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Healthcare Workforce Performance in the Era of Digital Transformation: The Role of Digital Competence, Technostress, and Employee Engagement

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Abstract

Digital transformation in the healthcare sector requires healthcare workers to possess adequate digital competence and manage technology-related pressures. This study examines the effects of digital competence and technostress on healthcare workforce performance, with employee engagement as a mediating variable. A quantitative associative approach was employed using questionnaire data collected from 184 healthcare workers in hospitals across the DKI Jakarta region. Data were analysed using Structural Equation Modelling–Partial Least Squares (SEM-PLS). The findings reveal that digital competence has a positive and significant effect on employee engagement but does not significantly affect healthcare workforce performance. Technostress does not significantly influence employee engagement, yet it has a positive and significant effect on performance. Employee engagement neither significantly affects performance nor mediates the relationships between digital competence, technostress, and healthcare workforce performance. The model explains 54.3% of the variation in performance. These findings highlight the importance of balancing digital competence enhancement and the management of technology-related pressures to support successful digital transformation and improve healthcare workforce performance.

Keywords: *digital competence; technostress; employee engagement; healthcare workforce performance; digital transformation.*

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INTRODUCTION

Digital transformation has become a strategic agenda in health system reform in various countries, including Indonesia. The utilisation of digital technology not only focuses on improving the efficiency of healthcare services but also promotes data integration, accelerates clinical decision-making, and enhances the quality of hospital services. The Indonesian Government, through the Ministry of Health, has established digital transformation as one of the main pillars of national health transformation through the development of the SATUSEHAT platform, Electronic Medical Records (EMR), interoperability of health information systems, and the digitalisation of hospital service processes. These changes require healthcare workers to adapt to technology-based working environments in order to maintain effective and high-quality healthcare services. The following presents the Health Technology Transformation Roadmap, which illustrates the stages of digital health transformation development in Indonesia based on the Blueprint for

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Digital Health Transformation Strategy 2024 (Ministry of Health of the Republic of Indonesia, 2021).

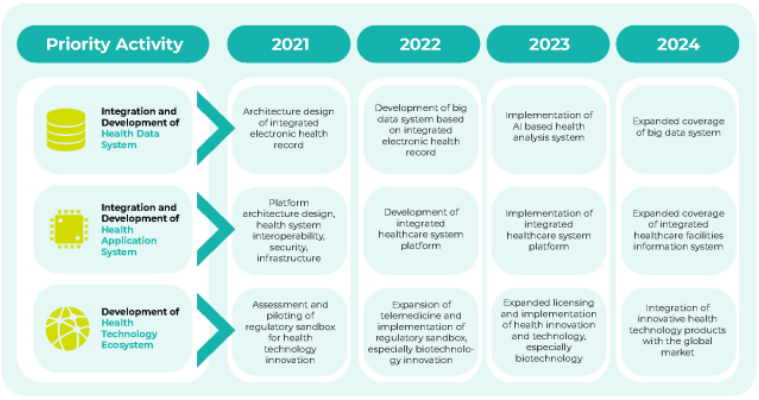

Figure 1. Health Technology Transformation Roadmap

Source: Blueprint for Digital Health Transformation Strategy 2024, Ministry of Health of the Republic of Indonesia

The Health Technology Transformation Roadmap demonstrates that the Indonesian Government has formulated the direction of digital health transformation development in stages, beginning with the establishment of a digital ecosystem, the integration of national health data, the development of healthcare applications, and the governance of digital transformation. This roadmap serves as the foundation for implementing various digital innovations in hospitals, such as SATUSEHAT, Electronic Medical Records (EMR), telemedicine, and health data interoperability. These policies indicate that digital transformation is no longer merely an innovation but has become a strategic necessity that must be implemented by all healthcare facilities. Consequently, healthcare workers are required to possess adequate digital competence in order to operate various digital systems effectively.

The implementation of the health technology transformation roadmap has accelerated the adoption of Electronic Medical Records (EMR) in hospitals across Indonesia. The following presents the percentage of hospitals according to their level of EMR implementation in 2024 as an overview of the development of healthcare digitalisation in Indonesia based on the Indonesia Health Profile 2024 (Ministry of Health of the Republic of Indonesia, 2025).

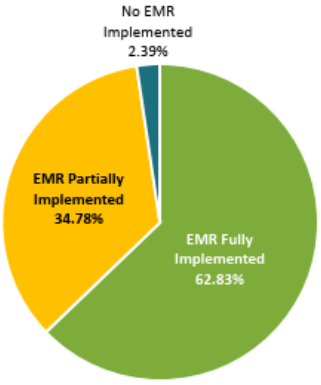

Figure 2. Percentage of Hospitals and Their EMR Implementation 2024

Source: Indonesia Health Profile 2024, Ministry of Health of the Republic of Indonesia

Data from the Ministry of Health indicate that, of the 3,102 hospitals surveyed in 2024, 1,949 hospitals (62.83%) had fully implemented Electronic Medical Records (EMR), 1,079 hospitals (34.78%) had only partially implemented EMR, while 74 hospitals (2.39%) had not implemented EMR at all. These findings indicate that although the implementation of digital transformation in hospitals has progressed considerably, EMR implementation remains uneven across Indonesian hospitals. This variation in EMR implementation reflects differences

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in the level of digital transformation across hospitals and provides an important context for examining how healthcare workers respond to digital technologies, including their digital competence and experiences of technostress.

