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Workforce Transformation and SME Performance: The Mediating Role of ICT Utilisation

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Abstract

This study aims to examine the effect of workforce transformation on SME performance with ICT utilisation as a mediating variable. A quantitative research approach was employed using survey data collected from 119 SME owners in Central Java, Indonesia. The data were analyzed using PLS-SEM with SmartPLS. The results indicate that workforce transformation has a significant positive effect on ICT utilisation. Furthermore, ICT utilisation significantly improves SME performance. The findings also show that workforce transformation directly enhances SME performance. In addition, ICT utilisation partially mediates the relationship between workforce transformation and SME performance. These results suggest that the development of workforce capabilities and adaptability plays an important role in supporting the effective utilisation of digital technologies and improving SME performance. From a practical perspective, SME owners are encouraged to invest in workforce development initiatives, particularly digital skills training and programs that enhance employees' adaptability to technological change, to maximise the benefits of ICT utilisation and strengthen business performance. This study highlights the importance of strengthening workforce competencies to support digital transformation in SMEs. Future research is recommended to involve larger samples and explore additional organizational factors that may influence SME performance.

Keywords: workforce transformation, ICT utilisation, SME performance, digital transformation, SMEs

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INTRODUCTION

Small and Medium Enterprises (SMEs) play a crucial role in economic development in both developed and developing countries. SMEs contribute significantly to employment generation, innovation, and economic resilience, making them an essential component of national economies (Faeroevik, 2024). In many emerging economies, SMEs are a key driver

of inclusive economic growth, creating jobs and supporting local economic activity (Faroque et al., 2026). However, amid increasing global competition and rapid technological advancement, SMEs must continually improve their capabilities and organizational performance to remain competitive (Antenozio et al., 2026). In the digital era, the integration of digital technologies into business processes has become an important strategy to enhance firm competitiveness and performance. Information and Communication Technologies (ICT) allow firms to improve operational efficiency, facilitate communication, and enhance access to strategic information for decision-making (Tănăsescu et al., 2025). Through the effective utilisation of digital technologies, organisations can optimise business processes, improve productivity, and expand their market reach.

SMEs play an essential role in supporting economic development in Indonesia. Their contribution to the national economy is substantial, particularly in terms of employment generation and economic activity. Data from the Ministry of Cooperatives and SMEs indicate that Indonesia has more than 64 million SMEs, which contribute approximately 61% to the national Gross Domestic Product (GDP) and absorb nearly 97% of the total workforce (Ministry of Cooperatives and SMEs of the Republic of Indonesia, 2023). These figures illustrate the strategic importance of SMEs in maintaining economic stability and supporting job creation across the country. Despite their significant contribution, many SMEs in Indonesia continue to encounter challenges in strengthening their competitiveness and improving overall business performance. One major issue relates to their relatively limited participation in export markets. Although SMEs dominate Indonesia's economic structure in terms of number of firms and employment absorption, their contribution to national export activities remains relatively low, accounting for only around 14–15% of total exports (Ministry of Cooperatives and SMEs of the Republic of Indonesia, 2023).

This situation indicates a gap in productivity and competitiveness between SMEs and larger enterprises. Many SMEs still struggle to expand their market reach and improve business performance. At the same time, Indonesia has been experiencing rapid development in its digital economy. A report by Google, TEMASEK, Bain & Company (2023) shows that the value of Indonesia's digital economy has exceeded US$82 billion, positioning the country as one of the fastest-growing digital markets in Southeast Asia. The rapid expansion of the digital economy offers significant opportunities for SMEs to enhance their competitiveness and improve business performance through the adoption of digital technologies. However, the level of ICT utilisation among SMEs has not yet fully kept pace with the growth of the digital ecosystem. While many SMEs have begun using digital platforms for basic activities such as communication and marketing, the integration of digital technologies into core business processes remains relatively limited. Although the number of SMEs participating in digital platforms has increased in recent years, many SMEs still use digital technologies only for basic purposes such as communication and marketing. The integration of ICT into core business processes remains relatively limited (Saptadi et al., 2025). This condition indicates the presence of a digitalisation gap, in which the potential benefits of digital technologies have not yet been fully realised by many SMEs.

In the Indonesian SME context, the effectiveness of digital transformation initiatives is often influenced by workforce capability and managerial readiness. Several studies highlight that limited digital literacy and skill gaps remain major challenges for SMEs in integrating digital technologies into core business processes (Destrian, 2025). Although digitalisation has been shown to improve operational efficiency and expand market opportunities, SMEs frequently encounter constraints related to human resource readiness and technological competence (Evangeulista et al., 2023). Empirical evidence also indicates that digital transformation can

enhance SME performance through improved marketing effectiveness, innovation capability, and organizational adaptability (Persada et al., 2025). In addition, leadership behaviour and digital capability development have been identified as important factors shaping the success of digital initiatives and strengthening SME competitiveness in Indonesia's dynamic business environment (Pradana et al., 2024). These findings indicate the importance of workforce transformation as a strategic mechanism for strengthening ICT utilisation and improving SME performance in Indonesia.

