

Role Of Ai Integration On Effectiveness Of Management Decision Quality And Swiftness: An Empirical Study

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Abstract

The adoption of Artificial Intelligence (AI) in organizational decision-making is reshaping, how businesses function across different sectors, leading to smarter, faster, and more informed managerial choices. With the rise of new-age technologies, artificial intelligence (AI) has become a valuable asset in improving the effectiveness and agility of management decision-making. The present research work delves into how Artificial Intelligence (AI) contributes to improving the quality, speed, and precision of managerial decisions. The results aim to showcase notable enhancements in how, quickly and effectively data can be analyzed and decisions made with the help of AI. Therefore, the study shows that Artificial Intelligence is changing the way the management of businesses, makes decisions. Companies are able to work more efficiently, make more accurate choices, and help encourage innovative thinking. Organizations with AI-integrated tools and technologies in their businesses can process and analyze large amounts of data efficiently, leading management towards quicker and more informed decision-making. Overall, the usage of AI in managerial decision-making thus leads to better results for businesses and influences how businesses operate in the future. A sample of 233 was collected for the study. The factors of AI integration on the effectiveness of management decision quality and swiftness are Enhanced Data Processing and Analysis, Enhanced Data Processing and Analysis, Predictive and Prescriptive Analytics, and Predictive and Prescriptive Analytics.

Keywords:

Artificial Intelligence, New-age technologies, Managerial decisions, Innovative thinking, Businesses.

Introduction

Managing businesses in the era of Artificial Intelligence (AI) brings both new challenges as well as exciting possibilities, particularly on a global scale. In this era of technology, “Artificial Intelligence continues to evolve, leaders of organizations must stay agile thus, adapting towards the changing landscape, making the most of emerging new-age tools and technologies, and staying mindful of the potential risks that come with them”. Here comes AI, the game-changing technology that, along with robotics, is thereby reshaping the core of how Organizations function from day-to-day operations to long-term strategies thereby, transforming the way work gets done across businesses. Artificial intelligence (AI) refers, to computer systems designed and developed by humans that enable machines to process information, learn from

their experiences to make decisions and adapt over time-much like human thinking. Helps businesses make smarter, more focused decisions towards saving both time and money. Artificial Intelligence (AI) can gather data, predict future outcomes, as well as analyze trends-to make decisions faster and more efficient. The major advantage of AI is helping businesses speed up their decision-making, by quickly examining large sets of data to spot trends and suggest management the best steps to consider. Thereby, transforming the way choices are made across all industries. Ahmed et.al. (2022), stated Artificial Intelligence tools and technologies help to process different types of information such as pictures, written texts, or data from sensors. They tend to use algorithms, which can therefore, be as basic as simple rules or as advanced as deep neural networks, to understand the data and draw useful conclusions. Machine learning helps allow it to learn from past data and results. With time, this helps AI systems get better towards making decisions. Such kind of AI-driven automation helps organizations make quicker and more accurate choices in areas like shopping, banking, communication and media. Benbya et.al. (2021), mentioned businesses are using AI tools and technologies, each and every day to make their work smoother, get things done in a quicker way, lower their expenses and boost overall efficiency. "Bringing Artificial Intelligence into business decision-making can completely change how companies work and plan for the future". Chesbrough. (2017), asserted Artificial intelligence is helping businesses work faster, make fewer mistakes as well as, and come up with new ideas in a swifter way. Allowing them to use data wisely and make smart choices in this fast-changing and competitive world. AI helps with decision-making in many fields such as banking, medicine, factories and advertising. This can also lead to better results in areas like managing risks, using resources wisely, and creating effective policies. According to Precedence Research, "the global decision intelligence market was worth around USD 10.55 billion in 2022". It is expected to grow significantly, reaching nearly USD 45.15 billion by 2032, growing at an average annual rate of 15.7% between 2023 and 2032. Jarrahi. (2018), acknowledged that artificial Intelligence has seen strong growth in decision-making, as more organizations are using their abilities to improve how they work and boost their profits.

Literature Review

Artificial intelligence or AI, means a machine's ability to copy how humans think and learn. According to Tien. (2017), the main objective of AI is, to solve problems and make decisions quickly, without the mistakes people might make. In tech language, such machines are often, called as smart bots. Technology and AI have improved over time, and the scope of what AI can do has grown a lot over the years. AI plays a key role in business decision-making, especially, when it handles all or part of the data processing. Without the requirement of human input, AI can analyze information, make reliable predictions, and support accurate decisions. Artificial Intelligence is becoming central to businesses because it can learn and improve over time. The more data it uses, the smarter its decisions become. AI can help to teach itself by analyzing large sets of information, by creating useful models from that data. Rane et.al. (2024), findings stated the majority of business leaders are integrating smart tools like- machine learning, natural language processing, and computer vision to reach their business objectives. But, despite usage, it's not only about using such technologies it's also about knowing how to combine them with human thinking, and data to make the best possible decisions. Decisions affect every part of a business, from the products and services it offers, to how money is managed. Making smart choices is very important for the management, and knowing how different types of decisions work helps a business succeed. Stone et.al. (2020), acknowledged despite so many challenges, spending on AI has gone up as more and more businesses are

