FACTORS FOR THE ADOPTION OF GENERATIVE ARTIFICIAL INTELLIGENCE IN THE INFORMATION TECHNOLOGY SECTOR IN KLANG VALLEY MALAYSIA

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A project report submitted in partial fulfilment of the requirements for the award of Master of Project Management

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DECLARATION

I hereby declare that this project report is based on my original work except for citations and quotations which have been duly acknowledged. I also declare that it has not been previously and concurrently submitted for any other master degree or award at UTAR or other institutions.

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APPROVAL FOR SUBMISSION

I certify that this project report entitled **"FACTORS FOR THE ADOPTION OF GENERATIVE ARTIFICIAL INTELLIGENCE IN THE INFORMATION TECHNOLOGY SECTOR IN KLANG VALLEY MALAYSIA"** was prepared by **PRIYANKA HARI VISNU** has met the required standard for submission in partial fulfilment of the requirements for the award of Master of Project Management at Universiti Tunku Abdul Rahman.

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ABSTRACT

Generative Artificial Intelligence (Gen AI) is reshaping the information technology (IT) sector, driving innovation and enhancing business processes. This study investigates the factors influencing the adoption of Gen AI in the IT industry in Klang Valley, Malaysia, with two main objectives: to rank the factors driving adoption and to uncover the latent structures influencing this process. Using the Technology-Organisation-Environment (TOE) framework, the research explores technological, organisational, and environmental factors through an extensive literature review. A quantitative methodology is employed, utilising surveys with IT professionals in Klang Valley experienced in AI technologies. The collected data is analysed using descriptive statistics and factor analysis and the sampling method is purposive sampling with the 70 participants of the sampling size. The study identifies four key factors crucial for the adoption of Gen AI: (1) Technological Capability, (2) Organisational Capacity, (3) Market Responsiveness, and (4) External Factors. These factors encompass various aspects of technological infrastructure, organisational readiness, market demand, and external influences that impact AI adoption. The study also explores the transformative effects of Gen AI on IT practices, focusing on one critical components: (1) Improved Information Technology Project Performance. Gen AI adoption significantly boosts IT project performance by streamlining decision-making, automating repetitive tasks, and enhancing data-driven insights. It also fosters innovation by enabling advanced problem-solving capabilities, ultimately driving higher operational efficiency. The findings provide a roadmap for IT organisations to successfully adopt and integrate Gen AI, offering valuable insights for decision-makers and stakeholders in shaping a conducive environment for its widespread implementation. The study’s implications promise to elevate the IT sector's capabilities, improving productivity, collaboration, and innovation in the region.

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LIST OF SYMBOLS / ABBREVATIONS

Gen AI	Generative Artificial Intelligence
AI	Artificial Intelligence
IT	Information Technology
KMO	Kaiser-Meyer-Olkin
NLP.	Natural language processing
PCA	Principal Components Analysis
SPSS	Statistical Package for Social Sciences
TOE	Technology Organisation Environment
URL	Uniform Resource Locator

CHAPTER 1

INTRODUCTION

1.1 Introduction

The Information Technology (IT) industry in Klang Valley, Malaysia, is an important hub for technical innovation and economic growth in Southeast Asia. This region, which includes the capital city of Kuala Lumpur and its neighbouring metropolitan regions, has undergone remarkable technological and infrastructure developments in the last decade (*World Bank*, 2015). As global technological trends shift, one of the most transformational developments to emerge is Generative Artificial Intelligence (Generative AI). Generative AI, a subtype of artificial intelligence, uses machine learning algorithms to create new material, ranging from writing and graphics to sophisticated data models, that resembles human creativity (Lv, 2023). Its potential to revolutionise businesses is especially relevant in the IT industry, which is distinguished by its quick rate of development and important role in promoting digital transformation (Lv, 2023).

Generative AI is a fast-expanding discipline that has the potential to transform several sectors, including information technology. Generative AI opens up tremendous opportunities for IT firms in Malaysia's Klang Valley by developing wholly new data or content (Mondal et al., 2023). However, a number of factors may impact this technology's adoption. This study project seeks to identify and analyse the important variables influencing the adoption of generative AI in the Klang Valley IT sector (Mondal et al., 2023).

The adoption of Generative AI in the IT sector in Klang Valley is an intriguing convergence of technology, economics, and organisational behaviour (Soni, 2023). Understanding the factors driving or impeding the integration of this technology necessitates a multifaceted approach that considers not only technological capabilities and advancements, but also economic incentives, regulatory environment, and organisational readiness in the region (Soni, 2023).

Natural language processing (NLP), computer vision, and generative adversarial networks are all examples of generative AI technology. These technologies enable systems to create fresh and unique content, automate difficult processes, and improve decision-making using predictive analytics (Lawton, 2024). The capacity of

IT firms in the Klang Valley to capitalise on these improvements can result in significant advantages in efficiency, innovation, and competitiveness (Lawton, 2024). The region's strong technical infrastructure, which includes high-speed internet and superior computer capabilities, creates an ideal setting for the adoption of such complex technology. The problem, however, is integrating Generative AI into current systems and workflows, which takes substantial technical skill and adaptability (Reuters, 2024).

The economic advantages of using Generative AI are enormous. Businesses may save money and increase productivity by automating mundane operations, improving data analytic skills, and allowing new types of content production. IT enterprises in Klang Valley that service both local and foreign clients may improve their market position and acquire high-value contracts by offering cutting-edge AI solutions (Chui et al., 2023). Furthermore, Malaysia's strategic position as a developing tech hub in Southeast Asia allows IT businesses to capitalise on regional and worldwide demand for AI-driven solutions (Kcomadmin, 2024). Government incentives, such as tax reductions and financing for IT firms, sweeten the bargain, making Generative AI a compelling prospect for many enterprises (Kcomadmin, 2024).

Moving on, the regulatory landscape for AI technology is changing worldwide, and Malaysia is no exception. The Malaysian government has been aggressive in developing rules that promote technology innovation while maintaining ethical standards and data protection. The National AI Framework and other key efforts demonstrate a commitment to creating a favourable environment for AI research (Walter, 2024). It is critical for Klang Valley firms to comprehend and navigate this regulatory environment. Compliance with data protection legislation, intellectual property rights, and ethical principles has an impact on Generative AI deployment and general acceptance (Walter, 2024).

Adopting Generative AI is more than just a technological problem; it's also about organisational preparedness. Companies in the Klang Valley must assess their internal capabilities, which include their workforce's skill sets, resource availability, and the alignment of their organisational culture to technology innovation (Team, 2023). Generative AI necessitates a shift in mentality towards data-driven decision-making and a willingness to experiment with new technologies. Organisations must invest in employee training and upskilling, promote an innovative culture, and form cross-functional teams capable of maximising AI's potential (Team, 2023).

Notwithstanding the high promises, various obstacles may limit the implementation of Generative AI. Technical challenges, such as integrating AI systems with legacy infrastructure and guaranteeing data quality, are important obstacles (Renz, 2023). Furthermore, the high expenses of developing and adopting AI technology may be prohibitive for small businesses. There is also the problem of dealing with possible ethical considerations, such as biases in AI-generated material and the effects of automation on employment (Renz, 2023).

On the other hand, the implementation of Generative AI in Klang Valley creates tremendous prospects for development and innovation. The capacity to use AI to create creative solutions, improve operational efficiency, and drive new business models may help firms stay at the forefront of technological innovation. Collaboration with regional academic institutions and research centres can also help to speed the development and deployment of Generative AI technology (Ng et al., 2023).

Thus, almost any form of material may be created with generative AI in a range of applications. Modern advancements, such as GPT, which can be customised for a variety of applications, are making technology more accessible to individuals of various backgrounds (Lawton, 2023). Here are a few examples of generative AI applications: Chatbots can help with technical support and customer service, deepfakes can impersonate individuals or groups, films and instructional materials can be dubbed in multiple languages, term papers, resumes, dating profiles, and email responses can be written in a photorealistic style, product videos can be enhanced, new medication combinations can be tested, tangible goods can be created, and structures can be built (Lawton, 2023).

Finally, the adoption of Generative AI in the IT industry of Klang Valley, Malaysia, is driven by a complex interaction of technological, economic, regulatory, and organisational variables. As businesses in the area traverse this changing terrain, they must handle both the difficulties and possibilities posed by Generative AI in order to fully realise its promise and create long-term success. The continued advancement of AI technology, together with supporting policies and a forward-thinking strategy, will influence the future trajectory of Klang Valley's IT sector, positioning it as a worldwide tech leader.

1.2 Research Background

The study of Generative Artificial Intelligence (Gen AI) adoption in the Klang Valley's Information Technology (IT) industry is critical because of the deep consequences for technical innovation, economic growth, and competitive posture. Klang Valley, which includes Kuala Lumpur and its neighbouring areas, is a thriving digital cluster with huge potential for harnessing cutting-edge technology. Understanding the variables driving Generative AI adoption in this setting provides valuable insights that can drive development and innovation (The Sun, 2024).

1.2.1 Technological Advancements and Innovation

Generative AI is a significant advancement in artificial intelligence, allowing computers to produce new and creative material, such as writing, graphics, and data models, with no human participation. The incorporation of Generative AI can speed technical breakthroughs and offer up new possibilities for innovation in Klang Valley's IT industry, which is known for its emphasis on innovation and technological capability (SAP, 2024). Studying this adoption gives vital insights into how firms may use these technologies to stay competitive, produce game-changing solutions, and push the frontiers of what is technically feasible. This expertise is essential for retaining a leading position in the continually changing global technology scene.

1.2.2 Economic Impact and Growth

The economic consequences of using Generative AI are considerable. Generative AI has the ability to increase productivity while lowering operating costs by automating complicated processes, improving data analysis, and developing new business models. Understanding the economic benefits and constraints of Generative AI adoption will help Klang Valley businesses make informed strategic decisions that promote development and profitability. This report is critical for governments, corporate leaders, and investors looking to maximise their technological resources and investments. It also aids in the identification of possible economic prospects, such as new income sources and cost-cutting technologies, that can enhance the region's economic development and global competitiveness (Chui et al., 2023).

1.2.3 Strategic Competitive Advantage

In a globalised economy, having a strategic advantage is critical to corporate success. Generative AI gives businesses a competitive advantage by allowing them to improve

services, optimise operations, and develop unique value propositions. For IT organisations in Klang Valley, researching the variables affecting Generative AI adoption aids in understanding how to use these technologies to differentiate themselves in a competitive market. Insights from this report may help businesses develop efficient AI integration plans, ensuring they capitalise on the newest breakthroughs to preserve and grow their market positions (Thought Leadership, 2023).

1.2.4 Regulatory and Ethical Considerations

Adoption of Generative AI raises a number of regulatory and ethical concerns. In Malaysia, the government has developed frameworks and rules to oversee the development and deployment of artificial intelligence technology. Understanding these restrictions and the ethical implications of AI is critical for firms seeking to ethically implement Generative AI (Said, 2023). This study emphasises the significance of successfully navigating the legal framework, guaranteeing compliance, and resolving ethical issues about data privacy, algorithmic biases, and the impact on employment. It outlines a strategy for organisations to comply with legal and ethical requirements while reaping the benefits of AI.

1.2.5 Organisational Readiness and Capacity Building

Generative AI adoption needs organisational preparedness, which includes the necessary skill sets, resources, and a culture that values innovation. By exploring the elements that determine this readiness, the study assists Klang Valley organisations in assessing their preparation for AI integration. It emphasises the need of training personnel, investing in technology infrastructure, and cultivating a creative culture (Uren & Edwards, 2023). This study's findings can help firms build internal capacity and create an atmosphere favourable to effective AI adoption.

1.2.6 Future Directions and Policy Formulation

Ultimately, research on Generative AI acceptance gives useful information for developing future policies and strategic efforts. It assists policymakers in understanding the demands and difficulties of the IT sector, directing the establishment of supporting frameworks and incentives to stimulate technology adoption and innovation (Renz, 2023). Furthermore, it may teach educational and research

institutions on the skills and knowledge needed to support the sector's growth, maintaining a consistent stream of talent and expertise.

In conclusion, the significance of researching Generative AI adoption in Klang Valley's IT industry stems from its ability to foster technical development, economic growth, competitive advantage, and responsible innovation. This study serves not just businesses and governments, but also the larger objective of establishing Klang Valley as a worldwide digital sector leader.

