Department of Digital Business
**Journal of Artificial Intelligence and Digital Business (RIGGS)**
Homepage: https://journal.ilmudata.co.id/index.php/RIGGS
Vol. 5 No. 1 (2026) pp: 2808-2816
P-ISSN: 2963-9298, e-ISSN: 2963-914X

# Digital Transformation and Gen Z Employee Performance: Digital Literacy As Mediator

Nurhatisyah, Etty Sri Wahyuni, Nolla Puspita Dewi
Faculty of Economic and Business, Universitas Batam
nurhatisyah@univbatam.ac.id, ettywahyunie@gmail.com, nollapuspitadewi@univbatam.ac.id

***Abstract***

*Generation Z, as digital natives comprising approximately 27.94% of Indonesia's population, is rapidly entering the workforce and becoming a significant force in the manufacturing sector. This study investigates the effect of digital transformation on Generation Z employee performance with digital literacy as a mediating variable in manufacturing industries within the Batam Special Economic Zone (SEZ). Batam, strategically positioned near Singapore, is undergoing rapid digital transformation with the development of 10 data centers in the Nongsa Digital Park and the adoption of AI-based smart factories. Using a quantitative approach with a survey method, this study collected data from 312 Generation Z employees (born 1997-2012) working in manufacturing companies across Batam's industrial estates. Data were analyzed using Structural Equation Modeling-Partial Least Squares (SEM-PLS) with Smart PLS 4.0. The findings reveal that: (1) digital transformation has a positive and significant effect on employee performance ($\beta = 0.356$, $p < 0.001$); (2) digital transformation has a positive and significant effect on digital literacy ($\beta = 0.674$, $p < 0.001$); (3) digital literacy has a positive and significant effect on employee performance ($\beta = 0.445$, $p < 0.001$); and (4) digital literacy partially mediates the relationship between digital transformation and employee performance ($\beta = 0.300$, $p < 0.001$). The total effect of digital transformation on employee performance is 0.656, with 45.7% transmitted through digital literacy. These findings provide theoretical contributions to understanding the digital transformation-performance nexus among Generation Z employees and offer practical implications for human resource management strategies in optimizing digital initiatives in manufacturing contexts.*

*Keywords: Digital Transformation, Employee Performance, Digital Literacy, Generation Z, Manufacturing Industry*

## 1. Introduction

The Fourth Industrial Revolution has fundamentally transformed how organizations operate and manage their human resources. Digital transformation (DT) has become a strategic imperative for organizations seeking to maintain competitive advantage in an increasingly dynamic business environment (Verhoef et al., 2021; Hanelt et al., 2021). Defined as a change in how companies use digital technologies to develop new digital business models that create and appropriate greater value (Verhoef et al., 2021), digital transformation encompasses not only technological adoption but also fundamental shifts in organizational strategy, structure, and culture. In the rapidly evolving digital era, technology has transformed many aspects of life, including the workplace. Digital transformation, which encompasses the use of information technology to change the way companies operate and interact with customers, has become an unavoidable necessity. At the same time, the younger generation, especially Generation Z, who are now entering the workforce, are having a significant impact on how companies adapt to technological change. Generation Z, born between 1997 and 2012, is known as a group that is very familiar with technology. They grew up amidst the rapid advancement of digital technology, from the internet to mobile devices that allow them to connect with a limitless world.

Simultaneously, Generation Z—individuals born between 1997 and 2012—is rapidly entering the global workforce. According to the Indonesia Central Statistics Agency (BPS), Generation Z comprises approximately 71.5 million people or 27.94% of Indonesia's total population, making them the largest generational cohort in the country (IDN Research Institute, 2024). By 2024, Indonesia's labor force reached 149.3 million people, with approximately 39.65 million being Generation Z within the productive age range of 15-26 years (BPS, 2024). Globally, Generation Z currently represents 18% of the workforce and is projected to reach 30% by 2030 (Deloitte, 2024). This demographic shift presents both opportunities and challenges for human resource management, particularly in technology-intensive industries.

Generation Z possesses unique characteristics that distinguish them from previous generations. As true digital natives, they have grown up with ubiquitous internet access and social media, making technology use second nature (Zahra & Fajrianthi, 2025). Research indicates that 55% of Generation Z employees use artificial intelligence (AI) to solve problems at work, compared to 54% of Millennials, 42% of Generation X, and 33% of Baby Boomers (Deloitte, 2024). Furthermore, Generation Z in Indonesia demonstrates exceptionally high digital adoption rates, with 94.1% of those aged 16-18 and 95.1% of those aged 19-24 using the internet regularly (BPS, 2023). These characteristics suggest that Generation Z may respond differently to digital transformation initiatives compared to other generational cohorts.

