EXPLORING CREDIBILITY IN TECHNOLOGY ACCEPTANCE: A STUDY OF RADAR SENSORS FOR HEALTH MONITORING IN BINH DUONG SMART CITY, VIETNAM

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ABSTRACT

As Smart Cities continue to evolve, the integration of advanced technologies is crucial for enhancing urban living standards and optimizing city management. Non-invasive monitoring devices like radar sensors hold significant potential for providing real-time, contactless health monitoring, offering a feasible solution for improving public health in densely populated urban areas. This study explores the factors that influence the acceptance and intention to use radar sensors for health monitoring, with a specific focus on Perceived Credibility (PC) within the framework of the Technology Acceptance Model (TAM). A survey conducted among 222 participants who are living or working in Binh Duong Smart City examined the relationships between Perceived Ease of Use (PEOU), Perceived Usefulness (PU), PC, Attitude Toward Use (ATU), and Intention to Use (ITU) using Structural Equation Modeling (SEM). The results revealed that PC significantly impacts PU (β=5.062, p<0.001), while PEOU positively impacts PU (β=5.687, p<0.001), and ATU (β=3.150, p=0.002). These findings suggest that ease of use not only increases perceived benefits but also improves user attitudes. Additionally, PU strongly predicts ATU (β=6.000, p<0.001), and ATU is a key determinant of ITU (β=32.297, p<0.001), highlighting the crucial role of positive attitudes in driving adoption. These insights underscore the importance of trust in technology, ease of use, and perceived usefulness in shaping positive attitudes and facilitating the adoption of radar sensors. By enhancing perceived credibility, city planners and technology developers can effectively integrate these devices into Binh Duong Smart City's infrastructure, thus improving urban health outcomes and supporting the city's vision of becoming a leading smart urban environment.

Keywords: Smart City, Radar Sensors, Health Monitoring Devices, Technology Acceptance Model (TAM), Perceived Credibility

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INTRODUCTION

In today's age of advanced science and technology, non-invasive monitoring devices have revolutionized healthcare by offering seamless, real-time tracking of vital signs, ensuring early detection and management of health conditions. These cutting-edge technologies provide a comfortable and safe alternative to traditional methods, making quality healthcare more accessible and efficient (Batista et al., 2021).

Among these devices, advanced technologies such as radar sensors stand out by enabling continuous monitoring of vital signs like heart rate and respiration without direct physical contact. The Non-Invasive Monitoring Device Market, which was valued at USD 21.5 billion in 2024, is projected to grow at a compound annual growth rate (CAGR) of 7%, reaching an estimated USD 36.39 billion by 2031 (Verified Market Research, 2024) This growth is largely driven by the rising demand for remote patient monitoring solutions and the increasing prevalence of chronic diseases (Kalid et al., 2018). Smart healthcare systems leverage the Internet of Things (IoT), artificial intelligence (AI), and other advanced digital technologies to optimize patient care through real-time monitoring and personalized interventions. The deployment of non-invasive devices, such as radar sensors, facilitates continuous and efficient data collection, which enhances diagnostic accuracy and improves patient comfort. Furthermore, these technologies support remote monitoring and telemedicine, expanding access to healthcare services and potentially reducing associated costs (Ahad et al., 2020).

In the rapidly evolving landscape of healthcare technology, the acceptance and use of new devices are critical to their successful implementation. The Technology Acceptance Model (TAM) provides a comprehensive framework to understand the factors influencing users' acceptance of new technologies. TAM is widely applied across various domains, including healthcare, to assess how and why users decide to adopt or reject technological innovations (Davis, 1989; Holden & Karsh, 2010). By exploring key determinants of technology acceptance, TAM offers valuable insights into the behavioral intentions of users, which is essential for the successful integration of new devices in healthcare settings (Venkatesh & Davis, 2000; Holden & Karsh, 2010).

In addition to the core constructs outlined in TAM, factor such as Perceived Credibility (PC) emerged as significant influences on technology acceptance. Perceived credibility plays a pivotal role in the adoption of health technologies, as it directly influences users' trust and confidence in the system. Several studies have emphasized the significance of PC in healthcare technology adoption. For instance, research by Khan et al. (2021) demonstrated that Perceived Credibility significantly impacts healthcare professionals' perceptions of social media's usefulness in clinical settings. This study underscores that when healthcare professionals perceive a technology as credible, they are more likely to trust and utilize it, thereby enhancing its perceived usefulness.

