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THE INFLUENCE OF GENERATIVE AI ADOPTION ON MANAGERIAL PROBLEM-SOLVING CAPABILITIES AND ORGANIZATIONAL AGILITY

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Abstract

The emergence of Generative Artificial Intelligence (GenAI) has transformed organizational decision-making processes, strategic planning, and managerial practices. Unlike traditional artificial intelligence systems that primarily focus on prediction and automation, Generative AI possesses the capability to create content, generate solutions, synthesize information, and support complex decision-making processes. This study investigates the influence of Generative AI adoption on managerial problem-solving capabilities and organizational agility. Drawing upon the Dynamic Capabilities Theory and Technology-Organization-Environment (TOE) framework, the study proposes that Generative AI adoption enhances managerial problem-solving effectiveness, which subsequently improves organizational agility. A quantitative explanatory research design is proposed involving managers and executives from organizations utilizing Generative AI technologies. The study contributes to the growing literature on AI-enabled management by providing a comprehensive framework linking technological adoption with managerial competencies and organizational adaptability. The findings are expected to demonstrate that Generative AI serves as a strategic organizational resource that strengthens managerial cognition, accelerates decision-making, improves innovative problem-solving, and enhances organizational responsiveness to environmental changes. The research offers significant theoretical and practical implications for organizations seeking competitive advantage in increasingly dynamic business environments.

Keywords: Generative AI, Artificial Intelligence Adoption, Managerial Problem-Solving, Organizational Agility, Dynamic Capabilities, Strategic Management

1. Introduction

Artificial Intelligence (AI) has become one of the most transformative technologies shaping contemporary organizations. Recent developments in Generative Artificial Intelligence (GenAI), including large language models, generative design systems, and multimodal AI applications, have fundamentally altered how managers process information, solve problems, and make strategic decisions. The introduction of advanced generative systems such as ChatGPT, Gemini, Claude, and other AI-powered tools has enabled organizations to automate cognitive tasks that traditionally required significant human expertise. These systems can analyze large datasets, generate strategic alternatives, summarize complex information, support scenario planning, and facilitate organizational learning (Dwivedi et al., 2023). Organizations increasingly operate in environments characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). In such environments, managerial problem-solving capabilities become critical determinants of organizational success (Teece, 2018). Effective problem-solving enables managers to identify opportunities, address operational challenges, and respond to market disruptions efficiently. Simultaneously, organizational agility has emerged as a critical strategic capability. Organizational agility refers to the ability of firms to sense environmental changes and rapidly adapt through strategic and operational responses (Doz & Kosonen, 2010).

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Agile organizations demonstrate superior responsiveness, innovation, and resilience in dynamic environments. While prior studies have explored AI adoption, digital transformation, and organizational performance, limited empirical research has examined the specific mechanisms through which Generative AI enhances managerial problem-solving capabilities and contributes to organizational agility. Existing literature predominantly focuses on technological aspects of AI rather than its cognitive and strategic implications for management (Brynjolfsson & McAfee, 2017). Therefore, this study seeks to address this gap by investigating the influence of Generative AI adoption on managerial problem-solving capabilities and organizational agility.

2. Problem Statement

Organizations are increasingly investing in Generative AI technologies; however, limited empirical evidence exists regarding how these technologies enhance managerial problem-solving capabilities and improve organizational agility. The absence of a comprehensive framework linking Generative AI adoption to managerial cognition and organizational adaptability creates uncertainty regarding the strategic value of these technologies.

3. Research Objectives

The study aims to:

1. Examine the impact of Generative AI adoption on managerial problem-solving capabilities.
2. Investigate the effect of managerial problem-solving capabilities on organizational agility.
3. Analyze the direct influence of Generative AI adoption on organizational agility.
4. Examine the mediating role of managerial problem-solving capabilities between Generative AI adoption and organizational agility.

4. Research Questions

RQ1: Does Generative AI adoption improve managerial problem-solving capabilities?
RQ2: Does managerial problem-solving capability enhance organizational agility?
RQ3: Does Generative AI adoption directly influence organizational agility?
RQ4: Does managerial problem-solving capability mediate the relationship between Generative AI adoption and organizational agility?

5. Theoretical Framework

A theoretical framework serves as the intellectual foundation of a study by explaining the underlying theories that support the proposed relationships among variables. In the context of this research, two complementary theories provide a comprehensive explanation of how Generative Artificial Intelligence (GenAI) influences managerial problem-solving capabilities and organizational agility: Dynamic Capabilities Theory (DCT) and the Technology–Organization–Environment (TOE) Framework. Together, these theories explain both the adoption of Generative AI and the mechanisms through which it creates organizational value.

5.1 Dynamic Capabilities Theory

Dynamic Capabilities Theory, introduced by Teece, Pisano, and Shuen (1997), has become one of the most influential theories in strategic management. The theory argues that organizations achieve sustainable competitive advantage not merely through possession of valuable resources but through their ability to continuously integrate, build, and reconfigure internal and external competencies in response to rapidly changing environments. Traditional resource-based perspectives emphasize ownership of strategic resources; however, Dynamic Capabilities Theory extends this view by focusing on an organization's ability to adapt and transform those resources over time. According to Teece (2018), dynamic capabilities consist of three core

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organizational processes: sensing opportunities and threats, seizing opportunities through strategic action, and transforming organizational structures and resources to maintain competitiveness. In today's digital economy, Generative AI can be viewed as a strategic technological resource that significantly enhances these dynamic capabilities.