Digital competence is one of the most important competencies in responding to technological developments and digital transformation across various sectors, including the healthcare sector. Digital competence refers to the knowledge and skills that enable individuals to use information and communication technology (ICT) to achieve professional, social, and personal goals effectively. Within healthcare organisations, digital competence represents the capability required by healthcare workers to utilise various technologies and digital systems in supporting task implementation and decision-making. Anohina-Naumeca & Āboliņa (2023) explain that digital competence encompasses an individual's ability to utilise digital technologies appropriately according to work requirements, thereby improving effectiveness, productivity, and the quality of performance in increasingly digitalised work environments. Therefore, mastery of digital competence is an important factor supporting healthcare workers' readiness to face changes and work demands in the era of digital transformation. Hospital services place increasing importance on digital competence because healthcare workers are required to operate healthcare applications, manage patient data electronically, and utilise digital technologies to enhance service effectiveness and quality.

The implementation of digital technologies in the workplace offers numerous organisational benefits but may also generate psychological pressure for employees required to use these technologies. Technostress arises as a consequence of increasingly intensive and complex digital technology use in work activities. Konovalova (2022) describes technostress as encompassing techno-overload, techno-anxiety, techno-invasion, techno-complexity, and techno-uncertainty. Previous studies have documented the effects of technostress across various sectors, including education, banking, public administration, and business organisations. However, empirical evidence regarding technostress among healthcare workers, particularly in the context of Electronic Medical Record (EMR) implementation in Indonesian hospitals, remains limited. Healthcare workers are required to integrate EMR, hospital information systems, and other digital health platforms into their clinical workflows, potentially increasing technology-related job demands. Understanding how these demands influence healthcare workers is therefore important for supporting successful digital transformation in healthcare organisations.

The success of digital transformation is also influenced by employee engagement as a form of healthcare workers' psychological attachment to their work. Work engagement is a positive and persistent affective-motivational state reflecting individual well-being at work. Hakanen & Kaltiainen (2026) explain that work engagement is characterised by three main dimensions, namely vigour, dedication, and absorption. Vigour reflects high levels of energy and mental resilience at work, dedication refers to strong involvement characterised by enthusiasm, inspiration, and pride in one's work, while absorption describes a condition in which individuals are fully immersed in their work and find it difficult to detach themselves from it. In hospital digital transformation, high levels of employee engagement encourage healthcare workers to become more adaptive to change, more motivated to utilise digital technologies, and better able to maintain optimal performance amidst dynamic working environments. Conversely, low employee engagement may reduce work enthusiasm, diminish organisational commitment, and hinder the effectiveness of digital transformation implementation.

The combination of digital competence, technostress, and employee engagement is believed to influence healthcare workforce performance. Individual performance is a multidimensional concept reflecting various work behaviours that contribute to achieving organisational goals. Hasinat et al. (2024) explain that performance is not only related to completing core job tasks but also encompasses contextual behaviours that support the work environment, adaptability to change, and the ability to avoid counterproductive behaviours

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that may hinder organisational effectiveness. In the context of healthcare services undergoing digital transformation, healthcare workers are required not only to perform service tasks effectively but also to adapt to technological changes, collaborate within dynamic work environments, and maintain work behaviours that support service quality. Therefore, improving digital competence, effectively managing technostress, and maintaining high employee engagement are important factors in supporting healthcare workforce performance and the success of digital transformation in hospitals.

Nevangga et al. (2023) investigated the digital literacy levels of healthcare workers and hospital employees as supporting factors for healthcare digitalisation. The findings revealed that high levels of digital literacy among healthcare workers contribute to the successful implementation of healthcare service digitalisation. These findings indicate that individuals' ability to understand and utilise digital technologies is an important factor in supporting the effectiveness of digital healthcare service delivery.

Bahamondes-Rosado et al. (2023) examined the phenomenon of technostress in the workplace during the accelerated adoption of digital technologies. Their findings revealed that technostress arises from high technological demands, information overload (techno-overload), and the intrusion of technology into working life (techno-invasion). These conditions may lead to techno-fatigue, which can disrupt employee well-being and reduce work performance.

Mishra et al. (2022) examined the importance of employee engagement in improving employee performance in the modern era. Their findings indicated that high work engagement encourages employees to demonstrate positive behaviours, strengthen commitment to organisational goals, and achieve better work performance. These findings confirm that employee engagement is an important factor in supporting both individual and organisational performance.

