

Electronic Medical Records as a Digital Transformation Strategy for Competitive Advantage in Indonesian Private Hospitals

Patricia Rani Rumondang¹

¹Doctor Business Administration Program, The Philippines Women's University, Manila, Philippines

Abstract. Digital transformation has become a strategic imperative for healthcare organizations seeking sustainable competitive advantage. This study examines Electronic Medical Records (EMR) adoption in Indonesian private hospitals, positioning EMR as a strategic digital capability that enhances patient experience through healthcare quality and patient safety. Using a quantitative cross-sectional design, data were collected from 150 patients in hospitals that had implemented EMR systems. Structural Equation Modeling (PLS-SEM) was employed to test the proposed relationships. The findings reveal that EMR significantly improves healthcare quality ($\beta = 0.756$, $p < 0.001$) and patient safety ($\beta = 0.725$, $p < 0.001$), and directly enhances patient experience ($\beta = 0.224$, $p < 0.001$). While healthcare quality does not significantly influence patient experience ($\beta = 0.020$, $p > 0.05$), patient safety demonstrates a strong positive effect ($\beta = 0.739$, $p < 0.001$) and partially mediates the EMR–experience relationship. These results indicate that EMR contributes to competitive advantage primarily through safety enhancement and trust-building rather than operational quality improvements alone. The study positions EMR as a strategic digital infrastructure that strengthens experiential value and supports long-term competitiveness in emerging healthcare markets.

1. Introduction

The healthcare sector is experiencing rapid digital transformation driven by technological advancements, market competition, and rising patient expectations. For private hospitals, digital transformation has become a strategic imperative to enhance operational efficiency, service quality, and long-term competitiveness. Electronic Medical Records (EMR) play a central role in this transformation, evolving beyond clinical documentation into strategic organizational assets that support information accessibility, care coordination, and evidence-based decision-making (Ismail, Khater, & Zaki, 2020; Alkhowaiter et al., 2023).

Despite growing research on the operational and clinical benefits of EMR, its contribution to competitive advantage through patient-centered outcomes remains insufficiently explored. This gap is particularly relevant in emerging healthcare markets such as Indonesia, where private hospitals increasingly compete through service differentiation, patient trust, and organizational reputation. Patient experience represents a critical intangible outcome that influences loyalty, perceived service quality, and

¹ Corresponding author: 2023t1109@pwu.edu.ph

competitive positioning (Nadaraja et al., 2022; Meesala & Paul, 2021).

Drawing on the Resource-Based View (RBV), this study positions EMR as a strategic organizational resource whose value emerges through its integration with healthcare quality and patient safety processes. Under the RBV framework, digital resources can contribute to sustainable competitive advantage when they are valuable, rare, difficult to imitate, and non-substitutable. Previous studies have highlighted the strategic importance of digital capabilities in improving healthcare organizational performance (Boukrami et al., 2022; Tavakoli et al., 2023).

Complementing this perspective, digital transformation theory emphasizes that strategic value arises not merely from technology adoption but from its effective integration into organizational processes. EMR can facilitate patient-centered information flows, real-time data accessibility, clinical coordination, and transparent communication, potentially improving healthcare quality, patient safety, and patient experience (Agarwal et al., 2023; Hsu et al., 2021). These improvements may strengthen patient satisfaction, service personalization, organizational agility, and loyalty, thereby supporting sustainable competitive advantage (Vial, 2019; Singh & Saini, 2024).

Accordingly, this study examines the relationship between EMR implementation and patient experience, focusing on the roles of healthcare quality and patient safety in private hospitals in Indonesia. Using a quantitative cross-sectional design, data were collected from 150 patients through purposive sampling between May and June 2025. Eligible respondents had received care at private hospitals where EMR systems had been implemented for at least one year, ensuring sufficient exposure to evaluate the relevant service dimensions.

2. Theoretical Framework

2.1 Resource- Based View and Digital Competitive Advantage

The Resource-Based View (RBV) posits that sustainable competitive advantage derives from organizational resources that are valuable, rare, inimitable, and non-substitutable (Barney, 1991). In the digital era, competitive advantage increasingly depends not on technology ownership alone but on an organization's ability to integrate digital resources into strategic processes, operational routines, and governance mechanisms (Vial, 2019; Warner & Wäger, 2019). This perspective aligns with digital transformation theory, which emphasizes organizational adaptability, leadership commitment, and capability development as essential mechanisms for translating technological investments into performance outcomes (Teece, 2020).