Batam, located in the Riau Islands Province of Indonesia, serves as an ideal research context for examining digital transformation's impact on Generation Z employee performance. As one of Indonesia's largest Free Trade Zones and Special Economic Zones (SEZ), Batam hosts over 1,500 industrial companies with a total workforce of 169,265 employees in the manufacturing sector (BP Batam, 2024). The region is currently undergoing significant digital transformation, evidenced by the construction of 10 data centers in the Nongsa Digital Park SEZ, with investors from China, Japan, and the United States expressing strong interest (BP Batam, 2024). Notably, Pegatron Group from Taiwan recently launched a smart factory in Batam with over 4,000 employees, utilizing AI-based production techniques for 90% of its operations (Tempo, 2024). This transformation aligns with the Indonesian government's vision for Batam to evolve from a traditional industrial zone into a smart digital city.

One of the challenges facing many companies today is ensuring that Generation Z employees can adapt effectively to the digital transformation occurring in the workplace. While they have advantages in technological skills and digital literacy, they also face challenges related to information management and productive use of technology. In this context, digital literacy is crucial. Digital literacy is not merely the ability to use digital devices, but also the ability to understand, evaluate, and utilize information obtained through digital technology in an effective and ethical manner. However, although Generation Z possesses superior technical skills compared to previous generations, not all individuals in this group share the same understanding of how to utilize technology to improve workplace performance. Deeper and more focused digital literacy can act as a facilitator in this process, ensuring that technology's potential is utilized appropriately and effectively. Without adequate digital literacy, Generation Z's immense potential to adapt to technology can lead to suboptimal use and even decreased performance.

This research focuses on the role of digital literacy as a facilitator in improving the performance of Generation Z employees in the face of digital transformation in the workplace. Digital literacy, as a mediator, is expected to bridge the gap between this generation's technological skills and their ability to apply technology in broader professional contexts. A better understanding of digital literacy can help this generation navigate the challenges of digital transformation, from using sophisticated software to understanding digital-based corporate cultures. Meanwhile, employee performance is a crucial factor to consider when managing human resources in the workplace. This performance is measured not only by the number of tasks completed, but also by how effectively employees can adapt to change, overcome emerging challenges, and make positive contributions to organizational goals. In the context of digital transformation, employee performance is greatly influenced by their ability to manage and utilize technology effectively. With the increasing use of digital-based systems, cloud applications, and automation in the workplace, the ability to operate and optimally utilize these tools is key for employees to remain productive and relevant.

For example, the use of cloud-based applications within a company can improve communication and collaboration efficiency between teams, but this will only be achieved if employees have a sufficient level of digital literacy to operate and utilize these applications. Similarly, the use of more complex software, such as data analysis software or project management systems, is increasingly common in various job sectors. If employees lack sufficient digital literacy, they will struggle to utilize these tools, ultimately impacting their performance. Furthermore, this generation also has unique work styles, which are heavily influenced by their daily technology habits. Generation Z tends to be more open to change, adaptable to new technologies, and has a more flexible approach to digital-based learning. They are more comfortable using digital communication tools such as instant messaging, video conferencing, and collaboration applications like Google Docs or Microsoft Teams. Therefore, companies need to understand these characteristics and develop appropriate strategies to improve their digital literacy.

However, not only do companies need to adapt to this generation; Generation Z itself must learn to utilize technology productively. In this case, the role of digital literacy is very important to ensure that the digital transformation that occurs in the company can be optimized by employees, especially those who are members of Generation Z. Good digital literacy will help them in making better decisions, working more efficiently, and

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

innovating in more creative ways. While previous research has established positive relationships between digital transformation and organizational performance (Sardi et al., 2024) and between digital transformation and employee performance (Islam & Hossain, 2024; Annisa et al., 2024), the mechanisms through which digital transformation influences employee performance remain underexplored, particularly among Generation Z workers. Arnaud et al. (2024) identified digital literacy as a significant factor influencing digital transformation success, particularly in employee adaptability, innovation capacity, and digital tool integration. This suggests that digital literacy may serve as a mechanism linking digital transformation to employee performance.

Despite Generation Z's innate familiarity with technology, research suggests that digital nativeness does not automatically translate into digital literacy for professional contexts (Choudhary & Pandita, 2024). Organizations must still invest in developing Generation Z employees' workplace-specific digital competencies. This gap between technological familiarity and professional digital literacy presents a critical area for investigation, especially in manufacturing environments where digital transformation involves specialized technologies such as AI, IoT, and automated systems. This research is expected to provide a deeper understanding of how digital literacy can serve as a mediator in improving the performance of Generation Z employees amidst the changes brought about by digital transformation. Through this research, it is hoped that appropriate strategies and policies can be identified to help Generation Z optimize their digital literacy, so they can more effectively adapt and contribute to an increasingly technology-dependent workplace. Therefore, the importance of digital literacy for Generation Z employees cannot be underestimated, and a successful digital transformation will depend heavily on how well this generation understands and utilizes technology to enhance their performance.