Longhini et al. (2024) investigated digital health competence and the factors influencing it among healthcare workers. Their findings demonstrated that digital competence is a key element supporting digital transformation in the healthcare sector. In addition, educational level, age, positive professional relationships, and involvement in organisational activities contribute to improving healthcare workers' digital competence. Adequate digital competence enables healthcare workers to adapt more effectively to the use of technology in healthcare services.

Duan et al. (2024) examined the utilisation of digital technologies in improving job performance within digital work environments. Their findings indicated that digital technology utilisation enhances individual performance through improved coordination, communication, knowledge sharing, and decision-making. These findings demonstrate that the ability to utilise digital technologies optimally plays an important role in improving work effectiveness and productivity in the era of digital transformation.

Based on previous studies, digital competence has been shown to be an important factor supporting healthcare workers' ability to utilise digital technologies and improve task effectiveness. Conversely, technostress may lead to techno-fatigue and impaired employee well-being, which may reduce performance. In addition, high levels of employee engagement have been shown to enhance motivation, commitment, and individual performance. These findings indicate that the success of digital transformation in hospitals is determined not only by technological readiness but also by healthcare workers' digital competence, their ability to cope with technology-related pressures, and their level of attachment to the organisation.

The empirical gap can be observed in the acceleration of healthcare digital transformation, marked by the increasing implementation of Electronic Medical Records (EMR), the SATUSEHAT platform, and integrated health information systems in hospitals across Indonesia. Although healthcare digitalisation continues to develop, the uneven implementation of digital transformation among hospitals indicates that the adaptation process to technology-based work systems is still ongoing. This condition requires healthcare workers to possess adequate digital competence, cope with the pressures arising from

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technology use, and maintain organisational attachment in order to sustain service performance. These phenomena indicate that human resources constitute an important factor in the success of hospital digital transformation and require further examination from a human resource management perspective.

The theoretical gap lies not in the absence of studies on digital competence, technostress, and employee engagement, but in the inconsistent empirical findings regarding how these constructs influence employee performance, particularly in healthcare organisations undergoing digital transformation. While previous studies have examined these relationships individually and in combination, empirical evidence explaining how digital competence and technostress jointly influence healthcare workforce performance through employee engagement remains limited, especially in hospital settings within emerging economies.

Building upon these gaps, this study makes three contributions to the literature. First, it extends the literature on digital transformation by examining the relationships among digital competence, technostress, employee engagement, and healthcare workforce performance in Indonesian hospitals, a context that has received relatively limited empirical attention. Second, it extends the application of the Job Demands–Resources (JD-R) framework by conceptualising digital competence as a personal resource and technostress as a technology-related job demand in explaining healthcare workforce performance. Third, it provides empirical evidence regarding the mediating role of employee engagement in the relationships between digital competence, technostress, and healthcare workforce performance, thereby addressing inconsistent findings reported in previous studies. Collectively, these contributions provide a more comprehensive understanding of how digital resources and technology-related job demands interact to shape healthcare workforce performance during hospital digital transformation.

The urgency of this study is based on the increasingly important role of human resource management in supporting the success of hospital digital transformation. Changes in technology-based service systems require hospitals not only to invest in digital infrastructure but also to develop and manage human resources as strategic organisational assets. Healthcare workers' ability to utilise technology, cope with pressures arising from digital change, and maintain strong organisational attachment are critical factors that should be effectively managed to optimise workforce performance and support the continuous improvement of healthcare service quality.

LITERATURE REVIEW

Job Demands-Resources Theory

Job Demands-Resources Theory was proposed by Bakker and Demerouti, who explained that every job possesses characteristics in the form of job demands and job resources that influence individual motivation, well-being, and performance. Job demands refer to aspects of work that require physical and psychological effort and therefore have the potential to generate stress and exhaustion, whereas job resources refer to resources possessed by individuals or organisations that support the achievement of work goals, reduce the negative effects of job demands, and enhance motivation and performance. In work environments undergoing digital transformation, the use of healthcare technologies such as Electronic Medical Records (EMR), hospital information systems, and integrated health platforms may increase job demands and potentially give rise to technostress. Conversely, digital competence and employee engagement can be regarded as resources that enable healthcare workers to adapt to technological changes and maintain optimal performance. Therefore, Job Demands-Resources Theory provides a relevant theoretical foundation for explaining the effects of

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digital competence, technostress, and employee engagement on healthcare workforce performance in the era of hospital digital transformation (Bakker & Demerouti, 2007).

Digital Competence

Digital competence refers to the capability encompassing knowledge, skills, and proficiency in using digital technologies effectively to support the performance of professional tasks. In the context of healthcare services, digital competence has become one of the fundamental competencies that healthcare workers must possess as digital transformation in the healthcare sector continues to increase. This capability reflects the level of healthcare workers' digital literacy in utilising various digital services and technologies employed in healthcare delivery processes. Digital competence is not limited to the ability to operate technologies but also includes the ability to understand, access, and appropriately utilise digital information in professional practice. Therefore, mastery of digital competence is an important aspect supporting healthcare workers' readiness to face technological developments and changes in digitally based healthcare systems (Gurtskoy et al., 2024).