While considerable research has explored the roles of perceived credibility in the adoption of health technologies, there remains a notable gap in understanding how these factors specifically influence the acceptance of non-invasive monitoring devices, such as radar sensors, within smart healthcare systems. Existing studies predominantly focus on general or wearable health technologies, leaving the unique challenges associated with non-contact, radar-based monitoring devices underexplored (Jeng et al., 2022; Vo et al., 2022).

The purpose of this research is to investigate the factors that influence the acceptance of radar sensors within smart healthcare systems, with a particular emphasis on the interaction of Perceived Credibility (PC) as outlined in the Technology Acceptance Model (TAM). This study explores the role of perceived credibility in fostering trust and encouraging the use of radar sensors, recognizing that credibility is crucial for the successful implementation of any new healthcare technology. Furthermore, this research aims to analyze how perceived credibility interacts with the core constructs of TAM, perceived ease of use and perceived

usefulness, to influence the overall acceptance and integration of radar sensors in healthcare practices. By providing strategic insights into how perceived credibility can be enhanced, this study aims to offer practical recommendations for improving the adoption rates of non-invasive monitoring devices like radar sensors, ultimately contributing to more effective implementation of advanced technologies in smart healthcare systems.

LITERATURE REVIEWS

Technology Acceptance in Healthcare

The adoption of new technologies in healthcare has become a critical area of study, especially as the industry increasingly embraces digital and patient-centered models of care. Various theoretical frameworks have been developed to understand the factors influencing technology adoption, with the Technology Acceptance Model (TAM) being one of the most influential. Introduced by Davis (1989), TAM is widely recognized for its ability to predict and explain user acceptance of technology across various domains. The model posits that perceived ease of use (PEOU) and perceived usefulness (PU) are the primary determinants of users' intentions to adopt and use a technology. PEOU refers to the degree to which a user believes that using a particular technology will be free of effort, while PU reflects the degree to which the user believes that the technology will enhance their performance. These two factors collectively shape users' attitudes toward the technology, influencing their behavioral intentions and eventual usage (Davis, 1989; Venkatesh & Davis, 2000; King & He, 2006).

Over recent years, TAM has been expanded and adapted to various healthcare contexts, where the adoption of new technologies can significantly impact patient outcomes and the efficiency of healthcare delivery. Researchers have applied TAM to a wide range of healthcare technologies, from electronic health records (EHRs) and telemedicine to wearable health devices and decision support systems. For instance, (Alaiad & Zhou, 2017) examined the adoption of home healthcare robots using an extended TAM, demonstrating that perceived usefulness and ease of use were significant predictors of acceptance. Similarly, a study conducted on the adoption of Personal Health Records (PHR) systems in Saudi Arabia utilized an extended TAM to investigate how self-determination in health management influences individuals' intention to adopt PHRs. The study found that perceived ease of use (PEOU), perceived usefulness (PU), and security were major factors influencing the intention to use PHR systems. Additionally, privacy was found to moderate the relationship between PEOU and intention to use, while usability moderated the relationships between PEOU, PU, and intention to use. This study provides critical insights into the factors driving the adoption of PHR systems and highlights the importance of addressing privacy and usability concerns in the implementation of such technologies (Alsyouf et al., 2023). These studies highlight the versatility and relevance of TAM in contemporary healthcare, making it a foundational model for understanding how new medical technologies are accepted and integrated into practice.

Perceived Credibility and Technology Acceptance in Healthcare

Perceived credibility (PC) is a critical factor in the adoption of healthcare technologies, influencing users' trust in the technology and their willingness to engage with it. In the healthcare context, where accuracy, reliability, and security of information are paramount, perceived credibility significantly impacts whether a new technology will be accepted by healthcare professionals and patients. For example, research has shown that users are more likely to adopt mobile health (mHealth) services if they perceive the platforms as credible and trustworthy, which is crucial for ensuring that patients feel comfortable sharing sensitive health data and relying on the technology for critical health decisions (Deng et al., 2018). Additionally, the role of perceived credibility has been highlighted in examining the adoption of social media by healthcare professionals, where it was found to significantly influence the perceived usefulness of the technology, ultimately affecting their usage behavior (Khan et al.,

2021). In particular, the trust that users place in these technologies can drive their intention to adopt and use them regularly, making perceived credibility a key determinant in the successful implementation of healthcare innovations (Wang et al., 2022).

