AI Capabilities: The Impact of IT Governance and IT Innovation on Organizational Performance

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***Abstract*—The existence of IT governance, IT innovation, and AI capabilities has been widely discussed in various literatures, but most still examine the three separately and tend to consider AI only as part of the IT infrastructure, and have not been able to describe the interaction and synergistic contribution between these constructs to the overall organizational performance. The purpose of this study is to develop and test a comprehensive conceptual model to empirically explain the relationships among constructs that improve organizational performance. This study uses a convergent triangulation approach in an explanatory design to analyze IT service-based creative industry MSMEs in West Kalimantan that have been operating for more than five years. Data were collected via an online survey using a random sampling technique from 310 respondents; 262 provided complete responses, yielding an 84.52% response rate. Data were processed using a Likert scale and PLS-SEM analysis tools. The results of the study show IT governance and IT innovation as complementary factors with an emphasis on the mediating role of AI capabilities, which reflects a weak positive influence, meaning that it still supports organizational performance but is not a dominant factor directly and simultaneously improving organizational performance.**

Keywords—IT Governance, IT Innovation, AI Capabilities, Organizational Performance.

I. INTRODUCTION

The pace of change in information technology (IT) has driven organizations to move beyond adopting new technologies and building measurable IT governance structures to develop long-term IT innovation strategies that address competitive pressures arising from an increasingly complex business environment. Within this context, IT governance serves as an external factor that shapes the strategic orientation of the IT perspective, facilitating accountability and maximizing the business value derived from ICT by coordinating decision-making processes, reducing risk, and optimizing ICT outputs [1]. In contrast, IT innovation reflects an organization's ability to leverage creativity to develop experimental and transformational information technology solutions that improve efficiency, enhance the customer experience, or create new business opportunities [2]. Although the contributions of these two factors to organizational performance have been studied for a long time, artificial intelligence (AI), as a strategic technological component, offers new opportunities to better understand their relationships. Today, AI is transforming the way organizations work, changing how they achieve operational efficiency, including in strategic decision-making and business performance [3]. Not just a simple tool but rather a harbinger of a paradigm shift in the manner in which business has been performed, answering the competitive question [4]. In this context, AI capabilities are seen as a critical asset that any organization can leverage through enhanced IT governance and IT innovation, including automation, predictive analytics, & data-driven decision-making. As a result, it is necessary to analyze the extent to which AI capabilities mediate the relationships among IT governance, IT innovation, and organizational performance in an overarching, quantifiable manner.

Although the significance of IT governance, IT innovation, and AI capabilities is increasingly acknowledged, a substantial gap persists in understanding how these factors interact to influence organizational performance. Previous studies [5, 6] frequently examine these elements independently, overlooking the complex interdependencies and synergistic effects that arise when considered collectively. Research on IT governance [7] has predominantly addressed its effects on IT performance, risk management, and compliance, with limited exploration of its role in fostering AI-driven innovation and enhancing organizational outcomes. Likewise, investigations into IT innovation [8] often prioritize the technological dimensions of new IT solutions, while underemphasizing the organizational and governance structures required for effective implementation and alignment with strategic objectives. Additionally, although extensive literature exists on AI and its applications across industries, few studies have directly investigated the mediating function of AI capabilities in converting IT governance and IT innovation into organizational advantages. Notably, comprehensive frameworks that delineate the specific mechanisms by which IT governance and IT innovation facilitate the development of AI capabilities to advance organizational performance are lacking.

Several studies indicate that IT governance and innovation significantly influence corporate performance directly and indirectly [9, 10]. Nevertheless, most research emphasizes the direct effects of each variable construct on organizational outcomes, neglecting the role of emerging technologies, such as AI, which further underscores the strategic significance of these two elements. While the individual aspects of IT governance, IT innovation, and AI capabilities have garnered significant scholarly interest, the integrative dynamics of their relationships remain largely unexamined. A thorough

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examination of academic databases reveals a notable absence of research explicitly investigating the combined effect of these elements on organizational effectiveness. Research by [11, 12] typically views AI as a component of IT infrastructure rather than an organizational competence that can systematically enhance competitiveness. Consequently, the literature lacks guidance on how AI capabilities might simultaneously shape and influence the relationships among IT governance, IT innovation, and organizational success. Moreover, the current literature often lacks empirical support for the proposed links and relies solely on conceptual frameworks and case studies [13, 14].

