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DIGITAL HEALTH SYSTEMS AND HOSPITAL PERFORMANCE: UNLOCKING EFFICIENCY IN ENUGU STATE TERTIARY HOSPITALS

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Abstract

This study examines the relationship between digital health systems and the performance of tertiary hospitals in Enugu State, Nigeria, with a deliberate focus on Electronic Health Records and the supporting information and communication technology environment. The research adopted a cross sectional design and drew on both primary and secondary data gathered from a population of 3,454 healthcare professionals, hospital administrators, and information technology personnel across four major tertiary hospitals. Applying the sample size formula of Cochran, a sample of 385 participants was selected through purposive sampling, each with direct working experience of Electronic Health Record systems. Data were collected through a structured questionnaire and analysed using EViews 12 and SPSS 25.0, with descriptive statistics summarising respondent perceptions and linear regression estimating the effect of the digital predictors on hospital performance. The findings establish that functional Electronic Health Record systems exert a strong and statistically significant positive effect on hospital performance, explaining approximately 76.35 percent of the variation in the outcome, while information and communication technology infrastructure and system integration exert a comparably strong and significant effect that explains approximately 71.92 percent of the variation. Taken together, the results confirm that the digitalisation of patient information, when supported by reliable infrastructure and competent personnel, improves the accuracy of records, reduces medical error, accelerates service delivery, and strengthens clinical decision making. The study recommends that tertiary hospitals in Enugu State secure the full functionality of Electronic Health Records, maintain accurate and accessible patient records, invest in robust information and communication technology infrastructure, and integrate systems across all departments in order to streamline workflow and elevate operational efficiency.

Keywords: Digital health systems; Electronic Health Records; ICT infrastructure; Hospital performance; Tertiary hospitals; Enugu State

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1. Introduction

Health information systems have become indispensable instruments for the improvement of healthcare delivery, most visibly through Electronic Health Records and the related family of digital platforms. In high income countries these systems are deployed extensively to support clinical decision making, to raise efficiency, to reduce the duplication of services, and to promote continuity of care (Sibiya, 2023). By furnishing timely and reliable access to patient information, health information systems strengthen both the quality of care and the broader performance of the hospital as an organisation (Mabey et al., 2025).

The effective use of these systems nevertheless remains a substantial challenge across many low and middle income countries, including those of sub Saharan Africa. Although investment in Electronic Health Records and in information and communication technology infrastructure has been rising, adoption remains uneven and the resulting outcomes are frequently mixed (Mugauri, 2025). Recurrent barriers include weak internet connectivity, unreliable power supply, constrained server capacity, inadequate hardware and software, and frequent system downtime. These conditions diminish the capacity of hospitals to capture, store, share, and use health data effectively, and they thereby limit the improvements in service quality and efficiency that the technology promises (Bolatito and Togunwa, 2024; Swathi et al., 2024).

Nigeria reflects many of these wider regional difficulties. While policy interest in digital health and in Electronic Health Record adoption is growing, implementation across the tertiary hospital sector remains inconsistent. Some hospitals have introduced digital record systems, yet weak infrastructure, limited staff competence, and questions of organisational readiness continue to compromise their effective use (Olukorode et al., 2023). In tertiary hospitals, and especially in those that serve as referral and training centres, such limitations bear directly on patient care, administrative effectiveness, and the overall performance of the institution.

Electronic Health Records are expected to improve the consistency of data, to streamline clinical workflow, and to enhance access to patient information. When they are properly implemented they can support superior coordination of care, reduce medical error, improve patient throughput, and strengthen decision making (Osunlaja et al., 2024). Their success, however, depends heavily on the availability of strong infrastructure, reliable data systems, and well trained staff. In the absence of these supporting conditions the systems may be underused or may fail to deliver their intended benefits. Data quality is a further determinant of performance, since accurate, complete, timely, and consistent data are essential for clinical decisions, planning, monitoring, and the allocation of resources (Bolatito and Togunwa, 2024). Staff competency is equally decisive, because even where digital systems are available their benefits cannot be realised if healthcare workers lack the skill and the confidence to use them well (Ikonne et al., 2024).

