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"The Impact of AI and Big Data on Evolution of Leadership in Digital Environments in Business Industries"

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ABSTRACT
In this research study the researcher identify the significant research issues on AI and Big data evolution of leadership in digital business industries. As we know that the rapid development of Artificial Intelligent (AI) and Bid data analytics reshaping the leadership of digital environment in business industries. The technological transformation in decision making process in business industries the AI and Big data analytics provides a significant role towards the development in business environment. This research study is based primary and secondary data which are collected from different published and unpublished research article and structure questionnaire on factors such as impact of artificial intelligence (AI) and big data on evolution of leadership in digital environments in business Industries. The researcher identified the factors such as AI and Big Data have significantly changed leadership responsibilities, Leaders must now possess technical data literacy to succeed, AI improves leaders' ability to make strategic decisions, Big Data helps in identifying team performance trends more accurately, and human aspect of leadership is diminished due to automation. The researcher collected 105 samples from different Industries and compiled by SPSS software. The probability of statistics P-Value 0.002 which are less than 0.05 significant levels so the null assumptions are rejected and results are significant. During the research study the researcher found that the factors of AI and Big data analytics are significant towards the decision making process with respect to digital leadership in business Environment.
Keywords: AI, Big Data, Leadership, Digital Environment,. .
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1. INTRODUCTION:

The evolution of leadership in digital environment is based on Artificial Intelligent (AI) and big data analytics to make a fast decision in business industries. The decision making is a completed process to operate any process with efficient manner. For decision making process the leader needs some past data to make future predictions towards the organizational development. In technological revolutions with respect to AI and Big data analytics, the things has been simplified and rapid way. The AI and Big data analytics have a significant impact on of Leadership in Digital Environments in Business Industries.

The influence of AI in digital environment with respect to leadership is increasing day by day. The researcher identified some of the significant factors which leads to fast and speedy way decision making in business industries. It is significantly changes over time to time. The rapid advancement of AI and big data analytics in digital technologies, automation and capable to handle all possible changes in business industries. It is one of the biggest enablers and foster employees engagement (Ghamrawi et al., 2023; Indrasari & Pamuji, 2023). The integration of AI and Big data analytics into leadership are the important consideration towards decision making process. The AI and Big data analytics transferring the leadership process in more effective and transferable way to enhance the decision making process, automating managerial task, personalized interactions and optimizing the work performance.

The increasing the demand of AI and Big data analytics has significantly transformed the leadership by enhancing decision making process. The researcher identified the key factors such as AI and Big Data have significantly changed leadership responsibilities, Leaders must now possess technical data literacy to succeed, AI improves leaders' ability to make strategic decisions, Big Data helps in identifying team performance trends more accurately, and The human aspect of leadership is diminished due to automation (Xiong, 2022; Uddin, 2023). Organizations like Amazon and Google have effectively integrated AI into their leadership functions, redefining management roles and reshaping decision-making processes (Xiong, 2022).

The AI automates the managerial tasks towards decision making process in business Industries, more focused on strategic decision rather than day to day business operations (Wood et al., 2018). The researcher focused on the algorithms management system by streaming performance tracking and evaluation, enhancing, and overall workforce performance. The system can automate performance of real time feedback increasing productivity and employee's satisfaction are the significant research issues in business industries (Xiong, 2022). The technology and leadership are the better equipments towards the decision making process and understand the

sentiments of employees and address to approach individual needs and concerns (Liu & Song, 2022).

2. LITERATURE REVIEW

The Artificial Intelligent(AI) is one of the biggest enablers that have primarily function to provide decision support system based on huge of data and interpretations towards the right approach. The capacity of AI analyze the valuable insight enhance decision making system (Shack et al., 2023). . For instances the human making decision process that empowering the leadership to priorities creativities, innovations, interpersonal skills are the significant components for making the decision (Shick et al., 2023). The researcher identified the relationship between AI limitations, and optimizes the business resources for creating decision making process based on machine learning approach. (Walczak, 2016) demonstrated the leadership towards decision making process, the AI provides significant role to analyze the data in digital environment towards the decision making process, the ethical leadership , the researcher emphasized the interpersonal relationship between human value and moral value of humanity is the crucial aspect of AI driven(Uddin, 2023).