In healthcare organizations, Electronic Medical Records (EMR) represent a foundational digital capability that facilitates information integration, clinical coordination, and evidence-based decision-making (Agarwal et al., 2010; Kruse et al., 2017). However, the strategic value of EMR depends on its effective integration into clinical workflows and patient-centered service delivery. For Indonesian private hospitals, where service reliability, patient trust, and differentiation matter increasingly, EMR implementation may strengthen competitive positioning by improving healthcare quality and patient safety. Accordingly, EMR is conceptualized as a strategic digital transformation capability rather than merely a

technological infrastructure investment.

2.2. EMR, Healthcare Quality, and Patient Safety

EMR implementation can improve healthcare quality by enhancing documentation accuracy, information accessibility, care coordination, and clinical process efficiency (Campanella et al., 2016; Kruse et al., 2017; Bae et al., 2022). These improvements strengthen organizational processes and support more consistent healthcare delivery. Nevertheless, operational improvements do not necessarily translate directly into positive patient experiences, particularly when patients cannot see their benefits (Bae et al., 2022).

Patient safety provides a complementary mechanism through which EMR capabilities may generate patient-perceived value. Safety-related functionalities, including medication alerts, structured clinical documentation, and clinical decision support, can help prevent errors and reduce risk (Liang et al., 2022; Wu et al., 2023). Unlike internal process efficiency, safety improvements may become meaningful to patients through reliable treatment, effective communication, and visible care coordination (Guo et al., 2023). Consequently, patient safety is proposed as a critical mechanism connecting EMR-enabled operational improvements with patient experience.

2.3 Patient Experience and Digital Competitive Advantage

Patient experience reflects patients' evaluations of healthcare interactions, including perceived reliability, communication, coordination, and safety. From an RBV perspective, positive patient experience is a patient-centered outcome through which strategically integrated digital capabilities may drive organizational differentiation.

Although EMR can strengthen internal healthcare processes, its contribution to patient experience depends on whether these improvements translate into tangible and perceptible benefits. Previous research suggests that safety-related digital functionalities and service transparency are relevant to patients' evaluations of healthcare delivery (Guo et al., 2023; Wu et al., 2023). Thus, healthcare quality and patient safety may represent distinct pathways linking EMR implementation to patient experience, with patient safety potentially playing a particularly important mediating role.

Integrating RBV and digital transformation theory, this study proposes that EMR implementation enhances patient experience by improving healthcare quality and patient safety. Within Indonesian private hospitals, this framework explains how digital transformation capabilities may generate patient-centered value and support competitive differentiation. Importantly, patient experience is treated as a potential indicator of competitive positioning rather than direct evidence of sustained competitive advantage.

3. Results

3.1 Measurement model

Figure 1 The diagram emphasizes that internal process improvements via EMR lead to optimal patient experience only when translated into tangible safety and protective mechanisms.

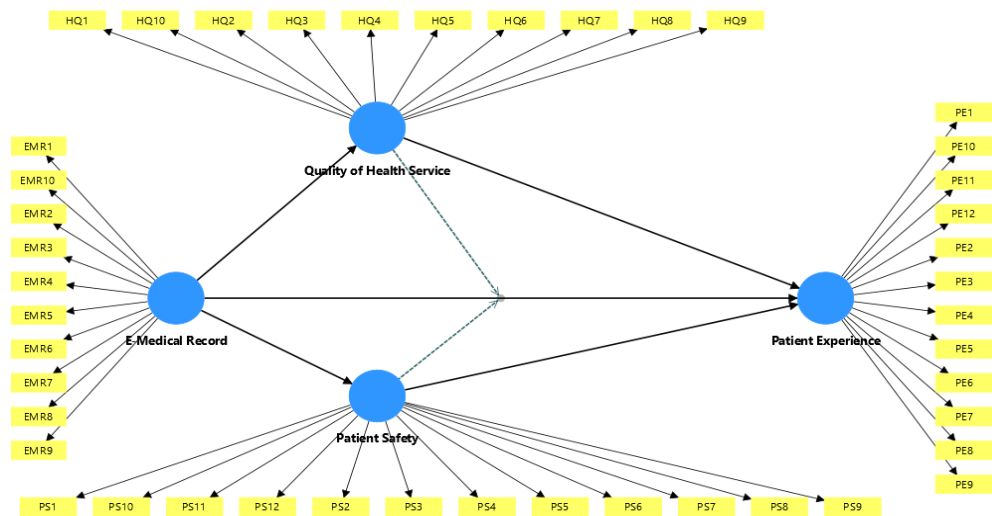


Figure 1. Path Diagram

All indicator outer loadings were above the recommended threshold of 0.70, confirming adequate indicator reliability across all constructs.