The Technology Acceptance Model (TAM) has been extensively used to understand the adoption of healthcare technologies, with a focus on perceived ease of use (PEOU) and perceived usefulness (PU) as key determinants of technology acceptance. Recent studies have expanded TAM to include factors such as perceived credibility, highlighting its importance in the adoption process. For instance, research on the adoption of electronic health records (EHRs) has found that perceived credibility, including aspects such as data security and system reliability, significantly influences healthcare professionals' perceptions of a technology's usefulness and ease of use (Holden & Karsh, 2010). Moreover, studies integrating TAM with other behavioral models, such as the Theory of Planned Behavior (TPB), demonstrate that perceived credibility can enhance users' trust in mobile medical platforms, thereby increasing their willingness to adopt and consistently use these technologies (Wang et al., 2022). These findings underscore the critical role of perceived credibility in the successful adoption and integration of healthcare technologies.

Binh Duong Smart City and the Relevance of Smart City to Healthcare Technology Acceptance

Binh Duong Smart City, located in Vietnam's Binh Duong province, is a flagship project aimed at transforming the region into a modern, innovative, and sustainable urban center. The initiative is part of the larger Binh Duong New City plan, which focuses on integrating advanced technologies across multiple sectors, including healthcare, transportation, and public services. The city's development strategy is heavily influenced by Industry 4.0 principles, with a strong emphasis on digitalization, connectivity, and smart infrastructure (Policy and Law, 2024). According to Ho et al. (2023), the government's initiatives and development strategies for Binh Duong Smart City are centered on creating a highly interconnected and efficient urban environment that leverages technological advancements to improve public services, particularly in healthcare. These innovations are supported by a robust digital infrastructure that facilitates real-time data collection and analysis, enabling more effective and personalized healthcare services. As a result, Binh Duong Smart City is positioning itself as a model for other regions in Vietnam and Southeast Asia, demonstrating the potential of smart cities to enhance the quality of life and drive economic growth through technological advancement (De Guimarães et al., 2020).

Globally, the concept of smart cities has gained significant traction, particularly in its application to healthcare. Smart cities are designed to leverage advanced technologies to create interconnected, efficient, and sustainable urban environments (Caragliu et al., 2011). This includes the adoption of smart healthcare technologies, which are essential for managing the health needs of growing urban populations (Neirotti et al., 2014). The Technology Acceptance Model (TAM) is frequently used to study how residents of smart cities perceive and adopt these new healthcare technologies (Venkatesh et al., 2012). Research has shown that perceived ease of use and perceived usefulness are critical factors influencing the adoption of healthcare technologies in smart cities. For instance, studies have highlighted that in smart cities, residents are more likely to adopt health-related technologies if they find them easy to use and believe they will significantly improve their health outcomes (Neirotti et al., 2014). Furthermore, the integration of smart healthcare within the broader smart city infrastructure can enhance user acceptance by providing seamless and interconnected services that improve overall healthcare delivery. Understanding these dynamics is crucial for the successful implementation of smart healthcare initiatives in urban environments worldwide (Ghazal et al., 2023).

Research Framework

Hypotheses Development

The successful adoption of radar sensors in smart healthcare systems heavily depends on users' trust in the technology, particularly its Perceived Credibility (PC). In healthcare, where accuracy and reliability are crucial, the credibility of a technology significantly influences its perceived usefulness. If users trust the radar sensors to be reliable and accurate, they are more likely to perceive them as beneficial in their healthcare practice (Wang et al., 2022). This relationship is critical, as trust in the technology directly enhances its perceived usefulness, leading to the hypothesis:

H1: Perceived Credibility (PC) positively influences Perceived Usefulness (PU)

Beyond credibility, the Technology Acceptance Model (TAM) provides a framework for understanding how Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) influence user attitudes and intentions towards technology adoption. When users find radar sensors easy to use (PEOU), they are more likely to perceive them as useful (PU), leading to a positive attitude toward their use (ATU). This favorable attitude then directly influences their Intention to Use (ITU) the technology (Davis, 1989; Venkatesh, 2000). Based on these relationships, the following hypotheses are proposed:

H2: Perceived Ease of Use (PEOU) positively influences Perceived Usefulness (PU)

H3: Perceived Usefulness (PU) positively influences Attitude Toward Use (ATU)

H4: Perceived Ease of Use (PEOU) positively influences Attitude Toward Use (ATU)

H5: Attitude Toward Use (ATU) positively influences Intention to Use (ITU).