The AI ensuring the digital technology alignment with organizational value and support tha well being employees are stated that the significant role of AI in digital environment (Uddin, 2023; Mohan, 2024). The Ai can be replace the human value and associability towards the decision making process and judgment role in leadership. The rise of algorithms development in companies like diminishes human institution and leadership role (Abasaheb & Rajagopal, 2023). The researcher recommended the AI and capabilities to make data driven decisions making capabilities capabilities likeUber and Amazons (Abasaheb & Rajagopal, 2023). The situation underscore the significant impact of AT on organizational hierarchies and decision making capabilities. The AI leadership emphasized the ethical issues and need attentions , transparency , accountability during the critical process of decision making (Mittelstadt et al., 2016). The research focuses on the managing human – AI interaction to enhance the decision making process (Yap et al., 2024; Mohan, 2024). The future of AI leadership concerning the process of development machine learning tools to organized the business process and its components (Yap et al., 2024; Mohan, 2024).

The AI driven technology is more efficient for ethical leadership and human interactions, the key attributes used the charisma, decision process and intelligent (Agustono et al., Journal of Management World 2025, 3: 188-193 190 2023). The behavioral model of AI based decision making process focused on the observable actions rather than traits that indicate the effective leadership significantly impact on organizational outcomes (Sari, 2022). The researcher indicates transformation leadership motivates employees to achieve more significant goal and fosters innovations (Rosing et al., 2011). That leads to effective leadership based on machine learning approach. The transactional leadership that focused on the rewarding approach on AI and supporting tools to measure the accuracy (Hwang et al., 2023).

The dynamic setting the AI approach need adaptability and innovations . the situations based leadership emphasized the decision making process that concern to effective leadership situation based and adjustment (Pugliese et al., 2015). The AI can improve the decision making process based on past history of data, it is one of the data driven technique where algorithms are looked insight data and gives some decision making statement(Kar et al., 2021). The Ai supported the decision making process for leadership to improve the dynamic organizational performance. The researcher suggested the current decision is more based on AI and Big data analytics (Pedroso et al., 2021).

The AI tool improves the performance of leadership human decision making by offering the valuable data and strategic and based on predictions that enable to make decision choice instead of solely leying on intuition (Rožman et al., 2022). The researcher emphasized the strategic planning , operational efficiency of business process and helping leaders align their goal with organizational objectives (Rožman et al., 2022). However leaders must be interpreted the insight the data and organizational ethical context (Mahmood et al., 2024). The AI leadership also raises concerns about potential decision making process based on bias data, as algorithms can reflect the biases in their training data (Ferrara, 2023).

3. PROBLEM STATEMENT AND RESEARCH OBJECTIVES

The researcher formulated some of the significant research issues on "The Impact of AI and Big Data on Evolution of Leadership in Digital Environments in Business Industries", how are AI and Big Data reshaping leadership approaches and competencies in digitally-driven organizations?. The researcher stated the following research objectives such as:

To study the influence of AI and Big Data on leadership decision-making.

To identify the factors of emerging leadership competencies in digital environments.

To analyze how leaders adapt to AI-augmented organizational cultures.

To identify the significant impact of ethical and strategic implications for leadership in the age of AI.

3.1 HYPOTHESES

H1: Leaders in organizations that integrate AI and Big Data demonstrate a more data-driven leadership style.

H2: The use of AI tools significantly improves the strategic decision-making capabilities of leaders.

H3: Digital leadership competencies differ significantly in AI-integrated environments compared to traditional ones.

4. RESEARCH DESIGN AND METHODOLOGY

This research study is based on Mixed-Methods (qualitative and quantitative) in which qualitative analysis the researcher used the liker's measuring scale and data collected through the structured questionnaire and

compiled by SPSS software at 0.05 significant level. In Quantitative analysis the researcher calculate descriptive analysis such as mean, medium, mode, and scenes about the scattering data. For Quantitative Phase the researcher used Method: Online survey, Population: Mid- to senior-level leaders in technology-driven industries, Sample Size: 100–105 participants, Data Analysis: Statistical analysis using SPSS or R (regression analysis, ANOVA).

For Qualitative Phase the researcher used the Method: Semi-structured interviews, Sample: 15–20 executives with experience in AI/Big Data integration, Data Analysis: SPSS software and used Chi- Square test for hypothesis testing , Measurement Scale: Likerts.

