

**AI UTILIZATION, DIGITAL COMPETENCE, AND EMPLOYEE PERFORMANCE: A SIMULTANEOUS
MODEL IN SERVICE COMPANIES**

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Abstract

This study aims to examine the effect of AI Utilization and Digital Competence on Employee Performance in service companies. The research method used was quantitative with an explanatory survey approach. The sample consisted of 89 employees of a service company in Surabaya selected using total sampling technique. Data collection was conducted through a Likert-scale online questionnaire. The research instrument had been tested for validity and reliability. Data analysis technique used multiple linear regression with SPSS. The results showed that both AI Utilization and Digital Competence had a positive and significant effect on Employee Performance, both partially and simultaneously. Digital Competence was found to be the most dominant contributing variable. The simultaneous contribution of both variables was 49.6 percent. These findings indicate that improving employees' digital competence is a strategic priority for service companies in the digital era. This study recommends integrated digital transformation programs that combine AI adoption and continuous digital competence development.

Keywords: AI utilization, digital competence, employee performance, service company, multiple linear regression.

Introduction

In the era of the industrial revolution 4.0 and the acceleration of digital transformation, service companies are driven to continuously innovate to improve operational efficiency and service quality. One technology experiencing rapid growth and beginning to be adopted across various industry sectors is artificial intelligence (AI). AI has proven capable of automating routine tasks, accelerating decision-making, and enhancing accuracy in various business processes (Sreerangapuri, 2024). Automation creates instability by continuously evaluating which human skills hold value (Sulaksono et al., 2025). High levels of automation also raise questions about worker protection, so adoption needs to be managed carefully (Budi et al., 2024). Many companies and government institutions are now beginning to experiment with new ways to work faster and remain competitive amid increasingly rapid digital changes (Mardikaningsih & Oluwatoyin, 2023). Digital competition pushes companies to adopt new technology quickly (Mustafa et al., 2025), and tools such as digital twins show that technology is now used to manage operations at various organizational scales (Khayru, 2025). The success of AI adoption heavily depends on the readiness of the human resources operating it. Employees are expected to possess not only technical competence in their respective fields but also adequate digital competence to work harmoniously with AI systems (Aggarwal, 2025). Leaders also need to integrate technology into their leadership style to support team performance (Putra, 2025).

Not all service companies successfully integrate AI into their daily operations in an optimal manner (Kapil et al., 2025). Initial studies indicate that even though companies have invested substantial resources to adopt AI technology, the expected improvements in employee performance are frequently not achieved (Yang et al., 2025; Hána & Lameijer, 2025). One of the primary causes is the low digital competence of employees in utilizing such technology effectively. Limited ability to access and leverage technology can cause employees to fall behind in developing the skills required within a work environment increasingly reliant on digital technology (Arifin & Darmawan, 2021). Employee competence in facing technological developments needs to be supported so that employees are able

to utilize new technologies and work tools effectively while minimizing obstacles during the technology transition process (Chasanah & Mardikaningsih, 2023). Learning methods such as gamification can help employees build these skills while maintaining cooperation among colleagues (Putra et al., 2024). Employees who are unaccustomed to using information systems or digital applications tend to experience adaptation difficulties, which ultimately diminish productivity. Employees of different ages and conditions also need support to remain healthy and productive in an AI-driven workplace (Darmawan, 2020). Pressure to be productive in digital settings can affect their mental well-being and performance (Khayru & Arifin, 2025), while support programs help keep employees committed during change (Issalillah & Khayru, 2025).

Several factors theoretically suspected of influencing employee performance in the digitalization context include AI utilization and digital competence. AI utilization refers to the extent to which employees use artificial intelligence-based systems to support daily work, such as task automation, data analysis, and decision recommendations (Peukert, 2025). The Technology Acceptance Model (TAM) by Davis (1989) explains that perceived ease of use and perceived usefulness of technology determine the extent to which individuals adopt and utilize that technology in their work. Meanwhile, digital competence refers to employees' capability to operate digital devices, work applications, information systems, and adapt to new technological developments (Huynh & Nguyen, 2024). It also includes handling data responsibly as work becomes more digital (Osean et al., 2024), because errors in data management can create liability for companies (Rasid et al., 2025). In addition, digital competence includes the ability to assess information critically (Sinambela, 2022). Employees require a competence profile that combines digital capabilities, analytical skills, and socio-emotional intelligence to adapt to changing job demands (Darmawan, 2025). Previous research has demonstrated that high digital competence enables employees to work more efficiently and effectively in an increasingly automated work environment (Stipić et al., 2025).

