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Mahatma Jyotiba Phule
(1827-1890)

Shrimati Savitribai Phule
(1831-1897)

OUR FAITH

न चौर हार्यम् नच राज हार्यम् ।
न भातृभाज्यम् नच भारकारी ।।
व्यये कृते वर्धते एव नित्यम् ।
विद्याधनं सर्वधन प्रधानम् ।।

Knowledge can neither be stolen by a thief,
nor snatched by a king.
It is indivisible unlike ancestral property,
it never burdens the bearer,
it multiplies manifold when offered to others.
Knowledge is the supreme form of wealth.

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1. To apply the domain knowledge, interdisciplinary skills & technological proficiency as entrepreneurs and corporate professionals.
2. To exhibit value-based managerial competencies in fulfilling corporate and leadership responsibilities.
3. To facilitate lifelong learning for sustainable development and professional excellence.

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Mumbai Educational Trust (MET)

Mumbai Educational Trust (MET) is a conglomerate of premiere educational institutions, driven by a single-minded focus on imparting quality education, to make students sharp. Training is imparted round-the-clock, seven days a week. Projects and assignments are given utmost importance and students learn on the job. Application-oriented knowledge, garnered in the lecture halls, is applied to industry assignments. The faculty spares no effort to make the students razor sharp, so that they make their mark in the corporate world. No effort has been spared, to create an environment that encourages students, to push the limits of their minds. All this, to help young professionals face the challenges of life. And make their mark in the corporate world.

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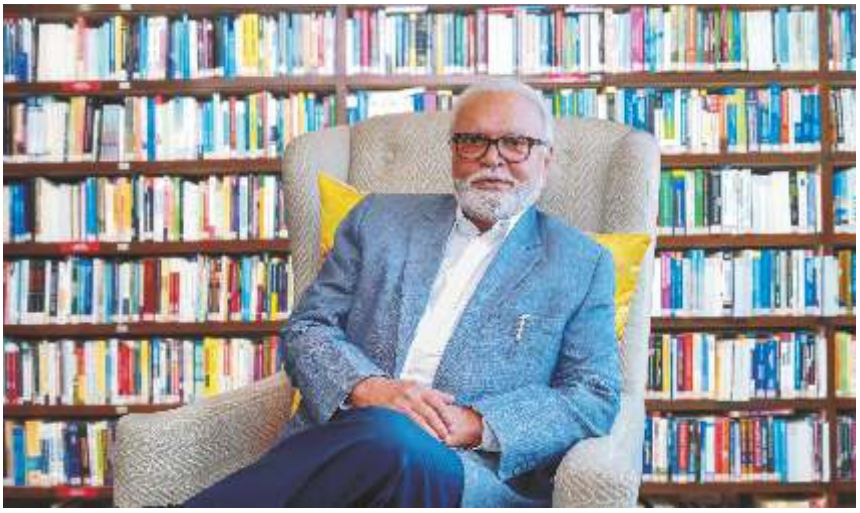
From the Chairman's Desk



With many Indians evidently occupying influential positions globally in business, research, space, design, fashion, technology and more, the world is unmistakably acknowledging India's potential, as much as counting on it. This also bears testimony to the fact that India's education system has consistently performed better than that of many countries. On one hand, the finest educational institutions like IITs, IIMs, AIMS are producing world class professionals. On the other hand, India has also successfully reached out to the rural and suburban section and significantly improved gender equality in education besides boosting literacy rate itself, making people life-long learners. This has resulted in students, even from India's interior districts, rising to commanding heights in various arenas.

With newer proposed changes in Education as a sector, and IT backing and enabling its delivery and reach, we look forward to not only better serve Indian students, but also to attract and groom talent from around the world. All stakeholders, including academia students, industries, and government will have to play critical roles in making institutions capable of taking the next major leap forward and build an independent education ecosystem.

We, at three of our world class MET BKC campuses in Mumbai and Nashik, and at our International School - MET Rishikul Vidyalaya, are ceaselessly endeavoring to provide the best infrastructure, human capital, processes and values, so that tomorrow's India will outperform the India of yesteryears. We at MET believe that India's glorious period is not behind us but ahead of us, as a matter of fact we all are carving it out today.

Chhagan Bhujbal
Hon. Founder Chairman
Mumbai Educational Trust

About MET Institute of Management

Since its inception three decades ago MET Institute of Management, a top B-School in Mumbai has focused on developing industry ready management professionals shaped to cross industry threshold to seek their chosen place under the Sun. Academic and scholastic rigor are finely woven into application oriented skill sets which positions the MBA students to hit the ground running as they face the challenges of market place and society. The structured learning systems are blended with the latest tools and technologies offered by the digital world. Therefore, despite Pandemic, a unique online learning experience was offered to the management students.

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Thus, despite statutory limitations students could access and benefit from our information and technology centers and learning aids supported by the latest audio visual facilities at our complex. A high-tech convention Centre, well equipped seminar halls and state of the art networked virtual classrooms provide a multidimensional exposure to the students as we offer a holistic immersion to the MBA students as they step into the global business arena. That is why MET Institute of Management is considered as one of the best MBA colleges in Mumbai. It remains a much sought after premium B-School in Maharashtra in which graduates and experienced MBA aspirants writing MAH-CET, CAT, CMAT, XAT, ATMA, MAT and other prestigious entrance exams seek to secure admission.

Director Speak

Dr. Swati Lodha
Director MET IOM

Dear Readers

Greetings from the Research Cell of MET Institute of Management

In the rapidly evolving technological landscape especially in the field of Artificial intelligence, Machine learning, and Quantum computing, research serves as the compass guiding towards innovation and progress for social and business challenges. It enables us to identify potential applications and uncover the challenges with groundbreaking discoveries or solutions.

These issues comprise selected research papers presented during the Two-day International Conference on the Role of AI in Management Research organized on December 1st and 2nd at MET IOM Campus in collaboration with Zimbabwe Open University and NSE Cogencis. These papers explore and suggest the application of AI and Machine Learning in addressing various business and social issues related to finance, HR, marketing, and Supply chain.

At the conference, the participants witnessed exceptional line-ups of esteemed speakers and researchers shedding light on AI's transformative impact.

Mr. Mukesh Jain, CTO VP and Global Head of People Analytics, Capgemini, in his inaugural address; delved into the pivotal role of AI and ML in reshaping the business landscape, emphasizing the significance of user-centric approaches, analytics, innovation, and essential AI competencies.

Mr. Anand Mohta, VP - Accounts Management, NSE Cogencis showcased a demo highlighting an NSE product tailored to bolster fund managers in their investment endeavors which caters to the requisites of fund managers and institutional investors, empowering them to navigate the ever-evolving terrain of financial markets effectively.

Looking at the remarkable journey on technological and other fronts in the last few years, the future of the country depends on the use of an available talent pool with a focus on innovation and research. The year 2047 holds immense significance for India, marking a century of sovereignty, progress, and resilience. Therefore the theme of the next international conference is "Vikasit Bharat @ 2047" which envisions a prosperous and inclusive India, guided by the principles of sustainable development, innovation, and social harmony in April 2024. We are sure that this conference will serve as a crucible for ideas, strategies, and collaborations that will shape the trajectory of the nation in the decades to come.

Dr. Swati Lodha
Director
MET Institute of Management

Harnessing Machine Learning and Artificial Intelligence for Early Fraud Detection Among Banks in Harare, Zimbabwe: Internal Auditors' Perspective

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Abstract

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The study explores the transformative power of utilizing machine learning and artificial intelligence for early fraud detection among banks in Harare, Zimbabwe using qualitative research. Data were collected through document reviews and in-depth interviews with bank internal auditors and senior management. The study addressed three key research questions, namely, examining internal auditors' understanding of machine learning and artificial intelligence tools/systems for fraud detection; understanding internal auditors' perceptions on the effectiveness of machine learning and artificial intelligence-based fraud detection systems; and identifying major challenges faced by internal auditors during implementation of artificial intelligence fraud detection systems. Internal auditors' perceptions were gathered through in-depth interviews which were conducted face to face and online. Findings from the study demonstrated strong consensus among internal auditors on the potential power of machine learning and artificial intelligence in detecting fraud at an early stage. In addition, the study revealed the potential benefits of utilizing machine learning algorithms and artificial intelligence which includes enhanced speed in identifying anomalies, improved accuracy, and the ability to detect fraud early, thereby enabling management to come up with internal control mechanisms which can prevent fraud. Successful implementation of machine learning and artificial intelligence-powered fraud detection systems require adequate training and support from the organization's leadership, and ethical considerations.

Keywords: Artificial Intelligence, Machine Learning, Fraud Detection, Internal Auditors

I. Introduction

Banks play a crucial role in any economy as they enhance economic growth and stability of nations worldwide. However, these banks have been a target of fraudulent activities since time immemorial because they house most precious and liquid assets such as cash and gold. The increasing rise of advanced technologies and use of the internet for operational purposes by banks and the transacting public has brought in advantages both to the bank and the customer, such as banks offering tailor made services to clients, cost reduction and development of new business models (Bredt, 2019). However, the same technology has brought in sophisticated ways of committing fraudulent activities by fraudsters as they manipulate the banking system leading to significant financial losses and reputational damage for the bank. To deal with this risk, financial institutions are exploring innovative and sophisticated approaches to ensure their fraud detection capabilities are enhanced. Recently, one such approach is integration of Machine Learning (ML) and Artificial Intelligence (AI) tools in the operational framework of the bank.

AI is changing how businesses are run worldwide. It is enabling institutions to automate their day to day processes, improving customer experiences and enhancing operational efficiency and is applied in different sectors of the economy including medical diagnostics, optical character recognition, automotive autonomous driving and financial services (Bredt, 2019). Key tasks such as customer services, risk assessment, trading and fraud detection are slowly being delegated to AI-powered systems (Goodell, et al., 2021). AI technologies are so powerful that they can analyze large quantities of data in a short space of time and can also quickly detect anomalies, hence this can enhance early detection of fraudulent activities. Globally, AI in the banking sector is gaining momentum and will have an accelerated impact on financial services (Accenture, 2021; Bredt, 2019), as banks are leveraging on AI tools to streamline their operations, personalize customer experience and strengthen their risk management frameworks. Internal auditors are a key ingredient in maintaining the integrity of financial systems within banks and traditionally they have relied on manual processes and basic data analytics to detect and predict potential fraud. However, the prevalence of technology has brought about sophisticated fraudulent activities that has necessitated adoption of advanced technology such as AI to enhance efficiency and effectiveness of audit processes.

ML continues to grow pervasively within job categories (Brynjolfsson, et al., 2018), and the internal audit profession is not an exception as tasks such as reconciliations, report writing and fraud detection can be assigned to AI tools. In order to efficiently adodpt AI in the workplace Brynjolfsson, et al (2018) advocates the redesign of jobs and reengineering of business processes. Banks in Zimbabwe embraced mobile banking for over two decades but the extent of using AI in fraud detection is not known. How has been the transformative power of utilizing machine learning and artificial intelligence for early fraud detection among banks in Harare, Zimbabwe? How have auditors embraced this technological shift? These are the overarching issues addressed in this study.

Emergence of AI dates back to the mid-20th centuries, during that time it was just a scientific discipline. The term AI was originated at the Dartmouth Conference, when a group of researchers gathered to discuss and explore ways of making machines that can emulate human thinking (McCarthy, et al., 1955). By that time progress was slow because of limited resources in terms of computing power as compared to the complexity of human intelligence. Fast forward to the 21st century there was a resurgence of AI, and this time around it was pervasive and driven by several factors. AI is now integrated in our everyday lives as it can be witnessed in almost all industries such as healthcare, agriculture, transport, finance and education. The improvement of AI is now exponential and its impact is nothing to ignore. The auditing profession is an anchor in organizations because auditors are in a position of ratifying on the trustworthiness of financial statements and operations of the organization, thereby influencing the operations of capital markets. As technology is emerging it also means that sophisticated forms of committing acts of fraud also improves, this therefore leaves auditors with no option but to embrace adoption of AI in their day to day activities. AI can not necessarily replace the human auditor but can augment and enhance the efficiency of the auditor and ultimately improve operational efficiencies and quality of financial reports. It is against this background that a study to explore the power of AI in early fraud detection be undertaken.

Research Questions

- What are the internal auditors' understanding of machine learning and artificial intelligence tools/systems for fraud detection among banks in Harare, Zimbabwe?

- What are the internal auditors' perceptions on the effectiveness of machine learning and artificial intelligence-based fraud detection systems among banks in Harare, Zimbabwe?
- What are the challenges faced by internal auditors during implementation of artificial intelligence fraud detection systems among banks in Harare, Zimbabwe?

This paper is organized into five sections. Section 1 presents the introduction and research questions to be addressed. Literature review and theoretical framework are covered in section 2. Section 3 provides the research methodology employed by the study while section 4 presents discussion of the research findings. Conclusion and recommendations emanating from the study are presented in section 5.

2. Literature Review

Theoretical Framework

Three theories were adopted as a basis for guiding this study and these are Technology Acceptance Model (TAM), Institutional Theory and Technology Organization Environment (TOE). TAM proposed by Davis (1989) and later on extended by Venkatesh and Davis (2000), this theory focuses on individual acceptance and adoption of new technologies. The theory suggests that users attitudes and intentions to use technology are influenced by perceived usefulness and perceived ease of use. TAM is useful in this study because it guides us in understanding internal auditors' perceptions, familiarity and understanding of ML and AI-tools for early fraud detection, therefore TAM provides insights into internal auditors' potential acceptance and likelihood of use of ML and AI.

Institutional theory has been developed by various scholars over time, these include Meyer and Rowan (1977), DiMaggio and Powell (1983), and Scott (1995), It looks at the influence of social and organizational structures on individuals' behaviors and actions, It propounds that institutions and their members are influenced by external pressures, norms and expectations the institution's environment and these factors shape the individual's beliefs, behaviors and practices within the organization. This theory was adopted in this study because it helps in understanding how the institutional environment in Zimbabwe's banking sector shapes auditor perceptions and behaviours related to ML and AI-based fraud detection systems.

The Technology Organisation Environment framework was initially proposed by Tornatzky and Fleischer (1990) and later on refined by Zhu, et al. (2006), this framework focuses on technological innovations in organizations and considers three major dimensions as follows: technological factors, organizational factors and environmental factors. This framework enhances understanding of the technological capabilities required in implementing ML and AI-based systems, as well as assessing the readiness of organizations to adopt these systems taking into account the influence of the external environment. Adopting this theory assists in analyzing critical success factors and challenges faced by internal auditors during the process of implementing ML and AI-based fraud detection systems.

Artificial Intelligence and Machine Learning

AI is a collection of different technologies working collectively to empower machines to mimic human-like levels of intelligence (Russell & Norvig, 2016; Accenture, 2023). Shambira (2020), defines AI as a theory and development of computer systems which have capabilities to undertake tasks that usually require human intelligence, such tasks include visual perception, speech recognition, decision making and language translation. On the other hand ML is a subfield of AI which studies ways of building computer programs that automatically improves performance tasks through experience

without explicit programming (Mitchell, 1997; Brynjolfsson, et al., 2018).

AI encompasses ML as its major key component and because of that AI and ML are often used interchangeably (McCarthy et al., 1955), However some authors draw clear lines between the two aspects and places ML as a broader field of AI (Goodfellow et al., 2016). This interchangeability can have implications for insinuating the capabilities and scope of AI and ML within the financial services sector. In the banking sector AI-powered chatbots and virtual assistants have become so prevalent, these expert systems utilize Natural Language Processing (NLP) and ML algorithms to converse with clients, respond to queries, provide support and perform basic transactions (Bank of America, 2020). With regard to banking and auditing, AI and ML offer many possibilities for improving efficiency, accuracy and enhanced decision making process, as auditors can automate data analysis in identifying audit risk and detection of anomalies in operations (KPMG, 2023). Moreover, AI-powered systems can help organizations improve customer experience in many ways such as reduced response time and personalizing financial services (The Economist, 2020; Lui & Lamb, 2018).

Buchanan (2019) show that AI is significantly changing the financial services sector in following four major ways:

Fraud detection: Since the emergence of e-commerce there has been widespread occurrence of online fraud, hence use of AI is likely to eliminate criminal funds from the system.

Banking chatbots and robot-advisors: ML algorithms can be trained on large quantities of customer data, thereby helping clients manage their money and savings.

Algorithmic trading: Use of AI for making trading decisions requires complex AI systems, algorithmic trading has the noble advantage of making quick trading decisions taking advantage of the limited profitable opportunities in the market.

Regulation and policy: AI and markets are becoming more complex by the day, thereby presenting some major challenges regarding regulation and policy making.

Artificial Intelligence & Machine Learning in Internal Auditing

Internal auditing is a critical department which plays a crucial role in the detection and prevention of fraud (Kahyaoglu & Aksoy, 2021), therefore in order to further enhance early fraud detection in banks there is need to adopt AI tools in the banking sector (Buchanan, 2019). The emergence of expert systems such as AI and machine learning tools is promising to curb the implications of delayed fraud detection and prevention as internal auditors can now automate audit and risk control processes in banks (Couceiro, et al., 2020). Many studies (Singh & Pathak, 2020); Kahyaoglu & Aksoy, 2021; Buchanan, 2019; Couceiro, et al., 2020) are being undertaken to examine the effect of AI in organizations, for example trying to understand internal auditors' familiarity and understanding of the emergence and operational effectiveness of AI and ML technologies. Shimamoto (2022) notes that auditors should embrace technology as much as they can and familiarize themselves with ML and AI techniques, because of this proper training and education for internal auditors should be prioritized to enhance internal auditors' skills and knowledge of AI and ML tools usage. Moreover, auditors need to understand the underlying principles of AI and ML tools in leveraging their potential for fraud detection and prevention, this therefore places internal auditors in a critical position of understanding and following AI trends and development over time.

AI powered fraud detection tools have the advantage of providing a more comprehensive understanding of risks that emanates from various transactions and customer behavior. This is because of the sophisticated power of machine learning. Since banks deal with vast quantities of data and information including customer profiles, transactional history and other external factors such as regulation, AI can assist internal auditors to quickly identify high risk activities and flag them for further investigations. This therefore enables internal auditors' priorities their efforts in other strategic areas, thereby adding value to the organization. However, care should also be taken by internal auditors as they adopt and utilize AI technologies in their work, because as it stands most of these AI tools still have a lot to learn in terms of operational systems. Management in conjunction with internal auditors should come up with a sustainable AI implementation framework which ensures that all the likely risks which comes from use of AI are safeguarded, therefore total delegation of AI technologies to perform all tasks is not recommended (Popenici & Kerr, 2017). Human auditors are still relevant to augment the efficiencies brought in by AI. Internal auditors should therefore always seek ways through their various professional bodies to capacitate themselves with AI skills so that they can continue to be relevant in their departments.

Since the emergence of AI and ML and their use in detection of anomalies, there has been mixed discoveries by scholars regarding effectiveness of these expert systems in fraud detection, In this regard Noor & Mansor (2019) finds that AI and ML tools significantly outperform traditional rule based approaches to fraud detection in organizational operations, and this shows that AI and ML based systems bring benefits of quick detection of fraudulent activities in organizations. On the other hand a study by Lui & Lamb (2018) notes concerns of false positives, whereby AI and ML systems can wrongly diagnose fraud when in actual fact there is no fraud, this therefore calls for continuous monitoring and refining of these AL and ML tools by systems developers together with end users such as internal auditors.

Adoption of AI and ML systems for fraud detection brings with itself various challenges on internal auditors, one issue has to do with lack of technical expertise, resistance to change and data quality issues and an inability to document use of technology in their audit methodologies (Seethamraju & Hecimovic, 2020). This then calls for management to come up with measures such as crafting policies which clearly articulate their vision and show of support on the adoption of AI and ML tools as fraud detection tools (Buchanan, 2019). Moreover Lui & Lamb (2018) finds that the transition period can be faced with hurdles in terms of integrating AI and ML tools into existing auditing processes so that the two systems can be integrated as they run parallel, in order to deal with a problem of this kind management and those charged with governance should at least continue to capacitate the internal auditing department with resources so that they can acquire skills and emerging methodologies which can accommodate the new technologies effectively, also there is need for strong collaboration between internal auditors and the IT department to guarantee smooth integration and transition of AI technologies into the existing infrastructure (Lui & Lamb, 2018).

The detection and predictive capabilities of AI and ML tools seem to be limited in scope, for example Buchanan (2019) notes that there have been several scenarios were the algorithms implemented by financial services firms acted in totally unexpected ways during financial crisis periods, leading to errors and financial losses. Therefore, internal auditors in banks should take some precaution when they decide to entirely automate their fraud detection systems because the consequencies of

AIand ML errors can be dire.

Internal auditors are afraid that full automation of their roles could lead to their replacement, especially the introduction of ML and AL (Alina & Cerasela, 2018). In the same vein Hasan (2022) also warns that because of the introduction of ML and AI it is highly certain that traditional jobs will dissapear. Given internal auditors' fears and genuine concerns of full automation, they should try to be pro-active and find ways to enhance their skills so that they can augment AI tools and add value in their organisation, for example they can choose to focus their attention on issues of ethics, improvement of internal controls, risk management and governance.

Although banks in Zimbabwe have been using digital banking platforms including mobile banking, the extent of AI use is unknown (Shambira, 2020). An interesting study by Singh & Pathak (2020), finds that increased use of AI in the Indian Banking system led to customers making more use of digital banking platforms because of the user friendly experiences brought about by AI use.