1.3 Problem Statements

The swift advancement of technology, especially the emergence of Generative Artificial Intelligence (AI), has generated both possibilities and difficulties in the Information Technology (IT) industry. Although AI has shown considerable promise to revolutionise several facets of corporate operations, its implementation in the IT sector is a multifaceted challenge shaped by diverse technological, organisational, and environmental elements (Ramadan, 2024). Despite the increasing interest in generative AI, there is an absence of comprehensive frameworks to facilitate its efficient integration into IT projects (Ramadan, 2024).

The issue stems from a lack of comprehension of the critical aspects that affect the adoption of generative AI in IT, and how these characteristics may be utilised to improve IT project performance (Prasetyo et al., 2025). The existing literature and practices lack a definitive framework to fully leverage generative AI for enhancing IT project results, particularly regarding efficiency, cost-effectiveness, and overall performance (Prasetyo et al., 2025). This research seeks to address this gap by examining the determinants influencing the adoption of generative AI and assessing its capacity to enhance IT project performance using a clearly articulated methodology (Prasetyo et al., 2025).

By addressing these shortcomings, this research seeks to present a methodology that will aid IT businesses in effectively implementing generative AI to maximise IT project performance, providing a more competitive and innovative approach in the fast expanding IT landscape (Ramadan, 2024).

1.4 Research Questions

The following are the study's research questions:

1. What are the factors for the adoption of generative artificial intelligence in the information technology sector?
2. What is the potential of generative artificial intelligence in the information technology sector to achieve improved information technology project performance?

1.5 Research Aim

To propose a framework for achieving improved information technology project performance through the adoption of generative artificial intelligence in the information technology sector, as influenced by technological, organisational, and environmental dimensions.

1.6 Research Objectives

The following research objectives are developed to fulfil the above-mentioned study aim:

1. To investigate the factors for the adoption of generative artificial intelligence in the information technology sector.
2. To investigate the potential of generative artificial intelligence in the information technology sector for achieving improved information technology project performance.

1.7 Research Scopes

This study's research focus includes the systematic gathering and analysis of field data pertaining to Malaysia's Information Technology (IT) industry. The scope of research for the limitation of respondent is only for IT department. Data was collected using a structured questionnaire survey directed at members of the local IT community employed in diverse organisations around the Klang Valley region of Malaysia. Participants were chosen from various management tiers, encompassing upper, middle, and lower management, with differing degrees of professional experience, notably those with less than or more than five years in the IT industry. The criteria for participant inclusion were established based on their active involvement with

Generative Artificial Intelligence (AI), without any other restrictions or requirements for participation.

1.8 Research Justifications

In the rapidly advancing field of Information Technology (IT), Generative Artificial Intelligence (AI) has surfaced as a groundbreaking technical innovation capable of transforming several facets of company operations. The use of generative AI offers improved functionalities for process automation, content creation, and decision-making enhancement via machine learning models. Nonetheless, despite its potential advantages, the integration of generative AI within the IT industry in Klang Valley, Malaysia, reveals inconsistencies among companies and industries, with substantial obstacles impeding its extensive adoption.

This study examines the many aspects affecting the adoption of generative AI in the IT industry of Klang Valley, Malaysia. The effective use of generative AI can provide significant consequences, such as increased operational efficiency, heightened innovation, cost reductions, and improved service delivery. Recognising and mitigating the barriers to adoption may significantly improve the sector's competitiveness and innovation by facilitating the implementation of more data-driven, automated, and efficient business operations.

Previous studies have examined several aspects of AI, encompassing its promise, limitations, and general acceptance across numerous sectors. Nonetheless, a significant vacuum persists in the research concerning the precise criteria that affect the acceptability and successful integration of generative AI inside the IT sector. A significant portion of current research has concentrated on general AI adoption patterns, resulting in a lack of insight into the specific issues affecting the adoption of generative AI in Malaysia.

This study examines the primary facilitators and obstacles to the use of generative AI in IT enterprises within Klang Valley. The report used a quantitative research methodology to uncover the key elements influencing AI adoption. The results will offer critical insights to assist corporations, politicians, and academics in formulating plans to promote the extensive use of generative AI in the area.

Comprehending the dynamics of generative AI adoption is essential for practitioners and policymakers as Malaysia experiences swift digital change. This study corresponds with the overarching objectives of promoting innovation, technical

progress, and sustainable economic development in the IT industry. By identifying the characteristics that facilitate or obstruct AI adoption, stakeholders may formulate tailored interventions and training programs to assist businesses in effectively addressing the issues related to generative AI integration.

Moreover, the findings from this study can guide subsequent research on pertinent subjects, including AI ethics, the incorporation of developing technologies, and the effects of generative AI on small and medium-sized firms (SMEs) in Malaysia. The findings will provide a basis for further investigation into the impact of generative AI on Malaysia's IT sector and its enhancement of global competitiveness.

1.9 Research Design and Methodology

This research will use a quantitative methodology to examine the determinants affecting the adoption of generative artificial intelligence (AI) within the information technology (IT) industry in Klang Valley, Malaysia. Computerised questionnaires will gather primary data from participants at various tiers within IT businesses, from entry-level employees to senior management. The structured surveys will examine critical elements like technology preparedness and organisational culture, as well as perceived advantages and obstacles associated with the use of generative AI.

Secondary data will be utilised to augment the source data. This will encompass materials such as academic journals, books, industry reports, and pertinent papers, offering a comprehensive background and substantiating the interpretation of findings. The study seeks to deliver a thorough understanding of the factors affecting AI adoption and its potential influence on IT project performance in the area by integrating both primary and secondary data.

1.10 Chapters Organisation

The organisation of chapters must conform to a logical and consistent structure. The research is structured into five principal chapters, detailed as follows:

Chapter 1: Introduction

This chapter presents the research by outlining the setting and backdrop of the investigation. The document encompasses the problem statement, research questions, aims and objectives, scope, and justification of the study. It outlines the study strategy

and methods, justifies the use of a quantitative approach, and specifies the structure of the next chapters.

Chapter 2: Literature Review

This chapter offers a thorough examination of the literature about the deployment of generative AI in the IT sector. It consolidates current research and examines the determinants of AI adoption, including technological, organisational, and environmental aspects. Principal subjects encompass AI preparedness, advantages, obstacles, and impediments to implementation within the IT sector. A comprehensive examination of pertinent frameworks and models will be provided.

Chapter 3: Research and Methodology

This chapter outlines the research strategy and technique employed to fulfil the study's goals and objectives. The text outlines the data-collecting methodology, detailing the justification for the use of electronic questionnaires, the intended sample population, and the analytical methodologies utilised. The chapter elucidates the use of secondary data to augment primary results.

Chapter 4: Result and Discussion

This chapter delineates the results derived from the study of the survey replies. It analyses the findings, emphasising the principal aspects affecting the adoption of generative AI in the Klang Valley IT industry. The findings are analysed concerning the study objectives, and comparisons with existing literature are made to discern trends, insights, and implications.

Chapter 5: Conclusions and Recommendations

This chapter encapsulates the study findings and examines their implications for comprehending the adoption of generative AI inside the IT sector. The study outlines its limitations and offers recommendations for industry practitioners and future research endeavours. Recommendations for surmounting obstacles to adoption and improving AI integration within the IT sector are also provided.

Every chapter must provide a seamless transition to the next, producing a unified narrative that successfully illustrates the progression and insights of the project.

1.11 Conclusion

This introductory chapter establishes the context for examining the determinants affecting the adoption of generative artificial intelligence (AI) within the Information Technology (IT) sector in Klang Valley, Malaysia. As digital technologies, especially AI, advance rapidly, comprehending the incentives and obstacles related to the use of generative AI in IT organisations is essential. The incorporation of generative AI has the capacity to markedly improve corporate operations, ranging from enhancing decision-making to automating intricate jobs. This chapter elucidates the background of AI adoption in Malaysia's IT industry, delineates the advantages of utilising generative AI, and exposes the deficiencies in existing information that this study intends to rectify. The next chapters will analyse the particular elements that either promote or hinder AI adoption in the sector. The study aims to offer significant insights that can assist businesses, legislators, and industry leaders in effectively integrating generative AI to improve IT project performance.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

Malaysia's Klang Valley Information Technology (IT) industry is at a tipping point, preparing to capitalise on the revolutionary potential of Generative Artificial Intelligence (AI). Define Generative AI and Its Relevance to the IT Sector. Generative Artificial Intelligence (Generative AI) is a transformational subset of AI technology that uses powerful machine learning algorithms to create new, previously viewed material, including text, photos, videos, and data models (Lv, 2023; Lawton, 2024). Unlike traditional AI, which is primarily concerned with categorising and analysing data, generative AI is intended to generate totally new types of material based on patterns discovered from current data. Generative Adversarial Networks (GANs), natural language processing (NLP) approaches, and machine learning frameworks are some of the AI models that make up its core processes (Lv, 2023; Lawton, 2024).

2.2 Why Generative Artificial Intelligence in the Information Technology Sector?

The use of Generative Artificial Intelligence (Generative AI) has garnered considerable interest across several sectors, particularly within the Information Technology (IT) industry. Generative AI, including technologies like generative adversarial networks (GANs), natural language processing (NLP), and machine learning models, is revolutionising commercial operations by producing fresh material, enhancing procedures, and refining decision-making (Lv, 2023). The adoption of generative AI is impacted by several aspects across technical, economic, socio-cultural, and regulatory realms (Lv, 2023). This literature review analyses these characteristics and their ramifications for enterprises, namely within the IT industry.

Generative AI is especially beneficial for automating monotonous, labour-intensive activities prevalent in IT operations (Sundararajan, 2024). AI may be utilised for code development, bug identification, and software testing. These activities often need substantial manual labour; however, generative AI models, such as generative adversarial networks (GANs), may independently generate code or identify software

flaws by analysing extensive datasets. This automation enhances productivity and minimizes human error, enabling IT experts to concentrate on their more intricate and strategic responsibilities (Sundararajan, 2024).

Generative AI lowers operational expenses by automating jobs and optimising workflows. The technology enables IT organisations to reduce resource waste and enhance operations, resulting in cost savings (Takyar, 2024). Furthermore, AI can optimise resource management by forecasting the demand for computational power and storage and hence dynamically changing infrastructure requirements. Generative AI enhances operational efficiency, accelerating time-to-market for new goods and services and enabling IT organisations to fulfil client expectations more swiftly and effectively (Takyar, 2024).

Generative AI promotes creativity by facilitating the development of novel software solutions, tools, and technologies. It can create novel algorithms, build innovative systems, or construct user interfaces, facilitating creative advancements in IT product development (Kumar et al., 2024). For instance, GPT-3, a robust language model, has been employed to produce human-like writing for customer service, whereas DALL-E, another AI model, is capable of generating realistic visuals from textual descriptions. These AI-driven advancements are expediting IT progress and empowering organisations to provide innovative services and solutions (Kumar et al., 2024).

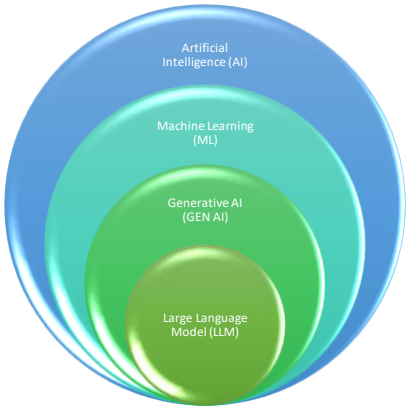


Figure 2.1: Generative AI concept

Generative AI is profoundly transforming the IT industry. Its capacity to automate processes, augment decision-making, decrease expenses, stimulate innovation, and

boost client experience renders it an indispensable asset for contemporary IT firms. As AI advances, its incorporation into IT operations is expected to increase, enhancing efficiency and competitive advantages. The integration of generative AI will be essential for IT organisations striving to remain in the front of technical progress in a more digital landscape. Above figure 2.1 can best describe how the concept integrated.

2.3 Technology-Organisation-Environment (TOE) Framework

The TOE framework, created by Tornatzky and Fleischer (1990), is a well-established model that offers an extensive array of criteria for comprehending and forecasting the probability of technological adoption. The concept asserts that the adoption of innovations, including generative artificial intelligence, is determined by three principal factors: technological characteristics, organisational context, and environmental influences.