Sensing Capability

Sensing refers to an organization's ability to identify market opportunities, environmental changes, emerging trends, and potential threats. Managers often face challenges in processing large volumes of information from diverse sources. Generative AI assists in overcoming these challenges by rapidly analyzing extensive datasets, identifying patterns, generating market insights, and forecasting future developments. For example, AI-powered systems can synthesize information from customer feedback, social media conversations, market reports, and competitor activities, enabling managers to recognize opportunities and threats much faster than traditional analytical methods. Consequently, organizations become more capable of anticipating environmental changes and responding proactively.

Seizing Capability

Seizing involves making strategic decisions and allocating resources to capitalize on identified opportunities. Effective decision-making requires managers to evaluate alternatives, assess risks, and select optimal courses of action. Generative AI strengthens seizing capabilities by generating multiple strategic alternatives, conducting scenario analyses, and providing evidence-based recommendations. Through AI-assisted decision support systems, managers can evaluate a broader range of possibilities and improve decision quality. This capability is particularly important in uncertain environments where timely and accurate decisions determine organizational success.

Transforming Capability

Transforming refers to the organization's ability to continuously adapt its structures, processes, and resources in response to changing circumstances. Generative AI facilitates organizational transformation by supporting innovation, knowledge sharing, process redesign, and continuous learning. Organizations adopting Generative AI can automate routine cognitive tasks, enhance cross-functional collaboration, and accelerate innovation cycles. As a result, they become more agile and capable of sustaining competitive advantage in dynamic environments.

Relevance to the Present Study

The Dynamic Capabilities Theory provides the primary theoretical lens for understanding how Generative AI contributes to organizational agility. The theory suggests that Generative AI itself does not automatically create organizational value. Rather, value is created when managers effectively utilize AI-generated insights to improve problem-solving capabilities and strategic decision-making. Therefore, managerial problem-solving capability serves as an important mechanism through which Generative AI translates into organizational agility. This theoretical perspective directly supports the mediating relationship proposed in this study.

5.2 Technology–Organization–Environment (TOE) Framework

The Technology–Organization–Environment (TOE) Framework was developed by Tornatzky and Fleischer (1990) to explain organizational technology adoption. The framework proposes that technology adoption decisions are influenced by three contextual dimensions: technological factors, organizational factors, and environmental factors.

The TOE framework has been widely used to examine the adoption of emerging technologies, including cloud computing, big data analytics, blockchain, artificial intelligence, and digital transformation initiatives.

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Technological Context

The technological context refers to the characteristics of technologies available to an organization. These characteristics include relative advantage, compatibility, complexity, observability, and technological readiness.

Generative AI technologies offer several advantages that encourage adoption, including:

1. Enhanced information processing capabilities
2. Increased productivity
3. Faster decision-making
4. Improved knowledge management
5. Greater innovation potential

Organizations are more likely to adopt Generative AI when they perceive these benefits to outweigh implementation costs and risks.

Organizational Context

The organizational context includes internal characteristics such as organizational size, managerial support, technological infrastructure, employee competencies, organizational culture, and resource availability.

Successful Generative AI adoption requires:

1. Strong leadership commitment
2. Digital readiness
3. Employee AI literacy
4. Adequate technological infrastructure
5. Organizational support for innovation

Managers play a critical role in facilitating AI adoption by creating an environment that encourages experimentation and technological learning.

Environmental Context

The environmental context encompasses external factors such as industry competition, customer expectations, regulatory pressures, and technological trends.

Organizations increasingly face pressure to adopt AI technologies due to:

1. Intensifying global competition
2. Rapid technological advancement
3. Increasing customer demands
4. Industry digitalization trends

Firms operating in highly competitive and uncertain environments are more likely to adopt Generative AI to improve responsiveness and maintain competitiveness. The TOE Framework explains why organizations adopt Generative AI technologies in the first place. While Dynamic Capabilities Theory explains how Generative AI creates strategic value, the TOE framework explains the organizational conditions that facilitate its adoption. Together, these theories provide a comprehensive explanation of both technology adoption and value creation.

6. Literature Review

6.1 Generative AI Adoption

Generative Artificial Intelligence represents one of the most significant technological developments of the twenty-first century. Unlike traditional AI systems that focus primarily on classification, prediction, and automation, Generative AI systems possess the ability to create new content, generate solutions, produce recommendations, and synthesize knowledge from vast datasets (Feuerriegel et al., 2024). The emergence of advanced language models has fundamentally transformed knowledge-intensive work. Generative AI technologies can generate reports, summarize complex information, support strategic planning, create forecasts,

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assist decision-making, and facilitate innovation. Recent empirical evidence demonstrates substantial productivity gains associated with Generative AI adoption. Brynjolfsson, Li, and Raymond (2023) found that employees using Generative AI tools experienced productivity improvements ranging from 14% to 37%, particularly in knowledge-intensive tasks. Similar findings suggest that AI systems enhance employee performance by reducing cognitive workload and increasing efficiency.

Dwivedi et al. (2023) argue that Generative AI is reshaping organizational processes through four primary mechanisms:

Knowledge Augmentation

Generative AI expands managers' access to information by synthesizing large volumes of data into actionable insights. This capability improves organizational learning and knowledge management.

Decision Support

AI-generated recommendations assist managers in evaluating alternatives, reducing uncertainty, and making informed decisions.

Process Optimization

Generative AI automates routine cognitive activities, allowing managers to focus on strategic and high-value tasks.

Innovation Enhancement

By generating new ideas, alternative solutions, and creative recommendations, Generative AI supports organizational innovation and problem-solving.

As organizations continue their digital transformation journeys, Generative AI adoption is increasingly viewed as a strategic investment rather than merely a technological upgrade.