According to the study by Vuorikari et al. (2025), digital competence consists of five main dimensions developed within the Digital Competence Framework for Citizens (DigComp), namely Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Safety, and Problem Solving. Information and Data Literacy refers to an individual's ability to search for, manage, evaluate, and utilise digital information effectively. Communication and Collaboration relate to the ability to communicate, interact, and collaborate through digital technologies. Digital Content Creation reflects the ability to create, develop, and manage digital content according to work requirements. Safety concerns the ability to maintain data security, privacy, and the responsible use of technologies. Meanwhile, Problem Solving refers to the ability to identify, analyse, and resolve problems arising from the use of digital technologies. These five dimensions constitute an important foundation enabling healthcare workers to adapt to digital transformation and support improvements in the quality of healthcare services.

Technostress

Technostress refers to a condition of stress arising from increasing demands associated with the use of digital technologies in the workplace. In an increasingly digitalised healthcare sector, healthcare workers are confronted with various new tasks and demands related to the utilisation of digital technologies in healthcare delivery processes. Such conditions may create pressure when individuals are required to adapt to continuously evolving technology-based systems, applications, and work procedures. Technostress has become an increasingly relevant phenomenon in line with the acceleration of digital transformation in hospitals because it is associated with healthcare workers' ability to cope with technological changes within their work environment. Therefore, technostress is regarded as one of the important factors that should be considered in human resource management within healthcare organisations implementing service digitalisation (Golz et al., 2021).

According to the study by Wang et al. (2020), technostress consists of two main dimensions, namely Abilities-Demands Misfit and Needs-Supplies Misfit. Abilities-Demands Misfit refers to the mismatch between an individual's capabilities and the technological demands that must be fulfilled in the workplace. This condition arises when individuals perceive that their abilities, knowledge, or skills are insufficient to cope with the complexity of the technologies being used. Meanwhile, Needs-Supplies Misfit relates to the mismatch between individual needs and the support or benefits provided by technology. This dimension describes conditions in which the technologies employed are unable to fulfil work requirements optimally, thereby generating discomfort, frustration, and psychological pressure. These two dimensions represent important factors in explaining the level of

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technology-related stress experienced by healthcare workers in responding to digital transformation within healthcare service environments.

Employee Engagement

Employee engagement is a concept describing the level of employees' involvement, commitment, and participation in their work and towards the organisations in which they are employed. Employee engagement reflects the extent to which individuals are willing to exert their best efforts, contribute actively, and demonstrate a willingness to support the achievement of organisational goals. In dynamic modern work environments, employee engagement has become an important aspect because it encourages employees to remain enthusiastic, participate actively, and strive to deliver optimal performance. This concept is regarded as a complex construct because it involves various psychological and behavioural aspects influencing the relationship between individuals and their work. Therefore, employee engagement represents one of the important factors that organisations should consider in their efforts to improve work effectiveness and achieve organisational excellence (Rai & Yadav, 2022).

According to the study by Ababneh et al. (2019), employee engagement consists of four main dimensions, namely Goal Identification, Positive Emotions, Persistence, and Discretionary Effort. Goal Identification refers to individuals' understanding of and alignment with organisational goals, thereby promoting greater involvement in their work. Positive Emotions reflect positive feelings, enthusiasm, and pride towards both work and the employing organisation. Persistence relates to individuals' ability to remain resilient and continue striving to complete their work despite facing various challenges and obstacles. Meanwhile, Discretionary Effort refers to individuals' willingness to exert additional effort beyond formal job requirements in support of organisational success. These four dimensions indicate that employee engagement not only reflects emotional attachment to work but also encompasses cognitive and behavioural aspects that encourage positive contributions to the organisation.

Healthcare Workforce Performance

Healthcare workforce performance refers to the ability of healthcare workers to carry out their duties and responsibilities in delivering healthcare services effectively and efficiently in accordance with organisational objectives. Within healthcare service environments, performance is reflected in healthcare workers' ability to perform service processes, communicate with patients, and complete work in accordance with established standards. In the era of digital transformation, healthcare workforce performance is increasingly influenced by the utilisation of digital technologies to support healthcare service activities. Effective use of digital technologies can improve work efficiency, facilitate communication between healthcare workers and patients, and contribute to enhancing the quality of healthcare services. Therefore, healthcare workforce performance constitutes one of the important indicators for assessing the success of digital transformation implementation within healthcare organisations (Anusi & Mutambara, 2022).

