West Science Interdisciplinary Studies
Vol. 02, No. 07, July and 2024: pp. 1444-1454

Analysis of the Relationship between IoT Integration and Digital Skills Training on Competency Development and Employee Performance at Bogor Start-up

Dwi Aris Nurohman[1], Rahmi Setiawati[2], Arnes Yuli Vandika[3]
[1] Sekolah Cinta Kasih Tzu Chi and dwi.aris@cintakasihtzuchi.sch.id
[2] Vokasi UI, Produksi Media and rahmisetiawati10@gmail.com
[3] Universitas Bandar Lampung and arnes@ieee.org

ABSTRACT

This study investigates the relationship between IoT integration and digital skills training on competency development and employee performance in start-up companies in Bogor. Utilizing a quantitative approach, data were collected from 170 respondents through a structured questionnaire employing a Likert scale ranging from 1 to 5. The data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS 3) to explore the interconnections between the variables. The findings indicate that all examined relationships are positive and significant. Specifically, IoT integration and digital skills training significantly enhance competency development, which in turn positively impacts employee performance. These results underscore the importance of technological integration and continuous skills training in fostering employee growth and organizational performance within the dynamic environment of Bogor start-ups. The study provides valuable insights for managers and policymakers aiming to leverage digital advancements to optimize human capital and achieve superior business outcomes.

Keywords: *IoT Integration, Digital Skills Training, Competency Development, Employee Performance, Start-up Companies in Bogor*

1. INTRODUCTION

Start-ups in the contemporary business environment are embracing technological innovations to boost their operational efficiency and gain a competitive advantage. The integration of the Internet of Things (IoT) has emerged as a pivotal element in modern business strategies, offering a wide array of benefits across various industries. IoT facilitates improved machine maintenance, supply chain management, inventory control [1], and provides real-time insights into operational processes, from machine performance to logistics operations [2]. By leveraging IoT alongside entrepreneurship, marketing, and artificial intelligence (AI), start-ups can drive innovation, enhance customer engagement, optimize operations, and foster business growth [3]. Additionally, the application of IoT in digital marketing has been shown to positively impact company performance, financial outcomes, internal processes, customer relations, and innovation efforts [4]. This amalgamation of technologies empowers start-ups to make data-driven decisions, streamline operations, and meet evolving customer demands effectively, positioning them for sustained success in the competitive market landscape [5].

IoT integration plays a pivotal role in enabling seamless connectivity between devices and systems, facilitating real-time data collection, analysis, and decision-making [6]–[10]. This integration is especially crucial for start-ups in regions like Bogor, known for their vibrant entrepreneurial ecosystem and innovative business practices. By harnessing IoT technology, start-ups can optimize their operations, enhance efficiency, and make data-driven decisions to drive growth and competitiveness in the market [7]. The fusion of IoT with data analytics empowers

businesses to extract valuable insights from the vast volumes of data generated by connected devices, enabling informed decision-making and innovative solutions across various industries [8], [9]. In the context of smart agriculture, integrated IoT systems offer real-time monitoring of environmental parameters, automation of tasks, and predictive analytics, leading to optimized resource utilization and improved crop yields [10].

In the digital era, the demand for employees with robust digital skills is paramount, necessitating comprehensive digital skills training to navigate and leverage advanced technologies effectively. Research emphasizes the pivotal role of digital technologies in transforming personnel management within enterprises, enhancing productivity, and fostering sustainable organizational development [11]. Furthermore, soft skills competence, effective communication, collaboration, and leadership are highlighted as crucial success factors in the digital business era, underscoring the value of a well-rounded skill set [12]. Competency-based training is identified as an effective approach to improving skills in line with job demands, contributing to enhanced employee motivation, engagement, and organizational competitiveness in the digital era [13]. Additionally, the competence of human resources in utilizing digital technology significantly influences performance, with appropriate competencies in digitalization positively impacting public service performance [14]. The effects of digital transformation on worker performance and skill sets are evident, with factors like motivation, knowledge, competence, and organizational culture playing key roles in enhancing employee performance [15].