The technological environment highlights critical elements, such as perceived utility and simplicity of use, which affect organisations' perceptions of the advantages and usability of generative AI. Compatibility with current systems, technological capabilities, and the comparative benefit of AI solutions are crucial factors influencing organisations' adoption of AI technology (Almogren et al., 2024). The capacity to test AI solutions prior to comprehensive implementation through trialability enhances the probability of successful integration (Almogren et al., 2024).

The organisational context emphasises internal elements, like the organisation's preparedness for change and its absorptive capacity, which influences its ability to absorb and integrate new technologies effectively (Yildiz et al., 2024). Support from top management and the presence of trained human resources are essential for promoting AI adoption. Large organisations, possessing greater resources, are better positioned to deploy generative AI owing to their scale and financial capabilities. Additionally, a proactive organisational culture focused on innovation significantly facilitates AI adoption (Yildiz et al., 2024).

The environmental context emphasises external issues, like market demand and competitive pressure. In the face of increasing competition, organisations must use generative AI to improve efficiency, foster creativity, and increase product offerings—making it a strategic imperative (Rana et al., 2024). Government assistance, via rules and incentives, affects adoption by mitigating the financial and operational risks linked to AI integration (Rana et al., 2024).

The main factors within each context of the TOE framework that affect the adoption of generative artificial intelligence are encapsulated in the subsequent table:

Table 2.1: TOE Framework Factors

Dimension	Adoption Factors
Technological	- Perceived Usefulness
	- Perceived Ease of Use
	- Technology Optimism
	- Technological Capability
	- Compatibility
	- Relative Advantage
	- Trialability
	- Observability
Organisational	- Organisational Scale
	- Organisational Readiness
	- Absorptive Capacity
	- Top Management Support
	- Human Resources
	- Managerial Support
Environmental	- Market Demand
	- Competitive Pressure
	- Government Support
	- Trading Partner Readiness

The interrelationships between the three contexts of the TOE framework and how they influence the adoption of Gen AI can be illustrated by the following diagram:

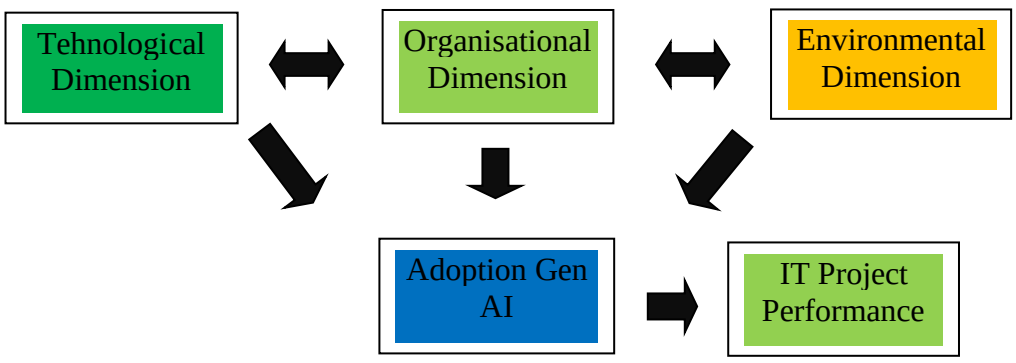


Figure 2.2: Interrelationships of TOE Framework

The TOE framework has been widely applied in studies on adopting various technologies, including Generative Artificial Intelligence. For example, Mihai & Dutescu, (2024), used the TOE framework to investigate the factors influencing the adoption of AI in accounting and audit sector, and after many research then found where, Wael AL-khatib (2023) applied the TOE framework to drivers of generative artificial intelligence to fostering exploitative and exploratory innovation: A TOE framework.

In conclusion, the TOE framework provides a good theoretical platform for understanding the complex interaction of factors that drive organisational technology adoption of Generative AI. By examining the technological, organisational, and environmental dimensions, researchers may get a more thorough comprehension of the aspects that affect the adoption of generative AI in the IT sector.

2.4 Factors for the Adoption of Generative Artificial Intelligence in the Information Technology Sector

The TOE framework provides a comprehensive view of the deployment of generative artificial intelligence (AI) in information systems. Essential elements of the technical dimension encompass perceived utility, perceived simplicity of use, technology optimism, technical capacity, compatibility, relative advantage, trialability, and observability. These factors are essential in assessing and incorporating generative AI technology into current systems.

The decision-making process is also influenced by other factors within the Organisational dimension. The factors encompass the organisation's scale, its preparedness for change, its absorptive capacity, the extent of support from senior leadership, the availability of trained personnel, and the amount of management engagement in promoting AI adoption.

To sum up, the Environmental Dimension factors show that things like industry standards, competitive pressure, regulatory support, trade partner readiness, and overall market demand have a big impact on a company's choice to use generative AI in its information systems. By looking at all of these factors in the context of the Theory of Planned Behaviour (TPB) and the TOE framework, we can learn more about

the many outside factors that affect people's decisions about whether to use generative AI technologies.

2.4.1 Technological Dimension

The technological aspect entails a set of eight essential factor:

2.4.1.1 Perceived Usefulness

Perceived usefulness is the extent to which an individual feels that utilising a specific technology would improve their work performance. Within the realm of generative artificial intelligence (AI) in information systems, perceived usefulness pertains to the degree to which users think that the integration of AI technologies will enhance their productivity, decision-making abilities, and general efficacy in information processing activities (Lu et al., 2024).

Research indicates that perceived utility is a critical determinant affecting the adoption of AI and other advanced technologies in corporate operations. Users are more inclined to adopt and incorporate generative AI into their workflows when they recognise that it is a beneficial instrument for job automation, insight generation, and innovation enhancement (Saihi et al., 2024).

2.4.1.2 Perceived Ease of Use

Perceived ease of use refers to the extent to which an individual feels that utilising a specific technology will be effortless (E. Koh et al., 2010). Perceived Ease of Use (PEOU) is a crucial factor influencing the adoption of generative artificial intelligence (AI) in the Information Technology (IT) sector. In the IT sector, where innovation and efficiency are paramount, PEOU can significantly impact the willingness of professionals to integrate generative AI tools into their workflows. Key factors influencing PEOU include user-friendly interfaces, ease of integration with existing systems, and the availability of comprehensive training and support. When generative AI tools are intuitive and require minimal technical expertise, adoption rates tend to be higher. Moreover, seamless interactions between AI systems and current IT infrastructures foster trust and confidence among users (Alwi & Khan, 2024). As generative AI tools continue to evolve, making them more accessible and less complex will be essential for accelerating their acceptance in the IT sector, ultimately driving innovation and improving operational efficiency (Alwi & Khan, 2024).

2.4.1.3 Technology Optimism

Technological optimism is crucial for the adoption of generative artificial intelligence (AI) within the Information Technology (IT) sector. It denotes the optimistic conviction that technology innovations, including generative AI, will yield substantial enhancements in productivity, efficiency, and creativity (Cologna et al., 2024). In the IT sector, workers that possess a positive outlook on the possibilities of AI are more inclined to adopt and incorporate these technologies into their workflows. Crucial elements that promote technological optimism encompass prior favourable encounters with technology, the anticipated efficacy of AI in addressing intricate issues, and the swift progress in AI capabilities (Ramge et al., 2023). IT workers are more inclined to employ AI tools when they see that these technologies may augment their capabilities by automating mundane chores, facilitating innovative solutions, and enhancing decision-making processes. The ongoing demonstration of practical advantages of generative AI can expedite its mainstream adoption and integration within IT organisations by promoting a culture of technological optimism (Ramge et al., 2023).

2.4.1.4 Technological Capability

Technology capability is a key factor in the adoption of generative artificial intelligence (AI) in the Information Technology (IT) sector. It refers to an organisation's ability to develop, implement, and leverage AI technologies effectively (Singh et al., 2024). The presence of sophisticated IT infrastructure, including high-speed internet, robust processing power, and cloud storage, is crucial for the deployment of AI technologies (Lv, 2023). Information Technology companies need access to sophisticated computer systems to facilitate the training and implementation of Generative AI models, which are often resource-intensive and necessitate substantial data (Ng et al., 2023). Organisations with obsolete or insufficient infrastructure may have difficulties in efficiently implementing AI solutions, whereas those with advanced systems are more well positioned to incorporate AI (Lv, 2023).

2.4.1.5 Compatibility

According to Rogers (2003), compatibility denotes the extent to which a novel technology aligns with an organisation’s established principles, historical experiences, and present requirements (Moon, 2016). In the IT sector, where organisations

frequently rely on intricate legacy systems, compatibility can facilitate or obstruct the integration of new technologies, such as generative AI. For effective integration, AI solutions must operate harmoniously with current IT ecosystems, including cloud platforms, databases, and corporate applications. Factors influencing technological compatibility include interoperability with existing systems, integration simplicity, and the capacity to grow AI solutions without interrupting ongoing operations (Katta, 2024). When generative AI aligns with current technologies, it diminishes the necessity for expensive and labour-intensive renovations, thereby enhancing the appeal of adoption. Ensuring technological compatibility enhances the efficiency of AI implementation and increases user trust in its dependability and efficacy within existing workflows (Katta, 2024).

2.4.1.6 Relative Advantage

Relative Advantage denotes the anticipated benefits of using generative artificial intelligence (AI) compared to current technologies or practices in the Information Technology (IT) sector (Felemban et al., 2024). It emphasises how AI may produce superior results, including increased efficiency, creativity, and cost reductions. In information technology, generative AI has substantial benefits, including the automation of intricate activities, enhancement of decision-making via predictive analytics, and expedited product creation through sophisticated simulations (Füller et al., 2022).

2.4.1.7 Trialability

Trialability denotes the degree to which generative artificial intelligence (AI) may be tested on a restricted scale before comprehensive implementation. In the information technology (IT) industry, trialability mitigates perceived risks and enables organisations to evaluate the value and efficacy of AI before committing to extensive adoption (Mannummel & Jerome, 2024). Providing pilot programs, testing environments, or modular AI tools allows IT workers to investigate AI functionalities in practical situations without interfering with essential operations. When AI technologies are readily tested, organisations may assess their performance, optimise integrations, and measure user adoption. This gradual method cultivates trust in the technology, facilitating broader acceptance. High trialability promotes

experimentation and enhances the probability of successful AI integration (*Ai-Enhanced Pilot training and simulation* 2024).

2.4.1.8 Observability

Observability refers to the extent to which the results of adopting generative artificial intelligence (AI) are visible to others within the organisation. In the Information Technology (IT) sector, observable outcomes, such as increased productivity, enhanced decision-making, and innovative solutions, encourage further adoption (MW Team, 2024). Visible, effective AI deployments among employees and stakeholders provide a ripple effect, enhancing confidence and enthusiasm in the technology. Favourable outcomes for early adopters provide a compelling incentive for others to investigate AI solutions, expediting broader acceptance and integration (Cooper & Brem, 2024).

2.4.2 Organisational Dimension Factors

The organisational dimension consist a set of eight crucial factors:

2.4.2.1 Organisational Scale

The scale of an organisation significantly influences the adoption of generative artificial intelligence (AI) within the information technology (IT) industry. More substantial organisations, possessing greater resources, may allocate investments towards AI technology, infrastructure, and training, facilitating wider implementation (Lee & Xia, 2006). They may possess the ability to conduct large-scale AI experiments, implement them across several departments, and evaluate their effects more efficiently. Smaller organisations may have difficulties owing to constrained resources; however, they can nonetheless implement AI in focused, economical ways. The scale of an organisation influences the velocity, breadth, and efficacy of AI integration (Lee & Xia, 2006).

2.4.2.2 Organisational Readiness

Organisational preparedness is a crucial determinant in the implementation of generative artificial intelligence (AI) in the information technology (IT) industry. It pertains to an organisation's readiness to embrace and assimilate new technologies, encompassing its culture, infrastructure, and resources (Palade & Carutasu, 2023). An

organisation prepared for AI adoption often possesses supportive leadership, a proficient staff, and a technological infrastructure capable of integrating new technologies. Organisational preparedness includes well-defined strategies for AI integration, adequate budget allocation, and the ability to manage change efficiently. When an organisation exhibits substantial preparedness, it can effortlessly integrate generative AI, resulting in improved outcomes and more fluid transitions (Burlage, 2024).