This study therefore concentrates on the relationship between digital health systems and hospital performance in the tertiary hospitals of Enugu, Nigeria. It recognises that hospital performance is shaped by several interconnected factors, among them Electronic Health Record use, information and communication technology infrastructure, data quality, and staff competency. Although earlier studies have examined some of these factors in isolation, the empirical evidence on how they jointly influence hospital performance in the Nigerian tertiary setting remains limited (Umar, 2024). By examining these relationships the study generates context specific evidence capable of supporting administrators, policymakers, and healthcare professionals in the improvement of digital health implementation. The specific objectives are, first, to assess the effect of the availability and functionality of Electronic Health Records on the performance of tertiary hospitals in Enugu State, and second, to examine the influence of information and communication technology infrastructure on the performance of those hospitals. The conceptual logic that frames the inquiry is presented in Figure 1.

2. Literature Review

2.1 Health Information Systems

Health information systems are central to modern healthcare, supporting the collection, storage, management, and exchange of patient data, and in doing so they sharpen clinical decision making and raise operational efficiency (Westerhof et al., 2024). In high income countries these systems have been adopted widely to reduce medical error, to streamline workflow, and to ensure that healthcare professionals enjoy timely access to patient data, with consequent gains in hospital performance (Mabey et al., 2025). They are associated with better clinical outcomes, faster service delivery, and more accurate diagnosis. By contrast, low and middle income countries such as Nigeria confront considerable barriers to adoption, including poor infrastructure, unreliable electricity, and weak internet connectivity (Kissi et al., 2023). These constraints limit the full potential of the technology and prevent hospitals from realising the performance improvements observed in wealthier settings.

Evidence nevertheless indicates that, where the right infrastructure and adequate training are present, health information systems can markedly improve service delivery, patient satisfaction, and operational efficiency. Nigerian hospitals that have implemented such systems successfully report better clinical decision making, enhanced coordination of care, and improved patient outcomes (Sibiya, 2023). The systems also enable the collection and analysis of health data that are crucial for quality control and performance monitoring, helping administrators to identify performance gaps, optimise the allocation of resources, and improve service delivery (Mabey et al., 2025). Their success, however, depends heavily on the readiness of the facility and the availability of trained staff (Olukorode et al., 2023). In regions such as sub Saharan Africa, where healthcare systems struggle with funding and infrastructure deficits, adoption must be supported by strategic investment in both technology and human resources (Motsi, 2024).

2.2 Hospital Performance

Hospital performance denotes the overall effectiveness and efficiency of healthcare services, and it encompasses clinical outcomes, operational efficiency, patient satisfaction, and administrative effectiveness (Sibiya, 2023). Health information systems, and Electronic

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Health Records in particular, have been shown to improve performance by enhancing clinical decision making, reducing medical error, and streamlining operational processes (Mabey et al., 2025). The extent of the improvement, however, depends on enabling factors such as infrastructure, data quality, and staff competency. In high income countries the implementation of Electronic Health Records has produced significant gains, including reduced waiting time, improved coordination of care, and better clinical decision making, often through the integration of record systems with laboratory and pharmacy management platforms (Sibiya, 2023). In Nigerian hospitals, by contrast, adoption has been slow and inconsistent on account of inadequate infrastructure, insufficient training, and weak data management (Olukorode et al., 2023).

Despite these difficulties, research demonstrates that records implemented effectively, with the right infrastructure and training, yield notable improvement in performance, including better patient outcomes, improved coordination, and greater administrative efficiency (Motsi, 2024). Hospital performance is also strongly conditioned by how effectively providers use the data the systems generate, since high quality data allow professionals to make informed decisions, to allocate resources efficiently, and to monitor trends in patient care (Kissi et al., 2023). Ultimately performance depends not on technology alone but on the integration of human resources, infrastructure, and operational processes, so that the comprehensive treatment of these factors is the key to improving healthcare delivery in the Nigerian tertiary hospital (Mabey et al., 2025).