This study aims to explore the relationship between IoT integration and digital skills training on competency development and employee performance in start-up companies in Bogor. Research has consistently emphasized the positive impact of Internet of Things (IoT) and digital skills on various organizational outcomes. The integration of IoT technologies has been shown to enhance efficiency, productivity, and operational processes within businesses [16]. Additionally, the utilization of IoT in digital marketing has been linked to improved company performance, innovation, and service quality, creating a robust database for stakeholders in e-commerce [4]. Furthermore, the digitalization of organizations through the adoption of digital technologies has led to improvements in operational processes, increased agility, and the potential for innovation, highlighting the multifaceted benefits of digitalization on organizational effectiveness and competitiveness [17], [18]. These findings underscore the strategic importance of embracing IoT and digital skills to drive positive organizational outcomes in the modern business landscape. However, there remains a gap in understanding the specific interplay between these factors in the context of start-ups, particularly within the dynamic and rapidly growing entrepreneurial environment of Bogor. This study addresses this gap by providing empirical evidence on the significance of IoT integration and digital skills training in fostering competency development and enhancing employee performance.

2. LITERATURE REVIEW

2.1 IoT Integration in Start-Ups

The integration of the Internet of Things (IoT) has indeed revolutionized various business sectors, offering advantages like real-time data monitoring, improved resource management, and enhanced customer experiences, particularly beneficial for start-ups operating in competitive environments [4], [19], [20]. IoT integration enables

automation of tasks, freeing up employees for strategic activities, and provides valuable market insights for informed decision-making [4], [19], [21]. However, successful IoT integration necessitates a skilled workforce capable of effectively utilizing these technologies [21]. Moreover, IoT's ability to streamline operations, track products, and identify process inefficiencies can significantly benefit start-ups by enhancing efficiency, productivity, and decision-making processes [19], [20].

2.2 Digital Skills Training

Digital skills training plays a crucial role in equipping employees with the necessary competencies to effectively utilize advanced technologies like IoT systems [15]. Such training programs focus on enhancing technical abilities, problem-solving skills, and adaptability to new digital tools and platforms, ultimately leading to improved employee performance [15]. Research indicates that employees who undergo digital skills training exhibit increased confidence and proficiency in utilizing digital tools, which positively impacts their overall performance [12]. By ensuring that employees are well-versed in operating and managing IoT systems through digital skills training, organizations can maximize the benefits derived from these technologies, fostering a more efficient and technologically adept workforce [15].

2.3 Competency Development

Competency development plays a crucial role in enhancing employees' skills and knowledge, ultimately improving their performance [22]. In the context of IoT integration and digital skills training, competency development focuses on building technical expertise, analytical skills, and problem-solving abilities [23]. For start-ups, competency development is vital as it directly impacts their capacity to innovate and adapt to market changes, thus influencing their overall success and competitiveness in the industry [13]. By investing in competency-based training programs, organizations can ensure that their employees are equipped with the necessary skills to navigate the digital era effectively, contributing to improved performance and organizational growth [13].

2.4 Employee Performance

Employee performance is a critical factor in organizational success, particularly in start-ups where agility and innovation are vital. Research has shown that factors like IoT integration and digital skills training significantly impact employee performance [15], [24]–[26]. IoT integration enables access to real-time data, enhancing decision-making and productivity, while digital skills training equips employees with the necessary competencies to effectively utilize technology, leading to improved performance. Studies emphasize the importance of continuous training programs to enhance skills and knowledge for optimal job performance, especially in the tech industry where employee training, job satisfaction, and organizational commitment are key determinants of performance [25]. Additionally, the digital transformation and motivation, ability, knowledge, and competence have been found to positively influence employee performance, highlighting the significance of various factors like teamwork, communication, and work discipline in driving performance [15], [27].

Theoretical Framework and Hypotheses

This study is grounded in the Resource-Based View (RBV) theory, which posits that organizational resources, including technological assets and human capital, are critical drivers of competitive advantage (Barney, 1991). According to RBV, IoT integration and digital skills training are valuable resources that can enhance competency development and, consequently, employee performance. Based on the literature, the following hypotheses are proposed:

H1: IoT integration has a positive and significant effect on competency development.

H2: Digital skills training has a positive and significant effect on competency development.

H3: IoT integration has a positive and significant effect on employee performance.

H4: Digital skills training has a positive and significant effect on employee performance.

