criteria: have a minimum of three years working in the area of international education, and serve or have served as an SIO at a regional comprehensive university in the United States in the last three years of their career. I set these criteria based on experience to collect rich data that could generate knowledge on the meaning of internationalization for SIOs at RCUs.

Data Collection and Analysis

Upon IRB approval, I emailed the participants asking them to sign and return the consent form. Semi-structured interviews were conducted at a convenient time for participants via Microsoft Teams and Zoom. The interviews lasted approximately sixty minutes each. Saturation was reached before the 12 interviews were conducted. The data collected was transcribed using Microsoft Teams or Microsoft 365, generating a total of 234 single-spaced pages. For confidentiality's sake, participants and their institutions were given pseudonyms.

The analysis of the data began with the identification of preset categories. Preset categories require the researcher to define some themes or categories and look for those themes from the data (Renner & Taylor-Powel, 2003). In addition to the identification of preset categories, I also read through the data to find emergent categories. The preset categories and the subsequent emergent categories were combined to serve as first-level codes using MAXQDA, a qualitative data analysis software. I identified 22 first-level codes from the interview data, and I synthesized them into 4 second-level codes based on specific topics related to SIOs' understanding of what internationalization means. These second-level codes were reviewed to make sure that each one of them provided a coherent explanation to the research question. Finally, I grouped them under one theme that addressed the research question.

4. Findings

The internationalization of higher education may have different connotations depending on individuals dealing with the phenomenon as a profession. The most widely used definition of internationalization is the one provided by Knight (2004).

Senior international officers at regional comprehensive universities operate at institutions that are usually focused on local and regional issues by design. It is then appropriate to unpack the understanding of those individuals in charge of implementing a comprehensive internationalization at their institutions. Questions that were asked of SIOs ranged from their perception of the concept when they first joined the international education field, how that perception has evolved, and what internationalization meant to them at the time of the interview when they were acting as SIOs at their institution. Four main themes emerged describing how the participants in this study understood internationalization. Table 1 summarizes the themes that indicate the understanding of the concept by SIOs in this study.

Table - 1: *SIOs' Understanding of Internationalization*

Internationalizing RCU: Meaning for SIOs
Internationalization = Study abroad
Educating good global leaders
Societal mandate for better communities
Developing intercultural competence

Internationalization = Study Abroad

Participants began by sharing how they joined the field and the roles they played when they first started working as international educators. Eight out of the twelve interviewees joined the field as study abroad advisors, and that position shaped their perception of internationalization. For those eight participants, internationalization mainly meant studying abroad, meaning recruiting and assisting domestic students willing to have an international experience overseas. Elodi, one of the participants states that "my expertise was just sending outbound American students overseas on study abroad programs." Lajeune, another interviewee said: "I looked at it [internationalization] through study abroad."

This limited understanding of internationalization evolved over time as participants gained more experience in the field. The interviewees mentioned that their understanding of internationalization broadened once they were appointed as SIOs. All participants asserted that the internationalization of higher education implies educating good global leaders and citizens who are prepared to address

global challenges. SIOs understood that to achieve that goal, facilitating the interaction between domestic and international students was necessary, that internationalizing the curriculum could help reach the entirety of the student body, and that managing risks related to international education was central to their tasks as SIOs.

Educating Good Global Leaders

A common theme that emerged from all of the participants' understanding of internationalization at regional comprehensive universities in the United States was that it allows higher education institutions to shape responsible and competent global citizen leaders to address global challenges. One of the interviewees, a provost at a Midwestern university who was assigned the pseudonym Jeli, described her comprehension of internationalization in the following terms:

I think it's that we bring Noir Plaine University to the world, and we bring the world to Noir Plaine University, and that ties to our mission that we're creating global citizens.

For Jeli, internationalization can be perceived as a means to bring the world to a university and take a university out into the rest of the world with the ambition of preparing good global leaders and citizens who can bring solutions to the world's challenges.

Lary, an executive director at a Northwestern university, understood internationalization in the context of a regional comprehensive university's mission:

I guess for a regional comprehensive university, an internationalized campus includes global perspectives and global knowledge and global sources and its curriculum and facilitates the exchange of students in both directions. And hopefully in an affordable way. And that no matter what academic discipline the student is in, they're able to engage in global learning, whether they go abroad or not.

This SIO implied that internationalization consists of exposing the entire campus community to global perspectives through the internationalization of the curriculum. In addition, an internationalized regional comprehensive university is one that facilitates the mobility of students both domestic and international in an affordable way.

Societal Mandate for Better Communities

Participants suggested that it is a societal mandate for universities to promote internationalization. Despite regional comprehensive universities tending to be more focused on local and regional issues, most of them incorporate an international dimension of education as a part of their mission statements. Five of the participants mentioned that it is the responsibility of universities to prepare individuals who are ready and able to address the challenges that societies face. According to Mike, a 25-year veteran of higher education,

Internationalization is one of the better tools to help create better societies in which regional comprehensive universities operate. I mean, most of them are located in areas that are not overly

developed. They're not necessarily, some are, but not necessarily in large metropolitan areas. Areas that struggle with economic development, with acceptance, belonging, diversity, and I think that internationalization can build stronger communities, not just economically but societally.

The diversity that is brought to communities where regional comprehensive universities operate can bridge some gaps faced by society. The interaction between individuals from diverse backgrounds can facilitate better understanding among citizens of different countries, cultures, ethnicities, and religions, to name but a few. Also, it is not uncommon to see people flee their countries due to conflicts and/or different kinds of persecution. Universities and some organizations in the United States are advocating for facilitating access to higher education for displaced people as a way to help them better their living conditions and contribute to society. In that vein, Mike added:

I have worked very hard on expanding access specifically for refugees and displaced students. And really looking at that as much as a bigger societal mandate instead of just, yes it contributes to globalization of the community and the campus, but it's a much bigger, you know, if we've got a world worth of 100 million displaced folks in the last year and less than 5% of those actually have access to higher education, that to me has been a very engaging and rewarding endeavor. Absolutely challenging but I've enjoyed that. And that focus I think has been quite a change over the last few years and I think that's what I'll probably be working on for the foreseeable future because the needs are so great.

Several participants mentioned that the construction of a better world requires tremendous investment in international higher education. The SIOs in this study argued that when individuals are forced to flee their countries for various motives when countries have been affected by conflicts, access to international higher education could help alleviate some of the consequences associated with those hardships. One subject speaking about the necessity of partnering with universities in countries that have experienced conflicts said one of her concerns is "how am I gonna support our students who are trying to rebuild their society in Cambodia? So, I got to be intentionally focused on doing good in the world and moving forward in a positive way" (Jeli). The SIOs described how internationalization to them means developing intercultural competence, not only for students but the entire campus community and the local community members.

Developing Intercultural Competence

All the respondents spoke of internationalization at regional comprehensive universities as a tool to develop intercultural competence among students, faculty, staff, and the entire communities where the institutions are located. In the higher education internationalization context, Deardorff (2008) states that intercultural competence is about knowing and being able to interact appropriately with individuals from different backgrounds. Jeli explained:

One of the things that I wanted to be able to focus on really intentionally when I first started in Global Affairs, I thought I was gonna be able to do sooner than I've been able to do is really focus

on all aspects of intercultural competence across. Not just students. That's kind of a given that we wanna have them interculturally integrated and teach them that. But our faculty and staff and our other stakeholders as well.

In the same sense, Francine, an international education professional from the West Coast said:

I think that a key part of our roles as international educators is the intercultural competencies and being able to navigate those differences. I think that is a big part of my daily dialogue and approach when I talk to partners, when I talk to students, when I talk to faculty is always checking that value system and understanding the difference in values.

Francine was describing how as an international educator, she has to pay close attention to cultural differences and respect those differences when interacting with partners overseas, students, and faculty members. Since senior international officers are in charge of implementing a comprehensive internationalization of their institution, it is their responsibility to promote and ensure that cultural differences are recognized and valued across campus and within their communities.

The respondents in this research agreed that racism and xenophobia are sometimes the results of the lack of intercultural competence. Regional comprehensive universities can play an essential role in developing interculturally competent students and communities. As Lary put it,

I worry sometimes about whether or not our community and our university is culturally competent enough to host international students without being seen as xenophobic and racist and what role we could play in helping our university community be more interculturally competent.

For SIOs in this study, developing interculturally competent citizens is what internationalization means in the context of regional comprehensive universities. Developing intercultural competency is a way to facilitate better understanding among individuals from different nations, build peace, and reduce the effects of racism and xenophobia. Some international students have often reported that they have been victims of racism, and discrimination for simply being different. Awuor (2021) found, for instance, that African international students are sometimes stereotyped by some faculty and staff members as not being smart enough. International offices being the first point of contact for international students, senior international officers need to ensure that faculty and staff members develop cultural competency skills that would allow them to effectively deal with foreign students and help them feel welcome in their host universities and communities.

5. Discussion

The participants described how they joined the field of international education before becoming senior international educators at their institutions. Several participants mentioned that they joined the field as study abroad advisors and their initial position influenced their understanding of the concept of internationalization. At first, internationalization for many of the participants was all about recruiting and assisting domestic students to study abroad. It is, however, important to note that this limited understanding was before they rose to the position of senior international officers.

Perceiving internationalization as study abroad, although reductive, is not quite wrong. This understanding is simply one component of the phenomenon. It aligns with the notion of internationalization abroad as defined by de Wit and Altbach (2021). Internationalization abroad is when students travel abroad to get a degree, credits, or certificates (de Wit & Altbach, 2021).

The participants articulated how their understanding of the phenomenon evolved as they gained experience in the field. The senior international officers at regional comprehensive universities understand internationalization as a tool that serves in the education of good global leaders, who are prepared to address the challenges the world faces. Before those leaders can address global challenges, they need to be aware, they need to understand them. That awareness and understanding may happen when students are taught about them, hence the necessity of internationalizing the curriculum. This understanding of internationalization indicates that senior international officers agree with Knight (2004) when she describes the concept as a process of integrating an international dimension into teaching.

The participants also defined internationalization in the context of regional comprehensive universities as a social mandate. Higher education institutions have the responsibility to equip individuals with resources so they can assist in the development of more just and equitable societies. That perception may imply that senior international officers agree that there are injustices that exist in the world (occupational wars, civil wars, exploitations, etc.) that may be addressed through the internationalization of higher education institutions. It appears again that the incorporation of a "global dimension" in higher education (Kight, 2004) constitutes an essential compass for senior international officers in their understanding of the internationalization of higher education. This understanding better aligns with the definition of internationalization mentioned by Heleta and Chasi (2023) according to which "internationalization of higher education is a critical and comparative process of the study of the world and its complexities, past and present inequalities and injustices and possibilities for more equitable and just future for all" (p.269).

Furthermore, the senior international officers at regional comprehensive universities understand internationalization as a tool to develop intercultural competence in students, faculty, and staff. An internationalized university allows individuals from diverse backgrounds to interact and learn from one another. The issues of hate, racism xenophobia, are sometimes the result of ignorance about other cultures. When people are exposed and have the opportunity to interact with individuals from different backgrounds, that facilitates understanding and improves their cultural competencies. The understanding of internationalization as a tool to develop intercultural competence is consistent with the definitions provided by Beelen and Jones (2015) and by Knight (2004).

To sum up, just as the concept of internationalization itself, the senior international officers' understanding of the phenomenon is not static. It evolves over time as they gain more experience in the field and as the world changes. From a reductive perception of the phenomenon, as student mobility, mainly study abroad in an American perspective, internationalization is now perceived by

senior international officers at regional comprehensive universities as a way to equip global citizen leaders with tools and resources to tackle the world's issues.

2. Conclusion

Given the multiple definitions and disagreements about the concept of internationalization, I propose that the phenomenon should always be contextualized. Countries have different educational systems with diverging purposes. Even within the same country – the United States, for instance, – different higher education institution types have different ways of doing internationalization. The realities of a research university are very different from those of a regional comprehensive university or a community college. As such, any attempt to provide a universal definition to the concept of higher education internationalization will simply be in vain. It seems vital for scholars and practitioners to pause and reflect on contextual internationalization and focus more on the type of citizens institutions of higher education seek to develop when they engage in internationalization. In the same vein, de Wit (2024) concluded that "rather than seeking to re-define, we should strive to describe new directions for internationalization, based on clear rationales and outcomes' (p.10).

Based on the input provided by SIOs at regional comprehensive universities, I propose that the internationalization of regional comprehensive universities should consist in developing global citizen leaders through teaching, research, and exposure to diverse cultures. Such global citizen leaders have general knowledge of world geography, history, and economy. They are inspired by their knowledge of the world to address challenges in their immediate environment and globally.

Future research should investigate SIOs' perception of internationalization at research universities and community colleges with an attempt to identify the type of citizen their institutions seek to train when they engage in internationalization efforts. Although SIOs are considered middle leaders, they are those who usually persuade senior leaders on the direction their institutions should take when it comes to internationalization. Finally, internationalization must always be contextualized. Future research should, therefore, be specific on the type of institutions at stake and world regions or specific countries.

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Corporate Social Responsibility and Firm's Performance of listed companies of Nepal

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ABSTRACT

The purpose of this study is to examine the relationship and impact between CSR activitities and firm's performance. This study is based on both quantitative and qualitative data. The quantitative approach was employed using published materials and a structured questionnaire through primary data collection for both the companies executives and the beneficiary institutions. Out of 162 questionnaires distributed, 127 usable questionnaires were used from companies executives and 400 questionnaires were from the beneficiary institutions. On the otherhand, the qualitative method was used through personal face-to-face semi-structured interviews with representatives of categorised seven participant companies. The findings show that out of eight research queries, from two divisions: financial performances and strategic decisions, six have significantly confirmed firm's positive performance. At the same time, customer and environmental relations appeared insignificant. The results show divergence from previous findings, especially in the context of Nepal by accepting a significant relationship between the community and firm's performance.This outcome confirms that the amount spent on CSR is poised to prove an investment instead of an expenditure. Equally, the beneficiary institution satisfaction can be achieved through adaptations in beneficiary good relations, which eventually leads to firm performance.

Keywords: Corporate Social Responsibility, firm's performance, beneficiary institutions, Nepal.

1. Introduction

Corporate Social Responsibility (CSR) is the process by which organizations manage their operations to have a beneficial overall influence on society through economic, environmental, and social initiatives. It has visually perceived lots of development in both academia and industry around the globe (Carroll & Shabana, 2010). Companies cannot exist in isolation; they are the component of the society in which they operate. So, in achieving their goals, they have to take care of their

impact on society and the environment (Ivanovic-Djukic & Lepojevic, 2015). Corporate social responsibility generally refers to the policies adopted by companies to perform their business in a way that is ethical to the government, amicable to society, and favorable to the community (Ismail, 2009). The stakeholder's theory (Freeman, 1984) accentuates the two constructs of a firm's performance: financial and strategic. While investors look for ways to be satisfied, financial performance is one of them (Chakravarthy, 1986; Shammari-AI et al., 2022), measured in profitability, growth, and market value (Cho & Pucik, 2005). At the same time, strategic performance is the process of ascertaining the long-term adaptation of a firm from its environment. It is also expressed in terms of employees, governments, and community satisfaction (Chakravarthy, 1986).

In spite of the overflow of CSR rehearsals in business around the world, it has quite recently gone into the conversation in Nepal (Adhikari et al., 2016). Since 2017, Nepal's government has mandated CSR for registered business firms and financial institutions. Business isn't just for acquiring benefits; it's also to find out the government's assistance to society by adding to social government assistance exercises. These days, the social qualities of organizations have decisively changed through CSR, and the organizations have involved it for its ability improvement purposes. Observable spending on CSR for their beneficiaries creates a significant influence on firm performance (Wang et al., 2021; Cherobon, 2014).

CSR is a way in business practices that ensures a company's long-term development. This success can materialize only through satisfied investors, loyal customers, committed employees, and the environment- amicable practices to favor the concept of win-win perspective. At times, companies exhibit utmost attention to CSR activities, but they are not clear on the relationship and the impact between CSR and overall performance in Nepal. In this backdrop, the proposed study is poised to strike the relationship and the impact between two in such a manner that it could really help all the stakeholders evolve policies that could makes CSR valuable for one and all.

2. Literature Review

2.1. Corporate Social Responsibility and Firm Performance

The concept of CSR is an emerging issue in Nepal; however, how the company recognized CSR activities was unclear. Good CSR practices firm can enhance the business image, which helps to improve organizational growth and profitability. CSR activities create a positive atmosphere for both the business and the society for the long term (Chaudhary, 2017). At the mandatory stage of CSR, social gravity and consumer clarifications were not strong (Chaudhary, 2017). Therefore CSR effectiveness is required up to the beneficiary level to test the firm's absolute performance. The relationship between CSR and a firm's performance has been performed using quantitative and qualitative methods. However, qualitative measurement is comparatively difficult to define (Semenova et al., 2010). From the empirical support, CSR has a significant positive impact on financial performance as return on assets (ROA), net profit (NP) (Harjoto & Jo, 2008; Walls et al.,

2012), and market price per share (MPS) (Ellis, 2010). Similarly, CSR has a positive influence on strategic relations too, that reduced business risk (Luo & Bhattacharya, 2009), improve brand image, customer loyalty, employee courage, and willingness to increase customer service, and cash flows (Lev et al., 2010; McWilliams & Siegel, 2011). Including a strong CSR reputation, firms can increase their market value compared to those poor CSR reputed firms (Peloza, 2006). Although the past research has found positive, negative, and neutral impacts from CSR and firm performance (Orlitzky et al., 2003), these findings support that the relationship was positive (Hill et al., 2007; Hull & Rothenberg, 2008; McWilliams & Siegel, 2011; Wood, 2010).

2.2. Theoretical Review

Theories are analytical tools for comprehending, explaining, and forecasting a specific subject (Gujarati & Porter, 2010). It provides the basic knowledge for establishing the objectives and hypothesis of the study. Corporate social responsibility is viewed as an agreement document between firms and the society towards which companies are expected to perform socially responsible without binding by acts (Woodward-Clydz, 1999). Regarding CSR, different theories have been developed. Related to the topic, this study is guiding based on (i) the Stakeholder's theory of CSR. It posits that associations ought to treat all partners impartially when working on their exhibition (Tilakasiri, 2012; Yin et al., 2013). Similarly, (ii) the Social contract theory of CSR, the company must behave in accordance with societal expectations and responsibilities. (Mwangi & Jerotich, 2013). and, (iii) Carroll's CSR pyramid model. It conceptualized the CSR as in pyramid form, which explains economic and legal, ethical and discretionary or philanthropic responsibilities (Carroll, 1991).

Corporate social obligation and firm execution have evoked a lot of vigor among the specialists toward the start of the required regulation time in non-industrial nations, including Nepal. The issue of whether CSR has an impact on a firm's performance is yet unanswered. Manifold number of studies concentrated on the relationship between CSR and financial performance worldwide (Khan et al., 2023; Nunn, 2015; Yang et al., 2010; Tsoutsoura, 2004; Abubakar, 2018). With regards to Nepal, there are restricted investigations that broadly investigate CSR drives, status, and effects. There is a shortfall of examination on CSR with firm execution and chiefs' insight in regards to their methodologies, execution, and rehearsing after the regulation. This study looked to break down CSR and firm execution from the perspective of policy execution level and the beneficiary communities to capture the emerging issues in Nepal. Different CSR models have been used in the studies. Some studies used Carroll's model (Chaudhary, 2017; Obeidat et al., 2016), while others have used stakeholders' (Judith, 2020; Oh et al., 2017; Adhikari et al., 2016). However, each model has its characteristics and is also deficient. In order to capture the multiple concerns of business operation, no single theory is sufficient. So, this study concentrated on the holistic view of CSR and operationalized it in six angles of stakeholders: shareholders, customers, employees, communities, environment, and the beneficiaries. Most of the empirical studies were based on quantitative (Resmi et al., 2018; Jiang et al., 2016), qualitative (Adhikari et al., 2016; Afsheen, 2015), and few of them

used both (Murtaza et al., 2014; Tilakasiri, 2012) methods. This investigation adopted quantitative and qualitative research designs based on the foundation of newly collected data. This research focused on the role of CSR and firm performance of the selected companies in terms of financial and strategic measurement in Nepal.

2.3. Research Framework
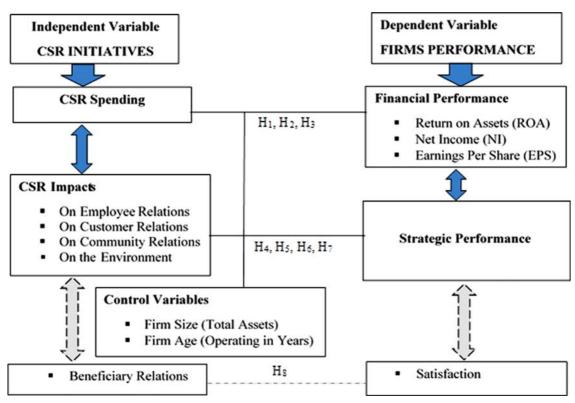
Figure 1 : Conceptual framework of CSR and Firm's Performance
Source: Developed by a researcher from various related studies, including Cherobon (2014)

This research framework focuses on CSR practices and its impact on firm's performance. Based on the literature, the researcher developed this framework of research (Figure 1) in which the study mainly adopted the data on CSR spending, CSR relations around employees, customers, community, environment, and several other possible beneficiaries and communities as independent variables. The firm size and firm age got recognized as control variables. Further, the firm s performance proxies and select strategic decisions were decided to be taken as dependent variables. Based on the theories, and the research framework, this hypotheses were proposed:

H$_1$: CSR spending has a significant effect on firm's performance i.e. return on assets (ROA).

H₂: CSR spending has a significant effect on firm's performance i.e. net income (NI).

H₃: CSR spending has a significant effect on firm's performance i.e. earnings per share (EPS).

H₄: Employee relations have a significant impact leading to the performance of the firms.

H₅: Customer relations have a significant impact leading to the performance of firms.

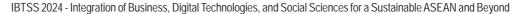**H₆:** Community relations have a significant impact leading to the performance of firms.

H₇: Environment activities have a significant impact leading to the performance of firms.

H₈: Beneficiary relations have a significant impact leading to the performance of firms.

3. Methodology

Mixed-methods research was applied to collect and analyze quantitative and qualitative data. The quantitative method was employed to identify the CSR utilization from accounting and market-based elements. For that, annual reports were collected from companies websites and analyzed. Moreover, two seperate sets of survey questionnaires were employed with the companies executives and the beneficiary institutions. Furthermore, the qualitative method was used to gain broader insight into the CSR phenomenon through semi-structured interviews. Furthermore, quantitative data were analyzed statistically, whereas qualitative data were analyzed through intensive and extensive content analysis.

The questionnaire was conducted using two methods; personal visit and email. There were a total of 127 samples collected out of active operating 162 listed compaies, all of which were eligible for data analysis (94 samples supported by docs.google.com; 33 samples collected using a paper-based method). For that, researcher used the company's websites to obtain the spokesperson's email and direct contact for administering the questionnaires. For beneficiaries, 20,313 institutions were registered in the Social Welfare Council (SWC) in the last 10 years (17 July 2010 to 16 July 2020). Out of them, 1000 respondents were selected by the stratified simple random technique that is proportionately distributed as per the list of the beneficiary institutions. From that, only 400 respondents answered to the questionnaire in usable form. So, total four hundred samples were gathered from beneficiary institutions and were trained for data analysis (169 samples were gathered from the personal visit; 231 from email, i.e., docs.google.com).This data has been collected using a staged approach to ensure the information in the right time. Before submitting the questionnaire, the researcher communicated with those 1000 respondents via phone calls and emails to encourage them to participate in the research.Then, the questionnaire link was sent via the bulk SMS scheme and email along with a cover letter. At the first contact, only a few of them took it seriously and responded through email. Multiple follow-up calls, sending reminder emails and SMS, and personal visits were required to get back the filled-out 400 questionnaire in a timely.

On the other hand, Individual, eye-to-eye, semi-organized interviews were conducted to capture the deeper information under investigation with representatives of seven participant companies out

of eight that the manufacturing and processing companies have not been included due to their unwillingness. Out of them, Hydropower Company's secretary was interviewed promptly. The interview typically lasted from 30 to 45 minutes, taken over a cup of tea or coffee. The Yes/No and Five-point Likert-type scale questionnaires were distributed to the companies executives and the beneficiary institutions to measure the respondent's attitude regarding CSR activities, i.e., 1 to 5 where 1 for strong disagreement, 2 for disagreement, 3 for neutrality, 4 for agreement, and 5 for strong agreement. In order to achieve the questionnaires content and construct validity, sample questionnaire carried with a group comprising quality experts, practitioners, and academics, like as the adoption of a questionnaire used in previous studies such as Chen (2015); Lee et al. (2015) Sweeney (2009), and Tilakasiri (2012). After addressing their comments and feedback, some modifications were made to the questionnaire. Similarly, the reliable test was executed by use of Cronbach's alpha. A pilot test was conducted using a random sample among 15 executives and 40 beneficiary communities from the targeted respondents. The Cronbach's alpha cut-off value of 0.7 and above is considered acceptable reliabilities in most social science research. However, some studies considered alpha 0.60 an acceptable value (Raihan & Karim, 2017).The respondents verbally consented with the executives and the institutions to the data collection before it began. All the collected data were manually checked for completeness and consistency. From that point onward, the gathered information was placed in MS Excel. IBM SPSS 25 and AMOS 26 version software for statistical analysis. Descriptive (frequency, mean, standard deviation, Shapiro-Wilk test) and Inferential (pearson correlation, multiple regression, confirmatory factor analysis) both statistics analysis were used for data analysis.

4. Analysis and Interpretation

Based on demographic composition the middle-aged, Brahmin caste, Hindu religion male was highly affiliated with the company in Nepal. Moreover, the company was retained highly educated employees in their organization for a long time. Similarly, In Nepal, the Hindu middle-aged man was handled as a registered beneficiary.

The p-value of both (firm's & beneficiary) relations of CSR by S-W test results indicate that the data are approximately normal by indicating p-value >0.05. Likewise, internal consistency reliability statistics of all constructs were obtained by calculating Cronbach's alpha which was found adequate (alpha value >0.7).

Correlation Analysis

Table 1 represents the Correlation between CSR spending and firm's financial performance. Result shows that CSR spending has highly positive correlation to net income (NI) (r=0.563, p-value<0.01), followed by return on assets (ROA) (r=0.136, p-value<0.01) and least by earning per share (EPS) (r=0.042, p-value<0.01). It means if the firm gives more attention to CSR spending in the same way NI, ROA, and EPS increase accordingly.

Table - 1: Correlation between CSR Spending and firm's financial performance

Variables	CSR Spending	ROA	NI	EPS
CSR Spending	1			
ROA	0.136	1		
NI	0.563**	0.240**	1	
EPS	0.042	0.371**	0.127	1

*** Correlation is significant at the 0.01 level (2-tailed)*
Source: Calculated from Secondary Data

Table 2 depits the relationship between overall csr activities and firms performance. In details, employees-related activities were highly positively correlated to firms performance ($r=0.469$, p-value<0.01). Likewise, Community-related CSR activities ($r=0.438$, p-value<0.01), Customers-related activities ($r=0.396$, p-value<0.01), and environment-related CSR activities were highly and positively correlated with firm performance ($r=0.388$, p-value<0.01).

Table - 2: Correlation between CSR activities and firm's strategic performance

Constructs	ER	Cus R	Com R	Env R	FP
ER	1				
Cus R	0.579**	1			
Com R	0.645**	0.562**	1		
Env R	0.641**	0.629**	0.799**	1	
FP	0.469**	0.396**	0.438**	0.388**	1

*** Correlation is significant at the 0.01 level (2-tailed).*

Multiple Regression Analysis

There is an positive relationship between CSR spending and a firm's financial performance (ROA, NI and EPS) in the context of selected companies in Nepal. It explained both the Model are Significant, i.e., F statistics p value is lower than 0.05, ($0.001<0.05$, & $0.003<0.05$), ($0.000<0.05$, & $0.000<0.05$) and ($0.024<0.05$, & $0.047<0.05$) respectively in both the situations, when the company's size and association's age are measurably controlled or not. But, in strategic performance, there is a positive relationship between CSR and employee relations, customer relations, community relations,

and environment activities only in Model 2 Significant when a firm's size and age are statistically controlled, i.e., F statistics p-value is lesser than 0.05, (p-value, 0.000<0.05). Similarly, beneficiary institutions explained the Model 1 is Significant, i.e., F statistics p-value is lesser than 0.05, (p-value, 0.000<0.05). Furthermore, the coefficient between the firm's strategic performance and each of the independent and control variables (employee relations, customer relations, community relations, and environmental activities) is shown in Table 3. Model 2's p-value column reveals that only two variables have a statistically significant impact on a company's strategic performance (p-value 0.05). The concern variables are CSR employee relations (CSR-EMR) and CSR community relations (CSR-COR) whose p-value are (0.001<0.05) and (0.029<0.05) with beta value 0.344 and 0.262 respectively. Moreover, CSR customer relations (CSR-CUR) have positive directions to firm performance, but CSR environment activities (CSR-ENA), and the controlled variable i.e firm age have negative directions to firm's performance. However, they all are statistically insignificant by indicating p-values (0.397>0.05), (0.618>0.05), and (0.112>0.05) respectively. Finally, there is a positive relationship between firms CSR activities and beneficiary institutions satisfaction in Nepal. It explained the Model are Significant, i.e., F statistics p value is lower than 0.05, (0.000<0.05). It suggests that the beneficiary institutions satisfaction is possible by the changes with beneficiary good relations which ultimately leading to the performance of firms.

Table - 3: Coefficients[a] table contribution of independent and control variables in explaining the variation in firms strategic performance

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	t	p-value
1 (Constant)	3.643	0.194	-	18.769	0.000
Firm Size					
Lower medium	0.232	0.243	0.124	0.953	0.343
Large	0.217	0.225	0.132	0.965	0.337
Firm Age	-0.005	0.005	-0.091	-0.949	0.345
2 (Constant)	0.880	0.460	-	1.914	0.058
Firm Size					
Lower medium	0.259	0.220	0.138	1.176	0.242
Large	0.243	0.195	0.147	1.247	0.215
Firm Age	-0.007	0.004	-0.134	-1.602	0.112
CSR-EMR	0.432	0.133	0.344	3.252	0.001
CSR-CUR	0.102	0.120	0.082	0.850	0.397
CSR-COR	0.312	0.141	0.262	2.207	0.029
CSR-ENA	-0.078	0.157	-0.067	-0.499	0.618

[a] *Dependent Variable: Firm Strategic Performance*

Confirmatory Factor Analysis (CFA)

Figure 2 display the factors that affecting the performance by firms CSR initiatives. As the rank from construct-wise, firm's overall performance was highly significant with community initiative ($\beta = 0.56$, p-value <0.001) followed by employees initiative ($\beta = 0.53$, p-value <0.001), environmental initiative ($\beta = 0.40$, p-value <0.001) and customers initiative ($\beta = 0.31$, p-value <0.001). The results showed that all statements have a factor loading of more than 0.30. It suggests that the statements correlated significantly to the factor itself when the factor loadings were ranging more than 0.30 (Hair et al., 2010) **Figure 2**.

Interview Findings

There was no single universally accepted definition of CSR among the respondents, but their understanding of CSR was similar. They were focused on their business practices involving initiations that benefited society. Companies prioritized employees safety as in the first corner. They had good welfare plans. They have given their employees plenty of opportunities to demonstrate expertise. Frequently, the company has consulted them on important issues. The company has implemented training and capacity development programs for employees. Likewise, all the firms have focused on customers as the central point of their business strategy. They develop and focused their CSR plan on their strategic action. They promise to care for all customer's services on their pre and post adapting of the process. They are committed to providing truthful information to their customers. They are trying to solve customer complaints as quickly as possible. Moreover, companies were highly involved in community CSR projects, youth support programs. Companies were concerned about their surroundings by conducting many environmental activities like plantation, noise protection, and pollution control. Companies were trying to develop green corporations. Finally, The government's mandatory CSR policy has given the company much social evidence to gain opportunities. Only one percent profit contribution policy did not seem scientific. Similarly, the companies were against provincial disclosure. It should be imposed in terms of business size, profile, and percentage of environmental destruction. In the end, they were optimistic and looked forward to timely policy reforms.

5. Discussion

There is a significant positive relationship between CSR spending and a company's financial performance (ROA, NI, and EPS) in both scenarios. These discoveries are predictable with a considerable number of past investigations (Amahalu, 2020; Mahmood et al., 2020; Syaduzzaman & Masud, 2019; Bagh et al., 2017; Chapagain, 2017; Arsoy et al., 2012). However, a few studies can be singled out that results into a neutral as well as contrary finding. Iqbal et al. (2012) and Resmi et al. (2018) have concluded that the return on assets (ROA) remained unaffected with CSR activities. Moreover, Selcuk and Kiymaz (2017) have found that CSR initiatives and firm performance (ROA) have a negative relationship. This study, however, does not find the result to
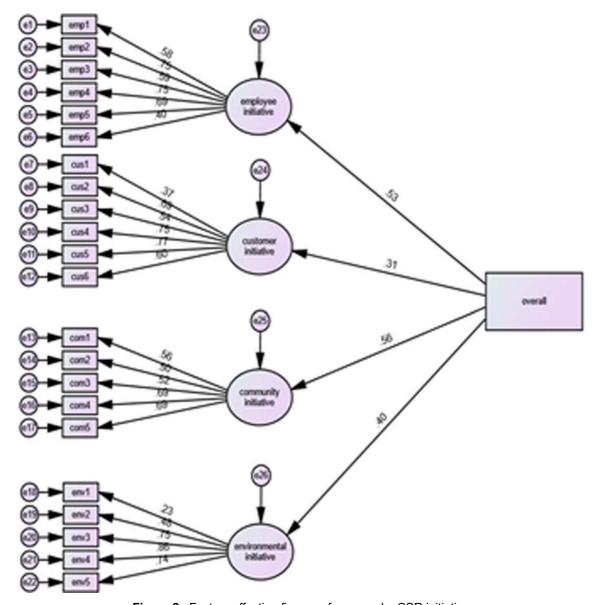
Figure 2 : Factors affecting firms performance by CSR initiative

be significant. This study's findings support the stakeholder's theory and social contract theory of CSR. Furthermore, it supports Carroll's CSR model. This model's economic responsibility focuses on the firm's profitability.

This study result declared a significant relationship between employee relations and firms performance in Nepal. This relationship is in support of previous studies, which also argued that the

relationship is significant (Dhanesh, 2014; Skudiene & Auruskeviciene, 2012). These findings of the study are compatible with the stakeholder's theory and Carroll's CSR model. This study found an insignificant positive relationship between customer relations and firms performance in Nepal, which contradicts the previous studies that stated the relationship is significant (Fu & Shen, 2015; Sweeney, 2009; Tilakasiri, 2012).

Nevertheless, previous studies have shown a negative relationship that CSR reduces customer satisfaction (Luo & Bhattacharya, 2006), and CSR does not play any prominent role in satisfying their customers (Lee & Heo, 2009). These findings of the study are not reliable with the stakeholder's CSR theory. Furthermore, these outcomes do not likely recommend Carroll's CSR model, which ethical responsibility focused beyond the law.

This study result exhibited a significant positive relationship between community relations on firms performance in Nepal. This relationship corresponds with previous studies (Bagh et al., 2017; Fu & Shen, 2015; Tilakasiri, 2012; Sweeney, 2009) that community-related CSR actions enhance firm performance. These findings are uniform with the stakeholder's theory of CSR. Moreover, it strengthens the social contract theories of CSR. Furthermore, it is reliable with the legal responsibilities of Carroll's CSR model, which explains that a firm has to build a social agreement between society and the business.

This study result found an insignificant negative association between environment activities and firms performance in Nepal. This outcome connects to a previous study that environmental cost negatively impacts firm's financial performance (Najihah et al., 2020). However, the other findings from earlier studies in different countries, present that the relationship is positively significant (Kuo et al., 2011; Chuang & Huang, 2018). These findings of the study are not constant with the stakeholder's CSR theory.

Finally, The study's result exhibited a significant positive relationship between firm's CSR initiatives and beneficiary institutions satisfaction in Nepal. Bhattacharya et. al. (2009) concluded that the beneficiaries of CSR initiatives continuously build strong connections with subscriber companies. This study are reliable with the stakeholder's theory and social contract theory of CSR. Moreover, it supports Carroll's CSR model.

6. Conclusion

This study showed that CSR spending and firm's financial performance connection are satisfactory in Nepal. In brief, corporate social responsibility is converting an expenditure on CSR into a firm's Investment. In this regard, the most common financial variables, return on assets (ROA), net income (NI), and earning per share (EPS), have found significantly positive relationship with the CSR expenditure. Another part of the findings showed that corporate social responsibility relations (employee, customer, community) and environment activities are also acceptable.

The study confined that firms CSR actions focused on community activities, followed by the employees, environment, and customers. The study revealed that employee relations ominously improve the performance of firms in Nepal. Another finding of the study is that customer relations have a positive and insignificant impact on the strategic performance of firms in Nepal. From the results, it can be said that Nepali companies have not significantly improved their performance from the activities of customer relations. Moreover, these results indicate that community relations significantly heighten the performance of firms, with the implication that the Nepali companies are significantly improving their performance from proper community relations. Similarly, environment relations have another outstanding result. It has a negative but insignificant impression on the firm's performance in Nepal. From this result, it can be said that Nepali companies are not competent in improving their firms performance by contributing to the environment. Finally, regarding the findings related to beneficiaries' relations, they are satisfied with firms CSR initiatives. It implies that Nepali companies can improve their performance from beneficiary institutional contributions.

7. Contributions

More importantly, this study contributes to stakeholder's theory in the context of Nepal by recognizing an additional variable, i.e., a significant relationship between community and firms performance. This variable was counted as not significant in the previous study (Chapagain, 2018). Moreover, this study has common acknowledgment towards Carroll's CSR Pyramid model to the previous study. The model concern on economic, legal, ethical, and philanthropic responsibilities of the firm. Out of four parameters, this study similarly confirmed in economic and philanthropic phases of firms performance but not in ethical and legal aspects (Adhikari et al., 2016).