6.2 Managerial Problem-Solving Capabilities

Managerial problem-solving capability refers to a manager's ability to identify, analyze, evaluate, and resolve organizational challenges effectively (Mumford et al., 2000). It is considered one of the most critical competencies influencing managerial effectiveness and organizational performance.

Problem-solving is a multidimensional process involving several interconnected stages.

Information Acquisition

Managers must first gather relevant information regarding organizational problems. Accurate information forms the basis for effective decision-making.

Problem Diagnosis

Managers analyze available information to identify root causes rather than merely addressing symptoms.

Alternative Generation

Effective managers develop multiple alternative solutions before selecting a course of action.

Evaluation and Selection

Alternatives are assessed based on feasibility, effectiveness, risks, and organizational objectives.

Implementation and Monitoring

Selected solutions are implemented and continuously monitored to ensure desired outcomes.

Generative AI significantly enhances each of these stages by improving information processing capabilities and reducing cognitive limitations. AI-assisted systems can rapidly analyze large datasets, identify patterns, generate alternative solutions, and support evidence-based decision-making. Dellermann et al. (2019) describe this phenomenon as "hybrid intelligence," where human expertise and artificial intelligence work collaboratively to achieve superior outcomes.

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6.3 Organizational Agility

Organizational agility refers to an organization's ability to rapidly sense environmental changes and respond effectively through strategic and operational adaptations (Doz & Kosonen, 2010). In increasingly turbulent business environments, agility has become a critical determinant of organizational success and survival.

Scholars generally conceptualize organizational agility through four primary dimensions.

Responsiveness

Responsiveness reflects the speed with which organizations react to market opportunities, customer demands, and environmental changes.

Flexibility

Flexibility refers to the organization's ability to modify structures, processes, and resource allocations in response to changing circumstances.

Speed

Speed involves the rapid implementation of decisions and execution of strategic initiatives.

Adaptability

Adaptability reflects the organization's capacity to continuously evolve and learn in dynamic environments. Digital technologies play a crucial role in developing organizational agility by improving communication, information sharing, and decision-making capabilities (Sambamurthy et al., 2003). Consequently, Generative AI has emerged as a potentially important driver of organizational agility.

6.4 Generative AI and Managerial Problem-Solving

The relationship between Generative AI and managerial problem-solving is grounded in the concept of cognitive augmentation. Rather than replacing managers, Generative AI extends human cognitive capabilities by enhancing information processing, analytical reasoning, and creative thinking.

Research suggests that managers using AI-supported systems:

1. Generate a larger number of alternative solutions.
2. Analyze information more comprehensively.
3. Make more informed decisions.
4. Reduce decision-making time.
5. Improve solution quality.

Jarrahi (2018) argues that AI systems function most effectively when they complement human judgment rather than replace it. Human managers contribute contextual understanding, ethical reasoning, and strategic intuition, while AI contributes computational power and analytical precision. Therefore, Generative AI is expected to positively influence managerial problem-solving capabilities.

6.5 Generative AI and Organizational Agility

Generative AI has significant implications for organizational agility because agility depends heavily on information processing speed and decision-making effectiveness.

Organizations adopting Generative AI benefit from:

1. Faster environmental scanning.
2. Enhanced strategic forecasting.
3. Improved innovation processes.
4. Accelerated knowledge creation.
5. More efficient decision-making.

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Verhoef et al. (2021) argue that digital technologies are essential enablers of organizational agility because they increase organizational responsiveness and adaptability. Generative AI further extends these benefits by introducing advanced cognitive capabilities into organizational processes. Consequently, organizations utilizing Generative AI are expected to demonstrate higher levels of agility compared to organizations relying solely on traditional decision-making approaches.

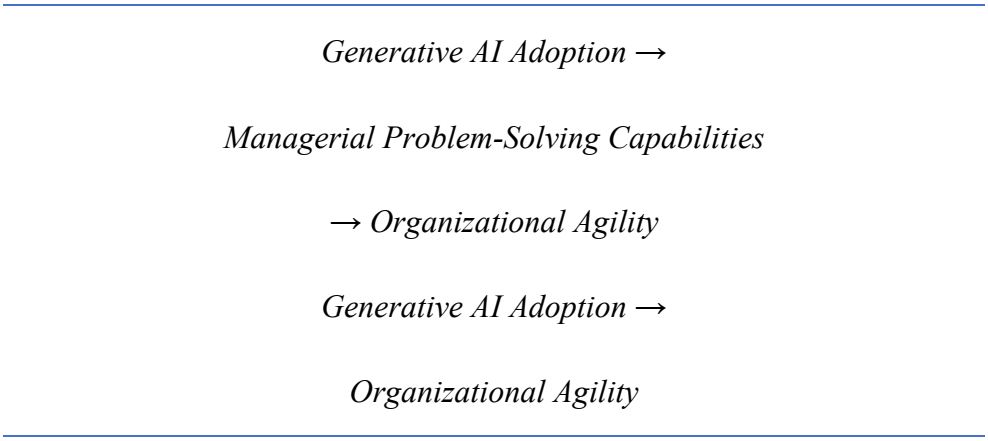
6.6 Mediating Role of Managerial Problem-Solving Capabilities

Although Generative AI provides substantial technological capabilities, technology alone does not automatically produce organizational outcomes. Dynamic Capabilities Theory emphasizes that managerial capabilities play a critical role in transforming technological resources into strategic advantages. Managerial problem-solving capability serves as an intermediary mechanism through which Generative AI influences organizational agility. AI-generated insights must be interpreted, evaluated, and implemented by managers before they can contribute to organizational adaptation and responsiveness. Managers with stronger problem-solving capabilities are better positioned to leverage AI-generated information, identify strategic opportunities, and implement effective responses to environmental changes. Therefore, managerial problem-solving capability is expected to mediate the relationship between Generative AI adoption and organizational agility.