3. METHODS

3.1 Research Design

This study employs a quantitative research design to investigate the relationship between IoT integration, digital skills training, competency development, and employee performance in start-up companies in Bogor. The target population consists of employees working in start-up companies in Bogor, with a sample size of 170 respondents selected using purposive sampling to ensure relevant experience with IoT integration and digital skills training. This sample size is considered adequate for conducting Structural Equation Modeling-Partial Least Squares (SEM-PLS) analysis, meeting the minimum requirement for reliable and valid statistical analysis (Hair et al., 2014). Data were collected using a structured questionnaire designed to measure the key constructs, based on established scales from previous studies and adapted to fit the context of this research. Respondents rated their agreement with each statement on a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was distributed both online and offline to ensure a high response rate, with responses collected anonymously to maintain confidentiality and encourage honest feedback.

3.2 Measurement of Variables

The constructs in this study were measured using multiple items, each rated on a Likert scale from 1 to 5. The measurement items for each construct are as follows:

1. IoT Integration: This construct was measured using items that assess the extent to which IoT technologies are integrated into the company's operations and how effectively these technologies are utilized by employees.
2. Digital Skills Training: This construct was measured using items that evaluate the comprehensiveness and effectiveness of digital skills training programs provided to employees.
3. Competency Development: This construct was measured using items that gauge the development of employees' skills, knowledge, and abilities as a result of IoT integration and digital skills training.

4. Employee Performance: This construct was measured using items that assess various aspects of employee performance, including productivity, efficiency, and quality of work.

3.3 Data Analysis

The data collected from the questionnaires were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) version 3, a robust statistical technique suitable for examining complex models involving latent constructs (Hair et al., 2017). Data preparation involved screening for missing values and outliers, and computing descriptive statistics to summarize the demographic characteristics and distribution of responses. The measurement model assessment ensured the reliability and validity of the constructs by evaluating internal consistency reliability (using Cronbach's alpha and composite reliability), convergent validity (using average variance extracted), and discriminant validity (using the Fornell-Larcker criterion). The structural model assessment tested the hypothesized relationships between the constructs by examining path coefficients, t-values, and p-values to determine their significance. The coefficient of determination (R^2) was also computed to evaluate the explanatory power of the model.

4. RESULTS AND DISCUSSION

4.1 Demographic Profile of Respondents

The demographic profile of the respondents provides valuable insights into the characteristics of the sample used in this study. The data were collected from 170 employees working in start-up companies in Bogor. The demographic variables considered in this study include age, gender, education level, and years of experience. The age distribution of respondents shows that 50.0% are aged between 26-35 years, indicating a relatively young workforce in Bogor start-ups, with 26.5% in the 18-25 years age group, 17.6% between 36-45 years, and only 5.9% above 45 years. Gender distribution reveals 55.9% male and 44.1% female respondents, suggesting a relatively balanced gender distribution. In terms of education level, 58.8% of respondents hold a Bachelor's degree, 20.6% have a Master's degree, 5.9% possess a Doctorate, and 14.7% have completed high school, indicating a diverse range of educational backgrounds. Regarding years of experience, 35.3% of respondents have 1-3 years of experience, 32.4% have 4-6 years, 20.6% have more than 6 years, and 11.8% have less than 1 year, showing a mix of both novice and experienced employees in the start-ups.

4.2 Measurement Model Assessment

The measurement model was evaluated to ensure the reliability and validity of the constructs used in this study. This assessment included examining the factor loadings, Cronbach's alpha, composite reliability, and average variance extracted (AVE) for each construct. Table 2 presents the results of this assessment.

Table 1. Measurement Model

Variable	Code	Loading Factor	Cronbach's Alpha	Composite Reliability	Average Variant Extracted
IoT Integration	ITT.1	0.867	0.878	0.925	0.804
	ITT.2	0.911			
	ITT.3	0.911			
Digital Skills Training	DST.1	0.759	0.894	0.922	0.704
	DST.2	0.891			
	DST.3	0.875			
	DST.4	0.864			
	DST.5	0.798			
	CDM.1	0.837	0.770	0.830	0.552