8. Limitations and Future Research

This study is based only on the 127 firms listed in the Nepal stock exchange (NEPSE). As a result, the conclusions may not apply to all listed companies or the country as a whole. Those seven companies were selected among the listed categorized companies for the semi structured interview, based on their disclosed CSR contribution, i.e., expenses and activities in their annual reports or websites as per Nepal government directives. Only registered 400 beneficiaries were selected for this study. It is suggested that further study should be extended to cross-sections between companies, more extensive studies are needed to explore CSR and financial performance. To find out whether similar results would be reported or not. Therefore, it could be better to apply a longitudinal method to obtained more valid measurements using more variables and sample size. This study implicit registered beneficiaries only. Besides this, the future researcher can also take non-registered beneficiaries because both types of beneficiaries may be benefiting from the firm's CSR campaign.

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Addressing the Representation of Families in ESL Coursebooks with the Intention of Building a more Inclusive Classroom Community.

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ABSTRACT

This paper addresses the issue with the representation of families in English as a second language course books. The paper will demonstrate that these representations are almost exclusively heteronormative and will show that this causes problems for language learners whose families do not fit this structure. For the majority of schools, course books form the syllabuses they teach and the lack of inclusivity in the books can lead to feelings of alienation for students. The paper discusses the reasons why inclusivity is important in a classroom. It examines materials from a selection of General English course books and representative levels within the CEFR framework. Even cursory research shows that these books focus almost exclusively on the nuclear family which can alienate and exclude students who come from different backgrounds. The paper hopes to build on the excellent work that has been done concerning LGBTQI+ inclusivity in the classroom and to show that all forms of exclusion are detrimental to learners. The paper hopes to demonstrate that coursebooks used to create syllabuses in ESL classrooms need to embrace inclusivity in all forms.

Keywords: Diversity, Inclusivity, Families, ESL, Coursebooks, Heteronormativity, Education, Teaching, Student-focused, Representation.

Introduction

This article aims to address what inclusion means for the English language classroom and considers why it is important for both the learner and the instructor. It will focus on the lack of diversity in the depiction of families in course books. The course books which are commonly used in the ESL classroom appear to use families as a common cultural connection between the writer and the learner, but they fail to address the wide range of family structures that exist. The course books chosen for this study have been used in classrooms throughout the ASEAN region and beyond. The purpose of the article is to augment and expand the conversation about inclusivity in

ESL classrooms, to examine a number of these course books from a range of levels, and to offer some suggestions as to how to adapt the materials given to create a more inclusive classroom.

The crux of the issue lies with the reliance on course books in ESL curricula at almost every level. They form the basis of most private schools' teaching and are often part of the financial arrangements of the school. Thornbury (2013) confirms that coursebooks are the basis for ESL teaching worldwide but affirms that they are extremely problematic and inhibit language learning. The lack of diverse identities can lead learners to discriminate against students who do not conform to the stereotypes shown in the coursebooks (Bollas, 2020). Moving away from a dependence on course books could be a positive thing. For the present, however, they remain at the heart of most programmes.

Families depicted in ESL textbooks are almost exclusively nuclear and heteronormative. Heteronormative is defined by Cameron and Kulick (2003) as structures, institutions, relations and actions that promote and produce heterosexuality. Sunderland and McGlashan (2015) argue that the way the sexes are represented is important as representation protects the hegemony and acts to disempower women, girls and men who do not conform to masculine norms. Although changes are ongoing, women are generally depicted in domestic surroundings and men in public spaces (ibid). Gray (2013a) shows that there is a total avoidance of LGBTQ+ characters in ESL textbooks and there was no mention of sexuality even when well-known gay men, such as Oscar Wilde, were referenced.

Although the research for this article was rather cursory due to time constraints, the nuclear family in these books appears to be omnipresent. However, exceptions to the nuclear family are not new in real life and have existed in every century and culture. War, death from childbirth, and the prevalence of disease in previous centuries meant that the number of children with single parents or who were orphaned was likely to be as common as now, if not more so. A family structure can take many forms. Children can be raised by a single parent, grandparents, aunts, uncles, siblings, a village community, same-sex parents, care homes or foster care. The complexity of family structures should be embraced in the classroom to promote inclusivity.

Why is Inclusivity Important?

Inclusion means a sense of belonging to a group in which differences are acknowledged and embraced. In the classroom, inclusion creates a community where every student should have an equal voice and feel confident using it. The outcome of this sense of community is a positive learning environment. Cynthia Nelson (1999) demonstrates that inclusivity promotes active participation by all, which is surely the aim of a lesson. Extensive work has been done on the development of inclusive practices in terms of gender, sexual identity, and race, and I have relied heavily on the work of Gray (2013b), Bollas (2020), and Dennis (2016) who have been important voices in these areas. Another reason that an inclusive classroom is essential is that it allows all

members of the class to feel that their opinions and experiences are as valid as those of their classmates. It also allows all students to understand the lived experience of others which creates a more empathetic classroom community. Roberts and Cooke (2009) show that authentic materials give the learner an authentic voice. Allowing for self-expression through speaking and writing are key activities in any language-learning classroom. It is essential that students are given the linguistic tools to express themselves and to share their ideas, and this includes describing their own unique family situations, not just the vocabulary of a heteronormative family.

When it comes to representation in the classroom and the materials used, some exclusions are clearly more significant than others. To be excluded from the classroom community in terms of race, gender or sexuality could mean that a student feels excluded completely from that class. They may feel that their voice and experiences are rarely addressed. The failure to address family structures that are non-nuclear could be described as a micro-exclusion. The student may feel alienated from the classroom community for just one lesson or a series of classes. However, the sheer pervasiveness of the heteronormative nuclear family in ESL textbooks could be overwhelming for those whose family structure does not fit the suggested norm. The fact that there are a huge variety of family structures means that narrowing the dialogue to heteronormative nuclear families has the potential to exclude so many students.

There were very few examples of families that didn't match the standard nuclear family in the textbooks that I studied. When there were families that appeared non-nuclear, these were ambiguous and not clearly defined as such. For example, in *American English File 1* (Latham-Koenig, Oxenden & Seligson, 2013 p.112) there is a writing exercise called *'My Favorite Day'* where Cristina writes that she has lunch with her mother and brother. Do we read from this that she has no father? Or do we understand that there is a father, but he is unable to attend the lunch? The question is whether this can be considered an example of a non-nuclear family.

The representation of families in ESL coursebooks needs to embrace the wide range of family structures that might be present in a classroom to make that classroom inclusive. When trying to sell a set of coursebooks, publishers need to bring a number of commercial interests into the equation. While traditional depictions may seem the safest and most profitable content in the books, creating text that is more contemporary and diverse could increase the appeal of the books. Gray (2013b) indicates that changes to coursebooks are beginning to show women in a less sexist manner. He shows that depictions of people of colour and those with disabilities are beginning to be shown less stereotypically. Paiz (2015) links the resources in the textbooks to the student's ability to define their own identities. If the purpose of a textbook is to promote English language learning, then that book should also connect to the learners' experience. As early as the 1990s, Apple (1992) raised the argument that the school curriculum is not neutral but reflects the power struggles of class, race, gender, and religion. The coursebooks studied in the ESL classroom often reflect a more conservative viewpoint and present a traditional view of British and American culture that is idealised.
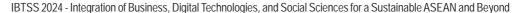
This normalises the idea of a nuclear family and can leave the learner lost as to how to express their own circumstances in the language they are learning.

English course books are often written for students who wish to travel to or work in an English-speaking country. The concept that learners study English to engage with the culture of the United Kingdom or that of the U.S.A. has lost traction (Bollas, 2020). The depiction of conservative heteronormative families is propaganda for conservative ideas of the culture of English-speaking countries. This culture has a basis in Christian religious values. This is true more deeply in the U.S. than in the U.K. or Australia but is still a core principle of conservative ideologies in these countries. However, English has become the lingua franca of international business and politics. Therefore, for most students, the reason for learning English has little to do with the culture of its countries of origin. Commercially speaking, the cultural ideals presented in ESL books have little appeal for the contemporary second language learner.

Publishers of course books have struggled to keep pace with modern trends in second language learning. Coursebooks are often updated to new editions, perhaps with newer pop groups or TV shows replacing the older ones, to make the content seem more relevant to the next generation of learners. However, they are rarely fully restructured. Modern social media platforms mean that fashion changes far more quickly than previously. Content featuring cultural icons that were popular while the book was being written has become dated and lost its cultural relevance even before the book was published. Renewing individual texts within the course books does not address the fact that the content misses the motivation of the learner. New books are needed with a focus on international topics, the myriad of international cultures that learners will meet, and which acknowledge the broad range of reasons why the learner is studying English.

How can language be made inclusive?

Just as non-heteronormative family structures are not a new concept, there are precedents for English language texts becoming more inclusive. English is constantly evolving and changing to adapt to new technological or social ideas. Adapting to new vocabulary and new concepts takes a little time, but soon becomes second nature. Looking back at texts from the early to middle twentieth century, masculine nouns and pronouns are almost exclusively used to describe both sexes. The term 'man' is used to encompass all homo sapiens, and 'he' is used as a purportedly gender-neutral word. This practice has disappeared in academic literature, and this illustrates that language can adapt and become more inclusive.

In the 1970s, Feminist theorists illustrated the importance of language in creating social norms and gender inequality. Kramer (1978) questioned whether men and women use language in different ways. The use of the generic 'he' was pervasive in literature produced until the late twentieth century. Stanley (1978) shows that the nouns child, student, youth and writer were all replaced by 'he' in grammar books produced at the time. This led to the women being excluded from discourses

on language and learning. This was reflected in the exclusion of women from higher education for most of the first half of the twentieth century. An examination of their work shows how far language use has come since the 1970s. The generic use of 'he' has all but disappeared from use, and the use of the word 'man' to describe humanity is no longer in common useage.

Some may argue that the language used in course books is not intended to exclude people, however, non-inclusive language use results in inequality. Stanley (1978) argues that the use of 'he', 'man', and 'mankind' was not generic, but used with an educated male reader as the intended audience. She suggests that the idea of these and other masculine terms only became fixedly generic in the twentieth century with the rise of women's education. The inflexibility of some to change the accepted writing structures is not based on the reality of the way that language develops and modifies over time. An academic who tried to use 'mankind' or 'man' generically in the twenty-first century would be considered sexist and out of touch with modern thinking.

Another example of how English has adapted to become more inclusive is how language has become less racist in the classroom. English coursebooks have begun to show a greater diversity of ethnicities both in the content and pictorial illustrations. There are words in English that were used to describe non-white ethnicities that would never be used in the classroom anymore. English is constantly advancing as societal changes occur.

How ESL Course Books Portray Families and How This Can Be Adapted.

The books selected are as follows: *Success Beginner* (McKinlay & Parsons, 2008) aimed at A1 learners, *American English File 1* 2nd edition (Latham-Koenig, Oxenden & Seligson,2013) aimed at A1/2 learners, *Cutting Edge Elementary* 3rd Edition (Cunningham, Moor & Crace, 2013) aimed at A2 learners, *Headway Intermediate* 5th Edition (Soars, Soars & Hancock, 2018) aimed at B1 learners, *Speakout Upper-Intermediate* 2nd Edition (Eales & Oakes, 2015) aimed at B2 learners, and *English File Advanced* 3rd Edition (Latham-Koenig, Oxenden & Lambert, 2015) aimed at C1/C2 learners.

It is not the intention of the author to single these textbooks out for criticism nor to suggest that the books have failed in some way. The books were selected from titles that I have used successfully in ESL classrooms, and all of them have been useful in developing a structured course. They are among the most commonly used general English books and they are popular for a reason. I chose the levels at random according to my own library and the books available in the university's library. I worked my way through each book noting when families were referenced. This is in no way intended to be seen as comprehensive or encompassing research. The following represents a selection of these lessons, and I will introduce a few ideas for adapting the materials. The materials will be divided according to skills: vocabulary, speaking and writing, and reading and listening.

Firstly, the materials related to vocabulary will be considered. Family vocabulary is introduced early and at the A1/A2 levels. This reinforces its importance and links the vocabulary of the family

to the student's own identity. A learner quickly acquires the language to describe a heteronormative nuclear family. In Unit Three of *Success Beginner* (McKinlay & Parsons, 2008), family vocabulary is introduced using a short reading about a fictional actress. The grammar point illustrated is possessives. She describes her family and her husband's family, both of which appear to be nuclear. *Cutting Edge Elementary* (Cunningham, Moor & Crace, 2013) follows an almost identical structure in Unit Two, also to demonstrate possessives. *American English File 1 (*Latham-Koenig, Oxenden & Seligson, 2013) is used for the same grammar point but this time has pictures of celebrities and one other person connected to them. Though the families are not obviously nuclear, there is no clear reference to a non-nuclear family either.

Following the materials in the book, the scope of the vocabulary could be broadened by introducing an alternative family tree. I often use my own family which would introduce the students to the concepts and vocabulary of divorce and stepparents. In many cultures, divorce still has a stigma attached to it and this can open the discussion. When trying this activity out in class I often found that there were a range of responses from expressions of sympathy for my upbringing, to curiosity about my family. Rather than asking the students to produce their own family trees, which could lead to feelings of exclusion and embarrassment for students whose own family structures do not fit the model given in the book, I would suggest using fictional characters. Superheroes are currently trendy and work well. For example, Wonder Woman grew up on an all-female island and was raised by her mother and aunts, and Spiderman was an orphan raised by his aunt and uncle. Any fictional characters would work provided a range of family structures are modelled. While working in Cambodia for the past decade, there has been a noticeable cultural shift. When I first began to teach here in 2011, Khmer students were often unaware of cultures from outside of Cambodia and found it hard to recognise characters from Western culture. However, Western cultural icons from films are much more widely recognized now. The use of superheroes in this activity has been almost universally greeted with enthusiasm in the past few years. The only students who may struggle to recognise the characters are from the older generation and these are rarely students in the classes that I teach.

Books aimed at levels B1 and above assume that the learners have already acquired basic family vocabulary, and these books often focus on adjectives of personality instead. These are not so relevant to the discussion here.

The next language skills that will be considered are speaking and writing. These have been grouped together because one activity often follows the other and they are closely connected. For books aimed at A1-A2 learners, speaking usually follows the vocabulary and grammar. Students are asked to describe their families. Using the fictional family tree of the superhero takes the focus away from the nuclear family and removes any awkwardness that students may feel if their family does not fit the given structure. Extra branches can be added to the tree to expand the trees using the students' imaginations. This can also help with the development of critical thinking skills. This

activity can be a little frustrating if students have not been encouraged to use imagination in class previously. However, it is still a useful exercise as the more frequently students are asked to do this, the more comfortable they become.

In *Headway Intermediate* Unit 1 (Soars, Soars & Hancock, 2018) there is a listening exercise where people describe the closest member of their family. Learners are then invited to describe their own closest relative in the speaking exercise. The students could be asked instead to describe the adult that they feel closest to or to describe a best friend. This will still follow the model given in the listening and allow the student to practice the vocabulary. Simply changing the focus away from family can open the discussion to more interesting characters as well as create a more inclusive classroom.

English File Advanced (Latham-Koenig, Oxenden & Lambert, 2015) in Unit 1 Colloquial English, students are asked to answer quite complex questions around the theme of family. With C1 and C2 learners, it should be possible to open a deep discussion of the kinds of family structures the people may have. This need not be aimed at the personal experience of the students in the class but invite the students to think critically about the possibilities. Changing the subject of the questions from 'you' to a less specific pronoun can widen the debate. For example, rather than asking 'Would you like to work with your parents or with your siblings?' (Ibid, p13), change the focus by asking 'Is it better to work with people you already know or with people who are strangers?'.

Writing exercises often follow a similar pattern, and students are asked to write up the ideas that they have used in speaking exercises. Removing the focus from their own family has the added benefit of allowing students to practice third-person subject/verb agreement which can be an area of difficulty for many students. In both speaking and writing, it is essential that students are given the vocabulary to allow them to produce the language needed to describe their own families. This is particularly necessary for speaking tests, where it is often the first question. Whilst in class, there may be a reluctance to personalize their family structure, whereas in a one-to-one situation a student may feel less embarrassed about revealing their family structure. Giving students the necessary linguistic tools will increase their chances of performing successfully in a speaking test.

Turning to the receptive skills of reading and listening, a similar set of adaptations can be made to the materials used. Prediction is particularly useful for guiding students through a task, but, once again, a focus on developing the imagination can build greater critical thinking skills. The simplest way to adapt the materials is often to take the title and any illustrations out of context and ask students to predict what the reading or listening might be about. In *Success Beginner* Unit One (McKinlay & Parsons, 2008), the initial reading about Victoria and her family could be made far more interesting by asking to predict who the people in the pictures are. Although the reading explains it is a nuclear family, the students may predict far more interesting characters. *American English File 1*(Latham-Koenig, Oxenden & Seligson, 2013) does not have pure reading tasks until later units. In Unit Seven, there is a reading where the upbringing of famous people is described.

These are people that few students in Southeast Asia would have heard of. The childhood of Marilyn Monroe is unnecessarily sanitized. It is described as hard because she had a sick mother and a father who was often absent. In reality, Monroe grew up in foster homes and orphanages. This is an ideal opportunity to introduce the subject of non-nuclear families. Monroe's childhood has far more cultural crossover for Khmer students whose parents and grandparents suffered during the genocide of the 1970s, or Vietnamese students who were involved in the American War. *Headway Intermediate* (Soars, Soars & Hancock, 2018) has a reading about the Angulo brothers in Unit One. Though their family is nuclear, there are sinister overtones as their father imprisoned them in their home. There could be a discussion about the different aspects to families, not all of which are secure and happy.

As with reading, prediction plays a key role in listening exercises. *Success Beginner* (McKinlay & Parsons, 2008) has an exercise in Unit Eight. In this unit, Tim is talking to his parents on the telephone and telling them what is happening in the house. There is a large and colourful picture of the rooms in the house which could be given to the students to predict what is occurring in each room. Encouraging imagination and creating more unlikely scenarios helps to develop critical thinking skills. In *American English File 1* (Latham-Koenig, Oxenden & Seligson, 2013) there are four pictures of a family travelling by car. The listening text describes a traditional family with the father driving, the mother in the front passenger seat, and the children in the back. This has been excellent in class for creating imaginative stories as the pictures show the car travelling along a dark, isolated road. Students have predicted scenarios where the man is a taxi driver and the woman and children are escaping a family member, or the adults are kidnapping the children. The stories that have come from the imagination of the students often contrast with the rather bland listening that follows their predictions. However, these stories can be used in follow-up activities as role-plays or writing practice.

How easy is it to move the language of families in a more inclusive direction?

The concept of the heteronormative family is deeply indoctrinated in both culture and religion. Conservative thinking recoils from the idea of non-traditional family structures and equates these families with the breakdown of society. For example, Howell (2015), in her dissertation, links single-parent families and crime. In this work she refers to single-parent families as 'broken' and the children are born 'out of wedlock'. Such emotive language lays most of the blame for criminal activity on the single-parent family structure. The Guardian (2024) reported that the Turkish president, Erdogan, described the Eurovision Song Contest as a threat to traditional family structures and values. This was believed to be a reaction to the non-binary winner of the contest. Mahdawi (2024) shows that Harrison Butker's misogynistic commencement speech is an indication that work still needs to be done to change ideas of how family structures are perceived.

When you close your eyes and picture a family do you see your own family or a generic traditional family? If we are programmed not to consider our own family as a family, then we

should consider this a societal failure. Everyone's experience and upbringing should be of equal value, and the materials provided should reflect this ideology. Families should be acknowledged as the complex, imperfect structures that they are for everyone. A heteronormative family structure throughout one's entire family is likely to be rare.

English is one of the easier languages in which to assimilate inclusivity. Unlike the Latin-based languages, objects are not gendered. The French government has legislated against inclusive neologisms such as *iel* (Jones, 2023). The same article (ibid) shows that there are efforts in the German language where an asterisk is added in the middle of the word to make it both masculine and feminine. Most nouns are gender-neutral in English, including the word 'family'. The fact that English does not have gendered nouns for objects makes it easier for learners to disassociate gender from the concept of family.

If language is an easy barrier to overcome in course books, then images can be equally easy to confront. It is said that a picture paints a thousand words, and a search of the internet can produce a range of illustrations of diverse family structures which can be used in place of the ones in the course book. These can generate a productive discussion of family structures and what family means to students in the class. The use of images is a useful tool for the language teacher and language is not required to interpret the image. Images form the basis for many lessons, particularly at lower levels. Finding more appropriate, inclusive, and diverse images will connect students to the language aim of the lesson and give them the tools to speak about their own family structure. They may wish to search the internet for images that match their ideas.

All in all, it is not difficult for English language lessons to be more inclusive. It requires the instructor to pause and give thought to the words that they use. The careful choice of words is something that teachers should be doing during their lessons habitually.

Moving away from Coursebooks.

It is common practice to use coursebooks as the basis for all courses in both private language schools and English courses taught in secondary schools, as well as in higher education. It is easy to base a curriculum around a course book, which moves through all of the levels in an orderly fashion. However, the rigidity of the structure makes it difficult for a teacher to address the specific needs of the class. The need to finish x number of units by the end of the term means that can be difficult to add sessions covering additional language points. Once course books cease to form the basis of the curriculum, it is easier to collate materials from different sources. This allows the teacher to explore diverse topics that may be more relatable to the culture of the students.

The culture and diversity of the students in the classroom must be addressed by the teacher in the lessons in order to allow the students to feel comfortable and welcomed in the classroom. Coursebooks rarely meet this requirement as they are offered globally with materials that are bland enough to work in all cultures. As illustrated by Curran (2003), the culture, and by default, the

diversity of the students in a classroom, is something that a teacher needs to educate themselves about. Awareness of the etiquette, the principles, and the traditions of the students in the class is surely essential for any teacher. A coursebook that ignores the protocols of the classroom community is detrimental to the learning process.

The internet offers an enormous wealth of resources that can be used as more than mere supplements to the course book. Books that focus on a specific skill, such as writing, are far more useful for students who generally need essay writing skills, rather than the more general writing tasks given in course books. The needs of the learner can be met with a range of materials rather than focusing only on a generic course book. Young learners can enjoy coursebooks, but students who are focused on learning for IELTS, TOEFL, or hope to study academically in English need to build skills found in longer texts and targeted writing skills. A two-minute-long listening text will not prepare students who may need to listen to hour-long lectures. The listening requirements of a future university student need to be built from an early stage in their language learning.

Going through a TEFL training course, minimizing 'Teacher Talk Time' (TTT) is a focus. A new teacher is trained to hand over the speaking time to the students to encourage second language use. This makes sense, as the student needs to build their confidence in using the second language. However, this strategy is impeded when the students are asked to talk about topics or situations that do not connect with their own experience. Moving away from the topics presented in course books allows the teacher free-rein to discuss current trends or areas that students express an interest in.

Conclusion.

To sum up, building an inclusive classroom community is beneficial for both students and teachers. It promotes a more positive learning environment and encourages active participation in class. A focus which solely targets the heteronormative nuclear family as a model for lessons excludes students who may have different family structures. It is crucial for the students' linguistic progress, that they be given all of the tools that they need to describe their own life experiences. The discussion of multiple possible family structures creates greater empathy within the classroom community. Fairly simple adaptations can be made to the materials in general English course books, and these can improve the materials in terms of creativity and in building critical thinking skills. However, a more successful approach would be to move away from using course books as a core component for ESL learning. Books will always be key to English language learning, but using books as supplementary materials would create more meaningful lessons. Books that use grammar, reading, and writing as a single focus contain more useful materials for the learner. They are less likely to become irrelevant after publication and they allow the teacher to be selective. Therefore, although this essay has offered ideas for adapting the materials in ESL coursebooks, the long-term aim as the teacher gains experience and develops professionally should be to move away from these core texts entirely. Building a database of varied texts that focus on the skills the students need for their

studies should be every teacher's aim. Working with the students towards their language learning goals should be the teacher's focus.

The limitations of this research are most evident in the range of course books examined. The research conducted here has been far from extensive due to time constraints and I intend to conduct further and more in-depth research in the future to make up for any shortcomings contained in this article. The course books selected are popular and successful books that have been reprinted and rereleased in multiple editions and it is not the intention of the article to suggest that these books are below standard in any way.

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Competitiveness of Local Industries: Sustainable Value-Based Procurement in The Implementation of Local Product Use Policy in Indonesia

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ABSTRACT

Social value is one of the aspects of sustainable public procurement. Social Value-based procurement is a procurement paradigm that encourages the achievement of long-term sustainable value in public procurement. This research explores the long-term procurement values of Indonesia's local product utilization policy in public procurement, the barriers to achieving them, and proposed solutions to overcome them. The research is a qualitative study that combines literature review, interviews, and Focus Group Discussions (FGD). Interviews and FGD were conducted with procurement actors from procurement units of government agencies representing the lowest, medium, and highest local product use implementation achievements. This research maps the value that should be received by users, procurers/public buyers, suppliers, and society. The barriers to implementation identified were the uncompetitive price and quality of local products. This research also formulated a proposal for collaboration between various parties to encourage local industry competitiveness and presented some examples of collaborative procurement best practices that have been carried out.

Keywords: Value-Based; Procurement; Local Product; Policy; Social Sustainability.

1. Introduction

A critical aspect of sustainable procurement involves deliberately using products sourced from local industries (Islam & Siwar, 2013; Pudjijono et al., 2022). This approach bolsters the local economy and addresses sustainable procurement's social and economic dimensions. Furthermore, utilizing products from local industries is anticipated to yield long-term sustainable value. This emphasis on sustainable value creation in public procurement aligns with the value-based procurement paradigm (Dumond, 1996; Malacina et al., 2022; Meehan et al., 2017; Prada, 2016a, 2016b; Provines, 2017; Rahmani et al., n.d., 2021).

The adoption of policies regarding the utilization of local product in public procurement has been implemented by various nations, including Indonesia (Awuzie & McDermott, 2019; Esteves & Barclay, 2011, 2012; Ettmayr & Lloyd, 2017; Hansen, 2020; Islam & Siwar, 2013; Kazzazi & Nouri, 2012; D. Olawuyi, 2017; D. S. Olawuyi, 2019; Ovadia, 2012; Romadiyanti et al., 2024; Warner, 2017). This study explores the creation of perceived sustainable value, the obstacles to its attainment, and potential solutions. The policy examined in this research pertains to using locally-produced items in government procurement, emphasizing the inclusion of local content in the goods or services acquired.

Sustainable value in public procurement is expected to reach at least users, buyers, and suppliers (Malacina et al., 2022). Sustainable value beyond the procurement process is also expected to reach the surrounding society. This research seeks to explore this through a literature review and interviews with representatives of procurement actors in Indonesia to investigate the scope of the growing and evolving value of implementing a policy on the use of local products.

Value-based procurement in its implementation also found several obstacles (Lefers, 2023; Malacina et al., 2022; Uyarra et al., 2014). The most common obstacle is related to the habits or culture of procurement organizations needing to become more accustomed to value-creating innovations (Lefers, 2023; Meehan et al., 2017; Verwey et al., 2015). Furthermore, this research also seeks to investigate the barriers to long-term value creation of procurement in using local products in Indonesia and propose solutions. Focus Group Discussions (FGD) and literature reviews explored the barriers and proposed solutions.

2. Methodology

This qualitative study uses three data collection methods: literature review, interviews, and focus group discussions. First, the research investigated the values that are believed to be gained by implementing the use of local products in public procurement through a literature review and interviews. Literature reviews and interviews were conducted in this first phase of the research. After the expected values were identified, the research continued to investigate the implementation of the policy on the use of domestic products that may hinder the creation of the expected long-term values. These barriers were investigated through Focus Group Discussion activities. Focus

Group Discussion activities were conducted by researchers with stakeholder representatives and procurement actors as informants.
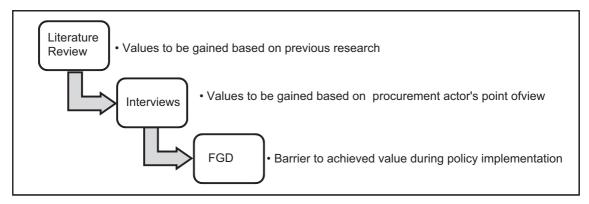

Figure 1 : Research Stages

Literature Review Stage

This stage was conducted to identify the value expected to b e achieved in public procurement with the implementation of the policy on the use of local products. Several relevant opinions and articles were summarized in this research. The results of the literature review were then juxtaposed with the results of the interviews conducted at a later stage in Findings. The retrieval of articles for the literature review did not use a systematic approach. By entering the keywords "value," "public procurement," and "using local product policy in public procurement," this research found several articles that discussed the value expected to be achieved in public procurement and the use of local products in public procurement.

Interviews Stage

Interviews were conducted to identify the value expected to be achieved in the implementation of the policy on the use of local products in public procurement from the perspective of procurement actors. The identification of expected values was done by asking about the expected benefits of implementing this policy. A total of 9 (nine) resource persons were interviewed regarding the benefits of implementing a policy on the use of local products in public procurement. The interviewees are representatives based on the assignment of 3 (three) agencies that represent the lowest, middle, and highest achievements of implementing local products. Values were identified by grouping the interviewees' statements about the expected benefits of implementing local product use policies and then matching them with the expected long-term procurement values.

Focus Group Discussion (FGD) Stage

FGDs in this study were conducted to find out the barriers to achieving the procurement value that had been identified. The informants comprised 9 (nine) individuals: three representatives of the

Indonesian National Procurement Agency, one of the Ministry of Industry, four procurement actors, and one academic procurement expert. This FGD activity also captured suggestions for improvement supported by a literature review. FGD activities discuss barriers to policy implementation that can affect the achievement of value. Based on the obstacles found, researchers then reviewed several proposed solutions based on some of the literature found. Researchers also tried to identify best practices based on the proposed solutions submitted.

3. Findings

Sustainable Value of Domestic Product Utilization Policy Implementation

Before proceeding to the research results, we will discuss some expert opinions and research results related to the values that can be achieved by implementing local products in public procurement. In their research, Malacina et al. (2022) captured some values that users, buyers, and suppliers expect in public procurement. Users expect to get the values of product/service availability, product/service quality, and environmental and social sustainability. The values expected by buyers are the creation and promotion of innovation, a well-functioning supplier market, the effectiveness of the public procurement process, and sustainable public procurement. Furthermore, the value expected to be obtained by suppliers is increased supplier innovation, new and better market opportunities, better operating capabilities, and improved sustainable performance.

Implementing local products in procurement from an industrial perspective is expected to create competitive national industries and sustainable jobs (Warner, 2017). Both are difficult to achieve, requiring appropriate policies, strategies, and management in public procurement and industrial development. The role of government policy is vital in achieving industrial competitiveness, including requiring local products in public procurement (Lall, 2003).

In sustainable procurement, using local products in public procurement is also expected to achieve a local green economy (Nijaki & Worrel, 2012). Sustainable local economic procurement is an effort to develop the local economy by combining efforts to buy local products with a focus on environmental sustainability. Sustainable procurement has three key aspects: social, economic, and environmental.

Furthermore, public procurement is also expected to have a social impact on society (Gidigah et al., 2021). Social value benefits are expected to be obtained by individuals and society from public procurement in the form of fundamental benefits from social, economic, and environmental aspects (Burke & King, 2015; Gidigah et al., 2021). Based on some of the explanations above, we can draw a common thread that the fundamental value expected to be received by users, buyers, suppliers, and the society must fulfill social, economic, and environmental aspects.

Interviews with procurement actors followed this research to identify the value expected to be gained by implementing local products in public procurement. The researcher grouped the statements of benefits and expectations to be achieved by implementing the local product use policy into value

themes. Furthermore, the value themes were grouped according to the parties expected to receive the value.

First is the value expected to be received by users; in general, what is expected is quality goods or services according to the needs conveyed by all interviewees. One of the interviewees said that low-quality products result in unmet needs or even users are reluctant to use the goods or services procured. Procurement results that meet the needs and have good quality support users' performance and public services. However, from the interview results, there were no expectations or benefits related to the impact on the environment from the implementation. This result shows that the implementation of procurement with local products has yet to be integrated with policies related to sustainable procurement, which have also been echoed in Indonesia (Romadiyanti, 2022). Based on the fundamental social, economic, and environmental values that should be derived from the procurement exercise, the environmental value is included as a long-term value that the user is expected to get.

Furthermore, the value expected from the procurer or public buyer from the interview results is more about the process and performance of public procurement. Procurement actors state that ease of implementation of procurement policies is essential. Buyers hope there are clear regulations and implementation procedures so that procurement performance is as effective as expected. Goods/services available in a healthy market or at competitive prices are also considered to help procurement actors. In addition, procurement actors also aim to achieve procurement goals through value for money. Again, in the interviews, procurement actors should have mentioned sustainable procurement, which is also one of the procurement goals in Indonesia (Romadiyanti, 2022).

Based on the interview results, the procurement actors also explained their expectations of local product suppliers. Procurement actors hope that local products have reasonable prices and international-standard quality. The availability of local products is also expected to vary to meet the needs of users, who also vary. The link with environmentally friendly products should be mentioned in the expectations of suppliers based on interviews.

Finally, the society expects value from public procurement of local products. Based on the results of the interviews, procurement actors all agree that procurement of local products can improve the local society's economy. In addition to creating jobs and turning money locally, this policy will likely attract outside business actors to invest in the country, which can have a multiplier effect. Using local products is also considered necessary to increase the competence of local resources. This expectation shows that, in the long run, this policy is also expected to improve the skills of local human resources. Based on the interview, information needed to be obtained regarding the impact of sustainable procurement on the society.

The results of the interviews and the subsequent literature study are presented in Table 1. Based on the results of the interviews, the interviewees have widely conveyed social and economic values. The environmental aspect should have been mentioned more by the interviewees. However,

the environmental aspect has been added to the value mapping results presented in Table 1. The values in Table 1 illustrate the three social, economic, and environmental aspects. These values are expected when procuring goods/services using local products.

Table - 1: Sustainable Values Drawn from Literature Review and Interviews

	Value	Aspect		
		S	Ec	En
Users	Quality goods or services		√	
	Goods/services that are sustainable and do not harm the environment	√		√
	Procurement results support performance.	√	√	
Buyers/Procurers	Effectiveness of the procurement process	√	√	
	Availability of goods and a healthy market (competitive pricing)		√	
	Procurement objectives achieved (value for money, sustainable procurement)	√	√	√
Suppliers	Produce Competitive Products (innovative, varied, quality, competitive price)	√	√	
	Eco-friendly products and services	√		√
Society	Improved society economy (investment, employment)	√	√	
	Society Skills Improved	√	√	
	Sustainable Environment			√

Details: S: Social; Ec: Economic; En: Environment

Barriers to Achieving the Expected Value

The researchers then conducted FGDs to investigate the barriers to achieving the identified procurement values. Based on the results of the discussion, it was found that the main problems in implementing procurement using local products are the high price of goods and the uncompetitive quality of products. One of the resource persons representing the Ministry of Industry in the FGD activity said that although it is considered a natural market mechanism because local products are

still limited, this needs to be anticipated. Limited local products are also one of the areas for improvement in implementing the policy on using local products in public procurement.

Price is essential in procuring goods or services (El-Samahy et al., 2008; Uddin, 2015). Domestic products in Indonesia must improve their sanitizing to compete with foreign products (Syukri et al., 2022). Generally, price is juxtaposed with quality when procuring goods or services. Competitive prices and the expected quality will undoubtedly be essential in procuring goods or services (Lewis-Faupel et al., 2014).

Suppliers who use local products in public procurement have an excellent opportunity to capture the government market, but based on the FGD results, they need to take advantage of this opportunity better. This fact certainly impacts users and buyers. Unqualified products and uncompetitive markets can impact users' and buyers' performance.

Quality cannot be compromised in public procurement (Estache & Iimi, 2012). Quality is also essential in evaluating bids, not just focusing on the lowest price. Implementing public procurement policies is problematic regarding price and quality, requiring serious attention. Other procurement goals can be neglected and not achieved because one party is not cooperative in creating sustainable value in public procurement.

Although not found in the FGDs, this research also found from the interviews that implementing sustainable procurement in Indonesia needs to be integrated with other procurement policies. Procurement actors in the interviews did not mention sustainability as one of the values expected from implementing local products.

4. Discussion

Based on the FGD results, the main problem in value creation comes from suppliers needing help to create competitive products. If you pay attention to the interviews conducted earlier, they also illustrate how implementing procurement with local products has yet to be integrated with sustainable procurement. This situation means strategies or policies are needed to encourage domestic industries to create globally competitive and environmentally friendly products.

Successful policy implementation can occur with the collaboration of various stakeholders (Peckham et al., 2022). Suppliers cannot solely resolve the problems that arise. Collaboration and government encouragement are needed to address these issues. Collaboration is essential in achieving value-based procurement (Lefers, 2023; Malacina et al., 2022; Rahmani et al., 2021; Verwey et al., 2015).

Collaboration allows suppliers, users, and procurement actors to exchange information. For suppliers, the information exchange is expected to provide input to innovate and produce products that align with user needs and preferences. Meanwhile, for policymakers, collaboration can make it easier to establish regulations that are in the interests of all stakeholders.

Goods/Services Users in Public Procurement can be classified as core stakeholders because they are the parties who will directly utilize the goods/services procured. Public procurement for innovation policy (PPI) highlights the strong relationship between suppliers, procurers, and end users (Torvinen & Haukipuro, 2018; Torvinen & Ulkuniemi, 2016). This concept considers innovative procurement policies expected to solve the problems faced.

Torvinen & Haukipuro (2018) outline 4 (four) roles that end users can perform: conventional, cooperative, collaborative, and controlling. Conventional role means that end users place themselves as consumers of the results of public services. The cooperative role shows the active role of end-users, but their role is less critical than procurement actors and suppliers. Furthermore, end users have an equal relationship with procurers and suppliers in the collaborative role. The collaborative role allows end-users to share independent value and access resources in public procurement, but not all individuals are suitable for this role. The collaborative role is only suitable for end-users with the motivation and qualifications matching the procurement objectives. Finally, the controlling role makes end-users dominant over procurers and suppliers. While this can have positive benefits, the controlling role can be damaging as the value of the end-user being too dominant can undermine the established procurement values. This role can become bullying if performed by highly skilled individuals.

End-users in local product utilization can help drive the quality of local products in cooperative and collaborative roles. The cooperative role can be carried out by providing positive feedback to local product providers and procurement actors. Meanwhile, users with expert competence in the goods/services procured can carry out the collaborative role by being involved in the local product production design process.