5. RESULTS AND DISCUSSION

Research Statement 1.1 Statistical analysis of Leadership and Digital Transformation factors such AI and Big Data have significantly changed leadership responsibilities., Leaders must now possess technical data literacy to succeed., AI improves leaders' ability to make strategic decisions., Big Data helps in identifying team performance trends more accurately., The human aspect of leadership is diminished due to automation are significant in business industries.

Descriptive				
			Statistic	Std. Error
AI and Big Data have significantly changed leadership responsibilities.	Mean		3.1048	.14943
	95% Confidence Interval for Mean	Lower Bound	2.8084	
		Upper Bound	3.4011	
	5% Trimmed Mean		3.1164	
	Median		4.0000	
	Variance		2.345	
	Std. Deviation		1.53124	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		2.00	
	Skewness		-.180	.236
	Kurtosis		-1.502	.467
Leaders must now possess technical data literacy to succeed.	Mean		3.9333	.11263
	95% Confidence Interval for Mean	Lower Bound	3.7100	
		Upper Bound	4.1567	
	5% Trimmed Mean		4.0238	
	Median		4.0000	
	Variance		1.332	
	Std. Deviation		1.15415	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		2.00	
	Skewness		-.824	.236

	Kurtosis		-.236	.467
AI improves leaders' ability to make strategic decisions.	Mean		3.5810	.14115
	95% Confidence Interval for Mean	Lower Bound	3.3010	
		Upper Bound	3.8609	
	5% Trimmed Mean		3.6455	
	Median		4.0000	
	Variance		2.092	
	Std. Deviation		1.44635	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		3.00	
	Skewness		-.709	.236
	Kurtosis		-.917	.467
Big Data helps in identifying team performance trends more accurately.	Mean		3.2952	.12023
	95% Confidence Interval for Mean	Lower Bound	3.0568	
		Upper Bound	3.5337	
	5% Trimmed Mean		3.3280	
	Median		4.0000	
	Variance		1.518	
	Std. Deviation		1.23198	
	Minimum		1.00	
	Maximum		5.00	
	Range		4.00	
	Interquartile Range		2.00	
	Skewness		-.616	.236
	Kurtosis		-.778	.467
The human aspect of leadership is diminished due to automation.	Mean		3.3048	.13268
	95% Confidence Interval for Mean	Lower Bound	3.0416	
		Upper Bound	3.5679	
	5% Trimmed Mean		3.3386	
	Median		3.0000	
	Variance		1.849	
	Std. Deviation		1.35961	
	Minimum		1.00	
	Maximum		5.00	

	Range	4.00	
	Interquartile Range	3.00	
	Skewness	-.128	.236
	Kurtosis	-1.294	.467

Case Processing Summary			
		N	%
Cases	Valid	105	100.0
	Excluded[a]	0	.0
	Total	105	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics	
Cronbach's Alpha	N of Items
.452	5

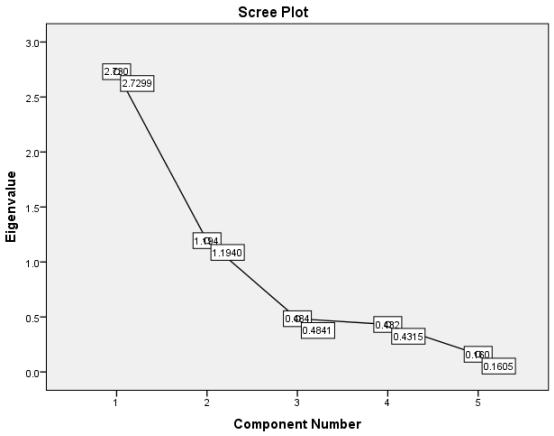
Reliability Analysis

The reliability analysis showing the internal consistency of attributes between independent and dependent variables which is summated scale where several features are summed to from the total score. The researcher stated the factors such as Factors such as AI and Big Data have significantly changed leadership responsibilities, Leaders must now possess technical data literacy to succeed, AI improves leaders' ability to make strategic decisions, Big Data helps in identifying team performance trends more accurately, and The human aspect of leadership is diminished due to automation.