7. Conceptual Framework

The conceptual framework illustrates the proposed relationships among the study variables. The framework positions Generative AI Adoption as the independent variable, Organizational Agility as the dependent variable, and Managerial Problem-Solving Capabilities as the mediating variable. The framework proposes that organizations adopting Generative AI technologies gain access to enhanced analytical, predictive, and knowledge-generation capabilities. These capabilities strengthen managerial problem-solving effectiveness by improving information acquisition, alternative generation, decision quality, and strategic reasoning. Improved managerial problem-solving capabilities subsequently enhance organizational agility by enabling faster responses, greater adaptability, improved flexibility, and more effective strategic execution. Additionally, Generative AI may directly influence organizational agility by improving organizational learning, innovation, and decision-making speed. Therefore, both direct and indirect relationships are proposed.

Conceptually, the framework can be represented as:



This framework forms the basis for hypothesis development and empirical testing within the study.

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8. Hypotheses

H1 Generative AI adoption positively influences managerial problem-solving capabilities.
H2 Managerial problem-solving capabilities positively influence organizational agility.
H3 Generative AI adoption positively influences organizational agility.
H4 Managerial problem-solving capabilities mediate the relationship between Generative AI adoption and organizational agility.

9. Research Methodology

9.1 Research Philosophy

The present study adopts the positivist research philosophy, which assumes that reality exists independently of the researcher and can be objectively observed, measured, and analyzed through empirical investigation. Positivism is particularly appropriate for studies that seek to establish causal relationships among variables using quantitative methods and statistical testing. The current research aims to investigate the influence of Generative AI adoption on managerial problem-solving capabilities and organizational agility by examining measurable constructs and testing theoretically derived hypotheses. Therefore, the positivist paradigm provides a suitable philosophical foundation for the study. According to Saunders, Lewis, and Thornhill (2019), positivist research emphasizes objectivity, hypothesis testing, reliability, validity, and generalizability of findings. Researchers operating within this paradigm seek to minimize personal bias and generate knowledge through systematic observation and empirical verification. In the present study, the positivist philosophy facilitates the examination of relationships among Generative AI adoption, managerial problem-solving capabilities, and organizational agility through statistical analysis. The findings generated through this approach are expected to provide objective evidence regarding the role of Generative AI in enhancing managerial effectiveness and organizational responsiveness.

9.2 Research Approach

This study employs a deductive research approach, which begins with established theories and existing empirical evidence and proceeds toward hypothesis formulation and empirical testing. The deductive approach is widely used in management and organizational research because it enables researchers to validate theoretical assumptions and examine the applicability of existing theories within new contexts. The theoretical foundation of the present study is derived from Dynamic Capabilities Theory (Teece et al., 1997) and the Technology–Organization–Environment (TOE) Framework (Tornatzky & Fleischer, 1990). These theories suggest that technological resources can enhance organizational capabilities and performance when effectively integrated into managerial processes. Based on these theoretical perspectives and prior empirical studies, a series of hypotheses are developed regarding the relationships among Generative AI adoption, managerial problem-solving capabilities, and organizational agility. The deductive approach allows the researcher to systematically test these hypotheses using quantitative data collected from managerial personnel working in organizations that utilize Generative AI technologies. Consequently, the study contributes to theory validation while simultaneously extending existing knowledge regarding AI-enabled organizational transformation.

9.3 Research Design

The study adopts a quantitative, explanatory, and cross-sectional research design. A quantitative design is appropriate because the research seeks to measure latent constructs and statistically examine the strength and significance of relationships among variables. Quantitative methods facilitate objective analysis, enhance reliability, and allow findings to be generalized across a broader population. The explanatory nature of the study is concerned with

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identifying and explaining causal relationships among variables. Specifically, the research seeks to determine whether Generative AI adoption contributes to improved managerial problem-solving capabilities and whether these capabilities subsequently enhance organizational agility. Rather than merely describing organizational phenomena, the study attempts to explain the mechanisms through which technological adoption influences organizational outcomes. Furthermore, the study utilizes a cross-sectional design in which data are collected at a single point in time. This design is appropriate because Generative AI adoption is a contemporary phenomenon, and managerial perceptions regarding its utilization can be effectively captured through a snapshot of organizational experiences. Although longitudinal designs may provide stronger evidence of causality, the cross-sectional approach offers practical advantages in terms of time, accessibility, and resource requirements while remaining suitable for theory testing and structural equation modeling.

9.4 Population of the Study

The target population for this study consists of managerial and executive personnel employed in organizations that have adopted Generative AI technologies within their operational, strategic, or decision-making processes. Specifically, the population includes senior managers, middle-level managers, executives, department heads, strategic planners, innovation managers, digital transformation specialists, and other organizational decision-makers.The selection of managerial personnel is justified because these individuals are directly involved in strategic planning, organizational problem-solving, resource allocation, and decision-making activities. Furthermore, managers are among the primary users of Generative AI applications in contemporary organizations and therefore possess relevant knowledge regarding the technology's impact on organizational processes and outcomes. To improve the generalizability of the findings, the study targets organizations operating across multiple sectors, including information technology, financial services, telecommunications, manufacturing, healthcare, education, and consulting services. The inclusion of diverse industries ensures that the findings are not restricted to a single organizational context and enhances the applicability of the results across different sectors characterized by varying levels of technological sophistication and environmental uncertainty.

