## A Conceptual Model of Sustainable Technology Use: The Role of Confirmation and Perceived Usefulness in the Hospital X Management Information System in Padang

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**Abstract:** *Background and Objective*: The adoption and use of Management Information Systems (MIS) in healthcare settings, like Hospital X in Padang, are crucial for improving operational efficiencies and patient care. Task-Technology Fit (TTF) measures how well technology supports its intended tasks and significantly influences user satisfaction and system use continuity. Key factors include Confirmation, assessing post-adoption user expectations, and Perceived Usefulness (PU), evaluating job performance enhancement. This study explores TTF's impact on Continuance Intention (CI), mediated by Confirmation and PU, within Hospital X's MIS context.

*Methods*: Data were gathered from staff at H.B. Saanin Mental Hospital, one of West Sumatera's public hospitals. A total of 158 questionnaires were distributed, with 150 deemed analyzable using structural equation modeling.

*Result*: The study finds no statistically significant relationship between TTF and PU. However, a marginally significant relationship between TTF and Confirmation suggests modest evidence that alignment between tasks and technology influences users' confirmation of their expectations. Notably, PU does not directly impact CI within Hospital X's MIS, nor does Confirmation significantly affect users' intention to continue using the system. Overall, the direct influence of technology-task alignment on users' intention to continue using MIS is inconclusive in this study context.

*Conclution*: This study reveals complex relationships among TTF, Confirmation, PU, and CI within Hospital X's MIS framework. Despite the theoretical significance of TTF and Confirmation, their direct impacts on PU and users' intention to continue system use are not statistically significant. These findings emphasize the ongoing need to evaluate and adapt MIS strategies to better align with user needs and ensure sustained effectiveness in healthcare operations.

**Keywords:** Task Technology Fit, Perceived Usefulness, Continuance Intention, Management Information System, Hospital.

#### INTRODUCTION

Hospitals are continuously required to improve medical services, reduce medical errors, provide timely and accurate information access, monitor service activities, and control operational costs. To meet these demands, the implementation of hospital services utilizing information technology, specifically through the use of integrated, computer-based Hospital Management Information Systems (HMIS), enables real-time, precise, and accurate information sharing [1-4]. HMIS is an information communication technology system that processes and integrates the entire flow of hospital service processes into a cohesive network of coordination, reporting, and administrative procedures to ensure the precise and accurate retrieval of information. This system constitutes a critical component of the Health Information System [5]. The obligation to implement HMIS in Indonesia was mandated by the Ministry of Health in a law enacted in 2013 [6].

The effective implementation of HMIS significantly impacts service quality and decision-making within healthcare institutions. Inadequate or improper implementation of it can lead to human errors and mismanagement in patient data recording and information retrieval, prolonged waiting times, suboptimal patient flow management in outpatient services, and errors in medication prescription at pharmacies [7]. Conversely, proper implementation of HMIS positively influences management efficiency and facilitates informed decision-making for future planning [8].

HMIS play an important role in improving operational efficiency and quality of health services. Around the world, many hospitals have adopted HIMS to optimize workflow, reduce medical errors, and improve patient safety [9]. This trend is also reflected in Indonesia, where many hospitals, including Hospital X in Padang, have implemented HMIS. However, successful implementation of HMIS depends not only on initial adoption, but also on continued use. In this context, confirmation and perceived usefulness are key

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factors that influence whether the technology will be used sustainably by hospital staff. Confirmation refers to the extent to which the user's expectations of the system are met after its use, while perceived usefulness reflects how much the user feels the benefits of the system in his daily work [10]. Task Technology Fit (TTF) refers to the degree to which a technology assists individuals in performing their tasks effectively. It is a concept used to evaluate how well a technology aligns with the requirements of the tasks it supports. In simpler terms, TTF assesses whether the technology provides the necessary functionality and features to help users accomplish their work more efficiently and effectively [11,12].

This research focuses on Hospital X in Padang, which has been running HIMS since 2015 called SEJIWA (Mental Hospital Electronic System). This application is a communication media for all information technology system that processes and integrates the entire hospital, such as medical records, polyclinic, outpatient registration, outpatient cashier, inpatient, laboratory, casemix, finance, service sector, nursing, pharmacy, and radiology. It also and integrated hospital between sections and units, reporting and administrative procedures to obtain precise and accurate information and to support the running of the home service process made by hospital's IT unit.

This study aims to investigate the impact of TTF on the continuance intention of users to adopt and utilize in Hospital. Specifically, it seeks to understand how TTF influences perceived usefulness and confirmation, and how these factors collectively affect the users' intention to continue using the technology. By examining these relationships, the study aims to provide insights into the critical factors that drive technology offer sustained usage and to recommendations for enhancing the alignment between technology and task requirements to improve user satisfaction and technology adoption.