According to the study by Bernales-Turpo et al. (2022), healthcare workforce performance consists of three main dimensions, namely Task Performance, Counterproductive Behaviours, and Context Performance. Task Performance refers to an individual's ability to perform core job tasks effectively in accordance with standards, procedures, and targets established by the organisation. Counterproductive Behaviours describe various behaviours that may hinder the achievement of organisational goals, such as negligence, procedural violations, or actions that have the potential to reduce service quality. Meanwhile, Context Performance relates to voluntary behaviours that support the work environment and organisational effectiveness, such as assisting colleagues, demonstrating initiative, and participating in activities that support the achievement of organisational objectives. These three dimensions indicate that healthcare workforce performance is measured not only by the successful completion of work tasks but also by the ability to

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maintain positive work behaviours and provide additional contributions that support improvements in healthcare service quality and organisational effectiveness.

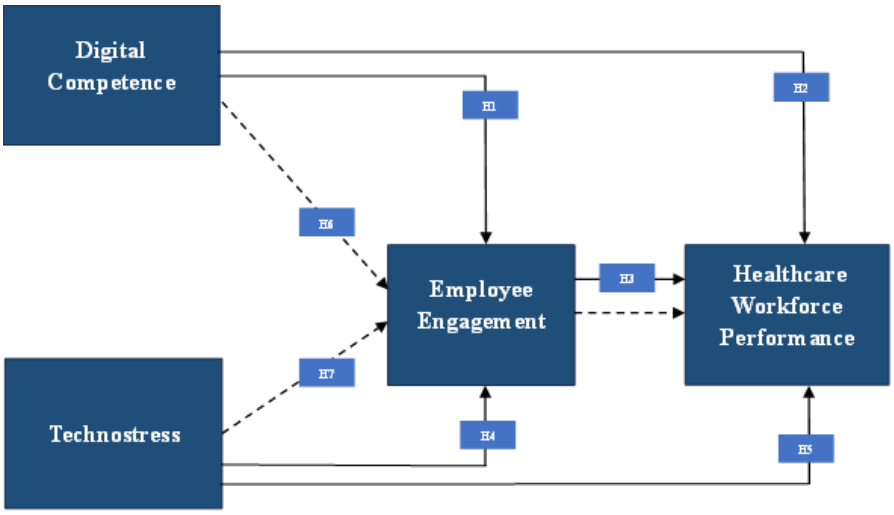

Figure 3. Conceptual Framework

METHODOLOGY

This study employed a quantitative approach with an associative research design to examine the effects of digital competence, technostress, and employee engagement on healthcare workforce performance in hospitals located in the DKI Jakarta region. The quantitative approach was selected because the study focuses on measuring variables in numerical form and objectively testing the relationships among variables using statistical techniques (Sugiyono, 2020). Meanwhile, the associative research design was used to explain the relationships and effects between the independent variables and the dependent variable under investigation (Creswell, 2009).

The data analysis technique employed in this study was Structural Equation Modelling–Partial Least Squares (SEM-PLS). This method was selected because it is capable of analysing relationships among latent variables simultaneously and is appropriate for research models involving several constructs with diverse measurement indicators. In addition, SEM-PLS offers flexibility regarding data characteristics and does not require strict normality assumptions (Hair et al., 2022). Data processing was carried out using SmartPLS software through several stages, namely descriptive analysis, measurement model evaluation (outer model), structural model evaluation (inner model), and hypothesis testing using the bootstrapping procedure. Assessment of the measurement model was conducted through construct validity and reliability tests, whereas the structural model was evaluated using the coefficient of determination (R^2), effect size, predictive relevance (Q^2), and path coefficients among variables.

The data sources used in this study consisted of primary and secondary data. Primary data were obtained directly through the distribution of questionnaires to respondents, whereas secondary data were collected from various supporting sources, including scientific journals, reference books, reports issued by the Ministry of Health of the Republic of Indonesia, and other publications related to digital transformation in the healthcare sector. Primary data collection was conducted using a survey method with a questionnaire instrument developed based on the indicators of each research variable. Respondents' answers were assessed using a five-point Likert scale, ranging from a score of 1 indicating strongly disagree to a score of 5 indicating strongly agree (Sekaran & Bougie, 2016).

The study population comprised all healthcare workers employed in hospitals in the Province of DKI Jakarta. The selection of the study location was based on the position of DKI Jakarta as one of the regions with a relatively high level of healthcare technology

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implementation, making it representative for examining the phenomenon of hospital digital transformation. Sample selection was carried out using purposive sampling, whereby respondents were chosen based on specific characteristics aligned with the objectives of the study. The criteria for respondents included healthcare workers employed in hospitals in DKI Jakarta, those who had utilised hospital digital systems such as Electronic Medical Records (EMR) or hospital information systems in their work activities, and those with at least one year of work experience. The sample size was determined based on recommendations for SEM-PLS, which suggest a minimum number of respondents equivalent to five to ten times the number of indicators used in the research model. Accordingly, the sample size obtained was expected to provide adequate analytical results.

RESULTS AND DISCUSSION

Results

Respondent Profile

A total of 184 respondents participated in this study, all of whom met the criteria as healthcare workers operating in the era of digital transformation. The respondents represented various healthcare professions, thereby providing an overview of healthcare workforce performance within work environments influenced by digital technologies. Most respondents were accustomed to using digital systems in their daily work activities, including health information systems, reporting applications, and digital communication platforms. Data collection was conducted online using structured questionnaires, enabling respondents to assess the variables of Digital Competence, Employee Engagement, Technostress, and Healthcare Workforce Performance.

