



Human Resources, Work Culture, Leadership, and Infrastructure in Electronic Medical Record Optimization and Employee Performance

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Abstract

Purpose: This study examines whether human resources, organizational work culture, leadership, and infrastructure predict electronic medical record (EMR) optimization and employee performance at Bhayangkara Level III Hospital, Puskid Brimob, Pasuruan, Indonesia.

Research Methodology: A quantitative cross-sectional design involved 67 employees engaged in outpatient EMR operations. Data were collected using a five-point Likert questionnaire based on the Doctor's Office Quality-Information Technology (DOQ-IT) readiness framework. Data analysis included descriptive statistics, validity and reliability testing, multiple regression, and path decomposition.

Results: Human resources, organizational work culture, leadership, and infrastructure significantly predicted EMR optimization, explaining 35.0% of its variance, with leadership showing the strongest contribution. The employee performance model explained 32.0% of the variance, with EMR optimization and leadership remaining significant predictors. Indirect-path estimates indicated that EMR optimization partially transmitted the effects of organizational readiness factors on employee performance, although formal mediation significance was not established.

Conclusions: EMR optimization and employee performance depend on the integration of technical infrastructure, leadership, workforce capability, and organizational culture.

Limitations: The study is limited by its single-hospital setting, cross-sectional design, small census sample, self-reported data, and lack of formal bootstrapped mediation testing.

Contributions: This study integrates organizational readiness factors with EMR optimization and employee performance, highlighting the importance of managing human, cultural, leadership, and technological dimensions in digital health implementation.

Keywords: *Electronic Medical Records, Employee Performance, Hospital Digitalization, Leadership, Organizational Readiness*

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1. Introduction

Electronic Medical Records (EMRs) have become a central component of digital transformation in healthcare because they integrate clinical documentation, administrative processes, and managerial

information within a shared digital environment. Effective EMR implementation can improve information accessibility, documentation continuity, service coordination, and organizational accountability. In Indonesia, the regulatory environment has increasingly encouraged the digitalization of medical records. Minister of Health Regulation No. 24 of 2022 requires healthcare facilities to organize medical records electronically, while Law No. 17 of 2023 positions health information systems as an integral part of broader health-service governance ([Ministry of Health of the Republic of Indonesia, 2022](#); [Republic of Indonesia, 2023](#)). However, regulatory compliance alone does not guarantee effective system utilization. The benefits of EMR implementation depend on how successfully the technology is integrated into routine workflows, supported by users, and managed as a process of organizational change rather than merely as a technological installation.

The implementation of EMRs is therefore not solely a technical issue. It involves a combination of human, organizational, managerial, and infrastructural readiness. Recent evidence indicates that successful EMR implementation is influenced by staff competencies, organizational culture, leadership commitment, workflow alignment, technical infrastructure, communication, and ongoing support. An Indonesian multi-hospital study found that EMR readiness varied according to infrastructure resilience, staff digital competencies, and the maturity of recordkeeping culture ([Hossain et al., 2025](#)). International studies likewise emphasize the importance of leadership sponsorship, user training, interoperability, workflow redesign, and technical assistance in ensuring that digital health systems become embedded in daily practice ([Arabi et al., 2022](#); [Campione & Liu, 2024](#); [Marwaha et al., 2022](#)). Organizational culture is also important because shared values and behavioral norms influence employee attitudes toward digital adoption and their willingness to adapt established work practices ([Jianxun, Arkorful, & Shuliang, 2021](#)).

Human-resource readiness represents one of the most important dimensions of EMR implementation. It extends beyond basic computer literacy and includes the ability to understand clinical documentation processes, navigate electronic systems confidently, manage access rights appropriately, maintain data accuracy, and resolve routine technical or procedural problems. Employees with stronger digital competencies are more likely to use EMR functions consistently and efficiently. Training and technical support should therefore be adapted to differences in professional roles, responsibilities, and levels of experience. Physicians, nurses, pharmacists, administrative staff, managers, and information-technology personnel may have different expectations and challenges regarding usability, safety, workflow compatibility, and system support ([Campione & Liu, 2024](#)). Consequently, human-resource development should be treated as a continuous process rather than a one-time training activity.