Artificial Intelligence and Machine Learning in the Banking Sector

The banking sector continues to witness significant advances in technology as the adoption of AI tools such as robots and chatbots is getting increasingly popular (Lui & Lamb, 2018). In the near future AI has the potential of becoming a central innovation driver in the financial services industry even though it is not yet clear what the future financial services industry would look like. AI and ML technologies enable banks to analyze large volumes of data, identify patterns and anomalies that may show fraudulent activities (Ris, et al, 2020). A study by Noreen, et al (2023) finds that some banks are using AI and ML tools for risk assessment, customer services, credit scoring and personalized financial recommendations. Using AI and ML tools this way can ultimately lead to enhanced operational efficiency and effectiveness.

A report by Deloitte (2018) shows that 76 percent of chief executive officers in the banking sector agree that AI is critical and should be top priority because it is a critical differentiating factor. In Zimbabwe AI is slowly getting traction and acceptance despite facing some hurdles, in this regard drivers to AI adoption in the Zimbabwean banking sector are customer satisfaction, cost reduction and the need to improve risk management. However, lack of resources including AI experts, lack of AI knowledge in general, data privacy and security issues have been cited as barriers to AI adoption (Shambira, 2020).

Evidence on ML algorithms show that AI use in the banking sector could lead to discrimination against certain races and gender (Lui & Lamb, 2018; Johnson, et al., 2019), therefore as AI adoption is being undertaken there is need for a holistic and interdisciplinary approach to AI regulation to avoid any negeative connotations that may come with AI adoption (Hasan, 2022), regulatory authorities should even consider mandating all institutions adopting AI use to have an established ethics committee that from time to time monitor the bahavior of AI towards such sensitive issues as gender and race (Fukas, et al., 2021). Moreover in the same vein Buchanan (2019) mentions that there are concerns, uncertainties and risks that still need to be addressed as AI is still in its early stages of adoption such concerns and issues include legal consequencies resulting from AI use, ethical issues, economic and social issues. All this shows that even though AI adoption may lead to positive disruptions in the financial services industry, still more need to be done to have a conducive operational environment for harnessing AI in organisations.

AI in Zimbabwean banks can be significantly accelerated if the Reserve Bank of Zimbabwe (RBZ)

as a regulator of banks realise the need to take advantage of opportunities for enhanced compliance and safety (Wall, 2018). Internal auditors in Zimbabwe are likely not to worry themselves in adopting AI and ML tools for fraud detection as long as the supervisor (RBZ) is not taking up an active role to push for AI use in banks fraud detection systems. Shambira (2020) observed that banks' reluctance to embrace AI in early fraud detection was due to lack of resources and expertise.

3. Research Methodology

The study used qualitative approach (Bryman, 2001). The study was aimed at understanding perceptions of auditors on the potential of artificial intelligence and machine learning in early fraud detention. The population of the study included all banks in Harare. The City of Harare was purposively selected., hence qualitative methodologies were adopted. Document reviews and in-depth interviews were used to gather data. The use of in-depth interviews was important in seeking further clarity. Both face to face and online interviews were conducted. Face to face interviews were important as non-verbal cues would be picked up as relevant information. Online interviews were mainly for convenience, and from the 10 interviews conducted 3 were done online. Purposive sampling was used, and only internal auditors were interviewed. Data saturation was reached at the 10th interview and interviews were immediately stopped. In terms of trustworthiness, interviews were triangulated as researchers were part of the interviews to ensure that no researcher would alter data. Participation in the study was voluntary. Thematic analysis was used in data analysis.

Discussion of Research Findings

Internal auditors' understanding of ML and AI tools/systems for fraud detection

The study found that there is a disparity between use of artificial intelligence in terms of two factors. The first factor is about age, as older internal auditors showed that they are not familiar with and showed resentment to ML and AI tools and younger internal auditors showed strong familiarity and confirmed that they are using these tools. For example, P5 said: "These AI and ML tools are not for us old people but I have seen young employees using them frequently in fraud identification." The other factor was on nature of bank. Banks that are owned by the government (parastatals) indicated that they are not using ML and AI tools for early fraud detection. For example, P2 from a parastatal bank said "Our bank has not been given permission by the government to use AI and ML in any activity." However, the study found that privately owned banks which are less rigid are using chatbots such as REVE chat, Shield, Actico and iComply. This slightly contradicts with findings from a study by Shambira (2020) which finds that only 16 percent of banks in Zimbabwe have adopted some form of AI such as chatbots to enhance customer satisfaction and experience.

Internal auditors' perceptions on the effectiveness of ML and AI-based fraud detection systems

The second research question was on internal auditors' perceptions on the effectiveness of ML and AI-based fraud detection systems. In terms of perceptions on effectiveness of ML and AI-based fraud detection systems, three themes were established. The major benefit of ML and AI tools is that there is speed in identification of anomalies. The study found that ML and AI is quick in identifying fraud and the bank is warned without incurring many costs. This is echoed by P1 in these terms, "You can't compare AI and a human being, AI immediately detects fraud……By the time a human being detects fraud the bank would have lost a lot of money." This finding concurs with Noreen et al (2020) in the UK who submit similar findings. The other perceived benefit is on improved accuracy. This was substantiated by P7 who submitted that "AI and ML tools are accurate

in fraud detection, us as humans at times we raise false alarms which can be costly, and this is not the case with these technologies." This is similar to Shambira (2020) findings in Zimbabwe that AI and ML are accurate than humans.

In addition, the study found that ML and AI tools reduce costs. This usually has to do with costs associated with hiring many employees to detect fraud. A single AI tool can do the job for more than 50 people. With the use of ML and AI, it means the organisation has to cut its auditing department costs. This is what P6 said on this "Some of the costs that make banks not profitable are human resources because they are recurring costs, with AI and ML you can trim down your human resources because you no longer need them." This converges with Sing & Pathak (2020) that AI and ML reduces labour related costs.

Challenges faced by internal auditors during implementation of AI fraud detection systems.

In terms of challenges the four themes emerged. The major challenge in using ML and AI fraud detection systems is lack of funding. Banks in Zimbabwe do not have funding to acquire these tools or to purchase licenses due to lack of external credit lines. This was echoed by P9 who stated that "Our bank would like to use these tools but we do not have money to purchase licenses to use these chatbots." However, this is not picked up in a study by Wall (2018). This may be because Wall (2018) studies were in America, whereas this study was conducted in Zimbabwe where the economy is harsh and banks do not have extra money to adopt AI and ML systems. The other challenge is on limited AI and ML skills amongst auditing staff. This is explained by P3 who submitted that "Many auditors are not tech savvy and they cannot operate and navigate these AI and ML systems." This different from Shinamoto (2022) studies in Japan, and this is because Japan is ahead of Zimbabwe in ICT literacy rates.

Furthermore, the study found that lack of leadership support is another challenge. Leadership support is needed when adopting ML and AI based systems because they are the policy makers, and they allocate resources. P10 said "Our leaders are hesitant to invest in AI because they think it consumes more capital." This funding is different Russell & Norvig (2016) who viewed leadership in banks in the United Kingdom have taken a leadership role in adopting AI and ML tools. The difference may be with levels of technology, as Zimbabwe is lower than UK in terms of technology adoption rate. The final challenge established is on ethical considerations. AI and ML are viewed as unethical practices that violate the privacy of banks' customers. This is finding is alluded to by P1 who stated that "Some of our customers will not be happy with AI and ML because it violets their privacy and secrecy." Participants interviewed also echoed the need for regulation and this is in sync to concerns raised by Buchanan (2019), wherein she notes that uncertainties and risks in the legal and ethical realm need to be addressed before AI could fully be adopted.

Conclusion and Recommendations

The study concludes that privately owned banks and younger internal auditors are using AI and ML in fraud detection. The study also concludes that AI and ML are highly beneficial as they are associated with speed in identification of fraud, improved accuracy, and reduction in costs. However, the study concluded that challenges associated with AI and ML tools in fraud detection are limited skills amongst staff, limited funding, lack of leadership support and ethical considerations.

The following recommendations emanated from the study.

- Banks should adopt AI and ML as they are highly efficient in fraud detection.
- Banks should train auditing staff on the use of AI and ML in early fraud detection.
- There should be clear policies and procedures on the use of AI and ML by banks.
- Future research should focus on the use of AI in other banking activities such as handling customer complaints.

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Estimating A Logistic Regression Model on The Role of Artificial Intelligence on Derivative Markets

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Abstract

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The study explored the role of Artificial intelligence on the stability, efficiency, depth, and access of derivative markets during the period 2009 to 2021. The study used mixed method research. Cross sectional data of 60 countries from North America, Latin America and the Caribbean, Western Europe, Eastern Europe, Middle East and North Africa, Sub-Sahara Africa, South and Central Asia, East Asia, and the Pacific. Simple random sampling was used to select the 60 countries according to their Government Artificial Intelligence Index. Logistic regression was applied on the cross-section data to determine the effect of Artificial Intelligence on derivative markets in terms of financial efficiency, financial depth, financial access, and financial stability. The proven role of Artificial Intelligence on derivative markets is to enhance financial inclusion and financial stability through the provision of derivative trading platforms. The results of the study showed that the use of Artificial intelligence on derivative markets is significantly and positively related to financial access as measured by the percentage of digital payments. Further, the test revealed that the use of Artificial Intelligence on derivative markets is significantly and negatively related to financial stability as measured by stock price volatility. The study showed that there was no effect on financial depth and efficiency arising from the use of Artificial Intelligence on derivative markets. The study recommended that governments should put in place adequate financial infrastructure as well as vibrant regulations prior to the use of Artificial Intelligence on the derivative markets to avoid systemic risk build ups.

Keywords: Artificial Intelligence, Derivative Markets, Financial Development, Government Artificial Intelligent Readiness Index, Logistic Regression

1.0 Introduction to the study

The study explored the role of Artificial Intelligent (AI) on Global Derivative markets. The global markets covered in the study comprise of sixty countries covering North America, Latin America, the Caribbean, Western Europe, Eastern Europe, Middle East, North Africa, South Asia, Central Asia, East Asia, and the Pacific.

1.1 Artificial Intelligent (AI)

Financial Stability Board [FSB, 2017] defined AI as a theory and development of computer systems able to perform tasks that traditionally had required human intelligence. According to the Organization for Economic Cooperation and Development [OECD, 2019] AI are regarded as machine-based systems with varying levels of autonomy that can

for a given set of human defined objectives, make recommendations, predictions or decisions using massive amounts of alternative data sources and data analytics referred to as big data.

1.1.1 Types of Artificial Intelligence

Futures Industry Association's Expo conference [FIA, 2023] deduced that artificial intelligence can be split into traditional machine learning termed discriminative AI and Generative AI. The role of discriminative AI was distinguished from that of generative AI in that discriminative AI looks for patterns and trends in the data it is trained on and makes predictions whilst generative AI are the models or algorithms that are used to create something new (Stanton, 2023). FIA [2023] declared at the Expo conference that generative AI gained a traction in the derivative markets as it is described as a big breakthrough in the power of AI and in the democratization of AI. Further the role of generative AI was seen as providing superpowers in personal productivity and product development [FIA, 2023].

1.1.2 Government Artificial Intelligence Readiness Index

The ambition of the index is to score governments according to their readiness to implement AI in the delivery of public services. 181 countries are ranked as AI readiness is regarded a global issue. The index is developed based on 39 indicators across 10 dimensions that make up 3 pillars comprising of the government pillar, technological sector pillar and the data and infrastructure pillar [Government AI Readiness Index, 2022].

The government pillar focuses on the strategic vision of how to develop and manage AI supported by appropriate governance and ethics. The technological sector pillar demands that the technological sector of any country should have high innovation capacity, underpinned by a business environment that supports entrepreneurship and good flow of research and development spending as well as good levels of human capital. Data and infrastructure pillar call for high quality of data availability to avoid bias and error and that the data should be a representative of the citizens in each country. The infrastructure pillar demands that appropriate infrastructure necessary to power AI should be put in place so that data potential can be realised [Government AI Readiness Index, 2022].

The index helps the government of any country to prepare for the adoption of AI in their services by having appropriate frameworks, capacities, resources, skills, and infrastructure in place to make good decision about AI [Government AI Readiness Index, 2022].

1.1.3 The role of Artificial Intelligence and Machine Learning

Financial Stability Board [FSB, 2017] identified the following purposes of artificial intelligence on the financial markets; sentiment indicators; trading signals; anti-money laundering (AML)/ combating financing terrorism (CFT) and fraud detection. Investment sentiment indicators are being developed through use of AI and sold to banks, high frequency trading traders, hedge funds and social trading and investment platforms. AI can be used to facilitate compliance with regulations, credit monitoring and risk mitigation purposes. AI can also be used to identify trading patterns and forecast trends [FSB, 2017].

In addition, the FSB [2017] identified the following as practical uses of AI in the financial markets; customer focused uses embracing client-facing chatbots, insurance and credit scoring; optimization of a bank's regulatory capital; derivatives margin optimization including value margin optimization; model risk management including back testing and model validation and stress testing; assess market impact of a given trade; asset management trading execution and portfolio management.

1.2 Statement of the Problem

Following the financial crisis of 2007/2008 derivatives were blamed for contributing towards the crisis. The period after the financial crisis has been characterised by revolution of artificial intelligence in all the global markets. The role of AI had been described as providing superpowers on the transformation of products and services relying on traditional economic and finance theory to systems currently being driven by deep learning smart finance. Most governments had been observed as not yet ready in the adoption of AI in their respective markets. Hence the study explored the role of artificial intelligence on derivative markets with respect to financial development.

1.3 Research Questions

1.3.1 Main Research Question

1. What is the role of Artificial Intelligent on Derivative markets?

1.3.2 Sub Research Questions

2.What are the risks of Artificial Intelligent (AI) on Derivative Markets?

1.4 Objectives of the study

The objective of the study is to examine.

1. The role of Artificial Intelligent on Derivative markets.

2. The risks of artificial Intelligent (AI) on Derivative Markets.

1.5 Research Hypothesis

1.5.1 Null Hypothesis

Derivative Market use of Artificial Intelligent (AI) is not significantly and positively related to financial development as measured by efficiency, depth, stability, and access.

1.5.2 Alternative Hypothesis

Derivative Market use of Artificial Intelligent (AI) is significantly and positively related to financial development as measured by efficiency, depth, stability, and access.

2.0 Literature Review

2.1 Empirical Review of Literature

2.1.1 The Role of Artificial Intelligent (AI) on Derivative Markets

Hajj and Hammoud (2023) acclaimed the use of Artificial Intelligence in algorithm trading, fraud detection, risk management, customer service and credit scoring. The study was based on convergent mixed method research design. The study was based on an online questionnaire survey of 144 questionnaires. The target population of the study was analysts, portfolio managers and traders. SPSS was used to produce descriptive statistics a multi regression equation was also deployed to examine the association between dependent and independent variables (ibid).

Mahalakshmi et al., (2022) alluded that artificial intelligence allows managers to concentrate on the strategic issues of the business rather than spending time on repetitive tasks. It is further reiterated that AI can be used for a wide range of activities ranging from credit lending, risk assessment, stock trading and risk assessment. The methodology of the study was based on qualitative research.

Longbing (2021) asserted that the advancement of Artificial Intelligence and Data Science (AIDS) resulted in the paradigm shift from conventional economy and finance that is based on economic and finance theories to a new era of smart finance driven by machine learning that involve deep data analysis and data driven evidence discovery that is combined with economic and finance theories.

Nobanee and Al-Blooshi (2020) proclaimed that the role of artificial intelligence around the world was for the detection of anomalies, establishment of optimal investment strategies and algorithmic trading. Furthermore, it is stressed that artificial intelligence was used in high frequency market trading through use of proprietary algorithmic programs that spontaneously integrate changing market dynamics and price levels. The study was based on systematic content analysis to evaluate related literature publications.

Further O' Halloran and Nowaczyk (2019) affirmed that artificial intelligence can be used as a robust approach to simulate the impact of financial regulations on systemic risk. Lin et al., (2022) demonstrated that derivatives strategies established by use of behavioural finance artificial intelligence deep neural network algorithms can yield positive results.

2.1.2 The risks of AI on Derivative Markets

Stiehl et al., (2021) conceptually illustrated that autonomous AI trading methods allowed for both old and new forms of market manipulation including emerging risks of algorithmic 'tacit collusion caused by the 'black box' nature of autonomous AI trading systems. The study was exploratory based on a financial market conduct perspective. It is reiterated that whenever the AI amounts to "black box" liability attribution rules are subverted and further existing enforcement mechanisms, including market surveillance mechanism can become outdated and increasingly leading to the inability to police those forms of market misconduct caused by AI algorithmic agents. It is further observed that algorithmic market abuse can go viral and spill over to the whole global financial system to the point of affecting the global systemic stability(ibid).

According to Ravikumar et al. (2021) AI and machine learning can give rise to embedded risk resulting from unfairly discrimination against certain individuals or groups of individuals in favour of others. It is further stressed that AI adoption can also raise concerns about data privacy and issues of financial stability(ibid). Furthermore Ravikumar et al. (2021) identified new unique cybersecurity threats such as novel threats in addition to the traditional cyber risks that are brought about by adoption of AI. Varona and Suarez (2020) alluded that AI could result in data biases or inaccurate or insufficient information and distrust for the technology.

The Financial Stability Board [FSB, 2017] asserted that the use of AI and machine learning to minimise margins and maximise expected return on capital may increase risks if the regulations are constraint thereby demanding tighter liquidity buffers, increased leveraged and faster maturity transformation than in cases when it had not been used for such optimization.

3.0 Research Methodology & Design

The methodology to be used for the study is the Mixed method Research (MMR) involving quantitative research as well as documentary review. Logistic regression was applied on the data obtained from the data base of the World Bank Financial Development Indicators covering the period from 2009 to 2021. The following logistic regression equation shall be used;

DMAI USEit = α + β1Made a digital payment + β2 Stock Market Capitalization to GDP % + β3Stock market turnover ratio + β4Stock price volatility + vit

Where it, is subscript for country derivative market artificial intelligence use in year t and takes a value of 1 if a country had a derivative market in the report for that year and is otherwise zero.

β1- Made a digital payment (% age 15+).

β2-Total value of all listed shares in a stock market

as a percentage of GDP.

β3-. Total value of shares traded during the period divided by the average market capitalization for the period.

β4- Stock price volatility is the average of the 360-day volatility of the national stock market index.

Vit- random error term

4.0 Data Analysis and Discussion of Research Findings

4.1 The role of Artificial Intelligent on Derivative Markets

The role of Artificial Intelligent (AI) on Derivative Markets is through the enhancement of risk management, algorithm trading, development of new derivative based approaches and development of Artificial Intelligent (AI) powered trading platforms (Frąckiewicz, 2023).

4.1.1 Enhancement of risk management

According to Frąckiewicz (2023) Artificial Intelligent (AI) allows investors to make more informed decisions when managing exposures to certain assets obviously leading to effective risk mitigation. This is enabled by Artificial Intelligent (AI) powered algorithms that can analyse huge amount of data that ultimately lead to an improvement in the prediction of market trends and identification of potential risks.

4.1.2 Improvement to Market Efficiency-Algorithm trading

Artificial Intelligent (AI) afforded the use of complex algorithms in the execution of derivative trades at high speeds in responds to changes in specific market conditions and market events. Further the integration of AI in derivative trading allows algorithms to learn from past data thereby adapting derivative strategies in real time resulting in better and spontaneous responds to changes in market conditions (Frąckiewicz, 2023).

4.1.3 Increased Customization of Derivative Products

AI enables customisation of derivative products thus tailoring the derivative products to the specific needs of the individual customers in terms of the client' s risk tolerance, investment goals and other preferences. In this regard AI offers a level of personalization that was never attained before in the derivative markets (Frąckiewicz, 2023).

4.1.4 Development of Artificial Intelligent (AI) Powered Derivative Trading Platforms

AI powered derivative platforms tend to bring greater transparency to the derivative markets as compared to the traditional over the counter (OTC) markets that were characterized with high degrees of obscurity. The lack of transparency in the traditional derivative markets contributed to the global financial crisis of 2007/2008, through market inefficiencies and market manipulation. The emerging AI-powered derivative platforms brings greater transparency to the derivative markets through use of advanced analytics providing valuable insights and real time pricing information on derivative products (Frąckiewicz, 2023).

Table 4.2 above shows the coefficients β1, β2, β3 and β4 of the panel regression equation that were used in this study. The dependent variable of the regression equation was Derivative Market use of artificial intelligence and took a value of 1 if the country had a derivative market and otherwise zero if a country had no derivative market. β1 relates to the percentage of respondents who reported using mobile money, a debit or credit card, or a mobile phone to make a payment from an account; or who report using the internet to pay bills or to buy something online or in a store in the past year. This included respondents who

Table 4.1 Descriptive Statistics for the role of Artificial Intelligence on derivative markets

Item	Mean	Median	Standard Deviation	Maximum	Minimum
Made a Digital Payment	59.35	65.52	31.77	99.48	5.36
Stock Price Volatility	18.51	16.80	9.16	65.35	4.02
Stock market Capitalization	69.80	59.10	55.63	322.71	4.59
Stock Market Turnover Ratio	49.97	28.33	66.26	480.29	0.093

Table 4.2 Estimating a logistic regression model on the role of Artificial Intelligence on derivative markets

	Logit regression	Logit regression	Logit regression
Constant	**Coefficient**	**Z-statistic**	**Prob.**
Made a Digital Payment (β1)	0.06	4.631	0.01
Stock Price Volatility (β4)	-0.02	-1.451	0.05
Stock market Capitalization (β2)	-0.0026	0.0054	0.6
Stock Market Turnover Ratio (β3)	-0.0023	0.0121	0.000

Level of significance @ 1%.

reported paying bills or sending remittances directly from a financial institution account or through a mobile money account in the past year.β2 relates to total value of all listed shares in a stock market as a percentage of GDP. β3 relates to total value of shares traded during the period divided by the average market capitalization for the period. β4 relates to Stock price volatility, the average of the 360-day volatility of the national stock market index (World Bank Group, 2022).

