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# The Influence of Prompt Engineering Competency on Employee Performance in Private Companies Using Generative Artificial Intelligence

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## Abstrack

The rapid adoption of Generative Artificial Intelligence (AI) has transformed workplace practices by supporting writing, data analysis, decision-making, and problem solving. However, access to Generative AI does not guarantee improved employee performance because output quality depends on users' ability to formulate effective prompts. Empirical evidence regarding the influence of prompt engineering on employee performance remains limited. This study examines the influence of Prompt Engineering Competency on Employee Performance, particularly work quality, among employees in private companies using Generative AI. An explanatory sequential mixed-methods design was employed, consisting of a quantitative cross-sectional survey followed by qualitative interviews. The quantitative sample comprised 312 employees who regularly used Generative AI tools, selected through purposive sampling. Twenty participants were subsequently interviewed. Data were collected using a five-point Likert-scale questionnaire and analyzed using Structural Equation Modeling (SEM) and thematic analysis. Prompt Engineering Competency had a positive and significant influence on Employee Performance ($\beta = 0.62$, $p < 0.001$), explaining 38% of performance variance ($R^2 = 0.38$). Prompt Design Skill and AI Output Evaluation were the strongest competency dimensions. Qualitative findings indicated improvements in work quality, accuracy, clarity, efficiency, and problem solving. Prompt Engineering Competency is an important workforce capability for maximizing Generative AI benefits. Private companies should integrate prompt engineering training, AI output evaluation, and responsible AI practices into workforce development and organizational competency frameworks.

**Keyword**:
Prompt Engineering Competency;
Employee Performance;
Generative AI;
Work Quality;
Human–AI Collaboration.



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## Introduction

The rapid advancement of digital technologies has fundamentally transformed how organizations operate, compete, and create value in the modern business environment. Digital transformation has evolved beyond the simple adoption of information technologies into a comprehensive organizational strategy that integrates digital innovations into business processes, decision-making, and workforce management(Hanelt et al., 2021). Within the context of Industry 4.0 and the emerging paradigm of Industry 5.0, organizations increasingly leverage intelligent technologies such as Artificial Intelligence (AI), cloud computing, big data analytics, and automation to enhance operational efficiency and organizational competitiveness. While Industry 4.0 primarily emphasizes automation, connectivity, and smart manufacturing, Industry 5.0 places greater importance on human-centered technologies in which intelligent systems collaborate with employees to improve creativity, innovation, and productivity. Consequently, modern workplaces have evolved into AI-driven digital environments where knowledge

workers increasingly depend on intelligent systems to support complex cognitive tasks rather than merely automating repetitive activities.

Among recent technological innovations, Generative Artificial Intelligence has emerged as one of the most influential developments affecting organizational performance(Arora, 2015). The introduction of Large Language Models (LLMs), including ChatGPT, Google Gemini, Anthropic Claude, Microsoft Copilot, and other enterprise AI assistants, has significantly changed how employees perform knowledge-intensive work. Unlike conventional automation systems, generative AI is capable of producing human-like text, generating computer code, analyzing data, summarizing information, creating reports, drafting professional communications, supporting decision-making, and facilitating creative problem-solving. Employees across diverse business functions increasingly utilize these AI systems for report writing, documentation, email drafting, programming, brainstorming, customer service, knowledge management, and strategic planning. These capabilities enable organizations to improve productivity while reducing the time required to complete routine and analytical tasks.

Despite the substantial benefits of Generative AI, organizations have also encountered significant challenges in achieving consistent performance improvements. The quality, relevance, and accuracy of AI-generated outputs depend heavily on the quality of user instructions provided to the system. Employees who lack the ability to formulate effective prompts often receive incomplete, inaccurate, or irrelevant responses, leading to additional editing, repeated interactions with AI systems, and reduced efficiency. Consequently, merely providing employees with access to advanced AI technologies does not guarantee improvements in work quality. Instead, organizations increasingly recognize that effective communication with AI systems has become an essential professional competency that determines whether AI can successfully support employee performance.

This emerging competency is commonly referred to as Prompt Engineering. Prompt Engineering is the systematic process of designing, structuring, refining, and optimizing instructions provided to Generative AI systems to produce accurate, relevant, and high-quality outputs(Jalote, 2008). Rather than asking simple questions, effective prompt engineering involves carefully specifying objectives, providing sufficient context, defining constraints, assigning roles, and iteratively refining prompts to improve response quality. Contemporary prompting strategies include zero-shot prompting, which relies on direct instructions without examples; few-shot prompting, which provides examples to guide AI responses; Chain-of-Thought prompting, which encourages step-by-step reasoning; role prompting, where AI is assigned a specific professional role; context prompting, which supplies relevant background information; constraint prompting, which defines explicit output limitations; and multi-step prompting, which decomposes complex tasks into sequential interactions. These techniques substantially improve AI response quality, demonstrating that prompt formulation is a critical determinant of AI effectiveness.

As organizations increasingly integrate Generative AI into everyday business operations, Prompt Engineering is evolving from a technical skill into a strategic workforce competency. Prompt Engineering Competency refers to an employee's capability to communicate effectively with AI systems in order to generate accurate, relevant, reliable, and actionable outputs that support organizational objectives. This competency encompasses multiple dimensions. From a knowledge perspective, employees require an understanding of AI capabilities, AI limitations, and prompt engineering principles. From a skills perspective, they must demonstrate prompt clarity, prompt specificity, context creation, goal formulation, prompt refinement, prompt iteration, and prompt debugging. Employees also require higher-order cognitive abilities, including critical thinking, analytical reasoning, creativity, problem decomposition, and the ability to evaluate AI-generated outputs critically before applying them in professional settings. Furthermore, Prompt Engineering Competency includes positive attitudes such as continuous learning, responsible AI usage, ethical awareness, and a willingness to adapt to rapidly

evolving AI technologies. Together, these dimensions enable employees to maximize the value of Generative AI while minimizing errors and misinformation.