Previous studies have suggested that digital technologies can significantly enhance SME performance by improving operational efficiency, expanding market access, and supporting innovation activities (Nguyen et al., 2025). Nevertheless, the successful implementation of digital technologies does not solely depend on technological availability. Organizational readiness and human resource capabilities also play a crucial role in determining whether digital technologies can be effectively utilized within business operations. In this regard, workforce transformation has become increasingly important in supporting digital transformation initiatives within organizations. Workforce transformation refers to the development of employees' competencies, adaptability, and readiness to respond to technological change. Employees with adequate digital skills and adaptability are more likely to adopt and utilise ICT effectively in business processes (Chotia et al., 2025; K. Sharma et al., 2024). Without sufficient workforce capability, investments in digital technologies may not lead to meaningful improvements in organizational performance.

Despite the growing importance of digital transformation in SMEs, research on the role of workforce transformation in facilitating ICT utilisation and improving SME performance remains limited. Most previous studies have focused primarily on technological adoption or digital readiness, while the role of workforce capability in enabling effective ICT utilisation remains relatively underexplored. This gap highlights the need for further investigation into how workforce transformation contributes to the effective utilisation of ICT and ultimately enhances SME performance. Therefore, this study aims to examine the relationship between workforce transformation, ICT utilisation, and SME performance. Specifically, this research investigates the mediating role of ICT utilisation in the relationship between workforce transformation and SME performance. By exploring this mechanism, the study provides insights into how workforce capability development can support the utilisation of digital technologies and enhance business performance among SMEs.

THEORITICAL REVIEW AND HYPOTHESIS DEVELOPMENT

This research is built upon the Resource-Based View (RBV), which emphasizes that organizational performance is largely determined by a firm's ability to manage and utilize strategic resources effectively. According to this perspective, firms achieve sustainable competitive advantage when they possess resources that are valuable, difficult to imitate, and not easily replaced by competitors (Aïssaoui et al., 2025; Barney, 1991; M. Sharma et al., 2022; Wernerfelt, 1984). Among these resources, human capital and technological capabilities are widely recognized as critical assets that support superior organizational outcomes (Ul-Haq et al., 2025).

Within the SME context, workforce transformation reflects the development of employees' competencies, adaptability, and professional capabilities. Meanwhile, ICT utilisation represents the organization's technological capability to integrate digital tools into business activities in order to improve efficiency and competitiveness. SMEs that are able to strengthen their workforce capabilities while effectively leveraging digital technologies are therefore more likely to achieve improved organizational performance.

Furthermore, the dynamic capabilities perspective provides additional insight into how organizations continuously adapt their internal resources and competencies in response to environmental change (Eisenhardt & Martin, 2000; Teece, 2007; Teece et al., 1997). Through workforce transformation and the effective use of ICT, SMEs can reconfigure their internal capabilities and align them with evolving technological and market conditions, thereby enhancing their overall business performance.

Theory and Concept of SME Performance

SMEs play a crucial role in economic development by contributing to employment generation, innovation, and economic growth. Due to their flexibility and adaptability, SMEs are often considered key drivers of competitiveness and resilience within modern economies. However, SMEs also face significant challenges, including limited resources, technological constraints, and environmental uncertainty, which may affect their overall business performance (Osei et al., 2026). SME performance generally refers to the extent to which SMEs achieve their strategic and operational objectives (Antenozio et al., 2026; Gutiérrez-Broncano et al., 2024). It is commonly measured using both financial and non-financial indicators, including profitability, sales growth, market expansion, productivity, and customer satisfaction. Evaluating SME performance is essential for understanding how effectively organizations utilize their resources and capabilities to create sustainable competitive advantage (Núñez et al., 2025; Persada et al., 2025).

From the perspective of the resource-based view (RBV), firm performance is strongly influenced by the ability of organizations to develop and deploy valuable, rare, inimitable, and non-substitutable resources (Aïssaoui et al., 2025). SMEs that successfully leverage strategic resources—such as innovation capability, digital orientation, and managerial competence—are more likely to achieve superior performance outcomes compared to competitors (Núñez et al., 2025). Recent studies highlight that integrating digital technologies and organizational capabilities is critical to enhancing SME performance. Digital orientation and technological capabilities enable firms to optimize business processes, improve operational efficiency, and strengthen competitiveness in dynamic markets. These capabilities allow SMEs to respond more effectively to technological changes and market opportunities, which ultimately contribute to improved financial and innovation performance (Antenozio et al., 2026).

In addition, technological environments and organizational capabilities significantly influence SME performance (Dinh et al., 2025). Firms operating in uncertain technological environments must develop adaptive capabilities such as digital capability and marketing innovation capability to maintain competitiveness (López et al., 2026). These capabilities help SMEs adapt to technological changes, respond to market dynamics, and sustain business performance in emerging markets (Wilopo et al., 2026). SME performance is also shaped by strategic orientations and external networks. Entrepreneurial orientation, international entrepreneurial orientation, and external support networks can enhance firm performance by enabling SMEs to access knowledge, resources, and market opportunities. These external relationships often help SMEs overcome resource constraints and improve their strategic positioning in competitive markets (Faroque et al., 2026).

Furthermore, internal organizational factors also influence SME performance. Entrepreneurial marketing practices, organizational commitment, and managerial decision-making capabilities contribute to the effectiveness of business strategies and operational outcomes. When SMEs effectively implement entrepreneurial strategies and maintain strong organizational capabilities, they are more likely to achieve higher financial and market performance (Cherchem et al., 2026; Osei et al., 2026). Overall, SME performance is a

multidimensional construct that reflects a firm's strategic initiatives and operational effectiveness. The performance of SMEs is influenced by a combination of internal capabilities, technological adoption, managerial practices, and external environmental factors. Therefore, understanding the drivers of SME performance is essential for identifying strategies that enhance competitiveness and long-term sustainability.