9.5 Sampling Technique

The study employs stratified random sampling as the primary sampling technique. Stratified sampling is particularly suitable when the population consists of heterogeneous subgroups that may exhibit different characteristics regarding the variables under investigation. Given that Generative AI adoption varies across industries and organizational contexts, stratification ensures adequate representation of different sectors within the sample. The sampling process begins by categorizing participating organizations into industry-based strata. Subsequently, respondents are randomly selected from each stratum to ensure that all sectors have proportional representation within the final sample. This approach minimizes sampling bias and improves the accuracy and representativeness of the findings. In comparison with simple random sampling, stratified random sampling produces more precise estimates and enhances the external validity of the study by capturing the diversity of organizational experiences with Generative AI technologies.

9.6 Sample Size Determination

The sample size is determined based on recommendations for Structural Equation Modeling (SEM), particularly Partial Least Squares Structural Equation Modeling (PLS-SEM). According to Hair et al. (2022), studies involving mediation analysis and multiple latent constructs require adequate sample sizes to ensure statistical power and stable parameter

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estimation. The present study consists of three latent constructs, multiple measurement indicators, and a mediating relationship. Considering the complexity of the proposed model, a minimum sample size between 300 and 500 respondents is recommended. In addition, the study seeks to achieve a statistical power level of 0.80 at a significance level of 0.05, thereby reducing the likelihood of Type II errors. Based on these considerations, a target sample size of 450 respondents is proposed. This sample size exceeds the minimum requirements suggested in the literature and is expected to provide sufficient statistical power for hypothesis testing, mediation analysis, and structural model evaluation. Moreover, a larger sample enhances the reliability and generalizability of the findings and improves the robustness of the PLS-SEM results.

9.7 Data Collection Procedure

Primary data for the study will be collected through a structured self-administered questionnaire distributed electronically to eligible respondents. The use of an online survey instrument is appropriate because managerial respondents are geographically dispersed across multiple organizations and industries. Electronic data collection also enhances efficiency, reduces administrative costs, and facilitates rapid data compilation and analysis. The data collection process will be conducted in four stages. Initially, organizations that actively utilize Generative AI technologies will be identified through industry databases, professional networks, corporate contacts, and publicly available information. Following organizational identification, managers and executives will be invited to participate voluntarily in the study. Invitations will include information regarding the study objectives, confidentiality assurances, and participation requirements. Subsequently, questionnaires will be distributed electronically through email invitations, professional networking platforms such as LinkedIn, corporate communication channels, and industry associations. Respondents will be requested to provide informed consent before completing the survey. After data collection, all returned questionnaires will undergo a rigorous screening process to identify missing values, incomplete responses, response inconsistencies, and straight-lining behavior. Responses that fail to meet quality standards will be excluded from the final dataset to ensure data integrity and analytical accuracy.

9.8 Measurement of Variables

The study employs a structured questionnaire using a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The measurement scales are adapted from previously validated instruments to ensure content validity and reliability.

Generative AI Adoption (Independent Variable)

Generative AI Adoption refers to the extent to which organizations integrate and utilize Generative AI technologies within managerial and organizational processes. The construct captures the degree of technological implementation, utilization frequency, and strategic integration of Generative AI systems. Measurement items are adapted from Ashaari et al. (2021) and Chatterjee et al. (2022), whose scales have demonstrated strong psychometric properties in technology adoption research. Sample items include statements assessing organizational reliance on Generative AI tools, managerial use of AI-generated insights, AI-supported strategic decision-making, and integration of AI technologies into routine organizational workflows.

Managerial Problem-Solving Capability (Mediator)

Managerial Problem-Solving Capability represents the ability of managers to identify, analyze, evaluate, and resolve organizational challenges effectively. This construct reflects critical managerial competencies associated with information processing, analytical reasoning,

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alternative generation, decision quality, and solution implementation. Measurement items are adapted from the work of Mumford et al. (2000) and Heppner and Petersen (1982). Respondents will evaluate statements relating to problem diagnosis, strategic thinking, decision-making under uncertainty, and implementation effectiveness. Higher scores indicate stronger managerial problem-solving capabilities.

Organizational Agility (Dependent Variable)

Organizational Agility refers to the ability of an organization to rapidly sense, respond to, and adapt to changes in its internal and external environment. The construct encompasses responsiveness, flexibility, adaptability, and speed of strategic execution. Measurement items are adapted from the scales developed by Sharifi and Zhang (1999) and Tallon and Pinsonneault (2011). Respondents will assess their organizations' capabilities in responding to market changes, adapting to customer demands, implementing strategic decisions efficiently, and maintaining flexible organizational processes.

9.9 Data Analysis Strategy

The collected data will be analyzed using SPSS Version 29 and SmartPLS Version 4. The analysis process will be conducted in several stages to ensure the accuracy, reliability, and validity of the findings. Initially, preliminary data screening procedures will be performed to identify missing values, outliers, normality issues, and multicollinearity concerns. Although PLS-SEM does not require strict normality assumptions, examination of data characteristics remains essential for ensuring data quality and identifying potential anomalies. Subsequently, reliability analysis will be conducted to assess the internal consistency of the measurement scales. Reliability will be evaluated using Cronbach's Alpha and Composite Reliability (CR), with values exceeding 0.70 indicating acceptable reliability. These measures will confirm whether the questionnaire items consistently capture their intended constructs.The validity of the measurement model will then be assessed through convergent and discriminant validity procedures. Convergent validity will be evaluated by examining factor loadings and Average Variance Extracted (AVE). Factor loadings greater than 0.70 and AVE values exceeding 0.50 will indicate satisfactory convergent validity. Discriminant validity will be examined using the Fornell–Larcker Criterion and the Heterotrait–Monotrait Ratio (HTMT), with HTMT values below 0.85 indicating adequate construct distinctiveness. Finally, the structural model will be evaluated using Partial Least Squares Structural Equation Modeling. The analysis will focus on path coefficients (β), coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and hypothesis testing through bootstrapping procedures involving 5,000 resamples. Mediation analysis will be conducted to determine whether managerial problem-solving capability serves as an intervening mechanism between Generative AI adoption and organizational agility. The use of PLS-SEM is particularly appropriate because it effectively handles complex predictive models, mediation relationships, and latent constructs while providing robust estimates even when strict distributional assumptions are not met.