Research Model

To understand the factors influencing the adoption of radar sensors in smart healthcare systems, it is essential to examine the interplay between various user perceptions and attitudes. The Technology Acceptance Model (TAM) offers a robust framework for exploring how Perceived Ease of Use (PEOU), Perceived Usefulness (PU), and Attitude Toward Use (ATU) drive the Intention to Use (ITU) new technologies. Additionally, in the context of healthcare, Perceived Credibility (PC) emerges as a critical factor, given the high stakes associated with trust and reliability in medical devices. By integrating these constructs, this study aims to develop a nuanced understanding of how these factors collectively influence the adoption of radar sensors. The proposed research model (Figure 1), grounded in TAM and extended to include Perceived Credibility, provides a structured approach to testing these relationships and offers valuable insights into the determinants of technology acceptance in healthcare environments.

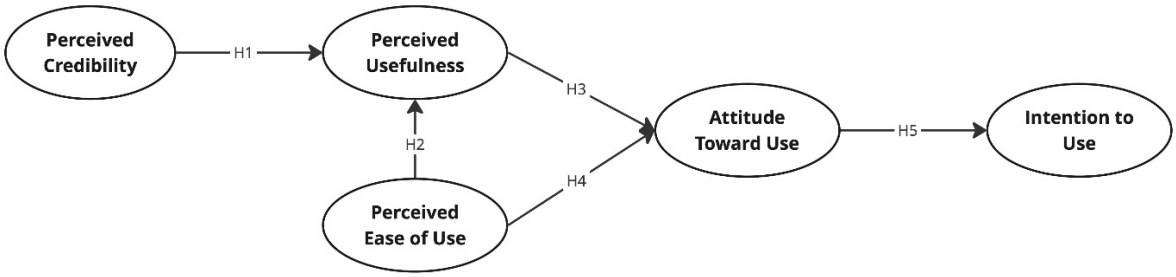


Figure 1 Proposed Research Model

RESEARCH METHODOLOGY

Sample

The study targets a sample of 222 participants residing or working in Binh Duong Smart City. A convenience sampling method will be used to select participants, as it allows for efficient data collection while ensuring a diverse representation of the population. Convenience sampling is particularly suitable for exploratory studies like this one, where participant accessibility is a priority (Bornstein et al., 2013). While convenience sampling has its

limitations, such as potential biases due to non-random selection, it remains a practical choice for studies where the goal is to gather data from a specific population that is readily available and willing to participate. The chosen sample size of 222 is deemed sufficient for conducting Structural Equation Modeling (PLS-SEM), as typically requires a minimum sample size of around 200 to ensure the stability and reliability of the model's estimates (Hair et al., 2009; Kline, 2023). This sample size allows for the testing of the complex relationships proposed in the extended TAM framework, providing reliable insights into the factors influencing the intention to use radar sensors in a smart city context.

Data Collection

Data will be collected using a structured questionnaire designed to measure the key constructs. Table 1 provides a comprehensive overview of each construct measured in the survey on the intention to use radar sensors in a smart care system. It details the number of items, measurement scales, purposes, and explanations for each construct, along with relevant academic references that support the constructs within the framework of the TAM.

Data Analysis

The data analysis for this study followed a structured approach to examine the relationships between the constructs of the Technology Acceptance Model (TAM) and Perceived Credibility (PC) in predicting the adoption of radar sensors in smart healthcare systems. First, descriptive statistics were calculated to summarize the demographic characteristics of the sample, including age, gender, education level, occupation, and income, providing an overview of the participants and assessing the sample's representativeness. Next, the reliability and validity of the measurement instruments were evaluated using Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), with all values indicating strong internal consistency and convergent validity. Confirmatory Factor Analysis (CFA) was then conducted, with factor loadings above 0.7 and goodness-of-fit indices of the measurement model (Nunnally, 1978). Structural Equation Modeling (PLS-SEM) was employed to test the hypothesized relationships among the TAM constructs (Perceived Ease of Use, Perceived Usefulness, Attitude Toward Use, and Intention to Use) and PC, revealing significant path coefficients that supported the proposed hypotheses. Additionally, mediation analysis was performed to explore the potential mediating role of PC, with significant indirect effects observed. The overall model fit was confirmed through several indices, indicating that the model effectively explained the relationships between the constructs. This comprehensive analysis provided robust evidence supporting the study's theoretical framework, demonstrating that both usability and credibility are crucial for the successful adoption of radar sensors in smart healthcare systems.