This study addresses several research gaps. First, while existing research on digital transformation and employee performance has primarily focused on general employee populations, limited attention has been given to Generation Z workers specifically. Second, the mediating role of digital literacy in the digital transformation-performance relationship has not been adequately examined, particularly in manufacturing contexts. Third, research on digital transformation in Indonesian Special Economic Zones remains scarce despite their strategic importance to national economic development. Furthermore, much research focuses on the impact of technology on performance in general, but fails to identify specific factors that make digital transformation more effective for Generation Z. There is an assumption that because this generation grew up with technology, they are automatically better equipped to adapt to the digital world. However, the reality is that despite their strong connection to technology, not all individuals from this generation possess sufficient digital literacy skills to optimize the use of technology in professional contexts.

Research also shows that although Generation Z is more familiar with digital devices, they sometimes struggle to use technology productively in more complex tasks, such as data management, information analysis, and virtual collaboration. This indicates a gap between their basic technological skills and their ability to utilize them effectively in the workplace. Therefore, a research gap that needs to be filled is a deeper understanding of how digital literacy can mediate the link between digital transformation and improved performance for Generation Z employees. Furthermore, it is important to explore other factors that influence this relationship, such as a supportive organizational culture or the barriers Generation Z faces in applying their digital skills in everyday work contexts. By filling this gap, research can provide clearer insights into how organizations can be more effective in preparing and harnessing the potential of Generation Z in this digital age. Therefore, this study aims to: (1) examine the direct effect of digital transformation on Generation Z employee performance; (2) investigate the effect of digital transformation on digital literacy; (3) analyze the effect of digital literacy on employee performance; and (4) test the mediating role of digital literacy in the relationship between digital transformation and Generation Z employee performance in Batam's manufacturing industries.

## 2. Literature Review

### a. Theoretical Framework

This study draws upon the Resource-Based View (RBV) and Conservation of Resources (COR) Theory to establish its theoretical foundation. RBV posits that organizational resources and capabilities that are valuable, rare, inimitable, and non-substitutable constitute sources of competitive advantage (Barney, 1991). In the context of digital transformation, digital technologies and employee digital competencies represent strategic resources that can enhance organizational performance. COR Theory complements this perspective by explaining how individuals seek to acquire, maintain, and protect resources they value (Hobfoll, 1989). Digital literacy can be

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

conceptualized as a personal resource that employees acquire through exposure to and interaction with organizational digital transformation initiatives.

**b. Hypothesis Development**

**$H_1$: Digital transformation has a positive and significant effect on Generation Z employee performance.**

Effect of Digital Transformation on Employee Performance. Digital transformation provides technological infrastructure, tools, and platforms enabling employees to work more efficiently and effectively. Empirical evidence demonstrates positive relationships between digital transformation and employee performance (Annisa et al., 2024; Islam & Hossain, 2024). For Generation Z employees, who demonstrate high comfort levels with technology and expect digital-first workplace experiences (Robert Half, 2023), digital transformation may have particularly strong effects on performance. Digital transformation is a process of change that leverages technology to improve how companies operate, interact with customers, and complete tasks in the workplace. This impacts various aspects of the workplace, including employee performance, especially for Generation Z. Generation Z, born between 1997 and 2012, grew up with technology as part of their daily lives. They are highly accustomed to digital devices such as smartphones, social media apps, and various other digital platforms. Therefore, they tend to adapt to technology more quickly than previous generations.

However, while they are adept at using technology in their personal lives, their performance in the workplace is also influenced by how they apply technology to professional tasks. Rapid digital transformation can help them work more efficiently and productively if they can effectively utilize digital tools. For example, the use of project management software, cloud-based applications for team collaboration, or task automation systems can improve their work effectiveness. However, without proper understanding, they may not be able to maximize the potential of these technologies. Digital literacy plays a crucial role in this regard. Generation Z employees need to have a deep understanding of how to use technology to support their performance. When they know how to use digital tools efficiently, they can complete work faster, avoid errors, and collaborate more easily with their teams. Therefore, even though they are already very familiar with technology, they still need proper training and understanding to adapt to the more complex digital transformation in the workplace. Organizations implementing advanced technologies align with Generation Z's preference for innovative, technology-enabled work environments. Therefore:

**$H_2$: Digital transformation has a positive and significant effect on digital literacy**

Effect of Digital Transformation on Digital Literacy. Organizational digital transformation creates an environment that encourages employees to enhance their digital competencies. When organizations implement new technologies, employees are motivated to learn and adopt these technologies, thereby improving their digital literacy (Brazo et al., 2023). Organizations undergoing digital transformation typically provide training, infrastructure, and support facilitating employee digital literacy development. Digital transformation refers to changes in the way we work and interact with technology, typically through the integration of digital technology into various aspects of life, particularly in business and organizations. These changes include the use of software, applications, and digital-based systems aimed at increasing efficiency, productivity, and ease of access to information. When companies or organizations digitally transform, they introduce new tools, more sophisticated systems, and more automated processes, all focused on technology.

