

# An Empirical Investigation of Electronic Health Record Adoption among Youth in Bangladesh

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## ABSTRACT

### Background

Technological advancement has revolutionized the healthcare industry. Electronic Health Records (EHRs), being a prominent technological innovation, significantly changed the healthcare delivery system, offering various advantages to both healthcare providers and patients. Understanding the significance of EHR, this study integrates the Technology Acceptance Model with the IS success Model to investigate the factors shaping the perception of users towards EHR and its subsequent adoption.

### Methodology

Data gathered from tertiary students through a survey and analyzed using PLS-SEM. Findings reveal that attitude toward EHR is significantly influenced by perceived usefulness, system quality, perceived cost, and perceived trust. Attitude, in turn, impacts EHR use intention. Theoretically, this study integrates the IS Success model with TAM and extends the model with perceived cost and perceived trust, enhancing existing literature on EHR adoption. Practically, this study provides insights to healthcare providers, system designers, and policymakers in advancing EHR adoption in developing country context.

### Keywords:

Electronic Health Records (EHRs); Perceived Trust; IS Success Model; TAM; Developing Country.

## INTRODUCTION

The advancement of digital technology has shaped modern society by giving easy accessibility to information for different sectors, especially the healthcare sector<sup>1</sup>. This transformation helps to create a connected society where technology has been used in the health sector in different ways, such as storing patient information, communicating with patients, and monitoring patient behavioral tracking<sup>2,3</sup>. Traditional paper-based information storing can be shifted to an integrated data-driven process that helps patients to make right decision about their health from any location. Thus, Electronic Health Record (EHR) has been considered as a key innovative platform through which medical history, diagnosis results, and history of medication are stored and shared by patients<sup>4</sup>. EHR is a computerized system for service providers that can be shared with all approved authorities<sup>5</sup>. It improves patient safety by ensuring adequate information flow and access to knowledge in real time so that prescribing and documentation errors can be reduced<sup>6-8</sup>. It can contribute directly to achieve quadruple aim, such as better health outcomes, lower cost, improved patient experience, and clinical experiences<sup>9</sup>.

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As a result, the nationwide basic EHR system has been adopted from 6.6% to 81.2%, where comprehensive EHR systems are increased from 3.6% to 63.2% from 2009 to 2019<sup>10</sup>. As global health system is adopting EHR to their healthcare sector, it has become an increasing topic for academicians, policymakers, and the healthcare industry.

However, low physician acceptance of EHR, lack of administrative support, Infrastructural such as hardware or software support<sup>11</sup> and lack of use of patients due to privacy and security concerns<sup>12</sup> affect negatively to transform from paper based system to EHR systems. Although Many developed countries have already utilized EHR systems for their health sector, the adoption and implementation of EHR remains limited in many low and developing countries (LDC)<sup>13,14</sup>. As Bangladesh is a developing country, the adoption rate of EHR systems is very low<sup>15,16</sup>.

Several studies have been conducted on health professionals perception towards EHR systems<sup>17,18</sup>, challenges of accepting EHR systems<sup>19</sup>, and way of implementing sustainable use of EHR systems<sup>20</sup> from different country contexts. Moreover, most research has been done in Bangladesh based on e-health adoption<sup>15,21</sup>, EHR adoption from clinical perspectives or doctors views<sup>16</sup>, and fears of implementing EHR systems<sup>22</sup>. All of these studies are conducted on the basis of service providers perspective. To the best of researchers' knowledge, no study has been conducted on the perspective of patients to the use EHR system for getting integrated medical services in Bangladesh. Patients are active participant to maintain health information<sup>23</sup>. They can use EHR system to track their medical history and can take appropriate decisions accordingly. Service provider should consider patient opinion regarding the design of EHR systems for accessibility, accuracy, and privacy<sup>24</sup>. Similarly, this study intends to fill the gap in literature by focusing on understanding the young users' perception of adopting EHR systems, as they have a great tendency to adopt digital systems in Bangladesh<sup>25</sup>. Moreover, no previous research showed the integration of different models with external variables in the context of electronic health systems adoption literature<sup>26</sup>. To address all these gaps, the primary objective of this study is to unveil the factors influencing young patients' perception to adopt EHR

systems through the lens of an integrating framework, such as Technology Acceptance Model (TAM) and the IS Success model with two external variables, perceived trust and cost in the context of Bangladesh. Based on the objectives, this study addresses following research questions (RQ):

RQ1: Do perceived usefulness, perceived ease of use, system quality, perceived trust, and perceived cost influence young users' attitudes toward using EHR systems in Bangladesh?