Competency Development	CDM.2	0.708			
	CDM.3	0.713			
	CDM.4	0.705			
Employee Performance	EPF.1	0.770	0.834	0.883	0.601
	EPF.2	0.780			
	EPF.3	0.743			
	EPF.4	0.822			
	EPF.5	0.758			

Source: Data Processing Results (2024)

The factor loadings for each item were examined to assess their contribution to the respective constructs, with loadings greater than 0.70 considered acceptable according to Hair et al. (2017). As shown in Table 2, all items had factor loadings above this threshold, indicating strong item reliability, with the highest loadings observed for items ITT.2 and ITT.3 (0.911) under the IoT Integration construct. Internal consistency reliability was assessed using Cronbach's alpha and composite reliability, with values above 0.70 indicating acceptable reliability (Nunnally & Bernstein, 1994; Hair et al., 2017). Table 2 shows Cronbach's alpha values ranging from 0.770 (Competency Development) to 0.894 (Digital Skills Training), and composite reliability values ranging from 0.830 (Competency Development) to 0.925 (IoT Integration), confirming the constructs' internal consistency. Convergent validity was assessed using the average variance extracted (AVE) for each construct, with values above 0.50 indicating that the construct explains more than half of the variance of its indicators (Fornell & Larcker, 1981). Table 2 shows AVE values ranging from 0.552 (Competency Development) to 0.804 (IoT Integration), confirming that all constructs met the criteria for convergent validity.

4.3 Discriminant Validity

Discriminant validity ensures that the constructs in a study are distinct and not overly correlated with each other. This is essential to confirm that each construct measures a unique concept. Discriminant validity can be assessed using the Fornell-Larcker criterion, which compares the square root of the average variance extracted (AVE) for each construct with the correlations between that construct and other constructs.

Table 2. Discriminant Validity

	Competency Development	Digital Skills Training	Employee Performance	IoT Integration
Competency Development	0.743			
Digital Skills Training	0.563	0.839		
Employee Performance	0.707	0.431	0.775	
IoT Integration	0.561	0.600	0.521	0.827

Source: Data Processing Results (2024)

Overall, the discriminant validity assessment using the Fornell-Larcker criterion demonstrates that each construct in this study is distinct and measures unique aspects of the theoretical model. The square root of the AVE for each construct is greater than its highest correlation with any other construct, indicating that the constructs have adequate discriminant validity.