Theory and Concept of Workforce Transformation

Workforce transformation refers to the process through which organizations reshape workforce capabilities, skills, and work practices to adapt to technological, organizational, and environmental changes (Mohammed, 2026; Shin et al., 2025). In the contemporary business environment characterized by rapid technological advancement and digital transformation, organizations are increasingly required to develop a workforce that is adaptive, flexible, and capable of responding to dynamic changes in the business environment (K. Sharma et al., 2024). Workforce transformation, therefore, emphasizes the development of new competencies, digital skills, and adaptive capabilities among employees to ensure organizational sustainability and competitiveness. The transformation of the workforce is closely related to the organization's ability to respond to technological disruption and digitalization (Lin et al., 2026). Employees are expected to develop digital competencies, technological literacy, and innovative capabilities to effectively engage with digital technologies in organizational processes (Iyamu et al., 2025). In the context of digital transformation, workforce capabilities such as agility, adaptability, and readiness to change are essential to support organizational transformation initiatives.

Workforce transformation is also associated with workforce agility, the ability of employees to respond quickly and effectively to changes in internal and external environments (K. Sharma et al., 2024). An agile workforce demonstrates flexibility, proactivity, and the ability to adopt new technologies and work practices. Organizations with agile workforces are better positioned to leverage technological innovations and adapt to evolving market demands (Carroll et al., 2023; Findsrud, 2020; Oliva et al., 2019). Furthermore, workforce transformation often involves organizational change processes that affect employee roles, responsibilities, and work structures. Implementing workforce transformation initiatives may require organizations to redesign work systems, introduce new technologies, and develop new collaboration models. However, the success of these transformation initiatives largely depends on employees' perceptions, readiness, and engagement during the change process. Poor communication, limited preparation, and inadequate training may hinder the implementation of workforce transformation within organizations (Glogowska et al., 2021).

In addition, workforce transformation is closely linked to workforce sustainability and professional capability development. Organizational reforms, changes in work structures, and evolving policy environments may significantly influence workforce conditions, professional identity, and work practices (Shin et al., 2025). Therefore, organizations must develop strategies that support workforce resilience, professional development, and capability enhancement to maintain workforce sustainability in dynamic environments (Sweetmore, 2026). Overall, workforce transformation reflects organizations' strategic efforts to develop human resource capabilities aligned with technological advancement and organizational change. By transforming workforce competencies and work practices, organizations can improve their ability to adopt digital technologies, enhance operational efficiency, and strengthen organizational competitiveness.

Theory and Concept of ICT Utilisation

Information and Communication Technology (ICT) utilisation refers to the extent to which organisations effectively use digital technologies to support business processes, communication, and decision-making (Castro & Delina, 2025; Pick et al., 2015). In modern organizations, ICT plays a crucial role in facilitating information exchange, improving operational efficiency, and supporting strategic decision-making processes. The integration of ICT enables organizations to process and distribute information more efficiently, thereby improving coordination and productivity within organizational operations (Tănăsescu et al., 2025). The development of ICT has significantly transformed how organizations operate and compete in increasingly digitalized environments (Saptadi et al., 2025). ICT technologies enable firms to collect, process, and use large volumes of data to support managerial decision-making and organizational planning. Through the use of digital platforms and communication systems, organizations can enhance productivity, improve service quality, and strengthen their competitiveness in the global economy (Nguyen et al., 2025; Tănăsescu et al., 2025).

In the context of SMEs, ICT utilisation is particularly important because it enables firms to overcome resource limitations and improve operational efficiency. SMEs can leverage ICT tools such as internet platforms, digital communication technologies, and data management systems to support business activities and expand market opportunities. The effective implementation of ICT can also facilitate organizational innovation and improve overall business performance (Nguyen et al., 2025). Furthermore, ICT utilisation contributes to organizational transformation by enabling the integration of technology with business processes (Destrian, 2025; Yamaguchi et al., 2023). ICT systems can automate operational activities, enhance information management, and improve coordination among organizational functions. Through effective integration between technology and business processes, organizations can improve efficiency and achieve better organizational outcomes (Saptadi et al., 2025).

ICT also plays an important role in information dissemination and communication within organizations and communities (Yunus et al., 2010). Digital platforms such as internet-based systems, mobile technologies, and social media enable organizations to deliver information rapidly and reach wider audiences. These technologies enhance communication effectiveness and support the dissemination of information necessary for organizational operations and strategic activities (Castro & Delina, 2025). Overall, ICT utilisation reflects the extent to which organizations adopt and integrate digital technologies to support business operations and strategic decision-making. Organizations that effectively utilize ICT are better positioned to improve operational efficiency, enhance organizational capabilities, and respond to dynamic business environments (Ozumba & Shakantu, 2018; Panagiotopoulos et al., 2023).