Organizational work culture is another critical factor in EMR optimization. Digital transformation requires employees to modify established routines, adopt new documentation practices, and develop greater dependence on shared information systems. A work culture characterized by discipline, openness to change, collaboration, accountability, and continuous learning can facilitate this transition. In contrast, resistance to change, fragmented communication, and inconsistent adherence to digital procedures may reduce the effectiveness of EMR implementation. Organizational culture therefore shapes whether digital systems become fully integrated into everyday work or remain underutilized. This is consistent with evidence showing that institutional pressures and organizational culture influence attitudes toward EHR adoption and implementation behavior ([Jianxun et al., 2021](#)).

Leadership also plays a central role in translating digital health policies into operational practice. Effective leaders provide direction, allocate resources, establish priorities, monitor implementation, address barriers, and reinforce accountability for system use. Leadership commitment is especially important during periods of organizational transition because employees often require clear guidance regarding new responsibilities and workflow expectations. Operational leaders also function as intermediaries between strategic policy and frontline implementation. Their decisions influence staffing, supervision, escalation mechanisms, problem resolution, and the standardization of work procedures. Recent evidence from healthcare settings indicates that leadership readiness and

management support are important dimensions of digital health preparedness ([Steenkamp et al., 2025](#)). Without consistent leadership support, even technically adequate systems may be implemented unevenly across organizational units.

Infrastructure constitutes another essential dimension of organizational readiness. EMR systems depend on reliable hardware, network connectivity, servers, software applications, security mechanisms, interoperability, data storage, and responsive technical support. Weaknesses in any of these components may interrupt workflow and reduce user confidence in the system. For example, slow applications, unstable networks, limited device availability, or delayed technical assistance may encourage employees to return to manual procedures or develop temporary workarounds. Such conditions can reduce efficiency and undermine the intended benefits of digitalization. Infrastructure readiness should therefore be assessed not only in terms of system availability, but also in terms of reliability, accessibility, responsiveness, and integration with clinical and administrative processes.

The relationship between EMR implementation and employee performance is also complex. In principle, digital systems can reduce duplicate documentation, accelerate access to patient information, improve communication across units, and strengthen traceability and accountability. However, digitalization may also change task structures, autonomy, workload, and interdependence among healthcare workers. A before-and-after study found that EHR implementation influenced healthcare workers' perceived job characteristics, even when autonomous motivation remained relatively stable ([Veenstra et al., 2022](#)). These findings suggest that employee performance cannot be assumed to improve simply because an EMR system is available. The more relevant issue is whether the system is optimized and used consistently, efficiently, and effectively in daily work.

In this study, EMR optimization refers to the effective and sustained use of electronic medical record functions across registration, clinical documentation, pharmacy services, information retrieval, reporting, and interunit coordination. Optimization therefore represents more than technical availability; it reflects the degree to which the system has become embedded in organizational routines. When optimization is achieved, EMRs may reduce information-search time, support documentation accuracy, improve coordination, and strengthen service efficiency. From this perspective, organizational readiness factors may influence employee performance indirectly by first improving the quality and consistency of EMR use. This mechanism is important because it helps explain why human resources, work culture, leadership, and infrastructure may not produce performance improvements unless they are translated into optimized system utilization.

Bhayangkara Level III Hospital, Pusdik Brimob, Pasuruan, provides a relevant setting for examining these relationships because the hospital had recently implemented outpatient EMRs and was still adapting its procedures, personnel, workflows, and supporting facilities. The underlying thesis identified several implementation challenges, including differences in staff readiness, workflow adaptation, leadership support, standard operating procedures, system integration, and technical infrastructure. These conditions indicate that EMR implementation at the hospital should be viewed as an organizational transformation process involving multiple dimensions of readiness rather than as a purely technological intervention.

Previous Indonesian studies using the Doctor Office Quality-Information Technology (DOQ-IT) framework have generally focused on assessing readiness levels for EMR implementation. Such studies provide useful diagnostic information regarding technological and organizational preparedness, but fewer have examined how multiple readiness dimensions jointly predict EMR optimization and subsequent employee performance. In addition, limited evidence is available regarding these relationships in newly digitalizing police hospitals, where organizational structure, administrative procedures, and service responsibilities may differ from those of other healthcare institutions. This creates an important research gap concerning the extent to which human resources, organizational culture, leadership, and infrastructure jointly contribute to optimized EMR use and employee performance.