Furthermore, collaboration is also essential for policy integration (Ansell et al., 2017; Azizi et al., 2019; Boada-Collado et al., 2020; Meehan et al., 2016a, 2016b; Ramjaun et al., 2024; Tosun & Leininger, 2017). Policy integration requires collaboration from various institutions (Azizi et al., 2019). Policy integration in the context of this problem is integration in implementation. Policies related to sustainable procurement and the use of local products have been mandated in Indonesian procurement regulations (Romadiyanti, 2022); however, their implementation has yet to be carried out in an integrated manner. This kind of implementation can lead to procurement goals not being achieved holistically but partially. The government needs to encourage the implementation of sustainable procurement that merges with all procurement practices.

Some of the things that are considered in sustainable procurement include environmentally friendly products and services, long-term (life cycle) risks and costs, local products or small businesses and social considerations (Abdelkarim Almumani, 2014; Adjei-Bamfo et al., 2019; Brammer & Walker, 2011; Delmonico et al., 2018; Eyo, 2017; Grandia, 2015, 2016; Grandia et al., 2015; Grandia & Voncken, 2019; Kuipers et al., 2014; Sourani & Sohail, 2011; Walker & Brammer, 2009). Implementing sustainable procurement cannot stand alone; it needs to be integrated with other

procurement policies. Integration efforts can be made by including environmental values in the procurement program (Nijaki & Worrel, 2012).

Furthermore, researchers will review a little about collaboration between users and procurers with suppliers. This research takes several previous studies and articles to provide an overview of collaboration practices that have been carried out. This article can provide a clear picture for related parties when planning collaboration efforts to improve the competitiveness of local products.

The first study was conducted in Finland. Reijonen et al. (2018) investigated the effect of collaboration on the competitiveness of small and medium enterprises in Finland regarding public procurement. Based on the study's results, Small and Medium Enterprises (SMEs) consider several efforts to improve their competitiveness, including collaboration between users in developing new products, improving production processes, and developing existing products to meet user needs.

Further research highlights collaborative procurement practices in Kenya by state corporations (Nyangweso & Boraya, 2013). Their research found that state corporations in Kenya are actively involved in the flow of information along the supply chain. State corporations also collaborate on skills and design needs and determine which capabilities are essential to improve competitiveness.

Further research is on collaborative procurement practices at The European Experience by G. M. Racca & Albano (2013). This research highlighted the benefits of collaborative procurement to drive value for money and innovation. This research highlights collaborative procurement through innovative procurement contracts. Procurement contracts are flexible and tailored to user needs, which is due to users' diverse needs.

Further research by Melander & Arvidsson (2020) investigated how suppliers respond to innovation requests in public procurement. The research found that the innovations that sellers or suppliers can make are in the areas of products, services, and business models. The research highlighted the efforts of several companies to interact with the government. The companies studied were found to have different interaction patterns to capture innovation ideas.

The research studies above show that collaborative provision has been widely practiced. Collaboration efforts can vary, from providing innovation input to innovating contract management. One important thing that we can capture from the articles discussed is the need for awareness among business actors to open up and improve the competitiveness of their products.

5. Conclusion

This research maps the value of sustainability in procurement using local products. The mapped values must fulfill the fundamental aspects of sustainability, namely economic, social, and environmental. This research does not describe the interviewees' statements in the interview activities one by one but reports the analysis results in summary.

Based on the value mapping, it was also found that sustainable procurement can be presented more broadly. Problems identified based on FGD activities that can interfere with the sustainable

value of procurement in the policy of using local products are the quality and price of products that could be more competitive. Both of these problems require stakeholder collaboration to solve. End users can take a strategic role in collaborating with suppliers. Meanwhile, integrated policy implementation needs to be done so that sustainable procurement can blend in with other policies in public procurement.

This study's limitation is that it collected perceptions and opinions from the government and did not involve procurement suppliers. A broader perspective could be developed in a follow-up study with suppliers to confirm the results and formulate improvement efforts. This research provides an overview of the sustainable value in procurement using local products and the implementation issues that may interfere with achieving value. Finally, it also presents some of the research on collaborative procurement practices that has been done.

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Blended Learning in the Educational System and Industry Revolution 4.0: Perceptions on the Effectiveness

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ABSTRACT

The Pandemic has changed the horizon of higher education, no doubt. Across the world, Higher Educational Institutions (HEIs) had to face health crisis during the last two years, and it is the right time to review and re-look into various instructional modes and approaches- online, hybrid, and blended learning from the eyes of Industry 4.0. The paper uses descriptive and analytical models of various studies to explain the effectiveness of the blended learning. The study provides an in-depth evolution of Blended learning models that started from the mid-2019. A visual and structured approach has been adopted and presented through fish-bone analysis. Even an evidence-based approach on how pandemic-situation impacted student can benefit from the blended models that can be adopted by the teachers and the tutors of the HEIs.

INTRODUCTION

The infectious coronavirus disease 2019 (COVID-19) has had a deep impact on many HEIs, public, and private school systems globally. The pandemic has changed the whole system of learning in the education sector, and increased the workload of faculty and staff, and forced many HEIs to remain closed and to operate with extremely limited resources to minimize risk of infection (Dhawan 2020; Rapanta et al., 2020). Blended learning is considered as a solution to address the various needs of HEIs all over the world. Blended learning is a combination of various classrooms teaching and online teaching methods. This encompasses the benefits of both face-to-face and electronic learning. It also aims to find the right balance between personal and impersonal interactive learning models. These models transform passive students into active students, and there is ease of access to broader learning. Education is not just a basic requirement for a period of life, but it is for life-long with the embedded skills needed for it in order to contribute to a nation's development and for its equitable growth in all the fields. Further, to discuss, both education and technology are inseparable ones, that the technology learnt by students to be implemented and improved upon by the IT industry. Hence, blended learning encourages independent and collaborative learning experience among the HEIs and the Industry 4.0.

Countries like India has the highest population in the world and need to provide high-quality educational opportunities for students that will determine the country's future. The best way for developing and maximizing the country's rich talents is having universal high-quality education. Technology is driving factor of Fourth Industrial Revolution in which digital automation, artificial intelligence, mobile supercomputing, intelligent robots are at its momentum. International competitiveness and global challenges demands highly innovative and competent Education environment. Digital era and globalization has led to a new trend in education. One such trend is Blended Learning. The objective of the present paper is to analyse the concept of blended learning and to explore the various types of blended learning. Further, the paper discusses the intricacies and technical complications involved during implementation of blended learning in Indian context. In addition, the paper also critically analyse the impact of blended learning upon the youth addressed by Industrial Revolution 4

REVIEW OF LITERATURE

C. J. & Graham, C. R[1] showcased future learning pedagogy in blended mode made the technology in faster and dozens of technologies impact learning, training environment will lead to new innovations in terms of blended learning. Bandwidth now become more affordable. Different technological tools will made easy the learning results. This will create interest among the learners to enhance and innovate the subject into research.

Dhawan, S. (2020)[2] describes in this article about Pandemic made easy to transfer traditional methods of learning to online which shift to blended mode. Many institutions relating to academics resist to change but pandemic made to sift to online mode. There was a drastic shift of teaching pedagogy overnight. This article enlighten the SWOC analysis of teaching online techniques.

Garrison, D.R. & Kanuka, H. (2004)[3] the article highlights the transformational potential of blended learning challenges facing in higher education institutions. There is need of an hour to restructure, rethink regarding blended learning approaches. The findings of the article was blended learning proven to enhance both effectiveness and efficiency of learning experience.

Sader, S.S.A., Husti, I., & Daróczi, M. (2017)[4] the article elaborates industry 4.0 enhancement of products quality, manufacturing processes and customers satisfaction. This article highlights the qualitative and quantitative parameter to determine the industry 4.0 technologies of the industry. This article explored the rules, measures to be assessed and various measures of enhance the ability of the work.

Research Design

The paper used secondary data which includes Government webports on education, journals, magazines, company websites. The paper employed the archival method of reviewing literatures available -theoretical, applied and empirical to provide an understanding on the blended learning and industry 4.0.
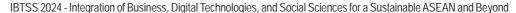
Objectives:

- To discuss on the blended learning models
- To study the recommendations of National Educational policy on the blended learning
- To analyze the challenges of blended learning using fish-bone analysis

DISCUSSION

Hybrid or blended learning offers one such opportunity provide engaging learning opportunities to students by combining face-to-face medium of instruction with online learning opportunities. Blended learning as defined by Dziuban et al. (2004), is an instructional method that includes the efficiency and socialization opportunities of the traditional face-to-face classroom with the digitally enhanced learning possibilities of the online mode of delivery. Characteristics of this approach include (a) student centered teaching where each and every student has to be actively involved in the content (b) increased opportunities for interaction between student-faculty, student-student, content-student, and student-additional learning material (c) opportunities to collect formative and summative assessment to improve course offerings. Hybrid and Blended learning are used interchangeably, with a slight difference that the components of hybrid courses tend to substitute in-person class timings. Online classes can be combined with real time meeting sessions or interactions at different times. (Siegelman, 2019).

BLENDED LEARNING APPROACH

In blended learning, in rotations, different groups of students will be working on different set of online learning activities in the classroom with the guidance of a teacher. In other words, teacher-led instruction is minimized, and the students engage in common tasks online. The Goal 4 in Sustainable Development (SDG 4) aims at the education for all children below 15 years. It aims to "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. In a distributed environment, most students prefer interacting socially and touch of human that exists in a face-to-face classroom. Many examples show how blending is used to provide a balance between flexible learning and the high touch human interactive experience[1].

The global education development agenda reflected in SDG4 of the 2030 Agenda for Sustainable Development, adopted by India in 2015 ensures inclusive and equitable quality education and promotes lifelong learning opportunities for all by 2030. India's goal must be to have better education system by 2040 that is second to none, with equitable access to the highest-quality education for all learners regardless of social or economic background [2]. It is peak time to bridge the gap between the current state of learning outcomes and the industrial requirements. This major reform brings the highest quality, equity, and integrity into the education system through higher education.

The effectiveness of blended learning depends on several factors and few among them are student characteristics, design features and learning outcomes. The survey proved that thefailure

of learners to continue their online education in some cases has been due to family support or increased workload leading to learner dropout [3].

Figure 1 : Structure of blended learning

The necessity to rethink and restructure the learning experience and its transformative potential is analyzed. Finally, the issues of administrative and leadership are addressed and the outline of an action plan to implement blended learning approaches in figure 1.[4].

INDUSTRY 4.0

India is facing the 4th industrial revolution, called Industrial Revolution 4.0. This revolution 4 needs innovation and education sector is required to experience changes to meet industrial revolution 4.0. The development of a nation depends upon the type of technology in education. The challenge to the IT industry is to synergize the cognitive, affective, and psychomotor domains simultaneously. Teaching using computer technology can inspire and motivate students to learn, optimize the classroom environment.

Many applications with the combination of emerging new technologies give rise to the emergence of IR 4.0. It includes AI, cyber-physical Systems, IoT, cloud computing, Industrial Integration, Enterprise Architecture, Business Process Management, Industrial Information Integration and few others [5]. The collaborative ability of IR 4.0 for the vertical, horizontal and end-to-end integration

is suggested [6].IR4.0 requires quality work, decentralized management, communication to machine to machine, and digitization levels [7]. Education 4.0 requires the needs of IR4.0 where human and technology are aligned to enable new possibilities [8].

Higher Education 4.0 teaching need to support learning, teaching, and training; using Massive Open Online Courses (MOOCs); development of students' skills; and using blended learning. Major solutions in facing the education globalization is to implement 21st century learning can improve basic skills in critical thinking, innovative thinking, creativity enhance and digital literacy [9].IR4.0 is not a technology project but a way to increase the competitiveness of the firms in the manufacturing sector for the future. The aim of IR 4.0 is gain more attention to the social aspects of this new development [10].

The Industrial Revolution 4.0 has resulted in the emergence of Education 4.0 and provides reasons and need for learning innovations in higher education by utilizing technology [11]. The development of technology comes out with the concept of "learning anywhere and anytime". The existing potential and systems make our students as a post-millennial generation and they need to manage it as a strategy to improve the quality of learning in universities and encourage students to have 21st century competencies. Numerous facilities contained in electronic devices provide opportunities for students to share experiences, discuss, and help each other, work together to share text, sound, image, and animation, video and combination files. Various other online social activities such as being active members in the job portals or study portals etc., can build students' experiences and social attitudes [12]. In this paper, we describe the design of online modules units for blended learning in higher education. The results of the implementation and evaluation of blended learning by using these learning units will also be studied to study the impact of blended learning on the student's performance.

National Educational Policy (NEP) and Industrial Revolution 4

NEP encourages student entrepreneurs with the exposure to vocational education in collaboration with industry and in alignment with the Sustainable Development Goal 4.4 (SDG). NEP tackles several major gaps in the present education system - it creates a more holistic approach, dedicates a much higher investment, focuses on gross enrollment. NEP will revolutionize the education system of the developing country in the near future, and the industry will experience a huge boom reaching employment. PM Modi emphasized that many students drop out is observed creating unemployment among the youth. Modi wanted the students to have the freedom of choosing their own subjects and continue the studies. IR4.0 provides a roadmap to the NEP.

This National Education Policy 2020 is the first education policy of the 21st century and aims to address the many growing developmental imperatives of our country. In order to improve the quality of teaching and learning, the government of India has taken several steps. Particularly, the focus is on a new initiative called technology-enabled learning (TEL). National Education Policy

2020 recommends setting up of a National Educational Technology Forum (NETF) for the free exchange of ideas on the use of technology to improve learning, assessment, planning and administration". At the same time, this is a very laudable measure to assist teachers in participating institutions to fix existing challenges and undertakes action research to improve the quality of learning.

TECHNOLOGY-ENABLED LEARNING: ROLE OF NATIONAL EDUCATIONAL TECHNOLOGY FORUM (NETF)

Technology-enabled learning is "the application of some form of digital technology to teaching and or learning in an educational context". (Kirkwood& price, 2016).

Technology-Enabled Learning: the two forms are A. Blended leaning and B. Online learning.

Blended learning is the use of traditional classroom teaching methods together with the use of online learning for the same students studying the same content in the same course. This is the integration of online tools in classroom teaching, but it is not about online education or distance education.

For successful implementation of Blended Learning in higher education, NETF it requires a three phase approach.

First phase: Major focus are on

- Identify the technology infrastructure like hardware and software.
- Identify the strength and weakness of the institution.
- Conduct workshops on the proposed technology.
- Develop policy to place before decision-making bodies for proper implementation

Second phase: The major focus are on

- Identify teachers who have experience of developing blended courses.
- Support mentors to oversee the course development.
- Develop blended courses and offer these students

Third phase:Major focus are on

- Measures the student learning outcomes from the blended courses and documents, the teacher pedagogical changes.
- Compare with TEL implementations with the similar institution and develop benchmarks to help assess their progress and institutionalizing

A community of practice through NEP Recent initiatives of technology-enabled Learning (TEL) in Higher education are: NPTEL: National Programme on Technology Enhanced Learning (NPTEL),

one of the earliest OER initiatives in the country, developed by the joint efforts of IITs, IIMs and Carnegie Mellon University(CMU) in 1999.SwayamPrabha is a group of 32 DTH channel maintained by INFLIBNET dedicated to telecasting of high-quality education programmes on 24*7 basis using the GSAT-15 satellite. Study Webs of Active-Learning for Young Aspiring Minds" (SWAYAM) (http://swayam.gov.in) is the official MOOC platform for India launched in early 2017 initiated by the Ministry of HRD renamed Ministry of education, Government of India.

Challenges of Teachers in Higher Education Institutions:

In general, when we talk about the online teaching classes, other than the NPTEL or swayam, it is very much true that based on the analysis done. There are altogether five challenges faced by HEIs Faculty members 1. Machines (computer and networks) 2. Method 3. Person 4. Material and 5.Environment **Figure 2**.

Data Analysis and Interpretation

Relevance and Challenges of Blended Learning in Teaching and Learning of Business Education

Table - 1: Mean and Standard Deviation on relevance of Blended Learning

Items	Mean	SD	Remark
With Blended learning, I can access the learning activities at times convenient tome.	3.68	.57	Agree
The online material is available at locations suitable for me.	3.64	.63	Agree
I am allowed to work at my own speed to achieve learning objectives.	3.09	.49	Agree
I decide how much I want to learn in a given period.	3.57	.76	Agree
I decide when I want to learn with blended learning.	3.04	.52	Agree
Cluster	3.40	.59	Agree

Source: Field Survey

The Table 1 reveals that the mean responses ranged from 3.04 to 3.68 while the standard deviation ranged from .49 to .76. The Table reveals that the respondents rated all the items above 2.5, which was the mean score for decision making. Since the cluster mean was 3.40 and it was above the criterion mean value of 2.5, it reveals that blended learning is relevant in the teaching and learning business education in Telangana State.
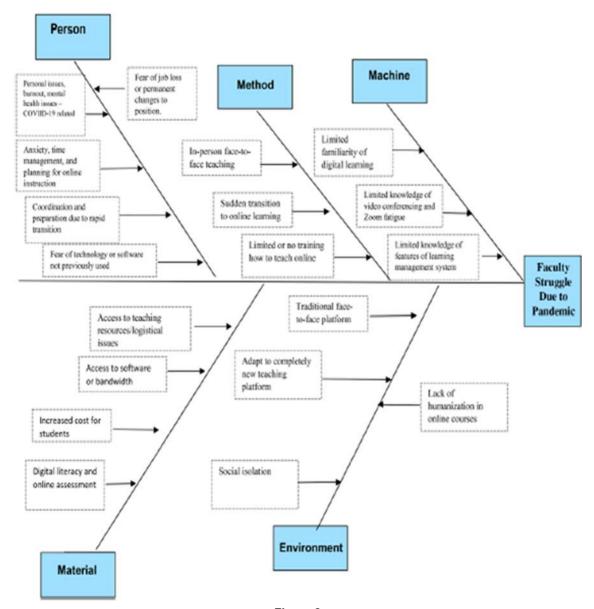
Figure 2

The findings arising from the analysis of research question two revealed that blended learning is faced with some challenges in the course of teaching and learning of Business Education students in Edo State. The findings revealed that poor funding, poor computer skills, inadequate technical and support staff, inadequate business educators and poor internet connectivity pose challenges to the effective utilization of blended learning in the teaching and learning of business education

Table - 2: Mean and Standard Deviation on Challenges of Blended Learning

Items	Mean	SD	Remark
Blended learning implementation involves high initial fund for start-up.	3.61	.69	Agree
Business educators with low computer skills will not be able to explore the potentials of blended learning.	3.08	.61	Agree
The inadequacy of technical and support staff is a challenge in the implementation of blended learning.	3.14	.58	Agree
The inadequacy of competent Business educators is a hallenge in the implementation of blended learning.	3.74	.54	Agree

Source: Field Survey

The Table 2 reveals that the mean responses ranged from 3.08 to 3.83 while the standard deviation ranged from .42 to .69. The Table reveals that the respondents rated all the items above 2.5, which was the mean score for decision making. Since the cluster mean was 3.48 and it was above the criterion mean value of 2.5, it reveals that blended learning is faced with some challenges in the course of teaching and learning business education in Telangana State.

Based on the findings, it can therefore be concluded that despite the challenges being faced in the utilization of blended learning in universities in Edo State, its use is still relevant in the acquisition of Business Education skills. The findings further revealed that the potentials of blended learning cannot be over-emphasized, and as such, stakeholders should continue to encourage all desirous of teaching and learning to utilize the blended learning strategy. It can also be concluded that male and female business education students significantly differ in their opinions on the use of blended learning in the teaching and learning of business education.

CONCLUSION

It is imperative that Indian higher education focuses on strengthening TEL by embracing a systematic approach to educate digital natives. Every stakeholder in the system has the responsibility to rethink the current approaches and focus in TEL. Moreover, university leaders and policymakers need to take appropriate decisions to make things happen in the right direction as outlined in this paper. It is a national call for steps.

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Sustainable Development through Green Banking Practices: Initiatives by Indian Banks

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ABSTRACT

Green banking is crucial for balancing economic growth with environmental protection, aiming to meet current needs without compromising future generations. It addresses environmental harm caused by extensive economic growth, such as resource depletion and pollution. Green banking initiatives, like net banking, green accounts, and mobile banking, reduce costs, improve efficiency, and enhance customer loyalty while promoting sustainability. Studies highlight the significant role of banks in environmental sustainability, emphasizing green banking's positive impact on technology, operations, and customer habits. Indian banks like SBI and Axis Bank have adopted green banking, demonstrating their commitment to sustainability. These initiatives, such as investing in green technology and pollution reduction projects, are vital for mitigating climate change and promoting sustainable development. SBI launched Green Channel counters at 57 branches on July 21, 2010, and expanded to over 5,000 branches within a year, earning the Best Customer Initiative Award for its tree-saving efforts meanwhile Axis bank decided that By FY 2026, it will provide an additional ?30,000 crores in funding to industries with positive social and environmental impacts. By integrating social and environmental factors into operations, green banking ensures a cleaner, greener future, showcasing a responsible approach that benefits the economy and the environment alike.

Keywords: Green Banking, Environmental protection, Indian banks, Sustainable Development goals.

"The Earth is not an inheritance from our ancestors, but on loan from our children"

Introduction:

Background of the study:

Extensive Economic growth is often achieved at the cost of environment. Depleting natural resources and polluted environment are the by products of rapid industrialization which are the major challenges for sustainable development.

High carbon emitting companies may carry on with their regular business operations even at the expense of the environment if they have easy access to bank loans and private financing as needed. Financial institutions make a lot of judgments about who to lend money to, what businesses to invest in, and other matters that have a big impact on the lives of people impacted by climate change. As a result, the banking and financial industries bear greater responsibility because there is still a connection between their operations and carbon emissions. increased domestic credit to the private sector for all economic types consistently contributes to an increase in carbon emissions in all seven layers of carbon emissions.(n.d.-a)

Therefore, Green finance is crucial for inclusive economic growth and environmental sustainability. A green economy relies on sustainable development that prioritizes health, wealth, and universal well-being, aiming to meet present needs without compromising future generations' quality of life. Green banking seeks to balance economic growth with environmental protection, fostering a clean and green future.(n.d.-b) Developing countries like India face the dual challenges of promoting economic growth and environmental sustainability, making environmental protection a vital social responsibility. This generation has witnessed significant environmental degradation, impacting human health.

"Green Bank is a normal bank which considers all the social and environmental factors with an aim to protect the environment and conserve natural resources," states the Indian Banks Association (IBA). In India, it's also referred to as an ethical bank or a sustainable bank. In contrast to other regions of the world, India's implementation of green banking is restricted to the use of fewer paper and more internet transactions.

The banking industry in India has experienced significant technical advancements and transformations, especially in response to findings that identified banks as major contributors to environmental degradation and carbon emissions, leading to efforts to adopt eco-friendly practices.(n.d.-c)

The benefits of green banking to the environment over conventional banking include:

1. Reduction in Carbon Footprint through Energy-efficient buildings & Paperless banking

2. Promotion of Sustainable Practices through Green loans and financing & Eco-friendly investment

3. Encouraging Corporate Social Responsibility (CSR) by enforcing Environmental policies and create Public awareness.

4. Support for Renewable Energy projects like Solar, wind and hydroelectric power

5. Biodiversity Protection by Financing sustainable agriculture and forestry practices that helps protect biodiversity and maintain ecosystems along with Habitat conservation

6. Improvement in Air and Water by funding projects that reduce pollution, such as clean energy and waste management initiatives.

7. Economic Incentives for Sustainability through Green job creation and cost savings

Literature study

After elucidating the notion of green CSR in the banking industry, Scholtens declares that a green bank provides stakeholders with savings accounts with the guarantee that the funds will be used to fund environmentally friendly initiatives. He created a framework to evaluate the social responsibility of multinational banks, tested it on thirty additional institutions, and came to the conclusion that a bank's financial scale and quality and its CSR score were positively and significantly correlated.(Scholtens, 2009)

"Green Banking Initiatives": A qualitative study on Indian banking sector. by Meenakshi Sharma and Akanksha Choubey: The study found that green banking initiatives, including green products, corporate social responsibility, and internal processes, positively influence green brand image and trust, with over 60% of bank managers affirming their banks' active engagement in these practices. This research article expressed that bank assumes a vital role in environmental sustainability.(Sharma & Choubey, 2022)

"Impact of Green Banking in India" by Soundarya Murugan June 2022: The study focused on the green banking initiatives which would bring technological and operational improvements and also a change in customers banking habits alongside reducing the carbon footprints. (Murugan, 2021)

"Low Carbon Pathways" by Himanshu Gupta in his research paper, observed that global emmission of CO_2, if continues in the same speed, undoubtedly leads towards the irrecoverable global warming. He prescribed low carbon alternatives which can generate electricity at a sustainable rate.(*Low carbon pathways*, 2015)

"GREEN BANKING PRACTICES– G Nandini Prabhu's "A Case Study on the Indian Green Banking System" The study uses secondary data analysis to look at green banking practices that both public and private sector banks in India have followed. The protection of the environment and natural resources is the main advantage of green banking. Through electronic transactions, such as ATMs, mobile banking, and internet banking, which not only promote sustainability but also improve consumer convenience, it reduces the usage of paper.8

From the Literature review we notice that there is insufficient published data on enumeration of initiatives taken by Indian banks towards the novel idea of Green banking therefore through this paper authors intend to collectively represent the initiatives by two of the largest stakeholders, SBI and Axis banks in India towards achieving the Sustainable development goal through Green banking.

Objectives of the study:

A) To study the concept and significance of green banking.

B) To know the green banking initiatives by Indian banks.

C) To identify the green banking financial products.

D) To analyse the link between contribution of green banking initiatives for sustainable development.

Methodology:

This research article is based on secondary data and conceptual in nature. This review was conducted using the search terms "green banking initiatives in India," "Green banking in India," and "green banking AND environmental sustainability." Among the available literature, studies conducted in India, published articles related to green banking, and academic and governance reports from the RBI and banks were included for the review.

Significance of green banking initiatives:

Industrialisation and urbanization are responsible for global warming which is the man created misery on this planet. The concept of environmental sustainability started in 1969 with the establishment of the The United States' National Environmental Policy Act of 2014. The aim is to advance the social, economic, and general wellbeing of the current and upcoming generations.9. As a result, a number of national and international organizations dedicated to environmental conservation are established. UNFCC, Bank Trajectory, Indian Green Banking Council, and numerous others are a few examples. Environmentalists and socialists are alerting nations to the need to preserve Mother Earth before it is no longer suitable for human habitation. Consequently, India has set three goals to be accomplished between 2020 and 2030 in accordance with the 2015 Paris Agreement. During COP 26 in Glasgow in 2021, Indian Prime Minister Narendra Modi unveiled a new set of five targets: By 2030, India aims to reach 500 gigawatts (GW) of non-fossil fuel energy capacity.

- By 2030, 50% of its energy needs will be satisfied by renewable sources.

- Between now and 2030, a reduction of one billion tonnes is anticipated in the overall expected carbon emissions.

- Its economy's carbon intensity will be reduced to less than 45 percent.

- India will meet its goal of having a net

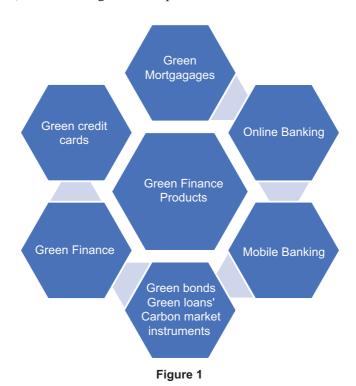A press statement on August 3 confirmed that three of these five targets had been approved by the Union Cabinet.

Green banking is one of the actions taken to mitigate the problems of climate change causes due to business operation.(Meena, n.d.) This is because Banks are the major economic agents influencing the industrial sector through its lending and financing policies. The banking industry is one of the major fund providers to industrial projects like steel, power, paper, chemicals, fertilizers etc which cause major carbon emissions. Hence banks should invest and finance green technology and pollution reduction projects.

Eco-friendly strategies of banks (adopted methods)

a. Net banking system :- customers can perform most of banking transaction through internet.

b. Green accounts :- Online account opening facility.

c. Use of green account checking :- customer can check their account details on ATM.

d. Mobile banking:- Transfer of funds payment of bills through smartphones.

e. Direct deposits :- Organizations are paying directly to beneficiaries accounts through e- banking.

Green (banking) financial products(Jha* et al., 2019): Green banking practice is beneficial as it can reduce cost, improve efficiency, brand image, staff morale and customer loyalty. This in turn contributes for the sustainable development. Green finance is fast emerging as a priority for public policy.(n.d.-d) Some of the green bank products are
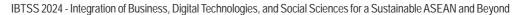

Figure 1

- Green Mortgages:- Energy Efficient Mortgages provide low interest rate advances to customers who invest in energy efficient houses or appliances.

- Online Banking:- E banking is an electronic banking system which enables customers to do financial transactions through bank website.

- Green Credit Cards:- It allows cardholders to earn rewards/ points which can be redeemed for contributing to sustainable charity organizations.

- Green Finance:- Bank financing for eco-friendly projects at concessional rate of interest.

- Mobile Banking: Bank transactions through smart phones which saves energy and time.

Green banking initiatives by Indian Banks :

Most of the public sector as well as private sector banks in India have effectively initiated Go green culture in their banking service. This paper specifically captures tow major stake holders initiatives.

1. **State Bank of India**(n.d.-e) – Strategy – Sustainability roadmap to future profitability.

   SBI is the first bank in the country to initiate the generation of green power by installing windmills.(n.d.-f)

Here are a few of the bank's green financing initiatives.

a) The bank launched Green Channel counters (GCC) at 57 specific branches nationwide on State Bank Day (July 21, 2010). One year later, the service was expanded to over 5,000 branches nationwide. SBI's tree-saving initiative earned them the Best Customer Initiative Award.

b) The bank is aiding in the development of wind farms located in India.

c) It is carrying out measures to become carbon neutral by 2070.

d) Online transfers of funds from branch banks in the United States to India.

e) Green Bond: This sum will go toward environmentally friendly initiatives.

f) SBI collaborates on green projects with international Development Finance Institutions (DFIs).

The bank has won The 10th Greentech CSR India Award 2023 in the category "Production of National Heritage and Culture".

In FY 2024 SBI is spending 9 % of its CSR fund towards environmental sustainability.(n.d.-g)

2. **Axis Bank(Axis, n.d.):** Choosing green... Creating impact.

The third-biggest bank in India's private sector. In order to support India's pledges under the Paris Agreement, Axis Bank has announced a service of commitments aligned to achieving the SDG. The Bank has established a stand-alone ESG Committee at the Board level, making it the

first financial institution in India to do so. This move highlights the Bank's strong intention to use ESG as a strategic driver for the organization's goals and performance. Prior to Glasgow, UK's 2021 UN Climate Change Conference (COP 26), the bank made its pledges known.

The bank's initiatives include (Commitments):-

a) By FY 2026, an incremental funding of 30,000 crores under wholesale banking will be provided to industries that produce favorable social and environmental results.

b) Reducing its response to its wholesale banking business portfolio's carbon-intensive industries.

c) Broadening the scope of its ESG lending policy's coverage of ESG risk in credit appraisal.

d) By FY 2024, 5% of its portfolio of retail two-wheeler loans will be electric, and new EV loans would come with a 0.5% APR waiver.

a) Establishing 2 million trees in India by FY 2027 to act as a carbon sink.

f) Reaching carbon neutrality and running the company accordingly.

g) Recently unveiled its framework for sustainable finance, which outlines the bank's approach to each area that is linked with social justice.

h) must cut the intensity of its carbon emissions by 3.5% by the end of FY 2027.2021

Axis Bank Corporation head office (Mumbai) achieved Platinum Certification under IGBC, the only private sector bank to achieve such a rating.

Various initiatives such as solar power generation, renewable power purchase agreement, implementation of CEMS procurement of wheat straw based paper and digital banking services (Saksham) have resulted in a significant amount of energy savings.

Mr. Rajesh Dahiya, Executive Director of the bank said "As a financial institution, we are aware of our responsibility towards helping India move on the path of equitable and sustainable economic growth. The ESG strategy is woven around our purpose of "Banking that leads to a more inclusive and equitable economy, thriving community and a healthier planet".

Green banking and sustainable Development:

We strongly recommend green banking initiatives to achieve sustainability goals, recognizing that banking, both directly and indirectly, is pivotal in achieving all the Sustainable Development Goals (SDGs). Specifically, green banking plays a crucial role in advancing SDG 7 (Affordable and Clean Energy), SDG 12 (Responsible Consumption and Production), SDG 13 (Climate Action), SDG 14 (Life Below Water), and SDG 15 (Life on Land). By adopting environmentally friendly practices, providing financing for sustainable projects, and encouraging responsible resource use, green banks not only enhance their own sustainability but also contribute significantly to global environmental and social well-being.

Findings and suggestions:

The existing literature in this area reveals that the green banking initiatives of most of the banks in India are confined to net banking and mobile banking. Some banks, particularly startups, face challenges in implementing green banking strategies due to their recent establishment and limited public recognition, making it difficult for them to pursue sustainable development through green banking initiatives.(*Green banking in light of COVID-19*, n.d.) The findings of certain research articles also disclosed that the bank employees need to be educated regarding green banking .It is heartening to know that public sector banks are keen in implementing green banking. SBI sets high standards towards green banking initiatives

Banks in India can consider the following suggestions for the effective implementation of their green initiatives:

- The customers should be made aware of green banking through banks website.
- Public should be educated through public website.
- RBI should conduct green banking literacy programs for the customers.
- The importance of green financing should be communicated through the media.
- Banks should educate the public or customers through e-Learning programs.
- The financial Institutions shall disclose about the specific green banking practices and also the fund earmarked for such initiative should form a part of their annual report.
- Energy consciousness
- RBI should ensure that private banks are committed to reduce their carbon footprints in the area of waste management and energy consumption.
- The government of India and RBI should frame a proper green policy guidelines and financial incentives .
- Investors should be encouraged to invest in eco-friendly projects.

Conclusion: Between environmental sustainability and economic prosperity, the banking industry is crucial. Excellent green initiatives are available from Indian public and private sector banks; they only need to be implemented well. Green banking is a proven business strategy that Indian banks should embrace for the economy's sustainable development. The findings of a study indicate that while funding options and public awareness have improved in India, longer-term, more environmentally friendly economic growth may be made possible by reducing asymmetric information through enhanced stakeholder coordination and improved information management systems.

The banking systems, through their direct contributions to increased carbon emissions via lending practices, have played a significant role in environmental degradation. Particularly, increased domestic credit to the private sector and commercial bank lending have consistently exacerbated carbon emissions across various sectors, especially in developing and emerging economies. Conversely, by

adhering to green banking practices, such as promoting higher deposit rates to reduce consumer spending on carbon-intensive products, supervising and limiting loans to carbon-polluting businesses, and prioritizing financing for greener initiatives, banks can make conscious choices that significantly reduce carbon footprints. This shift towards sustainable banking practices not only mitigates environmental harm but also fosters a healthier and more sustainable society for future generations.

India is the guiding light for the world in ethical practices since ages. Green banking is also called as ethical banking, hence it is the need of the hour to practice it and set an example for the world.

Our climate is changing, Why aren't we?

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Socio-Economic Conditions of Sugarcane Farmers: A Study (Special Reference to Jamkhandi taluk, Bagalkot District)

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ABSTRACT

India is the second biggest producer of sugar in the world (after Brazil) and the biggest consumer. This makes it a key driver for the outlook of the global sugar economy and for world market prices. In the last decade MECAS (15)19, entitled "India: Future Sugar Industry Prospects" – there has been substantial change in its standing and outlook. Gone is the era of India's Swing Cycle, where years of surplus and deficit would follow one-other on a regular basis, with arrears in farmer payments accentuating the swings. It has been superseded by a period of relatively stable, and surplus, sugar production which has allowed both record exports as well as an expansion of a domestic fuel ethanol programme.

Sugarcane is the one of the major commercial crops and it is considered as major source of income to the farmers. Sugarcane industry plays a major role in the rural and industrial development of a country. Asia is one of the leading producers of sugar followed by the Europe. Most of the sugar in Asia produced from sugarcane whereas in Europe beet is used to produce sugar. Currently, sugarcane is grown in an area of 16 m. ha across 79 countries in the world. The global production of raw sugar is about 112 m.t and India produce 167 m.t stands first in area (3.93 m. ha) among the sugarcane growing countries of the world. Sugarcane plays a pivotal role in the agro-industrial economy of India and in fact in the real economy. Sugarcane production for the year 2015-2016 stood at 306.02 million tonnes with yield of 61.94 tonnes per hectare (Indiastat, 2015-2016). The Sugar Industry in Karnataka has more than 50 sugar factories distributed well across the state. The major benefits of Karnataka sugar industry are many as it has generated many facilities in the state such as communication, employment and transport. The sugar industry in Karnataka contributes around ?36 crore per year to the state exchequer as central excise duty. The study was conducted in the Bagalkot district of Karnataka. Both primary and secondary data were used for the study.

Keywords: Sugar, agro, sugarcane, Farming communities, sugar Industries

INTRODUCTION

Sugarcane farming has been practiced the world over since the Persian farmers discovered the reeds that produced honey without bees between the 6th and 4th centuries in India. Since then, sugarcane farming has been practiced in various tropical regions in the world with the major driver of the industry being the world's increasing demand for sugar. This has led to the expansion of arable land under sugarcane cultivation, with a myriad of problems presenting themselves ecologically, socially and economically.

India is the second biggest producer of sugar in the world (after Brazil) and the biggest consumer. This makes it a key driver for the outlook of the global sugar economy and for world market prices. In the last decade, and since the publication of our study in 2015 – MECAS(15)19, entitled "India: Future Sugar Industry Prospects" – there has been substantial change in its standing and outlook. Gone is the era of India's Swing Cycle, where years of surplus and deficit would follow one-other on a regular basis, with arrears in farmer payments accentuating the swings. It has been superseded by a period of relatively stable, and surplus, sugar production which has allowed both record exports as well as an expansion of a domestic fuel ethanol programme.