Table 1 Detailed Explanation of Constructs Measured

Construct	Items	References
Perceived Ease of Use (PEOU)	PEOU1: Using the radar sensor would be easy for me	Davis (1989); Venkatesh (2000)
	PEOU2: Learning to operate the radar sensor would be easy for me	
	PEOU3: I think the radar sensor would be user-friendly	
	PEOU4: The radar sensor would require little effort to use	
Perceived Usefulness (PU)	PU1: Using the radar sensor would enhance my health monitoring capabilities	Davis (1989); Venkatesh (2000)
	PU2: The radar sensor would improve the effectiveness of my health management	
	PU3: I think the radar sensor would be useful for my health needs	

Construct	Items	References
	PU4: Using the radar sensor would provide me with valuable health information	
Perceived Credibility (PC)	PC1: I would trust the information provided by the radar sensor	Khan et al. (2021); Wang et al. (2022)
	PC2: I would consider the radar sensor to be reliable	
	PC3: I would feel confident in the accuracy of the radar sensor	
	PC4: I think the radar sensor is a trustworthy device	
Attitude Toward Use (ATU)	ATU1: I would have a positive attitude towards using the radar sensor	Davis (1989)
	ATU2: I think using the radar sensor is a good idea	
	ATU3: I would enjoy using the radar sensor	
	ATU4: I think the radar sensor would be beneficial for my health	
Intention to Use (ITU)	ITU1: I intend to use the radar sensor regularly if available	Davis (1989); Venkatesh (2000)
	ITU2: I plan to use the radar sensor in the future	
	ITU3: I would recommend the radar sensor to others	
	ITU4: I am likely to purchase a radar sensor for personal use	

RESEARCH RESULTS

Demographic Result

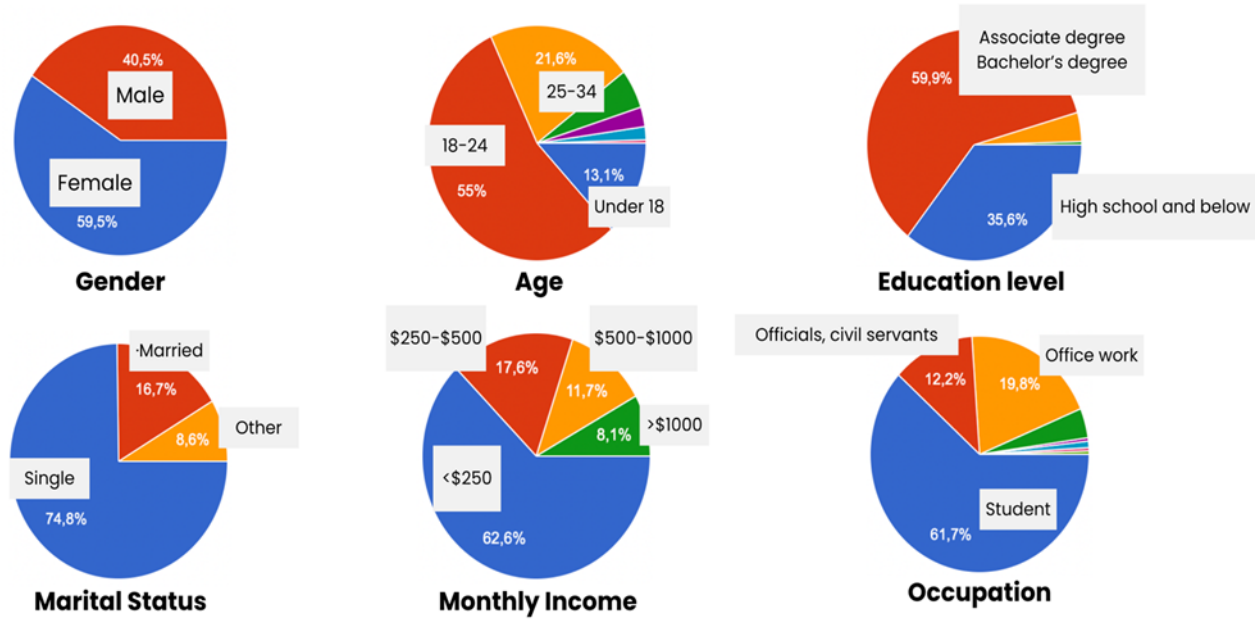


Figure 2 Demographics of respondents (N=222)