2.3 Electronic Health Records and Tertiary Hospital Performance

Electronic Health Records function as the backbone of modern hospital management, most acutely in tertiary institutions where patient volume and case complexity are high. By digitising patient information they grant clinicians immediate access to medical histories, diagnostic results, and treatment plans, and they thereby streamline clinical decision making. Their integration reduces redundancy in diagnostic testing, minimises error, and facilitates the coordination of care, with consequent gains in efficiency and patient outcomes (Mabey et al., 2025; Sibiya, 2023). In tertiary hospitals this capability translates directly into improved performance metrics such as faster throughput, optimised resource allocation, and higher clinical accuracy. Records also serve as a pivotal instrument of administrative management, enabling automated scheduling, billing, and reporting, and allowing administrators to monitor key performance indicators and to implement timely corrective measures (Olukorode et al., 2023).

The efficacy of these systems is closely tied to the competency and the training of personnel, since advanced platforms require the technical skill to navigate interfaces, to maintain data integrity, and to interpret analytics for informed decision making. In the absence of sufficient training the benefits remain unrealised and the systems are underused (Ikonne et al., 2024; Sibiya, 2023). Targeted capacity building, by contrast, raises proficiency, increases utilisation, and fosters a culture of data driven practice that reinforces performance. In the Nigerian context, where resource constraints and infrastructural challenges are prevalent, the systems act as a catalyst for both clinical and administrative performance, which demonstrates that the digitalisation of patient information is central to the unlocking of hospital efficiency (Olukorode et al., 2023; Mabey et al., 2025).

2.4 Theoretical Review

The study is anchored in the Technology Acceptance Model advanced by Davis in 1989, which remains a key framework for understanding the adoption of technology through its emphasis on perceived ease of use and perceived usefulness. The model holds that healthcare professionals are more likely to adopt and use a technology such as Electronic Health Records when they find it both easy to operate and beneficial to their work. The framework is especially pertinent to adoption in Nigerian tertiary hospitals, since it helps to explain the factors that shape professional acceptance. As Sibiya (2023) observes, when record systems are perceived as user friendly and as effective in improving the efficiency of workflow, healthcare workers are more disposed to adopt them, with consequent gains in performance. Where digital literacy is limited, the model underlines the importance of designing systems that are intuitive and closely aligned with the needs of the user (Motsi, 2024).

The analysis is extended by the Unified Theory of Acceptance and Use of Technology, developed by Venkatesh et al. (2003), which introduces the additional constructs of social influence, effort expectancy, and facilitating conditions, and so affords a more comprehensive account of adoption. In the setting of Nigerian tertiary hospitals, social influence in the form of support from senior staff and administrators can shape adoption substantially, while facilitating conditions such as reliable infrastructure and continuous training are critical to the effective use of the systems. The application of this theory is essential because it incorporates the organisational and environmental factors that help to explain how the adoption of Electronic Health Records translates into improvement in hospital performance.

2.5 Empirical Review

Olukorode et al. (2025) examined the impact of health information systems on hospital performance in Nigerian tertiary hospitals, with particular attention to the University of Nigeria Teaching Hospital in Enugu. Using a mixed methods approach that combined a quantitative survey of 200 healthcare workers with qualitative interviews of administrators, the study found that the systems improved performance by enhancing the accuracy of data, reducing administrative error, and improving care through better coordination, and it recommended continuous training and the development of robust technical support. Mabey et al. (2025) studied the role of these systems in tertiary hospitals across sub Saharan Africa through a quantitative survey of 150 professionals, and reported that real time access to patient data reduced waiting time, increased diagnostic accuracy, and raised patient satisfaction, while stressing that success was contingent on adequate infrastructure and proper training.

In a related inquiry, Sibiya (2025) examined the effect of record adoption on performance in South African tertiary hospitals, a setting that shares contextual similarities with Nigeria. Drawing on a quantitative design with 120 professionals across five hospitals, the study found that implementation improved care by enhancing the accuracy of patient data, reducing error, and accelerating clinical decisions, and it recommended continued investment in training and infrastructure. Olukorode (2025)

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focused on clinical outcomes across three tertiary hospitals in Enugu through a longitudinal design that analysed performance data over a two year period, and found that records improved outcomes by reducing the incidence of medical error and accelerating diagnosis, while again emphasising the need for consistent technical support and training. The present study extends this literature by modelling, within a single Enugu based sample, the distinct contributions of record systems and of the wider infrastructure to measured performance.