Outer Model Evaluation Results

The outer model evaluation was conducted using the Structural Equation Modelling–Partial Least Squares (SEM-PLS) approach to assess the validity and reliability of the research constructs. Convergent validity was examined through the Average Variance Extracted (AVE), whereas construct reliability was measured using Cronbach's Alpha and Composite Reliability. In addition, discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) method.

Table 1. Construct Reliability and Validity

Variable	Cronbach's Alpha	Composite Reliability	AVE	Description
Digital Competence	0.954	0.958	0.698	Valid and Reliable
Employee Engagement	0.962	0.968	0.789	Valid and Reliable
Healthcare Workforce Performance	0.953	0.958	0.639	Valid and Reliable
Technostress	0.949	0.957	0.738	Valid and Reliable

Source: processed using SmartPLS

Based on Table 1, all research constructs have Average Variance Extracted values exceeding 0.50. This indicates that each variable explains more than half of the variance of its indicators, thereby satisfying the requirements for convergent validity. Employee Engagement recorded the highest AVE value of 0.789, whereas Healthcare Workforce Performance had the lowest value of 0.639, which nevertheless remained above the required threshold.

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Furthermore, the reliability results indicate that all variables possess excellent internal consistency. The Cronbach's Alpha values of all constructs exceed 0.90, indicating that all indicators consistently measure their respective variables.

Similar results are observed for Composite Reliability, with all values exceeding 0.70. Employee Engagement recorded the highest value of 0.968, while Digital Competence and Healthcare Workforce Performance recorded the lowest value of 0.958.

Discriminant Validity Results (HTMT)

Discriminant validity was assessed using the Heterotrait-Monotrait Ratio (HTMT) method to ensure that each construct was conceptually distinct.

Table 2. Discriminant Validity (HTMT Matrix)

Variable	DC	EE	HWP	TS
Digital Competence	-			
Employee Engagement	0.279	-		
Healthcare Workforce Performance	0.067	0.112	-	
Technostress	0.068	0.104	0.760	-

Source: processed using SmartPLS

The results in Table 2 indicate that all HTMT values are below the maximum threshold of 0.90, demonstrating adequate discriminant validity for all constructs. The relationship between Digital Competence and Employee Engagement yielded a value of 0.279, indicating a low and statistically acceptable association.

Furthermore, the relationships between Digital Competence and Healthcare Workforce Performance and between Digital Competence and Technostress were 0.067 and 0.068, respectively, indicating clear distinctions between these constructs. Likewise, the relationships between Employee Engagement and Healthcare Workforce Performance (0.112) and between Employee Engagement and Technostress (0.104) were relatively low.

The highest HTMT value was observed between Healthcare Workforce Performance and Technostress at 0.760. However, this value remained below the threshold of 0.90 and therefore satisfied the criterion for discriminant validity. Overall, these findings indicate that each construct in the study possesses a distinct conceptual identity without overlapping with other variables.

Inner Model Evaluation Results

The inner model evaluation was conducted to analyse the structural relationships among the research variables and to test the proposed hypotheses. The analysis employed the bootstrapping procedure with a significance level of 5%.

Table 3. Path Coefficient Results (Direct Effect)

Hypothesis	Relationship	Coefficient (β)	t-statistic	p-value	Conclusion
H1	Digital Competence → Employee Engagement	0.349	4.397	0.000	Supported
H2	Digital Competence → Healthcare Workforce Performance	0.021	0.285	0.776	Rejected
H3	Employee Engagement → Healthcare Workforce Performance	-0.045	0.891	0.373	Rejected
H4	Technostress → Employee Engagement	-0.056	0.593	0.553	Rejected

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Hypothesis	Relationship	Coefficient (β)	t-statistic	p-value	Conclusion
H5	Technostress → Healthcare Workforce Performance	0.733	16.414	0.000	Supported

Source: processed using SmartPLS, 2026

Based on Table 3, Digital Competence exerts a positive and significant effect on Employee Engagement, with a coefficient value of 0.349, a t-statistic of 4.397, and a p-value of 0.000. These findings indicate that higher digital competence among healthcare workers enhances their level of engagement with their work. Accordingly, the first hypothesis was supported.

In contrast, Digital Competence does not significantly affect Healthcare Workforce Performance. This is reflected in the coefficient value of 0.021, a t-statistic of 0.285, and a p-value of 0.776. These findings indicate that digital competence alone does not directly improve performance. Therefore, the second hypothesis was rejected.

The results further indicate that Employee Engagement does not significantly influence Healthcare Workforce Performance. The coefficient value was -0.045, with a t-statistic of 0.891 and a p-value of 0.373. These findings suggest that work engagement does not significantly contribute to improving healthcare workforce performance. Consequently, the third hypothesis was rejected.