The global sugar market, at times, pivots around dynamics from within the Indian sugar industry. In 2022/23, India represents around 15.5% of global consumption. It is the world's largest consuming country, and its consumption total has increased by 10% since 2018/19. Meanwhile, Indian production has reached record output totals in 2021/22, of nearly 36 mln tonnes of sugar, up from the previous record tally in 2018/19 of 32.9 mln tonnes. This also represents a 10% rise and excludes product diverted to ethanol, which in Fig.1 is reflected in the gross production total. The industry is however seen, by some, as a heritage industry, where new innovations have largely passed-by unnoticed and agricultural practices, such as the manual harvesting of green cane and the use of bullocks for field work, are still the norm. But even on these low-tech foundations, the government and industry have combined in recent years to build out both a successful ethanol fuel blending programme and a record sugar export total. Furthermore, the incorporation of some of the Rangarajan report proposals has seemingly brought production onto a more stable footing, if recent production totals are a good proxy for the success of these changes. This positive momentum, towards liberalisation, was set back by the WTO ruling against India, on charges of cross-subsidisation of exports and exceeding WTO-agreed limits for domestic support. While an appeal, lodged by India, cannot be heard given the absence of an appellant body within the WTO structure, the Indian sugar industry structure continues to evolve.

In each of the last three years, and six out of the last seven years, India's sugar production has totalled more than 30 mln tones, as shown in Fig. 1. This benchmark level of production had not been reached in any season prior to 2017/18, suggesting a new era had arrived for the industry. The quiet evolution towards the use of high-pressure boilers, giving a higher return from waste bagasse through electricity generation, in excess of mill requirements, might be cited as a possible driver.

Alternatively, the improvement in molasses use, both domestically and internationally for fermentation and feed use can also be seen as helpful for the industry. However, from a high-level perspective, a more obvious reason is improvements in returns from growing cane, with better cane varieties attaining greater yields while also limiting the risk of crop disease. Two cane varieties, which are often cited in this respect, are Co0238 and Co86032 for subtropical and tropical regions of India respectively. However, the introduction of some 17 new varieties of cane in the last three years, according to CACP, suggests that further evolutionary increments in cane development are still on the horizon.

Unlike in the other major cane producer, Center-South (CS) Brazil, the cane growing cycle in India is short, meaning that there are few ratoons. Most cane varieties are selected to be harvested in 12 months or less, while the planting of new cane stock usually only gets a further two to three months of additional time to root in and establish. Cane harvesting in India is predominantly a two-year cycle. The cane is planted during or ahead of the monsoon between June and September, although it can also be planted after a Kharif (or monsoon) crop, such as rice, is harvested in late September or October. It is then cut for the first time in the fourth quarter of the following year and allowed to regrow once for harvesting after slightly more than 12 months, as most of India's cane processing and sugar production falls into the first quarter of the calendar year.

Sugarcane is tall perennial true grasses of the genus *Saccharum*, with originally soft, watery Culm sugarcane acquired through human selection a distinctive feature of partitioning carbon into sucrose in the stem.

Sugarcane is cultivated in more than 20 million hectares in tropical and sub-tropical regions of the world, producing up to 1.3 billion metric tons of crushable stems. It has served as a source of sugar since hundreds of years, represents an important renewable bio fuel source, which could turn into a global commodity and important energy source.

Background to the study

Sugarcane (Saccharum officinarum) is the prime Indian sugar source and holds a leading position as a cash crop. India is the second largest area under sugarcane in the world. Sugarcane is the important crop for earning the foreign exchange. The sugar industry has been a centre of attention for socio-economic growth of rural regions of India by mobilizing rural resources, creating employment and generating the farm income. Sugarcane gives raw material to the second largest agro-based industry after textile. A portion of the sugar processing factories have broadened by-products basis industries and have invested and set up natural substance plants, paper, refineries, cogeneration plant and alcohol production lines. It directions more prominent criticalness because of their surprising commitment to our nation economy through foreign trade earnings. Now-a-days, the productivity of these yields has raised, however, the magnitude has been exceptionally little. Sustainable manufacturing of such cash crops is essential in order to boost our domestic revenue due to its

significance in forex revenues. The present study was undertaken with the objective: To study the knowledge and adoption level of improved cultivation practices by sugarcane growers.

The main driver behind the expansion of land under sugarcane farming and increasing sugarcane monoculture is the constant rise in the world's demand for sugar. Sugarcane accounts for 80% of the amount of sugar produced worldwide. However, industrialization has led to more investments in sugarcane farming for production of clean fuels, namely; ethanol and biogas.

In 2010, sugarcane was cultivated on about 23.8 million hectares in more than 90 countries with a worldwide harvest of 1.69 billion tonnes. This acreage under sugarcane agriculture is set to expand as sugarcane monoculture is being favoured at the expense of other food crops with resulting impacts on food prices, availability and variability of food commodities in the market and the livelihoods of those who had previously depended on the substituted crops as a source of income. The encroachment of pastoral land by sugarcane in the Afar region of Ethiopia has forced pastoralists to supplement their livelihoods with subsistence-oriented cultivation of maize and sorghum and/or low paid wage labour like the picking of cotton (Altare *et al.*, 2010).

Sugarcane cultivation in India is the largest producer and consumer of sugar in the World. About 45 million sugarcane farmers, their dependents and a large agricultural force, constituting 7.5 percent of the rural population, are involved in sugarcane cultivation, harvesting and ancillary activities. This enabled India to become the largest producer of sugarcane and sugar in the world leaving the other major producers Brazil and Cuba. The major sugarcane crop growing states in India are Uttar Pradesh, Bihar, Assam, Haryana, Gujarat, Maharashtra, Karnataka and Tamil Nadu.

Sugarcane is important cash crop grown in India. Sugarcane cultivation and development of sugar industry runs parallel to the growth of human civilization and is as old as agriculture. The importance and use of sugarcane and sugar in the country's socio-economic milieu is deep rooted and immense. In the current day rural economy set up sugarcane cultivation and sugar industry has been focal point for socioeconomic development in rural areas by mobilizing rural resources, generating employment and higher income, transport and communication facilities. About 7 million sugarcane farmers and large number of agricultural labourers are involved in sugar cane cultivation and ancillary activities. Apart from this, the sugar industry provides employment to 5 lakh skilled and semi skilled workers in rural areas.

India is one of largest sugarcane producers in the world, producing around 300million tonnes of cane per annum. Production of the sugar is the second largest agro processing industry in the country after cotton and textiles. India is the only country that produces plantation while sugar unlike other countries that produce raw or refined sugar or both.

In India, sugarcane the key raw material for production of Sugar and Gur, planted once a year during January to March. It is the major cost driver for the production of sugar. It being an agricultural crop is subject to the unpredictable vagaries of nature, yielding either a bumper crop or a massive shortfall in its cultivation from year to year.

The sugarcane growing may be broadly classified into two agro climatic regions – subtropical and tropical. The subtropical zone includes four States: 1) Uttar Pradesh (UP) 2) Bihar 3) Punjab 4) Haryana. The tropical zones include five States. These are: 1) Maharashtra 2) Andhra Pradesh 3) Tamil Nadu 4) Gujarat 5) Karnataka (Pusappa, 2013).

Sugarcane is in great demand for various other uses like fodder, paper production and most importantly bio-fuels. In a typical sugar mill, 100 tonnes of sugarcane on an average produces 10 tonnes of sugar, 4 tonnes of molasses from which ethanol is produced, 3 tonnes of press mud which is converted into bio fertilizer, 30 tonnes of bagasse used for cogeneration of power to yield 1,500 KW electricity and for manufacturing paper. Besides, about 30 tonnes of cane tops and leaves are generally left in the field, which through recycling further add to the economic value of the crop (Anonymous, 2009).

Sugarcane plays a pivotal role in the agro-industrial economy of India and in fact in the real economy. Sugarcane production for the year 2015-2016 stood at 306.02 million tonnes with yield of 61.94 tonnes per hectare (Indiastat, 2015-2016). The Sugar Industry in Karnataka has more than 50 sugar factories distributed well across the state. The major benefits of Karnataka sugar industry are many as it has generated many facilities in the state such as communication, employment and transport. The sugar industry in Karnataka contributes around [1] 36 crore per year to the state exchequer as central excise duty. The study was conducted in the Bagalkot district of Karnataka. Both primary and secondary data were used for the study. The secondary data was obtained from District Agricultural office, Bagalkot and the primary data was obtained from farmers of Bagalkot district. Sugarcane growing farmers were purposively selected for the study.

Review or Literature

Rao Rama (2012) in his study entitled that efficiency; yield gap and constraints analysis in irrigated vis-à-vis rainfed sugarcane in North Coastal Zone of Andhra Pradesh. The economics of yield gap in irrigated and rainfed sugarcane cultivation have been studied in North Coastal Zone of Andhra Pradesh for the period 2008-09 by collecting data on various aspects of costs and returns. Budgeting techniques, cost concepts, benefit cost ratio (BCR), yield gap analysis and response priority index have been used for the analysis.

Singh, Jaswant *et al*. (2011) in their paper entitled that Alternative Sweeteners Production from Sugarcane in India: Lump Sugar (Jaggary). Importance of sweeteners has long been recognized in Indian diets. Sweetness and flavour are very important as regards consumers' acceptability. The increasing trend of their production is of much significance to learn about peoples' liking towards jaggery in rural areas mainly due to its nutritional and medicinal values. About 25-30% of sugarcane produced in the India.

Thangavelu and Subhadra, (2005) explained that footsteps of sugarcane right from 1923 to 2003. The data was compiled from various source and presented to give conclusion. They said that

sugarcane cultivation cannot be increased beyond a certain limit but the left out way before us was better variety and better cultivation practices.

Methodology

choose for my study purpose random sampling techniques. There is a wide range of sampling techniques including; convenience, typical case and representative and reputational samples. Rationale for selecting cases to addresses specific purposes related to the research questions. Each case is selected to address a particular set of questions so that each case has high information content value. Sample size is usually small, often 60 cases. Determinants of sample size, size is determined judgmental and where time and resources permit selection method judgement based on advice from experts combined with researchers' judgement and possibly checked through rapid exploratory studies.

Area of the study is siddapur village, jamkhandi taluk in Bagalkot district, selected for this study.

Objectives:

1. To know the socio- educational background of sugarcane farmers
2. To trace the economic conditions of sugarcane farmers
3. To know health conditions of sugarcane farmers
4. To know the awareness of benefit policies and programmes of the sugarcane farmers

Methodology:

For the present study the investigator used purposive random sampling method to collect data from siddapur village. For primary data a structured interview scheduled is propagated among respondent relating to the socio-economic aspects and also data was collected from sugarcane farmers in s iddapur village. The data was coded, tabulated and analyzed.

Scope of the study:

The study covers the approximately 60 responds who are differently sugarcane farmers from s siddapur village in bagalkot district.

Table - 1: Age of Respondents

Age	Number of respondents	Percentage (%)
20-35	12	20
35-55	33	55
55-75	15	25
Total	60	100

This table indicates the age group of the sugarcane farmers in the s iddapur village. This table represents 12 members of the respondents that is about 20% of the respondents are related to age group up to 35 years, 33 members of the respondents that is about 55% of the respondents are related to age group of 35 to 55 years and 15 members of the respondents that is about 25% of the respondents are related to age group of 55 to 75 years among the sugarcane farmers in the s iddapur village. According to the above survey the percentage of youngsters in the sugarcane farming is less.
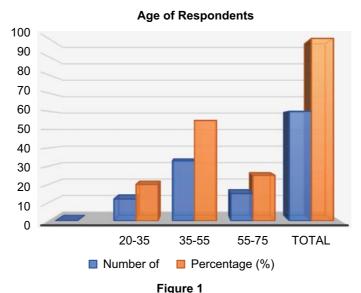

Figure 1

Table - 2: Type of Family

Type of family	Number of respondents	Percentage (%)
Nuclear	42	70
Joint	18	30
Single parent	-	-
Total	60	100

This table indicates the type of family in sugarcane farmers in the s iddapur village. This table represents 42 members of the respondents that is about 70% of the respondents are related to type of family is nuclear family, 18 members of the respondents that is about 30% of the respondents are related to type of family is Joint family and no respondents are related to type of family Single parent family. According to the above survey the percentage of Joint family in the sugarcane farming is less. It is because of financial problems and no respondents are Single parent family.
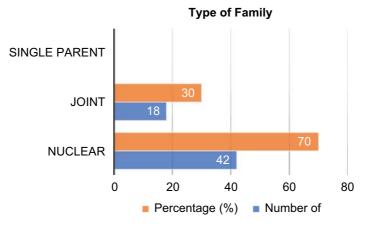
Type of Family

Figure 2

Table - 3: Educational Status

Educational status	Number of respondents	Percentage (%)
Illiterates	21	35
1-5th class	17	28.33
6-10 class	15	25
Inter – degree	7	11.66
Total	60	99.99

This table represents 21 members of the respondents that is about 35% of the respondents are related to the educational status of illiterates, 17 members of the respondents that is about 28.33% of the respondents are related to the educational status of up to 5th class, 15 members of the respondents that is about 25% of the respondents are related to the educational status of 5th to 10th class and 7 members of the respondents that is about 11.66% of the respondents are related to the educational status of Inter –degree.
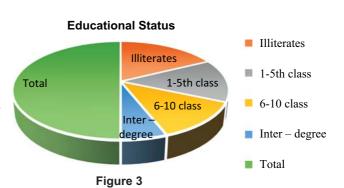
Educational Status

Figure 3

Table - 4: Acres of Land

Acres of Land(acres)	Number of respondents	Percentage (%)
< 5	10	16.66
6-20	39	65
>20	11	18.33
Total	60	99.99

This table represents 10 members of the respondents that is about 16.66% of the respondents are related to the acres of land is below 5 acres, 39 members of the respondents that is about 65% of the respondents are related to the acres of land is 6 - 20 acres, 11 members of the respondents that is about 18.33% of the respondents are related to the acres of land is >20 acres.

Table - 5: Sources of borrowings

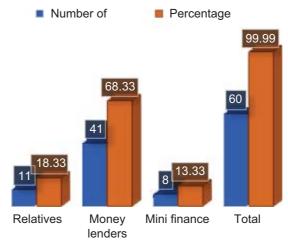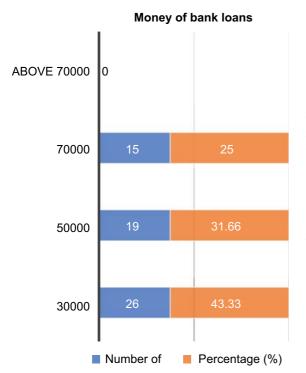| Sources of borrowings	Number of respondents	Percentage(%)
Relatives	11	18.33
Money lenders	41	68.33
Mini finance	8	13.33
Total	60	99.99

Figure 4

This table represents 11 respondents that is about 18.33% of the respondents are borrowings money from relatives, 41 respondents that is about 68.33% of the respondents are borrowings money from money lenders and 8 respondents that is about 13.33% of the respondents are borrowings money from mini finance. According to the above survey more farmers are depending up on money lenders.

Table - 6: Money of bank loans

Money of bank loans (Rs)	Number of respondents	Percentage (%)
30000	26	43.33
50000	19	31.66
70000	15	25
Above 70000	-	-
Total	60	99.99

Figure 5

This table represents 26 members of the respondents that is about 43.33% of the respondents are taken money from bank loans up to Rs 30000, 19 members of the respondents that is about 31.66%.of the respondents are taken money from bank loans up to Rs 50000, 15 members of the respondents that is about 25% of the respondents are taken money from bank loans up to Rs 70000 and no respondents are taken money from bank loans above Rs 70000.

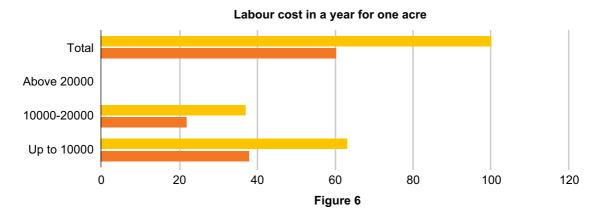**Table - 7:** Total labour cost in a year for one acre

Labour cost (Rs)	Number of respondents	Percentage (%)
Up to 10000	38	63
10000-20000	22	37
Above 20000	-	-
Total	60	100

Labour cost in a year for one acre

Figure 6

This table indicates the total labour cost in a year for one acre in sugarcane farming in the study area. This table represents 38 members of the respondents that is about 63% of the respondents are related to total labour cost in a year for one acre is up to Rs 10000,

22 members of the respondents that is about 37% of the respondents are related to the total labour cost in a year for one acre is Rs 10000 Rs 20000 and no respondents are related to total labour cost in a year for one acre above Rs 20000.

Table - 8: Mode of disposal of sugarcane

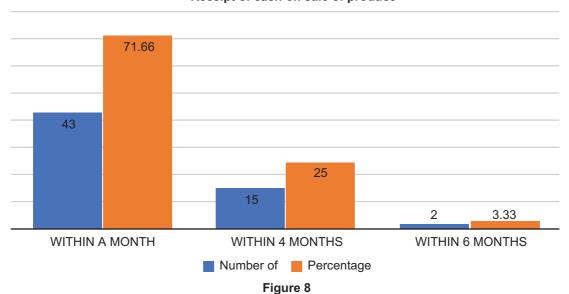| Disposal of sugarcane	Number of respondents	Percentage (%)
Sent to factory	42	70
Direct sale to jaggeryunits	18	30
Total	60	100

Figure 7

This table represents those 18 members of the respondents that is about 30% of the respondents are related to mode of disposal of sugarcane was sent to factory, no respondents are related to mode of disposal of sugarcane was direct sale to juice vendors and 42 members of the respondents that is about 70% of the respondents are related to mode of disposal of sugarcane was direct sale to jaggery units. According to survey a greater number of sugarcane farmers prefers to direct sale to sugar factory.

Table - 9: Time for receipt of cash on sale of produce

Time of cash	Number of respondents	Percentage(%)
Immediately	-	-
Within a month	43	71.66
Within 4 months	15	25
Within 6 months	2	3.33
Total	60	99.99

Receipt of cash on sale of produce

Figure 8

This table represents no respondents are receipt of cash on sale of produce Immediately, 43 members of the respondents that is about 71.66% of the respondents are related to the receipt of cash on sale of produce in within a month, 15 members of the respondents that is about 25% of the respondents are related to the receipt of cash on sale of produce in within 4 months and 2 members of the respondents that is about 3.33% of the respondents are related to the receipt of cash on sale of produce in within 6 months.

Table - 10: Government Schemes

Schemes	Number of respondents	Percentage(%)
Tractor loans	7	11.66
Crop loans	24	40
Spray subsidy loans	12	20
Input subsidy	17	28.33
Total	60	99.99
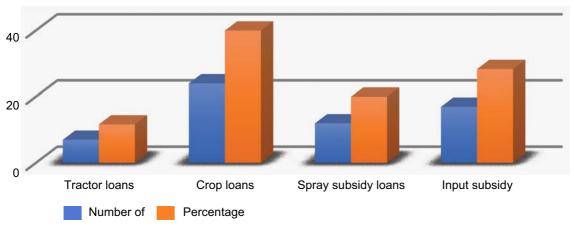
Figure 9

This table represents 7 members of the respondents that is about 11.66% of the respondents are related to the government programmes of tractor loans, 24 members of the respondents that is about 40% of the respondents are related to the government programmes of crop loans, 12 members of the respondents that is about 20% of the respondents are related to the government programmes of spray subsidy loans and 17 members of the respondents that is about 28.33% of the respondents are related to the government programmes of input subsidy.

Conclusion

Sugarcane production, farmers' perceived production constraints and preferred traits of small-scale sugarcane growers of the southern Ethiopia were assessed using a PRA approach. Further, 90 genetically diverse sugarcane germplasm grown by smallholder farmers were collected for breeding and conservation. Sugarcane production under the smallholder systems is challenged by a number of constraints across the value chain that limits the productivity and income of growers. Main sugarcane production constraints included drought stress, declining soil fertility, limited access to market, land shortage, lack of inorganic fertilizers, and other production inputs, and limited extension service.

The use of resources in the Sugar industry is spatially organized by the countries that produce sugar and the countries that buy or trade sugar. The producing countries are normally tropical countries and they are sometimes developing countries. The trade and export of sugar shows the interconnections of the world through one product. This ensures that the consumption and use of sugar which is in demand for more production. Though there is consequences by the health effects and environmental effects which can lead to many serious problems. The interconnections of sugar is led by the farmer who farm the sugarcane product, the workers that work in the refining prose, the engineers and the exporters. It is concluded from the research findings that although sugarcane was the main crop of the study area, but the farmers faced many problems regarding sugarcane production. Consequently, these problems in return cause low productivity of the crop due to which the area under sugarcane cultivation is decreasing which affect the socio-economic conditions of the farmers. The farmers of the study area also called increase in prices of farm inputs a big threat to sugarcane production and demanded an equivalent change in prices of canes by the government so that they can take equal return. Sugar factories across the country are not able to make payment of the sugarcane purchased from the farmers Farmers are suffering

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A Theoretical Framework for The Utilization of Artificial Intelligence Technology in The Transformation of Human Resource Management- A Conceptual Study

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ABSTRACT

Technological improvements have been crucial for achieving positive outcomes in many firms in recent times. Artificial Intelligence (AI) has permeated several industrial sectors and has become firmly established, exerting a more significant influence on human lives and society compared to ever before. AI is often associated with several advantages, but there is also significant concern due to the utilization of sophisticated algorithms, machine learning, and data analytics. Artificial Intelligence (AI) has established itself in several fields, and its potential is vast due to its limitless advantages. Thanks to recent breakthroughs in digital technology, AI applications have surpassed human capabilities in areas such as voice interfaces, facial recognition, and decision making using neural networks. Organizations should focus on customizing the employee experiences and retaining them by utilizing cutting-edge artificial intelligence technology. The primary objective is to demonstrate the effectiveness of Artificial Intelligence in Human Resource Management (HRM) inside organizations. This will be achieved by creating a conceptual framework that incorporates AI technology and six aspects of HRM using resource-based view and socio-technological theory. This model also elucidates the interconnections between AI and HRM that will revolutionize the manner in which HRM activities are executed. The study relies on prior research, publications in scholarly journals, expert insights from interviews, and white papers from organizations.

Keywords: AI, HRM, Integration of AI, AI technologies, AI in HRM

Introduction

The Industrial Revolution brought about rapid urbanization, which refers to the migration of individuals to urban areas. The movement from rural areas to urban centers was driven by advancements in farming techniques, the rapid growth of populations, and intensifying job market rivalry. In 2016, Schwab, the founder of World Economic Forum, introduced the term "the 4th Industrial Revolution" to refer to a time marked by a technology revolution that is eroding the distinctions between the biological, digital, and physical realms."We are currently sailing employment," which includes hiring, staffing, onboarding new hires, training, and handling pay and benefits. Instead, we are becoming a "convener of work," helping the company efficiently manage how projects are completed, whether they are carried out by employees, independent contractors, or individuals supported by machines. According to Whysall et al. (2019), the 4th Industrial Revolution has resulted in a substantial gap between the present skills of employees and the necessary competences needed to address the challenges brought about by technological changes. In order to bridge the gap, companies should contemplate employing the most current and influential methods for nurturing talent.

The main Objective of this study

- To learn about AI and future of work
- To understand the areas of application of AI in HRM
- To discuss about the ethical considerations of AI in HRM
- To develop a theoretical framework for integrating and applying Artificial Intelligence (AI) technology in Human Resource Management (HRM) operations.

The study utilized secondary data from many sources including journal articles, white papers, previous research works, books on AI and HRM, and websites. The data was collected using particular search phrases such as AI, HRM, Integrating of AI in HRM, Reinvention of AI, HR functional domains, and Application of AI technologies. The gathered literary works were examined and contributed to the formulation of the model.

Literature Review

Artificial Intelligence

Bhbosale, Pujari, and Multani (2020) define AI as a discipline and branch of engineering that concentrates on developing smart devices and algorithms , enabling them to do a range of jobs that would ordinarily necessitate human intelligence. As stated by Benko & Lányi (2009), this technology possesses the capacity to replicate a diverse array of tasks that a human is capable of performing. Artificial intelligence leverages large datasets to achieve outstanding performance on the given tasks. The origin of the concept of sentient machines can be traced back to Rene Descartes, a French philosopher, who used the metaphor of a "mechanical man" in his writings. Jules Verne, a

prominent writer in the 19th century, and Isaac Asimov, a renowned writer in the 20th century, capitalized on this chance to incorporate elements of fantasy into their science fiction works involving intelligent beings who are not human. According to Chan and Chary (2019), the DSRPAI has been regarded as a pivotal moment in the advancement of artificial intelligence. An instance of this can be demonstrated by the computer software ELIZA, a tool for natural-language processing developed by Joseph Weizenbaum, that possesses the ability to participate in discussions with human beings. ELIZA holds historical significance as the initial software to pass Turing's test with success (McCarthy et al., 2006). Although the development of machine learning and artificial intelligence has been inconsistent over time, the combination of exceptional computing power and vast amounts of data has greatly fueled the current expansion of intelligence-driven applications.Chien et.al. (2020) explain that the integration of AI and big data has led to a significant change in several industries globally. AI entails the emulation of human intelligence. AI subcategories, including deep learning and machine learning, are extensively employed in various business applications, such as marketing, customer support, and product suggestion, among others. The progress of technology in the modern day has a significant impact on various businesses, such as medical diagnosis, security, and numerous others. Furthermore, social media companies use big data and artificial intelligence to filter out objectionable comments and show advertisements. AI also leads to the development of digital assistants. Siri, Alexa, and Cortana, which are voice assistants developed by Apple, Amazon, and Microsoft respectively, have the capability to carry out tasks that include monitoring schedules, browsing the internet, and doing several other functions. Automotive parking is being automated with the help of deep learning, a subfield of artificial intelligence. Nvidia, a technology corporation, utilizes AI to enable cars to possess the ability to engage in reasoning, comprehension, and perception of various driving situations. Automakers like Audi, Tesla, Rolls-Royce, and other companies utilize artificial intelligence technologies. Google's predictive search, which utilizes AI, intelligently anticipates and suggests search queries based on user preferences. With the intelligent tools, intelligent profiles of users can be generated, which maximizes the outcome and helps to contextualize. Financial companies, including American Express, are utilizing AI to identify and prevent fraudulent activities, as well as to expedite and enhance decision-making processes. The introduction of smart technologies has enhanced and customized customers' shopping experiences. The retail sector, exemplified by companies such as Macy's and Ikea, has seen a transformation through the implementation of AI. This technology enables customers to have an in-store experience from the comfort of their own homes, thanks to personalized recommendations and interactive interactions facilitated by chatbots.

Application of AI in organizations: AI is widely employed by enterprises to accomplish several objectives, such as enhancing process effectiveness, refining current products and services, fostering innovation in creating novel goods and services, aiding in decision-making, and reducing expenses. An ongoing topic in AI-related literature has been the diminishment of workforce in the labour market; nonetheless, this is a matter of contention and experts argue that AI will collaborate with humans. Initially, executives focused on utilizing artificial intelligence technology to mechanize

particular workflow operations and monotonous jobs. Next, we will discuss subjective cognitive performance, which includes abilities such as prediction, solving issues, and innovation. These abilities were formerly believed to be impossible to automate, but recent advancements have challenged this notion.

AI and Future of Work

Despite the current challenges, artificial intelligence possesses the capacity to profoundly transform the organization of the workforce, the planning of job roles, the handling of information, and the decision-making processes in the future. We still don't completely understand or appreciate the profound effects these changes will have on communities and organizations.

Automation of job functions: It will be significantly impacted by AI, as it will automate repetitive jobs and replace a variety of human skills with machine learning. Faraj et.al. (2018) states that the impact of AI-enabled automation is distinct from previous technologies since AI has the ability to carry out tasks that previously relied on human judgment. Additionally, these effects are the first to affect knowledge workers' jobs.

Expertise: Acquiring and developing knowledge: Although automation can increase operational efficiency and reduce labour expenses, it ultimately leaves practitioners without the means to obtain information about their subjects or clients or to establish their expertise. According to Benbya (2008), these will ultimately end up in changes to the abilities and knowledge needed for the impacted jobs, and could even contribute to their reorganization.

Augmenting professionals not replacing them: AI systems can augment the capabilities of human experts by enhancing their decision-making and judgment skills, while they are not now capable of completely substituting human specialists. Working conditions are rapidly changing, and although many analysts predict that integrating human and machine intelligence will be the key to success, we still need to understand the tasks that the "augmented professionals" may complete and the possible implications for the workplace, institutions, and organizations (Lifshitz-Assaf, 2021).

Amidst the emergence of these advanced AI technologies, there is a pressing concern regarding the potential displacement of human workers by machines in the workforce. The final decision is still uncertain: certain experts firmly believe that AI is unlikely to sufficiently automate tasks to result in the loss of jobs for millions of individuals, but others consider it to be a crucial concern.

Human Resource Management

Human Resources (HR) is an essential element of any firm as it directly impacts the well-being of its employees. Schemerhorn (2001) defines human resource management (HRM) as hiring and training qualified employees to help a business accomplish its goals and fulfill its mission. HRM can be understood as a strategic approach to developing employees in order to create a workforce that is skilled and committed. This is achieved through several tactics, including cultural, structural, and

people initiatives, with the goal of giving the company a competitive advantage (Storey, 2004). HRM can be defined as systematic acquisition and retention of new skills, competencies, and competences within a company's workforce, achieved through the implementation of diverse management tactics. Maley (2014) states that the company's management system has traditionally given more importance to short-term financial objectives rather than longer-term goals associated with human welfare. Simultaneously, over the past thirty years, human resources have emerged as crucial elements in company strategy (Jackson et.al., 2014) and have been recognized for their ability to enhance firm performance by impacting revenue and expenses, and aligning with the economic objectives of stakeholders and owners. The management of human resources in a firm is a dynamic and constantly evolving part that necessitates proper attention and oversight by the organization (Bibi et.al., 2016).

Recent trends in human resource management

An effective human resources (HR) department is crucial for the success of any firm. Human resources refer to the individuals responsible for evaluating job applicants, selecting the most skilled candidates, and ensuring the retention of top personnel inside the organization. The recruitment and retention techniques employed by HR teams are constantly changing, especially brought forth by COVID-19 pandemic.

The following features are recent developments that have been implemented in organizations in relation to the HR function:

- Well-implemented and executed diversity and inclusion training programs and initiatives.
- Lately, departments have experienced a significant surge in their adoption of cloud technology for automating and managing their operations.
- Ensuring the organization's work culture is preserved in a virtual setting
- Prioritizing the well-being of employees
- Customized benefits adjustment to meet the specific needs of each employee
- Adaptations in human resources protocols and practices
- Constantly evolving skill prerequisites
- Flexible and adaptable workforce
- Dispersed work locations refer to virtual teams and remote work.

Six Dimensions of Human Resource Management

HRM is a dynamic and innovative field that encompasses a range of functions and processes. This study incorporates the major six aspects of human resource functions, which have been derived from an analysis of many studies and models provided by HR specialists. These dimensions are universally relevant to all organizations. The components encompassed in this context are strategic

planning, hiring, learning and growth, performance appraisal, compensation management, and employee engagement. Each of the six elements of HRM are interconnected and work together to form a streamlined HR system, as depicted in Figure 1. Strategic Human Resources Management is a concept discussed by Noe et.al. in 2006.

Figure 1 : Six dimensions of HRM

The HRM function commences with the process of HR planning. The main purpose is to help the business forecast future personnel needs and identify fundamental personnel characteristics. Recruitment and deployment, guided by human resource planning, are essential for the organization's functioning, providing sustenance and addressing staffing and fit issues. The central focus of employee development and training is learning, which facilitates the acquisition of new skills and knowledge to enhance efficiency. Performance management is a fundamental aspect of the six dimensions. Its periodic goal-setting and feedback methods also function as its main input for other dimensions. The objective of the compensation management role is to provide incentives and rewards to people in order to stimulate intrinsic motivation and retain them. Employee engagement aims to effectively oversee and support employees, so facilitating the establishment of a self-reinforcing cycle of rational human resource allocation inside the firm. All these roles are interconnected and interdependent, working together to generate a synergistic effect within an organization. The functions of Human Resource Management (HRM) also involve dealing with individuals who have varied emotions, feelings, and moods, which adds to the dynamic and complicated nature of the field.

AI Technologies for HRM

The application of AI in HRM may be analyzed from several theoretical perspectives. The Resource-Based View (RBV) hypothesis suggests that firms may gain a competitive advantage by effectively using resources that are valued, scarce, difficult to imitate, and have no substitutes (Barney, 1991). AI in HRM is seen as a strategic asset that boosts organizational capacities by optimizing efficacy, making decisions, and talent management procedures. AI-powered solutions can enhance the efficiency of recruiting processes by rapidly evaluating resumes and selecting the most qualified individuals, hence maximizing the utilization of human resources in the HR department (Bode et al., 2020). Through the integration of artificial intelligence (AI), firms may optimize the allocation of their human resources to focus on more important activities, therefore improving overall performance and gaining a competitive edge.

Another relevant theory is the Socio-technological Systems (STS) Theory, which highlights the interconnectedness of social and technological components inside an organization (Trist, 1981). To obtain effective outcomes, the use of AI in HRM tasks must take into account both the technology

components and the human factors. This idea posits that although AI has the capability to automate mundane jobs and offer insights based on data, the involvement of humans is still essential for making nuanced decisions and upholding the culture of an organization (Pasmore et al., 1982). AI can aid in performance reviews by offering unbiased data, but human discernment is necessary to understand these metrics in relation to the specific contributions of employees and the aims of the business (Davenport & Ronanki, 2018). Hence, the incorporation of artificial intelligence (AI) in human resource management (HRM) should be viewed as a socio-technical transformation, carefully managing the interplay between technology capabilities, human knowledge, and ethical deliberations.

Although the work structure is undergoing changes, artificial intelligence is not now displacing people. It allows us to effectively construct a system based on knowledge and utilize that information to enhance automation, leading to an improved quality of life. While there is some speculation, there is widespread concern about AI's impact on employment. It is probable that algorithms would primarily replace white-collar occupations, including those of business analysts, financial advisors, and legal professionals. With the increasing integration of artificial intelligence in various industries, it appears unlikely that all human vocations would be completely eradicated (Ahmed, 2018). Rather, a rising number of experts believe that future workforce trends will favor greater specialization. More capabilities that technology cannot replace, such creativity and qualitative characteristics like emotion intelligence, empathy, etc., will be required for these occupations. Generally, employees are typically expected to remain in the employment indefinitely, although their duties may evolve as technology progresses. As AI technology develops, sectors will see the birth of new companies, the growth of consumer applications and startup ecosystems, the replacement of some jobs with radically new ones, and the replacement of a small number of jobs.

Multiple research studies have demonstrated that incorporating artificial intelligence (AI) into human resources (HR) processes can enhance organizational performance. AI tools have the capability to analyze, forecast, and interpret data, providing valuable help to HR professionals in making informed decisions. In her paper, Wislow (2017) asserts how artificial intelligence is revolutionizing the methods by which companies oversee their workers and formulate strategies, resulting in heightened productivity and overall employee involvement. The question of if artificial intelligence (AI) may alter how businesses recruit, train, manage, and make use of the resources available in the workplace is posed in the following passage from Faiyaz (2018). Undoubtedly, AI plays a crucial part in HRM. However, it is imperative for every firm to embrace and enhance AI technology as it streamlines the tasks of human resources professionals and the firm's leaders. Peter (2018) convincingly illustrated that AI will soon cause a drastic transformation in the implementation of HR policies in businesses. Strategic planning is essential in the realm of managing human resources. During the strategic planning process, the manager of human resources will carefully analyse and condense past work, with a specific focus on the future growth trajectory of the company (Samarasinghe & Medis, 2020). McCarthy et.al. (2006), a pioneer in the subject, defines AI as "the scientific and engineering discipline focused on developing intelligent devices,

specifically intelligent computer programs." AI can be described as the utilization of computers to comprehend human intelligence, without being limited to biological observations. These artificial intelligence technologies pay close attention to detail, save time, process large amounts of data, and generate accurate results. Figure 2 below illustrates the integration of artificial intelligence with several types of technology.

Artificial intelligence is presently being widely employed in various domains, such as text analytics, speech recognition, picture processing, chatbot assistance, and the advancement of natural language processing. In conclusion, Strohmeier and Piazza's (2015) paper examines the possibilities of AI in HRM by examining six different scenarios.

| Intelligent Expert System |
| Data Mining |
| Knowledge Discovery |
| Big Data Analytics |
| Intelligent Robots |
| Face Recognition |
| Nerural Network |
| NLP |
| Voice Interaction |

Figure 2 : AI technologies

- Artificial neural networks are employed for predicting employee turnover

- Knowledge-based search engines are utilized for identifying potential candidates during the recruitment process

- Genetic algorithms are used for staff scheduling and platooning

- HR sentiment analysis is conducted using text mining techniques

- Information retrieval is employed for data capture

- Interactive voice response platforms and digital assistants provide employees with autonomy

- Strategies for implementing gamification and behavioural economics (nudges) in talent management

Ethical Considerations of AI in HRM

The incorporation of Artificial Intelligence (AI) into Human Resource Management (HRM) gives rise to several ethical considerations that must be resolved to guarantee just and impartial results. An important concern is the possibility of algorithmic bias, in which AI systems could reinforce preexisting prejudices found in historical data, resulting in unfair hiring practices. For example, if an artificial intelligence system is educated with data that reflects historical prejudices against specific groups, it may persist in exhibiting discriminatory behavior against these groups (Binns, 2018). Furthermore, the absence of openness in AI processes for making decisions might worsen this problem, as it becomes challenging to comprehend and question the reasoning behind AI-driven conclusions (Pasquale, 2015). To achieve fairness and minimize prejudice, it is necessary

to provide methods that can identify and rectify these biases in AI algorithms. Additionally, it is important to have strong monitoring and auditing systems (Raghavan et al., 2020).

Another important ethical concern is the influence of AI on confidentiality and the security of data. Human Resources (HR) departments are responsible for managing confidential personal data. The use of Artificial Intelligence (AI) requires strict procedures to ensure the privacy and security of this information, preventing unapproved access and leaks (Hoffman, 2019). It is essential to gain informed permission from workers and applicants regarding the usage of their data and consequences of AI-driven choices (Burt, 2019). In addition to privacy problems, the ethical challenges arising from the possibility of job displacement caused by AI automation of HR services necessitate firms to contemplate the wider consequences for their workforce and offer assistance to impacted individuals (Brynjolfsson & McAfee, 2014). Ultimately, the responsible integration of AI in HRM requires the establishment of ethical principles, the maintenance of openness, the assurance of responsibility, and the prioritization of human oversight (Cowgill et al., 2020).