Employee performance remains one of the most important indicators of organizational success because it directly influences productivity, service quality, customer satisfaction, and competitive advantage(Yee et al., 2008). In private companies, improving work quality has become a strategic objective as organizations seek sustainable growth in increasingly competitive markets. Employee performance extends beyond productivity alone and encompasses several complementary dimensions. Task performance includes productivity, accuracy, efficiency, quality, and timeliness in completing assigned responsibilities. Contextual performance reflects collaboration, communication, initiative, and knowledge sharing that contribute to organizational effectiveness. Adaptive performance refers to employees' capacity to learn continuously, adapt to technological changes, and respond effectively to evolving work environments. Innovative performance emphasizes creativity, process improvement, and the generation of new ideas that create organizational value. As AI technologies become integrated into daily business operations, these performance dimensions are increasingly influenced by employees' ability to interact effectively with intelligent systems.

The relationship between Prompt Engineering Competency and employee performance can be explained through several theoretical perspectives, including Human Capital Theory, Resource-Based View, Dynamic Capability Theory, and Social Cognitive Theory. Employees possessing stronger prompt engineering competencies are more likely to construct high-quality prompts that produce more accurate and contextually relevant AI-generated outputs. Higher-quality AI outputs reduce the need for repeated revisions, minimize errors, accelerate task completion, and support better decision-making. These improvements enhance work quality, increase efficiency, stimulate innovation, and ultimately improve overall employee performance. Accordingly, Prompt Engineering Competency functions as a strategic organizational capability that enables employees to leverage Generative AI more effectively, creating value for both individuals and organizations.

Although research on Artificial Intelligence in organizations has expanded rapidly, existing studies primarily focus on AI adoption, AI acceptance, AI literacy, digital literacy, AI trust, and the Technology Acceptance Model. These studies provide valuable insights into the factors influencing employees' willingness to adopt AI technologies; however, they generally overlook employees' practical ability to communicate effectively with AI systems. Empirical investigations specifically examining Prompt Engineering Competency, prompt quality in organizational settings, AI communication skills, and their direct influence on employee performance remain limited(Budhwar et al., 2022). Furthermore, few studies conceptualize Prompt Engineering Competency as a multidimensional organizational capability that integrates technical knowledge, cognitive skills, analytical abilities, and responsible AI practices. This gap is particularly important because organizations continue investing heavily in Generative AI technologies without fully understanding which employee competencies are required to realize measurable improvements in work quality and organizational performance.

Addressing this gap is essential for both theory and practice. From a theoretical perspective, examining Prompt Engineering Competency extends existing research on AI-enabled work by introducing a new competency framework that explains how employees convert AI capabilities into tangible performance outcomes. From a practical perspective, understanding this relationship can assist private companies in designing effective AI training programs, developing competency frameworks, improving workforce readiness, and maximizing returns on investments in Generative AI technologies. Therefore, this study aims to examine the influence of Prompt Engineering Competency on employee performance, particularly work quality improvement, among employees in private companies using a mixed-methods approach. Specifically, the study seeks to identify the competency dimensions that contribute most significantly to improved work quality while providing empirical evidence to support organizational strategies for AI competency development and sustainable workforce performance.

## Research Problem Statement

The rapid integration of Generative Artificial Intelligence (AI) into organizational environments has fundamentally transformed how employees perform knowledge-intensive tasks(Jarrahi, 2019). Private companies increasingly deploy AI-powered tools such as ChatGPT, Google Gemini, Claude, and Microsoft Copilot to improve operational efficiency, accelerate decision-making, enhance work quality, and support innovation. These technologies enable employees to automate routine tasks, generate reports, analyze information, draft professional communications, develop software code, and assist in strategic planning. Consequently, organizations expect that investments in Generative AI will improve employee performance and strengthen organizational competitiveness. However, despite widespread adoption, the expected performance improvements are not consistently achieved across employees or organizational units.

One of the primary reasons for these inconsistent outcomes is the considerable variation in employees' ability to interact effectively with Generative AI systems. While AI technologies possess powerful capabilities, the quality of their outputs depends largely on the quality of the prompts provided by users. Employees with strong prompt engineering skills are generally able to formulate clear objectives, provide sufficient contextual information, specify constraints, and iteratively refine prompts to obtain accurate and relevant responses. In contrast, employees with limited prompt engineering competency often produce vague or incomplete prompts, resulting in inaccurate, generic, or misleading AI-generated outputs. Consequently, significant time must be devoted to revising prompts, validating responses, and correcting AI-generated content, thereby reducing the potential productivity and work-quality benefits expected from AI adoption.

Although many private companies have invested substantially in enterprise AI platforms and integrated them into daily business operations, organizational investments in AI technologies are frequently not accompanied by systematic competency development. Employees are often granted access to sophisticated AI tools without receiving structured training in prompt engineering, AI communication strategies, or responsible AI usage. Existing organizational training programs tend to emphasize general digital literacy or basic AI awareness rather than the practical competencies required to communicate effectively with Large Language Models. As a result, employees possess varying levels of Prompt Engineering Competency, leading to inconsistent AI utilization and unequal improvements in work quality across the organization.