Hypothesis Development

Workforce Transformation and SME Performance

Workforce transformation represents an organization's effort to enhance employee capabilities, adaptability, and digital competencies to respond to technological and environmental changes. In a rapidly evolving business environment, organizations must continuously develop workforce capabilities to maintain competitiveness and improve business performance (K. Sharma et al., 2024). Workforce transformation enables employees to adapt to new technologies, adopt innovative work practices, and improve organizational productivity. For SMEs, workforce transformation is particularly important because human resources play a critical role in determining organizational success (Núñez et al., 2025).

Employees who possess adaptive skills, technological literacy, and flexibility in responding to organizational changes can contribute to improved operational efficiency and business outcomes. Previous studies indicate that workforce capability development and employee adaptability positively influence organizational performance by enhancing innovation and operational effectiveness (Iyamu et al., 2025; Lin et al., 2026; Mohammed, 2026; Shin et al., 2025). Therefore, organizations that successfully transform their workforce are more likely to achieve better business performance.

H1: Workforce Transformation has a positive and significant effect on SME Performance.

Workforce Transformation and ICT Utilisation

Workforce transformation plays an important role in facilitating the adoption and effective utilisation of ICT within organizations. Employees with digital skills, technological readiness, and adaptability are better able to integrate ICT into their work processes (Castro & Delina, 2025). Workforce transformation initiatives, such as training, reskilling, and digital capability development, enhance employees' ability to use technological tools effectively. In SMEs, the successful implementation of ICT largely depends on the workforce's readiness and competence (Tănăsescu et al., 2025). Organizations with employees who are adaptive and technologically competent tend to demonstrate higher levels of ICT utilisation (Saptadi et al., 2025). Workforce agility and readiness to change enable employees to adopt new technologies and integrate them into business operations more effectively (K. Sharma et al., 2024). Thus, workforce transformation can facilitate the adoption and utilisation of ICT within organizations.

H2: Workforce Transformation has a positive and significant effect on ICT Utilisation.

ICT Utilisation and SME Performance

ICT utilisation plays a crucial role in improving organizational performance by enhancing operational efficiency, communication, and information access (Nguyen et al., 2025). Through ICT adoption, organizations can automate business processes, improve data management, and support strategic decision-making processes. These technological advantages enable organizations to improve productivity and competitiveness (Panagiotopoulos et al., 2023; Saptadi et al., 2025; Tănăsescu et al., 2025). For SMEs, ICT utilisation provides opportunities to overcome resource limitations and enhance business performance. Digital technologies allow SMEs to expand market access, improve customer interaction, and increase operational efficiency. The effective use of ICT can therefore significantly improve financial and operational performance (Nguyen et al., 2025; Panagiotopoulos et al., 2023). Therefore, SMEs that effectively utilize ICT are more likely to achieve better business performance.

H3: ICT Utilisation has a positive and significant effect on SME Performance.

The Mediating Role of ICT Utilisation

ICT utilisation may serve as an important mechanism linking workforce transformation and SME performance. Workforce transformation enhances employees' digital competencies and technological readiness, thereby facilitating the adoption and utilisation of ICT in organisational processes (Iyamu et al., 2025; Mohammed, 2026; Shin et al., 2025). When employees possess adequate technological skills and adaptability, organizations are better able to leverage ICT to improve operational efficiency and decision-making processes (Saptadi et al., 2025). Through this mechanism, workforce transformation indirectly influences SME performance by improving ICT utilisation. Organizations that transform their workforce

are therefore more likely to utilize digital technologies effectively, which ultimately contributes to improved business performance (Nguyen et al., 2025; Panagiotopoulos et al., 2023; Tănăsescu et al., 2025).

H4: ICT Utilisation mediates the relationship between Workforce Transformation and SME Performance.

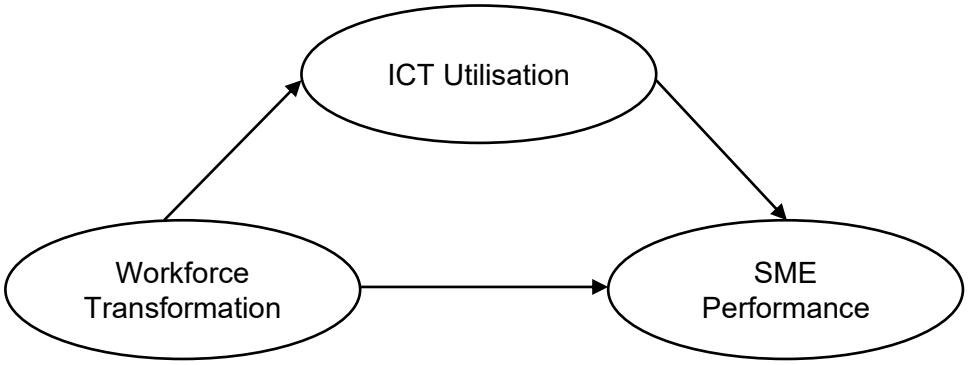

Figure 1
Conceptual Framework

RESEARCH METHODS

This research adopts a quantitative approach to investigate the relationships among workforce transformation, ICT utilisation, and SME performance. A quantitative design was selected because it enables the examination of relationships between variables through statistical analysis and allows theoretical models to be empirically tested (Creswell, 2014). The study focuses on analyzing both direct and indirect relationships among the variables included in the proposed research framework.