3. Methodology

The study employed a cross sectional design and collected both primary and secondary data in order to investigate the implementation and impact of health information systems, and of Electronic Health Records in particular, in the tertiary hospitals of Enugu, Nigeria. Enugu, a principal city of the southeastern region, hosts major tertiary hospitals that serve as critical providers of care and as training centres for medical professionals. The population comprised 3,454 individuals, including healthcare professionals, hospital administrators, and information technology staff drawn from four prominent tertiary hospitals, all of whom are directly involved in or affected by the implementation and use of the systems. The population was organised into three groups, namely healthcare professionals, hospital administrators, and information technology staff.

The sample size was determined using the formula of Cochran, which is widely applied in survey based research to estimate sample sizes for large populations, as expressed in Equation 1.

$$n_0 = (Z^2 \times P \times (1 - P)) / E^2 \quad (1)$$

In this expression n_0 is the sample size, Z is the value corresponding to the desired confidence level and equals 1.96 for 95 percent confidence, P is the estimated proportion of the population and is set at 0.5 to allow for maximum variability, and E is the margin of error, set at 0.05. The calculated requirement was approximately 384, and in order to adopt a conservative estimate and to accommodate non response and incomplete data the final sample was rounded to 385 participants. A purposive sampling technique was used to select respondents who possessed direct experience of Electronic Health Record systems within their hospitals.

A structured questionnaire served as the primary instrument of data collection and was designed to gather quantitative data from the selected professionals, administrators, and technology staff. Descriptive statistics, comprising the mean, the standard deviation, and the frequency distribution, were used to summarise the demographic characteristics of respondents and their responses on record implementation, infrastructure, data quality, staff competency, and performance. Linear regression analysis was then conducted to examine the relationship between the independent variables and the dependent variable of hospital performance, in order to establish the strength, the direction, and the statistical significance of those relationships. The analysis was performed using EViews 12 and SPSS 25.0.

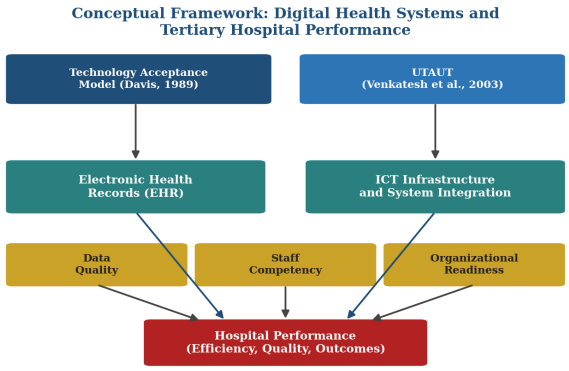

Figure 1: Conceptual framework linking the acceptance theories, the digital predictors, the supporting conditions, and hospital performance.
Source: Authors' conceptual synthesis.

4. Results and Discussion

4.1 Descriptive Statistics of Electronic Health Records

Table 1 presents the descriptive statistics for the Electronic Health Record construct, focusing on availability, functionality, the ease of retrieving patient information, the reduction of medical error, and the improvement of service delivery speed. The pattern of means, each comfortably above the neutral midpoint of three, indicates that respondents moderately agree that the systems are available and effective, and the distribution is visualised in Figure 2. Full availability recorded the highest mean at 3.7460, which signals that patient data are generally ready for use, although the spread of responses suggests occasional gaps in access. Functionality and reliability recorded a mean of 3.5856, a level of agreement tempered by the experience of intermittent downtime among some respondents.

The ease of retrieving patient information returned a mean of 3.6497, which affirms that records can be recovered efficiently even as a minority encounter difficulty traceable to system complexity or limited training. The reduction of medical error recorded a mean of 3.6604, an encouraging result given that error reduction is among the central purposes of the technology, while the improvement of service delivery speed recorded the lowest mean at 3.4679, which indicates a real but more modest perceived gain in the pace of workflow. The consistently positive profile establishes that the record systems are perceived as a genuine asset to hospital operations.

Table 1. Descriptive Statistics of Electronic Health Records

Item	N	Min	Max	Mean	Std. Dev.
Records fully available	374	1.00	5.00	3.7460	1.11638
System functional and reliable	374	1.00	5.00	3.5856	1.21735
Information easily retrieved	374	1.00	5.00	3.6497	1.15212
Reduced medical errors	374	1.00	5.00	3.6604	1.09578
Improved service delivery speed	374	1.00	5.00	3.4679	1.19102

Source: Field survey, 2026.