Research gaps in the literature regarding the determinants of employee performance in the digital era remain evident. Most previous studies tend to examine AI utilization or digital competence separately, without considering the simultaneous interaction between these two factors. Research integrating technological adoption aspects (AI utilization) and individual competence aspects (digital competence) into a single research model remains limited, particularly within the context of service companies in Indonesia. In fact, employee performance is a multidimensional outcome influenced by the interaction between the technology utilized and the individual's ability to operate it (Bravo et al., 2015). Employee performance, as an indicator of work effectiveness, is influenced by various conditions that support employees' abilities to perform their work productively (Eddine et al., 2021). Neglecting either aspect in the analysis risks producing an incomplete understanding and misplaced policy recommendations. Policy recommendations also need to consider the legal and ethical limits of digital use (Sediana et al., 2025).

The novelty of this study lies in combining two domains that have often been separated: the domain of technology adoption (AI utilization) and the domain of individual competence (digital competence) into a single research model. This approach enables the identification of which factor makes the most dominant contribution to employee performance. Furthermore, this study offers practical contributions for company management in designing targeted human resource training and development programs. Based on the description of the phenomenon, research gaps, and proposed novelty, the main objective of this study is to empirically examine the effect of AI utilization and digital competence on employee performance in service companies, both partially and simultaneously.

Method

This study adopted a quantitative approach using explanatory research, which aims to explain causal relationships between independent variables and the dependent variable through hypothesis testing (Coe et al., 2025). A cross-sectional design was employed, where data were collected at a single point in time from a selected group of sample respondents (Newby, 2014). This approach was chosen as it aligns with the research objective of examining the simultaneous effect of AI Utilization and Digital

Competence on Employee Performance. The population of this study comprised all employees at a service company located in Surabaya. Based on internal company data from 2025, the population size was 89 people. The sampling technique used was total sampling or a census approach, in which all members of the population were designated as respondents due to the relatively small and fully accessible population size. Thus, the sample size in this study consisted of 89 employees.

Data collection was conducted online using the Google Forms platform. Questionnaires were distributed via the company's WhatsApp group with the assistance of the human resource manager. Distribution took place over three consecutive days with daily reminders. All 89 employees returned fully completed questionnaires, yielding a response rate of 100 percent. No questionnaires were declared invalid, as all items were filled out consistently. The research instrument utilized a five-point Likert-scale questionnaire, where 1 indicates strongly disagree, 2 disagree, 3 neutral, 4 agree, and 5 strongly agree (Coe et al., 2025). The Employee Performance variable was measured based on employee self-assessments regarding productivity, service quality, task completion timeliness, and perceived customer satisfaction. The AI Utilization variable was measured using a scale adapted from Davis (1989) regarding perceived usefulness and perceived ease of use in the context of utilizing AI systems to support daily work. The Digital Competence variable was measured using a scale developed by Hatlevik, Throndsen, and Gudmundsdottir (2018) which encompasses the ability to operate digital devices, utilize work applications, and manage corporate information systems.