RQ2: Does young users' attitude influence their intention to use EHR systems in Bangladesh?

The findings of this paper will provide insight into users, healthcare administrators, policymakers, and technology developers of EHR systems on how to implement these systems effectively and efficiently.

## LITERATURE REVIEW

### Electronic Health Records in Bangladesh

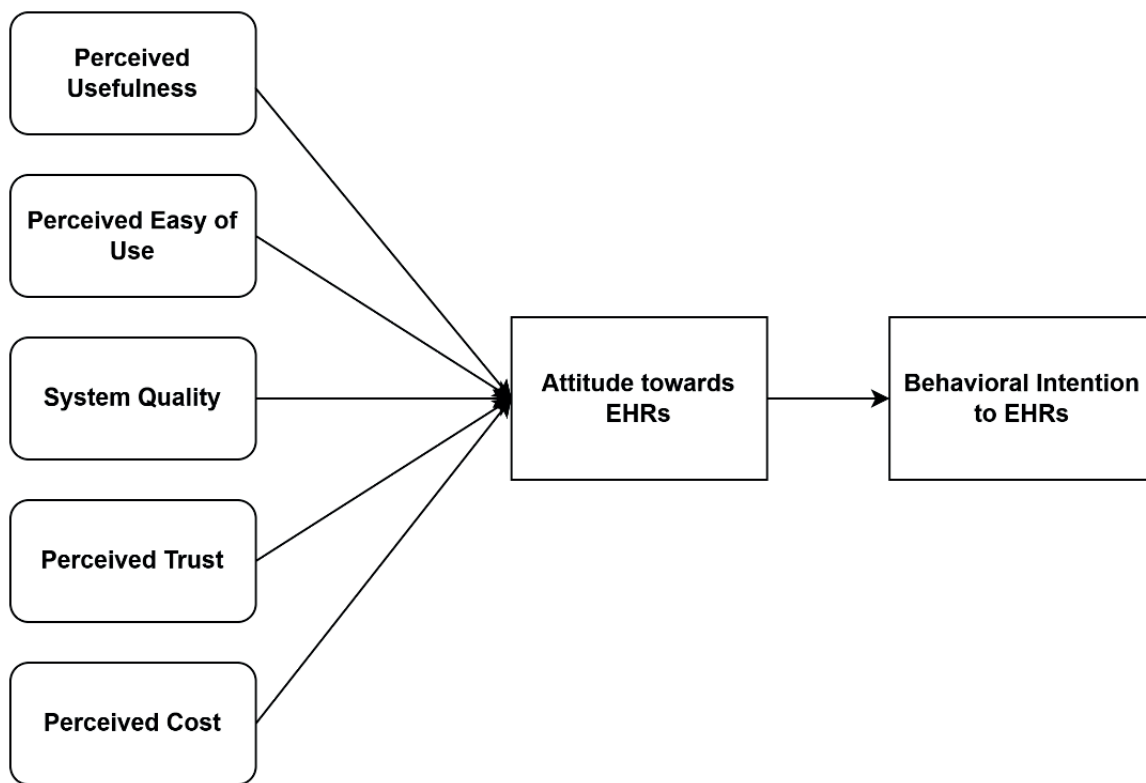
Electronic Health Records (EHRs) are defined as the digital systems used to collect, store, and manage patients' health information, including diagnoses, medications, laboratory results, and treatment histories, within and across healthcare settings<sup>27</sup>. Numerous studies highlight that EHRs enhance clinical decision-making, reduce medical errors, improve care coordination, and increase overall healthcare efficiency<sup>5</sup>. Although digital transformation in healthcare has gained recognition in Bangladesh, EHR implementation is still limited, and paper-based documentation continues to dominate routine clinical operations<sup>16</sup>.