The results of testing the hypothesis revealed that derivative market use of artificial intelligence is significantly and positively related to financial access as measured by the percentage of digital payments made. This resonates with the findings of Financial Stability Board [FSB, 2017] that AI and Machine learning expand the investor base in the financial markets by reducing the barriers to entry for investors in both the retail and capital markets. The implication of this is that increased use of artificial intelligence through creation of derivative trading platforms increases the outreach of derivative markets. In addition, the results of the study revealed that derivative market use of artificial intelligence is significantly and negatively related to financial stability as measured by stock price volatility. This means that an increased use of artificial intelligence on derivative markets will result in stable financial systems that can easily contain contagion risks. This resonates with the findings of Financial Stability Board [FSB, 2017]. However, the study results showed that derivative market use of artificial intelligence has no effect on both derivative market depth and derivative market efficiency.

4.2 Conclusions and Recommendations

The evolution of AI and machine learning had brought with it financial access and stability gains in the global economy as proven by the study. However, as the global markets continued to be revolutionized by AI algorithmic trading new forms of market manipulation and deep learning trading risks emerge that may lead to the impairment of global financial systems if they are not carefully supervised and monitored.

4.2.1 Recommendations

In adoption of AI algorithmic trading policy makers are recommended to carefully rethink and promulgate robust AI social, legal and regulatory reforms that substantially reduce the risk of autonomous AI algorithmic trading risks through the mandating of the human in the loop regulatory option. Hence government needs to continuously monitor the adverse effect of autonomous AI algorithmic trading on their financial systems in view of global financial stability. Policy makers are advised to continuously prepare towards their readiness for the fully adoption of AI algorithmic trading through the provision of adequate strategic vision, financial infrastructure, and technological capabilities necessary to power AI deep learning effects on their local financial system.

Governments that have an adequate prudential oversight of AI and Machine learning can benefit from AI through the growth of new credit platform that directly connect lenders and borrowers thus reducing overreliance on bank loans, reducing bank leverage, and thereby achieving a more diversified risk sharing structure in the overall financial system [FSB, 2017].

Lastly policy makers need to continuously monitor and strengthen their prudential oversight in relation to new developments in artificial intelligence.

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Artificial Intelligence and Training: Opportunities and Challenges in The Zimbabwean Mining Industry

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Abstract

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Artificial intelligenceis Each and every aspect of our society has been changed by artificial intelligence. Artificial intelligence still a new phenomenon in Zimbabwe. The main thrust Each and every aspect of our society has been changed by artificial intelligence. Artificial intelligence is still a new phenomenon in Zimbabwe. The main thrust of this research was to understand the opportunities and challenges of artificial intelligence in training activities in the mining industry. This study was guided by understand training activities that can be transformed by artificial intelligence. The study determined the challenges of using artificial intelligence in training. The investigator obtained data through telephone interviews that were conducted with 10 participants from the Zimbabwe Mining Industry. The investigation employed judgemental, convenient and snowball sampling. The study found that there is low use of artificial intelligence in the training activities, but there are activities that can be undertaken by artificial intelligence that include induction, online training, and refresher courses. Expensiveness, lack of skills, loss of jobs, cultural and ethical implications were found to be challenges associated with the use of artificial intelligence in the employee appointment process. Efficiency, effectiveness, enhanced trainee experience, reduced costs and organisation brand were found to be benefits of employing artificial intelligence in training. The study recommends partnerships to be developed among mining organisations, higher and tertiary education, and technology enterprises to develop artificial intelligence software that can cost-effectively meet the needs of trainers.

Keywords: Artificial Intelligence, Training, Human Resources, Development, Mining Sector

1. Introduction

Throughout history, human resource management, or HRM, has seen substantial changes in response to shifting social, technological, and economic environments. We can better understand the current situation and recognize the influence of AI on HRM by knowing the historical development of HRM. HRM's forerunner, people management, first appeared in the late 18th century during the Industrial Revolution (Gupta & Sigh, 2022). It was mostly concerned with administrative duties like hiring, paying employees, and maintaining compliance. Ensuring effective personnel management in the developing industrial economies was the aim (Bala et al, 2023). The human relations movement opposed the bureaucratic aspects of personnel management at the beginning of the 20th century. It was developed by experts like Elton Mayo and highlighted the significance of social interactions, motivation in the workplace. This shift marked a significant departure from the administrative focus of personnel management and laid the foundation for employee-oriented HRM practices.

Human resource management (HRM) became a strategic method to managing people in firms in the 1960s. This change was indicative of a move toward a human resources perspective that was more complete and integrated. Workforce planning, performance management, and employee engagement were all included in HRM. The focus was on acknowledging workers as important assets and coordinating HR strategies with company goals (Beer et al., 1984). Strategic HRM, which emphasizes the integration of HR strategies with overarching corporate plans, gained prominence starting in the 1980s (Mehta et al, 2023. This strategy acknowledged that human capital may be used to obtain a competitive edge. Organizations that concentrated on luring, nurturing, and keeping elite talent saw a surge in the usage of talent management. For a business to succeed, talent management and HRM must be strategically aligned (Zhang & Wang, 2019). Technological developments in the last few years have completely changed HRM procedures. The way HR departments function has changed as a result of the integration of automation and AI. AI-powered solutions make it possible to do things like scan resumes, ask questions of employees using chatbots, and organize the workforce using predictive analytics. AI also facilitates decision-making, improves worker satisfaction, and simplifies HR procedures. HRM can increase the efficacy, precision, and general efficiency of HR procedures by utilizing AI (Khanna & Sharma, 2023).

Organizations depend heavily on training, which is important for many elements of how they operate. Training helps a business succeed overall by promoting growth and development and improving employee performance and productivity (Mishra & Akman, 2010). Employees receive training to provide them the know-how, abilities, and competences needed to carry out their jobs well. It improves their job-related skills, empowering them to fulfill employment needs, overcome obstacles, and accomplish performance goals (Khatri et al, 2020). Employees with proper training are more competent, self-assured, and able to produce high-caliber work. Employee productivity is increased by training, which increases workers' efficacy and efficiency in completing duties. It aids staff members in picking up new skills, best practices, and shortcuts that can improve workflows and procedures (Singh et al, 2018). Training helps staff members do jobs more quickly and precisely by providing them with the necessary information and skills, which boosts productivity within the company. In the current dynamic business landscape, enterprises need to possess the ability to adjust and react quickly to changes. Employees can better accept and manage change by receiving the skills and information that training helps them obtain (Mishra & Akman, 2010). It fosters a learning mentality in staff members, allowing them to adapt to new procedures, technology, and market conditions, preserving the organization's flexibility and competitiveness.

Artificial Intelligence (AI) is becoming more and more significant in the field of Human Resource Management (HRM) as it transforms these processes (Rehman et al, 2018). AI integration in HRM offers businesses a host of advantages and prospects. Artificial intelligence (AI) technologies, including as chatbots and virtual assistants, may respond quickly and personally to questions from employees, answering frequently asked HR-related queries and offering round-the-clock help (Mehta et al, 2023). By guaranteeing timely support, cutting down on waiting times, and freeing up HR staff to concentrate on more difficult responsibilities, this enhances the employee experience. AI-powered solutions can also let employees have self-service choices so they can get information and work on their own. Artificial intelligence (AI) technologies can offer individualized learning programs based on the requirements and preferences of each employee. Based on employees' skill gaps, career goals, and learning history, AI can suggest pertinent training

modules, courses, and resources through intelligent learning platforms (Verma & Gupta, 2020). This customisation boosts the efficacy of programs for learning and development, encouraging ongoing development and upskilling inside the company.

The mining industry is the second largest contributor to the Zimbabwean economy. It is expected to contribute US$40 billion. This is only possible if its employees are continuously trained. This can be fused with artificial intelligence making the training effective and also cost-effective. Hence, there was need to conduct an assessment on the opportunities and challenges of artificial intelligence in training in the mining sector.

Problem Statement

Artificial intelligence have revolutionized the way things are done in human resources management. The mining sector is the second biggest sector in Zimbabwe. It is expected to contribute US$40 billion by 2030. However, this is only possible if employees are constantly trained so that they are effective and efficient in meeting vision 2030. Bigger conglomerates in the world are adopting artificial intelligence to make training effective. This study focuses on opportunities and challenges in usage of artificial intelligence in training. There has been dearth on studies on artificial intelligence and training in Zimbabwe. This study will go a long way in filling this knowledge gap. The study will inform mining companies on the viability of using artificial intelligence in the mining sector.

Objectives of the Study

1. To identify training activities that use artificial intelligence in the Zimbabwean mining sector;
2. To examine challenges associated with the use of artificial intelligence in training activities in the Zimbabwean mining sector; and
3. To assess benefits that can be derived from the use of artificial intelligence in training activities on the Zimbabwean mining sector.

2. Literature Review

Artificial Intelligence and Training

AI is the field concerned with building machines that can emulate human thought processes and behavior. The idea is for technology to digest massive volumes of data, identify patterns, and make data-driven judgments to assist humans with challenging tasks (Singh et al, 2018). AI systems concentrate on using large amounts of data to solve specific issues, whereas human intelligence creates complex associations. Reasoning, unprogrammed learning, environment perception, and object manipulation are important AI skills. Systems don't need explicit instructions to change behaviors based on data. AI is limited, though; unlike humans, it finds it difficult to apply knowledge or think creatively (Khanna & Sharma, 2023). These days, financial trading, picture recognition for medical diagnosis, translation, and other uses are popular. AI's influence increases as computers and data get more powerful, enabling it to detect illnesses, operate vehicles, combat climate change, and so on. Simultaneously, concerns about employment losses and a lack of transparency or accountability for AI judgments also surface and must be addressed (Bala et al, 2023). The distinction between humans and artificial intelligence may become increasingly hazy in the future due to advancements in algorithms, datasets, and processing capacity. This could present both new obstacles and possibilities to enhance human capabilities and productivity. The ultimate goal is still to put intelligence into

machines to simulate human cognition.

The process of enhancing an employee's knowledge, abilities, and competences to improve their productivity and performance in a particular job or role within an organization is referred to as training. It is crucial to both corporate expansion and employee development. There are many different ways to provide workplace training, such as acquainting new hires with the company's policies, practices, and culture (Gupta & Singh, 2020). Through this training, new hires will be made aware of their expectations as well as their tasks and responsibilities. supplying workers with the information and abilities they need to carry out their particular job duties well. Technical training, software training, and training on certain tools or procedures can all fall under this category. providing chances for staff members to advance their knowledge and abilities beyond the demands of their current positions (Sharma et al, 2022). Workshops, seminars, conferences, or online courses to hone leadership, communication, or other pertinent competencies might be examples of this. ensuring that workers understand and abide by company policies, industry standards, and legal and regulatory requirements. This training is particularly important in areas such as safety, data protection, ethics, and diversity and inclusion. Focusing on developing interpersonal skills, communication skills, teamwork, problem-solving, and other non-technical skills that are valuable in the workplace.

Giving managers and supervisors the tools they need to properly lead and oversee teams. Training in decision-making, performance management, dispute resolution, and strategic thinking are a few examples of this (Verma & Sharma, 2021). A variety of techniques, such as in-person seminars, online courses, e-learning platforms, mentorship programs, coaching, and job shadowing, can be used to provide workplace training. The selection of training methods is contingent upon various aspects, including the type of content, the quantity of personnel undergoing training, the available resources, and the preferences of the company.

Programs for workplace training that are effective should be customized to meet the unique requirements of the company and its personnel (Bala & Singh, 2022). They should include assessments or evaluations to gauge the success of the training, as well as clear objectives, active participant engagement, real-world examples, and practice opportunities. Continuous evaluation and feedback are essential to ensure that training programs are meeting their intended goals and making a positive impact on employee performance and organizational success.

Training Activities that use Artificial Intelligence

Artificial Intelligence (AI) has the potential to transform traditional training methods and improve the learning process in a number of workplace training domains. To generate personalized learning paths, AI systems may assess the talents, knowledge gaps, and learning preferences of specific personnel (Mehta et al, 2023). AI-powered systems can make individualized recommendations for training modules, courses, or resources based on an individual's skills and deficiencies. The effectiveness of training programs as a whole is increased, as is engagement and knowledge retention, thanks to this tailored approach.AI can help with content and training material production. Based on available resources or subject area expertise, Natural Language Processing (NLP) models can produce automated summaries, instructional content, and assessments (Gupta & Kumar, 2023). This guarantees consistency, expedites the material generation process, and frees up trainers to concentrate on more advanced instructional design.

Training experiences that are realistic and immersive can be obtained with AI-powered VR and AR

simulations. Workers can practice difficult jobs, safety protocols, or using equipment in a virtual setting, which lowers the possibility of mishaps and eliminates the need for real training facilities (Argawal & Sharma, 2021). AI systems are able to offer suggestions and feedback in real time, which helps with performance enhancement and skill growth. AI-driven tutoring programs can serve as virtual instructors, offering individualized instruction and support. These tools are able to evaluate students' performance, pinpoint areas that need development, and provide focused coaching and feedback. Intelligent tutoring systems maximize learning outcomes and enable self-paced training by adjusting to individual learning styles and progress.

AI-driven chatbots can function as virtual assistants, responding to inquiries from staff members, offering on-demand assistance, and distributing educational materials (Malik et al, 2019). Chatbots can comprehend natural language inquiries and respond with precision and context-specificity thanks to NLP algorithms. This boosts the learning process overall, increases accessibility, and lowers the need for human intervention. Adaptive assessments, which modify the material and difficulty level according to the learner's progress, can be created by AI algorithms (Zhang & Wang, 2019). Artificial intelligence (AI)-powered tests provide more accurate assessments of competency and pinpoint particular areas for growth by dynamically customizing questions to the individual's knowledge level. This guarantees the effective use of training resources and permits tailored training interventions.

Large volumes of training data can be analyzed by AI-powered analytics to find patterns, trends, and correlations (Bala et al, 2023). AI algorithms are able to predict future training needs, identify potential dangers, and offer insights into the effectiveness of training by integrating data from several sources, including learner performance, engagement, and feedback. Proactive decision-making, ongoing development, and evidence-based training methods are made possible by this data-driven approach. By removing language barriers, AI-powered language translation systems can help with training in global corporations. Employees with varying linguistic backgrounds can access training materials and take part in group learning activities thanks to real-time translation capabilities (Aggarwal & Mittal, 2022). Through the provision of insights and recommendations on cultural subtleties and sensitivities, AI can also support cross-cultural training.

AI can improve training engagement by using adaptive learning algorithms and gamification strategies. AI systems are able to monitor each person's development, provide incentives, and modify the training material in response to output. Leaderboards, badges, and challenges are examples of gamified aspects that encourage healthy competition, inspire learners, and create an immersive and interesting learning environment (Sharma et al, 2022). By providing bite-sized, on-demand training material in the form of microlearning modules, AI can support continuous learning. Based on the requirements, responsibilities, and skill gaps of employees, AI algorithms can suggest pertinent microlearning materials. Employees can now access learning resources at any time and from any location, and they can incorporate learning into their regular tasks.

AI can greatly advance the research of training needs by utilizing data analysis and predictive algorithms to identify skill gaps, determine training needs, and maximize training interventions (Singh et al, 2018). AI systems are able to collect and analyze data from a variety of sources, such as feedback forms, employee performance reports, job descriptions, and skill evaluations. Through the efficient and effective analysis of massive volumes of data, artificial intelligence (AI) is able to identify patterns, trends, and areas that require training.

AI-powered technology can be used to evaluate employees' skills and competencies against the intended performance standards. These tests can be given online or through interactive simulations. AI systems are able to identify specific skill shortages that need to be filled by comparing employee performance to pre-established benchmarks.

AI has a big impact on training evaluation. It helps companies analyze learning results, evaluate training programs, and make data-driven decisions for ongoing improvement. Large amounts of training data, such as assessment outcomes, engagement indicators, and learner performance, can be analyzed by AI algorithms (Khatri et al, 2020). AI can produce insights about learners' progress, pinpoint areas for development, and offer a comprehensive evaluation of training efficacy by analyzing this data. During training, AI-powered assessment systems can offer real-time evaluation and feedback. These systems have the ability to automatically grade tests, give students immediate feedback, and change the difficulty of the questions in response to the students' performance. For efficient learning, this makes prompt intervention and tailored feedback possible. Natural Language Processing algorithms can analyze qualitative feedback from learners, such as open-ended survey responses or comments in discussion forums. AI can extract sentiments, themes, and patterns from the text data to gain insights into learners' perceptions, needs, and areas of improvement. This feedback analysis helps in identifying training gaps and improving training content and delivery.

Challenges Associated with AI in Training

While AI has many advantages for workplace training, there are a number of drawbacks that businesses must take into account. Data is a major component of AI algorithms, and the availability and quality of training data have a big influence on how successful AI applications are (Bala et al, 2023). Incomplete, skewed, or low-quality data might result in biased results, erroneous suggestions, or inefficient training interventions when used to train AI models . To properly train AI models, organizations must make sure they have access to high-quality, diverse, and representative data (Khatri et al, 2020). AI systems may unintentionally reinforce biases found in the training set, producing suggestions or judgments that are prejudiced. AI algorithms may amplify and reinforce societal biases if the training data reflects them, which could result in training programs that have discriminatory effects. Companies need to be aware of potential biases in the data and take appropriate action to reduce them. Some strategies to do this include using inclusive and varied training data, utilizing algorithms that are sensitive to fairness, and routinely checking AI systems for bias.

Even though AI can automate some workplace training tasks, human oversight and expertise are still necessary. To guarantee that the training content is accurate and pertinent, AI models must be trained and adjusted by subject-matter experts (Bala et al, 2023). Furthermore, in order to evaluate AI-generated insights, offer context, and make defensible decisions based on the AI-driven suggestions, human trainers and instructional designers are required (Zhang & Wang, 2019). To maximize training results, organizations should find a balance between AI automation and human expertise. Access to individual employee data, like as performance metrics, learning progress, or feedback, is frequently necessary for AI-powered training systems (Khatri et al, 2020). It is vital to guarantee the confidentiality and security of sensitive data. To secure employee data from misuse, unauthorized access, and breaches, organizations must implement strong security measures and adhere to applicable data protection standards. To foster trust and uphold privacy standards, open communication with staff members about data collection, storage, and usage is vital.

There are ethical questions raised by the use of

AI in workplace training, especially in relation to accountability, transparency, and permission (Zhang & Wang, 2019). Employers need to make sure that staff members are informed about the use of AI in training as well as the potential effects it may have on their education and professional growth. Upholding trust and resolving ethical issues need open communication regarding the use of AI, the data that is gathered, and the decision-making process (Bala et al, 2023). In order for AI models and algorithms to continue to be useful, workplace dynamics, technological advancements, and skill needs must all change over time. To adapt AI models to evolving requirements, organizations must often update and retrain them. AI systems should also be adaptable enough to take into account the preferences, learning styles, and particular training needs of each student.

Employee resistance or hesitation may arise when AI is introduced into workplace training because they may mistrust AI-based technologies or fear losing their jobs. Companies must proactively address issues, explain the advantages of AI in training, and offer assistance and training to staff members so they can become familiar with and comfortable with AI technologies (Zhang & Wang, 2019). It's critical to communicate clearly about how AI improves learning and growth possibilities rather than taking the place of human teachers. Integration with current systems and a strong technical foundation are necessary for implementing AI in workplace training. Businesses must make sure that their infrastructure can support the computing demands of AI algorithms and that learning management systems, data storage, and analytics platforms integrate seamlessly. Adequate IT support and expertise are necessary to overcome technical challenges and ensure smooth implementation and operation of AI-powered training systems.

The costs of implementing AI in workplace training, such as purchasing AI technologies, developing AI models, and keeping up the infrastructure, might be high. Businesses must carefully weigh the advantages and disadvantages of implementing AI before allocating resources (Khatri et al, 2020). Compared to larger businesses, smaller organizations with tighter budgets could encounter more difficulties implementing AI for training. AI algorithms can be complicated and challenging to understand, especially deep learning models. The inability of AI systems to provide an explanation can make it difficult to comprehend the reasoning behind specific suggestions or choices (Zhang & Wang, 2019). This lack of openness may undermine user acceptability and cause problems with trust. Establishments ought to endeavor to create AI models and algorithms that are comprehensible and offer lucid explanation for their results.

3. Benefits of AI in Training

Artificial Intelligence (AI) is transforming the field of learning and development with its many benefits for workplace training (Zhang & Wang, 2019). AI allows for customized learning experiences based on the requirements, interests, and learning preferences of each employee. Based on an employee's performance, desired career path, and knowledge gaps, AI algorithms can evaluate learner data and generate personalized recommendations, material, and learning courses (Bala et al, 2023). By guaranteeing that workers receive customized training sessions, this customization promotes more effective and efficient learning outcomes.