Conceptual Framework

A conceptual model was developed by incorporating the six areas of human resource management by applying RBV and STS theory which were discussed above: human resource planning, recruitment and selection, training and development, performance appraisal, compensation administration, and employee relations through effective involvement. Figure 3 illustrates this concept. An organization's output can be made more efficient and effective by integrating artificial intelligence technologies—such as neural networks, facial and speech recognition, intelligent automation, NLP, analysing data, big data analysis, expert systems, and more—with human resource functions. The aforementioned outcomes lead to increased efficiency and productivity in machine-human coordination processes, including intelligent decision support, evaluation, training, incentive systems, consultation structures, and human-machine interactive systems.

Artificial intelligence (AI) can enhance the human resource planning process by utilizing data mining and expert systems. This integration enables more effective making decisions in job evaluation and determination of job characteristics. Making future projections, analysing past data, and getting insights into the environments within and outside of an organization are all made easier by artificial intelligence. This helps ensure that human resource management is strategically planned to increase the organization's effectiveness. AI software holds the capacity to significantly augment the effectiveness of hiring and selecting procedures.

The application screening process involves utilizing an Applicant Tracking System (ATS) to extract relevant data from the applications. This data is then analysed through data mining techniques, focusing on specific keywords related to the job description. The interview process is scheduled, and AI-based interviews and tests are conducted to assess the candidates' suitability for the position. Additionally, audio recognition and technologies that recognize faces are used to assist in the personal

interview process. Throughout the entire process, candidates are guided and supported through the use of a chatbot. This circumstance can be accommodated by a responsive human-machine system (Hmoud & Laszlo, 2019). Particularly, the utilization of machine learning in the video interview method (Escalante, et al., 2017) is gaining popularity, especially in the post-pandemic era. With the purpose of increasing the probability of concluding an agreement with the best qualified candidate, digital assistants assist in honing role proposals based on market data. New hires' first onboard and initiation process can be technologically facilitated with the use of artificial intelligence. Onboarding and induction can be conducted at any hour, reducing the overall duration of mundane administrative duties.
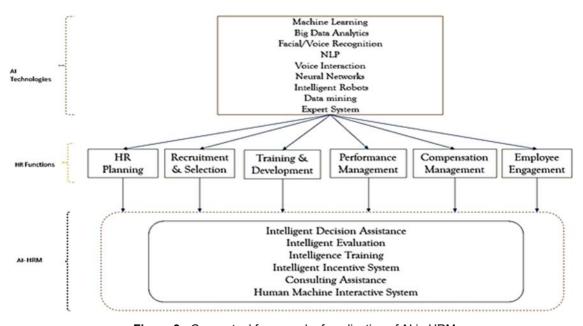

Figure 3 : Conceptual framework of application of AI in HRM

Maintaining employee engagement becomes challenging in the absence of active professional development opportunities or inflexible learning approaches. Artificial intelligence in training and development allows human resources to focus exclusively on creating top-notch learning programs that align with current trends, changes, and individual skillsets and competencies (Wislow, 2017). These programs can then be made accessible by means of a platform for e-learning. By utilizing AI, employees have the opportunity to enhance their productivity by independently acquiring new skills and knowledge at their preferred speed. Personalized learning and course suggestions based on competency assessments can be used to plan employees' learning and training. AI technology can address staff engagement issues by supplying essential resources, employing effective strategies and sessions, and implementing tracking and regular feedback systems, thereby lowering disengagement. Artificial intelligence is utilized to collect and provide personalized information

regarding the career progression of each individual. This helps human resources create plans for career growth and succession.

Thanks to advancements in artificial intelligence, it is now possible to develop personalized career trajectories and provide tailored recommendations. According to research, the majority of workers would choose a computer over their supervisor, and most have consulted a virtual assistant rather than their manager for advice. Due to the progress in artificial intelligence, evaluation of employee performance can now be based on data and focused on achieving specific objectives. Through the assistance of digital assistants and smart career development skills, employees have the ability to establish their professional objectives, establish connections with helpful mentors, propose new job opportunities, and identify suitable study courses. Digital assistants with intelligent career planning capabilities can facilitate many activities such as individual goal formulation, performance evaluation, personal development plans, and anytime feedback (Cregan et.al. 2021). This kind of performance management, combined with career growth, contributes to employee retention. Organizations strive to align their compensation management with that of their competitors. Artificial intelligence may offer a strategic and nuanced perspective on the best way to group jobs by analysing a vast array of salary data points in connection to the regional market and pertinent competitor data. Data mining and projections for the candidate chosen for the role can be used to determine the return on investment (Eubanks, 2018). Consequently, businesses will have enhanced capacity to fulfil the needs of their workforce and retain their best workers. This model illustrates that artificial intelligence can aid companies in customizing employee experiences throughout all human resources procedures, thereby helping them retain their top-performing staff.

Conclusion

Artificial intelligence, robotics, and neural networks are rapidly improving and changing various occupations, professions, and careers. Artificial Intelligence (AI) is revolutionizing the future of human resource (HR) functions by automating repetitive tasks like candidate screening and administrative processes, thus allowing HR professionals to focus more on strategic initiatives such as talent development and employee engagement. AI-powered tools are enhancing recruitment processes through predictive analytics that identify top candidates and personalize experiences. In performance management, AI provides real-time insights into employee performance and suggests personalized learning opportunities, fostering continuous growth. Moreover, AI-driven data analytics enable HR teams to make informed decisions about workforce planning, retention strategies, and organizational development, ensuring alignment with business goals. While AI streamlines operations and improves efficiency, its ethical implementation is crucial to maintaining fairness, transparency, and trust in HR practices, emphasizing the need for ongoing human oversight and ethical guidelines in AI integration within HR functions.

Human resources must familiarize themselves with the future workforce and expedite the process of redesigning the business at a faster pace than ever before. The integration of

HR approaches with solutions powered by AI is likely to have a substantial influence on improving the overall effectiveness of the business. These advanced AI-based HR tools can assess, predict, and diagnose—despite the fact that AI technologies lack human emotions and cognitive capacities. As such, they are an invaluable asset to any kind of business, regardless of sector. Regarding the debate about AI replacing human labour, it is highly unlikely to occur in the near future or even in the foreseeable future, except for a few specific job positions that do not require non-cognitive intelligences. However, there are a number of administrative roles in HRM that involve a significant amount of repetitive work that can be fully or partially automated using artificial intelligence. These tasks include creating timesheets, posting jobs, recruiting, screening, organizing interviews and meetings, recording and verifying accounts, and creating job postings. HR professionals have found this to be very advantageous as it will free up more time for more goal-oriented tasks like relationship development, relationship building, emotional intelligence, and people related issues at work.

The incorporation of Artificial Intelligence (AI) into Human Resource Management (HRM) signifies a substantial organizational transformation, substantially reshaping the execution of HR tasks. Artificial intelligence (AI) has the capacity to revolutionize several human resources (HR) procedures, such as recruiting, performance evaluation, employee involvement, and workforce strategizing. AI-driven systems have the ability to automate repetitive operations like resume screening, allowing HR professionals to allocate their time and attention to more strategic initiatives (Stone et al., 2015). In addition, AI has the capability to offer insights based on data analysis, which may boost decision-making and increase the precision of talent management procedures (Jiang et al., 2017). Nevertheless, this technological advancement necessitates businesses to confront any ethical issues, guarantee data confidentiality, and harmonize the utilization of AI with human discernment in order to preserve impartiality and openness (Leicht-Deobald et al., 2019).

The field of human resources has significant promise for the application of AI. Nevertheless, there exist specific obstacles that firms need to surmount in order to effectively use the advantages of incorporating AI into human resources (Bersin, 2017). In order for AI to mimic human behaviour, it is crucial to gather and evaluate useable, high-quality data. Without such data, the outcomes produced by AI can be unreliable. Collecting all data relating to individuals is a time-consuming process, however, it is merely the initial stage. Firstly, it is imperative to safeguard the privacy of employees' personal information, job achievements, and organizational policies to prevent any misuse, and necessary steps should be taken to maintain the security of this information. Artificial intelligence (AI) should possess transparency, comprehensibility, and verifiability. Users' trust in artificial intelligence may be undermined if they cannot grasp its operational mechanisms, while leaders may hesitate to embrace AI if they cannot observe tangible evidence of its decision-making process. Ultimately, it cannot be asserted that artificial intelligence will achieve a 100 percent efficiency in completing tasks. However, it is reasonable to state that it will greatly diminish human errors and bias. Notwithstanding these challenges, numerous firms are already making progress in incorporating artificial intelligence into their HR operations due to the superior advantages outweighing the obstacles.

Based on this study, it is evident that incorporating artificial intelligence into the administration of human resources should be regarded as a favourable prospect. This is due to the fact that, when properly understood and used, artificial intelligence (AI) has already started to improve people's quality of life and may lead to a more prosperous future for the economy.

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Green Finance and Sustainable Investment Practices

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ABSTRACT

This research paper examines the critical role that green finance and sustainable investment practices play in advancing environmental sustainability. It explores key theoretical frameworks, such as institutional theory, which motivate financial institutions to embrace green finance. The paper also delves into sustainable investment strategies, including socially responsible investing (SRI), impact investing, and the application of environmental, social, and governance (ESG) criteria. These practices have gained increasing prominence due to their growing demand and their demonstrated favourable risk-return profiles. Additionally, the study investigates the influence of international agreements, such as the Paris Agreement, and government policies on the expansion of sustainable finance. These regulatory frameworks encourage financial institutions to integrate environmental considerations into their investment decisions. Ultimately, the paper underscores the pivotal role that financial institutions can play in advancing global sustainability goals by promoting and scaling up green finance and sustainable investment practices. By doing so, they not only contribute to mitigating environmental risks but also support the transition to a more sustainable global economy.

Keywords: Green finance, sustainable investment, ESG criteria, impact investing, institutional theory, regulatory frameworks

I) Introduction

The term "green finance" covers a wide range of financial operations and investment techniques that have as their primary goals the promotion of ecologically friendly behaviour, the mitigation of climate change, and the assistance of sustainable development. In order to lower carbon emissions, improve energy efficiency, and encourage the use of renewable energy sources, it includes financial measures. Green financing is the process of raising money from the public and private sectors to support initiatives and innovations that promote environmental sustainability.

The integration of ethical and sustainable factors into investment decisions is the hallmark of sustainable investment practices, which are sometimes referred to as environmental, social, and

governance (ESG) or socially responsible investing (SRI). Along with having a beneficial social and environmental impact, these methods hope to provide long-term financial gains.

Socially conscious investors evaluate possible investments using a set of principles called environmental, social, and governance (ESG) criteria. Here's a breakdown of each component:

a) **Environmental:** This criterion looks at an organization's performance in managing the environment. It takes into account things like the company's influence on biodiversity, waste management, energy efficiency, carbon emissions, and the preservation of natural resources.

b) **Social**: This criterion examines how a business handles its interactions with its customers, suppliers, workers, and the communities in which it works. It addresses topics including human rights, diversity and inclusion, labour practices, and community involvement.

c) **Governance:** This criterion addresses internal controls, shareholder rights, audits, executive compensation, and leadership inside a corporation. It covers things like anti-corruption measures, openness, commercial ethics, and diversity on the board.

II) Importance

The importance of green finance and sustainable investment practices is crucial in achieving environmental sustainability goals for several reasons:

1. **Mobilizing Capital for Sustainable Projects**: Green finance is the allocation of financial resources to initiatives that support environmental sustainability, such sustainable agriculture, clean transportation, and infrastructure powered by renewable energy. The expansion of programmes aimed at reducing pollution, preserving ecosystems, and slowing down climate change requires this financial assistance.

2. **Encouraging Innovation and Technology Development**: Sustainable investing methods make it easier to make investments in green technology and developments. In order to maintain the environment and save resources, this financing promotes research and development in the areas of clean energy, energy efficiency, and other sustainable solutions.

3. **Enhancing Corporate Responsibility and Accountability**: By taking ESG factors into account, sustainable investment strategies encourage businesses to embrace ethical business practices. Improved social outcomes, less environmental effects, and increased stakeholder trust are all results of this integration's promotion of openness, moral behaviour, and responsible governance.

4**. Mitigating Environmental Risks and Enhancing Resilience**: Financial institutions and investors reduce the risks associated with climate change, environmental deterioration, and legislative changes by giving priority to sustainable investments. By taking a proactive stance,

communities and companies become more resilient to environmental threats, ensuring long-term economic growth and financial stability.

5. **Supporting Global Sustainable Development Goals**: Sustainable development goals (SDGs) of the United Nations are one international framework that green financing is in line with. Targets for social impact initiatives, inexpensive and clean energy, clean water and sanitation, and sustainable cities and communities are all directly impacted by investments in clean energy and sustainable infrastructure.

III) Objective

1. Develop a comprehensive theoretical framework for green finance, defining its components and mechanisms.

2. Conduct a conceptual analysis of sustainable investment practices, including ESG criteria and impact investing models.

3. Explore how government policies and international agreements influence green finance and sustainable investments.

4. Theorize the risk-return relationship in sustainable investments versus traditional investments.

5. Investigate institutional theory's role in explaining financial institutions' adoption of green finance practices.

IV) Research Methodology

The present study is purely based on secondary data. The main source like reference books, research papers, journals, periodicals and various website.

V). Theoretical Framework of Green Finance

A) Key components and Mechanisms of green finance

1. **Green Bonds:** Debt instruments issued to fund environmentally beneficial projects such the installation of renewable energy sources, improvements to energy efficiency, and conservation initiatives.

2. **Green Loans:** Eco-friendly project financing is provided through green loans, which are financial instruments. These loans sometimes include advantageous conditions, including lowered interest rates or longer payback terms, to encourage investments in environmentally friendly projects like energy-efficient infrastructure and renewable energy installations.

3. **Green Equity Investments:** Investing in firms or projects that satisfy environmental standards entails buying shares in them. With an eye towards both financial gain and a beneficial environmental impact, this kind of investment promotes the expansion of companies involved in clean technology, renewable energy, and other sustainable industries.

4. **Sustainable Investing**: investment plans that include governance, social, and environmental (ESG) considerations into financial choices. This includes impact investment, which seeks to provide quantifiable financial returns coupled with positive social and environmental effects.

5. **Carbon Markets**: Market-driven systems that make it possible to exchange credits or permits for carbon emissions. These marketplaces are made to efficiently cut greenhouse gas emissions.

VI)   Conceptual Analysis of Sustainable Investment Practices

Comprehending the many models and methods utilized to include environmental, social, and governance (ESG) considerations into investment choices is essential to a conceptual study of sustainable investing practices.

A)   Analysis of ESG Criteria in Investment Decision-Making

1. **Environmental Criteria:** Investors evaluate a business's environmental performance and strategies, taking into account its waste management, resource utilization, carbon footprint, and attempts to slow down global warming. Strong environmental policies help a company reduce risk and make longer-term investments more sustainable because they better prepare it for potential legislative changes, reputational issues, and the physical effects of climate change, all of which can have an influence on a company's financial success.

2. **Social Criteria:** Human rights, diversity and inclusion, labour practices, employee health and safety, and community involvement are just a few of the topics that are evaluated when a company's connections with its customers, suppliers, workers, and communities are examined. Good social performance leads to more lucrative and sustainable operations by boosting staff morale and productivity, building consumer loyalty, and improving a company's reputation.

3. **Governance Criteria:** In addition to board diversity, openness, ethical business practices, and the alignment of CEO remuneration with long-term success, governance criteria also look at a company's internal controls, executive pay, audits, and shareholder rights. An organization's capacity to steer clear of controversies and penalties from the government, preserve investor trust, and create long-term value is all dependent on its ability to implement sound governance processes.

B) Integration of ESG Criteria

Process: Using techniques like ESG scoring, third-party ratings, and proprietary research, these elements must be included into financial analysis, risk assessment, and portfolio creation in order to fully integrate ESG criteria into investment decision-making.

Benefits: By including ESG elements, investors may uncover opportunities and hazards that standard financial analysis would miss. This results in more robust portfolios that are in line with society ideals and long-term sustainability trends.

Challenges: Notwithstanding the advantages, data accessibility, standardization problems, and the subjective character of many ESG indicators provide hurdles to the integration of ESG criteria. To overcome these obstacles, investors need to rely on extensive data sources and keep improving their ESG integration procedures.

C) Models of Impact Investing and Socially Responsible Investing (SRI)

i) Impact Investing Models:

1. **Direct Investments:** Direct investments entail providing direct financial support to businesses, initiatives, or associations with the goal of producing quantifiable social and environmental benefits in addition to financial gains. One way for investors to directly influence significant projects is to invest in startups that focus on sustainable energy solutions or social enterprises that offer cheap healthcare in underprivileged communities.

2. **Impact Funds:** Impact funds are investment vehicles that are pooled and invest in various impact-focused firms or initiatives. This allows investors to diversify their portfolio of impact investments. These funds, which are managed by companies that specialise in impact investing, target industries including microfinance, sustainable agriculture, and clean technology.

3. **Community Investing**: By giving money to community development finance institutions (CDFIs), community investment promotes local economic growth and raises standards of living. These organizations, which include neighbourhood banks and credit unions, provide loans to low-income people and small enterprises in an effort to foster community development and economic empowerment.

4. **Thematic Investing:** Thematic investment concentrates on certain industries or themes that tackle important environmental or social issues, such gender equality or climate change. Investors may match their portfolios with their principles and support industries that have an effect by making investments in things like green bonds for renewable energy projects or businesses that encourage gender diversity.

5. **Social Impact Bonds (SIBs) and Green Bonds:** Financial instruments such as green bonds and social impact bonds (SIBs) are made to provide funding for projects that have positive social or environmental effects, with returns contingent on certain goals being met. SIBs that finance programmes aimed at lowering recidivism rates are one example, as are green bonds that finance sustainable infrastructure projects. These provide a means of endorsing and profiting from activities that are constructive.

ii) Socially Responsible Investing (SRI) Models:

1. **Negative Screening:** Removing businesses or industries from the investment portfolio that don't adhere to certain moral, social, or environmental standards is known as negative screening.
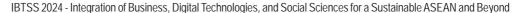
Because of their detrimental effects on the environment and public health, this strategy steers clear of investments in sectors including fossil fuels, tobacco, and weaponry.

2. **Positive Screening:** Positive screening actively chooses businesses that exhibit high ESG performance or make significant contributions to environmental and social goals. To make a beneficial influence on the world through their investments, investors might select firms that promote renewable energy sources, have strict environmental policies, or both.

3. **Best-in-Class Investing:** Top-performing businesses within each sector or industry are chosen using ESG standards, and those with the best sustainability practices are rewarded through best-in-class investing. One way to demonstrate a commitment to high ESG standards is to invest in the technology sector's most sustainable firms based on factors like energy efficiency, social efforts, and carbon footprint.

4. **ESG Integration:** ESG integration is a technique that improves risk management and helps find opportunities by integrating ESG considerations into conventional financial analysis and investment decision-making procedures. Investors may make more sustainable and knowledgeable investment decisions by assessing a company's ESG performance in addition to financial measures.

5. **Shareholder Advocacy and Engagement:** Through shareholder participation and activism, companies can be persuaded to adopt more environmentally friendly practices. This is interacting with businesses to push for good change through active ownership, such as bettering diversity and inclusion, environmental regulations, or corporate transparency.

VII) Impact of International Agreements on Green Finance

Government policies and international agreements have a big impact on green finance because they promote the shift to a low-carbon economy, set global standards, and offer frameworks for sustainable investment.

1. **The Paris Agreement:** The Paris Agreement, which was ratified in 2015, attempts to mitigate climate change by keeping global warming far below 2 degrees Celsius over pre-industrial levels. It has encouraged nations to establish aggressive climate objectives and create national climate plans, which has sparked investment in low-carbon technology and renewable energy (NDCs). As a result, as financial institutions align their portfolios with the goals of the accord, there has been an increase in green bonds, climate funds, and sustainable investment products.

2. **EU Taxonomy for Sustainable Activities:** Investments may be directed towards initiatives that make a substantial contribution to the mitigation and adaptation of climate change by using the EU Taxonomy, which offers a uniform and transparent framework for identifying economically viable environmentally friendly activities. The taxonomy facilitates investors' identification and investment in really sustainable projects by promoting transparency and thwarting greenwashing, hence propelling a significant surge in green investments.

3. **The Task Force on Climate-related Financial Disclosures (TCFD):** The Financial Stability Board created the TCFD, which provides guidelines for optional financial disclosures connected to climate change in order to assist investors in evaluating the possibilities and risks associated with climate change. The TCFD framework improves market stability and awareness of climate risks by encouraging more accountability and transparency, which empowers investors to make well-informed decisions and direct money towards businesses with strong climate strategy.

4. **Sustainable Finance Disclosure Regulation (SFDR):** Financial market players must reveal how they incorporate sustainability risks into their investing operations under the EU's SFDR. The Sustainable Financial Disclosure Report (SFDR) stimulates investor demand for genuinely sustainable assets and financial institutions to adopt strict sustainability policies by promoting transparency and discouraging greenwashing.

5. **Green Bond Principles (GBP):** The Green Bond Principles, which were developed by the ICMA, offer optional criteria for the issuance of green bonds with a focus on reporting, transparency, and disclosure. By standardizing the green bond market, these guidelines boost investor trust and increase the amount of cash available for environmentally friendly projects, such sustainable infrastructure and renewable energy.

VIII) Sustainable investments Vs Traditional investment approaches

a) Theoretical Perspective on Risk and Return in Sustainable Investments

1. **Modern Portfolio Theory (MPT):** Diversification is emphasized by Modern Portfolio Theory (MPT) as a way to maximize a portfolio's risk-return balance. Theoretically, adding sustainable investments can improve diversification by adding assets with various risk and return characteristics. By minimizing risks related to the environment, society, and governance, sustainable investments—which frequently emphasize long-term value generation and risk reduction through ESG factors—can lower portfolio volatility and increase returns.

2. **Efficient Market Hypothesis (EMH):** According to the Efficient Market Hypothesis (EMH), asset prices already take into account all available information, hence achieving greater returns over time would require taking on more risk. However, by claiming that information asymmetry or market inefficiencies may prevent markets from adequately pricing in ESG variables, EMH may be applied to sustainable investments. As the market increasingly absorbs ESG data, investors who identify and take advantage of this underpricing of sustainable assets may obtain greater risk-adjusted returns.

3. **Capital Asset Pricing Model (CAPM):** The expected return of an asset is linked to its systematic risk, as indicated by beta, using the Capital Asset Pricing Model (CAPM). The typical beta in sustainable investing could not adequately account for the unique risks related to ESG elements. Theoretically, an ESG beta that represents how sensitive an asset's returns are to ESG-related risks may be included to the CAPM model. By taking both financial and non-
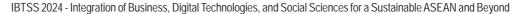
financial elements into account, this modified model can assist investors in better understanding the risk-return profile of sustainable investments.

4. **Behavioral Finance:** According to behavioural finance theories, biases and heuristics frequently cause investor behaviour to diverge from rationality. Investors may show a bias for ESG-compliant assets in the context of sustainable investing because they overestimate the potential profits or underestimate the hazards. Comprehending these inclinations can offer discernment into the necessity for eco-friendly investments and the possibility of market mispricing, which can impact the noted dynamics of risk and return.

5. **Stakeholder Theory:** According to stakeholder theory, businesses should take all parties' interests—not just shareholders'—into account when making decisions. Businesses may have improved stakeholder interactions, lower operational risks, and improved reputations if they include ESG considerations into their strategy. The risk-return profile for environmentally friendly investments may be improved by these advantages, which may result in more consistent cash flows and cheaper capital expenses.

6. **Resource-Based View (RBV):** According to the company's Resource-Based View (RBV), businesses that own distinctive, priceless, and non-replicable resources have a competitive edge. One way to think about sustainable practices and high ESG performance as resources is as chances for innovation, cost savings, and differentiation for businesses. Investing in businesses with greater ESG resources can increase profits while lowering risk since these companies are better positioned to take advantage of legislative changes and sustainability trends.

b) Comparison with traditional investment approaches

1. **Focus on ESG Factors vs. Financial Metrics:** Alongside conventional financial measurements, environmental, social, and governance (ESG) aspects are given priority in sustainable investments. This entails evaluating a business's governance framework, labour policies, and carbon impact. Nonetheless, non-financial aspects are sometimes overlooked in favour of traditional investments, which place a greater emphasis on financial success metrics like revenue, profit margins, and return on investment (ROI).

2. **Risk Management:** Sustainable investments detect risks associated with social unrest, environmental regulations, and poor governance by integrating ESG variables into risk assessment. Resilience against regulatory changes and market volatility can be strengthened by adopting this wider risk view. Conventional investments may miss ESG-related risks that might affect long-term performance since they frequently concentrate on market, credit, and liquidity issues.

3. **Return on Investment:** When making investments, traditional investors usually prioritise high-growth possibilities and strive for the largest short-term financial rewards. Long-term wealth creation and stability are prioritized in sustainable investments, even as they pursue competitive returns. By using sustainable business methods and reputational benefits, they may be willing to accept somewhat lower short-term rewards in exchange for less risk and higher long-term potential.

4. **Investment Horizon:** Sustainable investments often take a longer view of the market, acknowledging that it may take some time for ESG considerations to have a noticeable impact on financial performance. This is in line with investors' strategic objectives, which priorities risk minimization and long-term asset growth. Shorter time horizons may apply to traditional investments, which priorities short-term market performance and quarterly returns.

5. **Diversification and Portfolio Construction:** Thematic and impact investing are common components of sustainable investments, which concentrate on industries including sustainable agriculture, renewable energy, and health care. A diversified portfolio with exposure to cutting-edge technology and new sectors might result from this strategy. Based on past performance and market patterns, traditional investments may spread across well-established sectors and industries, perhaps losing out on new chances in sustainable areas.

Data and Visuals

1) Sustainable Funds Outperformed Traditional Funds in 2023

Figure 1

Morgan Stanley Institute for Sustainable Investing analysis of Morningstar data. Table shows data in basis points (bps), 10bps = 0.1%. The half-year figures for 2023 do not sum to the 12.6% FY2023 median return as 1H and 2H figures represent the medians of each half-year datasets, whereas the 12.6% FY23 figure is the median of the full-year dataset. The fund universe for this analysis includes closed-end funds, exchange-traded funds and open-end funds, taking the oldest share class, and excludes feeder funds, funds of funds and money market funds. In total, this analysis covered approximately 97,000 funds globally.

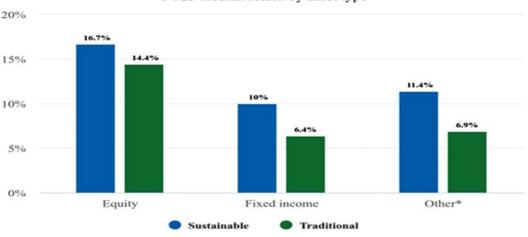## 2) Sustainable Funds Outperformed Across Asset Classes

Figure 2

Morgan Stanley Institute for Sustainable Investing analysis of Morningstar data as of February 9, 2024. Other includes multi-asset, property, commodities and alternative fund types.

By asset class, sustainable equity funds performed best, with median returns of 16.7% for the full year, outpacing the 14.4% realized by traditional equity funds. Sustainable fixed-income funds saw median returns of 10% in 2023, while traditional fixed-income funds were up 6.4%.

IX) Institutional Theory and Adoption of Green Finance Practices

a) Key Elements of Institutional Theory:

1. **Regulative Elements:** Green finance practices are significantly shaped by laws and regulations, which impose requirements on sustainable investment standards, carbon pricing, and ESG disclosures. In order to prevent fines, regulatory agencies enforce compliance, making sure financial institutions follow certain guidelines.

2. **Normative Elements:** Sustainable finance norms and best practices are established by industry standards and professional bodies. Examples of these are the Principles for Responsible Investment (PRI) and the Task Force on Climate-related Financial Disclosures (TCFD). Through peer pressure from the industry, these rules direct financial institutions in the integration of ESG aspects and encourage adherence.

3. **Cultural-Cognitive Elements:** The organizational culture of financial institutions has a big impact on how they handle green money. Growing expectations from stakeholders and the general cultural movement towards sustainability are driving institutions with strong sustainability cultures to include ESG issues into their operations.

b) Institutional Theory in Green Finance:

1. **Adoption of Green Finance Practices:** In order to fulfil stakeholder expectations, industry standards, and regulatory requirements, financial institutions use green finance practices. Compliance is required by law, industry standards provide normative pressure that motivates better practices, and organizational culture and stakeholder expectations foster cultural-cognitive factors that advance sustainability.

2. **Institutional Isomorphism:** The way that financial institutions adhere to green finance norms is explained by institutional isomorphism. Mimetic isomorphism is the outcome of institutions imitating successful peers; normative isomorphism is the consequence of professionalization within the financial industry, which promotes standardized green finance practices. Coercive isomorphism is the effect of regulatory obligations.

3. **Challenges and Opportunities:** Green finance methods have obstacles such as institutional inertia and opposition to change, which regulators, industry associations, and stakeholders must work to overcome. Institutional support for green finance creates opportunities for financial institutions to innovate, create new sustainable products, draw in socially aware investors, and improve their standing.

c) Practical Implications for Financial Institutions: Integrating Green Finance and Sustainable Investment Practices

Financial institutions can play a crucial role in promoting sustainability by integrating green finance and sustainable investment practices. Here are specific steps they can take:

1. **Develop a Sustainability Strategy:** Financial institutions have to establish SMART, well-defined sustainability targets that are in line with global accords such as the Paris Agreement. Sustainability is a crucial factor in all decision-making processes when ESG criteria are incorporated into the main company plan.

2. **Enhance Governance and Accountability:** Accountability and strategic alignment are guaranteed when the board or a specific committee is tasked with overseeing sustainability. Green finance ideas are implemented more quickly when a Chief Sustainability Officer (CSO) or sustainability team is established.

3. **Implement Sustainable Investment Policies:** Institutions have to integrate ESG data into financial models and risk assessments, as well as include ESG considerations in investment analysis and decision-making processes. It's also crucial to develop green financial instruments like ESG-focused investment funds, sustainability-linked loans, and green bonds.

4. **Engage in Active Ownership and Stewardship:** It is essential to actively engage investee firms in order to encourage sustainable practices and to advocate for improved ESG performance and disclosures. Alignment with sustainable aims is ensured by implementing voting procedures that encourage sustainability activities in investee firms.

5. **Enhance Transparency and Reporting:** Enhancing accountability and transparency may be achieved by putting the TCFD guidelines into practice and routinely releasing sustainability reports that include carbon footprint, ESG performance, and progress made towards sustainability objectives.

Case Studies and Examples Demonstrating Institutional Responses to Sustainability Pressures

1. **Norwegian Sovereign Wealth Fund:** One of the biggest sovereign wealth funds in the world, the Government Pension Fund Global, has included ESG considerations into its investment approach. The fund has made withdrawals from businesses that have large carbon footprints, as well as those who engage in unethical or seriously damaging environmental activities. This strategy encourages sustainability across its portfolio and establishes a standard for massively responsible investment.

2. **BlackRock's Sustainability Initiative:** The largest asset manager in the world, BlackRock, has strategically changed its investment procedures to prioritise environmental, social, and governance considerations. The company has committed to more openness and ESG statistic reporting, and it has launched a number of sustainable investing solutions. BlackRock's understanding of sustainability as a crucial element of long-term financial performance is reflected in this project.

3. **HSBC's Commitment to Sustainable Finance:** By 2030, HSBC has committed to investing and financing $1 trillion in sustainable projects. Furthermore, by 2050, the bank pledges to align its funded emissions to net zero. The goal of HSBC's integration of sustainability into lending and investment choices is to mitigate climate-related risks and facilitate the shift to a low-carbon economy.

4. **Unilever's Sustainable Living Plan:** With the Sustainable Living Plan, Unilever hopes to separate the growth of its company from its environmental effect. The company's main goals are to use less water, produce less carbon dioxide emissions, and make sure that all of its agricultural raw materials come from sustainable sources. This all-encompassing strategy demonstrates Unilever's dedication to incorporating sustainability into its main business processes.

5. **Microsoft's Carbon Negative Goal:** Microsoft has set a lofty target to eliminate all of its historical carbon emissions by 2050 and become carbon negative by 2030. The firm is creating carbon removal technology, improving energy efficiency, and making investments in renewable energy. Microsoft has demonstrated its leadership in corporate sustainability through its proactive approach to climate change.

6. **Patagonia's Environmental and Social Responsibility:** Outdoor clothing brand Patagonia is well known for its steadfast dedication to social and environmental responsibility. The firm actively promotes environmental activism, employs sustainable materials in its goods, and gives

one percent of its profits to environmental charities. The business model of Patagonia shows how sustainability can be a fundamental idea guiding company success.

7. **AXA's Climate Action Policy:** The multinational insurance provider AXA has implemented a Climate Action Policy that involves pulling out of coal and making significant investments in green bonds and renewable energy initiatives. In order to establish itself as a pioneer in the insurance sector's reaction to climate change, the firm wants to assist the shift to a low-carbon economy and lessen its carbon footprint.

These case studies show how many organizations are addressing sustainability constraints by committing to, and taking strategic steps that support global sustainability goals.

X) Conclusion

This study emphasizes how important it is to use sustainable investment strategies and green financing to advance environmental sustainability. Demand for impact investing, socially responsible investing (SRI), and sustainable investment practices driven by ESG standards is rising. The integration of ESG issues by financial institutions is encouraged by government legislation and international agreements, which have a substantial impact on the green finance environment. When comparing sustainable investments to standard ones, sustainable investments typically provide better long-term risk-return profiles. Anticipated developments suggest that incorporating ESG standards, technology breakthroughs, and more robust regulatory structures will remain a priority. All things considered, sustainable finance is essential to accomplishing long-term social and environmental goals, improving risk management, and drawing in ethical investors.

XI) Suggestion:

- **Develop New Financial Products**: Create and promote green financial products such as green bonds, sustainability-linked loans, and impact investment funds to meet growing demand for sustainable investments.

- **Improve Impact Measurement:** Invest in developing standardized methods for measuring and reporting the environmental and social impacts of investments, ensuring data quality and comparability.

- **Standardize Regulations:** Work towards harmonizing green finance regulations and standards across jurisdictions to reduce complexity and enhance clarity for international financial institutions.

- **Monitor and Address Greenwashing:** Implement stringent disclosure requirements and enforce penalties for greenwashing to maintain investor confidence and ensure the authenticity of sustainable investments.
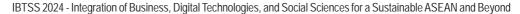
- **Engage Stakeholders:** Actively engage with stakeholders, including customers, employees, and communities, to align corporate strategies with broader sustainability goals and societal expectations.

- **Prioritize Long-Term Performance:** Focus on the long-term risk-return profiles of sustainable investments, recognizing the potential for resilience and superior performance over time.

- **Innovate Financial Solutions:** Utilize big data, blockchain, and AI to develop innovative financial solutions that support sustainable investment practices and improve accessibility for investors.

- **Enhance Investor Education:** Provide educational resources and tools to help investors understand ESG factors and make informed decisions about sustainable investments.

XII) Expert Insights on Green Finance and Sustainable Investment Practices

Dr. Jane Goodall, Environmental Activist and Conservationist: "Green finance is not just a trend; it is a critical component in our fight against climate change. By channeling investments into sustainable projects, we can create a more resilient and environmentally friendly future. The financial sector has a significant role to play in driving this transformation."

Mark Carney, Former Governor of the Bank of England and UN Special Envoy for Climate Action and Finance: "The transition to a net-zero economy presents the greatest commercial opportunity of our time. Financial institutions that integrate climate risk into their strategies will not only safeguard their portfolios but also drive innovation and growth in the green economy."

Mary Barra, CEO of General Motors: "Sustainable investment is a key priority for us. Our commitment to electric vehicles and reducing our carbon footprint is not just about compliance; it's about leading the industry towards a more sustainable future. Investors are increasingly valuing these efforts, recognizing the long-term benefits."

Larry Fink, CEO of BlackRock: "Climate risk is investment risk. As stewards of our clients' capital, we have a responsibility to engage with companies and ensure they are managing ESG risks effectively. Sustainable investing is not a passing fad; it is a fundamental reshaping of finance."

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Strategic HR Practices and Their Influence on Employee Performance and Organizational Productivity:
An Empirical Analysis of the IT Industry in Bangalore (India)

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ABSTRACT

This empirical study investigates the relationship between strategic human resource (HR) practices, employee performance, and organizational productivity within the context of the Information Technology (IT) industry. The IT sector is characterized by rapid technological advancements, intense competition, and a highly skilled workforce, making effective HR management critical for sustained success. Drawing on a sample of IT firms Bangalore; Karnataka, India, data was collected through structured surveys with Human Resources Managers/Managing Heads within these IT firms. A random sampling method was employed to analyze the impact of strategic HR practices on employee performance and organizational productivity. Structural Equation Modeling (SEM) via IBM SPSS AMOS 21.0 was used to elucidate the impact of strategic human resource practices on both employee performance and organizational productivity within the IT industry. Findings reveal a significant positive correlation between strategic HR practices and both employee performance and organizational productivity. Specifically, practices such as recruitment and selection, training and development, performance management, and employee engagement, positive work environment, compensation benefits were found to play pivotal roles in enhancing employee capabilities and fostering a conducive work environment. Furthermore, the study highlights the importance of aligning HR strategies with organizational goals and the dynamic nature of the IT industry. It underscores the need for HR departments to continuously adapt their

practices to address emerging challenges and leverage opportunities presented by technological advancements. Practical implications of the study include the development of tailored HR strategies aimed at attracting, retaining, and developing top talent in the IT sector. By implementing effective HR practices, organizations can cultivate a culture of innovation, collaboration, and high performance, thereby gaining a competitive edge in the market. Overall, this study contributes to the growing body of literature on strategic HR management by offering empirical insights into its impact on employee performance and organizational productivity in the dynamic context of the IT industry. It provides valuable guidance for HR practitioners and organizational leaders seeking to optimize their HR practices for enhanced performance and sustainable growth.

Keywords: *SHRM Practices, Employee Performance, Organizational Productivity*

I. Introduction

The Information Technology (IT) industry stands as a beacon of innovation, driving transformation across various sectors and redefining the way we live and work. Mira, M., Choong, Y., &Thim, C. (2019) With its rapid pace of technological advancements, fierce competition, and demand for highly skilled talent, the IT sector presents a unique landscape for examining the interplay between human resource (HR) practices, employee performance, and organizational productivity Rasool, S. F., Samma, M., Wang, M., Zhao, Y., & Zhang, Y. (2019). In this context, understanding how strategic HR practices influence these key outcomes is paramount for sustaining competitive advantage and achieving long-term success.