### Theoretical Framework

Several theoretical models have been used to explain technology adoption, including the "Unified Theory of Acceptance and Use of Technology" (UTAUT)<sup>28,29</sup>, the "Technology Acceptance" Model (TAM)<sup>30</sup>, and the "Theory of Planned Behavior model"<sup>31</sup>. This paper primarily draws on TAM, a theoretical framework developed by<sup>32</sup> to explain why people accept or reject new technologies. TAM emphasizes two core determinants, perceived usefulness and perceived ease of use, which shape users' attitudes and intentions toward new technologies. TAM has been widely validated in healthcare settings and is frequently used

to analyze EHR adoption<sup>33</sup>. Complementing TAM, the updated IS Success Model by<sup>34</sup> highlights system quality and trust-related aspects of information systems as key predictors of user satisfaction and continued use. Additionally, this study incorporates perceived cost as an external factor influencing user attitudes, consistent with extended adoption frameworks that

emphasize cost-benefit evaluations in resource-constrained contexts<sup>35</sup>. Together, these constructs offer a comprehensive lens for examining EHR acceptance in Bangladesh. Figure 1 explains the research framework of the study. Hypotheses are formulated based on this research model.



**Figure 1:** Conceptual Research Framework

### Perceived Usefulness (PU) and Attitude towards EHRs

Perceived Usefulness (PU) refers to the extent to which patients believe that using an EHR system will improve their healthcare experience<sup>32</sup>. In the patient context, PU reflects how strongly users feel that accessing EHRs helps them receive faster services, better communication with providers, improves the accuracy of medical information, and greater involvement in their own care. Therefore, we propose the following hypothesis:

**H1: PU positively influences users' attitudes towards the use of EHRs.**

### Perceived Ease of Use (PEOU) and Attitude towards EHRs

PEOU refers to the extent to which patients believe that using an EHR system will be simple, straightforward, and require minimal effort<sup>32</sup>. Research indicates that when patients find digital health systems intuitive and easy to use, they develop more positive attitudes toward adopting them<sup>36</sup>. Based on the arguments following hypothesis is developed.

**H2: PEOU positively influences users' attitudes towards the use of EHRs.**

### System Quality (SQ) and Attitude towards EHRs

SQ refers to how well an EHR system performs technically, including its reliability, speed, accuracy, security, and ease of navigation<sup>34</sup>. When patients

perceive an EHR system as reliable and secure, they are more confident using it, which encourages a positive attitude toward adopting digital health tools. Hence, this study suggests the following hypothesis:

### **H3: SQ positively influences users' attitudes towards the use of EHRs**

#### **Perceived Trust (PT) and Attitude towards EHRs**

PT refers to the extent to which patients believe that an EHR system is secure, reliable, and capable of protecting their personal and sensitive health information while functioning as expected<sup>37</sup>. When patients trust that the system safeguards their data, prevents unauthorized access, and consistently performs well, they are more likely to feel comfortable using it, leading to a more positive attitude toward EHR adoption. Based on the arguments, this study hypothesizes:

### **H4: PT positively influences users' attitudes towards the use of EHRs.**

#### **Perceived Cost (PC) and Attitude towards EHRs**

PC refers to the extent to which patients believe that using an EHR system requires financial, time, or effort-related sacrifices<sup>38</sup>. When patients feel that using an EHR platform demands too much effort or creates additional burdens, their attitude toward adopting the system becomes less favorable. Perceived effort and time consumption can reduce users' willingness to engage with digital health tools. However, some research offers contradictory insights.<sup>33</sup> found that even when users perceived high costs or effort requirements, positive attitudes still emerged if they believed that the system significantly improved their healthcare experience or access to information. These findings suggest that although perceived cost can discourage EHR use among patients, its negative effect may be moderated by perceived benefits and the availability of adequate support.

### **H5: PC positively influences users' attitudes towards the use of EHRs.**

#### **Attitude towards EHRs and Behavioral Intention to EHRs**

Attitude towards EHRs plays a critical role in shaping patients' behavioral intention to use these systems. According to TAM, individuals who hold favorable attitudes toward a technology are more likely to develop strong intentions to use it<sup>32</sup>. In the context of EHRs, when patients perceive the system as beneficial, trustworthy,

and easy to use, they form positive attitudes, which directly enhance their intention to adopt or continue using EHR platforms. Therefore, this study proposes:

### **H6: Attitude towards EHRs positively influenced behavioral intention towards EHRs.**

#### **Research Methodology**

##### **Research Design, Population, and Sampling Technique**

An exploratory research design was used to complete this research for unveiling the relationship between independent and dependent variables<sup>39</sup>. The population of this study consists of young users who are university students, as they are more prone to adapt digital transition<sup>25</sup>. Purposive sampling technique was used to select the respondents. The respondents who were both university students and in the age group under 30 years were selected for this paper.