By utilizing cutting-edge algorithms to optimize content delivery, adjust the difficulty level, and provide real-time feedback, AI-powered training systems can improve learning results. Employers are guaranteed to be suitably challenged and engaged by adaptive learning platforms, which use AI to dynamically modify the training content based on learners' knowledge levels and progress. Better knowledge retention, skill learning, and general performance improvement are encouraged

by this tailored approach (Zhang & Wang, 2019). AI makes it possible to access training resources and materials at any time, anyplace. AI-powered learning platforms enable employees to study at their own speed and accommodate a variety of learning preferences by delivering training information across a variety of devices and formats (Khatri et al, 2020). AI-based chatbots and virtual assistants can also respond to employee inquiries and offer on-demand help, increasing accessibility and lowering the need for human trainers.

Large volumes of training data can be analyzed by AI algorithms to produce predictive analytics and actionable insights. AI can be used by organizations to track training efficacy, detect skill gaps, and monitor learner progress (Zhang & Wang, 2019). Organizations are able to optimize training programs, manage resources efficiently, and match training initiatives with strategic goals and business demands thanks to this data-driven approach to decision-making (Bala et al, 2023). AI makes it easier to learn continuously by offering chances for continuing skill improvement and microlearning. Based on an employee's performance, interests, and evolving skill requirements, recommender systems powered by AI can make recommendations for pertinent training materials, articles, videos, or microlearning modules. This makes it possible for staff members to learn new skills gradually, keep up with market developments, and pursue ongoing professional growth.

Assessment solutions powered by AI have the ability to produce comprehensive performance reports, instantly provide comments, and automate the grading process. Artificial intelligence (AI) systems are able to examine student responses, spot trends, and offer tailored feedback to fill in knowledge gaps. Employees can monitor their progress, active learning is encouraged, and trainers may step in and offer more assistance as needed thanks to this real-time evaluation and feedback system.AI can save costs and save time by automating and streamlining a variety of training procedures (Khatri et al, 2020). Artificial intelligence (AI)-enabled chatbots, virtual trainers, or intelligent tutoring systems can reduce the need for human intervention by answering basic questions, assisting with employee onboarding, and giving fast access to training resources. AI also streamlines administrative chores like scheduling, registration, and reporting, giving trainers more time to concentrate on more strategic and valuable work.

Training platforms with AI capabilities can easily grow to accommodate many students at once. Artificial intelligence algorithms guarantee the uniform distribution of training materials and tests, removing discrepancies that could result from the different approaches or perspectives of human instructors. Organizations are able to provide training programs consistently across geographically dispersed teams or different locations thanks to this scalability and uniformity. AI analyzes learner data, assesses training outcomes, and pinpoints areas that need work to enable training programs to be continuously improved (Bala et al, 2023). Artificial intelligence algorithms possess the ability to monitor the efficacy of diverse training interventions, detect successful patterns, and suggest adjustments to enhance training endeavors. Training programs adapt to changing needs and stay in line with business goals thanks to this iterative approach.

AI enhances the effectiveness of human trainers and subject matter experts by giving them access to insights, analytics, and tools. Trainers can get help from AI algorithms with learner data analysis, trend identification, and intervention customization. Trainers may now make data-driven decisions, concentrate on strategic training elements, and provide more memorable learning experiences thanks to this enhanced intelligence. Organizations may build a learning ecosystem that is more effective, personalized, and engaging by utilizing

AI. Workplace training powered by AI enhances learning outcomes, fosters personal growth, and helps businesses adjust to a business environment that is changing quickly. In training, the integration of AI capabilities and human expertise produces a potent synergy that promotes skill development, ongoing learning, and organizational success.

4. Research Methodology

The study used qualitative methodologies in understanding the opportunities and challenges of artificial intelligence in training in the Zimbabwean mining sector. Qualitative methodologies, specifically face-to-face and telephone interviews, were chosen as they are well-suited for investigating perceptions and attitudes. The target population for this study consisted of human resources professionals working in Zimbabwean mining sector. Data collection involved conducting interviews with the participants. The study used a mixture of judgemental, convenient and snowball sampling. The interviews were carried out until data saturation was reached, which occurred after the 10th interview. This approach helped to ensure that a sufficient amount of information was gathered without unnecessarily prolonging the data collection process. By stopping the interviews at this point, the study was able to save on resources and time. Thematic analysis was chosen as the method for analyzing the collected data. Thematic analysis involves the identification and exploration of patterns or themes within the data, allowing for a comprehensive understanding of the participants' perceptions. This approach facilitates the organization and interpretation of the qualitative data, leading to the emergence of key findings and insights.

5. Results and Discussions

Training Activities That use Artificial Intelligence in The Zimbabwean Mining Sector

The first objective of the study was aimed at establishing areas in training that have been using artificial intelligence. The study found that artificial intelligences are used in induction, online training, refresher courses and conferences. The study found that many organisations are using artificial intelligence in induction training. This is where new employees are given a chatbot to ask questions on the organisation in order to familiarise themselves with the culture and practices of the organisation. For example, P2 said "We give new employees a link to our chatbot so as to make ask the chatbot as many questions as possible about our organisation." This is similar to Zhang & Wang (2019) who found that Chinese firms are using chatbots for induction of employees. The study also found that online training is now conducted using artificial intelligences. Chatbots are used to facilitate online training as opposed to using humans as facilitators. This also resonates with Arggawal & Khathuria (2023) who also found the use of artificial intelligence in online training. The study also establishes that artificial intelligence is also used in the refresher courses. They have the ability to train people on refresher courses uses chatbots. Refresher courses such as training and development. This resonated with P8 who said "Refresher such as health and safety we use chatbots, and these automatically conduct training examination and certify whether the employee has passed or not." This converges with Khatri et al (2020) that artificial intelligence is vital in refresher courses. However, the study found that organisations are not fully using artificial intelligence in training activities such as needs assessment, training implementation and training evaluations. This contradicts finding by Bala (2023) that organisations are fully utilising artificial intelligence in training activities.

Challenges Associated With The Use if Artificial Intelligence in Training Activities

The second objective was aimed at identifying challenges associated with use of artificial intelligence in training activities. The study found that expensiveness is one of the challenges associated with artificial intelligence. For example, P1 said "To invest in these technologies it is expensive and we cannot afford, hence not using artificial intelligence in training." This resonates with Bhardwaj et al (2020) that organisations are hesitant to use artificial intelligence because of costs associated with it. In addition, the study found that lack of skills in artificial intelligence is another challenge. For example, P9 said, "The training officers do not have the skills to leverage on artificial intelligence in executing their duties." This id different with Malik et al (2019) studies, the difference may be that India is ahead of Zimbabwe in terms of artificial intelligence skills. The study also found that artificial intelligence leads to loss of jobs especially in a country like Zimbabwe with its economic challenges. For example, P4 said "Where we need five human resources personnel we may need only one, it means that the other four should be let go." This converges with Mishra & Arkman (2010) that technology is leading in loss of jobs. The investigation found that artificial intelligence in training has cultural implications. For example, P5 and P7 cited that Zimbabwe has collective culture and use of artificial intelligence has resulted in little interactions amongst humans. This is not detected by Gupta & Singh (2020) who did their studies in the UK where there is individualistic culture.

Benefits That Can Be Derived From The Use Of Artificial Intelligence In Training Activities

The investigation found that use of artificial intelligence in training leads to training efficiency. Training is conducted using limited resources. For example, P3 said "Use of artificial intelligence in refresher course is quicker and uses less resources as it is the individual employee interacting with a chatbot." This is similar to findings by Sharma et al (2022) that efficiency is enhanced through artificial intelligence. The study found that training is effective when artificial intelligence. Human facilitators can have errors but this is not the case with well programmed artificial intelligence as all the relevant information may be fed to the artificial intelligence. This deviates from Aggarwal & Mittal (2022) who found humans to be more effective that artificial intelligence. The investigation also established that enhanced trainee experience is another finding pertaining benefits of artificial intelligence. For example, P6 said "With chatbots employees have to train at their own pace and time making the process interesting and stimulating." This is also picked up by Gupta & Singh (2020) in their studies in India. The research found that use of artificial intelligence is also part of organisational branding. It can be used to attract employees as it is viewed as more modern than the traditional training. This is not picked by various researchers on the same problem investigation (Bala et al, 2023; Bala & Singh, 2022; Rehman et al, 2021).

6. Conclusions

The study concludes that organisations in the mining sector are not fully utilising artificial intelligence in training, but some have been using it in induction, refresher courses and online training. The research recommends that expensiveness, lack of skills, loss of jobs and cultural implications as challenges associated with artificial intelligence. The investigation concludes that artificial intelligence is highly beneficial in training as it results in effectiveness, efficiency, enhanced trainee experience and organisational branding. The study recommends that:

Mining companies embrace artificial intelligence in all its training activities;

- Mining companies collaborate with higher education institutions and tech companies to help

them develop artificial intelligence capable of being used in training activities;

- Further studies to be conducted on training and artificial intelligence in other sectors such as manufacturing and telecommunications; and
- Further studies to be carried out on artificial intelligence and other HRM activities such as reward management and performance management.

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A Study on The Role of E-Commerce in The Indian Handicrafts Industry: A Consumer Perspective

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Abstract

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India is a land of tradition and culture. This culture is passed on to generations by various means. One such means is handicrafts. Indian handicraft industry has untapped potential in the global as well as domestic markets. The new era of digitalisation has made even traditional industries like handicrafts change their mode of business. E-commerce has significantly played an important role in bringing a variety of products and services to the door of the customer. However, its contribution to the Indian handicraft industry is unknown. With changing attitudes and lifestyles, the customers' perception of the products has also changed. This study intends to investigate the consumer perception of Indian handicrafts purchased through e-commerce platforms. This study aims at understanding the factors that determine customer satisfaction after online purchases of Indian handicrafts and determining the right segment of customers to sell handicrafts through e-commerce. The study led to the conclusion that there is a need to spread awareness about Indian handicrafts, and about the e-commerce site selling them online. The results showed that variables classified under web functionality, product perception and trust are the factors that have a positive impact on customer satisfaction and a satisfied customer is likely to recommend their online purchase to others. The customer segment likely to purchase handicrafts online was also thoroughly studied.

Keywords: **Consumer Perception, Customer Satisfaction, E-Commerce, Handicrafts, Online Purchase**

Introduction

India has been bestowed with a suitable climate, abundant natural resources, epics like the Ramayana and Mahabharata, diversity, and great people. Each state of India has its own unique natural resources, food, clothing, climate, festivals, rituals and also culture. This multifariousness of culture and the unique talent of its people make India the land of aesthetic innovation. And one such Indian speciality is handicrafts.

The crafts, which are produced by applying exquisite craft and artistic skills, using natural resources and tools, and made with love and care, depict a story about the place and the people who made them. With digitalization and the boom in internet availability, the business environment has completely changed. Unlike the traditional way of buying products from stores and shops, customers can now select, compare, buy, track, and even post reviews about their purchase on the internet; thus, the whole process of buying and selling has become quick

and transparent. This online buying and selling of goods and services is called e-commerce. It has not only enabled businesses to go global but also made the customer open to a variety of products and services. With the shift in the pace and way of buying from offline to online, the customers' perception of the purchasing process and product have also changed.

Though e-commerce is acting as a catalyst for various industries like apparel, electronics, daily-needs products etc. its role in traditional industries like handicrafts is vaguely researched. There is a need to understand the marketing and entrepreneurial knowledge in the handicraft industry so as to benefit the artisans to scale up and use the available resources to establish their businesses.

By understanding online consumer perception of e-commerce for handicrafts, this study will help innovators, entrepreneurs, etc., to strategically design their businesses according to the growing concerns of the world and the rising expectations of consumers. This study also intends to help various stakeholders of the market in enhancing and improvising handicraft growth in India. The study aims:

1. To study the Indian customers' perception of purchasing Indian handicrafts online.
2. To determine among the factors derived from the customer perception that will have the greatest impact on customer satisfaction.
3. To elucidate the customer segment who are likely to purchase Indian handicrafts via e-commerce.

Literature Review

As culture is an ever-changing and motionless value system, it is subtle in nature and can be expressed in various forms like attire, habits, cer-emonies, decorative items etc. One such mediator to pass on culture is handicrafts. The craftsmen require special skills which are generally passed from generation to generation and thus providing a sustained livelihood for artisans. But due to a gap in consumer awareness, high demand for western crafts, improper information dissemination, poor marketing and branding, financial constraints of craftsmen (dey, n.d.) other challenges faced by the industry, it is now on the road to downfall.

India is a country with heritage, rich culture, and artistic history. With its diverse culture, diverse climate and various utility requirement, the country has developed rich and sustainable methods of survival. India is home to 1405 million. Out of 70% of the population is depended on agriculture for its livelihood (Anon., n.d.). The second most important sector after agriculture has been agriculture-related business-like the handicrafts industry. With the rich essence of aesthetic and artistic skills, Indian handicrafts have always been a source to save and promote the culture and heritage of the country. In addition to that the handicraft industry has been a key factor in maintaining the aristocratic bar of the country (Indrajit Ghosal, 2019)

The industry is scattered all over India, with each state having its own unique traditional handicrafts. "The most popular things in Indian handicrafts include brassware, pen holders, vases, candles, and Christmas goods, ceramic pots, rugs, and other products of paper," says an expert on the country's handicrafts. Many Indian states, including Manipur, Maharashtra Tripura, Rajasthan, Kashmir, Gujarat, Tamil Nadu, and Kerala, are well known for their collections of handicrafts. Each country provides a variety of handicrafts, each with its own distinctive style." (Yadav, 2016)

1. Domestic market

Over 56% of all craftsmen in India's handicraft

sector are women, making up the majority of artisans. The nation has 744 handicraft clusters with over 212,000 artists working for them and more than 35,000 goods on offer (IBEF). Native markets in India are where local handicrafts made by Indian craftsmen are sold. Reliable statistical data is inaccurate because of the handicraft industry's fragmented domestic market. The "The development and promotion of this industry is primarily the ministries of Culture, the Department of Textiles, Khadi & Village Industries Corporation the Ministries of Small and Medium Enterprises, and the Handloom Development Officer. Several efforts, beginning with the handicrafts government, have been created, such as the "The Gandhi Shilpa Bazaar Program, the Export Promotion Program, the Bima Yojana for Craftsmen, the Babasaheb Ambedkar Hastashilpa Yojana, and other programmes are available. "These initiatives are mostly concerned with giving assistance and help financially. purchasing goods, health, insurance services, and technological expertise in successive five-year plans, the India Planning Commission discussed preserving India's culture and legacy." (Anon., 2020)

Global Market

Some early articles suggest that the handicraft industry contributes about 2% of the world handicraft market. The countries which are the biggest buyers of Indian handicrafts are American, German, British, Japanese, Italian, French, Canadian, Dutch, Saudi Arabian, and Swiss. The largest exporters of Indian handicrafts, accounting for around 50% of all goods, are the USA and Germany (Towseef Mohi-ud-din, 2014). Exports of handicrafts are projected to reach INR 28368 Cr (about US$ 6177 million) if an average growth rate of 18% per year is maintained during the 12th Five-Year Plan. The compound annual growth rate (CAGR) between 2012–13 and 2016–17 was 18%. (Jadhav, n.d.) Handicrafts exports from India increased by almost to US $3.39 billion in F20 (EPCH) Online shopping differs from the traditional shopping in many ways. Online shopping is easy, convenient, less time consuming and easy to compare but it also involves higher risks of being cheating, low confidence about product quality, no price negotiation, risk of data security and online transaction frauds. Because of all such reasons, consumer perception toward the online purchase of goods and services differs from the traditional way of shopping.

Consumer views in the context of internet buying are influenced by prior experiences (andiono, 2020).Consumer perceptions determine the effectiveness of e-service quality since impression is the source of subjective norms (Pudaruth, 2017) The effectiveness and efficiency of services, the amount of time consumers spend shopping online compared to offline, and consumer perceptions of the appearance of a friendly design and their ability to pique the desire to shop online compared to offline, among other factors, all have a major role in determining the success of electronic services. (Teoh, 2013). The use of e-service qualities such site design, responsiveness, dependability, and other factors greatly influences it.

There is limited literature available that has studied website functionality in India. Online commerce is a relatively new phenomenon in India, but it is on the rise and is drawing experts to study this new field. Indian-friendly websites are more popular. According to Kiran R, 2009, Accurate product characteristics and warranty information affect Indian buyers' trust in online purchases. Reliable supply chains, a focus on reverse logistics, and security for online transactions were advised by SK, 2011. They also suggested prompt and trustworthy delivery. A website's functioning provides insight into its quality. Functionality measures how well a website conforms to its intended structure and fulfils user expectations. He also recommended trustworthy supply chains, with an emphasis on the reverse. The efficiency of a website in carrying

out particular activities, as well as its usability, atmospherics, and design, may be evaluated. Additionally, experimenters have developed standards to predict website navigation and security features. Website performing studies by (Stefani A, 2006) and (Seffah A, 2008) included security as an element and other factors like payment system-service quality, website design, information quality, delivery service and product quality are all elements that significantly impact consumer satisfaction with online marketing. Analysing the product's aesthetic appeal, quality, utility, and design may also be used to summarise consumer perceptions of handicrafts. (Kumar, 2012). The capacity of handicraft designers to include distinctive cultural elements in handicraft design is what is meant by "cultural uniqueness" in the context of the handicraft sector. (Chand, 2014)

Data Analysis

For the quantitative data analysis, primary data was collected through a self-administered questionnaire for consumers, which was distributed randomly through online in all the parts of the country. The questionnaire was quantified on five-point basis of Likert scale. The questionnaire for the customer included demographic related question like age, income, occupation etc. It also included questions studying about their awareness towards Indian handicrafts and about their perception of buying handicrafts online. The primary data was reviewed and the analysis was carried in the IBM SPSS (statistical package for the social sciences) software and WarpPLS 7.0 for SEM model.

Descriptive statistics:

In the sample of 194, consumers 116% are females and 76 % are males and 1% are others.

- The sample of 194 respondents comprises of respondents whose age ranges from 18- 35 years. The highest percentage of members belong to the ages of 18 and 25 and the percentage is 52.3% followed by the age range of 35-50 years with 18% of the total data. It can be inferred from the figure 5.2 that 52.3 % of the respondents are of GenzZ followed by 18.1% of millennials

- Out of the respondents, 17.6% monthly earn less than ₹20,000, while 16.6% earn between ₹25,000 and ₹50,000 and lastly, 36.3% prefer not to disclose their income.

Factor Analysis

Factor analysis is used for reducing the dimensions. The Kaiser adequacy value is 0.901 which is greater than the minimum value i.e. 0.5. The significance level of the test is found to be "<.001" which is less than 0.05 and hence, proves that the correlation matrix is not an identity matrix. The correlation value runs from 0.532 (lowest) to 0.737(highest) in the communalities table below. This means that all of the variables are between 53 and 73 per cent, and no acceptable parameter no changes are required.

From the table below we can interpret that there are 3 major factors pertaining to the variables in the study. The respective variance of the three variables is 26.861, 25.014 and 12.530.

1. Factor 1 comprises 7 values -0.752,0.790,0.816,0.690,0.819,0.745 and 0.685. These variables are the design of the handicraft, the durability of the handicraft, pricing, functionality of the handicraft, aesthetic appeal, quality of the handicraft and packaging of the handicraft. All these variables summarise the factor "product perception". The higher the similarity between the customers' product perception and the actual product, the higher the satisfaction from the online purchase.

2. Factor 2 comprises 6 values-0.652,0.149,

Total Variance Explained									
Component	Initial Eigenvalues			Extraction Sums ofSquared Loadings			Rotation Sums of SquaredLoadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.733	42.081	42.081	6.733	42.081	42.081	4.298	26.861	26.861
2	2.555	15.971	58.052	2.555	15.971	58.052	4.002	25.014	51.875
3	1.016	6.353	64.405	1.016	6.353	64.405	2.005	12.530	64.405
4	.730	4.565	68.970						
5	.706	4.410	73.380						
6	.589	3.682	77.062						
7	.541	3.380	80.442						
8	.461	2.878	83.320						
9	.447	2.792	86.112						
10	.430	2.687	88.799						
11	.387	2.420	91.219						
12	.362	2.265	93.484						
13	.322	2.010	95.494						
14	.272	1.703	97.197						
15	.241	1.505	98.702						
16	.208	1.298	100.000						
Extraction Method: Principal Component Analysis.									

Source: SPSS output editor

0.677,0.757,0.850 and 0.773. these variables are user-friendly sites, discounts and offers, transaction processes, easy navigation, easy returns and tracking order. These variables represent the "website functionality" factor.

3. Factor 3 comprises 3 values- 0.686,0.658 and0. 823. These variables are brand name, friends and family recommendations and product reviews. These variables represent the "trust" factor which the consumers search for before making an online purchase.

SEM model

Structural Equation Model Analysis is a multivariate statistical analysis that is used to analyse the various relationships of the variables with a prime variable.