A poorly elucidated feature in the literature is how businesses navigate IT governance and IT innovation integration, particularly in enhancing AI capabilities, and how these three elements interact to yield sustainable performance. This is significant, considering AI's role not merely as a technological instrument but also as a strategic facilitator that can affect the effectiveness of IT policy implementation and the organization's pace of fostering data-driven innovation [15]. Furthermore, AI can be a pivotal catalyst for organizational agility in responding to market fluctuations when integrated within a robust governance framework and a strong culture of innovation [16].

This research aims to integrate the three fundamental concepts of IT governance, IT innovation, and AI capabilities into a single integrative model that clearly elucidates their contributions to corporate performance. This model addresses the essential topic of AI capabilities as mediators in management and strategic contexts. This paper presents a fresh examination of mediation linkages that have been insufficiently investigated, alongside practical contributions that provide policymakers with direction for developing AI capabilities informed by IT governance and IT innovation.

This research is based on the idea that a synergistic link exists among IT governance, IT innovation, and AI capabilities. The interplay among these three characteristics is essential for enhancing organizational performance, and this study aims to address the research gap by formulating and evaluating a comprehensive model that elucidates the interconnections among these constructs and their cumulative effect on organizational outcomes. The study's originality lies in its comprehensive approach, which views IT governance and IT innovation as synergistic enablers of AI skills and emphasizes the mediating role of AI capabilities in translating these enablers into concrete organizational advantages. This viewpoint contrasts with prior studies that typically examine these elements in isolation or concentrate solely on the direct effects of IT governance or IT innovation on organizational performance [17]. This research has a dual scientific contribution. Initially, it offers a more refined understanding of IT governance and the roles of IT and innovation in advancing AI capabilities within enterprises. Secondly, it presents a thorough empirical validation of the proposed model, elucidating the significance of IT governance, IT innovation, and AI capabilities in enhancing organizational performance.

This research posits a substantial correlation between organizational success and exogenous factors in IT governance and IT innovation, either directly or through AI capabilities. The fundamental issue is how the interplay among these constructs can enhance organizational performance. This research aims to design and empirically evaluate a comprehensive conceptual model that elucidates the relationships among constructs and their cumulative impact on organizational performance. This purpose is significant amid intensifying, dynamic commercial competition, where organizational performance hinges on operational efficiency and strategic management of digital technology, including AI as a transformative catalyst.

II. Literature Review

A. IT Governance

IT governance is a framework designed to ensure that IT is used effectively in alignment with business goals. Within this context, IT governance involves formal structures and decision-making procedures, as well as oversight practices and control mechanisms, to support value-adding IT within the organization [18]. In the new digital world, especially as organizations embark on their AI journey, technology governance plays an increasingly strategic role. Prior studies have also found that an established, integrated IT governance structure can be beneficial for innovation, including AI development. Cavusoglu et al. [19] noted that organizations with better IT governance are usually better prepared to implement emerging practices through a clear vision, strong leadership, and resource optimization. Moreover, IT governance that facilitates cross-departmental collaboration for data-driven decision-making [20] is a significant factor in integrating AI capabilities. Several studies also demonstrated the direct effect of IT governance on organizational performance [21]. It is believed that effective IT governance can improve accountability, reduce IT risks, and align business and IT strategies, thereby driving organizational success [18, 19]. At the same time, an effective IT governance function equips organizations with oversight and control mechanisms to manage risks that stem from emerging AI capabilities. Good IT governance is crucial to boosting AI maturity and organizational performance. However, much prior data has focused on direct and indirect [22] relationships rather than the role of AI capabilities.