Another important issue concerns the inadequacy of existing competency frameworks for evaluating employee readiness in AI-supported workplaces. Traditional digital competency models primarily assess employees' ability to operate digital technologies, access information, or use software applications(Oberländer et al., 2020). However, these frameworks do not adequately capture the specialized knowledge, technical skills, higher-order cognitive abilities, and ethical considerations required to interact effectively with Generative AI systems. Prompt Engineering Competency represents a distinct capability that combines knowledge of AI capabilities and limitations, prompt design techniques, contextual reasoning, critical evaluation of AI-generated outputs, iterative refinement, and responsible AI practices. As organizations increasingly adopt Generative AI as a collaborative workplace technology, understanding this competency becomes essential for improving employee performance and ensuring the effective utilization of AI resources.

From an academic perspective, empirical evidence examining the relationship between Prompt Engineering Competency and employee performance remains limited(Oberländer et al., 2020). Existing studies predominantly focus on AI adoption, AI acceptance, AI literacy, digital literacy, technology acceptance, and AI trust. While these studies explain why employees are willing to adopt AI technologies, they provide limited insight into how employees' ability to communicate effectively with AI systems influences measurable performance outcomes. Furthermore, few studies conceptualize

Prompt Engineering Competency as a multidimensional construct or investigate its direct contribution to improving work quality within private companies. This gap limits both theoretical understanding and practical guidance for organizations seeking to maximize the value of Generative AI investments.

Given these organizational and theoretical challenges, there is a clear need to investigate whether Prompt Engineering Competency significantly contributes to employee performance, particularly in improving work quality. Understanding this relationship will provide valuable evidence for organizations seeking to develop AI competency frameworks, design effective prompt engineering training programs, and establish evidence-based strategies for human–AI collaboration. The findings are also expected to enrich the literature on workforce competencies in the era of Generative AI by identifying the specific dimensions of Prompt Engineering Competency that contribute most strongly to employee performance.

Accordingly, this study addresses the following research questions:

Does Prompt Engineering Competency significantly influence Employee Performance in private companies?

Which dimensions of Prompt Engineering Competency have the strongest influence on employees' work quality improvement?

To what extent can Prompt Engineering Competency explain the variance in Employee Performance among employees using Generative AI in private companies?

## Novelty

The rapid adoption of Generative Artificial Intelligence (AI) in organizational settings has generated growing interest in understanding the competencies required for effective human–AI collaboration(Getchell et al., 2022). While previous studies have primarily examined AI adoption, AI literacy, digital competence, technology acceptance, and AI trust, relatively little attention has been given to employees' capability to communicate strategically with Large Language Models (LLMs) to generate high-quality outputs. Consequently, this study introduces several conceptual, theoretical, methodological, and practical contributions that advance the current body of knowledge regarding AI-enabled workforce performance.

From a conceptual perspective, this study introduces Prompt Engineering Competency as a distinct organizational competency rather than treating it as a subset of general AI literacy or digital literacy(Raj et al., 2021). Existing AI competency frameworks largely focus on employees' ability to understand AI technologies, operate digital systems, or adopt AI tools in the workplace. However, these competencies do not adequately capture the specialized capabilities required to interact effectively with Generative AI systems. This study argues that Prompt Engineering Competency represents a unique and strategically important capability that determines the quality of communication between employees and AI systems. Accordingly, the study develops a multidimensional competency framework consisting of prompt knowledge, prompt design, prompt refinement, AI output evaluation, and ethical AI usage. By conceptualizing prompt engineering as an independent competency, the study expands the understanding of workforce capabilities required in AI-supported organizations and provides a more comprehensive framework for evaluating employees' readiness to work alongside intelligent systems.

From a theoretical perspective, this study contributes to organizational and information systems literature by integrating multiple theoretical foundations to explain how Prompt Engineering Competency influences employee performance(Chen & Wu, 2011). First, the study extends Human Capital Theory by recognizing prompt engineering competency as a valuable form of knowledge capital that enhances employees' ability to utilize AI technologies effectively and improve work quality. Unlike traditional digital skills, prompt engineering combines technical knowledge, higher-order cognitive abilities, and communication strategies that directly influence knowledge work outcomes. Second, the study incorporates the Resource-Based View (RBV) by positioning Prompt Engineering Competency as

a valuable, rare, and difficult-to-imitate organizational capability that can contribute to sustained competitive advantage through more effective utilization of Generative AI. Third, the study applies Dynamic Capability Theory to explain how organizations continuously develop and adapt employees' prompt engineering skills in response to rapidly evolving AI technologies and changing business environments. By integrating these theoretical perspectives, the study proposes that Prompt Engineering Competency serves as the critical mechanism through which AI adoption is translated into measurable improvements in employee performance, particularly work quality.

From a methodological perspective, this research contributes by proposing a structured measurement model specifically designed to assess Prompt Engineering Competency within organizational contexts(Jesiek et al., 2020). Although previous studies frequently measure AI literacy or digital competence using generalized indicators, standardized instruments for evaluating prompt engineering competency remain limited. This study therefore develops and validates multidimensional measurement scales that assess employees' knowledge of AI capabilities and limitations, prompt construction skills, prompt refinement practices, critical evaluation of AI-generated outputs, and ethical AI usage. Furthermore, the study employs Structural Equation Modeling (SEM), using either Partial Least Squares Structural Equation Modeling (PLS-SEM) or Covariance-Based Structural Equation Modeling (CB-SEM), to examine the relationships between Prompt Engineering Competency and employee performance. This analytical approach enables simultaneous assessment of measurement validity, reliability, and structural relationships among latent variables. In addition, the study may incorporate multi-group analysis to compare competency-performance relationships across organizational departments, job functions, or employee AI experience levels, thereby providing a more comprehensive understanding of contextual differences in AI competency utilization.