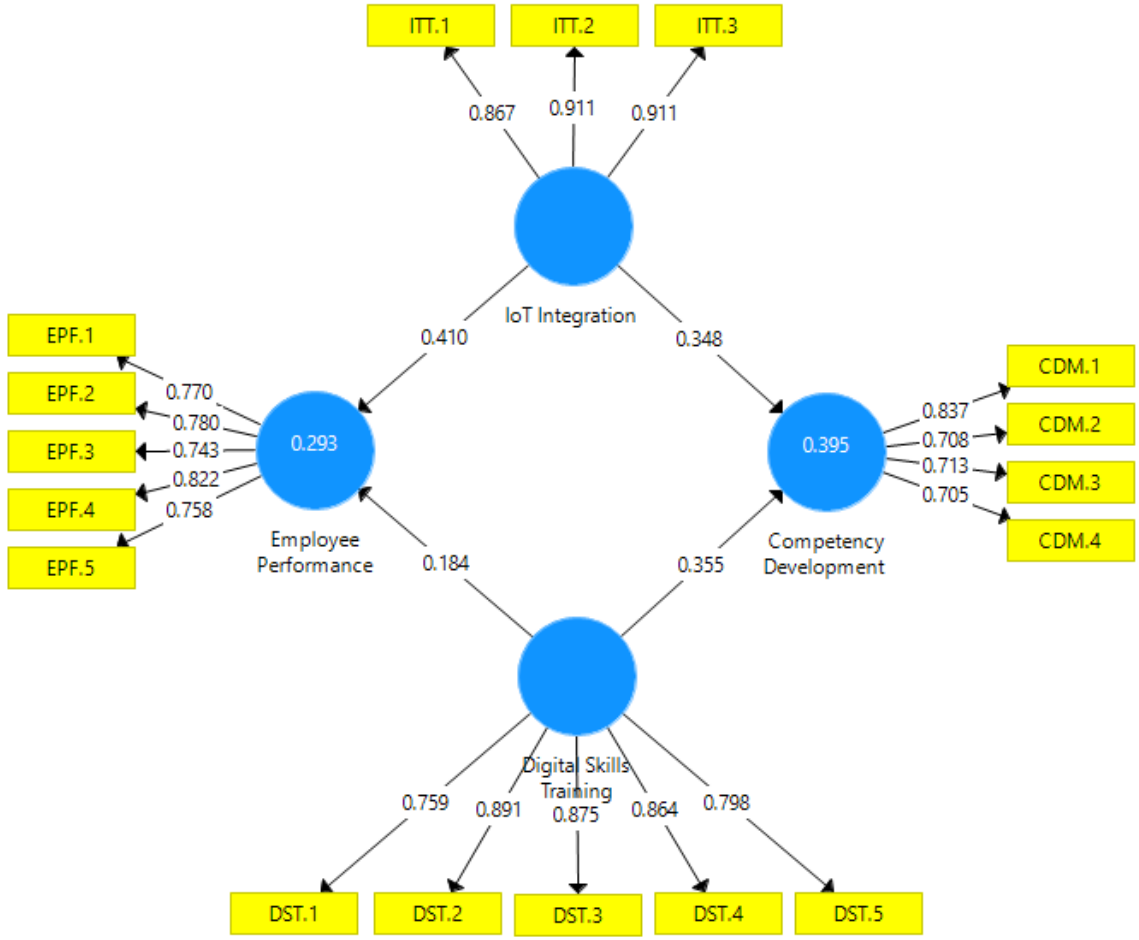

Figure 1. Model Results

Source: Data Processed by Researchers, 2024

4.4 Model Fit

Assessing the model fit is a crucial step in evaluating the adequacy of the structural model. The model fit indices provide insights into how well the proposed model represents the observed data. The following indices were used to assess the model fit: Standardized Root Mean Square Residual (SRMR), d_ULS (Unweighted Least Squares), d_G (Geodesic Distance), Chi-Square, and Normed Fit Index (NFI). Table 6 presents the fit indices for both the saturated model and the estimated model.

Table 3. Model Fit Results Test

	Saturated Model	Estimated Model
SRMR	0.101	0.134
d_ULS	1.550	2.731
d_G	0.472	0.563
Chi-Square	488.218	550.855
NFI	0.746	0.713

Source: Process Data Analysis (2024)

The Standardized Root Mean Square Residual (SRMR) measures the difference between observed and predicted correlations, with values less than 0.08 indicating a good fit (Hu & Bentler, 1999). In this study, the SRMR value for the saturated model is 0.101 and for the estimated model is 0.134, both exceeding the recommended threshold, suggesting discrepancies between the observed

data and model predictions. The d_ULS (Unweighted Least Squares) and d_G (Geodesic Distance) are fit indices used to assess the discrepancy between empirical and model-implied correlation matrices, with lower values indicating a better fit. For the saturated model, the d_ULS value is 1.550, and for the estimated model, it is 2.731. The d_G value for the saturated model is 0.472, and for the estimated model, it is 0.563, indicating room for improvement in model fit. The Chi-Square test, which assesses the overall fit of the model, shows values of 488.218 for the saturated model and 550.855 for the estimated model, with higher values typically indicating a poor fit. However, Chi-Square is sensitive to sample size, which can affect results. The Normed Fit Index (NFI) measures the proportionate improvement in fit when comparing a proposed model to a null model, with values closer to 1 indicating a better fit. The NFI values for the saturated and estimated models are 0.746 and 0.713, respectively, both below the commonly accepted threshold of 0.90, suggesting the model could be improved for a better fit.

R-Square (R^2) measures the proportion of variance in the dependent variable that is predictable from the independent variables, indicating the explanatory power of the model, with higher R^2 values suggesting that the model explains a significant portion of the variance in the dependent variable. The R^2 value for Competency Development is 0.495, indicating that 49.5% of the variance in Competency Development is explained by IoT integration and digital skills training, suggesting these variables are strong predictors. The R^2 value for Employee Performance is 0.393, indicating that 39.3% of the variance in Employee Performance is explained by Competency Development, IoT integration, and digital skills training, highlighting the importance of these factors. Predictive relevance (Q^2) indicates the model's ability to predict data points not used in model estimation, with a Q^2 value greater than zero indicating predictive relevance. The Q^2 value for Competency Development is 0.488, close to the R^2 value of 0.495, suggesting good predictive relevance for Competency Development, accurately predicting nearly half of the variance based on the independent variables. The Q^2 value for Employee Performance is 0.385, similar to the R^2 value, indicating moderate predictive relevance for Employee Performance, confirming the model's capability of predicting the variance to a reasonable extent.