Tabel 1. Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	Composite Reliability	AVE
Electronic Medical Records	0.938	0.948	0.647
Healthcare Quality	0.945	0.953	0.669
Patient Experience	0.919	0.940	0.614
Patient Safety	0.957	0.963	0.682

Source: Primary data processed, 2025

Table 1 shows that all Cronbach's Alpha and Composite Reliability values exceed the recommended threshold of 0.70, indicating strong internal consistency. Average Variance Extracted (AVE) values range from 0.614 to 0.682, surpassing the 0.50 criterion and confirming convergent validity across all constructs.

3.2 Discriminant Validity

Tabel 2. Discriminant Validity (Fornell–Larcker Criterion)

Construct	EMR	HQ	PE	PS
Electronic Medical Records	0.804			
Healthcare Quality	0.756	0.818		
Patient Experience	0.785	0.864	0.783	
Patient Safety	0.725	0.902	0.915	0.826

Source: Primary data processed, 2025

Table 2 demonstrates that the square root of AVE (diagonal values) exceeds inter-construct correlations, supporting discriminant validity. Each construct is empirically distinct from the others.

3.3 **Structural Model**

Table 3. Structural Model Results (Direct Effects)

Path	β	t-value	p-value	Result
EMR → Healthcare Quality	0.756	17.915	<0.001	Supported
EMR → Patient Safety	0.725	14.683	<0.001	Supported
EMR → Patient Experience	0.224	3.779	<0.001	Supported
Healthcare Quality → Patient Experience	0.020	0.221	0.825	Not Supported
Patient Safety → Patient Experience	0.739	8.299	<0.001	Supported

Source: Primary data processed, 2025

As shown in Table 3, EMR significantly improves healthcare quality, patient safety, and patient experience. However, healthcare quality does not significantly influence patient experience. In contrast, patient safety demonstrates a strong and significant effect, indicating that safety perceptions are the primary driver of experiential outcomes.

3.4 **Mediation Analysis**

Table 4. Mediation Analysis (Specific Indirect Effects)

Indirect Path	β	t-value	p-value	Mediation
EMR → HQ → PE	0.015	0.217	0.828	Not Significant
EMR → PS → PE	0.536	7.153	<0.001	Partial Mediation

Source: Primary data processed, 2025

Table 4 shows that patient safety significantly mediates the relationship between EMR and patient experience, whereas healthcare quality does not. These findings confirm that EMR enhances patient experience primarily through safety improvement rather than operational quality alone.

3.5 **Coefficient of Determination (R²)**

Tabel 5. Coefficient of Determination (R²)

Endogenous Construct	R ²	Interpretation
Healthcare Quality	0.572	Moderate
Patient Safety	0.526	Moderate
Patient Experience	0.880	Substantial

Source: Primary data processed, 2025

The model explains 57.2% of the variance in healthcare quality, 52.6% in patient safety, and 88.0% in patient experience. The high R² value for patient experience indicates strong explanatory power.

4. Discussion

The findings indicate that EMR adoption significantly improves healthcare quality, patient safety, and patient experience in Indonesian private hospitals. However, the structural relationships reveal important distinctions regarding how these improvements are translated into experiential outcomes. Although EMR significantly strengthens healthcare quality through improved documentation accuracy, coordination, and decision support, healthcare quality does not significantly influence patient experience in this study. This suggests that improvements in internal service processes may remain “back-stage” and are not automatically perceived by patients. From a service design perspective, quality improvements must be translated into patient-visible value (Bae, Lee, & Lee, 2022; Guo, Wang, & Gong, 2023; Balakrishnan et al., 2021). Without effective communication and front-stage integration such as transparent result sharing, clear treatment explanations, and continuity cues patients may not directly associate digitalization with improved care experiences.