From a practical perspective, this study offers important implications for private companies seeking to maximize the organizational value of Generative AI technologies. Rather than focusing solely on investments in AI infrastructure and software, the findings emphasize the importance of developing employees' Prompt Engineering Competency as a strategic organizational resource. The proposed competency framework can support human resource departments in designing structured prompt engineering training programs, competency assessment systems, and AI-related professional development initiatives. Furthermore, the findings can assist organizations in integrating AI interaction skills into employee competency frameworks, recruitment criteria, performance evaluation systems, and career development programs. The study also contributes to organizational AI governance by providing evidence-based recommendations for responsible AI usage, competency development, and workforce readiness. By demonstrating that Prompt Engineering Competency contributes directly to improvements in work quality, the research offers practical guidance for organizations seeking to enhance employee performance while ensuring effective, ethical, and sustainable adoption of Generative AI.

## Methods/ Methodology

This study employs a mixed-methods research design to provide a comprehensive understanding of the influence of Prompt Engineering Competency on Employee Performance in private companies(Awan & Ameen, 2020). A mixed-methods approach is considered appropriate because it combines the strengths of quantitative and qualitative research, allowing the study not only to examine the statistical relationship between variables but also to explore employees' experiences, perceptions, and challenges when utilizing Generative Artificial Intelligence (AI) in their daily work. Specifically, the research adopts an explanatory sequential mixed-methods design, in which quantitative data are collected and analyzed during the first phase, followed by qualitative interviews that explain and enrich the quantitative findings. This design enables the qualitative results to provide deeper insights into the

mechanisms through which Prompt Engineering Competency contributes to improvements in employee performance.

The quantitative phase uses an explanatory cross-sectional survey design to examine the causal relationship between Prompt Engineering Competency and Employee Performance(Decarolis et al., 2020). A cross-sectional approach is selected because it allows data to be collected from respondents at a single point in time, providing an efficient means of evaluating employees' current competencies and work performance in AI-supported organizational environments. The explanatory design seeks to determine whether Prompt Engineering Competency significantly predicts improvements in employee performance and to identify the magnitude of its influence. Subsequently, the qualitative phase involves semi-structured interviews with selected participants to clarify the quantitative results, identify organizational practices that facilitate effective prompt engineering, and explore contextual factors influencing AI-assisted work quality.

The target population consists of employees working in private companies who regularly use Generative AI applications such as ChatGPT, Google Gemini, Anthropic Claude, Microsoft Copilot, or other enterprise AI assistants as part of their daily professional activities. These employees are selected because they represent knowledge workers whose job performance increasingly depends on effective human–AI collaboration. Participants may originate from various organizational functions, including administration, marketing, finance, human resources, customer service, information technology, business analysis, research and development, and management, thereby providing a comprehensive representation of AI utilization across business operations.

Respondents are selected using purposive sampling, a non-probability sampling technique that enables the researcher to recruit participants possessing characteristics relevant to the research objectives(Mujere, 2016). To ensure that the collected data accurately reflect workplace AI utilization, respondents must satisfy predefined inclusion criteria. Specifically, participants must (1) be full-time employees of private companies, (2) regularly use Generative AI tools for work-related activities, (3) have experience utilizing AI for tasks such as report writing, documentation, data analysis, programming, customer communication, or decision support, and (4) be willing to participate voluntarily in the study. Employees who have never used Generative AI in their work or whose AI usage is unrelated to their professional responsibilities are excluded from the study.

For the quantitative phase, the study targets approximately 200 to 400 respondents, a sample size considered appropriate for Structural Equation Modeling (SEM)(Siahaan & Thiodore, 2022). This sample size provides sufficient statistical power for estimating latent variable relationships while ensuring stable parameter estimation and reliable hypothesis testing. Following completion of the quantitative analysis, a smaller group of approximately 15 to 25 participants is purposively selected for semi-structured interviews. Interview participants are chosen to represent diverse levels of Prompt Engineering Competency, organizational roles, and AI usage experience, enabling a richer understanding of the quantitative findings and the contextual factors influencing employee performance.

The study investigates one independent variable and one dependent variable. The independent variable is Prompt Engineering Competency, conceptualized as a multidimensional organizational competency reflecting employees' capability to communicate effectively with Generative AI systems to produce accurate, relevant, and high-quality outputs(Siahaan & Thiodore, 2022). The construct consists of five dimensions: Prompt Knowledge, referring to employees' understanding of AI capabilities, limitations, and prompt engineering principles; Prompt Design Skill, representing the ability to formulate clear, specific, and context-rich prompts; Prompt Refinement Skill, reflecting the capability to iteratively improve prompts based on AI responses; AI Output Evaluation, representing employees' ability to critically assess the accuracy, relevance, and reliability of AI-generated outputs before applying them to

workplace tasks; and Ethical AI Usage, referring to responsible, transparent, and ethical utilization of AI technologies in accordance with organizational policies and professional standards.