The importance of this research lies in its contribution to the literature on the adoption and sustainability of information technology in the health sector. In addition, it is hoped that the results of this research can provide practical recommendations for hospitals in overcoming challenges related to the use of HIMS, thereby increasing the efficiency and effectiveness of hospital operations.

This application evaluation was conducted to identify issues and assess the quality of the information

system based on user perceptions. This was necessary because no evaluation had been conducted since the system began operating in 2021. In the initial evaluation, several variables were tested. To the authors' knowledge, no prior empirical research in health organizations has focused on these relationships. Consequently, this paper aims to provide new insights into fostering hospital employees.

#### **METHODS**

The research was conducted at a governmentowned psychiatric hospital in West Sumatra. This hospital is one of the leading facilities in the region, providing comprehensive mental health services. The research took place from January to March 2024.

## **Study Design**

This research employs a descriptive cross-sectional design to investigate the sustainable use of the Hospital Management Information System (HMIS) at Hospital X in Padang. The study focuses on the roles of confirmation and perceived usefulness in influencing the continued use of the system. Data were collected through surveys, observation and interviews conducted with hospital staff who interact with the HMIS.

This study proposes that Task Technology Fit (TTF) is directly related to Perceived Usefulness (PU) and Confirmation (Conf). Perceived Usefulness (PU) is directly related to Confirmation (Conf), and Confirmation (Conf) is directly related to Continuance Intention (CI). Furthermore, Perceived Usefulness (PU) is indirectly related to, or mediates the assumed relationship between Task Technology Fit (TTF) and Confirmation (Conf).

The relationship between Task-Technology Fit (TTF), Confirmation, Perceived Usefulness (PU), and Continuance Intention (CI) represents a complex interplay of factors that influence technology adoption and continued use. TTF serves as the foundation by measuring how well technology capabilities match user task requirements, which directly influences users' confirmation of expectations. When users experience a good fit between technology and tasks, it typically leads to positive confirmation, which in turn enhances their perception of usefulness (PU). This enhanced PU, stemming from both TTF and confirmation experiences, plays a crucial role in shaping users' continuance intention (CI). The relationship flows in a chain where strong TTF contributes to positive confirmation, leading

to higher PU, which ultimately strengthens CI. Additionally, confirmation can directly affect CI, as positive experiences meeting or exceeding expectations naturally encourage continued system use. This integrated model highlights how these components work together to influence users' longterm commitment to technology use, with each factor playing a distinct yet interconnected role in the overall user experience and system success.

## **Study Participants**

The participants of this study included staff members from various departments of Hospital X, including medical records, polyclinic, outpatient registration, outpatient cashier, inpatient, laboratory, casemix, finance, service sector, nursing, pharmacy, and radiology. A total of 158 staff members were selected using a stratified random sampling technique to ensure representation from all relevant departments.

## **Data Collection**

Data were collected in Maret 2024 using a structured questionnaire and semi-structured interviews: The questionnaire was designed to assess the levels of confirmation and perceived usefulness of the HMIS among the hospital staff. It included demographic information, questions on system usage, and items measuring confirmation and perceived usefulness based on established scales. Responses were recorded on a five-point Likert scale ranging from "strongly disagree" to "strongly agree". It is continued by observation and Semi-structured interviews to gain deeper insights into staff experiences and perceptions of the HMIS.

## Variables

The key variables in this study include:

- Confirmation: The degree to which users' expectations of the HMIS match their actual experiences.
- Perceived Usefulness: The extent to which users believe that using the HMIS enhances their job performance.
- Sustainable Use: The continued use of the HMIS over time.
- Task-Technology Fit: The higher performance and user satisfaction, which can influence the continued use of the technology.

## Data Analysis

Descriptive statistics were used to summarize the demographic characteristics of the participants and the responses to the questionnaire items. Structural equation modeling (SEM) was employed to examine the relationships between confirmation, perceived usefulness, and sustainable use of the HMIS.