Furthermore, Technostress does not significantly influence Employee Engagement. This is demonstrated by the coefficient value of -0.056, a t-statistic of 0.593, and a p-value of 0.553. These findings indicate that technology-related pressure has not been proven to affect healthcare workers' engagement with their work. Accordingly, the fourth hypothesis was rejected.

Meanwhile, Technostress was found to have a positive and significant effect on Healthcare Workforce Performance, with a coefficient value of 0.733, a t-statistic of 16.414, and a p-value of 0.000. These results indicate that Technostress is the variable exerting the strongest influence on healthcare workforce performance within the research model. Therefore, the fifth hypothesis was supported.

Table 4. Path Coefficient Results (Indirect Effect)

Hypothesis	Relationship	Coefficient (β)	t-statistic	p-value	Conclusion
H6	Digital Competence → Employee Engagement → Healthcare Workforce Performance	-0.016	0.783	0.434	Rejected
H7	Technostress → Employee Engagement → Healthcare Workforce Performance	0.002	0.364	0.716	Rejected

Source: processed using SmartPLS, 2026

The indirect effect analysis revealed that Employee Engagement does not mediate the relationship between Digital Competence and Healthcare Workforce Performance. This is indicated by a coefficient value of -0.016, a t-statistic of 0.783, and a p-value of 0.434. These results suggest that the influence of Digital Competence on performance does not occur through enhanced Employee Engagement. Therefore, the sixth hypothesis was rejected.

Similarly, Employee Engagement was not found to mediate the relationship between Technostress and Healthcare Workforce Performance. The coefficient value obtained was

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0.002, with a t-statistic of 0.364 and a p-value of 0.716. These findings indicate that the effect of Technostress on healthcare workforce performance does not occur through changes in Employee Engagement. Consequently, the seventh hypothesis was rejected.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) indicates the ability of exogenous variables to explain the variance of endogenous variables within the research model. In this study, Employee Engagement is explained by Digital Competence and Technostress, whereas Healthcare Workforce Performance is explained by Digital Competence, Technostress, and Employee Engagement.

Table 5. Coefficient of Determination (R^2)

Endogenous Variable	R-square	R-square Adjusted
Employee Engagement	0.124	0.114
Healthcare Workforce Performance	0.543	0.535

Source: processed using SmartPLS, 2026

The results indicate that the R^2 value for Employee Engagement is 0.124. This value suggests that Digital Competence and Technostress explain 12.4% of the variance in Employee Engagement, while the remaining 87.6% is explained by factors outside the research model. According to PLS-SEM evaluation criteria, this value is considered weak, indicating that the model's explanatory power regarding healthcare workers' engagement remains limited.

Furthermore, the R^2 value for Healthcare Workforce Performance is 0.543, indicating that Digital Competence, Technostress, and Employee Engagement jointly explain 54.3% of the variance in healthcare workforce performance, while the remaining 45.7% is explained by variables not included in the model. This value falls within the moderate category, indicating that the model possesses satisfactory explanatory capability in explaining changes in healthcare workforce performance in the era of digital transformation.

Overall, the inner model results demonstrate that the research model has adequate explanatory power for Healthcare Workforce Performance, although its ability to explain Employee Engagement remains relatively low. The path analysis also indicates that Technostress exerts the strongest direct effect on Healthcare Workforce Performance, whereas Employee Engagement was not found to function as a mediating variable in the relationships between Digital Competence and Healthcare Workforce Performance or between Technostress and Healthcare Workforce Performance. These findings suggest that changes in healthcare workforce performance in the era of digital transformation are influenced more by factors directly related to technology utilisation than by employees' level of engagement with their work.

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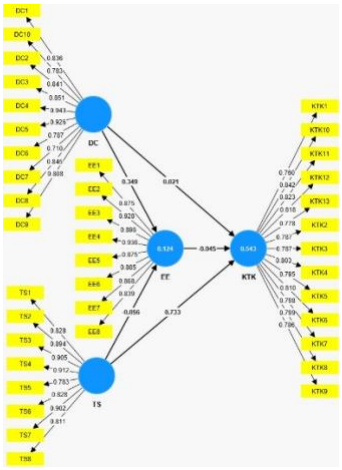

Figure 4. Structural Model Results

Source: processed using SmartPLS, 2026

Discussion

This study demonstrates that Digital Competence has a positive and significant effect on Employee Engagement. These findings indicate that improvements in healthcare workers' ability to utilise digital technologies are able to strengthen their attachment to both their work and the organisation. Mastery of various digital systems helps healthcare workers perform their tasks more effectively, enhances their confidence in carrying out their duties, and facilitates the process of adapting to technological changes within healthcare environments. These conditions encourage the development of a stronger sense of belonging and commitment towards the organisation.