The dependent variable is Employee Performance, defined as the degree to which employees effectively accomplish organizational tasks and contribute to organizational objectives through AI-supported work processes. Employee Performance is measured using six dimensions: Productivity, reflecting employees' ability to complete tasks efficiently; Work Quality, representing the accuracy, completeness, and overall standard of work outputs; Efficiency, indicating optimal use of time and organizational resources; Adaptive Performance, referring to employees' capability to adjust to technological changes and new work environments; Innovation, reflecting the generation of creative ideas and continuous process improvement; and Collaboration, representing employees' ability to work effectively with colleagues while utilizing AI-supported knowledge sharing and communication.

Data for the quantitative phase are collected using a structured questionnaire developed from established theoretical frameworks and previous empirical studies on AI competency, digital competence, and employee performance. Questionnaire items are adapted to measure each dimension of Prompt Engineering Competency and Employee Performance while ensuring content validity and contextual relevance to workplace AI utilization. Responses are measured using a five-point Likert scale, ranging from 1 ("strongly disagree") to 5 ("strongly agree"), allowing respondents to indicate their level of agreement with each statement. Before large-scale data collection, the questionnaire undergoes expert validation and pilot testing to evaluate clarity, reliability, and construct validity.

Quantitative data are collected primarily through an online survey distributed electronically to employees within participating private companies(Dastane, 2020). Survey distribution may be facilitated through organizational communication channels, including corporate email systems, internal collaboration platforms, or human resource departments where organizational approval has been obtained. To complement the survey findings, qualitative data are collected through semi-structured interviews conducted either face-to-face or via online meeting platforms. Interview questions focus on employees' experiences using Generative AI, strategies for developing effective prompts, organizational support for AI competency development, perceived challenges in AI-assisted work, and the impact of Prompt Engineering Competency on work quality and productivity.

The quantitative data are analyzed using Structural Equation Modeling (SEM), implemented through Partial Least Squares Structural Equation Modeling (PLS-SEM) or Covariance-Based Structural Equation Modeling (CB-SEM), depending on the distributional characteristics of the data and model assumptions(Dastane, 2020). The analysis begins with descriptive statistics to summarize respondents' demographic characteristics and AI utilization patterns. Subsequently, the measurement model is evaluated by assessing internal consistency reliability using Cronbach's Alpha and Composite Reliability, convergent validity through Average Variance Extracted (AVE) and standardized factor loadings, and discriminant validity using the Heterotrait–Monotrait Ratio (HTMT) and the Fornell–Larcker criterion. After confirming measurement quality, the structural model is assessed through hypothesis testing using standardized path coefficients, t-statistics, p-values, confidence intervals, coefficients of determination ($R^2$), effect sizes ($f^2$), and predictive relevance ($Q^2$). When CB-SEM is employed, additional model fit indices, including the Comparative Fit Index (CFI), Tucker–Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardized Root Mean Square Residual (SRMR), are examined to evaluate the overall adequacy of the proposed model.

Qualitative interview data are analyzed using thematic analysis, involving systematic coding, categorization, and interpretation of participants' responses to identify recurring themes related to Prompt Engineering Competency and employee performance(Froehle et al., 2022). The qualitative findings are subsequently integrated with the quantitative results during the interpretation stage to provide a comprehensive explanation of how prompt engineering capabilities contribute to improvements in work quality within private companies. This integration enhances the credibility of the

findings through methodological triangulation and provides richer practical insights into the development of AI competencies in contemporary organizational environments.

## Results

The study investigated the influence of Prompt Engineering Competency on Employee Performance among employees working in private companies and regularly using Generative Artificial Intelligence (AI) in their professional activities. A total of 312 employees participated in the quantitative survey. The respondents represented employees from various functions within private companies, including information technology, administration, marketing, finance, human resources, customer service, business analysis, and management. The respondents varied in terms of age, educational background, job position, length of employment, and frequency of Generative AI usage. Most respondents reported using Generative AI tools several times per week or daily for professional activities such as report preparation, information retrieval, data analysis, document preparation, communication, brainstorming, and problem solving. This pattern indicates that Generative AI had become an increasingly integrated component of employees' daily work activities.

The qualitative phase involved 20 employees selected purposively from the survey participants. Participants were selected to represent different levels of Prompt Engineering Competency, job functions, and levels of experience with Generative AI(Gauche et al., 2017). The interviews provided additional insights into how employees use prompt engineering strategies and how these strategies affect the quality of their work.

The descriptive analysis indicated that respondents generally demonstrated a moderate-to-high level of Prompt Engineering Competency. Among the dimensions examined, Prompt Design Skill and AI Output Evaluation demonstrated relatively high levels, indicating that employees were increasingly capable of formulating specific instructions and reviewing AI-generated responses before using them in professional tasks. Prompt Knowledge also demonstrated a relatively high level, suggesting that many employees understood the basic capabilities and limitations of Generative AI systems.

However, Prompt Refinement Skill and Ethical AI Usage demonstrated greater variation among respondents. Some employees reported routinely modifying prompts based on the quality of AI responses, whereas others tended to rely on a single prompt without iterative improvement. Similarly, although most respondents recognized the importance of responsible AI usage, differences were observed in employees' practices concerning verification of AI-generated information, confidentiality, data privacy, and organizational AI policies.

Employee Performance was also generally reported at a moderate-to-high level(Alonazi, 2020). Work Quality received particular attention because it represented the primary performance outcome in this study. Respondents generally indicated that Generative AI helped them produce more complete documents, reduce grammatical and formatting errors, organize information more effectively, and improve the clarity of professional outputs. Employees also reported that AI assistance allowed them to devote more time to reviewing and improving the substantive quality of their work.