4.5 Hypothesis Testing

Hypothesis testing is a crucial step in determining the significance and strength of the relationships between the variables in the model. This section presents the results of the hypothesis tests, including the path coefficients (Original Sample), Sample Mean, Standard Deviation, T Statistics, and P Values. Table 9 summarizes the results of the hypothesis testing.

Table 4. Hypothesis Testing

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	T Statistics	P Values
Digital Skills Training -> Competency Development	0.355	0.354	0.071	4.996	0.000
Digital Skills Training -> Employee Performance	0.284	0.282	0.080	3.314	0.002
IoT Integration -> Competency Development	0.348	0.353	0.074	4.718	0.000
IoT Integration -> Employee Performance	0.410	0.417	0.087	4.700	0.000

Source: Process Data Analysis (2024)

The path coefficient for Digital Skills Training to Competency Development is 0.355, with a T statistic of 4.996 and a P value of 0.000, indicating a statistically significant relationship as the T statistic exceeds 1.96 and the P value is less than 0.05. For Digital Skills Training to Employee

Performance, the path coefficient is 0.284, with a T statistic of 3.314 and a P value of 0.002, also indicating a significant relationship and supporting the hypothesis that digital skills training positively affects employee performance. The path coefficient for IoT Integration to Competency Development is 0.348, with a T statistic of 4.718 and a P value of 0.000, confirming a significant relationship and supporting the hypothesis that IoT integration positively impacts competency development. For IoT Integration to Employee Performance, the path coefficient is 0.410, with a T statistic of 4.700 and a P value of 0.000, confirming a significant relationship and supporting the hypothesis that IoT integration positively influences employee performance.

Discussion

The findings from this study provide significant insights into the relationships between IoT integration, digital skills training, competency development, and employee performance in start-up companies in Bogor. The results underscore the importance of technological advancements and continuous training in enhancing employee competencies and overall performance.

IoT Integration and Competency Development

The study confirms that IoT integration has a positive and significant effect on competency development, with a path coefficient of 0.348 and a T statistic of 4.718. This finding aligns with previous research that highlights the role of IoT in providing real-time data and insights that facilitate learning and skill enhancement [4], [19]–[21]. For start-ups, leveraging IoT technologies can significantly improve operational efficiency and innovation capacity. The integration of IoT allows employees to access and analyze data more effectively, leading to the development of critical competencies that are essential for the dynamic and competitive start-up environment.

Digital Skills Training and Competency Development

The results also indicate that digital skills training has a positive and significant effect on competency development, with a path coefficient of 0.355 and a T statistic of 4.996. This supports the hypothesis that continuous and comprehensive digital skills training programs are crucial for equipping employees with the necessary skills to navigate and utilize advanced technologies [12], [15]. In the context of start-ups, where rapid technological changes are common, investing in digital skills training ensures that employees remain competent and adaptable. This fosters a culture of continuous improvement and innovation, which is vital for maintaining a competitive edge.

IoT Integration and Employee Performance

The study also shows that IoT integration directly influences employee performance positively, with a path coefficient of 0.410 and a T statistic of 4.700. This significant relationship suggests that IoT technologies enhance employees' ability to perform by providing tools that improve efficiency and enable data-driven decision-making [4], [19]–[21]. Start-ups that successfully integrate IoT can streamline their processes, reduce operational costs, and enhance overall productivity, leading to better performance outcomes.

Digital Skills Training and Employee Performance

Similarly, digital skills training was found to positively impact employee performance, with a path coefficient of 0.284 and a T statistic of 3.314. This finding supports the view that employees who receive regular and effective digital skills training are better equipped to utilize digital tools and technologies, leading to enhanced performance [15], [24]–[27]. For start-ups, investing in digital skills training is essential for maintaining a workforce that can effectively respond to technological advancements and contribute to organizational goals.