B. IT Innovation

IT innovation refers to an organization's capacity to develop, adapt, and use new technologies to generate value and secure a competitive edge [23]. In the contemporary digital landscape, IT innovation is crucial for developing AI capabilities, encompassing an organization's proficiency in understanding, managing, and integrating AI into business operations. Numerous studies indicate that IT innovation profoundly affects an organization's preparedness to develop AI capabilities, as it provides the necessary infrastructure, culture, and technological receptiveness to enable the efficient application of AI. Research [24] indicates that firms engaged in IT innovation will implement AI technologies more rapidly. This aligns with the conclusions of [25], suggesting that IT Innovation can augment AI capabilities by improving data processing, algorithm development, and the creation of machine learning models tailored to business requirements. Similarly, IT Innovation demonstrates a sustained favorable correlation with corporate performance. IT innovation enhances value by improving process efficiency, developing new products or services, and enabling greater flexibility in the face of market fluctuations [26]. Comparable results were also reported by [27], emphasizing that IT innovation enables firms to respond to digital dynamics with greater agility, facilitate digital transformation, and enhance overall company

performance. Nonetheless, prior research remains inadequate in elucidating the role of AI capabilities in mediating the relationship between IT innovation and improved organizational performance.

C. AI Capabilities

AI capabilities are a strategic factor that expedites digital transformation and markedly enhances corporate performance. AI capabilities refer to an organization's proficiency in developing, managing, and integrating AI technology to enhance decision-making, operational efficiency, and product or service innovation [28]. Numerous studies indicate that AI skills foster competitive advantage and sustainable organizational performance. Research [29] suggests that firms with advanced AI capabilities can generate greater economic value through refined data management, process automation, and personalized customer care. Research [30] indicated that AI capabilities serve as operational instruments and strategic levers to enhance organizational adaptability and agility, which are critical determinants of organizational performance in a dynamic business context. Moreover, the role of AI capabilities as a mediating variable has not been adequately examined, and various studies have demonstrated that effective IT governance and IT innovation would directly enhance organizational performance. Research [31] indicates that firms with a robust IT governance framework are likely to have a solid foundation for AI development, thereby indirectly enhancing performance. Research from [32] indicated that IT innovation can substantially enhance AI capabilities. Its impact on organizational performance, enabling predictive analytics, automation, and real-time decision-making, remains unclear. It cannot be empirically positioned as a mediator linking IT governance to the effects of innovation on organizational performance.

D. Organizational Performance

Organizational performance refers to the efficient and successful attainment of corporate objectives, encompassing financial, operational, innovation, and customer satisfaction metrics [33]. Critical internal elements, such as IT governance and IT innovation, affect IT services, which serve as strategic tools for enhancing the value of IT investments. IT governance enables enterprises to direct, control, and manage IT activities in alignment with business strategy [34]. The presence of AI capabilities has not demonstrated the extent to which they play a crucial role in enhancing organizational performance [35]. Conversely, IT innovation promotes the integration of novel disruptive technologies to bolster competitiveness and improve corporate performance. Research [36] demonstrated that the efficacy of IT innovation directly influences organizational performance. Nonetheless, it has not been explicitly seen to provide criteria that promote the enhancement of AI capabilities. The ability to manage AI capabilities is often overlooked as a key mediator between IT innovation and organizational performance, with much of this relationship depending on effective IT governance and growing IT innovation in the digital age.

III. Research Method

This study uses an organizational-level analysis unit with a mixed-methods approach, namely the simultaneous combination of quantitative and qualitative techniques across a series of studies to obtain more comprehensive, valid, reliable, and objective data [37]. The applied mixed-methods approach is a convergent triangulation model with an explanatory design, followed by a follow-up explanation model. The research process begins with quantitative data collection, followed by qualitative data collection. The purpose of this stage is to provide a more in-depth interpretation of the quantitative results, supported by or explained with qualitative data. In general, the research flow includes the stages of background analysis, literature review, problem formulation, hypothesis development, data processing and analysis, results presentation and discussion, and conclusion [37].

The study population consisted of IT-based MSMEs in West Kalimantan that had been operational for more than 5 years. The designated timeframe is expected to demonstrate the performance outcomes of each MSME, regardless of its business type. The designated timeframe is sufficient to delineate and analyze trends and behaviors in the use of IT services within each MSME's operational management. Primary data were gathered via a survey conducted from January to May 2025, using a random sampling method and online questionnaires distributed via Google Forms to 310 participants. Nevertheless, only 262 respondents provided complete responses, yielding a response rate of 84.52%. Additionally, for triangulation, qualitative data were collected through comprehensive interviews with multiple key informants, who were also leaders of MSMEs in the creative sector. The objective was to pinpoint areas requiring further elucidation through qualitative data.