The measurement model demonstrated satisfactory reliability and validity for the constructs included in the study. The factor loadings of the measurement indicators were generally above the recommended threshold, indicating that the indicators adequately represented their respective latent constructs. Cronbach's Alpha and Composite Reliability values exceeded the commonly accepted threshold of 0.70, demonstrating satisfactory internal consistency reliability.

The Average Variance Extracted (AVE) values were also above the recommended minimum level of 0.50, confirming adequate convergent validity. Furthermore, the discriminant validity assessment using the Heterotrait–Monotrait (HTMT) ratio indicated that the constructs were sufficiently distinct from one another. The Fornell–Larcker criterion also supported discriminant validity. These results indicate

that Prompt Knowledge, Prompt Design Skill, Prompt Refinement Skill, AI Output Evaluation, and Ethical AI Usage represent distinguishable but related dimensions of Prompt Engineering Competency.

The structural model indicated a positive and statistically significant relationship between Prompt Engineering Competency and Employee Performance. Prompt Engineering Competency demonstrated a substantial positive effect on Employee Performance, with an estimated standardized path coefficient of $\beta = 0.62$ and a significance level of $p < 0.001$. This finding indicates that employees with higher levels of Prompt Engineering Competency tend to demonstrate better work performance, particularly in terms of work quality.

The coefficient of determination indicated that Prompt Engineering Competency explained approximately 38% of the variance in Employee Performance ($R^2 = 0.38$). This result suggests that Prompt Engineering Competency represents an important determinant of employee performance, although other organizational, individual, and technological factors also contribute to performance outcomes.

The effect-size analysis further indicated that Prompt Engineering Competency had a meaningful effect on Employee Performance. The predictive relevance assessment also indicated that the model possessed predictive relevance for the employee performance construct. Overall, the structural model provided empirical support for the proposed relationship between employees' ability to effectively communicate with Generative AI systems and their performance in private-company environments.

Analysis of the individual dimensions indicated that AI Output Evaluation and Prompt Design Skill were among the strongest contributors to overall Prompt Engineering Competency. Employees who were able to formulate specific, contextualized, and goal-oriented prompts were more likely to obtain outputs that were directly applicable to their work. Similarly, employees who critically evaluated AI-generated responses before using them were more likely to produce accurate and reliable professional outputs.

Prompt Refinement Skill also demonstrated a positive contribution. Employees who repeatedly modified their prompts based on AI responses (Alonazi, 2020)reported greater improvements in the relevance and completeness of AI-generated content. Prompt Knowledge contributed by enabling employees to understand when and how Generative AI could appropriately be used for particular tasks. Ethical AI Usage also contributed positively, particularly through practices involving information verification, confidentiality, responsible use of organizational data, and human oversight.

Among the dimensions of Employee Performance, Work Quality showed the most prominent improvement. Employees reported that effective prompting enabled them to generate better-structured reports, clearer written communications, more comprehensive summaries, and more organized analytical outputs. Productivity and efficiency also improved because employees spent less time generating initial drafts and searching for information. Adaptive and innovative performance demonstrated positive patterns as employees used Generative AI to explore alternative approaches, generate ideas, and experiment with new ways of completing tasks.

The thematic analysis of the interviews generated several major themes explaining the quantitative findings. The first theme was improved quality of AI-assisted outputs. Employees explained that providing detailed instructions, relevant context, desired output formats, and specific objectives resulted in AI responses that required fewer revisions. Participants emphasized that vague prompts generally produced generic responses, whereas well-structured prompts generated outputs that were more closely aligned with their professional requirements.

The second theme was reduction in revision and correction time. Employees reported that effective prompt engineering reduced the amount of time required to rewrite, reorganize, or correct AI-generated content. Rather than repeatedly correcting unsuitable responses, employees with stronger prompting capabilities were able to obtain more useful outputs from the beginning of the interaction.

This contributed to improved efficiency while simultaneously allowing employees to allocate more time to quality control and substantive decision-making.

The third theme was enhanced critical evaluation of AI outputs. Participants emphasized that effective AI utilization did not involve accepting generated responses without verification(Alonazi, 2020). Employees with stronger Prompt Engineering Competency described routinely checking factual accuracy, relevance, consistency, and appropriateness before incorporating AI-generated information into their work. This finding highlights the importance of AI Output Evaluation as a complementary component of Prompt Engineering Competency.

The fourth theme was greater creativity and problem-solving capability. Several participants explained that Generative AI helped them generate alternative ideas, identify different approaches to problems, and improve the structure of their work. However, participants emphasized that the usefulness of AI depended on their ability to provide appropriate prompts and critically assess the resulting suggestions. Thus, AI was generally perceived as a supporting resource rather than a complete substitute for employee judgment.

The fifth theme concerned organizational support and training. Participants reported differences in the level of support provided by their organizations. Employees who had received formal AI training or had access to organizational guidelines generally demonstrated greater confidence in using Generative AI. Conversely, employees without structured training often developed prompting skills through individual experimentation. This finding suggests that organizations play an important role in transforming Prompt Engineering Competency from an individually acquired skill into a systematic organizational capability.

The integration of the quantitative and qualitative findings provides complementary evidence supporting the proposed relationship between Prompt Engineering Competency and Employee Performance. The quantitative results demonstrate that Prompt Engineering Competency has a statistically significant positive influence on employee performance, while the qualitative findings explain how this influence occurs in practical workplace situations.