integrating AI, into their managerial decision-making and starting to use it. Earlier, just 40% of organizations using AI were putting over 5% of their digital budgets towards it. "Every decision affects different parts of a company it's the products offered, services provided, or how money is managed in the company." Considering smart and well-planned decisions is very important, and knowing how different types of choices are made- helps a business grow and succeed. Such choices shape the organization's future path. They are usually made up of top-level management which needs careful thinking and planning. The decisions made by them often lead, to major changes in how the business moves forward. Operational decisions are usually made by mid-level managers who deal with the daily running of the business. The above-mentioned choices often, involve balancing different goals and tend to affect the company over the medium term. "Tactical decisions are short-term choices, which deal with specific tasks or projects." Usually aims to improve certain areas of business management or solve immediate problems, rather than focusing on the bigger picture or long-term plans. "Good decision-making by management is key to an organization's long-term success." Thereby, influences how the business grows, builds relationships, and runs its daily activities effectively. AI plays an important role, in improving how such decisions are made by supporting different steps in the decision-making process. "Artificial Intelligence tools help to spot and understand issues more clearly by studying large amounts of data." They can find hidden patterns, unusual behaviour, or new trends that people might miss, making it easier to define the real problem. Paramesha et.al. (2024), mentioned Machine learning, Natural language processing (NLP), and data mining help businesses pull useful information from huge amounts of data which, allows them to clearly understand what's going on and make smarter decisions. AI looks at records and outside sources like social media sentiments, to suggest different strategies or ideas that people might not notice right away. Tools like machine learning systems and chat-bots help businesses better understand, what customers want and how satisfied they are. According to Shrestha et.al. (2019), before AI became a part of business decision-making, leaders of companies often had to make choices based on patchy or unreliable data. With the arrival of AI, they started using data-driven models and simulations to guide their managerial decisions. AI systems now, start from fresh and constantly learn by processing large amounts of business data every day. Helps doctors make decisions by studying patient information and recommending them with personalized treatments. Looks through, large amounts of medical records and test results to suggest the best care options, by helping healthcare providers choose what's best for each patient. AI looks at past data and forecasts future needs, to help decision-makers use resources wisely and make sure patients get the care they need with well-equipped facilities. AI helps predict possible disease outbreaks in the healthcare sector so that hospitals and health agencies are able to get ready in advance. Using AI in investment planning, helps investors make smarter choices by studying detailed data. Wu et.al. (2025), analyzed by looking at past trends and market behaviours, AI provides decision-makers with useful insights that help financial experts make better decisions and improve returns. Plays an important in supply chain and logistics, by offering smart insights from the data that help companies plan better and consider effective actions. AI tools study data to help keep the right amount of inventory-making sure items are available without, having too much in storage. Managers of organizations use such information to decide when to re-stock, how much to keep on hand, and how to handle slow-moving items. This helps a company to cut down storage costs thus, making day-to-day operations run more smoothly. Artificial intelligence helps plan production by studying data on customer demand, how well machines are working, and how easily materials can be sources. "Allows businesses to create efficient schedules and avoid delays and shortages." Business leaders use such information to decide when to re-stock products, how