Accordingly, this study examines three main relationships. First, it investigates whether human resources, organizational work culture, leadership, and infrastructure significantly predict EMR optimization. Second, it examines whether these organizational readiness factors and EMR optimization significantly predict employee performance. Third, it evaluates whether the estimated indirect pathways are consistent with EMR optimization functioning as an intervening mechanism between organizational readiness factors and employee performance. The novelty of this study lies in integrating a DOQ-IT-informed readiness framework with employee performance through an EMR optimization construct in the specific context of an Indonesian police hospital. By doing so, the study provides a more comprehensive perspective on how organizational readiness can be translated into meaningful digital-health outcomes.

2. Literature Review and Hypothesis/es Development

2.1 Electronic Medical Records and Organizational Readiness

Electronic Medical Records (EMRs) are digital systems designed to support the recording, storage, retrieval, and exchange of patient information across healthcare activities. Their implementation is intended to improve information accessibility, documentation continuity, coordination among service units, and the efficiency of clinical and administrative processes. However, the effectiveness of EMR implementation depends not only on the availability of technology but also on the readiness of the organization to integrate the system into routine work ([Pai, Ganiga, Pai, & Sinha, 2021](#)). Organizational readiness includes the ability of employees, managers, work systems, and supporting infrastructure to adapt to new digital processes. Therefore, EMR implementation should be understood as an organizational transformation process rather than solely as a technological intervention ([Aldhi, Suhariadi, Rahmawati, Supriharyanti, Hardaningtyas, Sugjarti, & Abbas, 2025](#)).

Organizational readiness is particularly important because healthcare digitalization requires simultaneous changes in employee competencies, workflows, leadership practices, and technical support. Previous studies have shown that EMR implementation outcomes are influenced by leadership support, staff capabilities, organizational culture, communication, interoperability, and infrastructure availability. In the context of this study, readiness is represented by four main dimensions: human resources, organizational work culture, leadership, and infrastructure. These dimensions reflect the capacity of the hospital to adopt, utilize, and sustain EMR functions effectively. When these readiness factors are adequately developed, the organization is more likely to achieve consistent and optimized use of EMR systems ([Oliveira, Santos, Mendes, Barbosa, Oliveira, Valle, & Mattos, 2023](#)).

2.2 Human Resources

Human resources represent a fundamental component of EMR readiness because employees are the primary users who interact directly with digital systems. Human-resource readiness involves knowledge, competence, technical skills, confidence, and the ability to adapt to digital work processes. In healthcare settings, employees are expected not only to operate the system but also to understand documentation standards, access rights, data security, and workflow requirements. Differences in digital capability among professional groups may influence how effectively EMR functions are used in practice. Therefore, employee preparedness is an essential condition for ensuring that digital systems contribute to better service delivery ([Alotaibi, Wilson, & Traynor, 2025](#)).

Training and continuous support play an important role in strengthening human-resource readiness. Employees who receive appropriate training are more likely to understand system functions, reduce input errors, and respond effectively to routine technical problems. Human-resource capability can also increase user confidence and reduce resistance to technological change. In this study, human resources are conceptualized through competence, knowledge, skill, and readiness to use EMR systems. Stronger human-resource capacity is therefore expected to improve EMR optimization and may subsequently support employee performance through more efficient and accurate

work processes ([Vong, Udomvitid, Ueki, Intalar, Pongsathornwiwat, Pannakkong, & Jeenanunta, 2025](#)).

2.3 Organizational Work Culture

Organizational work culture refers to shared values, norms, behaviors, and expectations that influence how employees perform their duties and respond to organizational change. In the context of EMR implementation, work culture determines whether employees are willing to adopt new digital routines, comply with documentation procedures, and collaborate across units. A culture that emphasizes discipline, openness to change, learning, and shared responsibility can support faster adaptation to digital systems. Conversely, resistance to change and inconsistent compliance may reduce the effectiveness of EMR implementation ([Tadesse & Debela, 2024](#)).