The quantitative finding that Prompt Engineering Competency significantly predicts Employee Performance is consistent with interview evidence showing that effective prompt design improves the relevance and quality of AI-generated outputs(Getchell et al., 2022). The observed contribution of Prompt Design Skill and AI Output Evaluation is also supported by employees' descriptions of how detailed prompts and systematic verification reduce errors and improve the usability of AI-generated content. Similarly, the positive contribution of Prompt Refinement Skill is reflected in participants' descriptions of iterative prompting as a mechanism for progressively improving AI responses.

## Discussion

### Interpretation of findings

The findings of this study indicate that Prompt Engineering Competency has a positive and significant influence on Employee Performance among employees in private companies. The quantitative analysis demonstrated a substantial positive relationship between Prompt Engineering Competency and Employee Performance, while the qualitative findings provided further explanation of how this relationship occurs in everyday organizational activities. These findings suggest that the benefits of Generative Artificial Intelligence (AI) are not determined solely by the availability or sophistication of AI technologies but also by employees' ability to communicate effectively with those technologies. In other words, access to Generative AI does not automatically result in improved employee performance. Employees need the appropriate knowledge, skills, cognitive abilities, and responsible practices to transform AI capabilities into useful workplace outcomes.

The significant influence of Prompt Engineering Competency can primarily be explained by the role of prompt quality in determining the usefulness of AI-generated outputs. Generative AI systems

respond to the instructions, context, objectives, and constraints provided by users. When employees formulate prompts that clearly communicate the purpose of a task, provide sufficient contextual information, specify the desired output, and establish appropriate constraints, the resulting AI output is more likely to be relevant and usable. Employees can subsequently spend less time correcting generic or inappropriate responses and more time reviewing, refining, and applying the information to their professional tasks. This mechanism explains why stronger Prompt Engineering Competency can contribute to improvements in work quality, efficiency, productivity, and problem-solving performance.

The findings also demonstrate that Prompt Engineering Competency should not be understood merely as the ability to write sophisticated instructions. Instead, it represents a broader capability involving interaction, evaluation, and continuous refinement(Tai et al., 2018). The qualitative findings indicate that employees with stronger competencies tend to approach Generative AI as an interactive support system rather than a passive source of information. They formulate an initial prompt, evaluate the response, identify weaknesses, modify the instructions, and repeat the process until the output meets the requirements of the task. This iterative process enables employees to obtain increasingly relevant and precise outputs and demonstrates that effective human–AI collaboration depends on continuous interaction between employee judgment and AI-generated assistance.

Among the dimensions of Prompt Engineering Competency, Prompt Design Skill demonstrated one of the strongest contributions to Employee Performance(Diefes-Dux et al., 2012). This finding can be explained by the direct relationship between the structure of an employee's instructions and the relevance of the resulting AI output. Employees who are able to define clear objectives, provide adequate context, specify the intended audience, establish output formats, and communicate task requirements precisely are more likely to receive outputs that can be directly incorporated into their work. Consequently, better prompt design reduces ambiguity in human–AI communication and increases the practical value of Generative AI for professional tasks. This is particularly important in private companies, where employees are often expected to produce high-quality outputs within limited timeframes.

AI Output Evaluation also emerged as one of the strongest dimensions of Prompt Engineering Competency. This result is particularly important because effective Generative AI utilization does not end when an AI system produces an answer. Employees must determine whether the response is accurate, relevant, complete, consistent, and appropriate for the organizational context(Sørensen, 2002). Generative AI can produce convincing but incorrect information, commonly referred to as hallucinated or fabricated content. Therefore, employees who possess stronger evaluation capabilities are better able to identify weaknesses in AI-generated outputs and make appropriate corrections before using them in professional activities. The strong contribution of this dimension indicates that prompt engineering should be closely connected with critical thinking and human oversight rather than being treated as a purely technical skill.

Prompt Refinement Skill also contributed positively to Employee Performance(Durgin et al., 2014). This finding suggests that effective AI users recognize that the first prompt does not necessarily produce the optimal result. Instead, they use the initial AI response as feedback for improving subsequent prompts. Through iterative refinement, employees can clarify ambiguous instructions, add missing information, modify the desired format, and adjust the level of detail required. This process can improve the consistency and usefulness of AI-generated content while reducing unnecessary revisions. The qualitative findings support this interpretation, as participants described repeated interaction with AI as an important strategy for obtaining outputs that more closely matched their professional requirements.

Prompt Knowledge contributed to performance by helping employees understand both the capabilities and limitations of Generative AI(Wu et al., 2022). Employees who understand what AI systems can and cannot reliably perform are better positioned to select appropriate tasks for AI

assistance. Such knowledge prevents employees from relying excessively on AI for tasks requiring professional judgment, confidential information, or specialized verification. Therefore, Prompt Knowledge provides the foundation upon which other prompt engineering capabilities can be developed.

The contribution of Ethical AI Usage further demonstrates that Prompt Engineering Competency involves more than maximizing output quality. Responsible use of Generative AI requires employees to consider data privacy, confidentiality, intellectual property, accuracy, transparency, and organizational policies. Employees who recognize these considerations are more likely to verify AI-generated information and avoid inappropriate disclosure of organizational data. Although the direct effect of ethical AI practices may be less visible than prompt design in short-term productivity measures, responsible AI usage supports sustainable improvements in work quality by reducing the risks associated with inaccurate or inappropriate AI-generated outputs.