much inventory to keep, and how quickly items should move through the system helping, an organization lower their storage costs and make the overall operation run more smoothly. AI plays a big role in marketing, by offering useful insights based on the data. It helps to break down the market into smaller groups and choose which ones to focus on by, studying different types of information. Marketers are able to create more personalized strategies that meet the needs and interests of each group more effectively. AI tools provide us with many benefits as; they help us to do more than just analyze numbers. These tools and technology can also understand and use unstructured data, like text and images, instantly and on a large scale. According to Mah et.al. (2022), “Natural Language Processing (NLP) helps computers understand human language, which makes it easier to automate tasks such as answering customer questions, studying data, and figuring out people's feelings or opinions.” Prescriptive analytics provides us with helpful suggestions by analyzing data, spotting trends and understanding the situation. “Generative AI tends to handle large amounts of information, grasp ideas, find connections, and produce insights quickly and on a much bigger scale than a person can.” When such tools work together, companies are able to more effectively link data, performance measures, plans, and daily operations to boost overall efficiency. Olayinka. (2019), acknowledged Machine Learning programs can study, past business choices and also large sets of data which, provides business leaders with useful suggestions and respond to data-based questions. This shows how AI can support smarter, informed decision-making. “Predictive analytics looks for trends and relationships in data to help predict future events, like changes that might happen during certain seasons.” Predictive tools help businesses stay ahead of changes, and update their plans in advance. For example- such tools help retailers and assist shops in managing their stock better, making sure items are available when customers want them. Generative AI is also very helpful as, it helps to get answers faster by quickly going through large amounts of information, spotting trends and ideas, and giving clear, real-time insights with context. Saves time and leads to avoiding long team discussions which might, otherwise take days or weeks to conclude. AI is transforming how leaders of businesses make decisions by offering faster and more efficient ways to work, giving customized insights, handling data smartly, reducing bias, helping use resources wisely, analyzing data effectively, and much more. AI doesn't just help with customer-facing tasks, it also improves how things run inside an organization. According to Sun & Jung. (2024), Human Resources teams use AI tools to find and keep the right employees, plan work shifts more effectively and improve the training sessions. Chatbots are able to quickly respond to employee questions, offering instant help and making the workplace more supportive and satisfying. Banks and financial institutions are able to use AI tools, to catch fake or suspicious transactions. Helpful towards spotting and dealing with possible dangers or problems. AI can look through, large amounts of past data to find unusual patterns or warning signs. Therefore, can help detect things like fraud, sudden changes in the market, or issues in the supply chain before they become serious. Walmart's use of AI for managing its stock is one of the great examples of how smart technology can make automatic business decisions. Kowalska & Ashraf. (2023), findings stated that AI systems look at large amounts of information from weather predictions, satellite pictures, and soil monitoring tools to give farmers quick and useful suggestions to help them consider better decisions. Smoothly addition of AI into current decision-making systems is key towards unlocking its full value. Businesses should work on building AI tools that fit with their existing technology setups, data systems and everyday business operations.

Objective

To study the Role of AI Integration on the Effectiveness of Management Decision Quality and Swiftness.

Methodology

A sample of 233 participants was collected from entrepreneurs running different business scales. The method of sampling was “Random sampling” for the collection of data and examination was done by “Explanatory Factor Analysis” for results.

Findings

Table 1 demonstrates demographic details, it shows that 54.08% are Male, and 45.92% are female. Looking at the age, 31.33% are between 35 to 40 years of age, 37.77% are between 40 to 45 years of age, and 30.90% are above 45 years of age. With regards to the Type of Business, 35.62% are small-scale businesses, 33.91% are medium-scale businesses, and 30.47% are large-scale businesses.

Table 1 Respondent’s Details

Variables	Participants	Percentage
Gender		
Male	126	54.08%
Female	107	45.92%
Total	233	100
Ages in years		
35 to 40	73	31.33%
40 to 45	88	37.77%
Above 45	72	30.90%
Total	233	100
Type of Business		
Small Scale Business	83	35.62%
Medium Scale Business	79	33.91%
Large Scale Business	71	30.47%
Total	233	100

“Factor Analysis”

“KMO and Bartlett's Test”

Table 2 “Kaiser-Meyer-Olkin Measure of Sampling Adequacy”

“Kaiser-Meyer-Olkin Measure of Sampling Adequacy”	.763
“Approx. Chi-Square”	3925.791

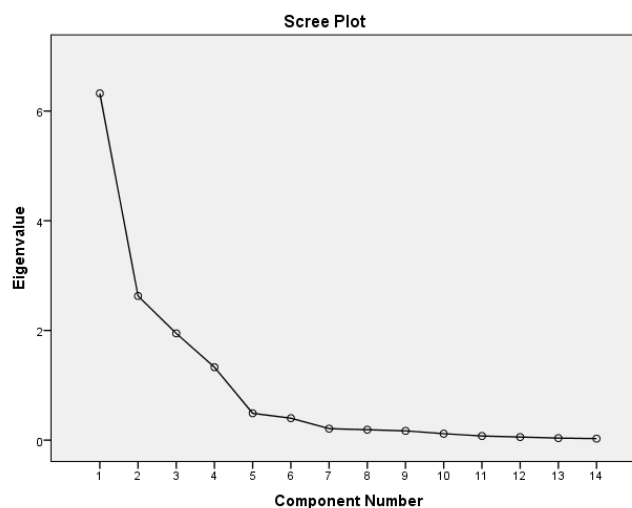
"Bartlett's Test of Sphericity"	df	91
	Significance	.000

"KMO and Bartlett's Test", the value of KMO is .763 (Table 2).