##### **Questionnaire Design and Measurement Items**

A structured questionnaire was created to collect responses from the respondents. The first section consists of demographic questions, and the second section consists of some constructs used for testing hypotheses. There was total 21 questions for all constructs. Constructs such as PU and PEOU were adapted from<sup>32,40</sup>, SQ items were from<sup>41</sup>, PT items were adapted from<sup>37</sup>, and PC items were from<sup>38,42</sup>. Finally, Attitude toward EHRs and Behavioral Intention to use EHRs were measured using items adapted from<sup>32</sup>. All the items were refined in this context.

##### **Pilot Testing, Data Collection, and Sample Size**

Three academic experts checked the questionnaire to validate its context. A pilot test was conducted by utilizing 15 respondents in February 2025 to ensure its clarity and ease of understanding. The actual data collection was from April 2025 to July 2025. The questionnaires were distributed both online and in printed form, resulting in 242 valid responses out of 300 distributed questionnaires (80.66% response rate), which is sufficient for quantitative analysis using PLS-SEM<sup>43</sup>. Moreover,<sup>44</sup> highlighted that the sample size of 200 is adequate for its hypothesis testing. Therefore, the final sample size of 242 respondents was deemed adequate to reliably test the structural relationships.

##### **Data Analysis Technique**

Initially, after collecting responses from the respondents, SPSS software version 28 was used to

analyze demographic information. Then Partial Least Squares Structural Equation Modelling (PLS-SEM) technique was used to test hypothesis using Smart-PLS 4.0 software. A measurement and structural model were employed to validate the reliability and validity of the items and test the proposed hypotheses, respectively. The common method bias was tested through variance inflation factors (VIFs), indicating all VIF values are below 3 that is under the threshold value <sup>45</sup>.

## RESULTS

### Demographic Analysis

The demographic information of the respondents is shown in Table 1. The majority of respondents were male participants (57%) compared to females (43%). As young users are the target population, data has been collected from those under 30 years. Most respondents belonged to the 26–30 years age group (57%), followed by those aged 20–25 years (43%). Regarding technology use, mobile phones were the most preferred device for accessing health information (92.6%), highlighting strong mobile technology adoption among participants.

**Table 1.** Demographic profile of the respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	138	57.0%
	Female	104	43.0%
Age Group	20–25 years	104	43.0%
	26–30 years	138	57.0%
Preferred Device for Health Info	Desktop	12	5.0%
	Tablet	6	2.5%
	Mobile Phone	224	92.6%

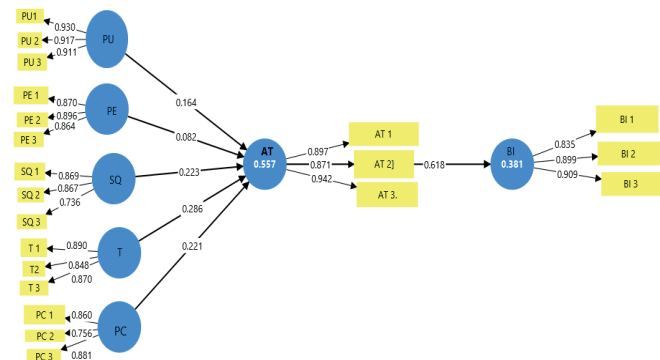
### Common Method Variance (CMV)

The dataset of the survey instrument was examined for common method variance (CMV) to mitigate any possible bias. The single factor test for this study, conducted by Harman (1976) revealed that one component explained 42.76% of the overall variance. The value, being under the suggested threshold value of 50%, indicates that no overarching factor predominates

the dataset. Consequently, for this study, CMV is not a substantial matter <sup>46</sup>.