The role of organizational culture becomes particularly important because EMR implementation often changes established work habits. Employees may be required to replace paper-based procedures, follow standardized digital workflows, and increase coordination with other service units. These changes require behavioral adaptation in addition to technical competence. In this study, organizational work culture is reflected through discipline, openness to change, and adaptation to digital routines. A supportive work culture is therefore expected to strengthen EMR optimization by creating an environment in which new digital practices become accepted and consistently implemented ([Arabi, Al-Moamary, AlHazme, & Al, 2022](#)).

2.4 Leadership

Leadership is a critical organizational factor in the implementation and optimization of digital health systems. Leaders are responsible for translating strategic policies into operational actions, allocating resources, monitoring implementation, and addressing barriers that arise during system adoption. Effective leadership can strengthen employee commitment by providing clear direction, expectations, and support. In the context of EMR implementation, leadership also influences the extent to which digital procedures are standardized and integrated into routine work ([Makhmut, Setiawan, & Manune, 2025](#)).

Leadership support is particularly important during periods of technological and organizational transition. Employees may encounter uncertainty, workload changes, and technical difficulties when adapting to new systems. Leaders can reduce these challenges by facilitating communication, providing supervision, evaluating performance, and coordinating problem resolution. In this study, leadership includes direction, policy, supervision, evaluation, and commitment. Strong leadership is therefore expected to improve EMR optimization and contribute directly to employee performance by creating clearer work structures and stronger accountability ([Manalu, 2025](#)).

2.5 Infrastructure

Infrastructure refers to the technological and technical resources required to support the operation of EMR systems. These resources include hardware, network connectivity, applications, servers, security systems, data storage, and technical support. Reliable infrastructure is necessary because digital systems depend on continuous access to technology during clinical and administrative activities. Technical disruptions such as slow networks, unavailable devices, or system downtime can reduce user confidence and interrupt service delivery ([Wikansari & Santoso, 2022](#)).

Infrastructure readiness should therefore be assessed not only in terms of the availability of equipment but also in terms of reliability, accessibility, and responsiveness. A technically available system may still fail to support effective work if users experience delays, limited access, or inadequate IT support. In this study, infrastructure includes hardware, network, application, server, security, and technical assistance. Adequate infrastructure is expected to support EMR optimization by reducing operational barriers and enabling employees to use the system consistently and efficiently ([Cucor, Petrov, Kamencay, Pourhashem, & Dado, 2022](#)).

2.6 Electronic Medical Record Optimization

EMR optimization refers to the effective, consistent, and efficient use of electronic medical record functions in everyday healthcare activities. Optimization goes beyond initial system adoption because it reflects the extent to which EMR functions are fully integrated into organizational workflows ([Purniari & Muna, 2024](#)). In this study, EMR optimization includes the effective use of the system for recording, storage, retrieval, reporting, and service coordination. This concept is important because the presence of an EMR system does not automatically guarantee improved organizational performance.

Optimized EMR use can support employees by reducing repetitive work, improving information accessibility, increasing documentation accuracy, and strengthening coordination among service units. It may also improve traceability and accountability by creating more structured and accessible digital records ([Makaranga, Moshi, & Sukums, 2025](#)). Therefore, EMR optimization can serve as a mechanism through which organizational readiness factors are translated into performance outcomes. Human resources, organizational work culture, leadership, and infrastructure may have stronger effects on employee performance when they first contribute to more effective system use.

2.7 Employee Performance

Employee performance refers to the extent to which employees accomplish their work effectively, accurately, responsibly, and within the required time. In healthcare organizations, employee performance is closely related to service quality, timeliness, documentation accuracy, responsibility, and work effectiveness. Digital systems such as EMRs can influence performance by changing how employees access information, document activities, communicate with other units, and complete administrative tasks. However, the effect of digitalization on performance depends on whether the system is used effectively and supported by appropriate organizational conditions ([Nugroho, Pranitasari, & Said, 2026](#)).