2.4.2.3 Absorptive Capacity

Absorptive capacity is an organisation's capability to identify, integrate, and use external information and innovations, including generative artificial intelligence (AI), to enhance its processes and results (Cohen & Levinthal, 1990). It need a proficient staff, a culture that promotes learning, and the infrastructure to assimilate and adapt AI solutions. Organisations possessing robust absorptive ability may swiftly assimilate new AI insights, tailor them to their requirements, and incorporate them into existing systems, therefore augmenting innovation and sustaining competitive advantage. (Cohen & Levinthal, 1990).

2.4.2.4 Top Management Support

Support from top management is essential for the effective implementation of generative artificial intelligence (AI) in the Information Technology (IT) sector. It denotes the proactive engagement and dedication of senior leadership in advancing AI projects, allocating essential resources, and fostering organisational cohesion (Korzyński et al., 2024). When senior management endorses AI adoption, they facilitate the establishment of a vision for AI integration, commit resources, and guarantee that AI initiatives are prioritised inside the organisation. Their support cultivates a culture of creativity and risk-taking, motivating other employees to adopt new technology. In the absence of robust leadership and support, AI adoption may encounter resistance, resource scarcity, and inadequate strategy alignment, eventually impeding its success (Korzyński et al., 2024).

2.4.2.5 Human Resources

Human resources (HR) is crucial in the implementation of generative artificial intelligence (AI) in the Information Technology (IT) sector. The HR department is

tasked with ensuring the organisation have the requisite personnel and skills to effectively integrate and utilise AI technology (Aon, 2024). This includes the recruitment of AI specialists, the enhancement of current employees' skills via training initiatives, and the promotion of a culture of perpetual learning. Furthermore, HR promotes cooperation between technical and non-technical departments by ensuring that AI projects are in accordance with organisational objectives. A well-prepared HR department facilitates AI adoption by ensuring staff are both technically proficient and open to change and innovation; hence, enhancing the overall success of AI initiatives (Gartner, 2024).

2.4.2.6 Managerial Support

Managerial assistance is an essential determinant in the implementation of generative artificial intelligence (AI) within the Information Technology (IT) sector. It denotes the proactive engagement and support from middle management in executing and advocating for AI projects inside their teams (Billion, 2024). Managers are essential in connecting top leadership with front-line staff, ensuring that AI implementation corresponds with organisational goals and is conveyed effectively across departments. Their assistance aids in resolving issues, enabling training, and supplying essential resources for AI integration. Managers cultivate an innovative culture, promoting experimentation and assisting staff in adapting to new technology. In the absence of robust management backing, even the most effective AI solutions may encounter opposition or fail to realise their maximum potential (Al Daboub et al., 2024).

2.4.3 Environmental Dimension Factors

The environmental dimension have a set of four important factors:

2.4.3.1 Market Demand

The adoption of generative artificial intelligence (AI) in the Information Technology (IT) sector is heavily influenced by market demand. As enterprises encounter intensifying competition and changing consumer requirements, the necessity for creative, efficient, and scalable AI solutions escalates (Kumar et al., 2024). Consequently, organisations are more inclined to implement generative AI technologies to maintain competitiveness, improve consumer experiences, and stimulate growth. Market demand frequently compels IT businesses to prioritise AI

development, incorporate AI into their goods and services, and adjust to market developments. Robust market demand for AI-driven solutions compels organisations to invest in requisite infrastructure, people, and resources to fulfil consumer expectations and leverage emerging possibilities (Haefner et al., 2023).

2.4.3.2 Competitive Pressure

Competitive pressure is a crucial determinant in the implementation of generative artificial intelligence (AI) within the Information Technology (IT) sector. As organisations encounter heightened rivalry, especially from nimble startups and global technology giants, the imperative to utilise AI for sustaining or acquiring a competitive advantage becomes essential (Michael & Olayide, 2014). Organisations that implement AI technology may optimise operations, accelerate innovation, improve customer experiences, and provide data-driven insights—essential benefits in a competitive landscape. The worry of lagging behind rivals that are already implementing AI technologies frequently expedite adoption. In the IT sector, competitive pressure compels organisations to use AI not just for technological progress but as a strategic imperative to maintain relevance and surpass competitors (Bombalier, 2024).

2.4.3.3 Government Support

Government support is crucial for the integration of generative artificial intelligence (AI) inside the Information Technology (IT) sector. Governments may affect AI adoption via policies, financing, and incentives that promote research and development (R&D), infrastructure enhancement, and talent acquisition (Pillai & Sivathanu, 2020). Financial incentives, such as grants, tax concessions, or public-private partnerships, might mitigate the obstacles faced by organisations aiming to use AI technologies. Moreover, government-driven initiatives, such as the establishment of AI frameworks or regulatory norms, can guarantee the secure and ethical use of AI by promoting confidence and acceptance (Sharma, 2024). In nations with robust governmental support, the adoption of AI is frequently expedited, as enterprises exhibit greater confidence in investing in AI technology due to the presence of policy endorsement and explicit laws.

2.4.3.4 Trading Partner Readiness

Trading partner readiness implies the preparation of external partners, including suppliers, customers, and collaborators, to assimilate and implement generative artificial intelligence (AI) technology into their operations (Angeles & Nath, 2000). In the Information Technology (IT) industry, the adoption of AI frequently necessitates engagement with external stakeholders, and their capacity to align with AI-driven efforts is essential. This encompasses their technology competencies, readiness to adopt innovation, and capacity to exchange data safely and efficiently. When trading partners are prepared to use and assimilate AI technologies, organisations may attain more seamless cooperation, increased supply chain efficiency, and refined business processes. The preparedness of trading partners may expedite AI adoption by facilitating smooth interactions and optimising comprehensive operations (Angeles & Nath, 2000). Nevertheless, if trading partners are unprepared or unwilling to embrace Gen AI. Consequently, it may impede efficient cooperation and restrict the potential benefits of this technology for the company.

2.5 Improved Information Technology Project Performance

The enhancement of information technology project performance is frequently propelled by the integration of breakthrough technologies such as generative AI, which improves efficiency, decision-making, and innovation. These improvements optimise procedures, save expenses, and enhance output quality, promoting organisational success.

2.5.1 Improved Time Performance

The enhancement of Information Technology project performance is frequently propelled by the integration of breakthrough technologies such as generative AI, which improves efficiency, decision-making, and innovation. These improvements optimise operations, save expenses, and enhance outcome quality, thereby promoting organisational achievement (Atlassian, 2024). AI optimises operations, enabling teams to concentrate on higher-value tasks while minimising delays and bottlenecks. Furthermore, AI's capacity to forecast project results and enhance resource distribution leads to more effective project implementation (Atlassian, 2024). Consequently, organisations may adhere to deadlines more consistently, enhance customer happiness, and bolster competitiveness.

2.5.2 Improved Cost Performance

Enhanced cost efficiency in Information Technology (IT) initiatives pertains to attaining superior outcomes inside a diminished or optimised budget (Leleko, 2024). The implementation of technology, such as generative artificial intelligence (AI), can substantially enhance cost efficiency by automating repetitive operations, minimizing human labour, and optimising resource distribution. AI technologies assist in detecting inefficiencies, forecasting possible problems, and optimising operations, thus reducing operating expenses (Leleko, 2024). Furthermore, by enhancing decision-making and project planning, AI may reduce expensive delays and resource inefficiencies. Ultimately, utilising AI results in economical solutions, guaranteeing that IT initiatives are executed under budget while preserving superior quality outcomes.

2.5.3 Improved Quality Performance

Improved quality performance in Information Technology (IT) initiatives signifies the provision of superior outcomes, fulfilling or surpassing client objectives, and guaranteeing that items and services are devoid of defects and dependable (Berkley & Gupta, 1994). The use of generative artificial intelligence (AI) improves quality by automating quality assurance procedures, detecting faults promptly, and providing data-driven insights for ongoing enhancement. Artificial intelligence may enhance design, testing, and development processes, minimising human error and assuring more consistency in outcomes (Berkley & Gupta, 1994). AI facilitates expedited issue identification and provides predictive analytics, ensuring that IT projects adhere to elevated standards, enhancing functionality and user pleasure while reducing post-launch complications and rework.

2.6 Theoretical Framework

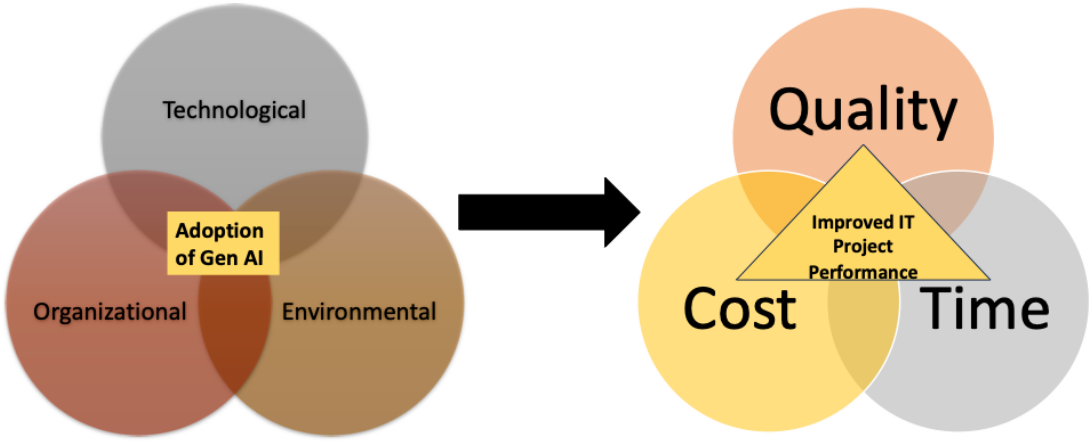


Figure 2.3: Theoretical Framework

The theoretical framework lists the factors that affect the use of generative artificial intelligence (AI) in the IT industry. These factors can be broken down into technological, organisational, and environmental factors that make AI use easier. These elements jointly influence IT project performance, enhancing time, quality, and cost, resulting in more efficient, innovative, and cost-effective IT projects. Further, These elements interact synergistically, boosting IT project performance by promoting efficiency, quality, and cost-effectiveness. AI can automate repetitive processes, speeding deadlines and decreasing mistakes, while also stimulating creativity and producing high-quality products. Additionally, AI's capacity to maximise resources leads to cost reductions, making projects more financially feasible. Ultimately, when these technical, organizational, and environmental aspects match, the outcome is a more efficient, inventive, and cost-effective execution of IT projects, making AI a revolutionary tool in the IT business.

2.7 Conclusion

The interaction of technological, organisational, and environmental aspects with IT project performance, specifically regarding time, quality, and cost, demonstrates the intricacy of using Generative AI in the IT industry. Technological preparedness,

organisational capabilities, leadership support, and external constraints are essential factors affecting the success of AI integration in software development initiatives. As organisations increasingly adopt generative AI, comprehending its characteristics will be essential for enhancing project results and securing sustained success. By considering technological compatibility, organisational preparedness, and market conditions, organisations may successfully utilise AI to improve project efficiency, provide superior outcomes, and ensure cost-effectiveness.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter will introduce the methodology employed to gather data for this research. The methodology section delineates the study strategy and methods employed to examine the adoption of generative artificial intelligence (AI) within the information technology (IT) industry in Klang Valley, Malaysia. The research uses a quantitative methodology to examine the determinants affecting generative artificial intelligence (AI) uptake. This quantitative method is appropriate for obtaining statistically significant results, yielding generalisable insights into IT workers in Klang Valley (Creswell, 2014).

3.2 Quantitative versus Qualitative Research

Quantitative research typically emphasises the collection and analysis of numerical data. It aims to quantify issues through the generation of statistical data or numerical evidence. Researchers employ instruments such as surveys, experiments, and structured interviews to collect data that can be quantified. The main objective is to create and use mathematical, statistical, or computational models to elucidate phenomena. Quantitative research is frequently employed in disciplines such as social sciences, health, and economics to evaluate hypotheses or ideas. A primary advantage is that it enables researchers to generalise findings to a broader population, thanks to the implementation of random sampling techniques. It is more objective and simpler to repeat, rendering it a preferred option for investigations requiring precision (Ghanad, 2023).