A Likert scale was used to convert qualitative data into a numerical format for quantitative analysis, yielding a range of 1 (strongly disagree) to 6 (strongly agree). This is an effort to mitigate bias in data and, consequently, improve data collection accuracy while also providing more credible and compelling research results [38]. This study employs Structural Equation Modeling (SEM) using a Partial Least Squares (PLS) approach as the primary analytical technique. In general, SEM-PLS is carried out in several steps that can be summarized as follows: developing a conceptual model, algorithm analysis, bootstrapping for path diagram preparation, full evaluation of the research model, and concluding and recommending [39, 40]. Bootstrapping and normality tests were performed on the data distribution to assess the reliability of the statistical analysis. This research consisted of detailed interviews with five MSME leaders to corroborate the quantitative findings. These informants were selected from within the institution using stringent inclusion/exclusion criteria and interviewed to verify feedback on the output of our path diagram analysis. The validation examines how IT governance and IT innovation affect organizational performance, with AI capability as the mediating variable.

This study conducted hypothesis testing to assess the extent to which each latent variable construct affects the driving forces of IT governance and IT innovation in enhancing organizational performance, with AI capabilities as a mediating mechanism. The offered hypotheses are as follows: H1: IT governance exerts a beneficial and significant impact on AI capabilities; H2: Information Technology innovation exerts a positive and substantial impact on Artificial Intelligence capabilities; H3: IT governance exerts a favorable and substantial impact on organizational performance; H4: IT innovation exerts a favorable and substantial impact on organizational performance; H5: IT

governance positively and significantly impacts organizational performance through AI capabilities; H6: IT innovation positively and significantly affects organizational performance via AI capabilities; H7: AI capabilities directly exert a positive and significant influence on organizational performance.

IV. Results and Discussion

The research results stage begins with path analysis and continues with Partial Least Squares (PLS) and bootstrapping techniques to obtain an optimal data distribution that meets the normality assumption. This technique uses a resampling-with-replacement method that generates many new samples from the initial dataset. This method is very effective when data are limited or when population inference is required without strict assumptions about the data distribution. In each resampling iteration, a random selection is made from the initial dataset for each data row, allowing duplicates [39]. This technique is very relevant for situations of uncertainty in population distribution or limited sample size. The implementation of Structural Equation Modeling based on Partial Least Squares (SEM-PLS) comprises several exogenous and endogenous latent variables. Each variable is measured using indicators that were determined and revalidated by reference to the findings of several relevant previous studies.

The following is a description of each construct of exogenous and endogenous latent variables and their respective indicators: (a) IT governance consists of IT decision-making structure (ITG1), alignment of IT strategy with business strategy (ITG2), appropriateness of IT risk management (ITG3), monitoring and evaluation of IT performance processes (ITG4), and stakeholder involvement (ITG5); (b) IT innovation consists of adoption of new technologies (ITI1), creativity in the use of IT (ITI2), speed in implementing innovative IT solutions (ITI3), management support for innovation (ITI4), availability of resources for IT experiments (ITI5); (c) quality of data sources for AI training (AIC1), AI supporting technology infrastructure (AIC2), human resources competent in AI (AIC3), integration of AI into business processes (AIC4), level of automation and intelligent analytics used (AIC5); (d) more efficient organizational operations (OGP1), high level of customer satisfaction (OGP2), increased organizational revenue growth (OGP3), increased product/service innovation (OGP4), organization has competitive market competitiveness (OGP5).