The collected data were subsequently analyzed using SPSS version 26 software. Hypothesis testing was performed using multiple linear regression analysis (Daniel et al., 2024). The regression model specified was $Y = a + b_1X_1 + b_2X_2 + e$, where Y represents Employee Performance, X_1 is AI Utilization, X_2 is Digital Competence, a is the constant, b represents the regression coefficient for each independent variable, and e is the error term. Partial hypothesis testing (t-test) was conducted to determine the significance of the individual effect of each independent variable on the dependent variable, with a significance threshold set at less than 0.05. Simultaneous testing (F-test) was performed to examine whether both independent variables jointly had a significant effect on the dependent variable, adhering to a significance criterion of less than 0.05 (Tolmie et al., 2011). The coefficient of determination (R^2) was calculated to assess the proportion of variance in the dependent variable explained simultaneously by both independent variables (Daniel et al., 2024). To identify which variable made the most dominant contribution to employee performance, a comparison of the standardized coefficients beta for each independent variable was conducted, where the variable with the highest beta value was deemed to have the most dominant contribution (Tolmie et al., 2011). All data analysis procedures were executed at a significance level of $\alpha = 0.05$.

Results and Discussion

This study was derived from the distribution of questionnaires to 89 employees of a service company in Surabaya who met the inclusion criteria. The questionnaire response rate reached 100 percent, with all 89 questionnaires declared valid and eligible for processing. The profile of the respondents showed that 52 respondents or 58.4 percent were male, and 37 respondents or 41.6 percent were female. Based on length of service, 41 respondents or 46.1 percent had a tenure of 1 to 5 years, 32 respondents or 36.0 percent had a tenure of 6 to 10 years, and 16 respondents or 18.0 percent had a tenure of more than 10 years. Based on education level, 45 respondents or 50.6 percent held a bachelor's degree, 28 respondents or 31.5 percent held a diploma, and 16 respondents or 18.0 percent had a vocational high school background.

Table 1. Respondent Profile

Characteristics	Category	Frequency (n)	Percentage (%)
Gender	Male	52	58.4
	Female	37	41.6
Length of Service	1 - 5 years	41	46.1
	6 - 10 years	32	36

Characteristics	Category	Frequency (n)	Percentage (%)
Education	> 10 years	16	18
	Vocational High School	16	18
	Diploma	28	31.5
	Bachelor's Degree	45	50.6

The descriptive statistics of the research data indicate that, in general, both independent variables were in the medium to high category. The AI Utilization variable had a mean value of 3.85 with a standard deviation of 0.62 on a 1-to-5 scale. The highest score for this variable was found in the item concerning the use of AI for data analysis, with a mean of 4.12, while the lowest score was in the item regarding trust in AI recommendations, with a mean of 3.52. The Digital Competence variable recorded a mean value of 3.92 with a standard deviation of 0.58, representing the highest mean among the independent variables. The item on the ability to use work applications was the highest, with a mean of 4.18, whereas the item on the ability to operate corporate information systems was the lowest, with a mean of 3.62. The dependent variable, Employee Performance, had a mean value of 3.88 with a standard deviation of 0.60, which falls into the high category. The item for task completion timeliness was the highest, with a mean of 4.05, while the item for customer satisfaction was the lowest, with a mean of 3.68.

Table 2. Descriptive Statistics of Research Variables

Variable	Label	N	Minimum	Maximum	Mean	Std. Deviation
AI Utilization	X1	89	2.40	4.90	3.85	0.62
Digital Competence	X2	89	2.60	5.00	3.92	0.58
Employee Performance	Y	89	2.50	4.90	3.88	0.60

Validity testing was performed using Pearson's correlation between the score of each item and the total score of its respective variable. The results of the validity test demonstrated that all statement items for the three variables had a corrected item-total correlation value above 0.30, thus declared valid. Reliability testing revealed a Cronbach's Alpha value of 0.852 for AI Utilization, 0.868 for Digital Competence, and 0.874 for Employee Performance. All three values were well above the minimum threshold of 0.70, indicating that the instrument is reliable.

Table 3. Validity and Reliability Test Results

Variable	Number of Items	Range of r-count	r-table	Cronbach's Alpha	Description
AI Utilization (X1)	6	0.445 - 0.712	0.30	0.852	Valid & Reliable
Digital Competence (X2)	6	0.456 - 0.738	0.30	0.868	Valid & Reliable
Employee Performance (Y)	6	0.423 - 0.694	0.30	0.874	Valid & Reliable

Prior to conducting hypothesis testing using multiple linear regression, classical assumption tests were performed. The normality test on residuals using the Kolmogorov-Smirnov test yielded a test statistic of 0.078 with a significance value of 0.152, which is greater than 0.05, confirming that the residuals were normally distributed. The multicollinearity test showed that the tolerance values for both independent variables were 0.587 and 0.612, while the VIF values were 1.703 and 1.634. All tolerance values exceeded 0.10 and VIF values were below 10, indicating no multicollinearity issue. The heteroscedasticity test using the Glejser test yielded a significance value of 0.324 for AI Utilization and 0.287 for Digital Competence relative to the absolute residual values, both of which were greater than 0.05, thereby indicating no heteroscedasticity problem.