10. Results

The results are presented in four stages. First, the demographic characteristics of the respondents are summarized. Second, the measurement model is evaluated through reliability and validity assessments. Third, the structural model is assessed using path analysis and mediation testing. Finally, explanatory power and predictive relevance are reported.

10.1 Respondent Profile

A total of 450 usable responses were obtained from managerial personnel working in organizations that utilize Generative AI technologies. The demographic characteristics of the respondents are presented in Table 1.

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Table 1: Demographic Characteristics of Respondents (N = 450)

Variable	Category	Frequency	Percentage
Gender	Male	278	61.8%
	Female	172	38.2%
Experience	1–5 Years	94	20.9%
	6–10 Years	156	34.7%
	11–15 Years	122	27.1%
	Above 15 Years	78	17.3%
Industry	Information Technology	132	29.3%
	Financial Services	96	21.3%
	Manufacturing	88	19.6%
	Telecommunications	72	16.0%
	Other Industries	62	13.8%

The sample was composed primarily of male respondents (61.8%), with female respondents representing 38.2% of the sample. Most participants had between 6 and 10 years of managerial experience (34.7%), followed by 11–15 years (27.1%). The Information Technology sector constituted the largest proportion of respondents (29.3%), reflecting the relatively higher adoption of Generative AI technologies in that industry.

10.2 Preliminary Data Analysis

Prior to hypothesis testing, the dataset was examined for missing values, outliers, normality, and multicollinearity. Cases with substantial missing data were removed during the screening process. Outliers were assessed using Mahalanobis distance, and no observations exceeded the critical threshold. Skewness and kurtosis values for all constructs fell within acceptable ranges, indicating approximate normality. Variance Inflation Factor (VIF) values ranged from 1.21 to 2.34, well below the recommended threshold of 5.0, suggesting that multicollinearity was not a concern.

10.3 Measurement Model Assessment

The measurement model was evaluated through reliability, convergent validity, and discriminant validity analyses.

10.3.1 Reliability and Convergent Validity

Internal consistency reliability was assessed using Cronbach's alpha and Composite Reliability (CR), while convergent validity was assessed through factor loadings and Average Variance Extracted (AVE). The results are presented in Table 2.

Table 2: Reliability and Convergent Validity

Construct	Cronbach's α	CR	AVE
Generative AI Adoption	.914	.929	.723
Managerial Problem-Solving Capability	.903	.920	.698
Organizational Agility	.926	.939	.754

As shown in Table 2, all Cronbach's alpha values exceeded .90, indicating excellent internal consistency reliability. Composite Reliability values ranged from .920 to .939, surpassing the

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recommended threshold of .70. Furthermore, AVE values ranged from .698 to .754, exceeding the minimum criterion of .50. These results confirm satisfactory convergent validity for all constructs.

10.3.2 Discriminant Validity

Discriminant validity was evaluated using the Fornell–Larcker criterion. The square root of AVE for each construct was greater than its correlations with other constructs, indicating adequate discriminant validity (Table 3).

Table 3: Discriminant Validity (Fornell–Larcker Criterion)

Construct	GAI	MPSC	OA
Generative AI Adoption (GAI)	.850		
Managerial Problem-Solving Capability (MPSC)	.642	.836	
Organizational Agility (OA)	.618	.704	.868

Additionally, all HTMT values were below the recommended threshold of .85, providing further evidence of discriminant validity.

10.4 Structural Model Assessment

The structural model was evaluated using SmartPLS 4. Path coefficients were estimated through bootstrapping with 5,000 resamples.

10.4.1 Hypothesis Testing

Table 4 presents the results of the direct relationships among the study variables.

Table 4: Hypothesis Testing Results

Hypothesis	Relationship	β	t-value	p-value
H1	GAI → MPSC	.641	14.327	< .001
H2	MPSC → OA	.492	10.114	< .001
H3	GAI → OA	.278	5.961	< .001

The results indicate that Generative AI adoption has a significant positive effect on managerial problem-solving capability ($\beta = .641$, $p < .001$), supporting Hypothesis 1. Managerial problem-solving capability also has a significant positive effect on organizational agility ($\beta = .492$, $p < .001$), supporting Hypothesis 2. Furthermore, Generative AI adoption exerts a direct positive effect on organizational agility ($\beta = .278$, $p < .001$), supporting Hypothesis 3.

10.4.2 Mediation Analysis

The mediating role of managerial problem-solving capability was assessed using the indirect effect bootstrapping procedure recommended by Hair et al. (2022). The results are presented in Table 5.

Table 5: Mediation Analysis

Path	Indirect Effect	t-value	p-value
GAI → MPSC → OA	.315	8.244	< .001

The indirect effect of Generative AI adoption on organizational agility through managerial problem-solving capability was significant ($\beta = .315$, $p < .001$). Because both the direct and indirect effects were significant, the results indicate partial mediation, supporting Hypothesis 4.