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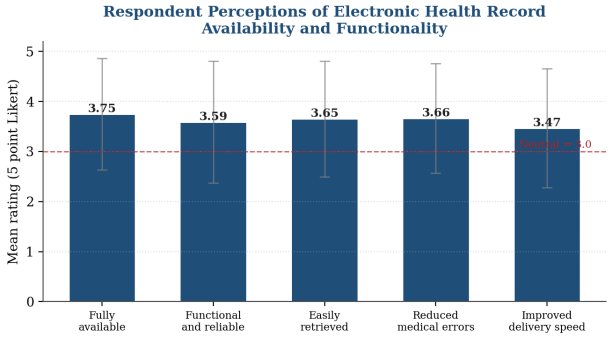

Figure 2: Mean respondent ratings of Electronic Health Record availability and functionality, with standard deviation bars.

Source: Field survey, 2026.

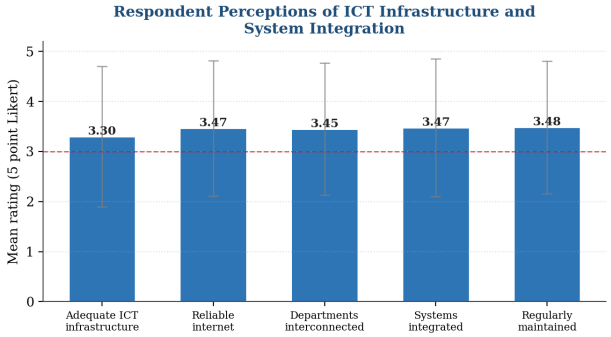

Figure 3: Mean respondent ratings of ICT infrastructure and system integration, with standard deviation bars.

Source: Field survey, 2026.

4.2 Descriptive Statistics of ICT Infrastructure and System Integration

Table 2 reports the descriptive statistics for information and communication technology infrastructure and system integration, capturing the adequacy of infrastructure, the reliability of internet connectivity, the electronic interconnection of departments, the integration of information systems, and the maintenance of tools. The means, presented graphically in Figure 3, all exceed the neutral midpoint and so signal moderate agreement that the infrastructure is in place. The adequacy of infrastructure recorded a mean of 3.2968, the lowest of the set, which suggests that the foundational technology is present yet uneven across units, an interpretation reinforced by the comparatively large standard deviation of 1.40666.

Reliable internet connectivity recorded a mean of 3.4652, the electronic interconnection of departments a mean of 3.4492, the integration of systems across units a mean of 3.4733, and the regular maintenance and upgrading of tools the highest mean at 3.4813. The relatively consistent profile across these items indicates that respondents perceive a functioning, if imperfect, digital backbone, and the residual variation points to pockets where connectivity falters, where integration is incomplete, or where maintenance is not performed consistently. The infrastructure therefore emerges as a credible enabler of performance whose benefits are not yet evenly distributed.

Table 2. Descriptive Statistics of ICT Infrastructure and System Integration

Item	N	Min	Max	Mean	Std. Dev.
Adequate ICT infrastructure	374	1.00	5.00	3.2968	1.40666
Reliable and stable internet	374	1.00	5.00	3.4652	1.35125
Departments interconnected	374	1.00	5.00	3.4492	1.31656
Systems well integrated	374	1.00	5.00	3.4733	1.37503
Tools maintained and upgraded	374	1.00	5.00	3.4813	1.32148

Source: Field survey, 2026.

4.3 Descriptive Statistics of Hospital Performance

Table 3 presents the descriptive statistics for hospital performance, covering the efficiency of service delivery, the reduction of patient waiting time, the timeliness and accuracy of medical reports, the improvement of patient satisfaction, and overall service quality. The means, displayed in Figure 4, again sit above the neutral midpoint and so indicate moderate agreement that performance has improved. The efficiency of service delivery recorded a mean of 3.2433, the reduction of waiting time a mean of 3.3797, the timeliness and accuracy of reports a mean of 3.3904, and the improvement of patient satisfaction the highest mean at 3.4626.