Qualitative research, conversely, aims to comprehend phenomena using subjective and descriptive methodologies. It entails the collection of qualitative data, including interviews, observations, and textual analysis. Researchers in this methodology aim to comprehend experiences, perspectives, and social settings. This methodology is prevalent in the humanities and social sciences, especially in disciplines such as sociology, anthropology, and psychology. The primary advantage of qualitative research is its ability to thoroughly investigate intricate human behaviors and societal dynamics. It is especially beneficial in environments aimed at developing

hypotheses or acquiring insights into poorly understood topics. Nonetheless, its conclusions are frequently not readily applicable to broader groups (Bhandari, 2024).

In summary, quantitative research yields quantifiable and objective facts, but qualitative research delivers profound, contextual insights. Both methodologies are applicable based on the study objectives, and occasionally a mixed-methods approach is employed to integrate the advantages of each.

3.3 Survey as the Research Method

This study used a quantitative research approach to achieve the research goals. The study emphasised the need of collecting data from a large sample to get the most trustworthy and best findings. This substantial sample size was meticulously chosen to provide an accurate and effective representation of the total population, hence enhancing the validity of the study results.

The quantitative research approach, using numerical data and statistical analysis, has advantages of objectivity, accuracy, and generalisability. Its dependence on quantitative data diminishes the likelihood of bias, offering a more objective perspective than the subjective analyses sometimes seen in qualitative research. Utilising larger sample sizes facilitates the generalisation of results to wider populations, while the use of statistical tools guarantees accuracy and replicability. Moreover, quantitative research may be more time- and cost-effective, particularly with the assistance of contemporary automated analytic tools, compared to the human interpretation required by qualitative approaches. This methodology provides a systematic and regulated framework for doing research, often rendering it advantageous in situations that need strong and generalisable results.

Qualitative research provides essential insights into the complexities of human behaviour, perceptions, and experiences; nonetheless, it also has inherent drawbacks. A significant limitation stems from the potential for subjectivity and bias during data collection and processing. Qualitative techniques are vulnerable to the effect of human biases due to their dependence on the researcher’s interpretations, thereby affecting the results and conclusions.

Moreover, qualitative research often employs lower sample sizes, limiting its ability to accurately represent the larger population. The extensive scope of qualitative

research may be arduous and resource-intensive, requiring significant commitment to data collection, transcription, and analysis.

Furthermore, qualitative research may encounter criticism about its low generalisability, since its conclusions are often dependent on certain contextual circumstances. Despite these limits, qualitative research may provide significant insights that improve understanding of complex social processes if used judiciously and in combination with other research methods.

3.4 Research Process

The study on the adoption of generative artificial intelligence (AI) in the Information Technology (IT) sector in Klang Valley, Malaysia, uses a quantitative research technique to comprehensively analyse the primary variables affecting acceptance. The research process starts with the articulation of a definitive research aim, followed by a comprehensive literature study to build a theoretical framework. A systematic survey instrument is used to gather data from experts in the IT business, concentrating on factors that affect the adoption of generative AI technology.

The data-gathering procedure includes perceived advantages, obstacles, and pertinent demographic parameters. A purposeful sample technique is used to guarantee broad representation across different IT sub-sectors in Klang Valley. The collected data is examined by vigilant quantitative methods, including descriptive statistics, correlation analysis, and regression modelling. The objective is to identify patterns, correlations, and trends within the data, yielding insights into the determinants influencing the adoption of generative AI.

The results are examined in relation to current literature and industry standards, emphasising their significance for IT companies. The study concludes with a detailed report that enhances comprehension of the variables influencing the adoption of generative AI in the Malaysian IT industry, providing essential insights for decision-making and future investigations. Ethical concerns are maintained throughout the study process to guarantee validity and reliability.

3.4.1 Literature Review

A literature review is a comprehensive investigation of available literature related to a certain topic. The method involves carefully locating, obtaining, analysing, and synthesizing relevant academic materials pertaining to the subject of the inquiry,

including scholarly papers, books, and other applicable sources. The process involves recognising, assessing, and synthesizing key results, methodologies, ideas, and concepts from diverse sources. Through a thorough examination of existing academic literature, researchers may get a complete understanding of the current level of knowledge for a certain topic. This technique allows them to identify inadequacies, paradoxes, or unknown areas, so emphasising possible opportunities for further investigation. It serves as a foundational base for building upon previous academic research and facilitates the advancement of new viewpoints, theories, or frameworks.

3.4.1.1 Purposes of Literature Review

The use of a questionnaire as a research tool serves several objectives. The use of electronic methods in research dissemination is a cost-effective strategy, allowing researchers to successfully reach a wide audience without significant costs. Standard questions ensure that all participants get the same prompts, enhancing the consistency and comparability of the gathered replies. Questionnaires may be efficiently given to large populations, enabling the collection of significant amounts of data in a very short period. Moreover, these platforms provide anonymity, cultivating an atmosphere that encourages greater honesty and transparency in personal comments, especially about sensitive or private topics. Furthermore, data acquired from a survey may be easily measured and analysed statistically, providing significant insights into the patterns and trends existing within the studied community. Questionnaires are generally acknowledged as useful research tools across several academic fields due to their variety, efficiency, and efficacy.

3.4.1.2 Literature Review Development

The formulation of a literature review is an essential element of the research process, as it lays the groundwork for understanding the existing body of knowledge related to a certain topic. In the first step, it is essential to establish the review parameters, which involves defining specific research questions or goals and establishing inclusion and exclusion criteria. A comprehensive examination of relevant academic material follows, using scholarly databases and search engines with designated keywords and filters.

Comprehensive screening and selection processes are then executed to guarantee that each research study included in the review corresponds to its designated

subject and offers varied viewpoints. The collected data is evaluated, summarising major results, study methods, theoretical frameworks, and closing comments succinctly. This step's fundamental elements include identifying patterns or inconsistencies in the literature, emphasising gaps or trends, and conducting a critical assessment of the work.

The review has a superior degree of organisation, with a unified framework often grounded in thematic or historical elements. This method promotes a coherent flow of ideas and enables the formation of connections between various studies. The writing process involves crafting succinct summaries, employing critical analysis, and integrating insightful synthesis, culminating in a conclusion that reflects on the current state of the discipline and its implications for the specific research undertaken.
Extensive citation of sources upholds academic integrity, while thorough review and editing improve the clarity and coherence of the work. The literature review is a vital component of the research process, highlighting the significance of the subject and positioning it within the wider academic discourse.

3.4.2 Questionnaire

A questionnaire is a specialist instrument used in research, consisting of a structured series of questions and associated prompts designed to elicit information from targeted respondents. This systematic method is used to collect data from a specified cohort, allowing researchers to get empirical or statistical insights into a certain topic of interest. The enquiries may be structured in many ways, including multiple-choice, open-ended, or scaled, each intended to elicit certain replies. Questionnaires may be administered in person, by telephone, online, or in printed formats to engage respondents. They are extensively used in information technology to get a deeper understanding of the target population's views, attitudes, habits, or characteristics. Developing a successful questionnaire requires careful consideration of elements such as the phrasing, order, and format of the questions. This is crucial to mitigate bias and ensure the correctness, validity, and dependability of the findings.

3.4.2.1 Purposes of Questionnaire

The integration of a questionnaire in research yields several beneficial results. This strategy offers a cost-effective solution, especially when used online, enabling researchers to reach a wide array of participants without significant expenses. The

consistent wording of enquiries ensures consistency across all respondents, hence enhancing the coherence and comparability of the resulting replies. Questionnaires may be effectively sent to large groups, facilitating the rapid collection of substantial data within a short period. Moreover, they provide anonymity that might encourage increased honesty and transparency in participant replies, a factor particularly relevant when discussing sensitive or private topics. Moreover, data obtained from questionnaire-based research may be easily analysed quantitatively, providing clear insights into common trends and patterns among the specified population. In conclusion, the broad flexibility, effectiveness, and potency of questionnaires highlight their essential value across many study disciplines.

3.4.2.2 Selection of Questionnaire Respondents

The intended respondents are IT professionals in Klang Valley, Malaysia, who are directly or indirectly associated with Information Technology projects. Individuals may possess diverse backgrounds according to their corporate connections, careers, age, utilisation of Generative AI, and years of professional experience. The sampling method use for this study is purposive sampling with 70 participants of sampling size.

3.4.2.3 Questionnaire Development

The first section of the questionnaire describes the intended goals and the background and aim of the questionnaire for the study underdone. There five components to the main questionnaire. Section A consists of four demographic details: firm size, position in the firm, years of working experience and experience using generative artificial intelligence in information technology projects.

Table 3.1: Section A – Respondent's Attributes

Ref. Code	Respondent's Demographic Information

DI01	Firm size
DI02	Position in the firm
DI03	Years of working experience
DI04	Experience using Gen AI in IT projects

Section B includes 8 close-ended questions, section C includes 6 and section D includes 4, each with a rating scale from one to five includes the factors of the TOE framework in Figure 2.1 to measure the importance of the adoption of generative artificial intelligence. The related question numbers to each of the TOE framework factors are summarised in Table 3.2.

Table 3.2: Questionnaire Summary for Sections B, C & D

TOE Framework Dimensions	**Questions No.**
Technological	F1 – F8
Organisational	F9 – F14
Environmental	F15 – F18

The details of each section's investigation questions asked in the questionnaire are tabulated in Table 3.3.

Table 3.3: Sections B, C & D – Close-Ended Questions

Items	**Questions**
	Technological Dimension
F1 – F8	To what extent do you agree or disagree that the following technological dimension factors are important for the adoption of generative artificial intelligence in information technology projects in your organisation?
	Organisational Dimension
F9 – F14	To what extent do you agree or disagree that the following organisational dimension factors are important for the adoption of generative artificial intelligence in information technology projects in your organisation?
	Environmental Dimension
F15 – F18	To what extent do you agree or disagree that the following environmental dimension factors are important for the adoption

Items	Questions
	of generative artificial intelligence in information technology projects in your organisation?

Section E comprises 3 closed-ended questions employing a rating scale from one to five, assessing the potential towards the Improved Information Technology Project Performance.

Table 3.4: Section E – Close-Ended Questions

Ref. Code	Questions
IITPP01	Generative artificial intelligence improves information technology project **time** performance.
IITPP02	Generative artificial intelligence improves information technology project **cost** performance.
IITPP03	Generative artificial intelligence improves information technology project **quality** performance.

3.4.2.4 Questionnaire Administration

The questionnaire was administered with great precision to guarantee the acquisition of accurate and trustworthy data for the study. A well designed and user-friendly questionnaire was created, including essential criteria related with usage of generative artificial intelligence in the information technology sector.

The final questionnaire was distributed to the selected participants using a safe and accessible online survey platform. The quiz was created using automated survey tools on the web platform Google Forms. The participants of this study may be reached by disseminating a link or universal resource locator (URL) via many methods, including email, LinkedIn, and social media platforms such as WhatsApp, Facebook, Twitter, and Instagram. The protocol includes clear instructions for participants, ensuring their understanding of the study's aims, the confidentiality of their responses, and the accurate completion of the survey. Furthermore, it encompasses the execution of strategies designed to enhance participant response rates, including the use of follow-up reminders or incentives. Careful consideration is given to the timing and context of the administration process to reduce prejudice and encourage genuine and thoughtful replies.

3.5 Data Analyses Procedures

The techniques for data analysis encompass many stages to analyse and evaluate the gathered data. Data is initially cleansed and structured to guarantee accuracy. As for the pretest, we did the questionnaire pretest by giving out to 6 participants and determine whether the questions are comfortable to answer. These 6 participants did not included into the real survey to avoid repetition or manipulation of data. Descriptive statistics encapsulate essential characteristics, whereas correlation analysis elucidates links among variables. Regression analysis may be employed to forecast outcomes. The results are subsequently analysed to reveal trends and patterns. The results are juxtaposed with current research to derive conclusions and guide decision-making. Ethical concerns guarantee the integrity of the analysis (Dibekulu, 2020).