In contrast, patient safety plays a critical mediating role in explaining how EMR contributes to patient experience. EMR significantly enhances patient safety through built-in mechanisms such as allergy alerts, medication reconciliation support, and structured documentation that reduce preventable errors, aligning with prior evidence showing that system-generated safety cues contribute to perceived reliability and trust (Hsu et al., 2021; D’Arcy & Devaraj, 2021; Liang, Xue, & Cui, 2022). More importantly, this study finds that patient safety significantly influences patient experience, indicating that patients are particularly sensitive to signals of safety, reliability, and risk reduction rather than technical efficiency improvements alone. The mediation analysis confirms that healthcare quality does not significantly mediate the relationship between EMR utilization and patient experience, whereas patient safety does. This finding clarifies that EMR contributes to experiential outcomes primarily through its impact on safety mechanisms rather than through quality performance alone. In other words, digital infrastructure becomes meaningful to patients when it translates into perceived protection and reliability, which explains why the indirect effect through patient safety was statistically significant while the indirect pathway through healthcare quality was not (Wu et al., 2023; Johnson et al., 2022).

Confirms that healthcare quality does not significantly mediate the relationship between EMR and patient experience, whereas patient safety does. This finding clarifies that EMR contributes to experiential outcomes primarily through its impact on safety rather than through quality performance alone. In other words, digital infrastructure becomes meaningful to patients when it translates into perceived protection and reliability. This explains why the indirect effect through patient safety is statistically significant, while the indirect pathway through healthcare quality is not.

Interestingly, the direct effect of EMR on patient experience remains significant even after including mediators, indicating partial mediation through patient safety. This suggests that patients may also perceive certain direct benefits of EMR, such as faster service, smoother registration, clearer information flow, or more organized care encounters. Prior research shows similar direct experiential benefits when digital tools improve transactional

efficiency and communication clarity (Nguyen et al., 2021; Alami et al., 2022), reinforcing the notion that EMR influences experience both directly and indirectly, although safety enhancement remains the strongest explanatory pathway.

Theoretically, these findings reinforce the Structure–Process–Outcome logic by showing that structural digital investments improve process reliability and safety, which then shape outcome perceptions. However, the results refine this framework by showing that not all process improvements equally shape patient experience. Safety-related processes carry more experiential weight than efficiency or administrative quality improvements (Bleustein et al., 2021; Jha & Topol, 2022), suggesting that patient experience outcomes are more sensitive to reliability and risk-reduction signals embedded in care processes.

Operationally, the results imply that hospitals should prioritize safety-centered digital transformation strategies. EMR investments should focus on strengthening medication safety protocols, allergy verification systems, structured handoffs, and real-time clinical alerts. At the same time, hospitals must ensure that safety mechanisms are well integrated into clinical workflow to prevent alert fatigue and usability barriers that could undermine their effectiveness (Carayon et al., 2021; Fitzpatrick et al., 2022).

Without careful attention to human–system interaction and process fit, safety functions may fail to generate the intended experiential benefits. Finally, this study highlights that digital transformation in healthcare is not merely about technological sophistication but about meaningful risk reduction and trust-building. When EMR systems visibly reinforce patient protection, they become strategic assets that enhance experiential value. Conversely, if digital improvements remain invisible to patients or fail to strengthen safety, their impact on patient experience may be limited, affirming that digital strategy must prioritize patient-centered values over mere backend efficiency gains (Mesko et al., 2021; Fernandes et al., 2023).

These findings contribute to the digital transformation and RBV literature by showing that digital infrastructure alone does not generate competitive advantage unless it is embedded in value-creating processes that stakeholders can perceive. In emerging healthcare markets, where trust and differentiation are critical, patient safety functions as a strategic bridge linking digital capability to experiential outcomes. This refines prior assumptions that quality improvements automatically translate into patient satisfaction, highlighting instead the centrality of risk reduction and reliability in shaping competitive positioning.

5. Conclusion

This study demonstrates that Electronic Medical Records (EMR) represent a strategic digital transformation investment that enhances healthcare quality, patient safety, and patient experience in Indonesian private hospitals. Although EMR significantly improves both healthcare quality and patient safety, only patient safety significantly mediates its effect on patient experience. The findings confirm that EMR influences patient experience both directly and indirectly through patient safety, highlighting the importance of error prevention, information reliability, and continuity of care in strengthening patient trust. These results suggest that improvements in healthcare quality do not necessarily translate

into better patient experiences unless their benefits are directly perceived by patients.

From a strategic perspective, EMR should be managed not merely as an operational technology but as a core organizational capability that supports sustainable competitive advantage. Hospital leaders should integrate EMR into patient safety governance, clinical workflows, and patient-centered service strategies to maximize its value. By prioritizing safety-driven digital transformation and making its benefits visible to patients, private hospitals can translate EMR investments into improved patient experiences, stronger trust, and long-term competitive differentiation.

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