The research population comprises SMEs in Central Java, Indonesia. SMEs were chosen as the focus of the study due to their significant role in supporting economic growth and employment generation. The sample was selected using a purposive sampling technique, in which respondents were selected based on specific criteria relevant to the research objectives. While this approach allows researchers to obtain relevant, information-rich data, it may also introduce sampling bias. Specifically, purposive sampling may limit the generalizability of the findings, as the selected respondents may not fully represent the broader SME population. In addition, SMEs that are more willing to participate in research may also be more proactive in adopting managerial and technological practices. The selected respondents were SME owners or managers who are directly involved in managing business operations and making strategic decisions within their organizations.

A total of 119 SMEs participated as respondents in this study. The participating businesses represent several sectors, including food and beverage, fashion and textile products, handicrafts, furniture, and service-related activities. This diversity of business sectors provides a broader representation of SME characteristics within the research context.

The study examines three primary constructs: workforce transformation, ICT utilisation, and SME performance. The operationalization of these variables and their measurement indicators are presented in Table 1. Data were collected using a structured questionnaire distributed to SME owners and managers. The questionnaire was designed to capture respondents' perceptions regarding workforce capability development, the utilisation of ICT in business activities, and the performance of their enterprises.

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS version 4. PLS-SEM was selected as the analytical

technique because it is suitable for exploratory research models and can effectively estimate complex relationships among latent constructs, particularly when the sample size is relatively limited (Hair et al., 2019, 2021).

Table 1
Measurement of Variables

Variables	Codes	Measurement Item	References
Workforce Transformation	WT1	Employees' adaptability to organizational and technological changes	(K. Sharma et al., 2024; Shin et al., 2025)
	WT2	Employees' readiness to adopt new technologies and work systems	
	WT3	Development of digital skills among employees	
	WT4	Employees' flexibility in responding to changes in work processes	
	WT5	Organizational support for workforce capability development	
ICT Utilisation	ICTU1	Use of ICT in daily business operations	(Nguyen et al., 2025; Saptadi et al., 2025; Tănăsescu et al., 2025)
	ICTU2	Use of internet-based technologies to support business activities	
	ICTU3	Use of digital communication platforms for business coordination	
	ICTU4	Use of ICT for accessing and managing business information	
	ICTU5	Effectiveness of ICT in improving work efficiency	
SME Performance	SMEP1	Sales growth of the business	(Núñez et al., 2025; Osei et al., 2026)
	SMEP2	Profitability improvement	
	SMEP3	Market share growth	
	SMEP4	Operational efficiency improvement	
	SMEP5	Overall firm performance compared to competitors	

Source: author's work (2026)

RESULTS AND DISCUSSION

Respondent Profile

Based on the collected data, a total of 119 SME owners participated in this study. The demographic profile focuses on business characteristics rather than on respondents' personal characteristics.

Table 2
Respondent Characteristics

Characteristics	Category	Frequency	Percentage
Type of Business	Food & Beverage	40	33.6%
	Fashion / Textile	45	37.8%
	Handicraft	10	8.4%
	Furniture / Wood	15	12.6%
	Services	9	7.6%
Number of Employees	1–5	63	52.9%

Characteristics	Category	Frequency	Percentage
	6–10	21	17.6%
	11–20	23	19.3%
	>20	12	10.1%
Daily Production Capacity	<50 units	46	38.7%
	50–100 units	39	32.8%
	101–300 units	22	18.5%
	>300 units	12	10.0%

Source: author's work (2026)

The respondents represent various types of businesses, including food and beverage, fashion and textile products, handicrafts, furniture, and service-based businesses. The majority of respondents operate in the fashion and textile sector (37.8%), followed by food and beverage businesses (33.6%). In terms of business size, most SMEs employ fewer than 5 workers (52.9%), indicating that the majority of respondents are in the micro-enterprise category. Regarding production capacity, most SMEs produce fewer than 100 units per day, which reflects the relatively small production scale of the surveyed businesses.

Measurement Model Assessment

The measurement model was evaluated to assess the reliability and validity of the constructs used in this study. The evaluation of the measurement model includes indicator reliability, internal consistency reliability, convergent validity, and discriminant validity.

Table 3

Item loading, Cronbach Alpha, CRs, and AVEs

Item	Loading	Alpha	CR	AVE
Workforce Transformation		0.862	0.866	0.645
WT1	0.839			
WT2	0.859			
WT3	0.718			
WT4	0.804			
WT5	0.788			
ICT Utilisation		0.909	0.926	0.732
ICTU1	0.852			
ICTU2	0.893			
ICTU3	0.821			
ICTU4	0.821			
ICTU5	0.889			
SME Performance		0.823	0.845	0.601
SMEP1	0.909			
SMEP2	0.851			
SMEP3	0.588			
SMEP4	0.864			
SMEP5	0.602			

Source: SmartPLS output (2026)

Table 4

Discriminant validity (HTMT ratio)

Construct	Workforce Transformation	ICT Utilisation	SME Performance
Workforce Transformation	-	0.695	0.780
ICT Utilisation	0.695	-	0.771
SME Performance	0.780	0.771	-

Source: SmartPLS output (2026)

Indicator reliability was examined by analyzing the outer loading values of each measurement indicator. In PLS-SEM analysis, indicators with outer loading values above 0.70 are generally considered to demonstrate satisfactory reliability. However, indicators with loading values between 0.50 and 0.70 may still be retained as long as the overall construct reliability and validity remain acceptable (Hair et al., 2019). The results show that most indicators meet the recommended threshold, indicating adequate reliability of the measurement items. Although two indicators of the SME performance construct have loading values slightly below 0.70, they were retained because their values still exceed the minimum acceptable level and the construct maintains sufficient reliability.