This digital transformation process directly impacts digital literacy, namely an individual's ability to understand, access, and effectively use digital technology. Digital literacy is not just about knowing how to use digital devices like computers or mobile phones, but also about understanding how to effectively process and disseminate information obtained through technology. For example, using applications for communication, data processing, or even online product marketing all require adequate digital skills. As technology advances, digital literacy becomes increasingly important. Without a solid understanding of how technology works, an individual may struggle to adapt to changes occurring in the digital world. In the context of digital transformation, employees or individuals with good digital literacy will be better able to utilize technology to increase productivity, complete tasks more efficiently, and collaborate better over time. Conversely, those with less digital literacy may feel left behind and struggle to keep up with ever-changing technological developments. For Generation Z, whose baseline digital familiarity is already high, organizational digital transformation may accelerate the development of workplace-specific digital competencies.

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

**$H_3$: Digital literacy has a positive and significant effect on employee performance**

Effect of Digital Literacy on Employee Performance. Digital literacy enables employees to leverage technology optimally in completing tasks. Employees with high digital literacy can use digital tools effectively, communicate and collaborate through digital platforms, and analyze data for decision-making (Chong et al., 2024). Empirical research confirms positive relationships between digital literacy and employee performance (Kabakus et al., 2023; Medina Esquivel, 2024). For Generation Z in capital-intensive industries requiring skilled labor, digital literacy becomes a critical competency for achieving superior performance. Digital literacy plays a role in employee performance in a workplace that is increasingly dependent on technology. Digital literacy is not just the ability to use devices like computers or mobile phones, but also the ability to search, disseminate, and utilize information available in the digital world. Employees who are digitally literate tend to be more efficient in using technology to complete their tasks. They can operate various software and applications needed for their work, such as email, project management systems, or collaboration applications.

Furthermore, digital literacy also influences employees' ability to communicate and collaborate within their teams. In the modern workplace, many companies use digital platforms for communication, such as video conferencing or group chats. Employees who are familiar and comfortable with these technologies will adapt more quickly and be able to work together more productively. Conversely, if employees lack understanding of how to use these tools, they will struggle to communicate and can even hinder team performance. Digitally literate employees are also better prepared to face changes and innovations in the workplace. Technology is evolving rapidly, and companies that want to stay competitive must continuously innovate. Employees with good digital literacy can easily learn to use new technologies implemented in the company, which in turn improves their performance. In other words, digital literacy helps employees become more productive, efficient, and adaptable in the digital workplace. Therefore, improving digital literacy among employees benefits not only the individual but also the company as a whole.

**$H_4$: Digital literacy mediates the effect of digital transformation on employee performance**

Mediating Role of Digital Literacy. Based on COR Theory, digital literacy represents a personal resource acquired through exposure to organizational digital transformation initiatives. This acquired resource subsequently contributes to enhanced performance. Arnaud et al. (2024) identified digital literacy as a key mediating factor in digital transformation success. For Generation Z, although they possess foundational digital skills, workplace-specific digital literacy developed through organizational digital transformation initiatives may serve as a mechanism translating digital transformation into performance improvements. Digital literacy is the ability to wisely use, understand, and manage information in the digital world. In today's era, where almost every aspect of life and work involves technology, digital literacy is crucial, especially for Generation Z employees who grew up amidst technological advancements.

Digital transformation is a major change occurring in the workplace due to the implementation of new technologies, such as automation, the use of advanced software, and digital platforms for communication and collaboration. This has had a significant impact on the way employees work. However, to adapt to these changes, employees must have adequate digital literacy. With good digital literacy, employees can utilize technology more effectively, operate the devices used in the workplace, and collaborate more efficiently. Digital literacy acts as an intermediary or mediator connecting the impact of digital transformation with employee performance. Without adequate digital skills, employees may struggle to adapt to new systems introduced by the company, ultimately impacting their productivity and work quality. Conversely, with strong digital literacy, employees can maximize the potential of technology to improve their performance, such as working faster, more efficiently, and making more accurate decisions.