The study sample of 222 participants from Binh Duong Smart City predominantly consisted of females (59.5%) and younger individuals, with 55% aged 18-24. Most participants held an Associate or Bachelor's degree (59.9%), and the majority were single (74.8%). Income levels were generally low, with 62.6% earning below 5,000,000 VND (~$250) monthly, and the largest occupational group was students (61.7%).

Measurement Model

Table 2 above demonstrated strong reliability and validity across all constructs, with high factor loadings (all above 0.8), Cronbach's Alpha values exceeding the 0.7 threshold (ranging from

0.892 to 0.957), and Composite Reliability values also indicating excellent internal consistency (ranging from 0.925 to 0.969). The Average Variance Extracted (AVE) for each construct was well above the recommended, with values ranging from 0.755 to 0.885, confirming the convergent validity of the constructs (Nunnally, 1978). These results collectively suggest that the constructs, Perceived Credibility (PC), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Attitude Toward Use (ATU), and Intention to Use (ITU), are measured reliably and are valid representations of the theoretical concepts they are intended to capture, providing a solid foundation for analysis in the research.

The fit of the research model, showed in Table 3 above, evaluated using several indices, comparing the Saturated Model and the Estimated Model. The Standardized Root Mean Square Residual (SRMR) values for both models were below the recommended threshold of 0.08, with the Saturated Model at 0.043 and the Estimated Model at 0.074, indicating a good fit. The discrepancy indices, d_ULS and d_G, were higher in the Estimated Model (d_ULS = 1.161, d_G = 0.615) compared to the Saturated Model (d_ULS = 0.388, d_G = 0.519), suggesting some deviation but still within acceptable limits. The Chi-Square statistic was slightly higher for the Estimated Model (762.621) than the Saturated Model (687.384), which is typical as the Estimated Model reflects constrained parameters. Finally, the Normed Fit Index (NFI) was slightly lower in the Estimated Model (0.863) compared to the Saturated Model (0.877), indicating a slightly less optimal fit, but still close to the recommended threshold of 0.90. Overall, these indices suggest that the model provides an adequate fit to the data, supporting its validity.

Table 2 Factor Loading and Reliability Test

Constructs	Items	Factor Loading	Cronbach's Alpha	Rho_A	Composite Reliability	AVE
PC	PC1	0.932	0.956	0.956	0.968	0.883
	PC2	0.947				
	PC3	0.941				
	PC4	0.939				
PU	PU1	0.953	0.957	0.957	0.969	0.885
	PU2	0.932				
	PU3	0.953				
	PU4	0.926				
PEOU	PEOU1	0.857	0.892	0.894	0.925	0.755
	PEOU2	0.889				
	PEOU3	0.863				
	PEOU4	0.866				
ATU	ATU1	0.926	0.933	0.935	0.952	0.833
	ATU2	0.927				
	ATU3	0.869				
	ATU4	0.928				
ITU	ITU1	0.924	0.930	0.933	0.950	0.826
	ITU2	0.930				
	ITU3	0.902				
	ITU4	0.878				

Note: Perceived Credibility (PC); Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Attitude Toward Use (ATU); Intention to Use (ITU)

Table 3 Model Fit

	Saturated Model	Estimated Model
SRMR	0.043	0.074
d_ULS	0.388	1.161
d_G	0.519	0.615
Chi-Square	687.384	762.621
NFI	0.877	0.863