The reliability of the constructs was further assessed using Cronbach's Alpha and Composite Reliability (CR). Both measures show values greater than the recommended threshold of 0.70 for all constructs, indicating that the indicators consistently measure the intended latent variables (Hair et al., 2021). These results confirm that the constructs demonstrate satisfactory internal consistency.

To evaluate convergent validity, the Average Variance Extracted (AVE) was calculated for each construct. The findings indicate that all AVE values exceed the minimum requirement of 0.50, which means that the constructs explain more than half of the variance of their indicators. This result confirms that the indicators adequately represent their underlying constructs.

In addition, discriminant validity was assessed using the Heterotrait–Monotrait ratio (HTMT). The analysis shows that all HTMT values are below the recommended threshold of 0.90, indicating that the constructs are empirically distinct from one another (Hair et al., 2021). Overall, the measurement model demonstrates satisfactory reliability and validity, indicating that the constructs are suitable for further evaluation in the structural model.

Structural Model Assessment

Once the measurement model was confirmed to meet the required reliability and validity criteria, the next stage involved evaluating the structural model. This stage aims to examine the relationships among the latent constructs and to test the research hypotheses proposed in the conceptual framework (Hair et al., 2021).The structural relationships were analyzed using the bootstrapping procedure in SmartPLS. Bootstrapping is a resampling technique that allows the estimation of the significance of path coefficients by generating standard errors and corresponding t-statistics. Through this approach, the strength and significance of the relationships among the constructs can be statistically evaluated.

In this study, the significance of each hypothesized relationship was assessed using three indicators: path coefficient values, t-statistics, and p-values obtained from the bootstrapping results. A hypothesis is considered supported when the t-statistic exceeds the critical threshold of 1.96 and the p-value is lower than 0.05, indicating that the relationship between the constructs is statistically significant. The results of the structural model analysis are summarized in Table 5, which presents the path coefficients along with their corresponding significance levels for each hypothesized relationship.

Table 5
Structural Model Results

Effects	Std (ß)	Mean	SD	t-value	p-value	Findings
Workforce Transformation -> ICT Utilisation	0.650	0.657	0.051	12.707	0.000	H1 Supported
ICT Utilisation -> SME Performance	0.435	0.439	0.109	4.003	0.000	H2 Supported
Workforce Transformation -> SME Performance	0.392	0.391	0.115	3.411	0.001	H3 Supported

Source: SmartPLS output (2026)

The structural model assessment examined the direct relationships among the constructs in this study. The results of the bootstrapping analysis indicate that workforce transformation has a significant positive effect on ICT utilisation ($\beta = 0.650$, $t = 12.707$, $p < 0.001$). This result indicates that higher levels of workforce transformation lead to greater ICT utilisation within SMEs, supporting H1. Furthermore, ICT utilisation has a significant positive effect on SME performance ($\beta = 0.435$, $t = 4.003$, $p < 0.001$). This finding suggests that the effective use of ICT improves SMEs' business performance. Therefore, H2 is supported. In addition, workforce transformation also has a significant positive direct effect on SME performance ($\beta = 0.392$, $t = 3.411$, $p = 0.001$). This result indicates that improvements in workforce capabilities and adaptability directly enhance SME performance. Thus, H3 is supported. Overall, the results confirm that workforce transformation plays an important role in improving ICT utilisation and SME performance.

Table 6
Coefficient of Determination (R^2)

Construct	R-square	R-square adjusted
ICT Utilisation	0.422	0.417
SME Performance	0.564	0.556

Source: SmartPLS output (2026)

The explanatory power of the structural model was evaluated using the coefficient of determination (R^2). This statistic reflects the extent to which the endogenous constructs can be predicted by the independent variables included in the model (Hair et al., 2021). As presented in Table 6, the R^2 value for ICT utilisation is 0.422. This result indicates that workforce transformation accounts for 42.2% of the variance in ICT utilisation among SMEs. The finding suggests that workforce capability development plays a meaningful role in determining the extent to which SMEs adopt and utilise ICT in their business activities. Meanwhile, the R^2 value for SME performance is 0.564, indicating that workforce transformation together with ICT utilisation explains 56.4% of the variance in SME performance. According to the guideline proposed by Hair et al. (2021), this value indicates a moderate to relatively strong level of explanatory power for the model. Overall, these results suggest that the structural model demonstrates an adequate level of predictive capability for the endogenous variables examined in this study.

Table 7
Mediation Result

Effects	Std (ß)	Mean	SD	t-value	p-value	Findings

Workforce Transformation -> ICT Utilisation -> SME Performance	0.282	0.288	0.073	3.843	0.000	H4 Supported

Source: SmartPLS output (2026)

The mediation test was conducted to determine whether ICT utilisation acts as an intermediary mechanism linking workforce transformation and SME performance. The results obtained from the bootstrapping procedure indicate that the indirect relationship between workforce transformation and SME performance through ICT utilisation is statistically significant.