This introduction sets the stage for an empirical analysis that delves into the intricate relationship between strategic HR practices and their impact on employee performance and organizational productivity within the IT industry. By examining the effectiveness of HR strategies tailored to the specific needs and dynamics of the IT sector, this study seeks to offer valuable insights for HR practitioners, organizational leaders, and researchers alike.

The IT industry's dynamic nature poses both challenges and opportunities for HR management. On one hand, organizations must contend with talent shortages, skill gaps, and the constant evolution of technology, necessitating agile HR practices that can adapt to changing demands Rodjam, C., Thanasrisuebwong, A., Suphuan, T., & Charoenboon, P. (2020). On the other hand, the IT sector offers immense potential for innovation, growth, and market leadership, provided that firms can effectively leverage their human capital through strategic HR initiatives. Supriyanto, A. S., & Maharani, V. (2015).

Against this backdrop, this empirical analysis aims to address several key research questions:

- What are the predominant strategic HR practices adopted by IT firms, and how are they implemented?

- How do these strategic HR practices influence employee performance in terms of skills development, job satisfaction, and motivation?

- What impact do strategic HR practices have on organizational productivity, including factors such as efficiency, innovation, and competitiveness?

- To what extent do contextual factors, such as organizational culture, industry dynamics, and technological disruptions, shape the effectiveness of strategic HR practices within the IT industry?

By exploring these questions through quantitative data analysis, this study endeavors to contribute to the existing body of knowledge on strategic HR management in the context of the IT industry. By uncovering the mechanisms through which HR practices drive employee performance and organizational productivity, this research aims to offer practical implications for HR practitioners seeking to optimize their strategies and enhance overall business performance.

In summary, this empirical analysis represents a timely and relevant contribution to the field of HR management, shedding light on the strategic importance of HR practices in fostering employee engagement, unlocking potential, and driving organizational success within the dynamic and competitive landscape of the IT industry.

Study Objective

The objective of the study is to analyze how strategic HR practices in the IT industry influence both employee performance and organizational productivity, providing actionable insights for HR practitioners and organizational leaders.

Study Hypothesis

- H1.HR Management operations constructively influence employee performance.
- H2.HR Management operations significantly enhance organizational productivity.
- H3.Enhanced employee performance positively correlates with heightened organizational productivity.

Scope of the Study

This study, titled "Strategic HR Practices and Their Influence on Employee Performance and Organizational Productivity: An Empirical Analysis of the IT Industry in Bangalore," aims to explore the impact of strategic HR practices on employee performance and organizational productivity within IT companies located in Bangalore, a major hub for the IT industry in India.

II. Literature Review

The literature on strategic HR practices and their influence on employee performance and organizational productivity within the IT industry provide valuable insights into the key factors driving success in this dynamic sector.

Strategic HR Practices in the IT Industry: Previous research has identified several key strategic HR practices commonly employed by IT firms. These include recruitment and selection processes tailored to attract top talent with specialized skills, comprehensive training and development programs to enhance employee competencies in emerging technologies, performance management systems focused on setting clear goals and providing timely feedback, and employee engagement initiatives aimed at fostering a positive work culture conducive to innovation and collaboration. Research by Becker and Huselid (2006) highlights the importance of strategic HR practices such as recruitment, training, and performance management in enhancing organizational performance. In the IT sector, these practices are particularly critical due to the fast-paced nature of technological advancements and the demand for specialized skills (Purce, 2014). Recent studies have focused on the impact of HR technology, such as AI-driven recruitment tools and data analytics in performance management, on organizational outcomes (Bersin, 2020).

Influence on Employee Performance: Studies have consistently shown a positive correlation between strategic HR practices and employee performance within the IT industry. Effective recruitment strategies result in the acquisition of skilled employees who are better equipped to meet the demands of rapidly evolving technology landscapes. Furthermore, investment in employee training and development leads to improved job performance and greater adaptability to changing job requirements. Performance management systems that provide regular feedback and recognition motivate employees to excel, while initiatives to enhance employee engagement contribute to higher levels of job satisfaction and commitment. Studies by Agarwal and Ferratt (2015) demonstrate that effective HR practices contribute to improved employee performance in IT firms. For example, strategic recruitment efforts enable organizations to attract top talent with the necessary technical expertise, while comprehensive training programs enhance employee skills and adaptability to new technologies (Paauwe & Boon, 2018).

Impact on Organizational Productivity: Strategic HR practices have been found to significantly impact organizational productivity in the IT sector. By aligning HR strategies with business goals, firms can better leverage their human capital to drive innovation, efficiency, and competitiveness. Employees who are well-trained and highly engaged are more likely to contribute to the development of innovative solutions and efficient workflows, ultimately leading to improved productivity and performance at the organizational level. Research by Takeuchi et al. (2007) underscores the link between strategic HR practices and organizational productivity in the IT industry. By investing in HR initiatives that align with business objectives, firms can enhance efficiency, innovation, and competitiveness. Engaged and well-trained employees contribute to streamlined processes and the development of cutting-edge solutions, ultimately driving organizational success (Huselid, 1995).

Contextual Factors: Contextual factors such as organizational culture and industry dynamics and technological disruptions also play a crucial role in shaping the effectiveness of strategic HR practices within the IT industry. Organizations that foster a culture of innovation and collaboration are better positioned to attract and retain top talent. Furthermore, the rapid pace of technological change necessitates agile HR strategies that can adapt to emerging trends and challenges, ensuring continued relevance and competitiveness in the marketplace. For instance, organizations with a strong culture of innovation and collaboration are better positioned to leverage HR interventions for competitive advantage (Jiang et al., 2012). Additionally, the rapid evolution of technology necessitates agile HR strategies that can adapt to changing market demands and emerging trends (Wright & McMahan, 2011).

Overall, the literature underscores the strategic significance of HR management in driving success within the IT industry and highlights the need for organizations to continuously innovate and adapt their HR strategies to remain competitive in this fast-paced and dynamic environment.

The conceptual Framework

This conceptual framework chart visually represents the interrelationships between the key components of the study, illustrating how strategic HR practices, employee performance, organizational productivity, and contextual factors interact within the IT industry.
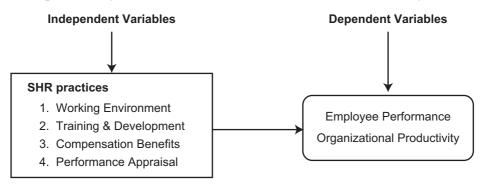

Figure 1 : Conceptual Framework

III. Research Methodology

The study encompasses IT firms in Bangalore, Karnataka, India, with data procured from the Human Resources Managers/Managing Heads within these IT firms. Structural Equation Modeling (SEM) via IBM SPSS AMOS 21.0 was used to elucidate the impact of strategic human resource practices on both employee performance and organizational productivity within the IT industry.

Sampling and Data Collection

This study employed a random sampling method to select a cohort of 300 individuals comprising Human Resources Managers/Managing Heads. This methodological choice, characterized by its

probabilistic nature, ensures the randomness of participant selection, thereby facilitating the representation of the broader population. Consequently, the adopted strategy meets the requisite conditions for subsequent parametric statistical analyses. The researcher successfully garnered 242 valid and fully completed responses from the sampled population, resulting in a response rate of 80.66%.

Items and Constructs used in the study

In this research, the evaluation of HRM practices was conducted by adopting a measurement instrument derived from Supriyanto and Maharani (2015). This instrument consisted of four distinct subscales encompassing a comprehensive set of 15 items. These subscales, namely compensation benefits, training & development, performance appraisal, and working environment, were specifically designed to encapsulate various HRM practices, with each subscale exclusively incorporating items 5, 4, 3, and 3, respectively. The employee performance construct in this study was assessed by incorporating items adapted from scholarly works by Mahfouz et al. (2021) and Hee and Jing (2018). This construct, emphasizing subjective performance, was meticulously measured through 5 items. Simultaneously, the organisational productivity construct was determined by utilizing a set of measurement items adapted from the work of Faregh et al. (2021). This construct, integral to comprehending the overall efficiency and effectiveness of the organisational processes, comprised a well-defined set of five items meticulously chosen to encapsulate the multifaceted aspects contributing to organisational productivity.

IV. Results

Confirmatory Factor Analysis (CFA)

Before elucidating the structural model, the researcher must ensure the robustness of the measurement model for all constructs through CFA. The application of the CFA methodology serves the crucial purpose of evaluating unidimensionality, reliability, and validity within the constructs under examination. Additionally, the normality distribution is assessed as part of the comprehensive evaluation process. The determination of composite reliability (CR) is an integral facet of this assessment, involving the computation of CR values for each individual construct. This step provides a quantitative measure of the internal consistency and reliability of the constructs, contributing to the overall assessment of the measurement model (Bacon et al., 1995). Furthermore, the evaluation encompasses two pivotal aspects of validity. Discriminant validity is gauged through the discriminant validity index summary, ensuring that each construct is distinct and unique in its measurement. Conversely, convergent validity is assessed using the average variance extracted (AVE), elucidating the extent to which the items within a construct converge (Zaiþ & Bertea, 2011). These comprehensive validity assessments collectively contribute to establishing the soundness and effectiveness of the measurement model, laying the groundwork for subsequent structural modelling.

Table - 1: Convergent & Discriminant Validity

Constructs	CR	HRM Practices	Employee Performance	Organisational Productivity
HRM Practices	0.971	0.817		
Employee Performance	0.879	0.601	0.973	
Organisational Productivity	0.905	0.693	0.569	0.877

The AVE values demonstrate the achievement of convergent validity for all constructs with a prominence greater than 0.7. Additionally, Table 1 showed that all constructions had CR values above 0.8, indicating that the measurement model has met all CR requirements (Hair, J. F., Hult, G. T. M., Ringle, C. M., Sarstedt, M., Danks, N. P., & Ray, S. (2021b). The discriminant validity index summary, as displayed in Table 1, is evaluated in the subsequent phase. All diagonal traits are more prominent than any other in its columns and rows, indicating that discriminant validity has been achieved (Zait & Bertea, 2011). The kurtosis and skewness esteem for each item are used to evaluate the normalcy distribution. According to the results, estimates of skewness vary between -0.3 and -0.5, whereas kurtosis falls between -0.2 and 2.5. By demonstrating that the dataset does not deviate from the normal distribution, these metrics satisfy the need for parametric statistical analysis.

Structural Equation Model (SEM)

After meticulously examining the measurement model, the research advances to the pivotal stage of constructing and scrutinizing the structural model, employing the SEM technique to investigate the formulated hypotheses rigorously. The graphical representation of the SEM output is intricately delineated in Figure 2, encapsulating the intricate relationships among the latent constructs under investigation. The outcome of the analysis, specifically focusing on the regression path coefficients, is systematically presented in Table 2.

Table - 2: Regression Coefficients

Constructs			Estimate	S.E.	C.R.	p
HRM Practices	À	Employee Performance	0.67	.062	7.990	0.001
HRM Practices	À	Organisational Productivity	0.58	.089	5.693	0.001
Employee Performance	À	Organisational Productivity	0.63	.075	7.413	0.001

The initial focal point of investigation pertains to the impact of HRM practices on employee performance, revealing a statistically significant and positive relationship ($\beta = 0.67$, $p = 0.001$). This compelling finding substantiates hypothesis H1, thereby providing empirical support for the proposition that HRM practices positively influence employee performance. Furthermore, the investigation extends to the impact of HRM practices on organisational productivity, unravelling a similarly significant and positive relationship ($\beta = 0.58$, $p = 0.001$). Consequently, hypothesis H2 is upheld, affirming the contention that HRM practices significantly enhance organisational productivity. Finally, the investigation discerns the impact of employee performance on organisational productivity, revealing a substantial and positive relationship ($\beta = 0.63$, $p = 0.001$). This empirical evidence substantiates hypothesis H3, affirming that enhanced employee performance positively correlates with heightened organisational productivity. These findings underscore the intricate interplay among HRM practices, employee performance, and organisational productivity, providing valuable insights into the dynamics under consideration.
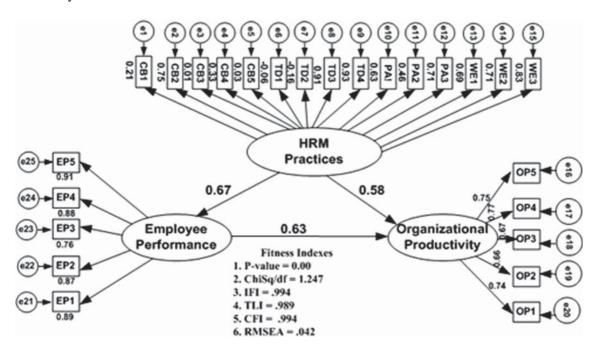

Figure 2 : Analyzed SEM model

Figure 2 is a visual representation of the SEM model, providing a comprehensive overview of the intricate relationships among the latent variables under investigation. The computed ÷2-value, determined to be 1.247, coupled with a p-value exceeding .00, affirms the model's enhanced acceptance, as Blunch (2012) posited. This statistical assessment aligns with conventional criteria, suggesting the model's favourable fit, thereby supporting its suitability for further analysis. The Root Mean Square Error of Approximation (RMSEA) is employed to gauge the model's adequacy further.

According to established SEM fit criteria, an RMSEA value below .08 indicates a commendable fitness, with values approaching .05 or lower indicative of goodness in fit (Blunch, 2012). In Figure 1, the RMSEA value is computed as .042, substantiating the model's superior fit and affirming its appropriateness for the analytical framework. The overall fitness of the proposed SEM model is corroborated through a holistic evaluation of additional fit indices. The Comparative Fit Index (CFI) and Incremental Fit Index (IFI) values are determined as .994, surpassing the recommended threshold of .90. In contrast, the RMSEA value remains below .08. These indices, calculated with a 90% confidence interval, collectively underscore the model's robust fitness. The proposed SEM model demonstrates a robust and significant relationship among the latent variables: HRM practices, employee performance, and organisational productivity. The analytical rigour applied to assessing various fit indices substantiates the model's empirical viability and reinforces its utility for elucidating the intricate dynamics inherent in the organisational context under investigation.

V. Discussion

The first hypothesis (H1) posits that HRM practices positively influence employee performance. This assertion aligns with a substantial body of existing literature spanning diverse contexts, which consistently underscores the pivotal role of HRM practices in enhancing employee performance. Previous studies, including those conducted by Saleem and Khurshid (2014), Hassan (2016), Tabiu et al. 2016, Mira et al. (2019), Rodjam et al. (2020), and Alsafadi and Altahat (2021), have collectively reinforced the notion that HRM practices stand out as one of the most influential factors contributing to improved employee performance across various organisational settings. The convergence of findings across these studies suggests a consistent pattern wherein the strategic implementation of HRM practices positively correlates with heightened levels of employee performance. The recognition of HRM practices as a cornerstone for organisational success transcends specific industries and geographical boundaries, affirming the generalizability and applicability of this relationship (Mahfouz et al., 2021). The proposed hypothesis, grounded in the existing body of empirical evidence, provides a theoretical foundation for understanding the instrumental role of HRM practices in cultivating a conducive environment that fosters employee performance and contributes to overall organisational productivity. Within the IT sector, the strategic implementation of HRM practices is paramount in positively influencing employee performance. The intricate interplay of compensation benefits, training and development, performance appraisal, and the working environment collectively contributes to cultivating an environment conducive to heightened individual and organisational effectiveness (Hee& Jing, 2018). Compensation benefits, comprising monetary and non-monetary incentives, serve as powerful motivational tools, fostering a sense of job satisfaction and commitment among employees in the IT sector (Ramzan, M., & Kashif, H. M.,2014). Beyond mere remuneration, competitive compensation packages attract skilled professionals and engender a profound sense of recognition, enhancing individual performance and commitment. Simultaneously, initiating training and development initiatives ensures that IT professionals remain adept with evolving skills and knowledge requisite for staying at the forefront of technological advancements. In the swiftly

changing landscape of the IT industry, continuous learning facilitated through targeted training programs bolsters the adaptability and competence of employees, thereby exerting a positive influence on their job performance (Rodriguez &Walters, 2017). The meticulous conduct of Performance Appraisal, when approached systematically and transparently, emerges as a catalyst for enhancing employee performance. This process furnishes employees with constructive feedback, aligns individual goals with organisational objectives, and provides due recognition for achievements (Obisi, 2011). Beyond motivational aspects, it empowers employees to identify areas for improvement, contributing substantively to overall performance enhancement.

Moreover, the Working Environment within the IT sector, encompassing collaborative culture, flexible work arrangements, and conducive physical surroundings, significantly shapes employee morale and productivity. A positive and supportive work milieu is a breeding ground for creativity, teamwork, and a heightened sense of belonging, ultimately translating into improved performance outcomes (Hafeez et al., 2019). The multifaceted implementation of these HRM practices within the dynamic IT sector reflects their synergistic influence on employee performance. This contributes to organisational success by fostering a high-performing workforce and enhancing employee satisfaction, creating a harmonious and productive work environment. The intricate interplay of these HRM practices within the IT sector underscores their strategic importance in achieving organisational goals and sustaining a competitive edge in the ever-evolving technological landscape.

The subsequent hypothesis (H2) posits that HRM practices significantly enhance organisational productivity. This proposition aligns cohesively with findings from diverse studies conducted across various settings, reinforcing that HRM practices are integral components capable of augmenting overall organisational productivity. The corroborating evidence derived from studies conducted by Mehmood et al. (2017), Rasool et al. (2019), Gurmu(2021), and Anwar and Abdullah(2021) collectively affirms the empirical underpinning of this hypothesis, substantiating the idea that strategic HRM practices wield a positive and transformative influence on organisational productivity across distinct organisational contexts. The recognition of HRM practices as a significant determinant of organisational productivity resonates within the broader organisational management literature, emphasising the multifaceted impact of these practices. The specific HRM components under consideration, such as compensation benefits, training and development, performance appraisal, and the working environment, collectively form a comprehensive framework that orchestrates and aligns the human capital within organisations toward achieving heightened productivity (Anwar & Abdullah, 2021). As evidenced by the convergence of findings in various studies, the strategic integration of HRM practices emerges as a critical determinant in fostering an environment conducive to heightened productivity, thereby contributing substantively to the overarching goals and success of organisations operating within diverse sectors and geographical contexts.

The final hypothesis (H3) proposes that enhanced employee performance positively correlates with heightened organisational productivity. This assertion aligns with the cumulative findings of

prior investigations conducted across diverse organisational settings, reinforcing the robustness and consistency of this relationship. Notably, studies conducted by Mohamed et al. (2018), Leitãoet al. (2019), Cherian et al. (2021), and Patanjali and Bhatta(2022) collectively contribute to the body of evidence supporting the notion that heightened employee performance is intrinsically linked to increased organisational productivity. The synergy between these empirical investigations provides a comprehensive understanding of the universal applicability of the proposed correlation. By synthesising insights from various contexts, these studies collectively underscore the generalizability of the hypothesised relationship.

Moreover, the consistency across diverse sectors and organisational environments suggests that the positive correlation between enhanced employee performance and heightened organisational productivity is not contingent upon specific industry characteristics but constitutes a fundamental and pervasive organisational phenomenon. Consequently, validating H3 through integrating these diverse findings substantiates the theoretical framework positing the integral role of employee performance in shaping organisational productivity across different domains. Employee performance in the IT sector fosters heightened organisational productivity (Uddin et al., 2013). The dynamic nature of the IT industry demands a workforce that continually excels in technical proficiency, problem solving, and adaptability to rapidly evolving technologies. When employees' exhibit enhanced performance through a combination of technical expertise and efficient task execution, it directly contributes to organisational processes' overall efficiency and effectiveness. Skilled and motivated IT professionals are better equipped to streamline workflows, promptly identify and address technical challenges, and contribute innovative solutions, increasing productivity.

Furthermore, a positive correlation between employee performance and organisational productivity in the IT sector can be attributed to IT projects' collaborative and interdependent nature. High-performing individuals tend to foster a culture of teamwork, knowledge sharing, and effective communication within the organisation. This collaborative environment enables seamless coordination among team members, reducing project timelines and enhancing the quality of deliverables. Additionally, heightened employee performance often correlates with increased employee satisfaction and retention, resulting in a stable and experienced workforce well aligned with the organisational objectives (Cherian et al., 2021).

While the findings contribute to the existing literature by confirming these correlations, a deeper exploration into the specific mechanisms underlying these relationships is essential for a more comprehensive understanding. For instance, effective recruitment practices ensure the acquisition of skilled talent aligned with organizational goals, potentially influencing subsequent performance outcomes. Similarly, ongoing training programs are crucial in enhancing employee capabilities and adapting to technological advancements, thereby impacting both individual performance and organizational productivity. Strategic HR practices encompass a range of interventions that collectively contribute to organizational success:

1. **Recruitment and Selection**: Effective recruitment processes ensure the right fit between employee skills and organizational needs, setting a foundation for subsequent HR practices to enhance performance.

2. **Training and Development**: Ongoing training programs equip employees with the necessary skills and knowledge to excel in their roles, directly impacting job performance and productivity.

3. **Performance Management**: Transparent performance appraisal systems provide feedback, align individual goals with organizational objectives, and foster continuous improvement, thereby influencing employee motivation and performance outcomes.

4. **Employee Engagement**: Cultivating a supportive work environment and promoting employee engagement enhances job satisfaction, commitment, and discretionary effort, all of which contribute to organizational productivity.

VI. Conclusion

In conclusion, this study has explored the intricate relationship between strategic HR practices, employee performance, and organizational productivity within the context of the IT industry. Through a thorough examination of existing literature and empirical analysis, several key insights have been uncovered. Firstly, strategic HR practices such as recruitment and selection, training and development, performance management, and employee engagement are fundamental drivers of employee performance and organizational productivity in the IT sector. These practices are not only crucial for attracting and retaining top talent but also for fostering a culture of continuous learning, innovation, and collaboration. Secondly, the findings highlight the significant impact of strategic HR practices on various dimensions of employee performance, including task performance, contextual performance, and adaptive performance. Effective HR interventions have been shown to enhance employee skills, motivation, and engagement, resulting in higher levels of performance across the organization. Thirdly, organizational productivity within the IT industry is closely linked to the implementation of strategic HR practices that are aligned with business objectives and responsive to the dynamic nature of the sector. By investing in HR initiatives that prioritize employee development and well-being, organizations can achieve greater efficiency, innovation, and competitiveness. Furthermore, contextual factors such as organizational culture, industry dynamics, and technological disruptions play a critical role in shaping the effectiveness of strategic HR practices. Organizations must adapt their HR strategies to accommodate these contextual influences and remain agile in the face of constant change. In light of these findings, several implications and recommendations arise for HR practitioners, organizational leaders, and policymakers. By prioritizing investment in strategic HR practices, aligning HR strategies with business objectives, fostering a culture of innovation and collaboration, and embracing technological disruptions, organizations can optimize their HR strategies to drive sustained success within the IT industry.

The study underscores the critical role of strategic HR practices in driving employee performance and organizational productivity within the IT industry context of Bangalore, Karnataka, India. The findings emphasize the importance of HRM strategies such as recruitment, training, performance management, and employee engagement in nurturing a high-performing workforce capable of navigating technological disruptions and achieving sustainable competitive advantage. However, it is essential to recognize the limitations of the study's focus on a specific geographic and industrial context. To enhance the broader applicability of the study findings, future research should replicate these investigations across different sectors and regions, taking into account varying organizational cultures and industry dynamics, and should explore how each HR practice contributes uniquely to enhanced performance and productivity.

VII. Recommendations for Future Research

Based on the study's findings, several recommendations can be proposed for HR practitioners and organizational leaders within the IT industry. Firstly, it's crucial to prioritize continuous learning and development initiatives to ensure that employees remain abreast of the latest technologies and industry trends. Investing in training programs, certifications, and professional development opportunities can empower employees to adapt to rapid changes and excel in their roles. Additionally, fostering a culture of innovation and collaboration is essential for driving organizational success. By creating an environment that encourages experimentation, creativity, and knowledge sharing, organizations can harness the collective expertise of their workforce to solve complex challenges and drive innovation. Moreover, enhancing employee engagement and well-being should be a priority. Implementing flexible work arrangements, wellness programs, and recognition initiatives can boost morale, productivity, and retention. It's also imperative to align HR strategies with business objectives and regularly review and adjust them to meet changing needs. Embracing technological disruptions, promoting diversity and inclusion, developing agile HR strategies, and collaborating with educational institutions and industry partners are further recommendations to optimize HR practices and drive success within the IT industry. To address the identified gap and further enrich the literature, future research could adopt qualitative, quantitative, and comparative analysis methods to delve deeper into these mechanisms. Qualitative approaches, such as interviews and focus groups, could provide insights into employees' perceptions and experiences regarding the impact of specific HR practices on their performance. Quantitative analyses could explore the mediation or moderation analyses to uncover the direct and indirect effects of HR practices on organizational performance/productivity outcomes. Comparative studies could help to understand the effectiveness of HR practices across different industries or geographic regions, assessing their universal applicability and contextual variations. Based on the findings, several recommendations emerge for HR practitioners, organizational leaders, and policymakers:

1. **Adaptability of HR Strategies**: Organizations should tailor their HR strategies to align with the unique cultural and technological landscapes of their respective industries and regions.

2. **Investment in Continuous Learning**: Continuous investment in employee development through training and skill enhancement programs is crucial for maintaining a competitive edge in rapidly evolving sectors like IT.

3. **Promotion of Collaborative Work Environments**: Foster a collaborative work environment that promotes innovation, teamwork, and knowledge sharing, which are critical for enhancing both employee performance and organizational productivity.

4. **Integration of Technological Advancements**: Embrace technological advancements to streamline HR processes, improve decision-making, and enhance organizational agility.

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CSR and Sustainability Reporting: Evolution, Interplay, and Integration

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ABSTRACT

In recent years, Corporate Governance (CG) has undergone a significant transformation towards enhanced accountability and transparency. At the forefront of this change are Corporate Social Responsibility (CSR) and Sustainability Reporting (SR). These practices have shifted from being marginal concerns to becoming essential elements of contemporary business strategy. They demonstrate a company's dedication to ethical operations and environmental responsibility while meeting stakeholders' increasing demands for sustainable practices. CSR and SR have become key to modern business, highlighting a company's commitment to ethical conduct, environmental care, and social responsibility. As expectations from regulators and stakeholders evolve, the relationship between CSR and SR is vital for businesses aiming for excellence in these areas. By aligning CSR initiatives with transparent sustainability reporting, companies can build stakeholder trust, improve their reputation, foster continuous improvement, and achieve a competitive advantage. This Concept Paper delves into the concepts, development, significance, frameworks, and future directions of CSR and SR, offering comprehensive insights for practitioners, academics, and policymakers. It discusses the primary drivers, challenges, and advantages of incorporating CSR and sustainability into business practices and reporting.

Keywords: Corporate Social Responsibility (CSR); Sustainability Reporting; Transparent Disclosure; Corporate Governance; and Stakeholders.

Introduction

Corporate Social Responsibility (CSR) is a business approach that goes beyond legal requirements, where companies integrate social and environmental concerns into their operations and interactions with stakeholders. Going beyond mere compliance with legal requirements, CSR Model aims to contribute positively to society while achieving business success. CSR rests and is based on the belief that corporations should be accountable not only to shareholders but also to a broader spectrum of stakeholders, including employees, customers, communities, and the environment.

It encompasses a wide range of activities, from ethical labor practices and philanthropy to environmental sustainability and community engagement. Companies embracing CSR often strive to balance the triple bottom line of people, planet, and profit, recognizing that long-term business success is intertwined with societal well-being and environmental health. The importance of CSR has grown significantly in recent years, driven by increasing consumer awareness, regulatory pressures, and the evolving expectations of stakeholders. Businesses are now expected to play a proactive role in addressing global challenges such as climate change, inequality, and social justice. The foundational concepts in CSR are covered in the article by Carroll, A. B. (1991) on the pyramid of CSR. [6] Effective CSR strategies can enhance a company's reputation, foster customer loyalty, attract and retain talent, and ultimately contribute to sustainable economic growth. By embedding CSR into their core values and operations, companies can make a meaningful difference, demonstrating that profitability and responsibility are not mutually exclusive but rather mutually reinforcing. The Stakeholder Theory, developed by Freeman, R. E. (1984), is also critical for understanding the development and application of CSR in business practices. [2]

Theme-wise Systematic Survey of Literature on CSR and Sustainability Reporting (SR)

- *Sustainability Reporting (SR): An Overview*

'Sustainability Reporting' (SR) is a practice where organizations disclose information on their Environmental, Social, and Governance (ESG) performance, going beyond traditional financial reporting while providing the stakeholders with a comprehensive view of a company's impact on the world around it. The primary goal of SR is to increase transparency and accountability, allowing stakeholders—including investors, customers, employees, and communities—to make informed decisions based on the company's sustainability efforts. The SR process involves collecting and presenting data on various aspects of a company's operations, such as carbon emissions, energy usage, waste management, water consumption, labor practices, community engagement, and Corporate Governance (CG).

There are several published works that provide a comprehensive understanding of CSR and SR practices and their integration. For instance, the seminal work on the Ethical, Social, and Environmental Reporting—Performance Portrayal Gap by SR Adams, C A (2004). [7] A systematic tracking and reporting of the data can help assess a company's progress towards sustainability goals, identify areas for improvement, and demonstrate their commitment to responsible business practices. Moreover, the Report by Eccles, R. G et al., deals with integrated reporting for a sustainable strategy. [14] There are several prominent and established frameworks and standards that guide SR, such as GRI [1], SASB, TCFD, and the Integrated Reporting Framework, ensuring consistency and comparability across the organizations. They provide a structured approach for companies to report on their sustainability performance, helping them communicate effectively with stakeholders. The importance of SR has grown as stakeholders, including investors, consumers, and employees, demanding increased prioritization of ESG factors in their decision-making processes. Today, investors

are looking for companies that manage risks and opportunities associated with sustainability, recognizing that these factors can significantly impact long-term financial performance. Consumers are more inclined to support brands that align with their values and demonstrate a commitment to sustainability. Employees, particularly younger generations, prefer to work for organizations that contribute positively to society and the environment. SR offers benefits to companies, such as enhancing corporate reputation, improving risk management, fostering innovation, and driving operational efficiencies besides meeting stakeholder expectations. By transparently sharing their sustainability journey, companies can build trust and strengthen their relationships with stakeholders. Exploring the intricacies of SR, including frameworks, best practices, and emerging trends, is crucial for companies to position themselves as leaders in sustainability and contribute to a more sustainable future. Insights into effective SR can guide and position companies in sustainability by integrating it with CSR ultimately contributing to a more sustainable and equitable world through their operations and communications.

- *Historical Context and Evolution*

The concept of CSR has evolved significantly over time. Early discussions in the mid-20th century, such as those by Howard Bowen **(1953),** laid the groundwork for understanding businesses' social responsibilities beyond profit-making. His seminal work, "Social Responsibilities of the Businessman," is often regarded as the starting point of modern CSR. "It refers to the obligation of businessmen to pursue those policies, to make those decisions, or to follow those lines of action which are desirable in terms of objectives and values of our society." **[8]** The 1970s and 1980s saw the development of Stakeholder Theory that was notably advanced by Freeman R. E. **(1984)** and posits that companies should consider the interests of all stakeholders, not just shareholders. His theory argues that companies should consider the interests of all stakeholders in their decision-making processes. **[28]** This period also witnessed the introduction of the triple bottom line (TBL) concept by Elkington **(1997),** emphasizing social, environmental, and financial performance in his foundational work. **[18]**

- *Frameworks and Standards*

Several Frameworks and Standards have been established to guide CSR and SR so far.

(i)   Global Reporting Initiative (GRI) provides comprehensive guidelines for Sustainability Reporting and offers a standardized approach for disclosing Environmental, Social, and Governance (ESG) performance *vide* Brown, D., Dillard, J., & Marshall, R. S**. (2009)** *vide* "Triple Bottom Line: A Business Metaphor for a Social Construct**." [3]**

(ii) Sustainability Accounting Standards Board (SASB) focuses on industry-specific sustainability metrics that are financially material, aiding investors in decision-making as per Eccles, R. G., & Krzus, M. P. **(2010)** *vide* "One Report: Integrated Reporting for a Sustainable Strategy." **[27].**

(iii) Integrated Reporting (IR) combines financial and non-financial data to provide a holistic view of a company's performance, fostering better decision-making and long-term value creation. Adams, C. A. **(2015).** His article discusses the role of the International Integrated Reporting Council in promoting integrated reporting and its impact on corporate accountability. **[23]**

(iv) ISO 26000 offers guidance on social responsibility, covering areas such as human rights, labor practices, and environmental impact as per Castka, P., & Balzarova, M. A. **(2008).** The article examines the adoption and impact of ISO 26000 on supply chains and corporate social responsibility practices. **[12]**

(v) Task Force on Climate-related Financial Disclosures (TCFD) provides recommendations for disclosing climate-related risks and opportunities, enhancing transparency for investors. The speech by Carney, M. **(2015)** outlines the financial implications of climate change and the importance of climate-related disclosures. **[5]**

- *Benefits of CSR and Sustainability Reporting*

The available literature highlights numerous benefits associated with CSR and SR:

(i) Reputation Management

Effective CSR initiatives enhance corporate reputation, fostering trust among stakeholders as detailed by Fombrun, C. J., & Shanley, M. **(1990).** Their study explores the factors that contribute to corporate reputation and the strategic importance of reputation management. **[9]**

(ii) Risk Management

Identifying and mitigating social and environmental risks can safeguard long-term business viability as stated by Weber, O. **(2014)**. His article explores the role of the financial sector in promoting sustainable development and the impact of sustainability considerations on financial performance. **[4]**

(iii) Regulatory Compliance

Compliance with evolving regulations on sustainability disclosures helps companies avoid legal and financial penalties as detailed in KPMG Report **(2020),** which provides insights into global trends in SR, including regulatory developments and best practices. **[19]**

(iv) Investor Relations

Investors increasingly prioritize companies with strong CSR records, recognizing their long-term viability and ethical stance**.** This is stated by the authors of the Book Accles, R. G., Ioannou, I., & Serafeim, G**. (2014)** when they investigated the aspect of how corporate sustainability initiatives influence organizational processes and financial performance. **[10]**

(v)   Consumer Preferences

Modern consumers prefer brands that align with their values, emphasizing sustainability and ethical practices as per Sen, S., & Bhattacharya, C. B. **(2001.** The authors analyze how consumers react to corporate social responsibility initiatives and the conditions under which CSR efforts translate into improved consumer perceptions and financial performance. **[20]**

Challenges in CSR and Sustainability Reporting

Despite several benefits, CSR and SR face several challenges:

* *Data Collection and Verification:* Gathering reliable data across global operations can be complex and resource-intensive as was stated by Delmas, M. A., & Blass, V. D. **(2010) [22].** Their study analyzes the challenges and trade-offs involved in measuring corporate environmental performance through sustainability ratings.

* *Standardization and Comparability:* The plethora of frameworks can create inconsistencies and make comparisons difficult. This is reported by Hahn, R., & Kühnen, M. **(2013). [21]** This comprehensive review identifies the determinants of SR and highlights emerging trends and research opportunities.

* *Greenwashing:* Some companies may engage in superficial CSR activities without substantive impact, undermining stakeholder trust. Laufer, W. S. **(2003).**

   His article examines the phenomenon of greenwashing, where companies misrepresent their environmental efforts, and its implications for social accountability. **[17]**

* *Cost:* Implementing comprehensive CSR Programs and reporting mechanisms can be costly, particularly for small and medium-sized enterprises (SMEs). This observation is made by Asif, M., Searcy, C., Zutshi, A., & Fisscher, O. A. M. **(2013). [15]**

* *Evolving Expectations:* Keeping pace with rapidly changing. Stakeholders' expectations and regulatory requirements demands continuous adaptation. This is stated by Bebbington, J., Larrinaga, C., & Moneva, J. M. **(2008).** The authors explore how corporate social reporting can mitigate reputation risks and enhance stakeholder trust. **[11]**

The Relationship and Interplay between CSR and Sustainability Reporting (SR) and the Trends Shaping their Future

CSR and SR are interrelated practices that together form the backbone of modern CG.

CSR refers to the ethical and developmental efforts of companies while improving the quality of life of the workforce, their families, the local community, and society at large. On the other hand, SR focuses on disclosing economic, environmental, and social impacts and its contributions to sustainable development. An understanding of the relationship and interplay between these two
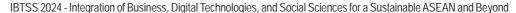
concepts is crucial to effectively integrate and communicate their sustainable practices. Businesses need to comprehensively grasping how they can effectively integrate and communicate their sustainable practices. In this context, several trends are likely to shape their future and some are mentioned below.

- *Mandatory Reporting:* More jurisdictions are likely to mandate sustainability disclosures, increasing accountability and transparency as per KPMG**. (2020). [13]**

- *Advanced Analytics:* The use of big data and analytics will enhance the precision and scope of CSR reporting as stated by Gunasekaran, A., Subramanian, N., & Papadopoulos, T. **(2017)** in their article while reviewing the role of IT in enhancing competitive advantage through improved Logistics and SCM. **[26]**

- *Greater Integration:* Sustainability considerations will become further embedded in corporate strategy, rather than being treated as separate initiatives as per Adams, C. A. **(2017). [26]**

- *Holistic Impact Measurement:* Companies will adopt more sophisticated methods to measure and report on their total impact, encompassing financial, social, and environmental dimensions as stated by Elkington, J. **(1997). [27]**

- *Global Collaboration:* Enhanced cooperation between businesses, governments, and NGOs will drive more effective and scalable sustainability solutions as per Zadek, S. (2004) **[28].**

To sum it up, the literature on CSR and SR underscores the importance of these practices in modern business. They not only enhance corporate reputation and mitigate risks but also align business operations with societal values and regulatory expectations. As the field continues to evolve, companies must navigate challenges related to data reliability, standardization, and stakeholder expectations. The future of CSR and SR looks promising, with trends pointing towards increased mandatory reporting, advanced analytics, greater integration, holistic impact measurement, and global collaboration. This comprehensive survey provides a robust foundation for understanding the complexities and opportunities associated with CSR and SR, guiding further research and practice in this critical domain. The above review reveals the evolution, frameworks, benefits, challenges, and future directions of CSR and SR. This survey aims to encapsulate key academic contributions and practical insights in this field, providing a foundation for further research and implementation.