The examination of the relationship between Digital Competence and Healthcare Workforce Performance produced different results. Although the relationship coefficient was positive, the effect was not significant. These findings indicate that digital capability has not yet become the primary factor directly determining improvements in healthcare workforce performance. Performance achievement is still influenced by various other aspects, such as work experience, organisational support, workload, leadership, and the availability of facilities supporting task implementation. The ability to use technology serves as a supporting competence, but it is not sufficient to generate direct improvements in performance.

The relationship between Employee Engagement and Healthcare Workforce Performance also showed insignificant results. High levels of employees' attachment to the organisation are not necessarily accompanied by improvements in work outcomes. Healthcare workers continue to face various operational challenges, including high patient volumes, work pressure, limited resources, and increasingly complex service demands. These conditions mean that the level of employee engagement has not yet been able to make a substantial contribution to improving performance.

The influence of Technostress on Healthcare Workforce Performance was found to be positive and significant. These findings indicate that pressures arising from the use of digital technologies do not always have negative effects. Under certain conditions, technological demands encourage healthcare workers to improve their adaptability, accelerate task completion, and utilise technology more optimally in delivering healthcare services. As long as these pressures remain at manageable levels, they may serve as a driver of improved healthcare workforce performance.

The relationship between Technostress and Employee Engagement did not show a significant effect. Pressures resulting from technological changes have not been shown to affect healthcare workers' level of attachment to the organisation. Employees' commitment to carrying out their duties remains intact despite the need to adapt to continuously evolving digital systems. These findings indicate that employee engagement is influenced more by

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organisational factors, such as leadership, organisational culture, recognition, and institutional support, than by pressures associated with technology use.

The indirect effect analysis revealed that Employee Engagement does not mediate the relationship between Digital Competence and Healthcare Workforce Performance. Although digital capability was found to enhance employee engagement, the resulting increase in engagement did not affect performance. These findings indicate that the relationship between digital competence and performance is not explained through the mechanism of employee engagement.

The mediation analysis also demonstrated that Employee Engagement does not mediate the relationship between Technostress and Healthcare Workforce Performance. Technology-related pressures exert a direct effect on performance without operating through increased employee engagement. The insignificant relationship between Technostress and Employee Engagement resulted in an insignificant mediation pathway. These findings indicate that employee engagement does not yet function as a mechanism explaining the effect of technostress on healthcare workforce performance.

Overall, the findings indicate that healthcare workforce performance in the era of digital transformation is influenced more strongly by Technostress than by Digital Competence or Employee Engagement. Digital competence contributes to strengthening employee engagement but has not yet exerted a direct effect on performance. Meanwhile, Employee Engagement has not functioned as a mediating variable in the relationships between Digital Competence and Healthcare Workforce Performance or between Technostress and Healthcare Workforce Performance. These findings indicate that the success of digital transformation in the healthcare sector requires a balance between enhancing digital competence, managing pressures arising from technology use, and providing organisational support in order to optimise healthcare workforce performance.

CONCLUSION

Based on the research findings and hypothesis testing regarding the effects of Digital Competence and Technostress on Healthcare Workforce Performance with Employee Engagement as a mediating variable, several conclusions can be drawn as follows.

1. Digital Competence has a positive and significant effect on Employee Engagement. These findings indicate that the better healthcare workers are able to utilise digital technologies, the higher their level of attachment to their work and organisation.
2. Digital Competence does not have a significant effect on Healthcare Workforce Performance. These findings indicate that improvements in digital competence have not yet been able to exert a direct influence on performance enhancement because other factors remain more dominant in determining healthcare workforce performance.
3. Technostress does not have a significant effect on Employee Engagement. These findings indicate that pressures arising from the use of digital technologies have not yet been able to influence healthcare workers' level of attachment to the organisation.
4. Technostress has a positive and significant effect on Healthcare Workforce Performance. These findings indicate that technology-related pressures that remain at manageable levels are able to encourage healthcare workers to adapt and improve their effectiveness in completing work tasks.
5. Employee Engagement does not have a significant effect on Healthcare Workforce Performance. These findings indicate that high levels of healthcare workers' attachment to the organisation are not directly followed by improvements in performance.
6. Employee Engagement is unable to mediate the relationship between Digital Competence and Healthcare Workforce Performance. These findings indicate that the influence of digital competence on performance does not occur through increased employee engagement.
7. Employee Engagement is also unable to mediate the relationship between Technostress and Healthcare Workforce Performance. These findings indicate that the effect of technostress

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on performance is more direct and does not occur through increased employee engagement.

Overall, this study demonstrates that Healthcare Workforce Performance in the era of digital transformation is influenced more strongly by Technostress than by Digital Competence or Employee Engagement. Digital Competence has been shown to contribute to improving Employee Engagement, but it has not yet been able to exert a direct effect on performance. Meanwhile, Employee Engagement has not been proven to function as a mediating variable in the relationships between Digital Competence and Healthcare Workforce Performance or between Technostress and Healthcare Workforce Performance. Therefore, healthcare organisations need to enhance healthcare workers' digital competence while effectively managing technology-related pressures so that digital transformation can optimally support performance improvement.

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