Generated through WarpPLS 7.0

Note: The above model depicts the main variables taken for the study. They are: WF - website functionality, independent variable

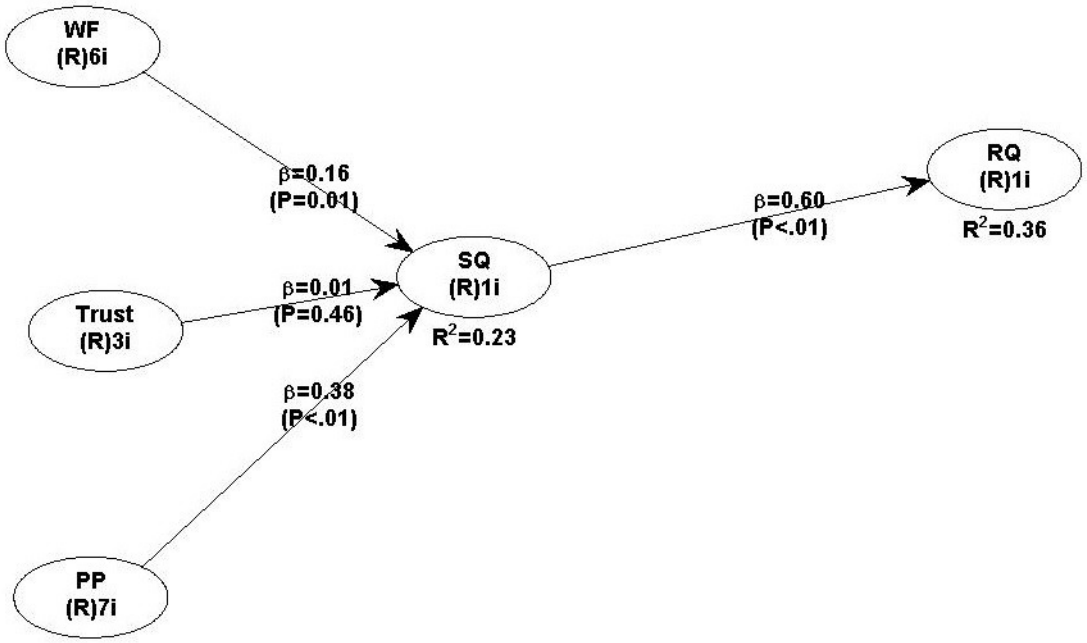
PP- product perception, independent variable

Trust- includes product review, brand name and friends and family recommendation variables, independent variable

SQ- customer satisfaction from online purchase, dependent variable RQ-recommendation of website, the dependent variable

Testing of Hypothesis

H1: Impact of web functionality upon online purchase of handicrafts: Null hypothesis is website



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functionality has no effect on the online purchase of Indian handicrafts. Alternate hypothesis is website functionality has a positive effect on the online purchase of Indian handicrafts. Since P = 0.01, it is statistically highly significant thus null hypothesis is rejected. From the results, it can be inferred that the variables of website functionality that are user-friendly site, discounts and offers, transaction process, easy navigation, easy return and tracking order have a significant impact on customer satisfaction. Hence, entrepreneurs and artisans who use e-commerce for selling handicrafts must enhance these website functionalities for higher customer satisfaction.

H2: Impact of product perception upon online purchase of handicrafts. Null hypothesis is product perception has no effect on the online purchase of Indian handicrafts. Alternate hypothesis is product perception has a positive effect on the online purchase of Indian handicrafts. Since P < 0.01, it is statistically highly significant, thus, null hypothesis is rejected. From the results, it can be inferred that the variables of product perception are design, durability, pricing, functionality, aesthetic appeal, quality and packaging of the product are the main features that lead to customer satisfaction. Hence, the product that the customer buys should meet all the standards to increase customer satisfaction. A study by (Debasis Pani, 2016) validates that aesthetic appeal is one of the most preferable features of Indian handicrafts.

H3: Impact of trust upon online purchase of handicrafts. Null hypothesis is trust has less effect on the online purchase of Indian handicrafts. Alternate hypothesis is trust has a positive effect on the online purchase of Indian handicrafts. Since P = 0.46, it is not significant. Thus, null hypothesis is accepted. From the results, it can be inferred that the trust factor has comparatively less impact on customer satisfaction than web functionality and product perception. The reason behind the low trust factor influence over customer satisfaction can be data security and privacy concerns while shopping from websites. Also, the e-commerce sites for handicrafts are in their initial stages hence the awareness of such websites is low among the customers which makes the customers doubt over their online purchase of handicrafts.

H4: Impact of customer satisfaction derived from online purchase of handicrafts. Null hypothesis: customer satisfaction does not lead to the recom-

mendation of e-commerce as a medium to purchase handicrafts. Alternate hypothesis: customer satisfaction leads to the recommendation of e-commerce as a medium to purchase handicrafts . Since the P value is highly significant we reject the null hypothesis and accept the alternate hypothesis which states that customer satisfaction leads to the recommendation of e-commerce as a medium to purchase handicrafts. From the results, it can be inferred that the variables of if the customer is satisfied with his online purchase of handicrafts he will recommend his purchase to others.

Correlation Analysis

The correlation between all the variables as shown in table 5-12 are positive correlation implying that there exists a positive relation between the variable, with increase in one variable will lead to increase other variable.

Correlation between variables	Pearson Correlation	Inference
User friendly site and transaction process	0.596	A strong positive relationship exists betweenuser-friendly site and transaction process variable. This can be inferred that customersbelieve that if transaction process is easy , the website is user-friendly.
Discounts and offers and tracking order	0.582	A strong positive relationship exists between discounts and offers and tracking order variable. This can be inferred that customersbelieve that customers constantly keep a track on the discounts and offers available
Transaction process and easynavigation	0.611	A strong positive relationship exists easy navigation and transaction process variable. This can be inferred that customers believe that if site is easy to navigate the transaction process will also be easy.
Easy navigation and trackingorder	0.643	A very strong positive relationship exist between easy navigation and tracking order variable, implying that ifsite is easy to navigate so will be the tracking of order
Easy return and tracking order	0.695	A very strong positive relationship exist between easyreturn and tracking order variable, implying that if tracking of order on a site is easy so will the returning of product process
Brand name and friends andfamily recommendation	0.613	A very strong relationship exist between brand name and friends and family recommendation, implying that more of the brand name is trusted then more people are likely to recommend that brand site.
Friends and family recommendation and product review	0.510	A strong positive relationship exists between friends and family recommendation and product review, implying that people are likely to recommend those sites which have high product reviews
Product review and brand name	0.613	A very strong relationship exist between brand name and product review, implying that more of product review are posted on the site, the more that brand is trusted
Design of product and qualityof the product	0.558	A strong positive relationship exists between design of product and quality of product (handicrafts).implying , if design of the product is upgraded so willbe the quality.
Durability of product and quality of the product	0.679	A strong positive relationship exists between durability of product and quality of product(handicrafts) .Implying, if durability of the product is upgraded so will be the quality.
Pricing of product and durability of product	0.605	A strong positive relationship exists between pricing of product and durability of product (handicrafts). Implying, if the product is durable. The pricing of the product can be increased.

Functionality of product anddurability of product	0.608	A strong positive relationship exists between durability of product and functionality of product (handicrafts) .Implying , if durability of the product is upgraded then product will be more functional.
Aesthetic appeal and functionality of product	0.549	A strong positive relationship exists between durability of product and functionality of product(handicrafts) .Implying , if the product is aesthetically appealing , the functionality of the product will increase.
Quality of product and packaging of product	0.603	A very strong positive relationship exists between quality of product and packaging of product (handicrafts) .Implying , if the packaging of product is satisfaction, the quality of product is assumed to be of high standard.

Correlation matrix for website functionality, product perception and trust variables.

Correlation Matrix

		WFQ11_A	WFQ11_B	WFQ11_C	WFQ11_D	WFQ11_E	WFQ11_F	WFQ11_G	WFQ11_H	WFQ11_I	PPQ12_A	PPQ12_B	PPQ12_C	PPQ12_D	PPQ12_E	PPQ12_F	PPQ12_G
C	WFQ11	1.00	.53	.59	.54	.46	.50	.46	.37	.471	.34	.20	.33	.23	.30	.24	.24
o	_A	00	6	6	0	2	9	0	9		5	8	1	7	6	8	9
rr																	
	WFQ11	.53	1.0	.56	.47	.58	.50	.44	.37	.527	.40	.22	.26	.24	.29	.21	.25
e	_B	6	00	4	2	2	1	6	2		4	0	6	3	0	9	6
l a ti																	
	WFQ11_C	.596	.564	1.000	.611	.531	.492	.399	.358	.438	.283	.158	.255	.206	.258	.153	.225
on																	
	WFQ11_D	.540	.472	.611	1.000	.643	.630	.483	.389	.408	.350	.283	.382	.325	.323	.309	.415
	WFQ11	.46	.58	.53	.64	1.0	.69	.44	.28	.428	.35	.11	.26	.15	.18	.17	.26
	_E	2	2	1	3	00	5	6	4		3	8	0	7	7	7	3
	WFQ11	.50	.50	.49	.63	.69	1.0	.52	.30	.519	.35	.21	.26	.25	.31	.24	.29
	_F	9	1	2	0	5	00	9	8		0	6	7	0	6	1	9
	WFQ11	.46	.44	.39	.48	.44	.52	1.0	.47	.613	.27	.27	.26	.26	.27	.28	.23
	_G	0	6	9	3	6	9	00	2		4	0	9	8	5	2	3
	WFQ11	.37	.37	.35	.38	.28	.30	.47	1.0	.510	.22	.20	.24	.28	.18	.35	.17
	_H	9	2	8	9	4	8	2	00		7	2	2	0	9	0	4
	WFQ11	.47	.52	.43	.40	.42	.51	.61	.51	1.00	.36	.12	.24	.27	.32	.24	.27
	_I	1	7	8	8	8	9	3	0	0	2	9	6	3	5	0	7
	PPQ12	.34	.40	.28	.35	.35	.35	.27	.22	.362	1.0	.51	.47	.53	.54	.55	.50
	_A	5	4	3	0	3	0	4	7		00	9	5	5	0	8	5
	PPQ12	.20	.22	.15	.28	.11	.21	.27	.20	.129	.51	1.0	.60	.60	.45	.67	.52
	_B	8	0	8	3	8	6	0	2		9	00	5	8	8	9	2
	PPQ12	.33	.26	.25	.38	.26	.26	.26	.24	.246	.47	.60	1.0	.56	.48	.57	.53

	_C	1	6	5	2	0	7	9	2		5	5	00	2	5	1	5
	PPQ12	.23	.24	.20	.32	.15	.25	.26	.28	.273	.53	.60	.56	1.0	.54	.59	.55
	_D	7	3	6	5	7	0	8	0		5	8	2	00	9	5	2
	PPQ12	.30	.29	.25	.32	.18	.31	.27	.18	.325	.54	.45	.48	.54	1.0	.49	.52
	_E	6	0	8	3	7	6	5	9		0	8	5	9	00	9	0
	PPQ12	.24	.21	.15	.30	.17	.24	.28	.35	.240	.55	.67	.57	.59	.49	1.0	.60
	_F	8	9	3	9	7	1	2	0		8	9	1	5	9	00	3
	PPQ12	.24	.25	.22	.41	.26	.29	.23	.17	.277	.50	.52	.53	.55	.52	.60	1.0
	_G	9	6	5	5	3	9	3	4		5	2	5	2	0	3	00

Source: SPSS output editor

Cluster Analysis

Cluster 1

About 29% of respondents belonged to cluster one. The demographic features of this cluster are females ageing from 25-35 years who work in the private sector as full-time employees and earn an income of ₹1-2 lakh per month. They buy handicrafts from online websites on festivals and are moderately satisfied with their online purchase of handicrafts. This cluster is overall moderately satisfied with the product and with the web functionality of the site from which they purchased handicrafts. This cluster strongly agrees that e-commerce will help in boosting the handicrafts industry. Moreover, this cluster encourages small businesses and believes that handicrafts are a tool to preserve culture. Thus, this can be inferred that marketers can use this information for positioning their product as an aesthetic appealer, culture preserver and a beautiful decoration item for festivals. The entrepreneurs can enhance the customer experience but adding more website functionality features and making this set of customers highly satisfied.

Cluster 2

About 40% of the respondents fall under the category of cluster 2. The demographic features of this cluster are female students whose ages range from 18-25 years, have a monthly income of ₹25,000-₹50,000 purchase handicrafts on festivals from online websites. This cluster is moderately satisfied with its online purchase and website experience. They moderately believe that e-commerce will help in boosting the handicraft industry. Since this cluster is still not permane ntly employed, it can be inferred that in the future cluster, 2 has the potential to become a loyal customer of e-commerce websites for purchasing handicrafts. Entrepreneurs and marketers must target these customers and position their products as decorative products. More than supporting small businesses, this cluster looks for aesthetic appeal, quality, durability, and the functioning of products.

Cluster 3

This cluster consists of 19% of the respondents who are male, full-time employed in the private sector. The age range of this cluster is 35-50 years and a monthly income of 50,000 to 1 lakh. The purpose behind their purchase is for festival decoration. Product review, brand name, tracking of orders and easy return are the features this cluster looks for purchasing handicrafts online. They are moderately satisfied with the purchase. However, they moderately disagree with supporting small

businesses as their motive. Rather they go for other features before making a purchase. They have a neutral perception of the product. This cluster also believes that handicrafts can be boosted by e-commerce. Hence, this cluster can also be targeted by marketers. And the entrepreneurs must build a brand image for their e-commerce site for capturing this cluster.

Cluster 4

This cluster includes female students who have never purchased handicrafts online but they do agree that e-commerce can boost the handicrafts of India. This counts for 11% of the respondents. It can be inferred from the information that the web functionality, product perception and trust value couldn't convince the cluster to purchase handicrafts. This is an insight for marketers to know about its dissatisfied customer reviews. Since the age range of this cluster is 18-25 years, it becomes important for the entrepreneurs and the marketers to cater to the needs of this cluster and make the necessary improvement.

Thus, cluster analysis gave an insight into existing customer segments and the segments that might become customers of online handicrafts. Out of which female customer of age 18-25 years are the most specific target for handicrafts. The study by (Dr. saikumari, 2021) also found the same result in her study.

Final Cluster Centers				
	Cluster			
	1	2	3	4
Percentage	29%	40%	19%	11%
Gender	Female	Female	Male	Female
Employment	Full time private sector	Student	Full time private sector	student
Age	25-35	18-25	35-50	18-25
Support Small Business	Moderatelyagree	Neutral	Moderatelydisagree	Moderatelydisagree
Preserving Culture	Moderately agree	Moderately agree	Neutral	Neutral
Satisfaction	Moderatelysatisfied	Moderatelysatisfied	Moderatelysatisfied	Neutral
Aesthetic Appeal As Purpose	Moderately agree	Moderately agree	Neutral	Neutral
Income (monthly)	**₹1 lakh-2 lakh**	**₹25,000-50,00**	**₹50,000-1 lakh**	**₹1 lakh-2 lakh**
Aesthetic Appeal asProduct	Moderatelyagree	Moderatelyagree	Neutral	Neutral
Gifting	Moderately agree	Moderately agree	Neutral	Neutral
Decoration/Festival	Strongly agree	Moderatelyagree	Neutral	Neutral
Packaging Of Product	Moderately agree	Moderately agree	Neutral	Neutral
Quality Of Product	Moderately agree	Moderately agree	Neutral	Neutral
User Friendly Site	Moderatelyagree	Moderatelyagree	Neutral	Moderatelydisagree
Functionality of Product	Moderately agree	Moderately agree	Neutral	Neutral
Pricing Of Product	Moderatelyagree	Moderatelyagree	Neutral	Moderatelydisagree

Durability Of Product	Moderately agree	Moderately agree	Neutral	Neutral
Design Of Product	Moderately agree	Moderately agree	Neutral	Neutral
Product Review	Moderately agree	Moderately agree	Moderately agree	Moderately dissatisfied
Friends And Family Recommendation	Moderately agree	Moderately agree	Neutral	Moderately dissatisfied
Easy Navigation	Moderately agree	Moderately agree	Neutral	Moderately dissatisfied
Brand Name	Moderately agree	Moderately agree	Moderately agree	Moderately dissatisfied
Tracking Order	Moderately agree	Moderately agree	Moderately agree	Moderately dissatisfied
Easy Return	Moderately agree	Moderately agree	Moderately agree	Moderately dissatisfied
Transaction Process	Moderately agree	Moderately agree	Neutral	Moderately dissatisfied
Frequency	On festivals	On festivals	On festivals	Never
Discounts And Offer	Moderately agree	Moderately agree	Neutral	Moderately dissatisfied
Boosting Handicrafts	Strongly agree	Moderately agree	Moderately agree	Moderately agree

Source: SPSS output editor

Findings and Suggestions

The study shows that consumers are mostly aware of the embroidery and weaving handicrafts, followed by jute, wood and bamboo handicrafts. The other category of handicrafts that some of the respondents told about are leather handicrafts, bone handicrafts, pattachitra paintings and palm leaves handicrafts. It was found that the most accessible market to purchase handicrafts is the art and craft events followed by local market and lastly e-commerce. The possible reason is due to poor marketing and advertising, the e-commerce sites are unable to reach to its customer, however about 41% of respondents have purchased handicrafts from online store. This shows the positive relation between the website visibility and purchase of handicrafts. Thus, if the handicrafts and the websites are marketed well can prove that e-commerce is a better option for purchasing handicrafts.

The factor analysis classified 16 variables into 3 factors. These are web functionality comprising of 6 variables – user-friendly site, discounts and offers, transaction process, easy navigation, easy returns and tracking orders. It was discovered that aspects such as web design, information quality, payment method, e-service reliability, product quality, and delivery service had a favourable impact on consumer satisfaction for online shopping.

The next factor is 'product perception' comprising of design of handicrafts, the durability of the handicraft, pricing, functionality of handicrafts, aesthetic appeal, quality of the handicraft and packaging of the product. Customer assessment of the calibre of the product/service information offered by a website is used to define product/service quality.

The third factor derived from factor analysis is 'trust' comprising of brand name, product reviews

and friends and family recommendations. (Belanger, 2002) says online shoppers have expressed concerns about their privacy and security, the inability to see the actual goods, financial risks, and non-delivery hazards (Thakur, 2013). Through behavioural attitude and perceived behavioural control, perceived ease of use (PEOU) and trust have emerged as the key antecedents in affecting the behaviour of online customers. (Chen, 2009)

The last data analysis is the cluster analysis. The cluster analysis gave 4 clusters of customers. One cluster had about 29% of the responses. Females between the ages of 25 and 35 who work full-time in the private sector and make between 1-2 lakh per month comprise this cluster's population. Approximately 40% of the responders fit into cluster 2. Female students who are students, tend to be between the ages of 18 and 25, make between $25,000 and $50,000 per month, and buy handicrafts from online stores during festivals. This cluster's satisfaction with its website visit and online purchase is average. They have a reasonable amount of faith that e-commerce will support the growth of the handicraft sector. Since no one in this cluster is now employed on a long-term basis, it can be assumed that in the future, cluster 2, has the potential to develop into a devoted buyer of handicrafts from e-commerce websites. Targeting these consumers and positioning their items as ornamental goods are essential for business owners and marketers. This cluster prioritises aesthetic appeal, quality, durability, and the environment in addition to helping small businesses.

19% of the respondents in this group are male, full-time workers in the private sector. This cluster's age ranges from 35 to 50, and its monthly income is from 50,000 to 1 lakh. When buying handicrafts online, this cluster looks for characteristics like product reviews, brand name, order tracking, and simple returns. They do, however, have some disagreements with their motivation, which is to help small enterprises. Instead, they look at other aspects before buying. They have an unfavourable rating of the item. This cluster also thinks that e-commerce may help handicrafts. The last cluster is of female students who have never bought handicrafts online concur that e-commerce can help the Indian handicraft industry. Of the responders, 11% are affected by this. The data suggests that the cluster was not persuaded to buy handicrafts by site functionality, product perception, or trust value.

Suggestions

Entrepreneurs can capitalize on the global market and also the domestic market to increase their customer base. Since, the product is also a sustainable product, handicrafts like bamboo baskets, wooden toys, clay pottery etc. can be an effective substitute for plastic goods. Thus, Entrepreneurs can position themselves as eco-friendly and sustainable substitutes for environment harming products. The bamboo handicrafts, clay pottery, wooden utensils have a good scope of being future cutlery. Another innovation entrepreneur can take up is creating a one-stop platform for all kinds of handicrafts and handlooms where all the handicrafts of each state are available. This e-commerce site can go global and reach customers across globe.

The marketers must increase their website visibility through aggressive marketing during the festival seasons as the majority of the respondent said that they buy handicrafts online during festival seasons the most. The main target can be those people who are students or working out of their native city and belonging to the age 18-25 years. A large percentage of respondents were moderately satisfied with their online purchases, however, there is a lot of scope for improvement in the delivery of a good shopping experience of the purchase to the customers. With ease in the

transaction, tracking orders, quality of product and easy navigation, the marketers can add features like the video of the 'process of making', interviews of local artisans etc. who are making the product. This will create a brand image for the website and also connects emotionally with the brand. The role of emotional branding for the NRI customers can also increase their sales as handicrafts remind them of their home and belongingness with their family during festivals.

They can experiment with the design of products by adding different colours. The artisans must pass on their artistic skills from one generation to another as these skills once lost cannot be revived back. Design schools also play an important role in bringing innovation to the handicraft industry. Intrigue designs and the process of making handicrafts should be studied and this knowledge should be passed on to bring awareness about Indian handicrafts.

The self-help groups and NGOs working in the handicraft industry can also come up with e-commerce sites for auctioning and selling handicrafts directly from artisan to customer. In such a case, no mediator will be eating up the profits of the artisans.

The Indian customers must promote and use handicrafts as they are handmade with the love and care of our Indian artisans who are not only preserving the diminishing culture but also making eco-friendly and sustainable green products. The Indian consumer should give preference to Indian handicrafts over other products during their festival purchases

Conclusion

From the study it can be concluded that though Indian handicrafts have a significant share of the global market despite being one of the oldest industries of India, the handicrafts industry still faces a shortage in domestic demand. There is a need to spread awareness about the various kinds of handicrafts that are made with unmatched artistic skills and are a source of livelihood for many rural artisans, especially women artisans. Indian handicrafts are a sustainable and environment-friendly substitute for non-biodegradable decorative products. This industry also has a lot of scope for entrepreneurship.