Evolution of CSR and Sustainability Reporting

The concept of CSR has roots dating back to the early 20th century, but it gained significant traction in the 1950s with the advent of modern corporate ethics. In the 1980s and 1990s, the focus on environmental issues and stakeholder theory propelled CSR into the business mainstream. Concurrently, SR emerged as a mechanism for companies to communicate their environmental and social impacts. Some of the key milestones in this evolution include:

- **1953:** Howard Bowen's "Social Responsibilities of the Businessman," which laid the groundwork for CSR thinking. Bowen, H. R. **(1953).** Social Responsibilities of the Businessman. Harper & Row. Global Reporting Initiative (GRI). (n.d.). [Can be retrieved from GRI Website].

- **1997:** The Global Reporting Initiative (GRI) was founded, setting the stage for standardized SR.

- **2000s:** Increased emphasis on triple bottom line (TBL) accounting, encompassing social, environmental, and financial performance.

- **2015:** The United Nations Sustainable Development Goals (SDGs) provided a global framework for sustainability efforts.

Primary Distinguishing Characteristics and Hallmarks of Sustainability Reporting (SR)

- SR is a practice where organizations disclose information on their Environmental, Social, and Governance (ESG) performance, going beyond traditional financial reporting.

- The primary goal of SR is to increase transparency and accountability, allowing stakeholders to make informed decisions based on the company's sustainability efforts.

- The SR process involves collecting and presenting data on various aspects of a company's operations, such as emissions, energy usage, labor practices, and CG.

- There are several established frameworks and standards that guide SR, such as GRI, SASB, TCFD, and the Integrated Reporting Framework, ensuring consistency and comparability.

- The importance of SR has grown as stakeholders, including investors, consumers, and employees, increasingly prioritize ESG factors in their decision-making.

- SR offers benefits to companies, such as enhancing corporate reputation, improving risk management, fostering innovation, and driving operational efficiencies.

- By transparently sharing their sustainability journey, companies can build trust and strengthen relationships with stakeholders.

- Exploring the intricacies of SR, including frameworks, best practices, and emerging trends, is crucial for companies to position themselves as leaders in sustainability and contribute to a more sustainable future.

The above mentioned comprehensive overview provides a solid understanding of the concept of SR, its significance, and the benefits it can bring to organizations. They are also valuable for guiding businesses in their efforts to integrate sustainability into their core operations and communications.

Comprehensive Rationale for Integrating CSR and SR

- *Comprehensive Impact Assessment:* Integrating CSR and SR provides a holistic view of a company's impact on society, the environment, and the economy.
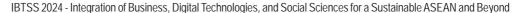
- *Enhanced Transparency and Accountability:* The combined approach to reporting promotes transparency and accountability, building trust with stakeholders.

- *Holistic Business Strategy:* Integrating CSR and SR ensures that social, environmental, and economic considerations are embedded into core business operations, leading to more sustainable and responsible practices.

- *Proactive Risk Management:* It helps companies identify, assess, and manage risks related to social and environmental issues, preparing them for emerging sustainability-related challenges.

- *Effective Stakeholder Engagement:* Integrated reporting enables more meaningful dialogue and engagement with various stakeholders, including investors, customers, employees, and communities.

- *Alignment with Global Standards:* The integration aligns with international frameworks and standards, such as GRI, SASB, and the UN SDGs, ensuring best practices and addressing global sustainability goals.

- *Fostering Innovation:* The integrated approach can drive innovation, leading to the development of new products, services, and business models that address social and environmental issues.

- *Enhancing Reputation and Talent Retention:* A strong commitment to CSR and transparent SR can enhance a company's reputation, attract and retain employees who value sustainability.

- *Improved Financial Performance:* There is evidence that companies with robust CSR and sustainability practices achieve better long-term financial performance.

This rationale highlights the strategic importance of integrating CSR and SR, as it aligns business operations with societal expectations, drives innovation, and contributes to long-term value creation. This understanding is valuable for guiding businesses towards a more sustainable and responsible future.

Importance of and Challenges in CSR and Sustainability Reporting (SR)

CSR and SR play several essential roles and also serve multiple functions that are critical in character. They demonstrate a company's commitment to ethical practices, enhancing its reputation and trust among stakeholders. They identify and mitigate social and environmental risks, protecting long-term business viability and sustainability. These practices also help companies comply with local and international regulations regarding environmental and social impact. Investors increasingly prioritize companies with strong CSR records, recognizing their long-term viability and ethical stance. Modern consumers prefer brands that align with their values, emphasizing sustainability and ethical practices. Despite their benefits, CSR and SR face significant challenges. Collecting reliable data across global operations can be complex and resource-intensive. The plethora of frameworks available can lead to inconsistencies, making standardization and comparisons difficult. Some companies may engage in peripheral and superficial CSR activities with minimal impact, undermining stakeholder trust. Implementing comprehensive CSR programs with substantive impact and reporting

mechanisms can be costly, particularly for Small and Medium-sized Enterprises (SMEs). Additionally, keeping pace with rapidly changing stakeholder expectations and regulatory requirements requires continuous adaptation.

- *Important Case Studies in CSR and SR*

a) Unilever—known for its Sustainable Living Plan, Unilever has integrated sustainability into its business model, leading to significant cost savings, innovation, and improved brand perception.

b) Patagonia—a pioneer in environmental responsibility, Patagonia's transparent reporting and commitment to sustainable practices have bolstered its reputation and customer loyalty.

c) IKEA—through its People & Planet Positive strategy, IKEA focuses on sustainable sourcing, renewable energy, and community impact, demonstrating the financial and social benefits of robust CSR policies.

The Relationship and Connection between CSR and Sustainability Reporting (SR)

CSR initiatives and SR efforts are interconnected, enhancing and reinforcing each other mutually. While CSR encompasses and provides the substance in the form of the actual policies and practices, SR serves as the platform to transparently communicate these activities to stakeholders. Their interaction is detailed below:

- *Substance and Communication:* Companies formulate and implement CSR policies focusing on ethical labor practices, environmental management, community involvement, and responsible governance. These efforts are recorded and shared through sustainability reports, providing detailed accounts of the company's achievements in these areas, ensuring transparency and accountability.

- *Strategic Integration:* Effective CSR strategies are well-defined and are aligned with the company's overall business strategy, incorporating social and environmental considerations into fundamental business operations. Frameworks like the Global Reporting Initiative (GRI) or Integrated Reporting (IR) offer standardized guidelines for documenting these strategies and their results, enabling stakeholders to assess the company's performance.

- *Stakeholder Engagement:* CSR requires active engagement with various stakeholders, such as employees, customers, suppliers, investors, and the community, to address their concerns and expectations. Sustainability reports act as a communication tool, presenting insights into how the company is addressing stakeholder concerns and promoting sustainable development.

CSR and Sustainability Reporting (SR) as Integral Components of Overall Corporate Governance (CG)

- CSR and SR are fundamental and integral elements of CG, ensuring that corporate strategies consider societal, environmental, and stakeholder impacts beyond financial performance. They
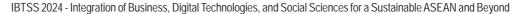
align corporate objectives with broader societal and environmental goals, promoting long-term viability and responsible business practices. Effective CG involves mitigating and managing risks related to social, environmental, and governance issues.

CSR practices help mitigate these risks by addressing potential liabilities and reputational threats, while ensuring compliance with regulations and standards. CG frameworks often emphasize stakeholder engagement, and CSR activities and SR foster transparent communication with stakeholders, including shareholders, employees, customers, and communities. This engagement builds trust and enhances relationships, which are crucial for sustainable business operations.

- Beyond short-term financial gains, CSR and sustainability initiatives focus on creating long-term value for all stakeholders. This includes enhancing brand reputation, attracting and retaining talent, improving operational efficiencies, and fostering innovation.

- Good CG requires accountability and transparency, and CSR engagement and SR provide mechanisms for companies to disclose their impacts, goals, and progress toward sustainability targets. This transparency helps stakeholders assess performance and hold companies accountable for their actions.

- Boards of Directors play a pivotal role in CG, overseeing CSR strategies, ensuring their integration into business practices, and monitoring performance through SR. Board leadership in these areas demonstrates a commitment to ethical behavior and responsible management practices. As essential elements, CSR and SR complement and strengthen CG Frameworks, promoting responsible business conduct, enhancing stakeholder trust, and contributing to long-term business resilience and success.

Major Opportunities and Key Challenges in Aligning CSR and Sustainability Reporting

- *Opportunities:* Companies that effectively align CSR initiatives with SR can enhance their credibility and build stronger relationships with stakeholders. The process of measuring and reporting on sustainability performance can drive innovation and operational efficiency, leading to cost savings and competitive advantage. Proactively aligning CSR with SR can prepare companies for future regulatory requirements and mitigate compliance risks.

- *Challenges:* Collecting accurate and comprehensive data for SR can be challenging, especially for large multinational companies. The lack of standardized metrics across different reporting frameworks can make it difficult to compare CSR performance across companies. Implementing and reporting on CSR initiatives requires significant resources, which can be a barrier for smaller companies. Some of the major challenges are given below:

- *Data Collection and Verification:* Gathering reliable data across global operations can be complex and resource-intensive.

- *Standardization and Comparability:* The plethora of reporting frameworks can create inconsistencies and make comparisons difficult.

- *Greenwashing:* Some companies may engage in superficial CSR activities without substantive impact, undermining stakeholder trust.

- *Cost:* Implementing comprehensive CSR programs and reporting mechanisms can be costly, particularly for small and medium-sized enterprises (SMEs).

- *Evolving Expectations:* Keeping pace with rapidly changing stakeholder expectations and regulatory requirements demands continuous adaptation.

These challenges underscore the complexities and the need for robust strategies and frameworks to ensure the integrity and effectiveness of CSR and SR. The process of measuring and reporting on sustainability performance can drive innovation and operational efficiency, leading to cost savings and competitive advantage. Proactively aligning CSR with SR can prepare companies for future regulatory requirements and mitigate compliance risks. Companies must proactively navigate these hurdles to achieve meaningful, credible, and transparent SR practices that build trust and contribute to sustainable development.

Finally, the insights provided as above on the challenges faced in CSR and SR domain are valuable for understanding the barriers that organizations need to overcome to successfully integrate CSR and 'Sustainability' into their operations and communications. This understanding is crucial for guiding future research and practical solutions to address these critical issues.

Case Studies Illustrating the Interplay between CSR and SR

- *Unilever:* Under the CSR initiatives, Unilever's Sustainable Living Plan focuses on improving health and well-being, reducing environmental impact, and enhancing livelihoods. It also uses comprehensive sustainability reports to track progress against these goals, demonstrating transparency and accountability to stakeholders. This reporting has enhanced their reputation and helped drive continuous improvement in their CSR efforts.

- *Patagonia:* Patagonia emphasizes environmental responsibility, fair labor practices, and community engagement. Their CSR initiatives include sourcing sustainable materials and donating a portion of profits to environmental causes. Patagonia's sustainability reports detail their environmental and social impacts, providing evidence of their commitment to CSR. This transparency has strengthened their brand reputation and built a loyal customer base.

- *IKEA:* IKEA's People & Planet Positive strategy aims to make a positive impact on people and the planet through sustainable sourcing, energy efficiency, and social initiatives. Its annual sustainability reports outline their progress towards these goals, showcasing their commitment to sustainability and enhancing stakeholder trust.

Real-world Business Examples of 'Sustainability Reporting' in the Indian Corporate World

There are several noteworthy examples of SR by Indian companies, highlighting their efforts and achievements in integrating sustainability into their business practices. They all demonstrate
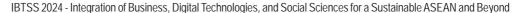
the commitment of leading Indian companies to SR and their efforts to integrate Environmental, Social, and Governance (ESG) factors into their business operations. By adopting and transparently communicating their sustainability practices, these companies set benchmarks for responsible business conduct in India and globally.

- **Tata Consultancy Services (TCS)**

  TCS has been a leader in SR in India. The company publishes an annual sustainability report aligned with the Global Reporting Initiative (GRI) standards. Its sustainability efforts focus on environmental sustainability, community engagement, and employee well-being. Its initiatives include reducing carbon emissions, promoting digital literacy through educational programs, and supporting community health and wellness projects.

- **ITC Limited**

  ITC Limited is renowned for its comprehensive sustainability initiatives and reporting. The company's sustainability report, guided by GRI standards, showcases its commitment to environmental stewardship, economic performance, and social responsibility. ITC has pioneered several sustainability projects, such as the "ITC e-Choupal" initiative, which empowers farmers through technology, and extensive water conservation programs that have made ITC water positive for over a decade.

- **Infosys**

  Infosys publishes an annual sustainability report adhering to the GRI standards and the Sustainability Accounting Standards Board (SASB) guidelines. The company is committed to becoming carbon neutral and has made significant investments in renewable energy, energy efficiency, and green building certifications. Infosys also focuses on social sustainability through education, healthcare, and rural development initiatives, particularly through the Infosys Foundation.

- **Wipro**

  Wipro is another Indian IT giant with a strong focus on SR. The company's sustainability report aligns with GRI, SASB, and the UN Sustainable Development Goals (SDGs). Wipro's sustainability initiatives include achieving carbon neutrality, waste management, water conservation, and promoting education and community development. Wipro's "Earthian" program engages students in sustainability education and projects.

- **Mahindra & Mahindra**

  Mahindra & Mahindra, a major player in the automotive and farm equipment sectors, is committed to sustainability and transparent reporting. Their sustainability report follows GRI standards and highlights initiatives such as reducing greenhouse gas emissions, water conservation, and

increasing the use of renewable energy. Mahindra's "Rise for Good" philosophy emphasizes inclusive development and social responsibility.

- **Reliance Industries Limited (RIL)**

  RIL has made significant strides in SR, following GRI and SASB Frameworks. The company's sustainability initiatives focus on energy efficiency, renewable energy, water management, and community development. RIL's efforts include large-scale solar power projects, waste management programs, and initiatives to improve healthcare and education in local communities.

- **Hindustan Unilever Limited (HUL)**

  It is a leader in sustainability in the fast-moving consumer goods (FMCG) sector. HUL's sustainability report aligns with GRI standards and the UN SDGs. The company's sustainability efforts include reducing the environmental impact of its products, promoting sustainable sourcing, and improving health and well-being. HUL's *"Project Shakti"* empowers rural women by providing them with training and employment opportunities.

- **Godrej Industries**

  Godrej Industries is committed to sustainability and transparent reporting, following GRI standards. The company's sustainability initiatives cover a wide range of areas, including energy efficiency, renewable energy, waste management, and social responsibility. Godrej's "Good & Green" strategy aims to create a greener India, foster employability, and promote health and well-being.

Current Trends in and the Future of CSR and Sustainability Reporting (SR)

There is a heightened focus on climate change, with increased attention on climate-related disclosures, carbon footprints, and strategies for achieving carbon neutrality. Organizations are emphasizing diversity, equity, and inclusion (DEI) initiatives, highlighting their impact on corporate culture and performance. Technological integration is on the rise, with companies leveraging digital platforms, blockchain, and AI for more accurate and transparent reporting. The movement and shift from shareholder to stakeholder capitalism is evident, with greater emphasis on engaging various stakeholder groups in CSR initiatives. Additionally, governments and regulatory bodies are increasingly mandating sustainability disclosures, pushing companies toward higher reporting standards. In the future, when we look forward, more jurisdictions are expected to mandate sustainability disclosures, increasing accountability and transparency. The use of big data and advanced analytics will improve the precision and enhance the scope of CSR reporting. Sustainability considerations will become embedded in corporate strategy, rather than being treated as standalone and separate initiatives. More sophisticated methods will be developed and used to measure and report the impacts of financial, social, and environmental dimensions. Enhanced cooperation among stakeholders will drive more effective solutions that are scalable and sustainable.

Future Directions

The interplay between CSR and SR reporting is likely to evolve with emerging trends and regulatory developments. There are several future directions. Under Mandatory Sustainability Reporting, increasing regulatory requirements for sustainability disclosures will drive more companies to integrate CSR initiatives with comprehensive reporting practices. Within Digital Transformation, advances in digital technologies, such as blockchain and AI, will enhance the accuracy and SR transparency. Similarly, on the issue of measuring Holistic Impact, companies will adopt more sophisticated methods to measure and report their total impact, including economic, social, and environmental dimensions. Finally, under the Global Standards, efforts to harmonize global reporting standards will improve comparability and consistency in SR.

Summary

Leading Indian companies demonstrate best practices in Corporate Governance (CG), emphasizing transparency, accountability, and ethical conduct. These firms set high standards, ensuring long-term sustainability and fostering stakeholder trust. Contemporary corporate governance encompasses Corporate Social Responsibility (CSR) and Sustainability Reporting (SR), which are crucial elements of modern business strategy. Various frameworks, such as GRI, SASB, IR, and TCFD, provide guidance on integrating CSR and SR to achieve consistency, comparability, and transparency.

Aligning CSR initiatives with transparent SR builds trust, enhances reputation, drives continuous improvement, and provides a competitive edge. As regulatory and stakeholder expectations evolve, integrating CSR and SR will become increasingly critical, presenting both challenges and opportunities for businesses globally. Understanding the interplay between CSR and SR offers a foundation for further research and practical implementation of sustainable business practices. While challenges remain, robust CSR programs and transparent reporting offer substantial benefits, including improved reputation, better risk management, and stronger investor and consumer trust. Businesses must continue to innovate and integrate sustainability into their core operations to ensure long-term viability and positive societal impact.

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Teachers Leadership For Student Success and Facilities to Meet the Needs of Modern Education

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ABSTRACT

The schools' leaders and the teachers today are encountering many difficulties to guarantee that their schools are fruitful. Since the section of No Child Left Behind Act, school leaders have been confronted with ensuring that all students, paying little heed to language as well as foundation, are fruitful on the final evaluation test. On the off chance that students do not gain final exam considering set principles, the school leader is seen as not being successful. The school principal/manager is at the progress edge for their school's advancement consistently and just to give some examples things, school security, suitable educational plan and facilities for students, great guidance administration to all students and using innovation to improve guidance and the board undertakings. Unluckily, instructive change drives in the twenties' century, which were intended to increment impressive skill inside educating, just prevailed with regards to expanding educational systems' organization by normalizing employing works on, executing uniform educational program programs, and applying unbending social strategies. As developing school systems turned out to be more unified and the managerial "step eliminated" turned into a "move forward," even the expert improvement of educators was taken out from their control. This study would talk about viewpoints and patterns in leadership in the accompanying regions: administration norms, authority advancement, shared administration, support for school authority, change in mission, office arranging and planning, utilization of educational time, early projects, extraordinary projects, school move, utilization of innovation and virtual schools. The first objective is to explore the teacher's leadership for teaching and learning. The second objective is to identify the planning and strategies for the teaching and learning. The benefactors are students, teachers, administrators and the school leaders.

Keywords: *: Teacher Leadership, Student success, Facilities, Modern Education*

Introduction:

Despite extensive research in the overall area of instructive administration, the meaning of educator initiative remaining parts changed because educators participate in such a great many

exercises and jobs that might include administration. For instance, Sherrill (1999) presents that teacher leaders are "clinical staff, clinical teachers, educators in-home, ace instructors, lead educators, and clinical leaders" (p. 57), while Crowther, Kaagan, Ferguson, and Hann (2002) consider instructor pioneers to be those "seeking to lead school change" (p. 5). Katzenmeyer and Moller (2001) characterize instructor pioneers as those educators who lead inside and past the classroom identify with and add to a local area of educator students and leaders and impact others towards worked on instructive practice" (pp. 5-8). Furthermore, educator leaders' definitions are educated by significant examinations that distinguish authority attributes, underline key preparation, and address moral issues in instructive settings, however the association between these hypotheses and the customary homeroom educator's central goal student learning is not clear (Archer, 2002). Besides, the utilization of authority hypothesis in the expert advancement of educators has not consolidated all educators, their study hall practice, and their learned (Brown, 1999). Educating and learning ought to be impacted by information gathered and such information could be utilized for leading applicable expert staff advancement exercises for workforce to work on the quality and sort of educational administrations required for meeting the singular necessities of understudies. The school leader and backing colleagues are supposed to show viable guidance to the educational staff. School leader/ executives need to remain momentum with the most recent patterns, best practices in view of exploration to guarantee that the educational employees are at their best in instructing and realizing so understudies are effective students. Some school leaders have asset employees to assist with guaranteeing that their companions are fruitful in educational conveyance administrations. The asset personnel might meet two times per week with educators to examine student achievement and what students are needing in the space of progress. The asset employees might notice peer employees and offer or propose ways of expanding the nature of guidance for students who need to work on their scholarly execution (Adams, 2006). The asset teaching faculty is an important asset for the school. The teaching faculty meet with the school leaders two times or when a month to examine the advancement of the educational workforce member(s) inside their given division. The school leaders and the help group are essential for the administration framework in many schools today.

Review of Literature:

Review of literature has many topics were reviewed, teacher leadership, students' success and modern education. The researcher used methodology also based on the systematic literature review.

Teacher Leadership

Early connectors who will attempt new things, Teacher leaders are daring people who relish difficulties and seek after proficient development for their own fulfillment and to increment student accomplishment. These instructors relate to and assist with cementing the statement of purpose of a school even as they add to the reception of new ways to deal with educating and school improvement processes (Crow, 1998). Difficulty people have frequently been classified "influencers"

because of their responsiveness to issues and their readiness to partake in navigation, to "stir up" the framework, and to handle the norm. Obviously, classroom teachers tackle issues and go with choices consistently, however the trademark that empowers educators to become pioneers is an assume responsibility disposition an inner locus of control and the certainty and hard-working attitude to define and achieve objectives.

Interior locus of control is the impression of command over results and the conviction that one could play out the ways of behaving whereupon the result depends. This is firmly connected with individual viability a singular's assessment of her or his presentation capacities (Simon, 2001). For instance, instructors with a solid inward locus of control are certain of their capacity to make precise, proactive choices. An educator's view of viability includes a judgment about her or his capacity to prevail at an undertaking, like expanding student accomplishment in science. The significant part of both interior locus of control and individual viability as each connects with leadership is that they are inside; that is, educator leaders accept that results are related with their activities as opposed to with activities, destiny, or outside factors (Wehril, 2003).

Student Success

Students have got benefit when they see their educators' facing challenges, broadening limits, and extending their abilities. An educator who attempts new showing models or uses innovation in her or his homeroom faces challenges openly. Nonetheless, educators who are not smug, however who are amped up for mastering and growing their abilities through oversaw risk-taking, give good examples to students wandering into new regions. Wilson (1993) upholds the idea that educator leaders are daring individuals who challenge processes and immediately take advantage of chances: "Instructor leaders go out of their method for tracking down imaginative, energizing projects, both to support their understudies as well as themselves" (p. 24). These are the instructors who persuade student by making significant opportunities for growth wherein student gain from both the interaction and the results anticipated. These are likewise the teachers who are really invigorated by educating; who end up tired yet fulfilled in the wake of conveying a very much arranged, action situated day (Wilen, 2003).

The students think basic learning stage on the grounds that in secondary school student will confront the need to take the school placement test. Thusly, the nature of a student's examinations will influence whether the student could enter a higher study, or even be owned up to a college. This might influence the improvement of student's future profession, and may likewise influence whether the student will work in better place. Having the option to have a fantastic work has a major effect (Clark, 1994). Scholastic work has forever been the norm for testing a student's learning level, and it is a capacity test to test the student's interior scholarly information throughout some undefined time frame. As far as learning inspiration, students focus closer on their own attributes, do not focus on learning, and are not even keen on learning, however are quick to take part in extracurricular sporting exercises. They do not care about their scholastic exhibition and

feel that the ongoing review is not reasonable for them. The absence of learning inspiration of students is basically appeared in the absence of clear learning objectives, learning for extra curricula activity, or in any event, becoming weary of learning and staying away from learning (Cohen, 1994).

Modern Education

Modern education innovation is another part of schooling, considering present-day showing hypothesis as an aide and science and innovation as a method, experimentally coordinating showing cycle and learning assets, the hypothesis and practice of accomplishing the motivation behind instructing streamlining (Haak, 2011). Current training innovation underscores the improvement of conventional showing techniques and showing abilities, focus on the levelheaded utilization of showing media in the showing system, enhance the showing system, and in this manner work on the nature of schooling and educating. The logical use of current instructive innovation in functional instructing has rolled out extraordinary improvements in showing specialized strategies, showing content show techniques, showing techniques and showing association frames, and has prompted principal changes in the connected instructive ideas, schooling system, etc., breaking the conventional training model, pooling another time of breath into the whole schooling and educating process (Handelsman, 2004).

For all nations, training is principal to create and succeed. Training shapes individuals' personality and knowledge. It likewise gives a feeling of inspiration to everybody. The customary school system at the tertiary level is a framework where the understudy gets precise training at the college by taking "full-time"/parttime required courses. In any case, this sort of framework additionally has a few impediments. Numerous advancements can be anticipated in the period ahead, one of the underpinnings of which is the continuous wellbeing emergency (Ladson-Billings, 1995).

Methodology:

Methodology of the study is literature review and content analysis were applied to collect data. Studies published between 2002 and 2013 in Science Direct, Eric and EBSCO are scanned and examined for this study, 161 studies matching with the criteria of this study are analyzed.

Findings & Recommendation:

The researcher reviewed research articles from the publication of Science Direct, Eric and EBSCO met the criteria for teaching and learning and are analyzed. In accordance with the purpose of the study, the data of each criterion is given below in figures.

The first objective is to explore the teacher's leadership for teaching and learning.

To explore desirable leadership style for teaching and learning. The following sections of the paper detailed the findings of the synthesis of review literature for the leadership styles for the teachers teaching and learning. The researcher reviewed leadership styles, autocratic, democratic,

laissez-faire, charismatic, transactional, servant, and situational. Those styles were widely used in leadership-based literatures. The figure showed that the teachers used for teaching and learning. The results were in percentage. The autocratic leadership style was used by the teachers for teaching and learning at 9% level. The democratic leadership style was used by the teachers for teaching and learning at 12% level. The laissez-faire leadership style was used by the teachers for teaching and learning at 7% level. The charismatic leadership style was used by the teachers for teaching and learning at 13% level. The transactional leadership style was used by the teachers for teaching and learning at 28% level. The servant leadership style was used by the teacher for teaching and learning at 21 %. The situational leadership style was used by the teacher for teaching and learning at 10%.
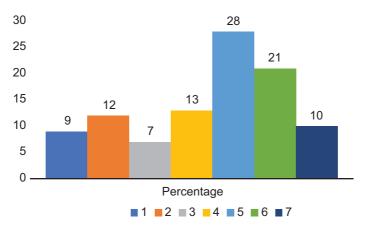

Figure 1 : Teachers Leadership styles

From the figure the highest percentage is at 28 % level of transactional leadership so the researcher concluded that the transactional leadership was used by the teacher for teaching and learning but other leadership was used very less percentage.

The second objective is to identify the planning and strategies for teaching and learning

To identify the planning and strategies for teaching and learning. The following sections of the paper detailed the findings of the synthesis of review literature to identify the planning and strategies for teaching and learning. The researcher found that the teachers planning and strategies were widely used. The table showed that the teaching strategy were used for teaching and learning. The results were in percentage. The strategy I (Classroom Management) was used by the teachers for teaching and learning at 23% level. The strategy II (Flexible seating) was used by the teachers for teaching and learning at 19% level. The strategy III (Webb's Depth Knowledge) was used by the teachers for teaching and learning at 12% level. The strategy IV (Active learning) was used by the teachers for teaching and learning at 29% level. The strategy V (Personalized learning) was used by the teachers for teaching and learning at 17% level.
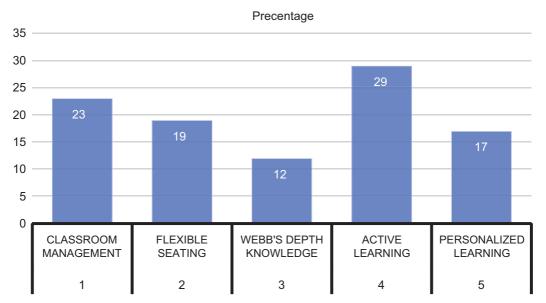
Figure 2 : Teachers Teaching strategies

From the figure the highest percentage is at 29 % level of active learning so the researcher concluded that the active learning was used by the teachers for teaching and learning but other strategies was used very less percentage.

The findings showed that the educators worked with power on this undertaking and the endeavor as hard as possible to finish this job. The instructors were pleased with their work on that assignment. The educator had a ton of consideration regarding the errand and let others worked in their desired way. The educators seldom provided guidance or direction to other people assuming they detected they could accomplish their objective. However long things were gone without a hitch, the instructors were fulfilled. The educators observed all undertakings that they were accountable for to guarantee the group meets its goal (Tobil, 1987).

The results conveyed that the educators helped other people on to grasp their dreams using apparatuses, like pictures, stories, and models. The instructors made a special effort to encourage others to associate with them. The instructor helped other people with their self-advancement. The instructors guaranteed others gain appreciation as well as remunerations when they accomplish troublesome or complex objectives. Impact others by creating shared loving and regard. They had a consistently growing organization of individuals who trust and depend upon them. They gave difficulties to their colleagues to assist them with developing. The educators oversaw others by setting norms that they all concur it (Devlin, 2010).

Conclusion:

The trends in leadership and the utilization of innovation in arranging and planning may a should be returned to by leaders today. As we consider instructive practices in schools, the chiefs and

members should consider planning school offices in view of the necessities of understudies and maybe the local area, yet additionally holding down cost however much as could reasonably be expected. School leaders should know about how the socioeconomics and synthesis of networks might be changing and better than ever approaches to conveying guidance to students in the best way should be major areas of strength for a. School leaders, organizers and creators should know about the thing might citizens want to help and how could instructive administrations be conveyed in a more effective way to address the issues of a wide range of understudies with respect to of foundation or language for the 21st century.

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Green Insurance: A Road Map For Sustainability

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ABSTRACT

The climate change is accelerating, and severe and widespread of the consequences are expected in many areas. Although the insurance sector is not closely associated with any of the sustainability dimensions, expectations may change rapidly. India, which has significantly exposure to tropical cyclones and extreme weather, experienced such conditions on 314 out of 365 days in 2022, & 2023 as highlighted in various reports. In the contemporary landscape, the insurance industry is increasingly recognizing the imperative of sustainability. As environmental, social, and governance (ESG) considerations gain prominence, regulatory bodies play a pivotal role in shaping the industry's trajectory. The Insurance Regulatory and Development Authority of India (IRDAI) is at forefront of fostering sustainable insurance practices in the Indian context. This article explores the multifaceted role of IRDAI in promoting sustainability within the insurance sector, encompassing environmental responsibility, social inclusivity, and ethical governance.

In the background, we analyze the role of insurers, especially in the property automobiles and casualty areas, in addressing the environmental and climate risk challenges and developing a truly sustainable, environmentally friendly business mode. Green insurance on the Principles of Sustainable relooks on the developed comprehensive roadmap along with insurance value chain for executive management to design their company's sustainability efforts, with special focus on property and casualty along with more information. This research paper is a conceptual study regarding the Insurance and Insurance products and during the study the Regulatory body is following the SDG goals that has been mapped to the products existing.

Keywords: Green Insurance, Sustainability, Insurance Management and Value Chain

Introduction:

The climate change is significantly affecting extensively and the consequences are affecting many areas. Insurers are playing a very important role in addressing the environmental and social challenges from mitigating the climate risk. In the modern scenario, the Insurance Industry is increasingly recognizing the sustainability factor. As environmental, social, and governance (ESG) considerations gain prominence, regulatory bodies play a pivotal role in shaping the industry's route. The Indian insurance industry has innovated the new products to support the environmental consciousness. The Indian insurance industry stands at the lead of development sustainable development and environmental responsibility. By embracing climate-resilient insurance products, green initiatives, and innovative solutions, insurers can not only protect individuals and businesses from the escalating risks associated with climate change but also contribute to building a more sustainable future.

The government of India has committed to a green growth path, having outlined an ambitious plan to source 40% of its electricity from non-fossil energy sources and bring down emissions intensity by up to 35% by 2030. The Insurance Regulatory and Development Authority of India (IRDAI) is at the forefront of fostering sustainable insurance practices in the Indian context.

Research Problem & objectives of the study:

India is one of the world's most vulnerable countries to climate change. It is estimated that India is incurring losses of about USD 9–10 billion annually due to extreme weather incidents. Nearly 80% of the losses remain uninsured.   The research paper focuses on these four areas mapping the SDG goals.

The research is focusing on these areas

Energy: It is exposed to a changing risk landscape. Unprecedented rainfall and droughts can lead to substantial crop failure. The lack of water is a threat to hydro-power generation and thermal power, affecting India's energy production plans. India is currently the fourth largest energy consumer globally.

Agriculture: Agriculture directly contributes to 17.6% of the country's emissions. The sector accounts for 17% of Gross Domestic Product (GDP) and almost 50% of employment.

Thirdly the pollution problem from vehicles: One significant way to cut greenhouse gas emissions is by using electric cars. In addition to lowering reliance on fossil fuels, electric cars help lessen the effects of compounds that deplete the ozone layer and encourage the widespread use of renewable energy sources.

Infrastructure development: Green Initiatives and Climate Risk Management: With climate change posing significant risks to the insurance industry, the IRDAI actively promotes green initiatives and climate risk management.

The Objectives of the study is

The study has been related to the sustainability themes covered and role of Insurers.

1. The objectives of the study is to understand the conceptual framework of green insurance products for the sustainable development.

2. To give the awareness on the insurance impact and SDG Goals through a conceptual model.

3. The journey of green insurance product awareness implemented.

REVIEW OF LITERATURE:

- Green innovation refers to new or improved processes, practices, systems, and products that benefit the environment and help to reduce or avoid the negative effects of pollution

- The greater awareness of environmental problems has triggered research on the factors influencing green innovation

- Existing studies have shown that green finance contributes to environmental improvements.

Research Methodology:

It is a conceptual study where the conceptual model is linked to the SDG goals and also the implementation of the model in different insurance products which helps in the main core sectors which has been shared in the research problem.

The importance of insurance to the SDGs.

The role of insurance is multidimensional and includes strengthening household and business flexibility and facilitating the flow of capital. The IRDAI encourages insurers to innovate and develop products that align with sustainable development goals. This includes insurance products that promote renewable energy, sustainable agriculture, and conservation efforts. By fostering product innovation, the regulatory authority contributes to the creation of a market that addresses emerging sustainability challenges

1. As the basic concept of Insurance, it protects against unexpected financial shocks that set back development progress.

2. Insurance builds flexibility

3. Insurance matters to the Sustainable Development Goals

Insurance products linked to sustainable Development goals.

Sustainable development goals take a holistic approach linking the environmental protection, economic growth & social inclusion. The contribution of the Insurance companies to the SDG Goals are
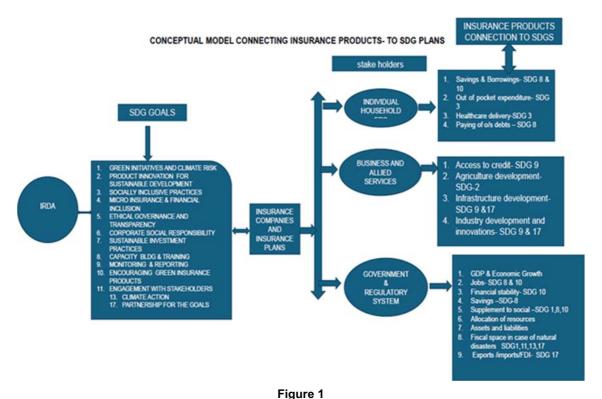
Figure 1

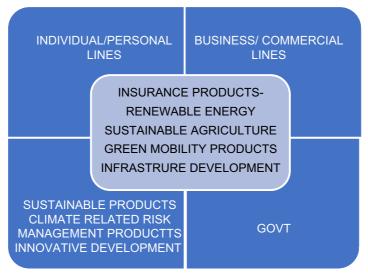## INSURANCE PRODUCTS CONNECTING TO INDIVIDUAL & HOUSEHOLDS:

Figure 2

Sustainability initiatives of global insurers in India:

Global insurers operating in India have been at the forefront in adopting Sustainability by taking definitive action.

- Munich Re has started to offer performance coverage for battery storage. It has developed new coverage solutions for manufacturers of photovoltaic projects which include compensation against guaranteed trigger.

- Swiss Re has announced that by 2023 it would stop providing insurance to the world's top 10% of the most intensive oil & gas producers and stop investing in them.

- Genrali has created a competence center to ideate and share best practices in underwriting the specific risks in the renewable energy sector. AIG has established an ESG divided fund to promote sustainable and impact investing; and it is also promoting natural catastrophe risk modelling and climate risk anticipation/pre-emption.

- Cigna has adopted a strategic Sustainability performance plan designed to manage global real estate portfolios with focus on emission reduction, energy efficiency, reusability/recycling, and waste management.

- Liberty Mutual has developed a new stochastic wildfire model by adjusting their latest wildfire model to better match their underwriting practices with latest information on weather.

Table - 1 : Details of the green products available to the individuals, business lines

Stakeholders	Product	Policy details	Description
Individual or personal lines	AUTOMOBILES	Hybrid vehicle premium discounts	optional coverage whereby, after a total car loss, the insured can replace his or her traditional automobile with a comparable hybrid vehicle
	AUTOMOBILES	Alternative fuel premium discounts,	which apply if the car uses an alternative energy source such as biodiesel, electricity, natural gas, hydrogen or ethanol.
	AUTOMOBILES	Pay as You Drive (PAYD) programs,	The PAYD offers policy discounts to drivers who, according to their sensor, drive fewer miles than the average—thus saving consumers money while reducing accidents, congestion and air pollution.

Stakeholders	Product	Policy details	Description
	AUTOMOBILES	Fuel-efficient discount	Premium discount or special insurance package could be designed and offered to customers using electric or hybrid vehicles
	Green Insurance For Homes	**Premium discounts for LEED certified homes.**	Green Building Rating System. This system, developed by the U.S. Green Building Council, is a recognized environmental standard in the building world and has high efficiency and sustainability standards.
	Green Insurance For Homes	Eco-friendly replacement materials endorsements	some standard homeownersm policies. After am loss, these allow the insured to replace or rebuild with more sustainable aterials, practices and products.For example, some Companies will pay homeowners extra if they recycle debris rather than send destroyed materials straight to a landfill, and replace old kilowatt-hungry appliances with Energy Star machines, which meet an energy-savings rating created by a joint program of the U.S. Environmental Protection Agency and the Department of Energy.
	Green Insurance For Homes	Green home insurance:	Insurers provide homeowners with insurance discounts or add-ons that help them save money and encourage them to construct with eco-friendly materials and consume less energy. In the event that a disaster ruins their homes, homeowners may choose to switch to eco-friendlier materials and appliances because their insurers will usually pay for the higher cost of such replacements.