In this study, employee performance is measured through quality, timeliness, responsibility, and work effectiveness. These dimensions are particularly relevant in healthcare settings because delays or inaccuracies may directly affect service delivery. EMR optimization is expected to improve performance by facilitating more efficient workflows and reducing information-related barriers. Leadership may also influence performance directly through supervision, coordination, and accountability, while human resources, work culture, and infrastructure may contribute indirectly through their influence on EMR optimization ([Apriani, Oktini, & Aspiranti, 2026](#)).

2.8 Relationship between Organizational Readiness and EMR Optimization

Organizational readiness provides the foundation for successful EMR optimization. Human-resource capability determines whether employees can use the system properly, while organizational culture shapes their willingness to adapt to digital practices. Leadership provides direction and ensures that implementation is aligned with organizational priorities. Infrastructure provides the technical conditions required for uninterrupted system use. These dimensions therefore represent complementary rather than independent elements of readiness ([Melawati, Murliasari, Judijanto, Saefudin, & Rahman, 2026](#)).

The relationship among these factors suggests that EMR optimization is more likely to occur when technical, human, cultural, and managerial conditions are developed simultaneously. Strong infrastructure without competent users may result in underutilization, while skilled employees without adequate leadership or technical support may still experience implementation barriers. Therefore, the effectiveness of EMR implementation depends on the combined configuration of organizational readiness dimensions. This perspective supports the use of an integrated readiness model in evaluating digital transformation within healthcare organizations ([Zabartih & Widhiarso, 2025](#)).

2.9 EMR Optimization and Employee Performance

EMR optimization may contribute to employee performance by improving the efficiency and quality of routine work. When EMR functions are used consistently, employees can access patient information more quickly, reduce duplicate documentation, and coordinate activities across service units more effectively. Improved access to information may also reduce delays and support more accurate decision-making. Therefore, optimized EMR use can create operational conditions that support higher levels of employee performance ([Nugroho, Pranitasari, & Said, 2026](#)).

However, the relationship between EMR use and performance is not automatic. Poorly integrated digital systems may increase workload, create additional documentation requirements, or disrupt established work patterns. For this reason, optimization is a more relevant construct than simple system availability. In this study, EMR optimization is positioned as an intervening mechanism that may transmit the influence of organizational readiness factors to employee performance. This perspective allows the study to evaluate not only whether organizational readiness matters, but also how those factors may contribute to performance through more effective digital-system utilization ([Hairul, Wibisono, & Catrayasa, 2024](#)).

2.10 Conceptual Relationship among Study Variables

The conceptual framework of this study positions human resources, organizational work culture, leadership, and infrastructure as predictors of EMR optimization. These four readiness dimensions are expected to influence the extent to which the system is used effectively and consistently in hospital operations. EMR optimization is subsequently expected to contribute to employee performance by improving work efficiency, documentation quality, coordination, and information accessibility. Leadership is also expected to have a direct relationship with employee performance because managerial direction and supervision influence work organization independently of technological use.

Accordingly, this study examines both direct and indirect relationships among the variables. Human resources, organizational work culture, leadership, and infrastructure are evaluated as predictors of EMR optimization, while the same variables together with EMR optimization are examined as predictors of employee performance. The conceptual model further considers whether EMR optimization functions as an intervening mechanism linking organizational readiness with employee performance. This framework is consistent with the study design described in the manuscript, which uses two regression models and path decomposition to evaluate these relationships.

3. Research Methodology

A quantitative cross-sectional design was used at Bhayangkara Level III Hospital, Pusdik Brimob, Watukosek, Pasuruan. The population consisted of employees involved in outpatient EMR operations. Total sampling was applied and resulted in 67 respondents. The respondents included six registration officers, three IT personnel, 22 outpatient clinic staff, four outpatient administrative staff, ten pharmacists or pharmacy assistants, and 22 specialists. Most respondents were male, accounting for 62.7% of the sample. In addition, 38.8% of respondents were younger than 25 years, while 53.7% held diploma qualifications. ([Abdulai & Adam, 2020](#)).