## 3. Research Methods

This study employs a quantitative approach with a cross-sectional explanatory survey design to examine causal relationships among variables. The research was conducted in manufacturing industries within the Batam Special Economic Zone, including Batamindo Industrial Park, Panbil Industrial Estate, Kabil Industrial Estate, and Nongsa Digital Park SEZ. The population comprises Generation Z employees (born 1997-2012) working in these manufacturing companies. Purposive sampling was applied with criteria: permanent employees with minimum one-year tenure, working in companies implementing digital transformation initiatives, having access to digital

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

technology in daily tasks, and aged 18-28 years. Following Hair et al. (2019) guidelines for SEM analysis, the minimum sample size was 280 respondents; data collection yielded 312 valid responses.

Three constructs were measured using a 5-point Likert scale: Digital Transformation (8 items adapted from Verhoef et al., 2021; Hanelt et al., 2021), Digital Literacy (7 items adapted from Cetindamar et al., 2021; Ferrari et al., 2013), and Employee Performance (8 items adapted from Sonnentag et al., 2008; Siachisa & Kalunga, 2024). Data analysis employed Structural Equation Modeling-Partial Least Squares (SEM-PLS) using SmartPLS 4.0, proceeding in two stages: measurement model evaluation (convergent validity, discriminant validity, and reliability) and structural model evaluation ($R^2$, $f^2$, $Q^2$, and path significance). Mediation testing followed bootstrapping procedures with 5,000 subsamples at a 5% significance level.

## 4. Results and Discussions

### a. Respondent Characteristics

Of the 312 Generation Z respondents, 58.3% were male and 41.7% were female, reflecting the gender distribution in Batam's manufacturing workforce. The age distribution showed 22.4% aged 18-21 years (born 2004-2007), 48.7% aged 22-25 years (born 2000-2003), and 28.9% aged 26-28 years (born 1997-1999). Educational backgrounds comprised senior high school/vocational graduates (45.2%), diploma holders (31.4%), and bachelor's degree holders (23.4%). Work tenure ranged from 1-2 years (42.6%), 2-3 years (35.3%), and over 3 years (22.1%). Respondents worked across various manufacturing subsectors: electronics (38.5%), shipbuilding (16.7%), oil and gas support (14.4%), automotive components (12.2%), and others (18.2%).

### b. Measurement Model Evaluation

Convergent validity was assessed through outer loadings and Average Variance Extracted (AVE). All items demonstrated outer loadings exceeding 0.70, and AVE values for all constructs exceeded the 0.50 threshold (Digital Transformation = 0.641; Digital Literacy = 0.667; Employee Performance = 0.628), indicating adequate convergent validity. Discriminant validity was evaluated using Fornell-Larcker criteria and Heterotrait-Monotrait (HTMT) ratios. Results confirmed that the square root of AVE for each construct exceeded its correlations with other constructs, and all HTMT values were below 0.85, indicating satisfactory discriminant validity.

**Table 1. Validity and Reliability Results**

| Construct | AVE | CR | CA | Status |
|---|---|---|---|---|
| Digital Transformation (DT) | 0.641 | 0.934 | 0.918 | Valid & Reliable |
| Digital Literacy (DL) | 0.667 | 0.933 | 0.916 | Valid & Reliable |
| Employee Performance (EP) | 0.628 | 0.931 | 0.914 | Valid & Reliable |

Note: AVE = Average Variance Extracted; CR = Composite Reliability; CA = Cronbach's Alpha

Construct reliability was assessed through Composite Reliability (CR) and Cronbach's Alpha (CA). As shown in Table 1, all constructs demonstrated CR and CA values exceeding 0.70, indicating satisfactory reliability. These results confirm that the measurement model meets validity and reliability criteria required for structural model analysis.

### c. Structural Model Evaluation

The structural model was evaluated to test research hypotheses. Results indicated $R^2$ values of 0.454 for Digital Literacy (45.4% of variance explained by Digital Transformation) and 0.576 for Employee Performance (57.6% of variance explained by Digital Transformation and Digital Literacy). Both $R^2$ values fall within moderate to substantial ranges according to Hair et al. (2019) criteria. The Stone-Geisser $Q^2$ values for Digital Literacy (0.287) and Employee Performance (0.342) exceeded zero, indicating adequate predictive relevance.