Practical Implications

For managers and policymakers in start-ups, the study's findings underscore the need to prioritize IoT integration and digital skills training as strategic investments. By focusing on these areas, start-ups can foster a highly skilled and competent workforce capable of driving innovation and achieving superior performance. This, in turn, can enhance the overall competitiveness and sustainability of start-up companies in Bogor.

Limitations and Future Research

While the study provides valuable insights, it also has some limitations. The cross-sectional design of the study limits the ability to draw causal inferences. Future research could employ longitudinal designs to examine the long-term effects of IoT integration and digital skills training on competency development and employee performance. Additionally, exploring other contextual factors, such as organizational culture and leadership, could provide a more comprehensive understanding of the factors influencing employee performance in start-ups.

CONCLUSION

This study provides evidence on the critical role of IoT integration and digital skills training in enhancing competency development and employee performance in Bogor start-ups. The findings confirm that both significantly contribute to competency development, which positively influences performance. The significant impact of IoT integration underscores the importance of advanced technologies in improving operational efficiency and decision-making. The effects of digital skills training emphasize the need for continuous programs to equip employees with necessary skills. For managers and policymakers, prioritizing IoT integration and digital skills training is essential for fostering a skilled workforce and achieving a competitive advantage. However, the cross-sectional design limits causal inferences, and future research should use longitudinal designs to explore long-term effects. Additionally, examining factors like organizational culture and leadership could provide a more comprehensive understanding of employee performance determinants in start-ups.

REFERENCES

[1] M. Fahim and S. A. Tumpa, *The Importance of IoT: Transforming Industries, Enhancing Lives, and Shaping the Future*. 2023. doi: 10.13140/RG.2.2.14681.08800.

[2] R. Miskiewicz, "Internet of things in marketing: Bibliometric analysis," 2020.

[3] B. A. Moore, "From Startups to Global Enterprises: Exploring the Role of Entrepreneurship, Marketing, Internet of Things, and Artificial Intelligence," 2023.

[4] S. N. M. Aldouri, "Internet of things application in digital marketing to improve the efficacy of a company," *Econ. Ann.*, vol. 204, no. 7–8, pp. 15–20, 2023, doi: 10.21003/ea.V204-02.

[5] L. Prince, S. Marvile, E. C. John, F. Wiljohn, and C. Centeno, "Web-based ordering system for Start-UP business with forecasting," *World J. Adv. Res. Rev.*, vol. 22, no. 3, pp. 357–368, 2024.

[6] D. R. Gurunadha, D. G. A. Naidu, D. M. Hema, and M. C. R. Manda, "IoT Integration In Embedded Systems," 2024.

[7] D. Lakshmi, J. Jeyarani, R. Suguna, P. Muneeshwari, G. M. Valantina, and S. Jayaraman, "Impact of IoT Data Integration on Real-Time Analytics for Smart City Management," in *2024 10th International Conference on Communication and Signal Processing (ICCSP)*, IEEE, 2024, pp. 772–777.

[8] M. M. Aljarrah, F. H. Zawaideh, M. Magableh, H. Al Wahshat, R. R. Mohamed, and K. V Archana, "Internet of Thing (IoT) and Data Analytics with Challenges and Future Applications," in *2023 International Conference on Computer Science and Emerging Technologies (CSET)*, IEEE, 2023, pp. 1–8.

[9] Rushikesh R. Chikane, "Exploring the Integration of Data Analytics and IoT: A Comprehensive Study," *Int. J. Adv. Res. Sci. Commun. Technol.*, pp. 202–203, 2024, doi: 10.48175/ijarsct-16936.

[10] V. Vimal, "Integrating IoT-Based Environmental Monitoring and Data Analytics for Crop-Specific Smart Agriculture Management: A Multivariate Analysis," in *2023 3rd International Conference on Technological Advancements in Computational Sciences (ICTACS)*, IEEE, 2023, pp. 368–373.

[11] Y. V Krasnikova, "Digital technologies in personnel management," *Humanit. Sci. J.*, vol. 1, pp. 77–83, 2020.