The implementation of data analysis is essential for correct data interpretation and ensuring exact research outputs. This procedure involves the organising, summarisation, rearrangement, and tabulation of data to facilitate understanding. This study utilised the following data analysis techniques:

1. Mean Ranking
2. Factor Analysis

The Statistical Package for the Social Sciences (SPSS), created by IBM Corporation, is a prominent statistical program widely employed by researchers and academics worldwide. This program provides a comprehensive toolbox that allows researchers and analysts to manage and analyse data efficiently (*IBM SPSS*, 2024). SPSS enables users to do complex data operations and analysis with simple instructions. It includes several advanced statistical procedures, ranging from linear to non-linear modelling, diverse statistical evaluations, and data visualisation tools.

3.5.1 Mean Ranking of the Adoption Factors

This research study will utilise the mean ranking approach to compute average values for ranking factors based on their perceived relevance, as given by the respondents. The mean, an essential statistical measure of central tendency, identifies the central position of the data distribution. This strategy enables the comparative evaluation of the collected data. The use of the mean is a well-known method in research for analysing correlations between variables and detecting significant

variations across samples (*Measures of central tendency* 2018). Calculating the mean for each variable enables the systematic ranking of the variables according to their mean values.

The relationship among variables in a sample or population can be clarified by summarising data via mean analysis, as noted by Kaur, Stoltzfus, and Yellapu (2018). This method, frequently acknowledged as the simplest kind of analysis, provides a thorough summary of outcomes via percentages or real numerical figures, as shown by Naoum (2013). The calculation of descriptive statistics, particularly the mean, represents the aggregate of the variables. The mean was calculated using the given formula:

Where,
= the mean
= individual values
= the number of values

3.5.2 Factor Analysis of the Adoption Factors

Factor analysis is a commonly used multivariate method in research, as noted by Kothari (2004). This statistical method is effective in reducing several linked variables into a more concise collection of fundamental components, as noted by Opoku and Abdul-Muhmin (2010) and Lee and Paik (2011). Factor analysis serves as a robust statistical technique, enabling researchers to apply their judgement and interpretation. This method enables the discernment of a unified, succinct array of latent components that effectively encapsulate a group of indications, as emphasised by Goretzko et al. (2021), Howard (2016), and Watkins (2018).

Two primary approaches for factor analysis are the confirmatory method and the exploratory method. The confirmatory approach is utilised to examine a given theory, whereas the exploratory technique enables researchers to investigate essential characteristics, facilitating the development of a theory or model from many factors. The confirmatory approach is often utilised in the later stages of a research project, while the exploratory technique is applied in the first phases, as indicated by Williams, Onsman, and Brown (2010). Factor analysis is a method for investigating the relationships between observable variables and latent variables that are not directly perceivable (Kusano & Uchida, 2023).

This study revealed three essential elements critical to the adoption of Generative AI. The factor analysis method was utilised to identify the underlying elements affecting these results. This approach is especially suitable for surveys with several variables, as it identifies latent patterns, reduces complexity, and organises them into understandable groupings based on underlying characteristics. Factor analysis was performed with Principal Components Analysis (PCA) with Varimax rotation. An evaluation of data acceptability and suitability was performed using the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test of sphericity.

3.6 Research Ethics

The ethics of research about the factors affecting the adoption of generative artificial intelligence (AI) in the IT sector underscore the necessity of performing the study with honesty, openness, and respect for participants. Safeguarding the privacy of responders is essential, especially when sensitive commercial or technology data is at stake. Confidentiality and anonymity must be guaranteed, with informed permission acquired from all participants. This entails delivering a lucid elucidation of the study's aims and methodology while safeguarding participants' freedom to withdraw at any stage of the research.

It is essential to establish safeguards that ensure confidentiality, particularly for proprietary technology or commercial strategies associated with AI implementation. The research must be conducted objectively, with a clear disclosure of any potential conflicts of interest that may influence the study's results. Moreover, data gathering and analysis must conform to stringent criteria to guarantee precision and dependability.

Furthermore, the extensive societal ramifications of integrating generative AI inside the IT industry must be evaluated, ensuring the research aligns with responsible innovation and sustainable growth. Compliance with these ethical guidelines guarantees the study's legitimacy and significantly enhances the domain of AI adoption inside the IT business.

3.7 Conclusion

This study uses a quantitative methodology with a structured questionnaire to examine the determinants affecting the adoption of generative AI in the IT industry

in Klang Valley, Malaysia. The technique guarantees a structured data collection process, facilitating statistically accurate results that may be generalised to other scenarios. A quantitative methodology is employed to enable the collecting and analysis of numerical data, therefore elucidating the link among numerous elements influencing the adoption of Generative AI. A cross-sectional form facilitates data collection at a singular moment, making it optimal for assessing current trends and discovering possible relationships between variables.

CHAPTER 4

RESULTS AND DISCUSSION

4.1 Introduction

The online questionnaire, detailed in Chapter 3, was available on Google Forms from May to November 2024. One hundred invites were dispatched using LinkedIn, email, and personal relationships, resulting in 70 legitimate responses by November 30, 2024. As per previous study, it reveals that at least 50 respondent is sufficient for a study (Memon et al., 2020). This chapter examines the survey data utilising SPSS, commencing with a review of respondent demographics and investigating variables influencing the adoption of generative artificial intelligence in Klang Valley, Malaysia. Quantitative methods, such as mean rankings, Bartlett's test, the Kaiser-Meyer-Olkin (KMO) measure, component analysis, total variance explained, and the rotated factor matrix, will be utilised to elucidate the principal drivers and obstacles to effective implementation. The objective is to furnish a comprehensive grasp of the determinants influencing the adoption of Gen AI technologies in the region.

4.2 Pre-Testing

Initial validation was conducted with six participants to pilot the assessment with the purpose of refining and enhancing the questionnaire. The participants in the pilot test were two small firms, two medium firms, and two large firms. These six participants not included in the real questionnaire. No more recommendations or concerns regarding the questions were presented. The questionnaire remained unaltered and was sent to the public. These participants did not included into the real study.

4.3 Respondent's Background

Table 4.1 illustrates the detailed attributes of respondents for all 70 individuals who participated in the questionnaire. Most respondents have the experience of usage of generative artificial intelligence (65.7%) whereas they are some with (34.3%) have no experience in using it. Additionally, the outcome were balanced where respondents have five years of experience or more or less has same amount with (50%) on both side. Percentage that hold positions in upper management (17.1%), medium management (51.4%) and lower management with (31.4%) which the medium management holds the most number.

Table 4.1: Attributes of Respondents (N=70)

Demographic Background	Frequency (N)	Percentage (%)
Firm size		
Small	15	21.4
Medium	22	31.4
Large	33	47.1
Total	**70**	**100**
Experience using Gen AI in IT Project		
Yes	46	65.7
No	24	34.3
Total	**70**	**100**
Position in the Firm		
Upper Management	12	17.1
Middle Management	36	51.4
Lower Management	22	31.4
Total	**70**	**100**
Years of Working Experience		
Less than 5 Years	35	50.0
5 Years and Above	35	50.0
Total	**70**	**100**

4.4 Mean Ranking of the Factors for the Adoption of Generative Artificial Intelligence in the Information Technology Sector

Mean scores below 3.0 were deemed inconsequential for the study, given they were below the neutral rating level. Standard deviations below 1.0 indicated a strong consensus among respondents with the presented results (Asante et al., 2018). To guarantee a fair ranking of variables, in instances when several factors exhibited identical mean scores, the component with the lowest standard deviation was assigned

the greatest priority rating. This methodology emphasised elements with elevated mean scores and a robust consensus among participants.

This section applied the mean score approach to identify and assess the impact of various variables on the adoption of Generative AI in the IT sector. Table 4.2 displays the average scores and ranks for the 18 criteria examined in the research. The findings indicate that the mean values of the variables span from 3.7429 to 4.2000, reflecting differing degrees of impact on the adoption of Generative AI.

The top four critical variables founded are Relative Advantage, Technological Capability, Technology Optimism, Competitive Pressure and Perceived Ease of Use. “Relative Advantage” appeared as the predominant factor, with a mean score of 4.2000, underscoring the significance of straightforward user interfaces and efficient processes in facilitating the adoption of Generative AI in IT inside Klang Valley, Malaysia.

“Technological Capability” where is the second rank, with the mean values of 4.1714 and standard deviations of 0.74155. This finding underscores the crucial role played by both infrastructure readiness and skills and expertise in fostering the adoption of innovative technologies like Generative AI.

Notably, “Technology Optimism” and “Competitive Pressure” shared the third rank, with a mean score of 4.1143 and a standard deviation of 0.79021 and 0.90958, emphasising the importance of the Innovation and Research & Development (R&D) and employee engagement and training in IT industry.

Ultimately, "Perceived Ease of Use" occupies the fifth place, with a mean score of 4.0857, indicating that the relative advantages of Generative AI compared to traditional approaches significantly influence its adoption.

Table 4.2: Mean Ranking on the Factors for the Adoption of Generative Artificial Intelligence in the Information Technology Sector

Factors	Mean	SD	Rank
F06) Relative Advantage	4.2000	0. 69366	1
F04) Technological Capability	4. 1714	0. 74155	2
F03) Technology Optimism	4. 1143	0. 79021	3.5
F16) Competitive Pressure	4. 1143	0. 90958	3.5
F02) Perceived ease of use	4. 0857	0. 82958	5.5
F05) Compatibility	4. 0857	0. 82958	5.5

Factors	Mean	SD	Rank
F15) Market Demand	4. 0714	0. 92190	7
F01) Perceived usefulness	3. 9857	0. 87630	8
F08) Observability	3. 9714	0. 83356	9
F12) Top management support	3. 9143	1. 01785	10.5
F17) Government support	3. 9143	0. 92850	10.5
F14) Managerial support	3. 8714	0. 93128	13
F11) Absorptive capacity	3. 8714	0. 83269	13
F07) Trialability	3. 8714	0. 96190	13
F09) Organisational scale	3. 8143	0. 87299	15.5
F18) Trading partner readiness	3. 8143	0. 96748	15.5
F10) Organisational readiness	3. 8000	0. 86141	17
F13) Human resources	3. 7429	1. 03119	18

4.5 Factor Analysis for the Adoption of Generative Artificial Intelligence in the Information Technology Sector

Factor analysis is a statistical method employed to discern underlying structures or factors that elucidate the interrelationships among a collection of variables. This study employed factor analysis to investigate the underlying variables influencing the adoption of Generative AI in the IT sector in Klang Valley, Malaysia.

4.5.1 Kaiser-Meyer-Olkin and Bartlett's Test for the Adoption Factors

Prior to doing factor analysis, the appropriateness of the data was evaluated by Bartlett's test of sphericity and the Kaiser-Meyer-Olkin (KMO) measure of sample adequacy. Bartlett's test of sphericity evaluates the null hypothesis that the correlation matrix is an identity matrix, signifying that the variables are independent. A notable result ($p < 0.05$) indicates that the data are appropriate for factor analysis. The KMO index, ranging from 0 to 1, quantifies the fraction of variance among variables that may be attributed to common variance. A number over 0.50 is deemed acceptable for factor analysis.

In this study, Bartlett's test of sphericity was significant ($\chi 2 = 985.833$, df = 153, $p < 0.05$), and the KMO index was 0.852 (Table 4.3), indicating that the data were appropriate for factor analysis.

Table 4.3: KMO and Bartlett's Test for Adoption Factors

Kaiser-Meyer-Olkin Sampling Adequacy Measured (KMO)	0.852
Sphericity Bartlett's Test:	
Chi-Square Approx. ($\chi 2$)	985.833
Degree of Freedom (df)	153
Significant Level	0.000

4.5.2 Total Variance Explained of the Adoption Factors

The quantity of elements to be extracted was established according to the eigenvalue criteria, retaining those with eigenvalues exceeding 1. The study identified four variables that collectively accounted for 75.343% of the total variation in the data (Table 4.4).

Table 4.4: Eigenvalues of the Adoption Factors

Factors	Eigenvalues	Percentage Variance	Cumulative Percentage Variance
1	8.784	48.800	48.800
2	2.336	12.975	61.775
3	1.358	7.547	69.321
4	1.084	6.021	75.343

4.5.3 Rotated Component Matrix of the Adoption Factors

The factor loadings, indicating the relationships between variables and factors, were analysed to allocate variables to factors. Variables with factor loadings greater than 0.30 were deemed significant contributors to the corresponding factors (Table 4.5). All 18 key variables were exclusively associated with one of the four derived components.