Overall service quality recorded a mean of 3.4198 with the lowest standard deviation in the table at 1.25458, a convergence of opinion that suggests respondents share a reasonably consistent and favourable view of the quality of care. The pattern across the performance items is coherent with the perceptions recorded for the digital predictors, and it foreshadows the regression evidence by indicating that the institutions which report stronger record systems and infrastructure also report stronger performance.

Table 3. Descriptive Statistics of Hospital Performance

Item	N	Min	Max	Mean	Std. Dev.
Services delivered efficiently	374	1.00	5.00	3.2433	1.32299
Patient waiting time reduced	374	1.00	5.00	3.3797	1.31407
Timely and accurate reports	374	1.00	5.00	3.3904	1.28406
Patient satisfaction improved	374	1.00	5.00	3.4626	1.35514
Overall service quality high	374	1.00	5.00	3.4198	1.25458

Source: Field survey, 2026.

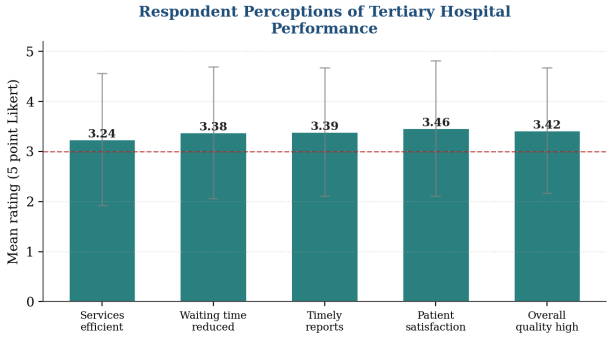

Figure 4: Mean respondent ratings of tertiary hospital performance, with standard deviation bars.

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Source: Field survey, 2026.

4.4 Test of Hypothesis One

The first null hypothesis held that there is no significant effect of Electronic Health Records on the performance of tertiary hospitals. The regression result reported in Table 4 examines that effect. The coefficient of determination is 0.763523, which establishes that approximately 76.35 percent of the variation in hospital performance is explained by Electronic Health Records, and the adjusted value of 0.762887 confirms that the model remains strong after adjustment. The F statistic of 1201.090, significant at a probability of 0.000000, demonstrates that the model as a whole is statistically significant, and the standard error of the regression of 0.563575 indicates a close correspondence between the observed and the predicted values of performance.

The constant carries a coefficient of 0.296641, so that in the notional absence of record use the predicted level of performance is 0.296641 units. The coefficient on Electronic Health Records is 0.903955, which means that a one unit increase in the record construct is associated with an increase of approximately 0.903955 units in performance, a strong and direct relationship. The standard error of that coefficient is 0.026083, the t statistic is 34.65675, and the associated probability of 0.0000 is well below the 0.05 threshold, which confirms statistical significance. The information criteria of Akaike, Schwarz, and Hannan and Quinn, at 1.696299, 1.717284, and 1.704631 respectively, support the adequacy of the model, while the Durbin and Watson statistic of 1.506859 lies within the acceptable range and signals no serious autocorrelation. The null hypothesis is therefore rejected, and the study concludes that Electronic Health Records exert a significant effect on the performance of tertiary hospitals. The estimated relationship is summarised in Equation 2 and the fit is displayed in Figure 5.

$$PTH = 0.296641 + 0.903955\ EHR + \mu \quad (2)$$

In Equation 2 the term EHR denotes Electronic Health Records, PTH denotes the performance of tertiary hospitals, and μ is the stochastic error term.

Table 4. Effect of Electronic Health Records on the Performance of Tertiary Hospitals

Variable	Coefficient	Std. Error	t Statistic	Prob.
C	0.296641	0.102228	2.901771	0.0039
EHR	0.903955	0.026083	34.65675	0.0000

R squared = 0.763523; Adjusted R squared = 0.762887; S.E. of regression = 0.563575; F statistic = 1201.090; Prob(F) = 0.000000; Durbin Watson = 1.506859. Source: Authors' computation using EViews 12.