Stakeholders	Product	Policy details	Description
Business/ commercial lines	Automobiles	**Hybrid vehicle premium discounts**	Discounts may also be available on boat insurance for hybrid-electric boats and yachts).
	Automobiles	discounturance to drivers	Usage-based insurance monitors driving behavior using GPS or mobile phone technologies, as well as through plugged-in devices in car ports. Customers can receive lower rates while lowering emissions because fewer kilometers driven on the road indicates a decreased likelihood of an accident.
	Green Insurance For Homes/ Businesses	Broad coverage for alternative energy sources	For homeowners who generate their own geothermal, solar or wind power and sell any surplus energy back to the local power grid, there are now policies that cover both the extra expense of temporarily buying electricity from another source and for the income lost during a power outage (as long as the outage is caused by a covered peril). Policies also generally cover the cost of getting back online, such as utility charges for inspection and reconnection.
	Green Insurance For Homes/ Businesses	Cover installing green building systems and materials	These eco-friendly replacements would include energy efficient electrical equipment and interior lighting, water conserving plumbing and nontoxic, low odor paints and carpeting.
	Green Insurance For Homes/ Businesses	Property loss mitigation discount	Insurers may consider offering premium credits to homeowners who use mitigation devices or materials or

Stakeholders	Product	Policy details	Description
			construction techniques which can reduce loss from catastrophes.
	Green Insurance For Homes/ Businesses	Allow "green ertified" rebuilding	in the event of a total loss. In addition to the building itself, this coverage may pay for engineering inspections of heating, ventilation, air-conditioning systems, building recertification fees, replacement of vegetative or plant covered roofs and debris recycling and loss of income and costs incurred when alternative energy generating equipment is damaged
Government / other regulatory bodies	Environmental Liability Policies	Environmental consultants errors and omissions policies cover consultants who advise third parties about environmental conditions.	
		Environmental Contractor policies cover operations that a remediation contractor performs.	
		Environmental testing laboratory overage addresses the liability of firms that analyze hazardous materials in the soil, ground or air.	
Government Initiatives on Agricultural Insurance products	National Agricultural Insurance Scheme	- Rashtriya Krishi Bima Yojana - Fasal Bima Yojana - Livestock insurance scheme - National Scheme on Fisheries Training and Extension - National Scheme on Welfare of Fishermen - Pradhan Mantri Kisan Samman Nidhi (PMKSN) for minimum support scheme - Pradhan Mantri Krishi Sinchai Yojana (PMKSY) for irrigation - Paramparagat Krishi Vikas Yojana (PKVY) for organic farming - Pradhan Mantri Fasal Bima Yojana (PMFBY) for crop insurance	

Stakeholders	Product	Policy details	Description
		• Farmer Income Protection Scheme (PM AASHA) • Micro Irrigation Fund (MIF) • National Mission For Sustainable Agriculture (NMSA)	
Government sponsored health Insurance schemes	Health Insurance Schemes	• Ayushman Bharat Pradhan Mantri Jan Arogya Yojana (PM-JAY) • Pradhan Mantri Suraksha Bima YojanaAam • Aadmi Bima Yojana • Central Government Health Scheme (CGHS) • Employment State Insurance SchemeJanshree Bima Yojana • Chief Minister's Comprehensive Insurance Scheme • Universal Health Insurance Scheme (UHIS) • West Bengal Health Scheme • Yeshasvini Health Insurance Scheme	

Table - 2 : Steps taken by Indian insurers towards Sustainability:

INSURANCE COMPANIES	PRODUCT DETAILS
The New India Assurance Co Ltd	New India Solar Energy Insurance Policy
Tata AIG General Insurance Company Ltd.	Weather Insurance Policy (Based on risk period.)
Tata AIG General Insurance CompanyLimited	Solar Module Warranty Insurance (The premium is paid for one year of production and the IP starts thereafter usually for 25 years of the warranty)
HDFC ERGO GICL	Solar Panel Warranty Insurance. Policy is issued on Annual basis and the coverage is up to the Manufacturer's Warranty period
ICICI Lombard General Insurance Company Limited	Photovoltaic Panel Warranty Insurance 10-12 years Product warranty, 25-30 Year Performance Warranty
IFFCO-Tokio General Insurance Co. Ltd.	Photovoltic Sales Policy-This policy covers the Performance warranty given by the manufacturers. In

INSURANCE COMPANIES	PRODUCT DETAILS
	addition to Performance warranty, it also covers the product warranty issued by the manufactures. This policy is extended to cover Buyer of thePhotovoltaic modules provided the manufacturer becomes insolvent. Buyer can also buy the policy over and above the Indemnity limit under Photovoltaic Buyer policy as a top up cover.The loss to the Buyers of the photovoltaic modules is indemnified provided manufacturer becomes insolvent or topup cover is opted. The insolvency of the manufacturer/Insured makes it impossible to satisfy obligations to indemnification under Photovoltaic Sales Policy & only permits recovery under Photovoltaic Buyers policy.
Cholamandalam MS GICL	Chola Solar Plant Protect Policy
Reliance General Insurance CompanyLimited	Reliance Solar Photovoltaic Module Warranty Insurance (Manufacturer Insurance Policy) Coverage Period: Solar Photovoltaic Modules sold over a defined sales period (example 3 years) are covered for the duration of warranty (usually up to 30 years from sale)

ROAD AHEAD FOR THE SUSTAINABILITY:

The key themes that India can further move towards sustainability agenda

- **Strengthening food and agriculture systems**: Insurers can increase accessibility to crop insurance, shielding farmers from both floods and droughts. Weather-based parametric insurance solutions can protect agricultural warehouses from utilisation risk. Insurers can also expand the boundaries of insurability by helping smallholders grow their farms into sustainable, commercially viable businesses.

- **Advancing energy transition:** By improving the bankability –means advancing credit for setting up various sustainable projects by promoting green initiatives targeting the renewables sector. Encouraging the new technologies aimed at making fossil fuel-driven processes more efficient; and carbon-capture processes.

- **Developing resilient infrastructure**: Insurers can explore coverage options for both construction and operation of green buildings, such as for damage to newly installed energy efficient systems; business interruption due to energy systems failure; and shortfalls in benefits from expected energy savings. The industry can also play its part in restoring investor confidence by identifying and insuring against hitherto unforeseen infrastructure project risks.

- **Driving affordable insurance with digital solutions**: Technology-based solutions can also aid insurers in cattle identification and crop yield assessments. Innovations such as insurance-backed guarantees can be developed to cover the failure of algorithms if they don't perform as expected. Insurers can partner with satellite vendors to enable remote sensing-based rapid damage assessment after large-scale floods. This will result in faster pay outs and early warnings for business and infrastructure.

- **Mitigating health risks**: With new and emerging health risks, Insurers can pivot to provide innovative solutions such as offering treatment for mental health disorders and developing specific nature-related preventive and therapeutic measures. They can also reverse the health implications arising from biodiversity degradation by protecting green roofs and forest covers.

Conclusion:

- The role of IRDAI in promoting sustainable insurance practices underscores the profound impact that the insurance industry can have on society and the environment. By integrating ESG principles, encouraging social inclusivity, and fostering ethical governance, the regulatory authority contributes to a holistic approach to sustainability. The emphasis on micro insurance, financial inclusion, and CSR aligns with broader societal goals, ensuring that insurance becomes a force for positive change.

- The key objectives of the IRDAI include protecting the interest of policyholders, speedy and orderly growth of the insurance industry, speedy settlement of genuine claims, effective grievance redressal mechanism, promoting fairness, transparency, and orderly conduct in financial markets dealing with insurance, prudential regulation while ensuring the financial security of the Insurance market.

- As the insurance industry continues to evolve, the IRDAI's proactive stance on sustainable investment practices, capacity building, and monitoring requirements positions it as a key driver of sustainability in the Indian insurance landscape.

- By championing green initiatives, supporting innovation, and engaging with stakeholders, the IRDAI paves the way for a resilient and responsible insurance sector that aligns with the imperatives of a sustainable future.

The ongoing commitment of the regulatory authority to sustainability principles reinforces the notion that insurance, when approached sustainably, can become a powerful instrument for positive societal and environmental impact

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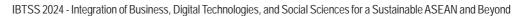
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Corporate Social Responsibility to Employees under the Influence of Pandemic and Artificial Intelligence

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ABSTRACT

. *This article investigates the evolving landscape of corporate social responsibility (CSR) towards employees amidst the growing influence of the pandemic and generative artificial intelligence (AI) in the business world. Through an examination of extant research on contemporary CSR needs and an introduction of relevant theories, the impact of the Covid pandemic and AI is analyzed. Based on the above analysis, the framework of CSR to employees is proposed which includes five dimensions: upskilling and reskilling, equal opportunity, employee engagement, flexibility, and mental health.*

Keywords: *Artificial Intelligence; Corporate social responsibility; Employees; Pandemic; Stakeholders.*

1. Introduction

As economic uncertainty has arisen in recent years, companies' commitment to Corporate Social Responsibility (CSR) will face increasing scrutiny (Berkowitz et al., 2022). Is a company CSR executor putting the CSR strategies into its operation or just a CSR actor, viewing CSR as its slogan only? It is believed that he upcoming years will continue to test a company's CSR commitment and give us a good answer. While cost-cutting measures are often implemented during economic downturns, prioritizing employee well-being, including fair wages and job security, remains paramount (Berkowitz et al., 2022). Furthermore, a steadfast commitment to social impact through CSR programs is still crucial. The modern workforce seeks employment with companies that prioritize corporate social impact. According to Edelman's 2023 special report "Trust in the Workplace," a significant portion (70%) of employees prioritize positions that provide them opportunities to contribute to societal well-being (Edelman, 2023). Companies that fail to align with these expectations risk losing talented employees. Similarly, consumers' purchasing decisions are also greatly influenced by a company's CSR efforts. The 2021 Porter Novelli Purpose Premium Index (PPI) highlights that 73% of consumers base their purchasing decisions on a company's commitment to the CSR performance including supporting communities and the environment (Berkowitz et al., 2022).

Investors, too, consider a corporation's purpose-driven initiatives and social contributions when making investment decisions. Therefore, CSR extends beyond simply social good or altruistic ends and it plays a vital role in business success and sustainable development by significantly influencing the decisions of key stakeholders, including employees, consumers, and investors etc.

The relationship between CSR and firm performance has been discussed a lot in previous studies (Velte, 2021). While some literature argued that the impact of CSR practices on firm performance is negative because implementing CSR is a cost (Huang et al., 2020) from the short term, most of the research has demonstrated a positive relationship with firm performance since CSR practices show the concern of the business to interests of various stakeholders (Mahrani & Soewarno, 2018) and ultimately to improve firm performance. CSR activities create cohesion between businesses and stakeholders; accordingly, businesses receive positive responses from stakeholders (Gunawan et al., 2020). Some empirical research shows that CSR practices have a positive relationship with business outcomes such as competitive edge (Eyasu et al., 2020), value of stock (Asogwa et al., 2020), sustainability performance (Le et al., 2021), organizational pride (Asante Boadi et al., 2020), and work engagement and turnover intention (Lin and Liu, 2017). According to the study of Feng et al. (2017), the success of a business depends on its ability to build relationships with stakeholders. George et al. (2020) in their studies have explored the impact of CSR perceptions on affective commitment and Soewarno et al. (2021) also demonstrate that CSR has a positive and significant impact on corporate performance. In this context, CSR is assumed to have a positive association with firm performance because consistent implementation of CSR initiatives can lead to positive attitudes of stakeholders towards the business, proactive innovation in the way of doing things, improved corporate reputation, enhanced competitive advantages and market performance, and improved firm performance in a sustainable way (Islam et al., 2021; Javed et al., 2020; Kong et al., 2020).

Even though CSR has been demonstrated to have a positive impact on a company's performance, in some contexts, especially after the pandemic, business leaders may not show a good and sustainable CSR commitment. Bersoff et al. (2024) reached more than 75,000 people in 28 countries in three separate surveys. One part of the survey is about the participants' attitudes toward which issues they believed companies should take responsibility for. The results shown in Fig. 1 indicate that people are clear about the core economic function of business since 85% respondents think the companies should be an engine of economic growth. The social responsibility is the second most highlighted in the survey. For example, 76% of respondents believe companies should work to solve major global problems such as climate change and poverty, 74 % of them think they should work to solve the country's major social problem, and 83% of the respondents think companies should also support local communities. Unfortunately, the public doesn't believe that business has done enough to fulfill their social responsibility. Based on the results in Fig. 1, the six facets of social responsibility all show big gaps between what respondents think business should be emphasizing and what they think it is doing well on. For example, only 29% of respondents think the business is doing well in

working to solve major global problems, which makes the biggest 47 points of the performance gap. Companies' work to solve major social problems has a 45-point performance gap. Even though companies have a major concern about their economic performance, it still shows 38 points of the performance gap.
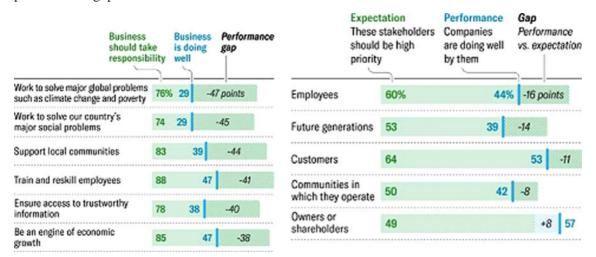

Figure 1 : Companies' CSR performance (Source: edited from HBR)

How is the business performance toward their various stakeholders and do business leaders give priority to their significant stakeholders? Previous research on CSR mainly focused on organizational level rather than individual level, but more recent studies have shown the importance of considering the psychological micro-foundations of CSR by studying employee-focused CSR (Tang et al., 2022; Rupp and Mallory, 2015). In the research of Bersoff et al. (2024) people were asked which stakeholders' interests should be given high priority in corporate decision-making. As is shown in Fig. 1, according to this survey, the interests of employees and customers were named most often and employees are not being well served with the biggest gap of 16 points. Tang et al. (2022) revealed that CSR to employees and organizational identification were positively and significantly related to job embeddedness and suggested engaging in CSR activities can lead employees to identify themselves with the organization and enhance their embeddedness. The implementation of ethical intergroup practices for employees can enhance their psychological attachment to the organization and bind them to it (Tang et al., 2022). Therefore, it is very crucial for organizations to recognize the emerging needs of employees in the current business landscape and to fulfill these needs in time.

2. CSR Theories

The concept of CSR has been present in academia since as early as the 1930s. Initial explorations into CSR were largely devoted to establishing a clear definition for the concept (Carroll, 1999).

These formative discussions predominantly framed CSR within the contexts of ethics and social welfare, rarely connecting it to the strategic management within firms

(Acquier, Gond, & Pasquero, 2011). Progressing into the late 1990s and beyond, the scope of CSR extended beyond the confines of ethical considerations and environmental regulation (Moir, 2001), encompassing a broad spectrum of research areas under its umbrella. The literature on CSR now incorporates a variety of viewpoints, often intersecting with adjacent fields such as corporate citizenship, social performance, responsiveness, and sustainability (Valor, 2005). This diversification in the scope of CSR research over the last fifteen years has led to the emergence of numerous definitions, with more than 30 distinct interpretations identified in the literature and is evolved over time in a more stimulating and profound way to attract further attention from businesses and stakeholders (Singh & Misra, 2021).

CSR is conceptually described as firm's voluntariness in implementing socially and environmentally responsible management practices towards their various stakeholders for a sustainable future on the balance of economic, social, and environmental value (Le et al., 2021; Sharma, 2019). In this regard, value-creating activities must be carried out with genuine effort and not compromise on environmental and social issues. In the context of globalization and series of environmental challenges today, stakeholders are increasingly concerned in the behavior and responsibility of businesses to the environment and society for sustainable development (Gunawan et al., 2020; Singh & Misra, 2021). With decades of development of CSR research, so far, there are quite a few theories relevant to CSR in academia that have a broad and profound impact both in practice and academia, such as stakeholder theory, Carroll's pyramid model, and triple bottom line.

2.1 Stakeholder Theory

Corporate Social Responsibility (CSR) studies often draw theoretical grounding from stakeholder theory, introduced by Freeman (1984). This theory emphasizes a business's responsibility to various societal groups – its stakeholders – who have a vested interest in the company's success (Freeman, 1984). Freeman's initial model identified seven stakeholder groups, including shareholders, employees (both management and workers), customers, government, competitors, suppliers, and the community (Freeman, 1984). He later reclassified these into "internal" (financiers, suppliers, employees, communities, and customers) and "external" stakeholders (NGOs, environmentalists, governments, critics, media, and others) (Freeman, 2003). While stakeholder theory faces criticism for its ambiguous definition of stakeholders (Fassin, 2009) and the challenges of identifying and managing them due to context-specific situations (Hall & Vredenburg, 2005), Freeman et al. (2020) argue these tensions with strategic management might arise because both fields address different problems. They propose that these tensions could be opportunities to bridge the gap between theory and practice. By embracing a more pragmatic approach, both strategic management and stakeholder theory could benefit from each other. Despite these criticisms, stakeholder theory remains a valuable and foundational framework for analyzing CSR. Its comprehensiveness and focus on stakeholder

identification, analysis, and negotiation empower managers to be more effective in their social responsibility efforts (Freeman, 2004).

2.2 Carroll's Pyramid Model

Based on his previous research, Carroll (1991) determined the pyramid of CSR dimension of CSR. It portrays the four components of CSR, beginning with the basic building block notion that economic performance undergirds all else. At the same time, business is expected to obey the law because the law is society's codification of acceptable and unacceptable behavior. Next is business's responsibility to be ethical. At its most fundamental level, this is the obligation to do what is right, just, and fair, and to avoid or minimize harm to stakeholders (employees, consumers, the environment, and others). Finally, business is expected to be a good corporate citizen. This is captured in philanthropic responsibility, wherein business is expected to contribute financial and human resources to the community and to improve the quality of life (Carrol, 1991). According to this pyramid model, organizations should carry out their responsibility to numerous stakeholders related to the companies directly or indirectly, such as employees, customers, community, business owners, and society using the business relation towards improving and maintaining good customers as well as spreading good behaviors and curbing, eliminating bad behaviors towards related firms' stakeholders.

2.3 Triple Bottom Line

The triple bottom line implies at least three distinct domains of firm performance: economic, social, and environmental performance (Elkington, 1997) and it argues that only when firms achieve high performance in all three areas are they able to achieve a sustainable advantage, where sustainability implies more than simply a competitive position within a strategic group. There are several CSR evaluation systems using triple bottom line as their theory foundation such as Dow Jones Sustainability Index (DJSI), FTSE4Good Index and JSE-SRI Index. DJSI was the first sustainability index in the world, and was created by Dow Jones, STOXX and SAM in 1999 with 3-tiers of criteria based on the triple-bottom line theory. The 1st-tier criteria include economic, environmental and social responsibilities. Under the economic criterion, there're 4 sub-criteria (2nd-tier) such as corporate governance, risks and crisis management, compliance/bribery and industry-specific criteria. Under the environmental criterion, there're 3 sub-criteria (2nd-tier), namely, environmental performance, environmental reporting and industry-specific criteria. Likewise, the sub-criteria for the social responsibility are human resource development, corporate citizenship/philanthropy, social responsibility reporting, employment performance and industry-specific criteria. And there are a number of 3rd-tier criteria under the second level.

FTSE4Good Index was established by London Stock Exchange and Financial Time in 2001 to promote ethical investment, covering 100 enterprises across England, Europe and America, etc. According to its definition, a socially responsible enterprise should accept responsibility for sustainable environmental development, positive stakeholder relations; it should support and protect human

rights, favorable supply chain and employment standards and implement anti-bribery measures, all of which serve as the 1st-tier criteria of the index. Under each criterion, there are three perspectives of policy, management and reporting as the 2nd-tier criteria, which furthermore divides into core and desired 3rd-tier criteria. JSE-SRI Index was created by Johannesburg Stock Exchange in 2004 to assist enterprises in integrating the principles of triple-bottom line and favorable governing structure into the daily operation and management. Quite similar to the structure of the FTSE4Good index, the index consists of economic, environmental, and social responsibility as its 1st-tier criteria, with policy, management, and reporting as its subordinate level with core and desired criteria as its 3rd layer.

3. The Evolving Business Landscape: Pandemic and AI

During the past five years, there are two trends that warrant mention in the contemporary business landscape: Covid pandemic and artificial intelligence (AI).

3.1 The Influence of Pandemic

As is known, the Covid-19 pandemic has brought great and unprecedented pressures to business. Even today, it has been about four years after the Covid-19 pandemic outburst, and most people are still struggling to find a new normal. Organizational life in the drastic circumstances of the Covid-19 pandemic had never been more challenging than now. Employers are grappling with a host of conflicting demands. On the one hand, confronting the current inflationary trends and slow economic growth, they need to boost productivity and control growing costs. On the other hand, organizations must solve the human energy crisis since many workers are burned out or show a low engagement in the workplace, still struggling to adjust to remote or hybrid work or stressed by return-to-office requirements. Some may also be managing health issues, including long Covid symptoms or mental health issues at the same time coping with drastically increased living costs **Figure 2**.

To deal with massive profit losses during the Covid-19 pandemic many business leaders are adopting various downsizing strategies to minimize the operation cost, among which layoff is one of the most often used by business leaders because of its quick effect. As a result, a large number of jobs disappeared from the labor market, which has created ongoing uncertainty and anxiety among the employees of organizations (Tang et al., 2022). This may explain why employees show a lower satisfaction with their organizations, which is indicated in one survey that 42% of employees say their employers don't care about them (Praslova, 2023). According to the result of the survey of Edelman (2023), investigating around 7000 respondents from 7 countries including Brazil, China, Germany, India, Japan, UK, and U.S., it is found that the percentage of employees who worry about losing their jobs increases to 78%, 5 points higher than 2022. The reasons why they are anxious are various but the most significant one is looming recession, which has been happening since the pandemic.

Even employees who still stay with their companies showed low engagement. It is indicated that employees' engagement hit its lowest in a decade, especially with younger workers and women
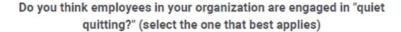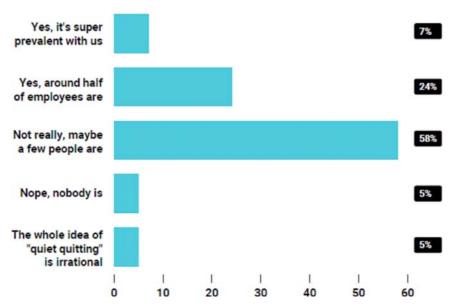
Do you think employees in your organization are engaged in "quiet quitting?" (select the one that best applies)

Figure 2 : Quiet Quitting (Source: HR.com's State of Employee Productivity and Engagement 2024)

(Moss, 2023). Meanwhile, some of employees choose quiet quitting, a term referring to the trend where employees stay on the job but only do the minimum amount of required work. Quiet quitting has been receiving a lot of media attention recently, which means this group of employees stay with the company physically but actually quit mentally already. In HR.com's 2024 research, it surveyed 243 HR professionals globally, with a majority from North America particularly in the US. Participants represent a diverse range of organizations by size, from small businesses (under 50 employees) to large enterprises (over 20,000 employees), with a focus on mid-sized and large organizations. As Fig 2 shows, almost a third of respondents say half or more of employees have quietly quit. Most respondents (68%) say quiet quitting is not a problem in their organization. That still leaves quite a few organizations (31%) that are suffering from quiet quitting saying either that around half have quietly quit or that it is "super prevalent." In those organizations where quiet quitting is a problem, HR will need to identify where in the organization the problem is most serious and work out possible solutions with the relevant managers (HR.com, 2024).

3.1 The Influence of AI

It is believed that generative AI like ChatGPT is becoming a transformational technology, and it is impacting and changing an organization's business environment in many aspects, from human resource management, consumer management, and logistics management even to corporations'

strategic management. It is true that ChatGPT's ability to generate lots of ideas has been recognized by its users. A survey by HR.com (2024) showed that AI could help organizations and employees in various ways as is shown in Fig. 3. Almost 60% respondents think AI is very useful to automate routine tasks. And 37% of respondents think AI improves employee communication, and 35% of them believe AI can help design more optimal workflows and teams. Meanwhile, AI also plays a role in personalizing more employee experiences (27%), enhancing decision-making (27%), improving customer experiences (25%), providing more just-in- time expert information to workers (24%), and offering insights into employee behaviors or sentiments (23%), etc.

The first CSR concern along with AI is social equity. Even though AI is becoming more popular and powerful, we have to admit it also faces some limitations and trust problems. Chakravorti (2024) in his research proposed 12 leading concerns on AI: disinformation, safety and security, the black box problem, ethical concerns, bias, instability, hallucinations in LLMs, unknown unknowns, potential job losses and social inequalities, environmental impact, industry concentration, and state overreach. It is believed that each of these issues is complex and difficult to solve. Among these twelve concerns, bias in one of most highly emphasized in practice and AI bias is becoming a CSR issue which needs to resolve in order to ensure social justice (Nkonde, 2019). There are quite a few reasons that bias many be generated during AI calculation. For example, the original data used in AI algorithm may exist bias or limitations already, so the model generated from the data is also biased. Other sources for bias may come from the limitations of the people involved in the training or the usage context. It is also found in some contexts, AI decisions can change dramatically when the input is changed slightly, leading to mistakes or great differences in outcomes. Therefore, from the current development and application of AI, it may never be reliably bias free in a short time **Figure 3**.

The second CSR concern caused by AI is its environmental influence. According to Artificial Intelligence Environmental Impacts Act of 2024, introduced in the U.S. senate, the hardware and other computing intensive technologies in AI operation will have significant impact on environment and the amount of power being used for AI computation has increased rapidly over the past ten years. It is indicated that AI's share of data centers' power use worldwide is expected to grow to 10% by 2025 (Chakravorti, 2024). The same thing will happen to water that is needed for AI cooling systems, it is proposed that by 2027, with water needed for cooling, AI's use of data centers could remove the equivalent of half the water consumed in the UK each year (Chakravorti, 2024). Furthermore, the need for increasingly powerful chips will keep growing when AI is used more and more, which is one of the fastest-growing waste streams. Meanwhile, during the process of generating images of generative AI, carbon dioxide will be emitted, which becomes another environmental concern. Therefore, even AI is being used more and more in business, it is also crucial to consider its environmental cost and take the relevant measures to control its impact on the environment.
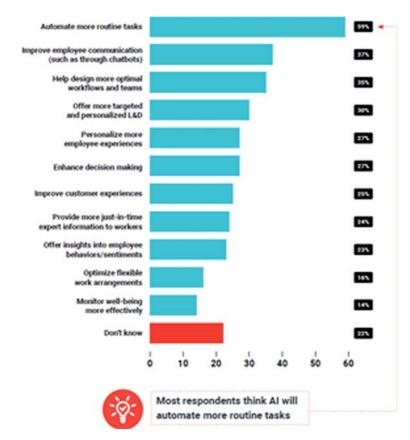
Figure 3 : AI's influence (Source: HR.com's State of Employee Productivity and Engagement 2024)

4. CSR to Employees in Current Business Landscape

Because of the challenges and opportunities brought by digital technology and Covid-19 pandemic, companies have a lot of things to do in order to fulfill their responsibilities to employees, which will help retain their employees and improve their commitment to the organizations. Turker (2009) proposed that CSR to employees includes good working conditions, career opportunities, organizational justice, or family-friendly policies. Based on the current employees' needs five facets of CSR to employees are developed in this study under todays' business landscape which are shown in Fig. 4, including upskilling and reskilling, equal opportunity, employee engagement, more flexibility and mental health, which will be discussed in the following parts.

4.1 Upskilling and Reskilling

We're definitely in the midst of an automation revolution today. According to the prediction of The World Economic Forum, there will be significant job losses by 2026 due to technological

automation and it is predicted that 1.4 million people will be unemployed then. (Medros, 2019). Similarly, the OECD anticipates that digital technology and automation may eliminate 14% of global jobs and significantly influence another 32% within the next two decades, which means over a billion workers worldwide will be affected (Doumi et al., 2023). With the rapid development of AI like ChatGPT, more and more types of jobs are likely to be impacted in the near future. Businesses have a crucial role in helping employees to navigate this challenge. Leaders recognize the urgent need for employee upskilling and reskilling. Reskilling, in particular, is a strategic priority and a responsibility for every leader and manager. Viewed through a CSR lens, employee upskilling and reskilling are becoming an investment in a company's most valuable asset of its workforce. By protecting employees from technological disruption, companies benefit not only their own business but also the wider community.

Upskilling and reskilling employees is one of the major parts of CSR to employees. Bersoff et al., (2024) found in their research that 88% of the respondents think companies should take responsibility to train and reskill their employees. Education holds significant importance in fostering economic prosperity. Throughout history, the presence of a well- prepared workforce has been linked to increased average incomes and reduced unemployment rates. Employees appreciate the continual learning opportunities their employers provide. In a LinkedIn report it is indicated that almost 94% of workers prefer staying with employers who invest in their future potential growth (Medros, 2019). Furthermore, the business leaders such as CEOs and COOs plays a very important role during the process of employee upskilling and reskilling (Doumi et al., 2023), such as offering meaningful upskilling and reskilling programs, creating an ongoing learning environment, providing update information on the technology development.
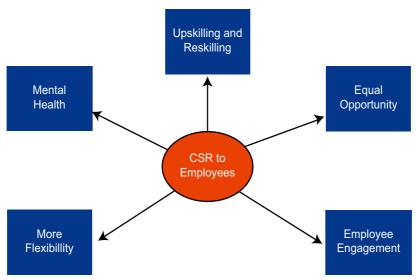

Figure 4 : The Framework of CSR to Employees

4.2 Equal Opportunity

Generative AI is experiencing meteoric adoption in both private and professional contexts. ChatGPT, for example, attracted its first 100 million users in just two months. In comparison, it took Netflix 10 years (60 times longer than ChatGPT) and Google Translate 6.5 years (39 times longer than ChatGPT) to acquire the same goal (Gupta, 2024). However, this rapid adoption presents a significant challenge: how can companies harness the power of generative AI while fostering a sense of equity and trust with employees, customers, and the general public? This question demands careful consideration from both business leaders and AI ethics experts. The potential downsides are clear. For example, Amazon stopped using its recruitment system in late 2018, because they found the system discriminated against women, neglecting resumes with references to women or downgrading applicants from women's colleges (Nkonde, 2019). Furthermore, amidst and post the Covid-19 outbreak, additional concerns regarding gender parity are surfacing. Progression toward increased gender equality has been sluggish and intermittent over the last half-decade, and the Covid- 19 pandemic now threatens to reverse it. According to the analysis conducted by Mahajan et al. (2020), women's employment is 1.8 times more susceptible to the impacts of this crisis compared to men's employment and despite constituting 39% of global employment, women represent 54% of the total job losses recorded as of May 2020.

Absolutely, there are also other types of the unequal phenomena in the workplace Therefore, in both practical and academic field, there is an increasing need for Diversity, Equity, and Inclusion (DEI), which tries to build an equal environment in the context of the workplace and assure employees' fairness no matter what is their race, ethnicity, gender, age, disability, socioeconomic status, religion, and other individual differences, etc. it is not easy to establish an equal and diverse working atmosphere, it needs the effective and sustainable policies, practices, and programs to foster it with the effort of both employees and business leaders. However, it's worth doing so since a fair and diverse workplace aims to ensure that all voices will be heard and considered in decision-making processes and all concerns will be known and understood in business operations. This guarantees a just and equitable environment where every employee could succeed and feel valued.

4.3 Employee Engagement

The Covid-19 pandemic has accelerated the rise of remote and hybrid work models across many companies and industries. In the United States alone, the number of people working primarily from home increased from 5.7%, roughly 9 million employees in 2019 to 17.9%, about 27.6 million employees by 2021 (Praslova, 2023). This shift to remote work brings a new challenge to current organizations. How to maintain effective employee engagement is becoming an urgent and tough issue to face for most managers. What makes it worse is that some companies even fail to realize the problem. A 2024 HR.com survey reveals that over a third of companies don't have any tools to measure their employees' engagement (HR.com, 2024). Therefore, for many organizations, measuring engagement is a crucial first step to guide the next effective steps. Without such metrics,

it can be even harder to focus on boosting employee engagement. According to other results of the survey in Fig. 5, over 40% of respondents report a low average employee engagement, and only 26% of respondents show a high level of engagement, implying a strong need for effective strategies to improve employees' engagement.
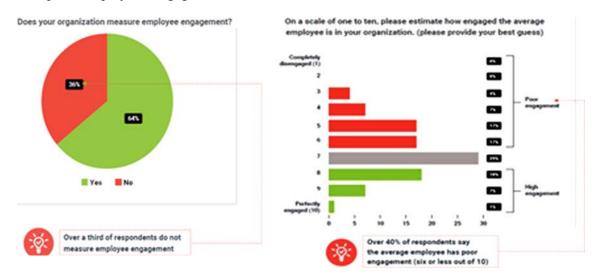

Figure 5 : Employees' Engagement (Source: HR.com: State of Employee Productivity and Engagement 2024)

Therefore, it is crucial for a manager to keep their employees engaged in the current working context. First of all, business leaders need to understand what their employees need to get highly engaged in the work place. However, it is indicated that managers don't know fully what is the most important thing to get employees engaged, so they indeed need effective guidelines and strategies to work out this mismatch. Stein et al. (2021) proposed three crucial strategies that business managers can use to increase their employees' engagement. First, managers need to align employee work with what they value most. Second, a less stressful and more enjoyable work environment is a good way to get employees engaged. Third, supplementing financial incentives or additional time off should also be considered to engage employees more efficiently. Therefore, business leaders need to make their decisions on the basis of more acute and detailed investigation to understand better what their employees actually need so they can really increase their engagement.

4.4 More Flexibility

Because of anxieties and uncertainties caused by Covid-19 pandemic, more employees are pursuing a flexible working environment in order to keep their work-life balance and a happy working experience. Remote work, or a hybrid working model, is becoming the choice of many organizations, offering benefits that extend beyond individual happiness to positively impact business

success. Moss (2023) stated that happy employees are 13% more productive than unhappy employees and employee dissatisfaction leads to about $8.8 trillion loss in global productivity, representing a significant 9% of global GDP. Even though some managers may have a concern about productivity with a flexible environment, the flexibility they provide will motivate employees' commitment and may even work harder than before. Bloom et al. (2023) claimed that employees value remote working greatly, as much as an 8% salary increase and it also helps reduce turnover rate. Therefore, the increased flexibility contributes to a more positive and productive work outcome.

Specifically, flexibility in the workplace comes in many forms, including schedule flexibility, place flexibility, mode flexibility, continuity flexibility and workload flexibility (Praslova, 2023). Schedule flexibility allows employees to adjust their working hours to fit their needs. For example, a parent may need to leave early in the afternoon to pick up their child. Place flexibility gives employees the choice to work from home, or from anywhere. This benefits employees who struggle with commuting or need a quiet environment to concentrate and supports many other needs. Mode flexibility enables employees to work in their most effective mode, whether that is in person, virtually, or in a hybrid model. This type of flexibility is a crucial factor in attracting talent. One recent job growth report found that companies with hybrid or fully flexible work models are hiring at two times the rate of companies that require employees to be in the office full-time (Praslova, 2023). Continuity flexibility allows employees to take a leave of absence and come back when they can. Besides maternity leaves and paternity leaves, other types of extended time off, such as sabbaticals and leaves for mental health, caregiving, illness, or education are also valued by employees. Workload flexibility refers to the ability to work full time, part-time, or job share, typically with another part-time employee. This can give people who can't work a traditional full- time schedule the opportunity to be employed.

4.5 Mental Health

Mental well-being is another trend that employers should emphasize in the current business. During the past decade, a consistent rise in anxiety and depression has been noticed in the United States, particularly among young adults. A 2024 study by Headspace found that work stress and anxiety have a significant influence on employees, with 77% of them experiencing adverse effects on their physical health, and 71% on their personal lives, and a 2023 Gallup poll found that one-quarter of American adults under 30 indicated that they currently have depression, a significant rise from the 13% reported in 2017(Aarons-Mele, 2024). Routledge (2023) in a health survey on 152 large companies in the United States also found that 77% of the respondents think there is an increase in mental health issues among their organizations.

The research has highlighted the relationship between employee mental health and key performance indicators like engagement, productivity, and retention. However, a 2022 Gallup analysis found that fewer than one in four employees felt their organization cared about their well-being, which has decreased dramatically since the start of the Covid-19 pandemic (Aarons-Mele, 2024). Therefore, business managers and leaders need to realize employees' mental health needs and

strive to establish a caring culture and take practical methods to improve employees' well-being. How can employers offer effective support without inadvertently encouraging employees to dwell on negative thoughts and experiences in an environment where mental health concerns are on the rise? Routledge (2023) proposes a novel approach that focuses on outward and action-oriented behaviors, such as promoting acts of kindness and collaboration among colleagues, creating opportunities for participation in physical activities that improve overall health, and infusing work with a sense of purpose and meaning that goes beyond simply finishing tasks. By prioritizing these outward actions, employers can not only create a positive effect on employee well-being but also foster a more positive work environment.

5. Conclusion

The meteoric adoption of ChaptGPT, coupled with the exacerbating repercussions of the global pandemic on social and professional structures, has compelled a review of CSR practices by key organizational stakeholders. Managerially, corporate leaders must be able to integrate AI technologies responsibly into CSR strategies by prioritizing ethical considerations and employee well-being. Policymakers, in turn, should create varying frameworks that strongly support flexible work environments and equitable AI adoption for sustainable and inclusive growth for all employees. What's clear is that neither the lasting effects of the pandemic nor the utilization of emerging AI technologies are going to abate. In light of this reality, scholars need to investigate the evolving nature of CSR, most significantly as it relates to the deployment of CSR in these shifting social paradigms. Future research should emphasize the importance of this new world CSR framework on employee outcomes, employee adoption, and external perceptions thereof.

This paper serves as a comprehensive exploration of the impact that the global pandemic and generative AI are making on CSR. A rich literature on CSR continues to develop as an incorporation of social shifts. Theories such as stakeholder theory, Carroll's pyramid model, and triple bottom line highlight this incorporation of social shift into relevant theory. The growing importance of CSR efforts as it relates to employee outcomes such as upskilling and reskilling, equal opportunity, employee engagement, flexibility, and mental health, will continue to require more scholarship and organizational focus.

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