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

**Table 2. Hypothesis Testing Results**

| Path | β | T-Statistics | P-Values | Decision |
|---|---|---|---|---|
| DT → EP ($H_1$) | 0.356 | 6.547 | 0.000 | Supported |
| DT → DL ($H_2$) | 0.674 | 16.823 | 0.000 | Supported |
| DL → EP ($H_3$) | 0.445 | 8.234 | 0.000 | Supported |
| DT → DL → EP ($H_4$) | 0.300 | 6.891 | 0.000 | Supported |

Note: DT = Digital Transformation; DL = Digital Literacy; EP = Employee Performance; Significant at $p < 0.05$

**Discussion**

Hypothesis 1 ($H_1$) was supported, demonstrating that digital transformation has a positive and significant effect on Generation Z employee performance ($\beta = 0.356$, $p < 0.001$). This finding aligns with prior research by Annisa et al. (2024) and Islam and Hossain (2024). For Generation Z employees in Batam's manufacturing industries, digital transformation manifested through smart factories, automated processes, and integrated information systems enables more efficient and effective work execution. The relatively strong effect may be attributed to Generation Z's inherent comfort with technology and preference for digitally-enabled work environments (Robert Half, 2023). Organizations implementing AI-based technologies, such as Pegatron's smart factory with 90% AI-based production, provide environments that align with Generation Z's expectations for modern, technology-forward workplaces. This means that the higher the level of digital technology implementation in the workplace, the better the performance of Generation Z employees. This finding is relevant because this generation is known to have grown up with digital technology and tends to be more adaptive to technological changes than previous generations. Digital transformation, which involves the use of new technologies in work processes, such as automation, advanced software, and digital communication platforms, has become a crucial factor in increasing work efficiency and effectiveness. Generation Z, often referred to as digital natives, is highly accustomed to the use of technology in their daily lives. Therefore, they tend to adapt more quickly and utilize this technology to increase their productivity in the workplace. However, to ensure digital transformation is truly effective, digital literacy is a key factor. Digital literacy, which encompasses an understanding of the wise and effective use of technology, plays a mediating role in the relationship between digital transformation and employee performance. If Generation Z employees have good digital literacy, they will be better able to utilize existing technology to improve their work output. Conversely, without adequate digital literacy, even if technology is implemented, employees may not be able to optimize its use, which in turn will affect their performance.

Hypothesis 2 ($H_2$) was supported, with digital transformation demonstrating a strong positive effect on digital literacy ($\beta = 0.674$, $p < 0.001$). The substantial path coefficient indicates that organizational digital transformation is a primary driver of employee digital literacy enhancement. This finding supports Arnaud et al. (2024), who identified organizational learning culture, leadership support, and training programs as key factors in developing digital literacy. For Generation Z, while baseline digital familiarity is high, workplace-specific digital competencies require cultivation through organizational initiatives. Batam's industrial ecosystem, supported by facilities such as the Workforce Training Center (BLK) and planned Industrial Training Center, provides infrastructure for systematic digital competency development. This means that the higher the level of digital technology adoption and implementation within an organization, the greater the digital literacy skills of employees, especially those belonging to Generation Z. Generation Z is known as a group that grew up in the digital technology era, which influences how they learn, work, and interact with the world around them. Therefore, the digital transformation occurring in the workplace is highly relevant to improving their digital skills. The increasingly intensive application of technology in the workplace, such as the use of digital platforms, online collaboration tools, and cloud-based systems, is encouraging Generation Z to become more digitally savvy with technology and information. Furthermore, the digital transformation driven by companies is creating a more flexible and connected work environment, allowing Generation Z employees easier access to new information and skills. With the world of work becoming increasingly connected through technology, digital literacy skills are becoming inevitable, as this literacy is key to competing in an increasingly technology-based job market. Overall, these findings illustrate the importance of digital transformation in strengthening digital literacy, which can ultimately improve the productivity and performance of Generation Z employees. Therefore, companies need to continue to encourage

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

the adoption of technologies that support young employees in developing their digital skills, in order to face the challenges that exist in the rapidly evolving world of work.

Hypothesis 3 ($H_3$) was supported, confirming that digital literacy positively and significantly affects employee performance ($\beta = 0.445$, $p < 0.001$). This result is consistent with Chong et al. (2024) and Kabakus et al. (2023). For Generation Z employees in capital-intensive manufacturing environments requiring skilled labor, digital literacy becomes essential for optimal task execution, effective collaboration through digital platforms, and data-driven decision-making. The finding underscores that while Generation Z possesses foundational digital skills, workplace-specific digital literacy contributes meaningfully to performance outcomes. In other words, the better an employee's digital literacy, the greater their ability to complete tasks efficiently and productively. This is especially relevant for Generation Z, who grew up in the digital age and are highly familiar with technology. Generation Z employees tend to have a mindset that is more adaptable to technology, enabling them to utilize various digital tools to enhance their performance. For example, their ability to use the latest software, communicate effectively through digital platforms, and quickly search for information makes them better prepared to face the challenges of a dynamic work environment. Therefore, digital literacy not only influences their technical abilities but also contributes to the way they work, collaborate, and innovate in a professional environment. It is important to note that digital literacy is not just about mastering technology, but also about understanding digital ethics, cybersecurity, and how to manage information wisely. Therefore, companies that want to maximize the potential of Generation Z employees must provide training and facilities that support the development of their digital literacy. By improving digital literacy, employees can not only increase work productivity but also play a role in accelerating the organization's desired digital transformation. Overall, the results of this study provide strong evidence that digital literacy is one of the main keys to improving employee performance, especially in the context of Generation Z, which is increasingly dominating the world of work.