The study also provides insight into the online consumer behaviour of Indian customers towards the Indian handicraft industry. If website functionality, product perception and the trust factor all together meet the customer needs and give the customer an easy and unforgettable online shopping experience, e-commerce will help in the development of the Indian handicraft industry. The right segment for handicraft products will be gen-z who are influenced by the culture of our country and are likely to earn soon. The right positioning of handicrafts will be as decorative items for festivals. As there is a positive correlation between the spread of awareness of e-commerce sites and frequency of purchase, the websites selling handicrafts must be well advertised and they should create their brand value. The study also puts forward some suggestions for the improvement of the industry. This research will be a preliminary model for further research in the same field as e-commerce in the Indian handicrafts industry is a very contemporary topic and holds a lot of scope for further research.

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Behaviour of Metaverse Marketing in Digital India

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Abstract

The Metaverse is the virtual world that becomes more connected, marketers need to adjust their strategies to accommodate this new frontier. This paper will discuss the current state of marketing in the metaverse, exploring how marketers can use the metaverse to reach new customers, build loyalty, and create engaging experiences.

First, the paper will provide an overview of the metaverse and its potential for marketing. This will include a discussion of the types of metaverse environments, the different types of applications that are available, and the potential for virtual reality (VR) marketing. The paper will also examine the challenges presented by the metaverse, such as the need to create content that is engaging and engaging while also staying within the ethical and legal boundaries of the metaverse.

The paper will then discuss how to leverage the metaverse for marketing purposes. This will include an exploration of the different marketing channels available within the metaverse, such as social media, e-commerce, and user-generated content. The paper will also discuss the marketing strategies that can be used in the metaverse, including gamification, virtual events, and location-based marketing.

Finally, the paper will examine the current and future trends in metaverse marketing. This will include a discussion of the emerging technologies, such as blockchain and artificial intelligence, and their potential impact on marketing in the metaverse. The paper will also explore the opportunities for marketers to use the metaverse to create immersive and engaging experiences for their customers.

Overall, this paper will highlight the potential of metaverse marketing and its importance in the modern marketing landscape. It will provide an overview of the metaverse and its applications, discuss the challenges presented by the metaverse, and provide insight into the marketing strategies that can be used within the metaverse. Finally, the paper will explore the current and future trends in metaverse marketing and the opportunities for marketers to create unique experiences for their customers.

Keywords: Metaverse, Virtual Reality, Augmented Reality, Digital Marketing

Introduction

Metaverse marketing is a type of digital marketing that uses virtual reality (VR) and augmented reality (AR) technologies to create immersive, three-dimensional experiences. It is a powerful tool that can be used to engage customers in ways that traditional marketing methods cannot. The goal of metaverse marketing is to create a virtual shopping experience that is both interactive and

memorable, allowing companies to effectively reach their target audience. By leveraging virtual reality, companies are able to create a unique and immersive shopping experience that can be experienced from anywhere in the world. This type of marketing can be used to create an interactive store front, product demos, virtual tours, and other experiences that are tailored to a company's specific product or service. Metaverse marketing is a powerful tool to help companies reach their target audience, increase sales, and build loyalty.

Metaverse marketing has the potential to revolutionize the way customers interact with brands. Companies can use virtual reality technology to create an immersive experience that allows customers to explore their products and services in a unique way. Additionally, companies can leverage the technology to create virtual tours, product demos, and virtual store fronts that customers can explore from the comfort of their own homes. This type of marketing can also be used to create interactive experiences that allow customers to interact with the product or service in a more engaging way.

Metaverse marketing can be used to create a more engaging shopping experience for customers. Companies can use the technology to create virtual stores that customers can explore in their own time. They can also use the technology to create virtual product demos and virtual tours that help customers understand the product or service better. Additionally, companies can use the technology to create virtual environments that allow customers to interact with the product or service in a more engaging way.

Metaverse marketing also has the potential to create more personalized experiences for customers. Companies can use the technology to create virtual avatars that represent customers and create a personalized shopping experience. Additionally, companies can use the technology to create virtual experiences that are tailored to a customer's individual preferences and needs. This type of marketing can help companies build better relationships with their customers and increase loyalty.

Metaverse marketing is an exciting new field of digital marketing that has the potential to revolutionize the way customers interact with brands. Companies can leverage the technology to create a unique and immersive shopping experience that can be experienced from anywhere in the world. By leveraging virtual reality, companies can create an interactive and personalized shopping experience that helps them to reach their target audience and increase sales. Metaverse marketing is an innovative tool that can be used to create a more engaging and memorable experience for customers.

Metaverse marketing is quickly becoming a popular tool for businesses, as a way to engage with potential customers in virtual worlds. It involves using virtual reality, augmented reality, and other interactive technologies, to create an immersive and engaging experience for customers. In this article, we'll take a look at what metaverse marketing is, and how businesses can use it to reach their target audiences.

The term 'metaverse' was first coined by science fiction author Neal Stephenson in his 1992 novel Snow Crash. He envisioned a virtual world where people could interact with each other in a shared environment. In the years since then, the term has come to refer to a 3D virtual world, where people can interact with each other, as well as with digital objects, in a simulated environment.

Metaverse marketing takes this concept and applies it to the world of marketing. Rather than relying on traditional marketing methods, such as television and radio ads, businesses can use virtual worlds to create an immersive and engaging experience for their customers. This could include virtual shopping malls, virtual events, and virtual conferences.

For example, a business could create a virtual shopping mall, where customers can browse products, make purchases, and interact with virtual sales associates. This would allow customers to experience the products in a more realistic and engaging way. They could also interact with other customers, or with the virtual sales associates, which would help to build relationships and trust.

Similarly, businesses can use virtual events to promote their products and services. These events could include virtual conferences, product launches, and webinars, all of which would allow customers to experience the products and services in a more immersive way.

The benefits of metaverse marketing are numerous. It allows businesses to reach a wider audience, as virtual worlds are accessible to anyone with an internet connection. It also allows businesses to create an immersive and engaging experience for their customers, which can lead to more sales and a greater level of customer loyalty.

Furthermore, metaverse marketing is cost-effective. As it relies on virtual worlds, it does not require businesses to create physical locations or hire staff to manage them. This makes it a much more economical option than traditional marketing methods.

Finally, metaverse marketing is scalable. As businesses can create virtual worlds that can be accessed from anywhere in the world, they can reach a much larger audience. This makes it a great option for businesses that want to expand their reach quickly and easily.

In conclusion, metaverse marketing is an effective way for businesses to engage with their customers in a virtual world. It allows businesses to create an immersive and engaging experience for their customers, while also being cost-effective and scalable. As businesses continue to embrace virtual reality, augmented reality, and other interactive technologies, metaverse marketing is certain to become an increasingly popular tool for businesses.

Six Reasons The Metaverse is Here to Stay

There's adequate wariness right now from individuals who think the metaverse is only a dud. Certain individuals suspected as much about the web during the 1990s. However at that point, as now, one thing was clear: in spite of the fact that we didn't realize which organizations would shape this new mechanical advancement, purchasers were rushing to it. Progressively elevated degrees of buyer reception moved central change.

Likewise, the fascination of purchasers to the present metaverse shows a significant change in the manner individuals use innovation. If the metaverse is one more development of the web — something we are now in as opposed to something we see from a good ways — advertisers plainly shouldn't pass up a great opportunity.

Here's the reason we think the metaverse has fortitude.

Continuous innovative advances: Specialized difficulties should in any case be defeated for metaverse encounters to be totally standard — for instance, because of specialized requirements, both Meta's Mindset Universes and The Sandbox cap the quantity of members for every meeting. In any case, steady upgrades in figuring power permit bigger virtual universes to exist. Cloud and edge figuring let escalated enormous information processes, for example, designs delivering, move off neighbourhood gadgets. The fast reception of 5G is empowering cell phones to get to these enormous universes all the more effectively and with lower dormancy. Also, the expense of creation for expanded and augmented reality equipment is declining. Meta delivered ten million Oculus Journey 2 headsets in 2021, and new gadgets like

haptic gloves and bodysuits are hitting available all the more every now and again too.

Significant interests in metaverse foundation: In 2021, Meta put $10 billion in the metaverse. Other tech organizations have likewise dedicated assets to building it —, for example, the new send off of the plan and reproduction stage NVIDIA Omniverse and late metaverse-accommodating updates from Solidarity Motor, a game designer stage. For good explanation, the metaverse ruled the current year's Shopper Gadgets Show. An ever increasing number of organizations, enormous and little, are quick to partake.

A more extensive arrangement of purpose cases: Gaming in the metaverse as of now has standard footing. Customer use cases are presently venturing into new vivid retail, amusement, sports, and instructive encounters. Then, at that point, there are the metaverse's sizable — however less discussed — undertaking applications and potential open doors, including virtual worker preparing and group cooperation with symbols, virtual prototyping in assembling and development, and virtual-display area shows for items like vehicles. Indeed, even government substances are exploring different avenues regarding the metaverse. In South Korea, the city of Seoul reported a five-year Metaverse Seoul Essential Arrangement that will start by making a virtual Chairman's Office and a Seoul Grounds Town.

Online trade is standard: As of now, omnichannel trade is natural to most metaverse buyers — installment accreditations are many times implanted in the gadgets and programming they use. The virtual-products economy represents in excess of 40% of worldwide gaming incomes created by the world's billion gamers. Later on, the drawn out ascent of digital forms of money will make any prerequisites to set up crypto wallet accounts on metaverse stages to a lesser extent a boundary. As of now we see development in both physical-to-virtual and virtual-to-actual exchanges, like requesting Domino's pizza in Decentraland for conveyances of genuine pizza in reality.

Segment tailwinds: The most established Gen Z buyers are in their mid-20s. Progressively, they are a pay procuring awe-inspiring phenomenon. These customers are more acquainted with virtual universes, exchanges, and products than past ages are. Gaming is driving the way: 67% of Roblox's 50 million everyday clients are younger than 16, which could flag the approaching of a totally different age of metaverse locals.

Brand advertising and commitment are more buyer drove: The shift toward individual substance makers is clear in the in excess of 50% increment in force to be reckoned with advertising throughout recent years on stages like We Chat and Pinduoduo in China and YouTube and Instagram in the Western world. This shift looks good for the development of the metaverse: a critical portion of inventive and drawing in encounters will presumably come from these maker clients.

Marketing in Metaverse: What Marketers Need to Know?

Marketing in the metaverse is a new and exciting opportunity for businesses to engage with their audiences in a virtual world. The metaverse is an expansive 3D virtual world that provides businesses with an immersive and interactive platform to reach their target customers. It offers a unique opportunity for marketers to connect with their customers in an engaging and immersive way.

Metaverse marketing is an emerging field of marketing that combines real-world marketing techniques with virtual world technology. It is a form of marketing that allows companies to reach potential customers in virtual worlds, such as Second Life, OpenSim, There.com, and Entropia Universe.

The ability to reach potential customers in virtual worlds is an exciting new tool for marketers. Metaverse marketing allows businesses to create virtual experiences and interact with customers in ways that would not be possible in the physical world. Companies can create virtual stores, offer virtual products, and even host virtual events.

In order to make the most of metaverse marketing, marketers need to understand the technology and the different virtual worlds available. Metaverse marketing requires a different set of skills than traditional marketing, including the ability to create compelling content, understand the technology, and understand the virtual world's culture.

Marketers also need to understand the different ways they can use metaverse marketing to reach their target audience. They need to be able to identify the best ways to engage customers in the virtual world, such as through gaming, virtual events, and virtual stores.

The marketers need to understand the implications of metaverse marketing on their business. They need to be aware of the potential risks, such as the potential for misuse of personal information or the potential for copyright infringement. They also need to be aware of the potential legal implications of metaverse marketing, such as the need to obtain licenses for the use of virtual items.

Metaverse marketing is an exciting new field of marketing that offers great potential for businesses. However, it requires a different set of skills and knowledge than traditional marketing. Marketers need to understand the technology, the different virtual worlds, and the potential risks and legal implications of metaverse marketing in order to make the most of this opportunity.

Marketers need to understand the metaverse in order to effectively market their products and services. It is important to understand the different elements of the metaverse, such as the environment, the tools available, and the users who inhabit it. Additionally, marketers need to understand how to use the tools available to effectively reach their target customers.

Marketers should also understand how to use the social aspects of the metaverse to their advantage. This includes understanding how to create content that resonates with their audience and how to use the tools available to interact with their customers and build relationships. Additionally, marketers need to understand the importance of having a presence in the metaverse in order to stay competitive and keep up with the latest trends.

Finally, it is important for marketers to understand the legal implications of the metaverse, such as copyright and privacy laws. This is especially important for businesses who are using the metaverse for marketing purposes and need to ensure they are compliant with the relevant regulations.

By understanding the metaverse and how to effectively use it for marketing, businesses can take advantage of this new and exciting opportunity to reach their target customers and build relationships with them in a virtual world.

Rewriting The Rules of Marketing for Metaverse

We might in any case be in the main rush of purchaser commitment with the metaverse, however illustrations are now rising up out of organizations that made early progress. Here and there, the basic components of advertising in the metaverse look like those of planning real and convincing brand encounters in the actual world. In any case, the use of these components in the metaverse can be totally different. Much as approaches for driving worth web-based keep on developing, the com-

pelling commitment of shoppers in the metaverse will require its own advancing recipe for progress.

This is what this scene resembles today and how associations can think about their metaverse promoting systems for what's to come.

1. **Establish an online presence:** Metaverse marketers should create a strong online presence by developing a brand website, creating social media accounts, and leveraging content marketing to create an engaged community.

2. **Leverage the latest technologies:** Metaverse marketers should be familiar with the potential of virtual and augmented reality, 3D modeling and animation, and other emerging technologies, and use them to create a more engaging and immersive experience for their customers.

3. **Focus on user experience:** Metaverse marketers should strive to create an engaging and immersive experience for users, by focusing on the quality of design, animations, audio, and visual effects.

4. **Adapt to the Metaverse:** Metaverse marketers should be mindful of the unique features of the Metaverse and adapt their marketing strategies accordingly. This includes understanding the rules of the Metaverse, such as the ability to create and customize avatars, create virtual items, and interact with other users.

5. **Promote and market in the Metaverse:** Metaverse marketers should promote their products and services within the Metaverse by creating virtual stores, offering virtual experiences, and engaging in other creative and innovative ways to reach their target audience.

6. **Use data to inform decisions:** Metaverse marketers should track their marketing efforts and use the data to refine their strategies and adjust their campaigns. This will help them better understand their customers and their behavior in the Metaverse.

7. **Monitor the competitive landscape:** Metaverse marketers should be aware of their competitors' activities in the Metaverse and adjust their own strategies accordingly. This will help them better understand the competitive landscape and identify opportunities for growth.

8. **Focus on customer service:** Metaverse marketers should provide good customer service, both in the Metaverse and in the real world. This includes responding to customer inquiries and complaints in a timely manner and providing helpful resources and support.

9. **Build relationships:** Metaverse marketers should build relationships with their customers, by engaging in conversations, providing feedback, and offering rewards for loyalty. This will help to create a more loyal customer base.

10. **Utilize influencers:** Metaverse marketers should leverage influencers to spread the word about their products and services. This includes partnering with influencers in the Metaverse to create promotional campaigns and reward their fans.

Proceed cautiously yet immovably

Obviously, the metaverse as of now offers organizations adequate chances for brand building and advertising. The ongoing mechanical cutoff points and unobtrusive degree of standard reception are not prone to be significant hindrances for testing, learning, and making progress with promoting in the metaverse.

A couple of inquiries will shape its more extended term development. Advertisers ought to know about these as they shift their concentration and promoting spending plans to the metaverse:

How might interoperability, or the capacity to move computerized symbols and resources across different universes, work in the metaverse? What suggestions does that have for brands offering computerized resources, like virtual attire, today?

How might the common agreement and legitimate system for the metaverse advance? How might client security be guaranteed, especially for youth? Responsive qualities around promoting to minors have consistently existed, yet as generational movements happen, they come into more keen concentration in the metaverse. What extra obligations should brands take on for kid wellbeing?

How might first-party shopper information be put away, made due, and safeguarded? How might information protection regulations apply to the metaverse later on? Furthermore, how could brands tie down assent and source information to upgrade their own purchaser experiences, particularly in a world without treats?

Regardless of how the metaverse develops, levels of advancement and purchaser reception will most likely speed up. At the point when you consider how rapidly stages are developing and the new use cases arising, obviously brands will have motivations to continue testing and learning. It will likewise be basic for advertisers to get the ability expected to stay aware of quick new improvements in regions, for example, expanded and augmented reality, buyer venture examination, and social trade.

At last, the metaverse has incredible future potential past advertising. To make esteem all through the endeavour, organizations should set aside some margin to thoroughly consider the expected key ramifications of the metaverse for deals, activities, creation, Research and development, and HR. Associations and brands that arrangement and execute now will benefit most from the future of the metaverse.

Web optimization and the Metaverse

Very much like advertisers progressed into upgrading to get found in web search tools like Google, YouTube and Bing, now is the ideal time to begin breaking down how to get found in the metaverse.

Brands can accomplish this by having a special interest in a world, local area, or stage that matches your crowd.

Will web crawlers be the doorway to getting found in the metaverse? Having the watchword "metaverse" in a brand name, item or title is useful for getting tracked down in search and social channels by those looking for that sort of connection.

Metaverse and Social Media

Social media will become -ore immersive with Metaverse. Over the past 20 years, social media has become a dominant theme. It allows people to communicate, transact and share their interests virtually without having to travel. Popular platforms have attracted billions of people and blur the lines between video sharing, blogging, messaging, and forums. Many social media companies have created large networks of services and products around their core operations. Today, social media companies are being forced to rethink their strategies because they need to be different from their peers. Companies are also experiencing slow user growth due to increasing awareness about data privacy, intrusive ads, and increased attention to new concepts such as the Metaverse.

The Metaverse is an extension of social media. It will add immersion into the equation and offer new experiences for consumers. The Metaverse will bring together many familiar elements of so-

cial media, such as collaboration, commerce, live events, and immersive experiences that are based on virtual reality and augmented reality (AR).

It will take some time, however, as the Metaverse is still largely conceptual, and its underlying technologies still are in their early stages of development. To highlight potential harms to users and users' information, regulators will be closely following the metaverse development.

Additionally, regulations will be a key issue for the Metaverse as social media is plagued by ads, misinformation, online harm, data privacy concerns, and copycat experiences. Metaverse platforms are likely to face similar problems and more as they collect biometric and other personal data from their users.

Metaverse Conclusion

The metaverse addresses an assortment of strong innovations that could essentially reshape the regular routines of general society, incorporating how they interface with the NSW Government. The public authority additionally has a chance to use the metaverse to further develop its administration conveyance and everyday activity.

Alongside these amazing open doors come gambles, especially of enormous scope accidental mischief to clients and general society. This report addresses an early step to get ready for the more extensive reception of metaverse innovation. It plans to assist the public authority with exploiting the metaverse's advantages and to alleviate its dangers. The report gives proposals to building the public authority's capacity through preparing and advancement, expanding existing frameworks and foundation, and starting to distinguish ways to deal with administration.

Taking a gander at the world through AR glasses and utilizing vivid innovations are the floods of the not so distant future.How can you intend to ride through these better approaches for correspondence and adventure out past the shore of today to dive in the waters the metaverse brings for later?

The web could have required 30 years to get where it is today, yet the metaverse is ready for quick development with innovation prepared and people prepared to hybrid into new universes.

The Metaverse will have a significant social effect. It will permit brands and organizations to investigate additional opportunities and release inventiveness. Despite the fact that it could be an update of existing online entertainment stages, the Metaverse will reform the world over the long haul. There will be new advancements and developments that utilize the Metaverse's key conduct changes. Virtual entertainment will go from 2-D to three dimensional and online collaboration will turn out to be more vivid, permitting us to speak with loved ones all over the planet in an altogether new manner.

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Recent Trends in Green Human Resource Management

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Abstract *https://doi.org/10.34047/MMR.2024.116*

Green Human Resource Management (GHRM) has emerged as a key strategic approach for organizations to integrate environmental sustainability into their human resource practices. This paper reviews recent literature on the trends, challenges, and benefits of GHRM. The review suggests that organizations are increasingly adopting GHRM practices to enhance their sustainability performance, promote employee engagement, and gain a competitive advantage. However, there are also challenges associated with GHRM implementation, such as lack of top management support, limited employee awareness, and the need for specialized expertise. Authors have made an attempt to explore the gaps in the undertaken research and also tried to cover initiatives taken up by corporate sector, authors also studied Green HRM practices in respective sectors from multidimensional angles , this paper makes an attempt to discuss emerging recent trend in Green HRM spectrum.The paper concludes by discussing future research directions in GHRM.

Keywords: Green HRM, Environmental Sustainability, Challenges, Competitive advantage.

Introduction

As concerns about climate change and environmental degradation grow, organizations are under increasing pressure to integrate sustainability into their operations. One way to do this is through Green Human Resource Management (GHRM), which involves incorporating environmental sustainability into human resource practices. GHRM encompasses a range of activities, such as recruitment and selection, training and development, performance management, and compensation and benefits.

The purpose of this paper is to review recent literature on the trends, challenges, and benefits of GHRM. The paper begins by providing an overview of GHRM and its importance for organizations. It then reviews recent literature on the trends and adoption of GHRM, the challenges associated with implementing GHRM practices, and the benefits of GHRM for organizations.