Table 4.5 presents the factor loadings for four components. A meticulous analysis of the components led to the understanding of the underlying factors. The following are:

(1) Component 1: Technological Factors
(2) Component 2: Organisational Capacity
(3) Component 3: Market Responsiveness
(4) Component 4: External Factors

These criteria denote the fundamental structures that affect the adoption of generative AI in Klang Valley, Malaysia. Comprehending these aspects can yield significant insights for parties engaged in the implementation and promotion of generative AI in the region.

Table 4.5: Rotated Component Matrix of the Adoption Factors

Factors	**Components**			
	1	**2**	**3**	**4**
F08) Observability	0.849			
F07) Trialability	0.820			
F05) Compatibility	0.797			
F04) Technological capability	0.748		0.316	
F01) Perceived usefulness	0.689		0.465	
F06) Relative advantage	0.675	0.365	0.333	
F03) Technology optimism	0.657		0.547	
F02) Perceived ease of use	0.651		0.403	
F14) Managerial support		0.839		
F12) Top management support		0.810		
F11) Absorptive capacity		0.773		
F10) Organisational readiness		0.755	0.398	
F13) Human resources	0.377	0.710		
F15) Market demand			0.701	0.325
F16) Competitive pressure			0.653	0.569
F09) Organisational scale	0.322	0.514	0.608	
F17) Government support				0.876
F18) Trading partner readiness		0.338	0.362	0.740

4.6 Mean Ranking of Improved Information Technology Project Performance

This part seeks to discover and assess the possibilities for enhanced efficiency and effectiveness in building through the adoption of Generative AI in IT within Klang Valley, Malaysia. The mean score technique was utilised to rank the four elements examined in the study. Table 4.6 displays the average scores and ranks for the four variables. The findings indicate that the mean values of the variables span from 4.1286 to 4.1429, reflecting differing degrees of IT project performance efficiency and effectiveness.

The top three crucial factors defined are time, cost and quality of IT project performance. "Generative artificial intelligence improves information technology project time performance" and "Generative artificial intelligence improves information technology project quality performance'' identified as the variable with the most potential for enhancement, exhibiting a shared mean score of 4.1429 and standard deviations of 0.90547 and 0.87287. Finally, "Generative artificial intelligence improves information technology project cost performance" ranks third, with a mean score of 4.1286 and a standard deviation of 0.88336.

The mean scores indicate the typical consensus among respondents concerning the prospective enhancements in IT project performance resulting from the implementation of Generative AI. A greater mean score signifies a more robust consensus. The standard deviations indicate the variability of responses around the mean, with lower values signifying greater consistency across individuals.

Table 4.6: Mean Ranking of Improved Information Technology Project Performance

Factors	Mean	SD	Rank
IITPP01) Generative artificial intelligence improves information technology project time performance	4.1429	0.90547	1.5
IITPP03) Generative artificial intelligence improves information technology project quality performance	4.1429	0.87287	1.5

IITPP02) Generative artificial intelligence improves information technology project cost performance	3.1286	0.88336	3

4.7 Factor Analysis of Improved Information Technology Project Performance

This study's factor analysis highlights significant elements that might inform policymakers and decision-makers. The findings on total variance explained, factor matrix, and KMO and Bartlett's test will be given and analysed.

4.7.1 Kaiser-Meyer-Olkin and Bartlett's Test of the Performance Effects

In this research, Bartlett's test of sphericity was significant ($\chi 2 = 113.745$, df = 3, $p < 0.05$), and the KMO index was 0.745 (Table 4.7), indicating that the data were apt for factor analysis.

Table 4.7: KMO and Bartlett's Test Sphericity for Performance Effects

Kaiser-Meyer-Olkin Sampling Adequacy Measured	0.745
Sphericity Bartlett's Test:	
Chi-Square Approx. ($\chi 2$)	113.745
Degree of Freedom (df)	3
Significant Level	0.000

4.7.2 Total Variance Explained for Performance Effects

The quantity of elements to be extracted was established according to the eigenvalue criteria, retaining those with eigenvalues exceeding 1. The analysis revealed that a single factor accounted for 81.607% of the total variation in the data presented in Table 4.8.

Table 4.8: Eigenvalues for more Performance Effects

Factors	Eigenvalues	Percentage Variance	Cumulative Percentage Variance

1	2.448	81.607	81.607

4.7.3 Component Matrix of the Performance Effects

Table 4.9 indicates that each of the three important elements pertains only to a single component. Table 4.9 presents the factor loadings for a single component. Upon meticulous analysis of the components, the ensuing interpretation was deduced to signify the fundamental aspects of the components. The following are:

(1) Component 1: Improved Information Technology Project Performance

Table 4.9: Result of Component Matrix of the Performance Effects

Factors	**Components**
	1
IITPP02) Generative artificial intelligence improves information technology project cost performance	0.910
IITPP01) Generative artificial intelligence improves information technology project time performance	0.910
IITPP03) Generative artificial intelligence improves information technology project quality performance.	0.890

4.8 A Proposed Framework for Improved Information Technology Project Performance

The proposed methodology for augmenting environmental and cost performance, alongside raising work productivity and quality in the implementation of generative AI, centres on four essential components: Technological Factors, Organisational Capacity, Market Responsiveness, and External Factors.

Technological factors impact IT project performance by facilitating efficient processes, augmenting accuracy, and promoting communication. Advanced technologies, like generative AI, optimise processes such as design, resource

allocation, and decision-making, minimising mistakes and rework. This results in cost efficiency, expedited project completion, improved quality, and ultimately, superior project outcomes.

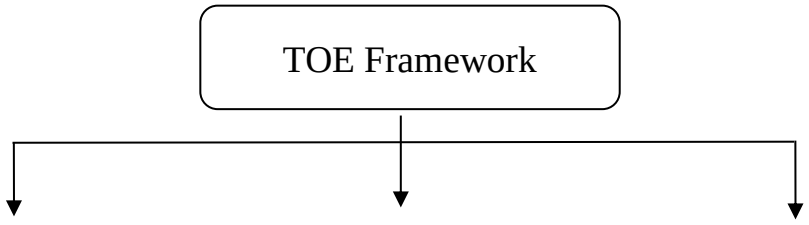
Organisational capacity influences project success by guaranteeing the appropriate infrastructure, resources, and proficient staff are established. Robust leadership endorsement, efficient training initiatives, and an innovative culture facilitate successful technology integration. This augments the organisation's capacity to administer and assimilate new technology, hence enhancing project efficiency, quality, and sustainability.

Market Responsiveness affects project success by allowing organisations to swiftly adjust to market needs and industry developments. By being responsive to client demands and competition activities, firms may adopt novel technologies, such as generative AI, to improve project results. This agility enhances competitiveness, optimises resource distribution, and elevates customer pleasure.

External factors influence IT project performance through elements such as regulatory frameworks, economic situations, and society trends. Government laws and industry regulations influence technology adoption and project methodologies, but economic constraints and public expectations need sustainability and innovation. External factors can expedite or hinder project advancement, affecting expenses, quality, and overall success.

The suggested framework delineates how addressing technical aspects such as technology and organisational capability, market responsiveness, and external influences may facilitate the effective implementation of generative AI. This adoption results in superior environmental and financial efficiency, increased productivity, and higher quality in IT industry projects.

Below is the framework that produced from the research above:



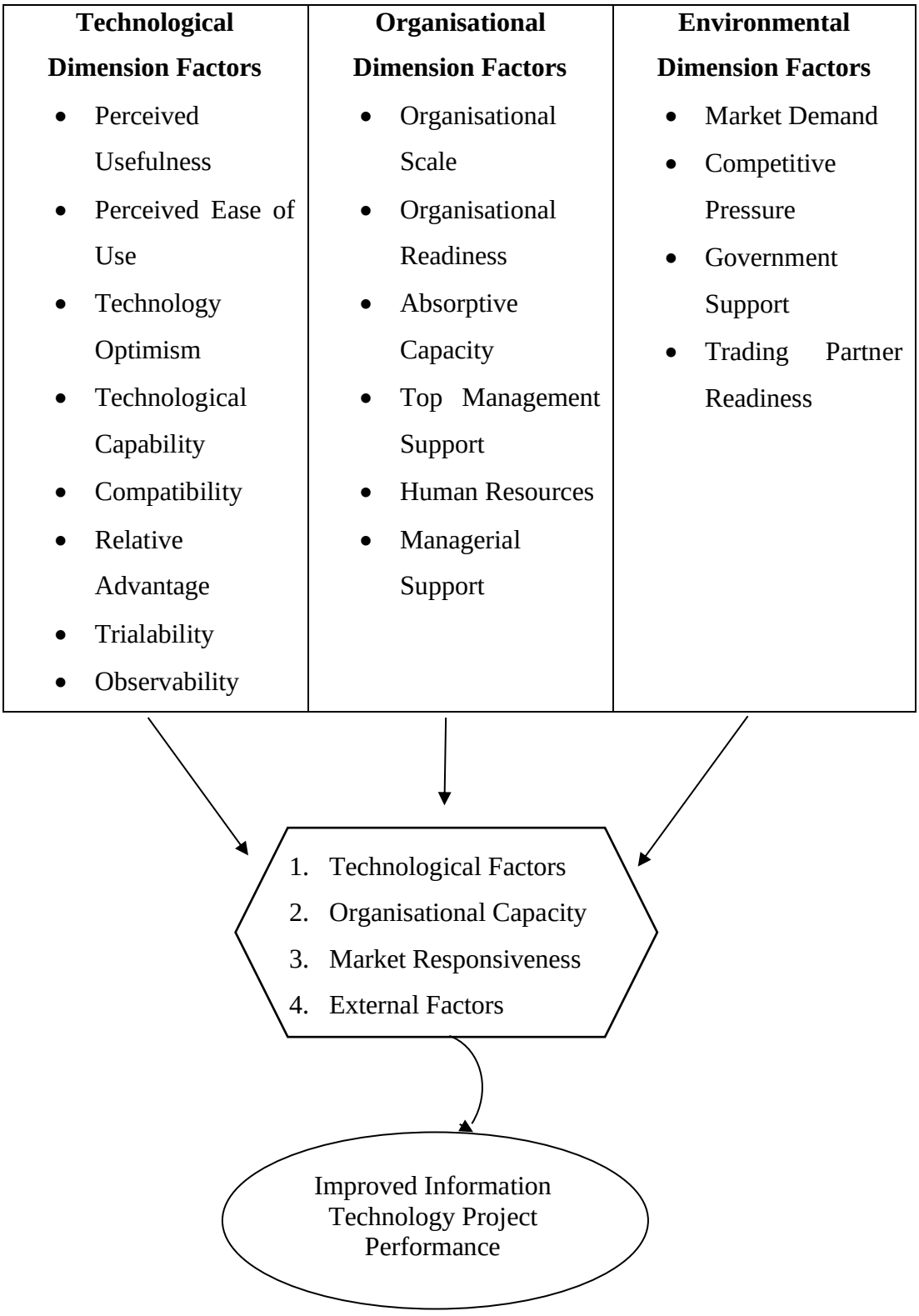


Figure 4.1: A Framework for Adoption of Generative AI in IT

4.9 Conclusion

The suggested technique for adopting generative AI emphasises four essential components: Technological Factors, Organisational Capacity, Market Responsiveness, and External Factors. Technological elements improve efficiency and quality by improving processes. Organisational capacity guarantees the necessary infrastructure and proficient personnel for effective integration. Market responsiveness allows companies to adjust to industry developments. External variables, like rules and economic conditions, affect adoption. Collectively, these elements enhance environmental and economic efficiency, productivity, and project quality within the IT business.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This final chapter encapsulates the study's conclusions about the research aim and objectives. It emphasises the accomplishments of each target, delineates the research's contributions to the discipline, and recognises the study's limits. This chapter also offers ideas for future study to improve the comprehension of Generative AI adoption in the field of Information Technology. This chapter provides a thorough and contemplative review of the study by examining these critical elements, so enhancing its significance and pertinence to the area.

5.2 Achievements of Research Objectives

The attainment of the research's goals and objectives may be demonstrated through the following explanations.

5.2.1 Research Objective 1: To investigate the factors for the adoption of generative artificial intelligence in the information technology sector.