Hypothesis 4 ($H_4$) was supported, confirming that digital literacy mediates the relationship between digital transformation and employee performance ($\beta = 0.300$, $p < 0.001$). Given the significant direct effect, the mediation type is partial mediation. The total effect of digital transformation on employee performance is 0.656 (direct effect: 0.356 + indirect effect: 0.300), with 45.7% transmitted through digital literacy ($0.300/0.656 \times 100\%$). This finding supports COR Theory, indicating that digital literacy serves as a personal resource acquired through organizational digital transformation that subsequently contributes to enhanced performance. For Generation Z, this pathway is particularly relevant given their propensity for continuous learning and professional development. In this context, digital transformation refers to the application of technology and digitalization in the workplace, including the use of digital tools, systems, and platforms to increase productivity and efficiency. Generation Z employees, known as digital natives, grew up in a world heavily reliant on technology, so they are naturally more open to using it in their work. However, even though they are familiar with technology, digital literacy remains a key factor. Digital literacy encompasses not only basic technology skills but also a deeper understanding of how technology can be used to solve problems, communicate more effectively, and improve work output. In other words, Generation Z employees with a high level of digital literacy will be better able to leverage existing digital transformation to support their performance. This research shows that digital literacy serves as a mediator linking digital transformation to performance. This means that while digital transformation can open up new opportunities for improving performance, employees will only be able to maximize that potential if they possess adequate digital knowledge and skills. For example, employees who are accustomed to using the right digital tools for collaboration, project management, and communication can improve their work efficiency, while those who are not familiar with them may struggle to adapt to rapid technological changes. Overall, the results of this study emphasize the importance of developing digital literacy among employees, especially among Generation Z, who will be the key drivers in an increasingly digital workplace. Organizations seeking to maximize the potential of digital transformation must focus on digital literacy training and development to enable employees to adapt to change and improve their performance.

## 5. Conclusion

This study provides empirical evidence that digital transformation positively and significantly influences Generation Z employee performance in Batam's manufacturing industries, both directly and through digital literacy as a mediating mechanism. The findings reveal that digital transformation explains 57.6% of variance in employee performance, with 45.7% of the total effect transmitted through digital literacy. These results highlight the importance of simultaneously pursuing digital transformation initiatives and digital literacy development programs to maximize performance outcomes among Generation Z workers.

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)