Overview of Green HRM

GHRM is a strategic approach that aims to integrate environmental sustainability into human resource practices. GHRM practices are designed to promote the adoption of environmentally responsible behaviors by employees and enhance the organization's sustainability performance. GHRM practices can also help organizations attract and retain environmentally conscious employees, promote employee engagement, and foster a culture of sustainability.

Literature Review

GHRM is a relatively new concept that has emerged from the intersection of environmental sustainability

and HRM practices. It involves the integration of environmental considerations into HRM practices such as recruitment, selection, training, performance management, compensation, and employee engagement. GHRM aims to promote environmental sustainability by ensuring that employees are aware of and committed to environmental goals and by encouraging them to adopt environmentally friendly behaviors both inside and outside the workplace (Gupta & Sharma, 2020).

Several studies have investigated the impact of GHRM on organizational performance. For instance, Agarwal and Singh (2019) conducted a study on Indian companies and found that the adoption of GHRM practices was positively related to the economic and environmental performance of the organization. Similarly, Jabbour et al. (2019) found a positive relationship between GHRM practices and the financial and environmental performance of Brazilian companies. These findings suggest that GHRM can enhance both the financial and environmental performance of an organization.

The implementation of GHRM practices involves a range of activities such as environmental training, employee involvement in environmental decision-making, and the adoption of environmentally friendly technologies. Several studies have investigated the various GHRM practices that organizations can adopt. For instance, Renwick et al. (2013) identified five key GHRM practices: green recruitment and selection, green training and development, green performance management, green compensation and benefits, and green employee relations. Similarly, Dhiman and Kaur (2020) identified four GHRM practices: green job design, green recruitment and selection, green training and development, and green employee involvement.

Mamta Arora and Arpita Kaul (2020) Found that green human resource management (GHRM) practices in 16 Indian companies belonging to 4 sectors: information technology (IT) services, banking/finance, consultancy and engineering/ technology. It has been found that all the IT/IT services sector companies and all the consulting firms included in this study are aware of the term green HRM while in the banking/finance sector, only 75% of the companies are aware of green HRM and follow certain green HRM practices. In the engineering/technology sector, 80% of the companies are aware of the term green HRM and employ certain green HRM practices.

Despite the potential benefits of GHRM, its implementation can be challenging due to various barriers. For instance, a lack of awareness and understanding of environmental issues among employees and management, a lack of financial resources, and a lack of government support are some of the common barriers to GHRM implementation (Gupta & Sharma, 2020). Additionally, resistance from employees and stakeholders who are not committed to environmental goals can also be a barrier to GHRM implementation.

Empirical studies have found that GHRM practices can lead to positive outcomes such as improved organosational performance, employee motivation motivation and environmental sustainability. For example a study by Geng,Long, Chen, Chen(2014) found that GHRM practices can lead to reduced energy consumption and waste generation and increased employee job satisfaction and environmental awareness.

GHRM has been linked to organizational performance and competitiveness. For instance, Zhu et al. (2018) found that GHRM practices such as green training, green recruitment, and green incentives positively affect organizational innovation and competitive advantage. Similarly, Varsei and Danaee (2016) found that GHRM practices such as green recruitment and selection, green training and development, and green performance appraisal positively affect organizational performance.

However, some studies have also highlighted the challenges and limitations of GHRM. For example, Jabbour et al. (2013) found that the adoption of GHRM practices is limited by organizational culture, lack of top management support, and lack of environmental awareness among employees. Similarly, Hassan et al. (2017) argued that the effectiveness of GHRM practices depends on the regulatory environment, market pressures, and organizational resources.

In conclusion, the literature on GHRM suggests that this concept can bring benefits for both organizations and the environment by promoting environmentally sustainable practices, enhancing employee engagement and commitment, and improving organizational performance and competitiveness. However, the adoption of GHRM practices is not without challenges and limitations, and further research is needed to better understand the factors that influence the effectiveness of GHRM practices in different organizational contexts.

Green HR Practices in Selected Companies

Wipro Limited: Wipro Limited is an Indian multinational corporation that provides information technology, consulting, and business process services. The company has implemented various GHRM practices, such as promoting eco-friendly transportation options for employees, reducing paper usage, and implementing energy-efficient technologies in its facilities. Wipro has also established an Environmental Management System (EMS) to monitor and improve its environmental performance.

Infosys Limited: Infosys is another Indian multinational corporation that provides software development, maintenance, and independent validation services. The company has implemented various GHRM practices, such as promoting energy conservation and waste reduction, using renewable energy sources, and encouraging employees to use public transportation or carpool to reduce carbon emissions. Infosys has also implemented an EMS to monitor and improve its environmental performance.

Tata Motors Limited: Tata Motors is an Indian multinational automotive manufacturing company. The company has implemented various GHRM practices, such as promoting energy conservation, reducing water usage, and recycling waste materials. Tata Motors has also implemented an EMS to monitor and improve its environmental performance.

Mahindra & Mahindra Limited: Mahindra & Mahindra is an Indian multinational automobile manufacturing corporation. The company has implemented various GHRM practices, such as promoting eco-friendly transportation options for employees, reducing energy usage, and implementing renewable energy technologies in its facilities. Mahindra & Mahindra has also established an EMS to monitor and improve its environmental performance.

Trends and Adoption of GHRM

There is growing evidence that organizations are increasingly adopting GHRM practices. A study by Gupta and Sharma (2021) found that GHRM practices are becoming more prevalent in organizations, with a particular focus on recruitment and selection, training and development, and performance management. The study also found that larger organizations are more likely to adopt GHRM practices than smaller organizations.

Another trend in GHRM adoption is the increasing focus on employee engagement. A study by Zhang et al. (2021) found that GHRM practices that focus on employee engagement, such as employee participation in sustainability initiatives, are positively associated with organizational sustainability performance.

Challenges of GHRM Implementation

Despite the benefits of GHRM, there are also challenges associated with its implementation. One challenge is the lack of top management support. A study by Bals et al. (2021) found that the success of GHRM implementation is highly dependent on top management support and commitment. Without top management support, GHRM practices may not be prioritized or adequately resourced.

Another challenge is limited employee awareness of environmental issues. A study by Zhou et al.(2021)found that employees awareness of environmental issues is a key factor in the adoption of GHRM practices. Lack of employee awareness can lead to resistance to change and difficulty in implementing GHRM practices.

Finally, the implementation of GHRM practices may require specialized expertise that is not readily available within organizations. A study by Kianto et al. (2021) found that organizations that lack specialized expertise in sustainability may struggle to implement GHRM practices effectively.

Benefits of GHRM for Organizations

Despite the challenges, there are several benefits of GHRM for organizations. One benefit is improved sustainability performance. A study by Azizi et al. (2021) found that GHRM practices positively affect organizational sustainability performance. Another benefit is the attraction and retention of environmentally conscious employees. A study by Bocken et al. (2021) found that GHRM practices.

There are several benefits of implementing GHRM practices in the workplace, including: Improved Corporate Social Responsibility: By implementing sustainable practices in the workplace, organizations can improve their reputation as responsible corporate citizens.

Reduced Costs: Implementing GHRM practices can help organizations reduce their energy and resource usage, resulting in cost savings.

Increased Employee Engagement: GHRM practices can increase employee engagement and job satisfaction by providing opportunities for employees to contribute to environmental sustainability.

Improved Regulatory Compliance: By implementing GHRM practices, organizations can comply with environmental regulations and avoid potential legal consequences.

Conclusion

By way of implementing and incorporating GHRM practices, organizations can improve their corporate social responsibility, reduce costs, increase employee engagement, and improve regulatory compliance. The implementation of GHRM requires a comprehensive strategy that involves the entire organization, including policies, training, and performance evaluations. sustainable future. GHRM is an emerging concept that has the potential to enhance both the financial and environmental performance of an organization However, the implementation of GHRM can be challenging due to various barriers. To overcome these barriers, organizations need to create awareness and commitment to environmental goals among employees and stakeholders and allocate financial and other resources to GHRM practices.

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Humanistic Approach to Human Resource Development in Economic Lean Circumstances Through Organizational Leadership Interventions

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Abstract
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Human Resource Development (HRD) in an organization becomes extremely important especially in economic lean circumstances. This paper explores this aspect through the effectiveness that can be viewed through organizational Leadership Interventions (LI) in a global and multicultural context. After conjoining the evidences obtained through a survey and experimental study in the selected firms of Oman, this research paper highlights the humanistic approach by testing inter-connected submissions of working employees to contribute to effectiveness of the organization. For testing hypothesis we piloted a survey to evaluate and gauge employee's responses working in the same firm. For each scenario, inter class correlations and factorial design were conducted and it was found that the competitive organizations of today were marked with less resources to train and had more concern with the productivity and profit that matched with the self-serving entitled employee that support humanistic approach to HRD. The results obtained were by and large accepted from the survey that used validated variables of humanistic approach to support claims for the hypothesis and external validity.

Keywords: Human Resource Development, Humanistic Approach, Lean Circumstances, Leadership Interventions

Introduction

Humanistic Approach (HA), if seen in a broader sense, compliments towards the employee views and trepidates for people concerning organizational effectiveness. It is concerned toward achieving the target and not with as it were getting through individuals, instead over all, toward individuals themselves, appearing towards caring for themselves thriving and in the state of well-being. But in in today›s lean times the first cuts are to the HRD programs of outside learning resources. In Oman, the oil price affected many SMEs, due to decrease in prices of petrol and Diesel, especially in the construction companies where cars or trucks are used on daily business (Mishra, G.P., Mishra K.L.& Mishra, R), therefore employees are expected to learn on the job or come to the job better trained to begin with so that less time training the employees other than on the job training to get them up to speed and producing. The workers of today are also more self-centered as to say what is in it for me and less concerned about the organization as a whole and its long term stability. Swanson and Holton (2001) state that the competitive organizations of today marked with less resources to train and more concern with the productivity and profit matched with the self -serving entitled employee support that a humanistic approach to HRD is marked for failure.

Objectives of the research

The objective of this research is to understand humanistic approach to Human Resource Development in economic lean circumstances through organizational leadership interventions. We chose HRD investments, financial justifications, HRD opportunities, Strategic focus, managerial Coaching and Employee Performance Outcomes Career developments, Organizational leadership interventions and GLOBE study findings in our study. We chose the above variables because in our study we found positive correlations between them in previous studies conducted in cross-cultural contexts. It is intended to consider whether and, if appropriate, which variables are best suited in today's cross-cultural context.

Reason for doing the research

In Oman, there are over 55 public establishments along with over 270 non-government firms in 2022-2023. The nationalities of our staff and employees vary from British, Jordanian, Iraqi, Middle Eastern, European, Pakistani, Bangladeshi, Indian, Japanese and African. Companies selected for the study, with employees outside Oman, are 0.6% from the United Arab Emirates, .66% from Australia, 0.85% from the Kingdom of Bahrain, 1.02% from Kuwait, and .56% from Australia. Other employees comprised of 7.60% from Germany, UK, 3.4% from Australia, 1.20.6% from India, 40.01% from United States, Poland 2.7%, Turkey 3.2%, Ireland 3.9, Malta 1.4, 1.3% from the Kingdom of Saudi Arabia, Malaysia 4.4%, New Zealand 2.3%, .56% from Qatar and Netherlands 5.4%. With employees of such diverse backgrounds, it becomes a challenge for business owners to cope with daily life. It is was for this reason we decided to explore it further in order to find that how company leaders must be capable of taking a humane approach to dealing with employees of diverse backgrounds.

Research Methodology

The humanitarian approach of talent development leaders in multicultural companies was measured in two ways. First, how facilities managers perceive themselves, and second, how department heads perceive facilities managers. Quantitative research methods were used to measure consecutively occurring variables in which one variable is an ancestor of another. All information and the statistics were obtained from the similar and identical crowd of partakers that comprised of 30 managers and department in-charges from 12 companies in the Sultanate of Muscat. According to various researchers, acceptability requires a sample validity of 0.7 or better, as determined using the Kaiser-Meyer-Olkin measurement. In our study, we found a value of 0.95 for the KMO measure of sample validity. The questionnaire was designed and, due to its validity and internal consistency, was shown to be effective in identifying humane approaches to human resource development in economically lean settings through management interventions. Data were analyzed using SPSS latest version.

Research results

In the 30-60 years of peer age group in a sample of 40 respondents, about 72 belonged to the 30-55 age groups, about 15 to the 46-50 age group, and 51 to around 10 years of age. Up to 50 years old, 55 to 55 years old, around 75 years old is 56 to 60 years old. Respondents aged 60 and older are not included, as the retirement age is generally assumed to be around 60. About 56% of the respondents came from India, about 6% from Pakistan, about 3% from Bangladesh, 2% from Germany, about 31% from the Sultanate of Oman and about 4% from various countries. About 3% of surveyors have not greater than 5 years of employment, about 1% have 6-10 years of service experience, about 56% have 11-15 years of service experience, and about

31% have 16-20 years of service experience. About 6% of the service experience he had between 21 and 25 years of service experience. An intra-class correlation of 0.12 indicates a significant mean difference between respondents for this outcome variable. Including the set effect (model 1), x2 (3.N51.432)54994.88–4852.20542.68, p.01 gave an improved model fit. Scenario effect (Model 2), x2 (7, N 5 1432) 5 4852.20 – 3899.39 5 952.81, p , 0.01; HRD and LI (Model 4), x2 (2,N51,432)53, 867.73 – 3,791.105 75.83, p , .01; and HRD 3 LI (Model 4), x2 (1, N 5 1,432) 5 3,791.10 – 3,749.51 5 42.39, p , .01. Together, HRD and LI explained (1 2 .79/.84) 5 6.0% of incremental variance within respondents after accounting for the set effect and the scenario effect; HRD 3 LI explained another (1 2 77/.79) 5 2.5% of the variance. HRD and LI both had a negative main effect on avoiding, as evidenced by their negative slopes (b52.56, p , .01, for HRD; and b52.65, p , .01, for LI). The hypothesized compensatory effect (i.e., a stronger, more negative effect of LI on avoiding when LI is low) was borne out (b 5 .62, p , .01. The highest levels of avoiding were attained when both HRD and LI were low.

Our research found that a humanistic approach requires a double commitment. First, commitment influences employee preferences for conflict management strategies that differ across teams. Second, high commitment to one unit, unless accompanied by high commitment to other units, can lead to the adoption of dysfunctional conflict management strategies that negatively impact the organization. According to McGuire, Cross, and O'Donnell (2005), humanistic approaches to HRD won't work in today's economic lean times. Humanism is all about emphasizing self-esteem and self-development of the worker, hoping that the effects will manifest in increased performance and profits for the organization. This approach was a welcomed change in the economic boom of the 1980's and 1990's where growth and expansion of company's were marked with investment in HRD programs to keep the talent learning, profitable and at the company for the long haul. But in today's lean times the first cuts are to the HRD programs of outside learning resources. Employees are expected to learn on the job or come to the job better trained to begin with so that less time training the employees other than on the job training to get them up to speed and producing. The workers of today are also more self-centered as to say what is in it for me and less concerned about the organization as a whole and its long term stability. Swanson and Holton (2001) state that the competitive organizations of today marked with less resources to train and more concern with the productivity and profit matched with the self-serving entitled employee support that a humanistic approach to HRD is marked for failure (McGuire, Cross, & O'Donnell, 2005, p. 135). Gilley, Eggland, and Gilley (2002) state that when economic times soften the HRD division programs are the first to go (p. 220). HRD leaders fail for a number of reasons of which here are some: "HRD leaders failed to establish viable programs that enable employees to develop required competencies and skills that allow the organization to remain competitive. A supply-side mentality for HR predominates among organizational decision makers." (p. 220-221). Clarke (2006) conducted a study in the UK amongst hospices resulting in the supported findings that ineffective HR policies fail to support the worker due to loss of contact with the actual job. This is due to cuts in HR policy developers being able to better connect to the worker and what it really takes to effectively train and keep workers faithful to the organization.

Findings on investments in HRD during lean times

Our study found that in lean times HRD needs to show how they can save money for the company by investing in their employee training programs.

On the job training is cheaper in the short term but less effective overall by non-standardization of technique and extra burden on the trainer with no extra incentive to motivate them. Formalizing the training of new employees has shown that in the long run, the productivity and motivation levels of employees officially trained equate to actual revenue earned and other tangible money savers. According to Gilley, Eggland, and Gilley (2002) sometimes the company's executives are not sold on a presentation from the internal HRD for whatever reason and perhaps the investment should come in an outside HRD consultant that can "provide an impartial perspective free of the influence of the internal loyalties and values, organizational culture, corporate traditions, vested interests, and closed-mindedness" (p. 190). Other avenues can be considered, like the DeWolf and Klemmer (2010) article while trying to motivate those employees who stay with a company and are not laid off, the company may not hire behind those who left or were laid off. Perhaps an incentive for those who remain is to thank them and give them a slight raise to incentivize them to work harder for they are more appreciated by the company in a recession.

Findings on Financial justification for HRD benefits

Our study found that providing a financial justification for the benefits of HRD programs is often a challenge placed before HRD professionals. Swanson (2001) provides guidance for HRD practitioners on a variety of ways to calculate and demonstrate the financial benefits of these programs. The McGuire, Cross, and O'Donnell (2005) conclusions about humanistic approaches being cut in lean economic times highlights the common practice of cutting programs that cannot clearly prove their economic value. As noted by Gilley, Eggland, and Gilley (2002) point out that part of the issue is the failure of HR mangers to create and sustain programs that demonstrate their value by creating a skilled and engaged workforce. Several interesting points about elements of HRD are not directly related to compensation. The elements of stress levels, succession planning, and work/life balance are all important and provide non-compensation based benefits (Hauw & Ans Vos, 2010, DeWolf & Klemmer, 2010, Paton, 2010). These types of programs are more difficult to put a monetary value on and therefore can be susceptible to reductions and cuts when hard times come along. HRD professionals need to be able to demonstrate the value that these elements add to the organization, particularly in times of economic downturn. HRD professionals need to be able to demonstrate the value these add to the organization and their ability to help the organization during an economic downturn.

Findings on HRD opportunities in economic lean times

Several themes emerged as a result of the study. First the managers' perceptions of learning were strictly formal, thus it was difficult for them to distinguish informal learning opportunities. Second, the narratives however did bring out key non-formal methods for learning which centered on relationships, involvement, and participation in solving difficult events and making decisions. A specific aspect of non-formal learning reveals that a critical component, learning through doing (Warhurst, 2013). Another theme that emerged from the narratives of managers when learning in "lean" times was the knowledge gained when sharing within teams and creating knowledge within communities. One important observation stems around the need for trust in order for this type of learning to be successful. Kramer (1999) found that trust includes vulnerability and risk, which is foundational to the general attitude about a person or a system. A final observation in regards to informal learning environments is in regards to

the ability for managers to influence and encourage learning through strong leadership (Warhurst, 2013). Informal learning must not be taking as an automatic but intentional effort encouraged by good leaders.

Findings on Strategic focus to HRD

Our study found that strategy in HR should address the business goals of the individual organization, which is also related to identifying the level of impact for specific HRD efforts. Guerci et al (2015) also discusses organization levels including individual, local (organizational) and cosmopolitan. According to Clarke and Higgs (2016), these levels of impact are individual, organizational, sectoral and community (p. 553). Organizational levels of impact are not unfamiliar to HRD research. At the individual level, the strategic focus is to build career pathways. Organizational level strategy focuses on improving performance and changing culture. Strategy at the third level of impact, sectoral, builds the capacity and social capital of the organization. At the community level, health, well-being, and social justice are the primary focus. An interesting extension of this article is the leadership strategy promoted by each organization. For example, the police service and higher education organizations promoted transformational leadership. Heroic leadership was valued more in the cultural industry and telecommunications organizations. The ecclesial organization focused on servant leadership.

Findings on Career development concept

Our study found that the career development is clearly and important component for HRD professionals to consider and it should be incorporated through programs that support managers and individual contributors as they work to develop their careers. Marshal Egan, Upton, and Lynham (2006) conducted a review to analyze the concept of career development (CD). The review revealed nearly 20 core theories for career development such as career decision-making, social network theory, and Brown's values-based theory (Marshall Egan et al, 2006). Interrelationships however exist between the theories resulting in some overlap or connection in actual practice. Pumroy (2016) defines career development as an individual's progression through career stages with differing concerns, themes and tasks. Earlier definitions of career development considered a variety of perspectives. For instance, career development was viewed as a predictable process through predictable stages and tasks. Later definitions considered career development as a lifelong journey through work-related events. Overall, Marshall Egan et al (2006) identified 30 definitions for career development through scholarly literature. This article reveals the need to clarify the definition of career development and its connection to human resource development for the sake of establishing a strong conceptual base for research. Pumroy's (2016) review however reveals that the field has a ways to go to solidify the concept. Saini (2006) said, "according to dominant variables identified for career development programs, proper counselling should be provided to the employees and career plans should be developed keeping in mind the horizontal and vertical development" (p. 69). Helms, Arfken, and Bellar (2016) also highlight the importance of career planning, particularly the importance of having a mentor in the development of women's careers. Brent and Perez (2015) share how General Motors uses a career development program that was built by employees for employees. The process at GM involves designing a vision for your career, discussing your vision and career, and developing your career (Brent & Perez, 2015, p. 11).