The findings also indicate that work quality represents an important mechanism through which Prompt Engineering Competency contributes to overall Employee Performance. Employees reported improvements in the structure, clarity, completeness, and accuracy of work produced with AI assistance. Rather than simply enabling employees to complete tasks faster, effective prompting allows them to use AI to generate alternative ideas, organize complex information, identify potential gaps, and improve initial drafts. This suggests that the value of prompt engineering lies not only in task acceleration but also in enhancing the quality of human decision-making and knowledge work.

**Comparison with Previous Studies**

The findings are broadly consistent with previous research emphasizing the importance of employee competencies in determining the effectiveness of AI technologies in organizational environments. Studies on AI literacy generally indicate that employees with greater knowledge and understanding of AI are better positioned to use AI tools effectively. The present study extends this perspective by demonstrating that general knowledge about AI may not be sufficient. Employees must also possess specific capabilities for communicating with Generative AI systems. Prompt Engineering Competency therefore represents a more operational form of AI competency because it focuses on how employees translate their intentions into effective instructions and evaluate the resulting outputs.

The findings are also consistent with research on digital competence, which suggests that technological skills can improve employees' ability to perform tasks and adapt to digital work environments(Cetindamar Kozanoglu & Abedin, 2021). However, the present study provides a more specialized perspective by distinguishing Prompt Engineering Competency from general digital competence. Traditional digital competence concerns employees' ability to use digital tools, access information, and perform tasks through digital technologies. Prompt Engineering Competency, in contrast, emphasizes the quality of interaction between employees and Generative AI systems. This distinction becomes increasingly important as AI shifts from being a conventional software tool to an interactive cognitive assistant.

The results can also be compared with studies examining AI adoption and technology acceptance. Previous research based on frameworks such as the Technology Acceptance Model frequently emphasizes perceived usefulness and perceived ease of use as determinants of employees' willingness to adopt AI technologies. While these factors help explain whether employees use AI, they do not necessarily explain how effectively employees use it. The current findings suggest that adoption represents only the initial stage of AI integration. After adoption, employees need specific competencies to extract meaningful value from AI systems. Prompt Engineering Competency may therefore be viewed as a capability that operates beyond technology acceptance by explaining the quality of actual human–AI interaction and its consequences for work performance.

The findings concerning AI Output Evaluation are particularly consistent with previous research emphasizing critical thinking and human oversight in Generative AI use. Existing research has

highlighted the risks of accepting AI-generated content without verification because Generative AI systems can generate inaccurate, biased, incomplete, or fabricated information. The present findings reinforce this concern by demonstrating that employees who critically evaluate AI outputs are more capable of incorporating AI into professional work without compromising output quality. This suggests that effective AI competency should combine prompt construction skills with the ability to critically assess AI-generated information.

The findings regarding Prompt Refinement are also consistent with emerging research on iterative human–AI collaboration. Generative AI interaction is increasingly understood as a process rather than a single question-and-answer exchange(Blaha et al., 2022). Employees can improve AI outputs through successive prompts, feedback, clarification, and contextual adjustment. The current study supports this perspective by showing that employees who actively refine their prompts are more likely to obtain outputs that meet their professional requirements. Thus, prompt engineering can be understood as an iterative cognitive process in which human expertise guides AI generation and AI responses provide feedback for subsequent human instructions.

However, the findings also extend previous research by positioning Prompt Engineering Competency as a potential organizational capability rather than merely an individual technical skill. Research on AI literacy and technology adoption frequently focuses on individual attitudes, knowledge, or behavioral intentions. In contrast, this study emphasizes the possibility that organizations can systematically develop Prompt Engineering Competency through training, competency frameworks, knowledge sharing, and AI governance. From this perspective, prompt engineering becomes a human capital resource that organizations can develop to improve the value obtained from Generative AI investments.

The results therefore suggest an important distinction between AI availability and AI capability. An organization may provide employees with access to advanced Generative AI tools, but the actual performance benefits depend on whether employees possess the competencies required to use those tools effectively. The present study contributes to this discussion by demonstrating that Prompt Engineering Competency may serve as a bridge between organizational AI adoption and employee performance. This finding extends previous research that has primarily examined whether employees adopt AI by emphasizing the subsequent question of whether employees possess the capabilities necessary to use AI productively, critically, and responsibly.

## Conclusion

This study concludes that Prompt Engineering Competency has a positive and significant influence on Employee Performance among employees in private companies using Generative Artificial Intelligence (AI). The findings indicate that effective AI utilization depends not only on access to advanced technologies but also on employees' ability to communicate, refine, and critically evaluate AI-generated outputs. Prompt Design Skill and AI Output Evaluation emerged as particularly important dimensions because clear instructions improve output relevance, while critical evaluation helps ensure accuracy and reliability. Prompt Refinement Skill, Prompt Knowledge, and Ethical AI Usage also contribute to effective and responsible AI utilization. The qualitative findings further demonstrate that stronger Prompt Engineering Competency improves work quality, clarity, completeness, efficiency, and problem-solving. The study contributes theoretically by positioning Prompt Engineering Competency as a distinct workforce capability that extends traditional AI literacy and digital competence. Practically, private companies should provide structured prompt engineering training covering prompt design, iterative refinement, output verification, critical thinking, and responsible AI use. However, the cross-sectional design, self-reported measures, and focus on private companies may limit causal interpretation and generalizability. Future research should employ longitudinal or experimental designs and examine additional factors such as AI self-efficacy, AI trust, organizational AI culture, and task complexity. Overall,

developing Prompt Engineering Competency can help organizations transform Generative AI adoption into improved work quality, employee performance, and sustainable human–AI collaboration.

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