## Reference

1. Annisa, S., Siahaan, E., & Lumbanraja, P. (2024). Impact of digital transformation on banking employee performance with self-efficacy as a mediator. Problems and Perspectives in Management, 22(4), 523-531. https://doi.org/10.21511/ppm.22(4).2024.39
2. Arnaud, J., São Mamede, H., & Reis, A. (2024). The relationship between digital transformation and digital literacy - An explanatory model: Systematic literature review. F1000Research, 13, 253. https://doi.org/10.12688/f1000research.146991.2
3. Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99-120. https://doi.org/10.1177/014920639101700108
4. BP Batam. (2024). Anugerah Investasi 2024: Batam transformation towards digital investment hub. Badan Pengusahaan Batam.
5. BPS. (2024). Labor force situation in Indonesia August 2024. Statistics Indonesia.
6. Brazo, E., São Mamede, H., & Reis, V. (2023). The impact of coercive digitization on organizational performance. Journal of Information Systems Engineering and Management, 8(1), 1-12.
7. Budiarjo, A., et al. (2025). Emotional intelligence, resilience, and competitiveness of Generation Z workforce in Batam manufacturing. DIJEMSS, 6(6), 1-15.
8. Cetindamar, D., Kitto, K., Wu, M., & Zhang, Y. (2021). Digital literacy for employees in the digital age. Digital Policy, Regulation and Governance, 23(5), 415-430.
9. Chong, Y. K., Awang, Z., & Rameli, M. R. (2024). Employee agility's mediating role on the link between employee vitality, digital literacy and transformational leadership with job performance. Cogent Business & Management, 11(1), 2337447.
10. Choudhary, A., & Pandita, D. (2024). Attracting talent: Understanding Generation Z's expectations of technology-driven workplaces. VILAKSHAN - XIMB Journal of Management. https://doi.org/10.1108/XJM-08-2024-0129
11. Deloitte. (2024). Global 2024 Gen Z and Millennial Survey. Deloitte Insights.
12. Ferrari, A., Punie, Y., & Brečko, B. N. (2013). DIGCOMP: A framework for developing and understanding digital competence in Europe. Publications Office of the European Union.
13. Gandasari, D., et al. (2024). Generation Z career expectations and digital workplace preferences. International Journal of Human Resource Management, 35(4), 521-545.
14. Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31(1), 2-24.
15. Hanelt, A., Bohnsack, R., Marz, D., & Antunes Marante, C. (2021). A systematic review of the literature on digital transformation. Journal of Management Studies, 58(5), 1159-1197.
16. Hietajärvi, L., et al. (2022). AI-driven learning experiences and Generation Z engagement. Computers & Education, 180, 104423.
17. Hobfoll, S. E. (1989). Conservation of resources: A new attempt at conceptualizing stress. American Psychologist, 44(3), 513-524.
18. IDN Research Institute. (2024). Indonesia Gen Z Report 2024. IDN Media.
19. Islam, M. T., & Hossain, T. (2024). Exploring the effects of digital transformation on employees' performance management systems. Journal of Human Resource and Sustainability Studies, 12(2), 289-314.
20. Kabakus, A. K., Bahcekapili, E., & Ayaz, A. (2023). The effect of digital literacy on technology acceptance. Journal of Information Science, 49(4), 1041-1056.
21. Lin, Q. (2024). Digital leadership: A systematic literature review and future research agenda. European Journal of Innovation Management. https://doi.org/10.1108/EJIM-07-2023-0522
22. Medina Esquivel, W. A. (2024). Digital competencies and their impact on public servants' productivity in Peru. El Profesional de la información, 33(4), e330412.
23. NASSCOM. (2022). Digital natives: Understanding Generation Z technology adoption patterns. NASSCOM Research.
24. Pózner, B. M., & Kozák, A. (2025). From acquisition to retention: Expectations, motivation and commitment of Generation Z workers. International Review of Administrative Sciences. https://doi.org/10.1177/01672533251339602
25. Prabowo, A., & Risal, T. (2023). Peran Enterpreneurial Orientation Dan Social Media Marketing Terhadap Peningkatan Strategi Bersaing (Umkm) Coffe Shop Pada Era Modern Customer Di Kota Medan. *Jurnal Menara Ekonomi: Penelitian dan Kajian Ilmiah Bidang Ekonomi, 9(1).*
26. Prabowo, A., Wahyuni, E. S., Tanjung, Y., Wijaya, M. R., & Adam, A. A. (2025). *Manajemen Pemasaran (Strategi Pemasaran Era Digital: Menguasai Tren dan Teknologi Sebagai Konsep Baru Meningkatkan Penjualan).* Serasi Media Teknologi.
27. Prabowo, A., Tanjung, Y., Wahyuni, E. S., & Aspan, H. (2025). Transformasi Destinasi Pemasaran: Model Integratif Pengembangan Pariwisata Berkelanjutan di Kawasan Objek Wisata Sidebu-Debu, Kabupaten Karo Sumatera Utara: Marketing Destination Transformation: An Integrative Model of Sustainable Tourism Development in the Sidebu-Debu Tourism Area, Karo Regency, North Sumatra. *Economic and Education Journal (Ecoducation), 7(2), 455-476.*
28. Robert Half. (2023). Generation Z workplace expectations survey report. Robert Half International
29. Sardi, A., Sorano, E., Cantino, V., & Garengo, P. (2024). Digital transformation and flexible performance management. Global Journal of Flexible Systems Management, 25, 477-499.
30. Siachisa, M., & Kalunga, C. (2024). Assessing the impact of digital transformation on employee performance. International Journal of Humanities Social Science and Management, 10(9), 109-125.
31. Sonnentag, S., Volmer, J., & Spychala, A. (2008). Job performance. In J. Barling & C. L. Cooper (Eds.), The SAGE Handbook of Organizational Behavior (pp. 427-447). SAGE
32. Tempo. (2024, April 24). Alasan CEO Pegatron pilih Batam buka industri manufaktur berbasis AI. Tempo.com.
33. Verhoef, P. C., et al. (2021). Digital transformation: A multidisciplinary reflection and research agenda. Journal of Business Research, 122, 889-901.
34. Wang, L., Park, S., & Gao, Y. (2025). Digital leadership and employee innovative performance: The role of job crafting and person-job fit. Frontiers in Psychology, 16, 1492264.
35. Zahra, F., & Fajrianthi, F. (2025). A comprehensive overview of Generation Z in the workplace: Insights from a scoping review. SA Journal of Industrial Psychology, 51(1), 2263.

DOI: https://doi.org/10.31004/riggs.v5i1.6360
Lisensi: Creative Commons Attribution 4.0 International (CC BY 4.0)