This research employed descriptive analysis to calculate the implication of each factor within the T-O-E framework. The top 5 underlying factors for adopting Generative AI in Information Technology Klang Valley, Malaysia, are considered more influential than other factors. These factors are Relative Advantage, Technological Capability, Technology Optimism, Competitive Pressure and Perceived Ease of Use. The mean ranking of these factors is as follows:

i. Relative Advantage (mean = 4.2000): This factor ranks highest, where providing better efficiency, creativity, and a competitive advantage via automation, cost minimisation, and superior decision-making abilities.
ii. Technological Capability (mean = 4.1714): The second-highest ranked factor enabling organisations to integrate advanced AI tools, optimize processes, enhance innovation, and maintain a competitive edge in a dynamic IT environment.
iii. Technology Optimism (mean = 4.1143): Although shared third ranking, favourable disposition towards the use of emerging technology, particularly

generative AI. It fosters enthusiasm and a readiness to harness AI's potential for enhancing efficiency, innovation, and competitive advantage in the IT sector.

iv. Competitive Pressure (mean = 4.1143): This factor shared third ranking too, impact of industry competitors compelling organisations to implement generative AI for competitive advantage. The necessity for innovation, enhanced efficiency, and fulfilment of client requests propels accelerated AI deployment to sustain market standing towards the Gen AI.

v. Perceived Ease of Use (mean = 4.3415): This factor ranks as fifth, indicating the extent to which generative AI technologies are seen as user-friendly and easily assimilated into current processes. The perception of AI technologies as straightforward and user-friendly fosters increased adoption, hence boosting productivity and diminishing opposition inside IT field in Klang Valley, Malaysia.

These findings illuminate the essential factors influencing Gen AI adoption within the T-O-E paradigm. This study identifies four primary variables that can aid stakeholders, such as IT firms, software developers, and policymakers, in prioritising their efforts and resources for the effective application of this technology in the Klang Valley IT sector.

The tentative factor analysis in Table 4.4 revealed four key components:

(i) Technological Factors
(ii) Organisational Capacity
(iii) Market Responsiveness
(iv) External Factors

These findings offer significant insights into the essential aspects affecting the adoption of Generative AI in the IT industry of the Klang Valley. The research emphasises four key elements: technological factors; organisational capacity; market responsiveness; and external factors. The results indicate that organisations and experts should evaluate many elements when determining the implementation of generative AI, including technology capabilities, organisational preparedness, market needs, and external influences, such as legal frameworks.

This study achieves Research Objective 1 by identifying latent elements, hence enhancing the knowledge of the dynamics related to the adoption of Generative AI in the region. This research may inform the creation of customised plans and activities to promote the use of Generative AI, eventually resulting in improved efficiency, innovation, and competitiveness within the IT sector.

5.2.2 Research Objective 2: To investigate the potential of generative artificial intelligence in the information technology sector for achieving improved information technology project performance.

Among the analysis of the collected data, only one key component were found that highlight the potential of Gen AI in enhancing Information Technology practices: Improved Information Technology Project Performance

(i) Component 1: Improved Information Technology Project Performance

The adoption of GEN AI in IT has shown a crucial latent in improving information technology project performance. Generative AI improves project efficiency by automating repetitive tasks such as data input and problem identification, hence liberating human resources for more intricate responsibilities. It utilises predictive analytics to anticipate hazards, delays, and resource requirements, facilitating improved planning and proactive decision-making. Furthermore, AI enhances resource allocation through the analysis of project data, guaranteeing the efficient utilisation of time, talent, and technology. AI solutions enhance real-time collaboration and communication, optimising team coordination, minimising misunderstandings, and augmenting productivity.

Moreover, AI-powered quality assurance technologies detect and rectify possible problems promptly, guaranteeing superior outcomes. Ultimately, Generative AI decreases expenses by enhancing efficiency, diminishing mistakes, and mitigating dangers. In summary, Generative AI improves IT project performance by augmenting efficiency, decreasing costs, enhancing decision-making, and assuring superior outcomes in IT project management.

5.3 Research Contributions

The contributions of this research to the industry, regulatory authorities, and academic communities are delineated as follows:

Industry: The findings of this research can help IT industry professionals in Klang Valley, Malaysia, understand the key factors driving the adoption of Generative AI. This knowledge can guide the development of strategies to overcome barriers and promote AI adoption in their organisations. For example, companies can invest in training programs to enhance employees' skills in using Generative AI tools, foster a culture of innovation and collaboration, and allocate resources to support the integration of AI technologies into existing systems.

a) **Governing bodies:** The findings can assist governing bodies in Malaysia, such as the Ministry of Communications and Multimedia (MCMC) and the Malaysia Digital Economy Corporation (MDEC), in formulating policies and initiatives that encourage the adoption of Generative AI in the IT sector. For instance, they can provide financial incentives such as grants or tax incentives for organisations investing in AI technologies. Additionally, governing bodies can establish standards and guidelines for AI implementation to ensure ethical use, data security, and intellectual property protection.

b) **Research or academic communities:** This research contributes to the expanding body of knowledge on the adoption of Generative AI in the IT industry. Academics and researchers can build on these findings to develop new theories, models, and frameworks that further explore the factors influencing AI adoption. The study also serves as a foundation for future research on the impact of Generative AI on productivity, innovation, and the competitive landscape in the IT sector. Additionally, the research methodology and instruments used can be adapted for similar studies in other industries or geographical contexts.

5.4 Study Limitations

This research offers significant insights into the determinants affecting the adoption of Generative AI across the IT industry. Nonetheless, it is crucial to recognise the constraints of the research:

1. Restricted sample size: The quantitative research approach depended on a certain cohort of participants. Despite attempts to get a representative sample, the sample size

remained very limited. Some responder groups had fewer than 30 people, thereby constraining the generalizability of the findings to the wider IT sector in the Klang Valley. Addition to this, the focus only with IT department and did not provided to other departments.

2. Geographic Constraints: The study was confined to the Klang Valley region, thereby limiting the generalisability of the results to other places with distinct market dynamics, regulatory environments, or cultural factors that may influence the adoption of Generative AI in the IT industry.

3. Self-reported data: The data was gathered using questionnaires reliant on participants' self-reported answers, potentially introducing biases such as social desirability bias or recollection bias. Participants may have answered in ways they deemed socially acceptable, or they may have encountered difficulties correctly recalling their experiences with AI adoption.

4. Quantitative focus: The quantitative methodology facilitated the analysis of correlations among variables and the testing of hypotheses, but it may not adequately include the intricacies and nuances of individual experiences and perspectives. Qualitative research approaches, including interviews and focus groups, may provide a more comprehensive and nuanced insight into the issues affecting Generative AI adoption within the IT sector.

5.5 Recommendations for Future Research

To enhance comprehension of the determinants affecting the adoption of Generative AI in the IT sector, many targeted research enquiries for forthcoming studies are proposed:

1. Qualitative investigation of adoption determinants:

- Perform comprehensive interviews or focus group talks with IT experts to acquire a more profound insight into the determinants affecting Generative AI adoption.
- Investigate the obstacles, achievements, and contextual elements influencing adoption decisions to enhance the quantitative results of the study.

2. Longitudinal studies:

- Examine the enduring effects of Generative AI implementation on IT project results, organisational efficacy, and overarching industry changes.

- Perform longitudinal studies to evaluate the progression of the adoption process over time and its ramifications for many stakeholders within the IT sector.

3. Comparative analysis across diverse areas, department or nations:
- Expand the geographical parameters of the investigation to encompass locations or nations outside Klang Valley, Malaysia.
- Extend the survey to evaluate the types of organization or department involvement in the questionnaire to get more data accuracy.
- Examine the determinants affecting the adoption of Generative AI in many contexts, highlighting parallels, discrepancies, and optimal practices across areas with differing market situations.

4. Integration with alternative theoretical frameworks:
- Investigate the amalgamation of the TOE framework with pertinent theories, including the Technology Acceptance Model (TAM) and the Diffusion of Innovation (DOI)theory.
- Examine how the integration of several theoretical frameworks may provide a more thorough comprehension of Generative AI implementation within the IT industry.

5. Studies tailored to stakeholders:
- Perform focused research on the adoption determinants, obstacles, and advantages pertinent to various stakeholder groups within the IT industry, including software developers, system integrators, and data scientists.
- Examine the effects of Generative AI adoption on the roles, responsibilities, and workflows of various stakeholders, and determine solutions to enhance cooperation and creativity.

5.6 Conclusion

The implementation of Generative AI in the IT industry of Klang Valley is shaped by a confluence of technological, organisational, market, and external variables. Technological attributes, like system dependability and user-friendliness, are crucial in facilitating adoption. Organisational elements, such as leadership endorsement and employee preparedness, dictate the internal capability for effective implementation. Market response, propelled by competitive pressures and consumer desire for creative solutions, further pushes AI adoption. Ultimately, external variables such as legislative

frameworks and economic situations affect the widespread acceptance and integration of Generative AI. Comprehending these variables may assist IT organisations and stakeholders in Klang Valley in adeptly manoeuvring through the intricacies of AI adoption, hence improving performance, productivity, and innovation within the industry.

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Appendices

1 November 2024

TO WHOM IT MAY CONCERN

Dear Sir/Madam,

QUESTIONNAIRE SURVEY FOR MASTER'S PROJECT

Please be advised that PRIYANKA A/P HARI VISNU (Student ID Number: 22UEM00629) is a student in the Master of Project Management programme at the Department of Surveying, Lee Kong Chian Faculty of Engineering and Science, Universiti Tunku Abdul Rahman, Sungai Long Campus.

To enable the student to implement her master's project, we seek your kind cooperation in allowing the student to conduct a questionnaire survey in collecting data on Factors for the Adoption of Generative Artificial Intelligence in the Information Technology Sector in Klang Valley Malaysia.

All collected data will be kept strictly confidential and used only for academic purposes.

If you have any questions, please contact the student at 016-9833405 or harivisnupriyanka@gmail.com.

Your cooperation is greatly appreciated.

Yours faithfully,
Toh
ASST PROF TS DR TOH TIEN CHOON
Supervisor
Department of Surveying
Lee Kong Chian Faculty of Engineering and Science

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Generative Artificial Intelligence Adoption Questionnaire

Section A: Demographic Information
Please select only one answer for each item.

DI01) Firm size:
1) Small
2) Medium
3) Large

DI02) Position in the firm:
1) Upper management
2) Middle management
3) Lower management

DI03) Years of working experience:
1) Less than 5 years
2) 5 years and above

DI04) Experience using generative artificial intelligence in information technology projects:
1) Yes
2) No

Section B: Technological Dimension
To what extent do you agree or disagree that the following technological dimension factors are important for the adoption of generative artificial intelligence in information technology projects in your organisation?
1) Strongly disagree

2) Disagree
3) Neither agree nor disagree
4) Agree
5) Strongly agree

F01) Perceived usefulness
F02) Perceived ease of use
F03) Technology optimism
F04) Technological capability
F05) Compatibility
F06) Relative advantage
F07) Trialability
F08) Observability

Section C: Organisational Dimension

To what extent do you agree or disagree that the following organisational dimension factors are important for the adoption of generative artificial intelligence in information technology projects in your organisation?

1) Strongly disagree
2) Disagree
3) Neither agree nor disagree
4) Agree
5) Strongly agree

F09) Organisational scale
F10) Organisational readiness
F11) Absorptive capacity
F12) Top management support
F13) Human resources
F14) Managerial support

Section D: Environmental Dimension

To what extent do you agree or disagree that the following environmental dimension factors are important for the adoption of generative artificial intelligence in information technology projects in your organisation?

1) Strongly disagree
2) Disagree
3) Neither agree nor disagree
4) Agree
5) Strongly agree

F15) Market demand
F16) Competitive pressure
F17) Government support
F18) Trading partner readiness

Section E: Improved Information Technology Project Performance

To what extent do you agree or disagree with the following statements?

1) Strongly disagree
2) Disagree
3) Neither agree nor disagree
4) Agree
5) Strongly agree

IITPP01) Generative artificial intelligence improves information technology project time performance.
IITPP02) Generative artificial intelligence improves information technology project cost performance.
IITPP03) Generative artificial intelligence improves information technology project quality performance.