Data were collected using a five-point Likert questionnaire informed by the Doctor Office Quality-Information Technology readiness domains. Six constructs were measured using five items for each construct. These constructs included human resources, organizational work culture, leadership, infrastructure, EMR optimization, and employee performance. Human resources covered competence, knowledge, skills, and readiness. Organizational work culture reflected discipline, openness to change, and adaptation to digital routines. Leadership included direction, policy, supervision, evaluation, and commitment. Infrastructure covered hardware, networks, applications, servers, security, and technical support. EMR optimization reflected the effective use of the system for recording, storage, retrieval, and service coordination. Employee performance was assessed

through quality, timeliness, responsibility, and work effectiveness ([Kabukye, de Keizer, & Cornet, 2020](#)).

The thesis reported that all questionnaire items met its validity criteria and that internal consistency was acceptable to high, with Cronbach alpha values from .842 to .901. Descriptive statistics summarized construct scores. Multiple regression Model 1 estimated the contribution of the four readiness factors to EMR optimization. Model 2 estimated employee performance from the four readiness factors and EMR optimization. Standardized coefficients, *t*-statistics, *p*-values, *F*-tests, and coefficients of determination were interpreted at $\alpha=.05$. Indirect effects were calculated by multiplying standardized path coefficients. Because the thesis did not report bootstrapped confidence intervals or a Sobel test, indirect effects are treated as exploratory evidence rather than definitive causal mediation. The cross-sectional design also limits temporal and causal inference ([Hair, Hult, Ringle, & Sarstedt, 2022](#)).

4. Results and Discussions

Table 1. Descriptive statistics and reliability of study constructs

Construct	Mean	SD	Cronbach α
Human resources	4.08	.54	.861
Organizational work culture	4.12	.51	.878
Leadership	4.15	.50	.884
Infrastructure	3.95	.57	.842
EMR optimization	4.10	.52	.901
Employee performance	4.14	.49	.889

As presented in Table 1, all study constructs demonstrated relatively high mean scores, indicating generally positive respondent perceptions across the measured dimensions. Leadership recorded the highest mean score ($M=4.15$, $SD=.50$), followed closely by employee performance ($M=4.14$, $SD=.49$), organizational work culture ($M=4.12$, $SD=.51$), EMR optimization ($M=4.10$, $SD=.52$), and human resources ($M=4.08$, $SD=.54$). Infrastructure showed the lowest mean ($M=3.95$) and the highest standard deviation ($SD=.57$), suggesting greater variability in respondents' perceptions of technical readiness. In addition, the Cronbach alpha values ranged from .842 to .901, indicating satisfactory internal consistency for all constructs.

The regression results further indicate that Model 1 was statistically significant, $F(4, 62) = 12.579$, $p<.001$, explaining 35.0% of the variance in EMR optimization (adjusted $R^2=.307$). Among the four predictors, leadership had the strongest standardized effect ($\beta=.285$), followed by human resources ($\beta=.252$), organizational work culture ($\beta=.231$), and infrastructure ($\beta=.214$). These findings indicate that EMR optimization is influenced by a combination of managerial, behavioral, and technical readiness factors rather than by a single organizational dimension.

Similarly, Model 2 was statistically significant, $F(5, 61) = 9.094$, $p<.001$, explaining 32.0% of the variance in employee performance (adjusted $R^2=.261$). EMR optimization emerged as the strongest significant predictor ($\beta=.336$, $p=.005$), while leadership also retained a significant direct effect ($\beta=.238$, $p=.031$). In contrast, human resources, organizational work culture, and infrastructure remained positive but were not individually significant after controlling for the other predictors. This pattern suggests that their contribution to employee performance may operate indirectly through EMR optimization or through shared variance among organizational readiness dimensions.