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10.5 Explanatory Power and Predictive Relevance

The explanatory power of the model was assessed using the coefficient of determination (R^2), while predictive relevance was evaluated using Stone–Geisser's Q^2 statistic.

Table 6: Coefficient of Determination (R^2)

Endogenous Variable	R^2
Managerial Problem-Solving Capability	.411
Organizational Agility	.598

The model explains 41.1% of the variance in managerial problem-solving capability and 59.8% of the variance in organizational agility. These values indicate moderate to substantial explanatory power according to commonly accepted guidelines in PLS-SEM research. Blindfolding procedures produced positive Q^2 values for both endogenous constructs, indicating that the model possesses predictive relevance.

10.6 Summary of Findings

Overall, the results provide strong support for the proposed research model. Generative AI adoption significantly enhances managerial problem-solving capabilities, and these capabilities, in turn, contribute to higher organizational agility. The findings further demonstrate that managerial problem-solving capability partially mediates the relationship between Generative AI adoption and organizational agility, suggesting that organizations derive agility benefits from Generative AI both directly and indirectly through improved managerial cognition and decision-making effectiveness.

11. Discussion

The primary objective of this study was to investigate the influence of Generative AI adoption on managerial problem-solving capabilities and organizational agility. The findings provide substantial empirical support for the proposed conceptual model and contribute to the growing body of literature examining the strategic implications of Generative Artificial Intelligence within contemporary organizations. The results indicate that Generative AI adoption positively influences managerial problem-solving capabilities, managerial problem-solving capabilities positively influence organizational agility, and Generative AI adoption directly contributes to organizational agility. Furthermore, managerial problem-solving capability was found to partially mediate the relationship between Generative AI adoption and organizational agility. Collectively, these findings provide strong support for the assumptions of Dynamic Capabilities Theory and the Technology–Organization–Environment (TOE) Framework. The significant positive relationship between Generative AI adoption and managerial problem-solving capability suggests that organizations adopting advanced AI technologies are better positioned to enhance managerial decision-making and analytical effectiveness. This finding aligns with the work of Jarrahi (2018), who argued that artificial intelligence functions as a tool for cognitive augmentation rather than a replacement for human intelligence. Managers increasingly operate in environments characterized by information overload, uncertainty, and rapidly changing market conditions. Under such circumstances, Generative AI technologies assist managers by processing large volumes of information, synthesizing complex datasets, generating strategic alternatives, and identifying patterns that may otherwise remain unnoticed. Consequently, managers are able to devote greater attention to strategic thinking, critical evaluation, and decision implementation. The findings further support the concept of hybrid intelligence proposed by Dellermann et al. (2019), which emphasizes the collaborative relationship between human intelligence and artificial intelligence. Rather than replacing managerial judgment, Generative AI appears to complement managerial capabilities by

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enhancing information acquisition, problem diagnosis, alternative generation, and decision quality. Managers utilizing Generative AI systems are likely to possess access to broader knowledge bases and more comprehensive analytical support, thereby improving their ability to solve complex organizational problems. This outcome is particularly relevant in contemporary business environments where strategic decisions often require rapid analysis of diverse and dynamic information sources. The results also reveal a significant positive relationship between managerial problem-solving capability and organizational agility. This finding reinforces the argument that managerial competencies play a central role in determining an organization's ability to respond effectively to environmental changes. Organizational agility is fundamentally dependent upon the quality and speed of managerial decision-making. Managers who possess strong problem-solving capabilities are better equipped to identify emerging opportunities, respond to competitive threats, allocate resources effectively, and implement strategic changes in a timely manner. As a result, organizations become more responsive, adaptable, and resilient in the face of uncertainty. This finding is consistent with Dynamic Capabilities Theory, which emphasizes the importance of organizational sensing, seizing, and transforming capabilities (Teece et al., 1997). Effective managerial problem-solving contributes directly to each of these dimensions. Through superior analytical capabilities, managers can sense environmental changes more effectively. Through informed decision-making, they can seize strategic opportunities more efficiently. Through implementation and adaptation, they can transform organizational processes and structures to maintain competitiveness. Therefore, managerial problem-solving capability serves as a critical organizational capability that facilitates agility and long-term sustainability. Another important finding is the direct positive relationship between Generative AI adoption and organizational agility. This result suggests that Generative AI technologies contribute to organizational responsiveness and adaptability beyond their impact on managerial problem-solving capabilities. Organizations utilizing Generative AI systems can process information more rapidly, improve communication flows, accelerate innovation processes, and enhance organizational learning. These technological advantages enable organizations to respond more quickly to changes in customer demands, competitive pressures, technological disruptions, and market opportunities. The finding supports previous research by Verhoef et al. (2021), who emphasized the role of digital technologies in enabling organizational agility and transformation. Generative AI extends these benefits by introducing advanced content generation, predictive capabilities, knowledge synthesis, and decision-support functionalities. Through these capabilities, organizations can shorten decision cycles, improve strategic forecasting, and enhance their capacity to adapt to changing business conditions. Consequently, Generative AI emerges not merely as an operational technology but as a strategic resource that strengthens organizational competitiveness. Perhaps the most significant contribution of this study lies in the identification of managerial problem-solving capability as a mediating mechanism linking Generative AI adoption and organizational agility. The mediation analysis revealed that managerial problem-solving capability partially mediates this relationship, indicating that Generative AI contributes to organizational agility both directly and indirectly. This finding provides important theoretical insights because it demonstrates that technological investments alone are insufficient for achieving organizational benefits. Instead, the value generated by technological resources depends substantially on how managers utilize those resources within organizational decision-making processes. This result strongly supports the assumptions of Dynamic Capabilities Theory, which argues that resources create value only when they are effectively integrated, deployed, and transformed through organizational