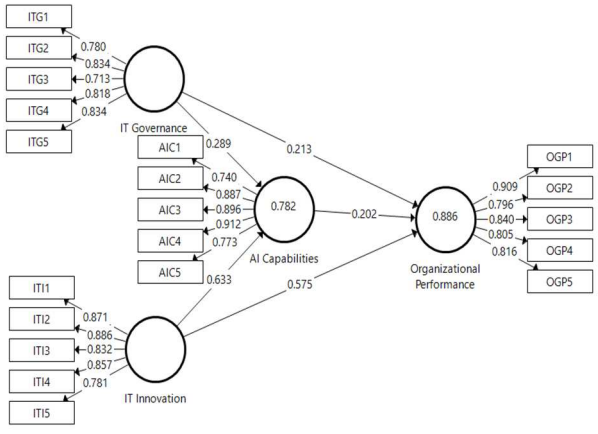

Fig. 1. Research Path Diagram Model

The path diagram illustrates the relationships among exogenous and endogenous latent variables and their corresponding indicators in the outer model analysis (see Figure 1). This analysis seeks to assess the validity and reliability of indicators concerning the latent constructs they denote. The path analysis results indicate the influence levels and relationship strengths among the variables in the research model: IT innovation significantly affects AI capabilities (path coefficient = 0.633) and organizational performance (path coefficient = 0.575). Innovation in IT is the primary driver of AI advancements, enhancing organizational performance. IT governance positively impacts AI capabilities (path coefficient = 0.289) and organizational performance (path coefficient = 0.213). The relationship is positive; however, its influence is comparatively weak compared with the impact of IT innovation. This indicates that IT governance plays a role in developing AI capabilities and enhancing organizational performance, though its impact is less pronounced than that of IT innovation. Additionally, AI capabilities benefit organizational performance, evidenced by a path coefficient value of 0.202. This indicates that enhancing the organization's capacity to manage and adopt AI improves organizational performance, though the effect is relatively weak. Additionally, if AI capabilities mediate the relationships between IT innovation and IT governance, and between IT governance and organizational performance, the path coefficients (0.128 and 0.058) will be reduced relative to the direct effects. The analysis indicates that IT innovation significantly influences AI capabilities and organizational performance. Simultaneously, IT governance serves as a reinforcing element that enhances the process. AI capabilities have demonstrated limited influence and partially mediate the relationship between IT and organizational performance.

Table I presents the results of the discriminant validity test using the Fornell-Larcker approach. Simultaneously, Table II presents reliability and validity assessments using Composite Reliability (CR), Cronbach's Alpha (CA), and Average Variance Extracted (AVE). A construct is deemed reliable and valid if the Composite Reliability (CR) exceeds 0.80, Cronbach's Alpha (CA) surpasses 0.70, and Average Variance Extracted (AVE) is greater than 0.50 [39]. The test results validate that the latent constructs in the study model accurately reflect their indicators.

TABLE I. Discriminant Validity

Fornell-Larcker Criterion	AIC	ITG	ITI	0GP
AI Capabilities (AIC)	0.844			
IT Governance (ITG)	0.805	0.797		
IT Innovation (ITI)	0.868	0.815	0.846	
Organizational Performance (OGP)	0.872	0.844	0.923	0.834

TABLE II. Reliability and Validity Of Constructs

Fornell-Larcker Criterion	CA	rho_A	CR	AVE
AI Capabilities (AIC)	0.897	0.905	0.925	0.713
IT Governance (ITG)	0.858	0.881	0.897	0.636
IT Innovation (ITI)	0.901	0.905	0.926	0.716
Organizational Performance (OGP)	0.890	0.894	0.919	0.696

The outer model analysis verifies that all constructs—IT governance, IT innovation, AI capabilities, and organizational performance—satisfy the standards for convergent validity, discriminant validity, and reliability. All AVE values span from 0.636 to 0.716 (>0.5), signifying robust convergent validity. Composite Reliability (0.897–0.926) and Cronbach's Alpha (0.858–0.901) are above the 0.7 criterion, affirming internal consistency. Furthermore, all indicators exhibit loadings exceeding 0.7 on their respective constructs, thereby confirming discriminant validity. Consequently, the instrument is both valid and reliable for subsequent structural model and hypothesis testing. The inner model study used SmartPLS's bootstrapping technique to assess the significance of correlations among constructs. Indicators are deemed significant if the t-statistic exceeds 1.96 (at the 95% confidence level) and the p-value is less than 0.05 [39]. The findings presented in Table III demonstrate that all path coefficients are positive and statistically significant, with t-statistics surpassing the critical threshold.