Table 2. Regression Models for EMR Optimization and Employee Performance

Outcome	Predictor	<i>B</i>	<i>B</i>	<i>t</i>	<i>p</i>
EMR Optimization	Human Resources	.241	.252	2.363	.021
	Work Culture	.218	.231	2.271	.027
	Leadership	.296	.285	2.741	.008

Outcome	Predictor	<i>B</i>	<i>B</i>	<i>t</i>	<i>p</i>
EMR Optimization	Infrastructure	.195	.214	2.143	.036
Employee Performance	Human Resources	.182	.201	1.838	.071
	Work Culture	.154	.173	1.692	.096
	Leadership	.223	.238	2.208	.031
	Infrastructure	.147	.161	1.729	.089
	EMR Optimization	.318	.336	2.944	.005

As shown in Table 2, the regression results indicate that all four organizational readiness factors significantly predicted EMR optimization. Leadership had the strongest standardized effect ($\beta=.285$, $p=.008$), followed by human resources ($\beta=.252$, $p=.021$), organizational work culture ($\beta=.231$, $p=.027$), and infrastructure ($\beta=.214$, $p=.036$). These findings confirm that EMR optimization is influenced by a combination of managerial, human, cultural, and technical readiness factors.

For employee performance, EMR optimization emerged as the strongest significant predictor ($\beta=.336$, $p=.005$), while leadership also retained a significant direct effect ($\beta=.238$, $p=.031$). In contrast, human resources ($\beta=.201$, $p=.071$), organizational work culture ($\beta=.173$, $p=.096$), and infrastructure ($\beta=.161$, $p=.089$) showed positive but statistically non-significant direct effects. This pattern suggests that the contribution of these readiness factors to employee performance may occur partly through EMR optimization.

The path decomposition further showed indirect effects of .085 for human resources, .073 for organizational work culture, .096 for leadership, and .066 for infrastructure through EMR optimization. Leadership demonstrated the largest indirect effect and the highest total standardized association with employee performance (.334), followed by human resources (.286), organizational work culture (.246), and infrastructure (.227). These results are consistent with an intervening role of EMR optimization; however, because bootstrapped confidence intervals or other formal significance tests for indirect effects were not reported, the mediation interpretation should be treated as exploratory rather than conclusive.

4.1 Discussion

The findings reinforce a socio-technical interpretation of hospital digitalization. EMR optimization was not explained solely by infrastructure, even though hardware, networks, servers, security, and technical support are indispensable. All four readiness dimensions were independently significant in Model 1, and leadership produced the largest standardized coefficient. This suggests that technological capacity becomes operationally valuable when leaders provide direction, allocate resources, monitor compliance, and align system use with clinical and administrative priorities. The result is consistent with evidence that large-scale EMR implementation is a complex adaptive change process requiring visible sponsorship, communication, obstacle removal, and institutionalization of new routines ([Arabi, Al-Moamary, AlHazme, & Al, 2022](#)).

Human resources and work culture also predicted optimization. Employees must be able to enter, retrieve, interpret, and protect information while adapting to a workflow in which documentation becomes simultaneously clinical, administrative, and auditable. The positive human-resource coefficient is therefore not merely a training effect; it reflects the hospital's absorptive capacity for digital work. Similarly, the work-culture coefficient indicates that discipline, openness to change, peer expectations, and shared responsibility shape whether EMR use becomes routine. This interpretation is supported by research showing that organizational culture conditions EHR adoption attitudes and by Indonesian evidence that recordkeeping culture and digital skills remain uneven across hospitals ([Jianxun, Arkorful, & Shuliang, 2021](#); [Hossain, Sutanto, Handayani, Haryanto, Bhowmik, & Frings-Hessami, 2025](#)).

Infrastructure had the lowest mean but still significantly predicted optimization. This combination is practically important. A positive coefficient indicates that reliable technical resources matter, while the

lower mean and higher variability suggest that users did not experience those resources uniformly. In a service environment, intermittent networks, slow applications, insufficient devices, or delayed IT response can convert a theoretically efficient digital process into queues, repeated entry, and temporary paper workarounds. Consequently, infrastructure improvement should be prioritized according to workflow criticality, system downtime, response time, and the units reporting the greatest operational friction rather than through undifferentiated procurement ([Falda & Ali, 2021](#)).

The second model provides a more discriminating account of employee performance. Once EMR optimization was included, human resources, work culture, and infrastructure no longer had individually significant direct coefficients, whereas leadership and EMR optimization remained significant. This does not mean that the three factors are unimportant. Rather, their contribution may be expressed by enabling a usable, integrated, and consistently applied EMR environment. The result supports the argument that system availability and employee capability must be translated into optimized workflows before performance gains appear. EMR optimization can reduce search time, prevent duplicate documentation, improve interunit information continuity, and increase traceability of work, thereby linking organizational readiness to day-to-day productivity.