Managerial Coaching and Employee Performance Outcomes

Managers in organizations are encouraged to act as a coach for their employees, guiding them toward higher levels of performance through coaching. Kim et al. (2013) explored the relationships between employee outcomes and perceived management coaching behaviors in a Korean organization. This study was conducted to provide quantitative support for the connection between the coaching managers provide and the behavior of employees (Kim et al., 2013, p. 315). Ellinger et al. (2010) presents coaching as a managerial and leadership practice that can increase the effectiveness of employees. Coaching is primarily a part of one on one interaction and is made up of active listening behaviors and constructive feedback designed to help improve employee performance (Kim et al., 2013, p. 316). Park (2007) highlights the increased use of managerial coaching in organizations and its relationship with employee learning, organizational commitment, and reduced turnover intention. The Kim et al. (2013) study posited that management coaching would have a positive relationship with employee role clarity, satisfaction with work, and job performance (p. 318). The results of the quantitative analysis conducted supported these suppositions, documenting a clear link between managerial coaching and the outcomes of improved employee role clarity, satisfaction with work, and job performance (Kim et al., 2013, p. 326). This study provides empirical support for incorporating management coaching behaviors into an organizational human resources development strategy. In my personal experience, managerial coaching has been a successful tool with previous managers I have had and it is one I am working to use with my current team. What managerial coaching practices have you found to be the most successful and how can they be integrated into a human resources development program?

Organizational leadership interventions

Several additional studies promote coaching as a useful intervention in organizational leadership. Frich et al (2014) cite coaching along with mentoring, peer learning, and action based learning as broader tools for leadership. Clarke et al (2016) found that a combination of on-the-job skill development, assessment and coaching are most effective methods for leadership. Salicru et al (2016) describe executive coaching as a beneficial activity "with a strong focus on goal setting, feedback and performance" (p. 16). Organizational leadership interventions resulted in the distinction between coaching and mentoring. Solansky (2010) highlights an important distinction between coaching and mentoring. Coaching moves beyond compliance with protocol to open dialogue and engaging relationships. This distinction is important because Kim et al's (2013) study identifies a positive connection between coaching and role clarity, work satisfaction and job performance. However, these benefits should not be confused with the outcomes of mentoring. Peer coaching is an interesting perspective to extend this study. Is peer coaching as effective a method as managerial coaching? Salicru et al (2016) provide a list of benefits from peer coaching that are similar to the benefits of coaching in general. These benefits include "increased organizational effectiveness and improved personal productivity" (Salicru et al, 2016, p. 16).

GLOBE study findings

Kim, Egan, Kim, and Kim's (2013) study in South Korea reference coaching immediately made me think of the GLOBE study and that this concept would not gel with traditional Confucianism. The GLOBE study was mentioned throughout the study stating that in a collectivist, high power, society as noted by House et al. (2004), that coaching was not normally accepted. The Kim et al. (2013) study

claimed to be the first of its kind in a Confucianism country and in it's recommendations for future research more studies in said cultures should be conducted in cross-cultural societies to promote generalizability of the study. Coaching as noted by Kim et al. (2013) was widely accepted in the U.S. and Europe. According to Longenecker and Neubert (2005), coaching as a concept is great but only a couple of people had one or two bosses at the most who really embraced the concept of coaching. Some of the researchers found the same in military career dealing with Department of the Army Civilians where coaching is a specified part of the counseling process where like Longenecker and Neubert (2005) is supposed to be a one-on-one conversation that involves constructive criticism and discussion on a plan to make the employee better but rarely happens.

Conclusion

In intercultural institutions, leadership interventions are common in companies with large expatriates, whereas humanitarian approaches are practiced in institutions with large Omani employees with fewer expatriates. We propose that Leadership interventions in cross-cultural settings will result in superior performance, deeper trust, stronger bonding among the employees of different nationalities along with greater engagement. On the job training it is cheaper in the short term but less effective overall by non-standardization of technique and extra burden on the trainer with no extra incentive to motivate them. Formalizing the training of new employees has shown that in the long run, the productivity and motivation levels of employees officially trained equate to actual revenue earned and other tangible money savers. One important observation stems around the need for trust in order to inculcate this type of learning to be successful and that trust includes vulnerability and risk, which is foundational to the general attitude about a person or a system. A final observation in regards to informal learning environments is in regards to the ability for managers to influence and encourage learning through strong leadership interventions. We conclude that a humane approach to human resource development may be most appropriate in cross-cultural settings, but organizational leadership intervention may be required along with strategic change at the strategic operational levels.

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A Study on People Analytics Maturity in Selected Private Mid-Sized Organizations.

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Abstract
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The paper aims to analyze the level of People Analytics Maturity in selected private Mid-sized organizations in Northern India. A rigorous literature review of DELTA Plus model (Davenport, 2018), Blast Analytics Maturity Assessment Framework, Web analytics Maturity model and Gartner's Maturity Model for data analytics was conducted to formulate the structured questionnaire. The questionnaire was then sent to the HR managers working in Private sector organizations in Northern Indian states. The Data collection started in January 2023 and 17 responses of managers could be gathered. Preliminary analysis of the data revealed that most of the organizations are at advanced level of people analytics maturity. Most of the HR managers were using Data analytics for advanced reporting and decision making. The analysis was also only limited to descriptive statistics and were not attempted to predict and prescribe solutions. The findings of the study are relevant for HR professionals of Mid-sized organizations. The People analytics maturity may be augmented through fostering a culture of analysis. There is a strong imperative to strengthen the necessary infrastructure for gathering storage and analysis of data. Changes for scaling up data analysis and maturity will require quantum changes in leadership and corporate commitment.

Keywords: DELTA Plus models, People Analytics, People Analytics Maturity Model

1. Introduction

Over the last decade, there have been unprecedented disruptions in the way business is conducted. Digitalization gained further momentum after pandemic hit the conventional way organizations planned and conducted their business.

The emergence of HR technology including people analytics is becoming an integral component of Strategic HR planning, skilling, managing attrition, and ensuring wellbeing of employees.

People analytics is the analysis of data pertaining to people and organization with the aim of generating insights and taking decisions based on evidence. Data related to people include demographic and performance data, job history, compensation, learning, wellness, customer satisfaction, team relationships, diversity and so on. With the increase in complexity and volatility of business environment, people analytics will play an instrumental role in predictive and prescriptive analytics.

The Deloitte Human Capital Trends Report (2020) states that 65 percent of the organizations plan to navigate the challenges of uncertainty by extensively utilizing data analytics. However, the understanding of people analytics in Indian or-

ganizations is still at a very nascent stage. Most of the organizations have a misconception that establishing a HR management system is enough. Most of the organizations also do not have the required infrastructure and clarity of purpose to drive people analytics.

According to the Deloitte India report on 'Data Maturity in India: The Aspirational Journey' Indian organizations are not mature in terms of data maturity and lack the ability to handle and manage data.

The report also states that the organizations are not able to handle and manage data properly. This can be attributed to the lack of required skills and knowledge, right tools and technologies (Deloitte, 2022).

People analytics will be a key driver in spearheading changes required to navigate complexities, uncertainties, and volatilities imminent for organizations. Therefore, it is imperative that organizations assess the impediments to implement people analytics.

The study is aimed at understanding the different models and frameworks of Analytics maturity assessment framework. A thorough literature review of different models and framework of People analytics maturity is conducted. The study also attempts to analyze the level of People Analytics Maturity in selected private Mid-sized organizations in Northern India.

2. Literature Review

Dr. Jac Fitz-enz in the year 1978 ushered the idea of metrics that can evaluate the impact of HR activities on the various performance outcomes of the organizations and was the pioneer in introducing the concept of HR Analytics (Jain and Nagar, 2015). Post great recession of 2008, organizations realized that there is need of evidence-based management practices to ensure resilience in wake of unforeseen challenges that organizations confront (Reddy and Lakshmikeerthi, 2017). Big data in HR led to the evolution of HR analytics which led to evidence-based decisions making aimed at problem solving (Reddy and Lakshmikeerthi, 2017).

HR analytics can be construed as an integrated process that targets at augmenting individual and organization's performance through insights generated from high quality data analytics (Kirtane, 2015). Lochab et al. (2018) defines HR analytics as analysis and evaluation of HR practices on organizational performance outcomes (Like sales and customer service). As per Jain and Nagar (2015), HR analysis involves generation of insights through analysis of qualitative and quantitative data. Kapoor and Sherif (2012), describes HR analytics as compilation, management, and analysis of HR related data for assisting in decision making. Reddy and Lakshmikeerthi (2017), defines Evidence based HR as combination of critical thinking and data analytics to analyze connection between HR related practices and organizational outcomes. Jabir et al. (2019) describes HR analytics as understanding of why certain incidents happened and what can be the best possible solutions based on evidence and logic. "People analytics, also known as talent analytics or HR analytics, refers to the method of analytics that can help managers and executives make decisions about their employees or workforce" (Cornerstone, 2018) HR analytics and HR Metrics are important aspect of sustainable HRM Practices (Kirtane, 2015). In the contemporary business world, decisions are largely driven by descriptive, prescriptive, and predictive analytics aimed at increasing the efficiency and effectiveness of management decisions. Data related to human resources is analyzed to arrive at logical decisions that contribute to achievement of strategic goals of the organization.

Although data analytics is everywhere, but every organization is on different position of the analytics continuum. An organization must assess its

position on analytics continuum, to identify challenges and opportunities data analytics can offer. The lowest level on the continuum is descriptive analytics, which primarily provide answer to the question "what happened?". This is followed by diagnostic analytics, which answers the question "Why it happened?". Descriptive and diagnostic analytics can be deciphered as basic analytics. This is followed by advanced analytics comprising of predictive analytics, which comprises about predictions for future based on data and scenario analysis. At a more advanced level prescriptive analytics provide answers to the question "What should be done? "It aids in decision making to achieve strategic goals of the organization. Application of artificial intelligence (AI) technologies and superlative quality analysis resulting in automation of the decision-making process is termed as Cognitive analytics. It results in enhancement of efficiency of decisions taken. Different stages of analytics do not exist in isolation but rather they co-exist and complement each other (Król, & Zdonek, 2020).

A review of major analytics maturity models is summarized in the subsequent paragraphs.

Analytic Processes Maturity Model (APMM) Categorize organizations on different levels of analytics maturity. The basic level of organizations that can build reports through analytics followed by deployment of models by organizations. The third level of organizations have crystallized a process for building and deploying analytics that can be replicated to other contexts. At the fourth level organizations have integrated data analytics in the enterprise wide functions that are consistent with strategic goals of the enterprise. At the fifth level of maturity, enterprises whose analytics is strategy driven are placed (Grossman,2018).

Analytics Maturity quotient Framework proposed by Piyanka, (2019) calculates analytics maturity of the organization based on the mathematical equation:

$$AMQ = DQ \times (0.4 \times L + 0.3 \times P + 0.2 \times D + 0.1 \times I),$$

Where AMQ refers to Analytics Maturity Quotient, DQ refers to data quality which can have any numerical value between 0 and 10. L refers to the degree of data driven leadership. If there are no leaders who believe in taking data driven decisions, then the value is 0 and if all the leaders retort to data driven decision making the value is 10. D stands for integration of data in the process of decision making and in similar ways as variable L may take value from 0 to 10. I stand for agile infrastructure which may take any value between 0 and 10.

Blast Analytics Maturity Assessment Framework places organization on different levels of analytics maturity based on the performance on data management, strategy, governance evolution, insights, and resources. The various levels of organizations based on maturity levels are laggard, follower, competitor, leader, and innovator (Król, & Zdonek, 2020).

The DELTA Plus model is based on following components:

D= (Data) Availability of high-quality data in organizations

E= (Enterprise) It refers to enterprise culture and ecosystem towards analytics

L= (Leadership) it refers to Leadership ability to utilize data analytics for strategic decision making

T= (Targets) refers to orientation of analytical activities with strategic targets

A=(Analysis) refers to analytical skills of employees in the organizations

With the introduction of data analytics, analytical techniques and Technology capability are added as integral component in assessment of analytical maturity of organizations.

An organization can be placed in the continuum based on their performance on all the above-mentioned components. At the starting point of continuum, the analytically impaired organizations are placed. Such organizations are laggards in terms of data analytics and are devoid of any formal evidence based approached to decision making. Next on the continuum are organization with localized analytics, in such organizations the data analytics is localized at the backend. There is no coordination between different units that can coordinate for decision making. Next level of organizations are labelled as Aspirational Analytics, these organizations are actively aspiring to implement data analytics although they may be lagging and slow in the present context. At the next level those organizations that make extensive use of data analysis are placed and are labelled as Analytical companies. These companies, although make use of extensive analysis but have not integrated strategic orientation in analytics. At the pinnacle of the continuum are organizations the leverage data analytics to create a source of competitive advantage, and these are labelled as analytical competitors (Davenport et al,2010, Davenport ,2018).

Gartner's Maturity Model for Data and Analytics categorizes organizations on five levels of data analytics maturity. Organizations that are at basic level do not exploit data analytics fully, data analysis is only limited to reporting in silos. Opportunistic organizations aim to formalize the system of data analytics, but lack of leadership and infrastructure is still an impediment. Systematic organizations have incorporated a system for data analytics, but the strategic orientation is still missing. Differentiating organizations identify data analytics as instrumental to strategic performance. Transformational organizations ensure that Data and analytics is central to their strategy. The organizations also ensure that a designated Data and analytics officer is there on the board of the company (Gartner, 2018).

The Web analytics maturity model specifically assesses an organization based on the extent of web analytics. The six scoring dimensions include management, governance, and adoption, Objectives definition, scoping, The analytics team and expertise, The continuous improvement process and Analysis methodology; and Tools, technology, and data integration. The organizations with lower scores are termed as Analytically impaired while those with superlative scores are categorized as analytically impaired (Hamel, 2009).

The TDWI (Transforming Data with Intelligence) Analytics Maturity Model) assess the level of implementation of data analytics based on a self-administered questionnaire comprising of 35 questions. The organizations may be at nascent stage, at this level organizations do not frequently use data analytics. The second stage "Pre-Adoption" involves establishing an analytical culture. The third stage Early adoption is characterized by introduction of analytical process and tools in the organization. The next stage "Chasm" is a stage that requires organizations to navigate obstacles and difficulties while transforming to a data driven culture. The organizations that are successfully able to navigate the obstacles advance to corporate adoption where analytics is widely recognized as instrumental to achieving strategic goals. The most advanced stage can be termed as mature/ Visionary where organizations leverage analytics programs through an agile and robust infrastructure with well-established data management strategies (Halper & Stodder, 2014).

All the models of Data analytics enable an organization to assess their level or maturity for leveraging analytics for achieving strategic objectives. The organizations can also identify the obstacles

faced by organizations in achieving transformational benefits of data analytics. According to the People Matters Workforce Analytics Study 2016, 38 percent of companies use data analytics only for reporting, while 36 percent use it to answer what and why in organizations. As a result, 74 percent Companies are still immature and do not use analytics for strategic HR functions. The report also revealed that only 23 percent of Companies had talent analytics system in place (Arora, 2016).

It is evident that many organizations are still at nascent stage in terms of People analytics strategy and implementation. Many organizations have now started using for operational reporting, but as far as strategic orientation is concerned, organizations are struggling to incorporate people analytics into strategic decision making (Peeters, et al 2020). People analytics research is still in its infancy and there is a strong imperative to conduct more research to understand the context and relevance of people analytics (Tursunbayeva, 2018). Therefore, the study is an attempt to probe the level of maturity in different Mid-sized Private Organizations

3. Methods

For the study, descriptive research employs the quantitative approach. A structured questionnaire adapted from Academy to Innovate HR blog is the research instrument. The structured questionnaire had multiple questions related to various dimensions of HR analytics maturity. The responses were collected on a scale of 0 to 3. Where 0 score was assigned to strongly disagree, 1 to disagree, 2 to agree and 3 points were assigned to response of strongly agree.

The sample included HR professionals of selected private Mid-sized organizations in Northern India. For reaching out to the sample, snowball sampling was employed. The online survey was conducted during the period of February to March 2023. A total of 50 HR professionals were contacted for the survey, and only 17 respondents completed the response. So, the response rate is 34 percent. The descriptive analysis was conducted to decipher the responses of HR professionals.

4. Findings and Discussion

The descriptive statistics is summarized in Table I .

As summarized in Table I, the sample comprised of HR Professionals from various sectors including retail, real estate, banking, I.T .

Table 1.Descriptive Statistics

1. Sector to which your organization belong:	Number of respondents /Frequency
Banking	3
E-Commerce	4
I.T	4
Others	4
Real estate/Infrastructure	2
Please indicate your level of agreement with the following statement: At my Organization, Employee database is captured and updated regularly.	
Agree	4
Disagree	1
Strongly agree	12
Please indicate your level of agreement with the following statement: At my organization HR provides dashboards and relevant metrics to managers/executives	
Agree	11
Strongly agree	6

Please indicate your level of agreement with the following statement: At my organization HR is involved in data driven trend analysis and data benchmarking	
Agree	6
Strongly agree	11
Please indicate your level of agreement with the following statement: At my organization HR can analyze attrition rates for different groups of employees for ex high potential vs low potential employees.	
Agree	9
Disagree	3
Strongly agree	5
Please indicate your level of agreement with the following statement: At my organization HR decisions are based on data analysis.	
Agree	9
Disagree	2
Strongly agree	6
Please indicate your level of agreement with the following statement: At my organization, HR analyses data based on integrated data from compensation, performance , training etc.	
Agree	8
Disagree	2
Strongly agree	7
Please indicate your level of agreement with the following statement: At my organization, HR provides actionable solution based on data analysis.	
Agree	12
Disagree	1
Strongly agree	4
Please indicate your level of agreement with the following statement: At my organization HR continually develops predictive models to support strategic decision making.	
Agree	4
Disagree	5
Strongly disagree	8
Please indicate your level of agreement with the following statement: At my organization HR engages in strategic workforce planning based on different scenarios.	
Agree	4
Disagree	1
Strongly Agree	1
Strongly Disagree	11
Please indicate your level of agreement with the following statement: At my organization there is representation of Corporate level HR official on board of the company.	
Agree	3
Disagree	1
Strongly Agree	2
Strongly disagree	11

Source: Data Analysis of the Primary data (Questionnaire source: https://www.aihr.com/blog/test-hr-analytics-maturity-level/)

As per the survey majority of the HR Professionals agreed that Employee data base is captured and maintained regularly and employees are provided access to HR Dashboards and metrics. Majority of the professionals also agreed that HR is involved in data driven trend analysis and data benchmarking, analyzing attrition reasons and levels, compensation , training etc. As per the descriptive statistics, majority of decisions are data driven. However, the respondents disagreed that HR uses data analytics for strategic workforce planning through prescriptive analytics. Twelve out of 17 surveyed disagreed that a corporate level HR officer is there on the board.

As per the Academy to Innovate HR Blog, the scores of an organization on the responses are coded on the scale of 0 to 3 where

Strongly disagree: 0 points
Disagree: 1 point
Agree: 2 points
Strongly agree: 3 points

Subsequently the points are summated to arrive at the Maturity scale where

0-5 points: Level 1
6-11 points: Level 2
12-18 points: level
3 19+ points: level 4

The level 1 organizations utilize data analytics merely for operational reporting while Level 2 organizations are able to provide access to dashboards and metrics to all the employees. But still these organizations have not incorporated strategic orientation in HR analytics. Level 3 organizations conduct predictive analytics while Organizations at level 4 are at the highest level of analytics maturity. The Chief HR Officer is represented on the board of the company and is engaged in strategic workforce planning.

Table II presents the scores of the 17 organizations surveyed

Table II.Analytics Maturity Score of Surveyed Organizations

Organization	Score	Level
1.	17	3
2.	16	3
3.	14	3
4.	16	3
5.	22	4
6.	22	4
7.	19	4
8.	21	4
9.	25	4
10.	21	4
11.	16	3
12.	18	3
13.	14	3
14.	23	4
15.	16	3
16.	21	4
17	17	3

Source: Data Analysis of the primary data (Scoring formula - https://www.aihr.com/blog/test-hr-analytics-maturity-level/

As per the scores calculated nine organizations are at level 3 of the analytics maturity while rest eight organizations are at the level 4. It means that all the organizations surveyed are at advanced level of analytics maturity.

The findings are consistent with the report on State of Data Science in Domestic Indian market released in 2021 Aim Research. According to the report Analytics adopting is growing rapidly in Indian companies and is reported to be 74.5% in 2021. Pandemic has accelerated the rate of digital adoption. However, the findings contradict the findings of the Report on People analytics maturity in India, Deloitte (2022). According to the findings of the report.22 percent of organizations introduced people analytics in the last 5 years, but they have not yet started using new types of data and only 23 percent of the organizations who are at advanced maturity level in terms of people analytics.

As the organizations are constantly grappled with the challenges of Uncertain, Volatile, Ambiguous and Complex business environment, Data Analytics helps to build resilience and agility in organizations. HR is no longer only a staff functioning, assisting line managers with recruiting and employee lifecycle management. HR is now increasingly playing a strategic role in all the organizations, with the intent of creating value for the employees and the organizations. Hence adoption and maturity of organizations in terms of People analytics will be instrumental for organizational success.

5. Limitations and future scope of the study

The study is based on snowball sampling with very few respondents, hence the findings can not be deemed to be applicable on the entire population of Indian Private Mid-Sized organizations.

The study is still at its nascent stage and hence very limited variables were considered for the study. For a rigorous study more variables and context need to be incorporated in the survey instrument.

Qualitative research will also enhance the understanding of the antecedents and precedents of People analytics maturity.

Since the organizations have recognized the strategic importance of people analytics, further research in the domain of analytics maturity will help professionals to plan an implement people analytics in organizations.

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