As reported in Table 7, the indirect path coefficient is β = 0.282 with a t-statistic of 3.843 and a p-value of 0.000, confirming the presence of a significant mediation effect. These findings imply that improvements in workforce capabilities can enhance SME performance indirectly through the effective utilisation of ICT. In addition, the direct relationship between workforce transformation and SME performance remains significant even after the inclusion of ICT utilisation in the model. This condition indicates that ICT utilisation functions as a partial mediator in the relationship between workforce transformation and SME performance. Therefore, hypothesis H4 is supported. Overall, these results emphasize the important role of ICT utilisation as a mechanism through which workforce capability development can translate into improved SME performance.

Discussion

The Effect of Workforce Transformation on ICT Utilisation

The findings of this study reveal that workforce transformation has a significant positive influence on ICT utilisation among SMEs. This result indicates that the development of workforce capabilities, particularly in terms of adaptability and digital competencies, plays an important role in supporting the adoption and effective use of digital technologies within business operations. When organizations invest in improving employee skills and readiness to adapt to technological change, employees become more capable of integrating digital tools into their daily work activities.

Workforce transformation not only involves the development of technical skills but also includes fostering employees' flexibility, learning orientation, and openness to organizational change (Davies & Matuska, 2018; Lin et al., 2026). These aspects are particularly important in the context of digital transformation, where the successful implementation of new technologies often depends on the ability of employees to adapt to evolving work processes and technological environments (Iyamu et al., 2025). As employees acquire stronger digital competencies, they become more confident in utilizing ICT systems to support communication, information management, and operational activities.

For SMEs, workforce transformation is especially critical because these organizations often face limitations in resources and technological infrastructure. The presence of a skilled and adaptable workforce can therefore serve as a key enabler of ICT adoption. Employees who possess adequate technological literacy are more capable of understanding, adopting, and effectively utilizing digital systems in business activities. As a result, workforce capability development helps SMEs integrate ICT into their operational processes and improve the efficiency of their business activities (Gibson et al., 2015; Jabeen et al., 2024; Kinosian et al., 2016).

This finding is consistent with previous research highlighting the importance of workforce agility and employee readiness for change in facilitating digital transformation

initiatives within organizations (Jabeen et al., 2024; Mesagan & Hossana, 2025). Employees who demonstrate higher levels of adaptability and technological competence are more likely to engage with digital technologies and incorporate them into organizational practices (Singh et al., 2025; Wang & Tong, 2026). In addition, workforce agility enables organizations to respond more effectively to technological disruption and changing business environments (K. Sharma et al., 2024). Overall, these findings suggest that workforce transformation serves as an important organizational capability that supports the successful utilisation of ICT. Organizations that actively invest in workforce development, particularly in strengthening digital skills and adaptability, are more likely to leverage technological resources effectively and enhance their digital capabilities.

The Effect of ICT Utilisation on SME Performance

The findings of this study indicate that ICT utilisation has a significant positive influence on SME performance. This result suggests that the effective use of digital technologies plays an important role in improving the operational and strategic capabilities of SMEs. By integrating ICT into business activities, organizations are able to streamline operational processes, facilitate communication, and enhance access to relevant information that supports managerial decision-making (Nguyen et al., 2025). The utilisation of ICT also enables organizations to improve productivity and competitiveness through the automation of various business processes and more efficient data management systems. These technological advantages allow firms to respond more quickly to market demands and adapt to changes in the business environment (Panagiotopoulos et al., 2023; Saptadi et al., 2025; Tănăsescu et al., 2025). In the context of SMEs, where financial and human resources are often limited, the adoption of ICT becomes particularly valuable because it helps businesses overcome operational constraints and improve efficiency.

Furthermore, digital technologies provide SMEs with broader opportunities to expand their market reach and strengthen customer engagement. Through online platforms, digital communication tools, and internet-based marketing channels, SMEs can access wider markets and interact more effectively with customers. These capabilities enable SMEs to improve service quality, strengthen relationships with customers, and ultimately enhance business performance. In addition, ICT utilisation supports more effective coordination and information sharing within organizations. The availability of digital information systems allows managers to monitor business activities more efficiently and make more informed strategic decisions. As a result, SMEs that actively integrate ICT into their business processes tend to achieve higher levels of financial and operational performance (Nguyen et al., 2025; Panagiotopoulos et al., 2023). Overall, these findings highlight that ICT utilisation represents a strategic tool for SMEs to improve efficiency, expand market access, and strengthen competitiveness in an increasingly digital business environment. Therefore, SMEs that are able to effectively adopt and utilize ICT are more likely to achieve superior business performance.

The Effect of Workforce Transformation on SME Performance

The empirical results of this study indicate that workforce transformation has a significant positive effect on SME performance. This finding highlights the importance of developing employee capabilities, adaptability, and professional skills in improving organizational outcomes. When organizations actively invest in strengthening workforce competencies, employees become better equipped to handle operational challenges and contribute more effectively to business activities. Workforce transformation enables

organizations to build a more capable and responsive workforce that can support productivity, innovation, and continuous improvement. Employees who possess higher levels of competence, flexibility, and learning ability are more likely to perform tasks efficiently and respond effectively to changes in the business environment. These capabilities allow organizations to improve operational efficiency and enhance overall business performance (Dao et al., 2025; Gautam et al., 2026).