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capabilities. Generative AI represents a valuable technological resource; however, its benefits materialize when managers leverage AI-generated insights to improve problem-solving and decision-making processes. In other words, managerial capabilities function as the mechanism through which technological potential is converted into organizational outcomes. The partial mediation effect further suggests that while Generative AI directly enhances agility through technological efficiencies, a significant portion of its influence operates through improvements in managerial cognition and problem-solving effectiveness. The findings also provide empirical support for the Technology–Organization–Environment Framework. Organizations that successfully adopt and integrate Generative AI technologies appear better positioned to develop managerial capabilities and achieve higher levels of organizational agility. This supports the notion that technological readiness and organizational support structures are essential determinants of successful technology utilization. As competitive pressures and technological disruptions continue to intensify, organizations that strategically adopt and integrate Generative AI technologies are likely to gain substantial advantages over competitors that fail to embrace such innovations. From a broader perspective, the study contributes to the emerging literature on AI-enabled management by demonstrating that the strategic value of Generative AI extends beyond automation and efficiency improvements. While much of the existing discourse surrounding AI focuses on cost reduction and process automation, the present findings suggest that Generative AI also serves as a catalyst for managerial development and organizational transformation. By enhancing managerial cognition, supporting strategic thinking, and improving organizational adaptability, Generative AI can become a critical enabler of sustainable competitive advantage in increasingly dynamic business environments. The findings also carry important implications for organizational leaders. Investments in Generative AI technologies should be accompanied by initiatives aimed at developing managerial competencies and AI literacy. Organizations that focus solely on technological implementation without investing in managerial capability development may fail to realize the full benefits of AI adoption. Therefore, leadership development programs, digital transformation strategies, and AI governance frameworks should be designed to facilitate effective human–AI collaboration. Such efforts will enable organizations to maximize the strategic value of Generative AI while maintaining the essential role of human judgment and expertise in organizational decision-making.

12. Conclusion

The rapid advancement of Generative Artificial Intelligence has transformed the technological landscape and created new opportunities for organizations seeking to enhance decision-making, innovation, and adaptability. This study examined the influence of Generative AI adoption on managerial problem-solving capabilities and organizational agility by integrating insights from Dynamic Capabilities Theory and the Technology–Organization–Environment Framework. The findings demonstrate that Generative AI adoption significantly enhances managerial problem-solving capabilities by improving managers' ability to acquire information, analyze complex situations, generate strategic alternatives, and make informed decisions. The results further reveal that managerial problem-solving capability positively influences organizational agility, enabling organizations to respond more effectively to environmental changes and competitive challenges. Additionally, Generative AI adoption directly contributes to organizational agility, highlighting the strategic importance of AI-enabled technologies in facilitating organizational responsiveness and adaptability. The mediation analysis provides further evidence that managerial problem-solving capability serves as a critical mechanism through which Generative AI creates organizational value. This

finding underscores the importance of managerial competencies in transforming technological resources into strategic outcomes. Rather than functioning solely as an automation tool, Generative AI acts as a cognitive augmentation technology that strengthens managerial effectiveness and organizational capabilities. Overall, the study contributes to both theory and practice by demonstrating that Generative AI represents a strategic organizational resource capable of enhancing managerial cognition, improving problem-solving effectiveness, and strengthening organizational agility. As organizations continue to navigate increasingly complex and uncertain business environments, the effective integration of Generative AI technologies will become a key determinant of competitive advantage, innovation capacity, and long-term organizational success.

13. Limitations

Despite its contributions, the study is subject to several limitations that should be acknowledged when interpreting the findings. First, the study adopts a cross-sectional research design in which data are collected at a single point in time. Although this design is appropriate for examining relationships among variables, it limits the ability to establish causal inferences and observe changes over time. Future studies may employ longitudinal research designs to examine the long-term effects of Generative AI adoption on managerial capabilities and organizational agility. Second, the study relies on self-reported survey data obtained from managerial respondents. While self-reported measures are widely used in organizational research, they may be susceptible to common method bias, social desirability bias, and subjective perceptions. Future research could incorporate objective organizational performance indicators, archival data, or multi-source assessments to strengthen the validity of findings. Third, the study focuses primarily on organizations that have already adopted Generative AI technologies. Consequently, the findings may not fully capture the experiences of organizations in the early stages of AI adoption or those operating in contexts with limited technological readiness. Future research could compare adopters and non-adopters to gain deeper insights into the factors influencing AI implementation and outcomes. Fourth, although the study includes organizations from multiple industries, sector-specific differences were not examined in detail. The impact of Generative AI may vary across industries due to differences in technological maturity, regulatory requirements, organizational structures, and competitive conditions. Future studies should investigate industry-specific variations to provide more context-sensitive insights. Fifth, the rapidly evolving nature of Generative AI technologies presents challenges for maintaining the long-term relevance of research findings. New technological developments, regulatory frameworks, and organizational practices may alter the relationships examined in this study over time. Continuous research is therefore necessary to understand how emerging AI capabilities influence managerial and organizational outcomes. Finally, the study examines managerial problem-solving capability as the sole mediating variable. Other organizational mechanisms, such as organizational learning, innovation capability, knowledge management, leadership effectiveness, and digital transformation maturity, may also influence the relationship between Generative AI adoption and organizational agility. Future research should explore these additional pathways to develop a more comprehensive understanding of AI-enabled organizational transformation.

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