TABLE III. PATH SIGNIFICANCE TEST

Fornell-Larcker Criterion	Original Sample (O)	T-Statistic (|O/STDEV|)	P-Values
AI Capabilities → Organizational Performance	0.202	3.277	0.001
IT Governance → AI Capabilities	0.289	6.401	0.000
IT Governance → Organizational Performance	0.213	4.833	0.000
IT Innovation → AI Capabilities	0.633	16.565	0.000
IT Innovation → Organizational Performance	0.575	11.940	0.000

The examination of the original sample (O) value, which reflects the degree of direct effect across constructs in the structural model, shows that the relationship between IT innovation and AI capabilities has the greatest impact, with a path coefficient of 0.633. This indicates that heightened IT innovation will substantially improve the firm's AI capabilities. Furthermore, IT innovation directly affects organizational performance, as evidenced by a path coefficient of 0.575, indicating a significant contribution. This conclusion corroborates previous studies [24, 25], suggesting that judicious AI implementation can bolster user trust by providing transparency in decision-making and alleviating harmful bias. The impact of IT governance on AI capabilities is indicated by a coefficient of 0.289, which is moderate yet positive and significant, suggesting that IT governance serves as a catalyst for enhancing AI competencies. The direct effect of IT governance on organizational performance has a path coefficient of 0.213, indicating that its role in improving organizational performance is rather modest when juxtaposed with the impact of IT innovation. The relationship between AI capabilities and organizational performance has a path coefficient of 0.202, indicating a positive but weak influence. This indicates that although AI skills improve organizational performance, their direct influence is less significant than that of IT innovation. This evidence reveals a contradiction, given that previous studies demonstrate that IT governance substantially improves organizational performance [18, 19]. Furthermore, AI capabilities demonstrate a slight positive effect, indicating that the firm's AI systems improve organizational performance, though not as a principal factor. The direct effects of IT governance and IT innovation on organizational performance exhibit larger path coefficients than those of AI capabilities, at 0.058 and 0.128, respectively. The research findings suggest that advancing AI capabilities is not essential for improving organizational performance, whereas IT governance and IT innovation exert a greater influence. The capabilities of AI cannot be categorized as a foundational element that augments or guides the strategic impact of IT governance and IT innovation on corporate performance. This may stem from poor AI deployment, insufficient supporting infrastructure, or the lack of AI integration inside the organization's core business activities. To maximize AI's capacity to improve organizational performance, it is crucial to strengthen AI competencies in technical, human resources, and implementation strategies, in accordance with IT governance and innovation policies.

The subsequent phase entails performing the Goodness-of-Fit test by computing Adjusted R-Squared values. The findings indicate that AI capabilities have an Adjusted R-Squared of 0.782, explaining 78.2% of the variance, with IT governance and IT innovation accounting for 78.2% and external factors the remaining 21.8%. Organizational performance exhibits an Adjusted R-Squared of 0.886, indicating that 88.6% of its variance is explained by AI capabilities, IT governance, and IT innovation, with 11.4% attributed to external factors not included in the model. Moreover, the model's predictive relevance (Q^2) attains 0.975, signifying exceptional predictive accuracy and affirming its dependability and validity for forecasting latent variables. The elevated Q^2 score indicates the model's significant capacity to facilitate decision-making and to extrapolate findings beyond the existing research sample.

A focus group discussion (FGD) was conducted to refine the analysis, revealing that AI capabilities are essential for linking IT governance and innovation to organizational performance. However, challenges remain, including the weak alignment between AI strategy and business goals, with AI often seen as a complement rather than a performance driver. Study limitations include a cross-sectional design, limited indicator analysis, and a narrow participant sample, which affect the generalizability of the findings.

V. CONCLUSION AND FUTURE RESEARCH

IT innovation has the most dominant influence on AI capabilities and organizational performance, while IT governance is a supporting factor with a weaker influence. AI capabilities contribute positively but not significantly to mediating the relationship between IT governance and IT innovation on organizational performance. Nevertheless, the limited application of AI in organizations remains an obstacle, especially in strategic integration and its support for business goals. This study also has methodological limitations, including a cross-sectional design and a limited sample size, so further studies with a longitudinal design and broader coverage are needed to draw stronger generalizations.

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