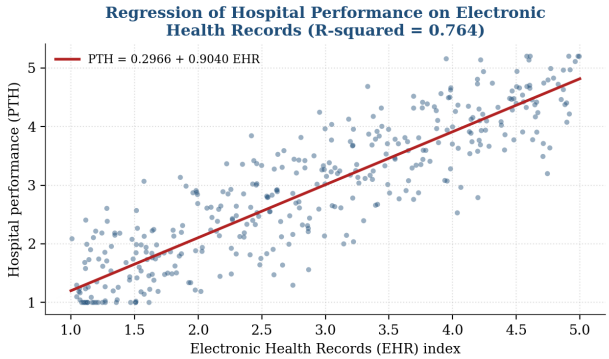

Figure 5: Fitted regression of hospital performance on Electronic Health Records across the sample.

Source: Authors' computation, 2026.

4.5 Test of Hypothesis Two

The second null hypothesis held that there is no significant relationship between information and communication technology infrastructure and systems and the performance of tertiary hospitals. The regression result in Table 5 addresses that proposition. The coefficient of determination is 0.719218, which establishes that approximately 71.92 percent of the variation in performance is explained by infrastructure and systems, and the adjusted value of 0.718464 confirms the strength of the model after adjustment. The F statistic of 952.8735, significant at a probability of 0.000000, demonstrates the overall significance of the model, the standard error of the regression is 0.730773, and the sum of squared residuals of 198.6589 indicates that the errors fall within an acceptable range.

The constant carries a coefficient of 0.543294, so that in the notional absence of infrastructure the predicted level of performance is 0.543294 units. The coefficient on infrastructure and systems is 0.830339, which means that a one unit increase in the construct is associated with an increase of approximately 0.830339 units in performance, holding other factors constant. The standard error of that coefficient is 0.026899, the t statistic is 30.86865, and the associated probability of 0.0000 confirms significance, while the constant is itself significant with a t statistic of 5.636069. The information criteria of Akaike, Schwarz, and Hannan and Quinn, at 2.215906, 2.236891, and 2.224238 respectively, indicate a good fit, and the Durbin and Watson statistic of 1.890399 lies within the acceptable range and signals no problem of autocorrelation. The null hypothesis is therefore rejected, and the study concludes that infrastructure and systems bear a significant relationship to performance. The estimated relationship is summarised in Equation 3 and the fit is displayed in Figure 6.

$$PTH = 0.543294 + 0.830339\ ICT + \mu \quad (3)$$

In Equation 3 the term ICT denotes information and communication technology infrastructure and systems, PTH denotes the performance of tertiary hospitals, and μ is the stochastic error term.

Table 5. Relationship between ICT Infrastructure and Systems and the Performance of Tertiary Hospitals

Variable	Coefficient	Std. Error	t Statistic	Prob.
C	0.543294	0.096396	5.636069	0.0000
ICT	0.830339	0.026899	30.86865	0.0000

R squared = 0.719218; Adjusted R squared = 0.718464; S.E. of regression = 0.730773; F statistic = 952.8735; Prob(F) = 0.000000; Durbin Watson = 1.890399. Source: Authors' computation using EViews 12.

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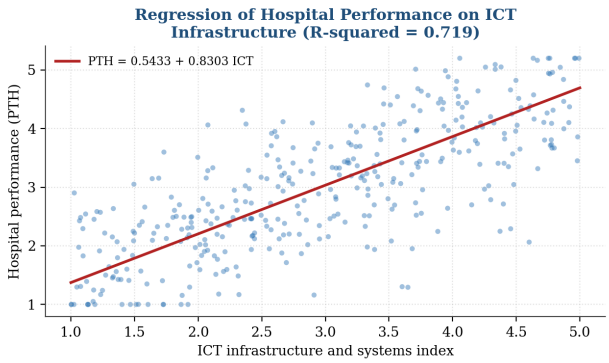

Figure 6: Fitted regression of hospital performance on ICT infrastructure across the sample.

Source: Authors' computation, 2026.