The researcher used SPSS software to compile data with statistical reliability tool Cronbach's Alpha which is showing the 0.452 which is least acceptable, the researcher strongly recommended to collect more data on "The Impact of AI and Big Data on Evolution of Leadership In Digital Environments in Business Industries".

Total Variance Explained						
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.730	54.599	54.599	2.730	54.599	54.599
2	1.194	23.879	78.478	1.194	23.879	78.478
3	.484	9.682	88.160			
4	.432	8.631	96.790			
5	.160	3.210	100.000			
Extraction Method: Principal Component Analysis.						

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.658
Bartlett's Test of Sphericity	Approx. Chi-Square	224.713
	df	10
	Sig.	.000



Test Statistics					
	AI and Big Data have significantly changed leadership responsibilities.	Leaders must now possess technical data literacy to succeed.	AI improves leaders' ability to make strategic decisions.	Big Data helps in identifying team performance trends more accurately.	The human aspect of leadership is diminished due to automation.
Chi-Square	10.381[a]	48.857[a]	30.667[a]	50.762[a]	10.095[a]
df	4	4	4	4	4
Asymp. Sig.	.034	.000	.000	.000	.039
a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 21.0.					

6. INFERENCE

The above data analysis report is compiled by SPSS software at 0.05 significant levels. The researcher included factors such as Factors such as AI and Big Data have significantly changed leadership responsibilities, Leaders must now possess technical data literacy to succeed, AI improves leaders' ability to make strategic decisions, Big Data helps in identifying team performance trends more accurately, and The human aspect of leadership is diminished due to automation on "The Impact of AI and Big Data on Evolution of Leadership In Digital Environments in Business Industries" and compiled by SPSS software at 0.05significant level. The probability of statistics P-value 0.00 which is less than 0.05 significant levels, so the null hypothesis is rejected and results are significant towards this research study.

Data Analysis Report

The data analysis report on awareness in of awareness and Use of AI and Big Data in Business Industries. The statistical analysis shows that not familiar 0.0%, somewhat familiar 20%, familiar 20.0 %, and very familiar are 60% are respondents aware about the AI and Big data in Business Industries and its usage. The majority of respondents are having 80% are aware about usage of AI and Big Data in Business Industries.

The data analysis report on respondents how often your organization uses AI or Big Data in decision-making processes. The statistical analysis shows that never 0.0%, rarely 40%, always 20.0 %, and frequently are 40% are respondents aware about the AI and Big data in Business Industries and its usage. The majority of respondents are having 60% are aware about organization use AI or Big Data in decision-making processes in Business Industries.

The above data analysis report on leadership qualities do you believe are most enhanced by AI and Big Data. The statistical analysis shows that leadership qualities factors such as decision making 100.0%, communication 80%, Emotional intelligent 80.0 , strategy making 100%, and adaptability 40% are leadership qualities do you believe are most enhanced by AI and Big Data in Business Industries and its usage. The majority of respondents are having decision making , communication and strategy making are significant factors towards leadership qualities do you believe are most enhanced by AI and Big Data in Business Industries.

7. SUMMARY AND CONCLUSION.

Finally the researcher concluded that factors such as AI and Big Data have significantly changed leadership responsibilities, Leaders must now possess technical data literacy to succeed, AI improves leaders' ability to make strategic decisions, Big Data helps in identifying team performance trends more accurately, and The human aspect of leadership is diminished due to automation statistical analysis probability of statistics P- value is 0.00 which is less than 0.05 significant level , so the null assumption is rejected and results are significant and showing Impact on AI and Big Data on Evolution of Leadership In Digital Environments in Business Industries. The researcher also emphasized that Modern leaders are increasingly leveraging these technologies to drive decision-making, enhance efficiency, and foster innovation. AI enables leaders to automate routine tasks, analyze large datasets in real-time, and predict market trends with greater accuracy. Big Data, on the other hand, provides valuable insights into consumer behavior, operational efficiency, and strategic planning. Together, AI and Big Data facilitate data-driven leadership, allowing for more informed and agile decision-making. Digital transformation has also shifted leadership paradigms from hierarchical models to more collaborative and adaptive structures, emphasizing the need for leaders to be tech-savvy, data-literate, and resilient in the face of rapid change.

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