The independent leadership coefficient in Model 2 indicates that leaders influence performance beyond their role in EMR implementation. Clear priorities, supervision, rapid resolution of barriers, feedback, and accountability can improve work organization directly while also strengthening digital-system use. This dual pathway is compatible with studies of digital health readiness that identify leadership, management support, culture, and capacity for change as distinct but interacting domains ([Steenkamp, Peltonen, & Chipps, 2025](#)). It also explains why technical deployment without governance may create fragmented use: users possess the application, but local processes, responsibilities, and escalation mechanisms remain unclear.

The significant EMR-optimization coefficient should nevertheless be interpreted carefully. Cross-sectional self-report data can capture perceived alignment between system use and performance but cannot establish temporal order or objective productivity improvement. Employees who perceive themselves as effective may evaluate the EMR more positively, and common-method variance may inflate associations. Moreover, EHR implementation can alter autonomy, interdependence, and workload in ways that are not uniformly beneficial ([Veenstra, Rietzschel, Molleman, Heineman, Pols, & Welker, 2022](#)). Future evaluation should therefore combine employee surveys with system logs, documentation completeness, registration time, medication-processing time, error rates, downtime records, and patient-flow indicators.

The indirect-path pattern is theoretically plausible but methodologically provisional. The thesis calculated products of standardized coefficients and labeled them mediation; however, no bootstrapped confidence intervals or formal significance tests for the indirect effects were reported. The scientifically defensible conclusion is that the data are consistent with partial transmission through EMR optimization, especially for leadership, but do not conclusively establish mediation. A subsequent study should use a larger multisite sample, temporal measurement, and bootstrapped structural-equation modeling to test whether readiness precedes optimization and whether optimization subsequently improves objective and perceived performance.

For hospital management, the results imply an integrated implementation agenda. First, leadership should establish a multidisciplinary EMR governance team with authority to standardize workflows and resolve cross-unit problems. Second, competency-based training should be tailored to registration, clinical, pharmacy, administrative, and IT roles, followed by on-site coaching rather than one-time instruction. Third, standard operating procedures should specify documentation responsibilities, access control, downtime procedures, data-quality checks, and escalation routes. Fourth, infrastructure monitoring should focus on network reliability, device availability, application response, interoperability, backup, security, and IT service time. Finally, management should review EMR-use and performance indicators together so that optimization becomes a continuous quality-improvement process rather than a one-time compliance project.

5. Conclusions

Human resources, organizational work culture, leadership, and infrastructure significantly predicted the optimization of EMR implementation at Bhayangkara Level III Hospital, Pusdik Brimob, Pasuruan. The combined model explained 35.0% of the variance in EMR optimization, with leadership showing the strongest contribution. Employee performance was significantly predicted by the overall model, which explained 32.0% of its variance. EMR optimization and leadership remained significant after simultaneous adjustment. Indirect estimates indicated that EMR optimization may transmit part of the relationship between organizational readiness and employee performance. However, formal mediation significance was not demonstrated.

The study advances the practical understanding of EMR implementation by indicating that organizational readiness is most relevant to performance when it is translated into optimized system use. Hospitals should therefore integrate leadership commitment, workforce capability, adaptive work culture, and reliable infrastructure with standardized workflows and continuous evaluation. Generalization is limited by the single-hospital, cross-sectional, self-report design and the small census sample. Future research should employ multisite longitudinal designs, objective operational indicators, and bootstrapped mediation analysis.

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Author Contributions

AM contributed to the conceptualization, research design, data collection, data analysis, interpretation of findings, and preparation of the original manuscript. SHS contributed to the conceptualization, supervision, methodology, validation, critical review, and editing of the manuscript. BRP contributed to the methodology, validation, interpretation of results, critical review, and manuscript editing. All authors reviewed and approved the final version of the manuscript.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the research, authorship, or publication of this article. The study was conducted independently, and no personal, financial, or institutional interests influenced the research process, interpretation of the findings, or preparation of the manuscript.

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