Table 3 "Total Variance Explained"

"Component"	"Initial Eigenvalues"			"Rotation Sums of Squared Loadings"		
	"Total"	"% Of Variance"	"Cumulative %"	"Total"	"% Of Variance"	"Cumulative %"
1.	6.322	45.159	45.159	3.783	27.022	27.022
2.	2.628	18.773	63.932	3.659	26.133	53.154
3.	1.946	13.902	77.834	2.476	17.686	70.840
4.	1.330	9.497	87.331	2.309	16.490	87.331
5.	.489	3.495	90.826			
6.	.400	2.860	93.685			
7.	.210	1.499	95.184			
8.	.190	1.354	96.539			
9.	.169	1.210	97.749			
10.	.117	.839	98.588			
11.	.076	.543	99.131			
12.	.057	.405	99.536			
13.	.037	.265	99.801			
14.	.028	.199	100.000			

The four factors contribute towards explaining a total of 87.331% of the variance. Variance explained by Enhanced Data Processing and Analysis is 27.022%, Real-Time Decision Support is 26.133, Predictive and Prescriptive Analytics is 17.686%, and Automation of Routine Decisions is 16.490%. (Table 3).



Scree Plot

Table 4 "Rotated Component Matrix"

S. No.	Statements	Factor Loading	Factor Reliability
	Enhanced Data Processing and Analysis		.951
1.	AI systems process vast amounts of structured and unstructured data from multiple sources	.950	
2.	It leads to more informed and rational decision-making	.905	
3.	Identify patterns, correlations, and trends that would be impossible to detect manually.	.859	
4.	NLP enables AI to analyse data from emails, reports, social media and customer feedback	.844	
	Real-Time Decision Support		.964
1.	AI provides managers with immediate, actionable insights	.959	
2.	Increases speed of response in such as supply chain management, crisis handling	.907	
3.	Helps to get answers faster to large amounts of information, giving clear, real-time insights	.905	
4.	Help decision-makers evaluate various courses of action quickly and with lower risk	.879	
	Predictive and Prescriptive Analytics		.875
1.	AI employs machine learning algorithms to predict future trends	.910	
2.	AI integration prescribes optimal courses of action	.839	
3.	Allow managers to make proactive decisions, reducing uncertainty and risk	.799	
	Automation of Routine Decisions		.826
1.	AI can autonomously handle repetitive, low-risk decisions	.924	
2.	Freeing up managerial time for strategic and high-impact thinking	.917	

3.	AI-driven automation helps organizations make quicker and more accurate choices	.645	
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Factors of the study and its related variables

The first factor of the study is Enhanced Data Processing and Analysis, the variables it includes are AI systems can process vast volumes of structured and unstructured data from multiple sources, which leads to more informed and rational decision-making, identify patterns, correlations, and trends that would be impossible to detect manually, and NLP enables AI to analyze text-based data from emails, reports, social media, and customer feedback. Real-time decision Support is the second factor, it includes variables like AI provides managers with immediate, actionable insights, increases the speed of response in supply chain management, crisis handling, increases speed of response in such as supply chain management, crisis handling, and Helps decision-makers evaluate various courses of action quickly and with lower risk. Predictive and Prescriptive Analytics is the third factor, its variables are AI employs machine learning algorithms to predict future trends, AI employs machine learning algorithms to predict future trends, and Allows managers to make proactive decisions, reducing uncertainty and risk. The last and fourth factor is the Automation of Routine Decisions, its variables are AI can autonomously handle repetitive, low-risk decisions, AI can autonomously handle repetitive, low-risk decisions, and AI-driven automation helps organizations make quicker and more accurate choices.

Table 5 “Reliability Statistics”

“Cronbach's Alpha”	“Number of Items”
.895	14

The total reliability of 14 items that include variables for the Role of AI Integration on the Effectiveness of Management Decision Quality and Swiftness is 0.895 (Table 5).

Conclusion

Even though there are worries about artificial intelligence, its benefits in helping with decisions are clear in today's data-driven world. AI plays a key role in handling the huge amount and different types of information we deal with every day, making it easier to make smarter and better decisions. Unquestionably, through this recent study, we have come to realize that, despite so many challenges related to security, Artificial Intelligence (AI), plays an important role in how managers consider their decisions. Brings about numerous benefits, like saving time, and helping businesses stay ahead of different organizations by providing more personalized experiences to customers. Anastasios & Maria. (2024), also concluded advancements taking place in AI, will shape how decisions are made in different fields, by guiding people to make smarter, quicker, and better-informed choices. AI though, has a very strong future and will lead people to make better decisions. Companies that use AI wisely, will keep improving their managerial decision-making skills and change how choices are made in business as well as other areas. Implementation of Artificial Intelligence also led to help protect the environment in many areas by improving the way how things are needed to be done and reducing waste. The factors of AI integration on the effectiveness of management decision quality and swiftness are Enhanced Data Processing and Analysis, Enhanced Data Processing and Analysis, Predictive and Prescriptive Analytics, and Predictive and Prescriptive Analytics.

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