Finalized Model and Hypothesis Analysis

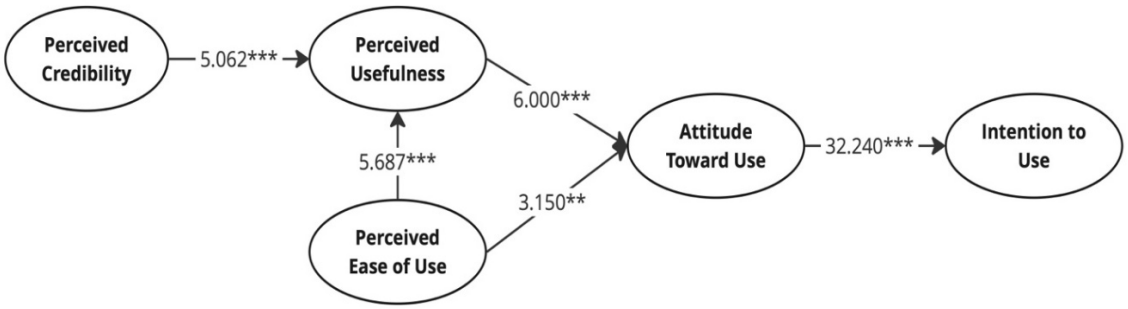
The results (Table 4) strongly support the proposed hypotheses. The analysis revealed that Perceived Credibility (PC) exerts a significant positive influence on Perceived Usefulness (PU) ($\beta = 5.062$, $p < 0.001$), supporting H1. This finding underscores the importance of credibility in shaping users' perceptions of the usefulness of radar sensors in healthcare contexts. Similarly, Perceived Ease of Use (PEOU) was found to positively affect Perceived Usefulness (PU) ($\beta = 5.687$, $p < 0.001$), supporting H2. This result highlights that ease of use is a critical determinant of the perceived value of these technologies.

Table 4 Summary of Hypotheses Testing Results

Hypothesis	Path	Standard Deviation	Path Coefficient	*t* value	*p*-value	Result
H1	PC→PU	0.095	5.062	5.008	<0.001	Supported
H2	PEOU→PU	0.082	5.687	5.568	<0.001	Supported
H3	PU→ATU	0.100	6.000	6.016	<0.001	Supported
H4	PEOU→ATU	0.097	3.150	3.143	0.002	Supported
H5	ATU→ITU	0.026	32.240	32.297	<0.001	Supported

Note: Perceived Credibility (PC); Perceived Ease of Use (PEOU); Perceived Usefulness (PU); Attitude Toward Use (ATU); Intention to Use (ITU)

Furthermore, the results indicate that Perceived Usefulness (PU) significantly influences Attitude Toward Use (ATU) ($\beta = 6.000$, $p < 0.001$), supporting H3. This relationship suggests that users who perceive high usefulness are more likely to develop a favorable attitude toward the technology. The analysis also confirmed a positive impact of Perceived Ease of Use (PEOU) on Attitude Toward Use (ATU) ($\beta = 3.150$, $p = 0.002$), supporting H4. Finally, Attitude Toward Use (ATU) was found to have a robust and significant positive effect on Intention to Use (ITU) ($\beta = 32.240$, $p < 0.001$), supporting H5. This strong relationship underscores the pivotal role of user attitude in predicting the intention to adopt radar sensors within smart healthcare systems. Collectively, these findings validate the research model, emphasizing the interplay of credibility, ease of use, usefulness, and attitude in determining the adoption of new healthcare technologies.



Note: $p<0.01$**; $p<0.001$***

Figure 3 Finalized Model

DISCUSSION

Perceived Credibility and Its Impact on Technology Adoption

The study finds that Perceived Credibility (PC) is a significant factor in determining the acceptance and use of radar sensors in healthcare settings. Users who perceive the technology as reliable, accurate, and secure are more likely to trust it, which in turn enhances its perceived usefulness (PU) and ease of use (PEOU). This finding aligns with Gefen et al. (2003), who emphasized that trust is a critical factor in technology adoption, particularly in environments where users are concerned about privacy and security. The strong correlations observed between PC, PU, and PEOU suggest that establishing credibility is essential for overcoming resistance to new technologies. In healthcare, where trust in technology is paramount due to the sensitive nature of patient data and the critical outcomes at stake, perceived credibility becomes a key driver of adoption. This finding is consistent with the work of Wang et al. (2022), which highlights the importance of credibility in enhancing users' trust in mobile medical platforms, thereby increasing their willingness to adopt these technologies. This study underscores the importance of incorporating strategies to build and maintain credibility in the design and implementation of radar sensors to ensure their successful adoption.