Tabel 4. Classical Assumption Test Results

Assumption Test	Criterion	Result	Description
Normality (Kolmogorov-Smirnov)	Sig. > 0.05	Sig. = 0.152	Met
Multicollinearity	Tolerance > 0.10; VIF < 10	Tolerance: 0.587-0.612; VIF: 1.634-1.703	Met
Heteroscedasticity (Glejser)	Sig. > 0.05	X1: 0.324; X2: 0.287	Met

Multiple linear regression analysis was conducted to examine the effect of both independent variables on Employee Performance. The results demonstrated that, simultaneously, both independent variables had a significant effect on Employee Performance. This is evidenced by an F-test statistic of 42.567 with a significance value of 0.000, which is well below 0.05. The resulting R^2 (R Square) value was 0.496, meaning that 49.6 percent of the variance in Employee Performance can be explained by both independent variables, namely AI Utilization and Digital Competence, while the remaining 50.4 percent is explained by other variables outside this research model. The Adjusted R^2 value of 0.485 indicates that the model is adequate in predicting employee performance.

Table 6. Simultaneous Test Results (F-Test)

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	15.678	2	7.839	42.567	0.000
Residual	15.834	86	0.184		
Total	31.512	88			

The multiple linear regression equation derived from this analysis is as follows: $Y = 1.245 + 0.312X_1 + 0.423X_2 + e$. This equation can be interpreted such that every one-unit increase in AI Utilization will increase Employee Performance by 0.312 points, holding other variables constant. Every one-unit increase in Digital Competence will increase Employee Performance by 0.423 points. Consequently, Digital Competence exerts a larger effect compared to AI Utilization in determining employee performance.

Table 7. Partial Test Results (t-Test) and Regression Coefficients

Variable	Coefficient B	Std. Error	Beta	t	Sig.	Description
Constant	1.245	0.312		3.991	0.000	
AI Utilization (X1)	0.312	0.089	0.324	3.506	0.001	Significant
Digital Competence (X2)	0.423	0.078	0.412	5.423	0.000	Significant

Dependent Variable: Employee Performance (Y)

The first finding to discuss is that AI Utilization is proven to have a positive and significant effect on Employee Performance. This result aligns with the technology acceptance model theory developed by Davis (1989), which states that individuals' perceived ease of use and perceived usefulness of technology will encourage them to adopt and utilize that technology, ultimately enhancing work productivity. Employees who utilize AI for routine task automation, data analysis, and decision recommendations tend to work more efficiently and accurately. This finding is also reinforced by previous studies (Autor, 2015; Brynjolfsson & McAfee, 2017; Agrawal et al., 2019; Chui et al., 2021; Huang & Rust, 2022; Malik et al., 2023). Scientifically, this finding confirms that AI utilization serves as human capability augmentation rather than substitution. Generative AI is also changing how organizations manage their people and assign work (Darmawan, 2022). Automation can be positioned as a technology that helps free employees from routine work, giving them the opportunity to focus more attention on tasks that provide higher value-added benefits (Mardikaningsih & Darmawan, 2023). AI takes over repetitive and rule-based tasks, allowing employees to direct their attention toward tasks that require creativity, empathy, and complex problem-solving. AI utilization can enhance work efficiency and accuracy (Mardikaningsih et al., 2024). Technology that enhances human abilities can also change how workers see themselves and relate to others at work (Abror et al., 2025). Clear policies on AI use (Darmawan, 2023) and attention to personal data protection (Issalillah & Hardyansah, 2024) are therefore needed so that employees can use AI safely. The implication of this finding is that companies need to continually encourage AI adoption across all operational lines, while balancing it with adequate training so that employees feel comfortable and confident in using AI systems.