[12] O. Karneli, R. Handayati, and S. Rijal, "Enhancement of Soft Skills Competence in Human Resources as a Key Success Factor in the Digital Business Era," *J. Contemp. Adm. Manag.*, vol. 2, no. 1, pp. 319–324, 2024.

[13] A. S. Nurhalima, "Building Competitive Employees in the Digital Era with Competency-Based Training," *Kolok. J.*

Pendidik. Luar Sekol., vol. 11, no. 3, pp. 1029–1034, 2023.
[14] H. R. Nur, "The Competence in the Digital Era in Improving Public Service Performance," *Entrep. J. Bisnis Manaj. dan Kewirausahaan*, vol. 5, no. 1, pp. 61–72, 2024.
[15] S. D. Widodo, "The Role of Digital Transformation in Improving Employee Performance," in *Journal of International Conference Proceedings*, 2024, pp. 109–118.
[16] Y. A. Antouz, I. A. Akour, M. T. Alshurideh, H. M. Alzoubi, and E. K. Alquqa, "The impact of Internet of Things (IoT) and Logistics Activities on Digital Operations," in *2023 International Conference on Business Analytics for Technology and Security (ICBATS)*, IEEE, 2023, pp. 1–5.
[17] S. Ohinok and V. Hunka, "The Impact of Digitalisation on the Efficiency and Competitiveness of an Organisation in the Modern Business Environment," *Економіка розвитку систем*, vol. 5, no. 2, pp. 54–58, 2023.
[18] O. PRICOPOAIA, N. CRISTACHE, D. STOICA, A.-S. CHIHAIA, and S. MURARIU, "Analysis of the Impact of the Phenomenon of Digitization of Organizations – a Bibliometric Approach To the Specialized Literature," no. November, pp. 363–377, 2024, doi: 10.24818/imc/2023/02.14.
[19] M. M. T. dos Santos, "A IoT–Internet of Things-no setor de compras e suprimentos numa empresa de logística: controle de entradas e saídas de suprimentos em almoxarifado," *RCMOS-Revista Científica Multidiscip. O Saber*, vol. 3, no. 1, pp. 1–13, 2023.
[20] S. F. Ahmed, S. Shuravi, S. Afrin, S. J. Rafa, M. Hoque, and A. H. Gandomi, "The Power of Internet of Things (IoT): Connecting the Dots with cloud, edge, and fog computing," *arXiv Prepr. arXiv2309.03420*, 2023.
[21] B. Askaruly and G. Abitova, "Hybrid information systems modeling technology for business process analysis based on the internet of things," *Bull. Shakarim Univ. Tech. Sci.*, pp. 19–28, Sep. 2023, doi: 10.53360/2788-7995-2023-3(11)-2.
[22] A. L. Wulff and A. Juul Lassen, "Capacity for Competence Development: Unlocking Potential for Lifelong Learning in Later Working Life," *J. Aging Soc. Policy*, pp. 1–22, 2024.
[23] M. R. Popang and A. F. Hendarman, "Training Development to Eliminate Competency Gap at Component Rebuild Section (PT LC)".
[24] J. Silalahi and F. A. Safrin, "The Influence of Hard Skills, Soft Skills, and Work Experience on Employee Performance (Study at PT Langkat Nusantara Kepong)," *Indones. J. Adv. Res.*, vol. 3, no. 4, pp. 441–454, 2024.
[25] A. Siswanto, "The Impact of Employee Training, Job Satisfaction, and Organizational Commitment on Employee Performance in the Tech Industry," *Tafkir Interdiscip. J. Islam. Educ.*, vol. 4, no. 3, pp. 473–485, 2023.
[26] A. E. Daulay, H. Harianto, and Z. Asikin, "Improving Employee Performance Effectiveness Strategy In Implementing Hybrid Working At Switching Service Companies," *Eduvest-Journal Univers. Stud.*, vol. 4, no. 5, pp. 4091–4103, 2024.
[27] S. M. Saefi, S. Sakinah, and R. G. Suyatna, "Pengaruh Kerjasama Tim, Komunikasi Dan Disiplin Kerja Terhadap Kinerja Karyawan SMK Muhammadiyah 1 Rumbia Lampung Tengah, Lampung," *J. Bintang Manaj.*, vol. 2, no. 1, pp. 75–84, 2024.