### Measurement Model Analysis

Indicator reliability was examined using outer loadings, internal consistency reliability was assessed through Cronbach’s Alpha (CA) and Composite Reliability (CR), and convergent validity was evaluated using “Average Variance Extracted” (AVE). As shown in Table 2, all indicator outer loadings exceeded the recommended threshold of 0.70, indicating strong indicator reliability <sup>43</sup>. CA values ranged from 0.772 to 0.909, demonstrating acceptable to excellent internal consistency among the measurement items <sup>43</sup>. Similarly, CR values ranged from 0.865 to 0.943, further confirming the reliability of all constructs. Convergent validity was also established, as all AVE values were well above the minimum criterion of 0.50, ranging from 0.702 to 0.868 <sup>47</sup>. Overall, these results confirm that the measurement model is reliable and valid, supporting its suitability for subsequent structural model and hypothesis testing in the context of EHR adoption in Bangladesh.



**Figure 2:** Measurement model

**Table 2:** Measurement Model

Construct	Item Code	Outer Loading	CA	CR	AVE
Perceived Usefulness (PU)	PU1	0.930	0.909	0.943	0.868
	PU2	0.917			
	PU3	0.911			
Perceived Ease of Use (PE)	PE1	0.870	0.849	0.909	0.783
	PE2	0.896			
	PE3	0.864			

Construct	Item Code	Outer Loading	CA	CR	AVE
System Quality (SQ)	SQ1	0.869	0.772	0.865	0.702
	SQ2	0.867			
	SQ3	0.736			
Perceived Trust (PT)	PT1	0.890	0.839	0.903	0.771
	PT2	0.848			
	PT3	0.870			
Perceived Cost (PC)	PC1	0.860	0.782	0.872	0.752
	PC2	0.756			
	PC3	0.881			
Attitude Toward EHRs (AT)	AT1	0.897	0.888	0.931	0.828
	AT2	0.871			
	AT3	0.942			
Behavioral Intention (BI)	BI1	0.835	0.856	0.913	0.801
	BI2	0.899			
	BI3	0.909			

### Structural Model

Table 3 defines the  $R^2$  value for this model. The model represents 54.8% variance in Attitude towards EHRs and 38.1% in users' intention to use EHRs, respectively, indicating that the model fits well.

Table 3. Measurement of determination coefficient ( $R^2$ )

Constructs	R-square	R-square adjusted
AT	0.557	0.548
BI	0.381	0.379

The structural model was conducted to test hypotheses using bootstrapping technique. In Table 4, it is shown that All hypotheses except H2 are accepted PU ( $t = 2.733$ ,  $p = 0.007$ ), SQ ( $t = 3.780$ ,  $p = 0.000$ ), PT ( $t = 4.767$ ,  $p = 0.000$ ) and PC ( $t = 2.733$ ,  $p = 0.037$ ) significantly affect the attitude toward EHR, supporting H1, H3, H4 and H5. Moreover, AT ( $t = 11.236$ ,  $p = 0.000$ ) significantly has influence on behavioral intention to use HER that support H6.

**Table 4:** Structural model assessment for direct connections

Hypothesis	Path Coef. (O)	T-Value	P-Value	Decision
H1: (PU → BI)	0.164	2.733	0.007	Accept
H2: (PE → BI)	0.082	1.439	0.151	Reject
H3: (SQ → BI)	0.223	3.780	0.000	Accept
H4: (PT → BI)	0.286	4.767	0.000	Accept
H5: (PC → BI)	0.164	2.733	0.007	Accept
H6: (AT → BI)	0.618	11.236	0.000	Accept

\* at the significance level of  $< 0.05$ .

## DISCUSSION

This study investigated the factors influencing users' behavioral intention to adopt Electronic Health Records (EHRs) in Bangladesh by extending the TAM with constructs drawn from the IS Success Model and trust-related literature. The results demonstrate that PU has a significant positive effect on users' attitudes toward EHRs, which subsequently influences behavioral intention. Similar results have been reported in healthcare contexts, where PU significantly predicts favorable attitudes and intention to use EHRs and other eHealth systems<sup>33</sup>. In developing countries, perceived usefulness is particularly critical, as users are more inclined to adopt systems that demonstrably improve efficiency, reduce paperwork, and enhance clinical decision-making.

Conversely, PE was found to have an insignificant influence on attitude toward EHRs. This result is consistent with several recent studies suggesting that ease of use becomes less influential when users are already technologically competent<sup>48</sup>. In healthcare environments where professionals and users frequently interact with mobile applications and digital platforms, usability concerns may be secondary to system effectiveness and reliability.