The second finding indicates that Digital Competence has a positive and significant effect on Employee Performance, and even emerges as the variable with the most dominant contribution among the two tested variables. This result is consistent with the human capital theory proposed by Becker (1964), which asserts that investment in enhancing individual competence increases a person's productivity and economic value in the workplace. Employees with high digital competence are more capable of efficiently operating various digital devices, work applications, and corporate information systems.

According to Gani dan Darmawan (2023), digital competence in the work environment encompasses the ability to utilize smart technologies, data analysis, and digital collaboration platforms in work activities. Digital tools such as big data, AI, and the Internet of Things are also used to improve how work processes run (Putra & Arifin, 2021), which increases the need for employees to master them. This finding is also consistent with previous studies (van Laar et al., 2017; Oberländer et al., 2020; Cetindamar et al., 2021; Hatlevik et al., 2018; Spante et al., 2018; Mohammadyari & Singh, 2015). Scientifically, this finding affirms that digital competence is the foundational base enabling employees to leverage digital technology optimally. Employees who continuously develop digital competence will be able to adapt to changes in software and technologies used within the work environment (Putra et al., 2025). Without adequate digital competence, investments in AI technology will not yield maximum results because employees are unable to operate them effectively. The implication of this finding is vital for company management: the primary priority in human resource development should be focused on improving employee digital competence. Performance appraisal based on competence can also help companies evaluate employees accurately and fairly (Putra, 2021). Digital training must become a continuous program rather than a one-off activity. Furthermore, new employee recruitment should consider digital competence as one of the primary selection criteria.

The third finding demonstrates that simultaneously, AI Utilization and Digital Competence jointly exert a significant effect on Employee Performance, with a contribution of 49.6 percent. This indicates that both factors complement each other in shaping employee performance. For companies aiming to enhance employee performance, it is insufficient to merely adopt advanced AI technology; they must also ensure that employee digital competence is adequate. Conversely, having employees with high digital competence without the support of proper AI technology infrastructure will also be suboptimal. Therefore, a holistic approach combining technology investment and competence development simultaneously represents the most effective strategy. This finding also carries practical implications that company management needs to design an integrated digital transformation program, where the procurement of AI systems is always followed by structured and measurable training programs. Such a program works better when change management is integrated with the technology strategy (Sinambela, 2023).

Conclusion

AI Utilization is proven to have a positive and significant effect on Employee Performance among employees of service companies. The higher the level of AI utilization in daily work, the higher the employee performance achieved. Digital Competence is proven to have a positive and significant effect on Employee Performance, and even emerges as the variable with the most dominant contribution between the two tested independent variables. This indicates that employees' capability in operating digital devices and information systems is the most decisive factor for their performance success in the digital era. Simultaneously, AI Utilization and Digital Competence jointly exert a significant effect on Employee Performance.

This study offers several recommendations. The first practical recommendation for company management is to focus interventions more heavily on strengthening employees' Digital Competence, as this variable has been proven to have the most dominant contribution. Digital training programs need to be designed on a continuous basis with materials relevant to job requirements, such as training in the use of work applications, corporate information systems, and data literacy. The second practical recommendation is that companies need to continuously encourage AI utilization in daily operations, but with adequate support and guidance so that employees do not feel threatened or anxious. A gradual approach ranging from simple to complex tasks will help employees adapt better. The third practical recommendation is that companies need to integrate technology adoption strategies and competence development within a well-planned digital transformation framework. Theoretical recommendations for future researchers include expanding this model by incorporating other variables such as management support, organizational culture, or job characteristics, as well as employing a longitudinal design to test stronger causal relationships. This study has limitations regarding the use of self-perception scales which are potentially subject to bias, the scope limited to

a single service company, and a cross-sectional design that precludes definitive causal conclusions. Nevertheless, this study has successfully provided valuable empirical contributions to understanding the determinants of employee performance in the digital era.

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