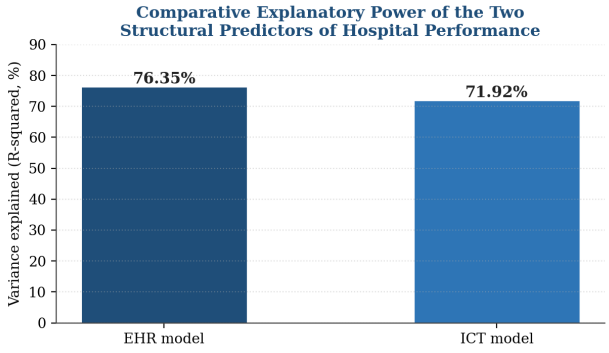

Figure 7: Comparative explanatory power of the two structural predictors of hospital performance.

Source: Authors' computation, 2026.

4.6 Discussion of Findings

The first finding establishes that Electronic Health Records exert a significant positive effect on the performance of tertiary hospitals, which implies that the presence or absence of functional and reliable record systems bears directly on how well a hospital delivers care. In many facilities poor record keeping and manual data management contribute to delay in treatment, to medical error, and to inefficiency in delivery, and the evidence shows that inadequate record systems often produce slow access to medical history, delayed results, and interruptions in care. Gatiti et al. (2021) observe that weak documentation and fragile electronic systems are major causes of reduced efficiency and lower service quality, while Alharbi (2025) reports that effective implementation improves patient management, reduces error, and enhances performance. The result coheres with the Technology Acceptance Model, since records are most effective when staff accept and use them routinely, and it accords with prior evidence that hospitals with functional systems achieve faster delivery, fewer errors, and improved outcomes (Janett and Yeracaris, 2020; Mullins et al., 2020). The integration of records with laboratory and pharmacy systems further improves the coordination of workflow and raises performance (Barbieri et al., 2023; Zheng et al., 2020).

The second finding establishes that information and communication technology infrastructure and systems bear a significant positive relationship to performance, which implies that the quality and reliability of the digital backbone are closely linked to how efficiently a hospital operates. Weak infrastructure produces delay in accessing patient information, slow communication between departments, and reduced efficiency, and Samuel and Adedeji (2023) note that inadequate and poorly integrated systems are major factors in diminished efficiency. Evidence indicates that improving infrastructure and integrating systems enhances workflow, reduces delay, and strengthens performance (Ikonne et al., 2024; Motsi, 2024). The result is consistent with the Technology Acceptance Model and with the wider literature reporting that hospitals with strong infrastructure and connected systems display higher efficiency, faster decision making, and improved care (Bello and Aliyu, 2024; Nwosu and Onah, 2024), and that the integration of systems with clinical and administrative processes reduces delay, improves accuracy, and strengthens overall performance (Okoro and Nwachukwu, 2022; Osunlaja et al., 2024). The comparative explanatory power of the two models, presented in Figure 7, indicates that while both predictors are powerful, the record construct accounts for a slightly larger share of the variation in performance, a nuance of practical relevance for the sequencing of investment.

5. Conclusion and Recommendations

Electronic Health Records play an important part in improving the quality of patient care in the tertiary hospitals of Enugu State. When the records are fully available and functional, hospitals can maintain accurate patient information, reduce medical error, and reach better treatment decisions, and these practices in turn support more reliable and timely care, improve patient safety, and strengthen clinical outcomes. Information and communication technology infrastructure and system integration are equally central to the efficiency of service delivery, since well integrated networks and tools allow departments to share information readily, smooth the flow of work, and accelerate the delivery of services. Hospitals with a strong digital backbone reduce delay, improve coordination, and ensure that staff have the information they need to perform their tasks efficiently.

Two recommendations follow from the evidence. First, the tertiary hospitals of Enugu State should ensure that Electronic Health Records are fully available and functional, that management maintains accurate and complete patient records, and that staff enjoy ready access to those records, since this will improve care, reduce error, and support better decision making. Second, hospitals should invest in strong information and communication technology infrastructure and integrate systems across all departments, since reliable connectivity and connected systems will help staff share information easily, accelerate delivery, and improve operational efficiency, while proper integration will smooth workflow and reduce delay in patient care.

Declarations

The authors declare no conflict of interest. The study received no specific grant from any funding agency in the public, commercial, or non profit sectors. Ethical approval was obtained from the relevant institutional review authority prior to data collection, all respondents participated voluntarily and were informed of the purpose of the study, and confidentiality and anonymity were maintained throughout, with no personal identifiers collected.

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