The analysis further reveals that SQ has a significant positive impact on attitude toward EHRs. Prior studies

in healthcare information systems consistently report that reliable system performance, fast response time, and system stability enhance users' perceptions and acceptance of EHRs<sup>49</sup>. In the Bangladeshi healthcare context, where technical failures and infrastructure constraints are common, high system quality appears to be a crucial factor in shaping positive attitudes.

PT was also found to significantly influence users' attitudes toward EHRs. Empirical research in eHealth settings has shown that trust in data security, confidentiality, and institutional integrity significantly enhances acceptance of EHRs<sup>15</sup>. In Bangladesh, where concerns regarding data privacy and regulatory enforcement remain prominent, trust plays a decisive role in shaping user perceptions and willingness to engage with EHR systems.

The results also indicate that PC significantly affects users' attitudes toward EHRs. This finding is supported by studies conducted in developing and resource-constrained environments, where financial considerations often influence technology adoption decisions<sup>50</sup>. Costs related to internet connectivity, digital devices, and system access may indirectly shape attitudes toward EHRs, particularly among users from lower-income backgrounds.

Most importantly, attitude toward EHRs (AT) emerged as the strongest predictor of behavioral intention (BI), confirming its central role in the adoption process. This result is consistent with TAM and the TPB, which posit attitude as a direct antecedent of intention<sup>32,38</sup>. Previous studies in eHealth adoption have similarly reported that a positive attitude strongly predicts intention to use EHRs and other digital health systems<sup>16</sup>. In the Bangladeshi context, increasing digital literacy and exposure to mobile technologies may foster favorable attitudes, thereby accelerating EHR adoption.

Overall, the discussion confirms that extending TAM with system quality, trust, and perceived cost provides a more comprehensive explanation of EHR adoption behavior. The findings are well supported by similar studies in both developed and developing healthcare settings, highlighting the relevance of the proposed model.

### **Theoretical and Practical Implications**

This study offers both theoretical and practical

implications in revealing the young users' attitude toward using EHR systems in Bangladesh. Theoretically, this study integrates IS Success model with TAM and extends the model with perceived cost and perceived trust, enhancing existing literature on EHR adoption. This novel model combination advances the predictive power for users' attitude toward EHR and usage intention. Moreover, the strong explanatory power of the integrated model with R-square of 56% for attitude and 38% for intention reflects the robustness of the study and its theoretical contribution.

Practically, this study provides insightful guidance to healthcare providers, system designers, and policymakers in this discipline by discovering key predictors influencing the users attitude toward EHR and its subsequent adoption intention. System developers should design apps particularly focusing on mobile phone users as most users' access systems using mobile phones. Besides, service providers may drive attitude by improving system quality and trust among users, enabling easy and reliable document sharing. As trust and attitude are significant predictors of EHR adoption, healthcare companies should build user confidence through developing data governance, enhanced privacy and security measures. Government and non-government agencies develop awareness development programs to change individual's attitude towards EHR and its use.

### **Limitations and Future Research Avenues**

Although this study provides valuable insights, it has several limitations. First, use of cross-sectional data collection method, and young and literate sample groups limits the generatability of the study. Additionally, the study is based on a developing country's context. Hence, future studies may adopt longitudinal design to observe the changes in respondents' behavior over time and collect data from several age groups having differences in education level across various regions. Second, the current study employs only quantitative approach. Therefore, future studies integrating mixed method approach may provide comprehensive insights on EHR adoption, which may not be possible through quantitative approach only.

## CONCLUSION

This study aims at understanding the determinants of EHR adoption among young users of Bangladesh using an integrated TAM-IS success model. Primary data collect from Dhaka metropolitan area has been analyzed using PLS-SEM. Results show that Perceived usefulness, system quality, perceived trust and perceived cost influence attitude toward EHR, while attitude significantly impact behavioral intention. On the contrary, perceived ease of use has no significant impact on attitude. Young users who are literate and have sound technological knowledge value usefulness more than ease of use. Moreover, trust, cost and system quality play vital role in shaping users' perception toward EHR use. The findings also highlight that young user access EHR system mostly using mobile devices. This study enhances existing literature by combining TAM with IS success model in unveiling the young user perception to use EHR, which offers valuable insights for healthcare providers, healthcare system developers, and policymakers.

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