Furthermore, the development of workforce capabilities supports innovation and organizational adaptability (Liu et al., 2026). Employees who are capable of learning new skills and adapting to evolving technologies can contribute to the creation of new ideas, improved work processes, and better problem-solving approaches within the organization. As a result, organizations are able to maintain productivity and competitiveness in increasingly dynamic business environments (Luo et al., 2025; Radicic & Petković, 2023). In the context of SMEs, workforce transformation is particularly important because human resources often represent one of the most valuable organizational assets. SMEs generally operate with limited financial and technological resources, making the capability of their workforce a critical factor in achieving business success. By developing employees' competencies and adaptability, SMEs can enhance their ability to respond to technological developments and market changes (Bashir & Alsaeed, 2026).

These findings are also consistent with the Resource-Based View (RBV), which emphasizes that internal resources—especially human capital—play a crucial role in generating sustainable competitive advantage (Núñez et al., 2025). From this perspective, organizations that are able to develop and utilize their human resources effectively are more likely to achieve superior performance outcomes. Therefore, investing in workforce transformation can be considered a strategic effort to strengthen SME competitiveness and improve overall business performance.

The Mediating Role of ICT Utilisation

Beyond the direct relationships identified in this study, the findings also highlight the important mediating role of ICT utilisation in the link between workforce transformation and SME performance. Although ICT utilisation is found to significantly mediate the relationship between workforce transformation and SME performance, the mediation effect is only partial. This finding indicates that workforce transformation influences SME performance not only through the utilisation of digital technologies but also through other organizational mechanisms. In the context of SMEs, improvements in workforce capabilities—such as adaptability, problem-solving ability, and operational skills—can directly enhance productivity, service quality, and innovation, which ultimately contribute to better business performance.

From the Resource-Based View (RBV) perspective, human capital represents a strategic organizational resource that can generate performance advantages independently of technological utilisation. Therefore, while ICT utilisation serves as an important pathway through which workforce transformation improves organizational outcomes, workforce capability development may also influence performance through alternative routes such as improved work efficiency, enhanced customer responsiveness, and stronger innovation capacity. This explains why the mediating role of ICT utilisation in this study is partial rather than full.

This result suggests that transforming the workforce—through the development of skills, adaptability, and technological competencies—does not only strengthen organizational performance on its own, but also enables firms to make better use of information and communication technologies (Iyamu et al., 2025). When employees possess adequate digital

capabilities and are open to technological change, they are more capable of integrating ICT tools into business processes and daily operational activities (Yuwono et al., 2025). As a result, the organization can utilize digital technologies more effectively to improve efficiency, coordination, and decision-making processes. The development of workforce capabilities therefore plays a crucial role in facilitating the successful adoption and utilisation of digital technologies within SMEs. Employees who are well-prepared to work with digital systems are more likely to leverage ICT in ways that enhance productivity, streamline business operations, and support innovation initiatives (Çallı et al., 2024). In this way, workforce transformation indirectly strengthens organizational performance through improved technological utilisation (Dao et al., 2025; Iyamu et al., 2025; Jabeen et al., 2024).

These findings are also consistent with previous studies that highlight the utilisation of digital technology as a key mechanism linking organizational capabilities and firm performance outcomes (Saptadi et al., 2025; Zhang et al., 2026). By enabling organizations to process information more efficiently, expand market access, and optimize operational activities, ICT utilisation becomes an important pathway through which workforce capability development translates into improved performance. Furthermore, SMEs often operate under resource constraints that limit the extent to which digital technologies can be fully integrated into all business processes. As a result, workforce transformation remains a critical driver of performance even when ICT utilisation is not optimally implemented. These findings highlight that workforce capability development and ICT utilisation function as complementary mechanisms in strengthening SME competitiveness.

CONCLUSION

The findings of this study highlight the important role of workforce capability development and digital technology utilisation in strengthening SME performance. The results demonstrate that workforce transformation contributes significantly to the effective use of ICT within SMEs. When organizations enhance employee competencies, particularly in terms of adaptability and digital skills, they become better equipped to integrate information and communication technologies into their operational activities.

The study also reveals that ICT utilisation plays a crucial role in improving SME performance. The use of digital technologies allows businesses to enhance operational efficiency, improve access to strategic information, and expand market opportunities. SMEs that are able to integrate ICT into their business processes are therefore more capable of improving productivity and responding to market changes. Another important finding is that workforce transformation directly contributes to SME performance. The development of employee capabilities and flexibility enables organizations to strengthen productivity and support business growth. In addition, ICT utilisation functions as an important mechanism that links workforce transformation to SME performance. The analysis confirms that ICT utilisation partially mediates this relationship, indicating that workforce transformation improves SME performance both directly and indirectly through the effective use of digital technologies.

From a managerial perspective, these findings emphasize the importance of investing in workforce capability development. SME owners and managers should prioritize improving employee competencies, particularly digital skills and technological adaptability, in order to support the effective utilisation of ICT and enhance business performance. More specifically, SMEs are encouraged to implement structured training programs, adopt digital mentoring practices, and gradually integrate digital tools into core business functions such as marketing, customer service, and operational management.

Despite these contributions, several limitations should be acknowledged. The study is based on data from 119 SMEs, which may limit the generalizability of the results. Furthermore, the model only includes three main variables, whereas other organizational factors—such as digital leadership, organizational culture, or innovation capability—may also influence SME performance. Future research is therefore encouraged to expand the research model and involve larger samples to provide deeper insights into the drivers of SME performance in the digital transformation era.

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