Strength of TAM Constructs

The core constructs of the Technology Acceptance Model, Perceived Usefulness and Perceived Ease of Use, are reaffirmed as crucial determinants of technology adoption. The study confirms that these factors significantly influence users' attitudes toward radar sensors and their behavioral intentions to adopt and use these devices. This finding is consistent with Davis (1989) and Venkatesh et al. (2012), who established that perceived usefulness and ease of use are key determinants of user acceptance of technology. When users perceive that a technology is easy to use, they are more likely to find it useful, which fosters a positive attitude toward its adoption. This relationship highlights the need for user-centered design in developing radar sensors, ensuring that the technology is both intuitive and capable of improving the efficiency and effectiveness of healthcare delivery. The positive impact of PEOU and PU on the intention to use radar sensors emphasizes the ongoing need to focus on enhancing both the functionality and user-friendliness of healthcare technologies, as supported by Alsyouf et al. (2023), who demonstrated that usability and perceived usefulness are significant predictors of technology adoption in healthcare.

This study significantly contributes to the understanding of technology acceptance in healthcare by highlighting the critical role of Perceived Credibility alongside the traditional constructs of TAM. The results suggest that for radar sensors to be effectively integrated into smart healthcare systems, they must be designed with a strong focus on usability, reliability, and the establishment of trust. These elements are essential for ensuring that healthcare technologies are not only accepted by users but are also seamlessly integrated into everyday healthcare practices, leading to improved outcomes and more efficient healthcare delivery.

Implications

Theoretical Implications

The research extends the Technology Acceptance Model (TAM) by highlighting the critical role of perceived credibility in technology adoption. While TAM traditionally focuses on perceived usefulness (PU) and perceived ease of use (PEOU), this study suggests that perceived credibility is equally important, especially in contexts where trust and security are paramount. (Zin et al., 2023) reinforce this by showing that perceived usefulness and ease of use significantly influence attitudes toward technology adoption, particularly among older adults using digital healthcare wearables. This finding supports the notion that any comprehensive model of technology acceptance must include factors related to user trust and credibility. Additionally, the integration of perceived credibility into TAM aligns with (Gefen et al., 2003), who argue that trust is a fundamental component in extending TAM to online and digital

environments. These insights suggest that future theoretical models should consider perceived credibility as a core factor when predicting technology adoption in sensitive and trust-dependent domains such as healthcare and smart cities.

Practical Implications

In practical terms, the study underscores the necessity for developers to design radar sensors that are user-friendly and provide clear, practical benefits. Perceived usefulness and ease of use are key drivers of technology adoption, a principle that remains relevant in the development of smart city technologies (Kashef et al., 2021). The study by Zin et al. (2023) further highlights the importance of these factors, particularly in ensuring that the technology is accessible to a wide range of users, including older adults. This suggests that radar sensor technology should be designed with simplicity and practicality in mind to enhance user acceptance and integration into daily life.

Moreover, the importance of providing robust technical support and clear operational guidelines is emphasized by Holden and Karsh (2010), who found that the availability of support and training is crucial for the successful implementation of new technologies. For radar sensors in smart cities, ensuring that users have access to comprehensive support and clear instructions will be vital in overcoming initial resistance and ensuring successful adoption. By integrating these implications, both researchers and practitioners can better navigate the challenges of implementing advanced technologies like radar sensors, ultimately contributing to more effective and widespread adoption in urban environments.

Limitations and Future Research

This study provides valuable insights into the adoption of radar sensor technology in smart cities but is subject to several limitations. The research focuses on a specific sample from Binh Duong Smart City, which may limit the generalizability of the findings to other regions with different socio-economic and cultural contexts. The cross-sectional design captures data at a single point in time, which does not account for changes in user attitudes and behaviors over time, and the reliance on self-reported data introduces potential biases. Additionally, the study primarily focuses on constructs within the Technology Acceptance Model (TAM) and perceived credibility, without fully exploring other external factors such as economic conditions, cultural norms, and individual psychological traits that could influence technology adoption.

Future research should address these limitations by expanding the scope and methodology. Conducting studies across multiple regions and employing a longitudinal design would provide a more comprehensive and generalizable understanding of technology adoption. Exploring additional external variables like economic and cultural influences, as well as individual traits, could offer deeper insights into the complex dynamics of technology adoption. Additionally, employing mixed methods approaches, combining quantitative surveys with qualitative interviews, could enrich the context and understanding of user experiences and motivations, ultimately enhancing the effectiveness and adoption of smart city technologies like radar sensors.

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