In the statistical analysis of data using the SEM PLS method, the following techniques are employed [13]:

- a) Outer Model Analysis: This analysis is conducted to ensure that the measurements used are valid and reliable. Several calculations are involved in this analysis:
  - Convergent Validity: This assesses the validity of each predictor against a composite score determined by the magnitude of the loading factor. A predictor or item is considered valid if the loading factor is greater than 0.7. Convergent validity can also be determined based on the AVE (Average Variance Extracted) value, with a predictor deemed valid if the AVE value is greater than 0.5.
  - Discriminant Validity: This assesses the validity of a predictor by comparing its correlation with other variables, determined by cross-loadings. A predictor or item is considered valid if the crossloading is greater than 0.7 or if the loading value on its own latent variable is greater than its loading value on other variables.
  - Reliability: This is determined based on Cronbach's alpha and Composite Reliability values. A predictor is considered reliable if both the Cronbach's alpha and Composite Reliability values are greater than 0.7.
- b) Inner Model Analysis: This analysis is used to examine the relationships between latent constructs. Several calculations are involved in this analysis:
  - R<sup>2</sup> (R-Square): This measures the degree of variation in the dependent variable explained by the independent variables.
  - Path Coefficient Values: These are indicated by the T-statistic value, with a rule of thumb for hypothesis testing being a T-statistic value greater than 1.96.

#### RESULTS

#### Subject's Characteristics

A total of 158 healthcare workers involved in the MIS program across the hospital were included and agreed to participate in this study. All respondents were interviewed using closed-ended questions. Table **1** provides a summary of the participants' demographic and occupational characteristics. Most of the subjects in this study were female (73.4%), aged between 26 and 35 (52.5%), and had been employed for 5-10 years (44.9%).

# Table 1: Personal Characteristics of the Study Sample (N=158)

		Percent
Sox	Male	26,6
UCA	Female	73,4
	<5 years	34,8
Employed	5-10 years	44,9
	>10 years	20,3
	26-35	52,5
Age	36-45	29,1
	>45	18,4

The initial model included indicators such as Organizational Factors, System Quality, Technology Factors, Task-Technology Fit, Confirmation, Continuance Intention, and Performance Impact, as shown in Figure **1**. This model was adopted from Cheng in 2019 and 2020 [14,15] by combining two models from previous studies. The design was illustrated by connecting the latent variables, followed by testing the construct validity and reliability by examining the loading factor values.

The final results showed that the variables Organizational Factors, System Quality, Technology Factors, and Performance Impact could not be retained due to their low loading factor values <0,7 [16]. The testing was continued by applying only the variables Confirmation, Task-Technology Fit, Perceived Usefulness, and Continuance Intention as constructs, as shown in Figure **2**.

The measurement model or outer model analysis was used to test the relationship between latent variables and their indicators. This analysis ensures each construct's feasibility, which must be valid and reliable.

As illustrated in Fig. (2), the conceptual model of this study includes both direct and indirect relationships. This study proposes that Task



Figure 1: Conceptual framework.



Figure 2: Research hypothesis model path.

Table 2:	Latent v	ariables	and	Claims	Usea in	the Study	

Latent Var	Label	Statements				
Task Technology Fit	TTF1	The Hospital Management Information System (HMIS) application is very suitable for my work goals and needs.				
	TTF2	The HMIS application is very compatible with the way I like to enhance work efficiency.				
	TTF4	The HMIS application fits well with all aspects of my job.				
Confirmation Conf	Conf3	Using the HMIS provides me with more work ease than I expected.				
	Conf4	My expectations for the HMIS application have been met.				
Perceived Usefulness	PU1	The HMIS is very beneficial for my work.				
	PU2	The HMIS supports the important aspects of my job.				
	PU4	Overall, I find the HMIS useful in all aspects of my job.				
Continuance Intention	CI2	I will use the HMIS regularly to complete my work.				
	CI4	My intention is to continue using the HMIS rather than any alternative methods.				

Technology Fit (TTF) is directly related to Perceived Usefulness (PU) and Confirmation (Conf). Perceived Usefulness (PU) is directly related to Confirmation (Conf), and Confirmation (Conf) is directly related to Continuance Intention (CI). Furthermore, Perceived Usefulness (PU) is indirectly related to, or mediates the assumed relationship between Task Technology Fit (TTF) and Confirmation (Conf). All items used in this study, summarized in Table **2**.

#### **Measurement Model**

To evaluate the reflective measurement model, we assessed convergent validity, internal consistency

reliability, and discriminant validity. Convergent validity measures how well a variable correlates with other variables designed to assess the same construct, and this was evaluated using variable loadings and average variance extracted (AVE). Internal consistency reliability estimates the reliability of a construct by examining the intercorrelations among observed variables and was measured using composite reliability and Cronbach's alpha. Discriminant validity determines how distinct a construct is from other constructs and was assessed using the heterotrait–monotrait (HTMT) ratio of correlations between constructs. The test ensures that the 95% confidence interval of the HTMT value does not include the value of 1, as was the case

Role of Thumb		Convergent Validity		Dicriminant Validity			
		Outer Loading AVE Compo		Composite Reliability	Cronbach's Alpha		
Latent Var	Label	>0,7	>0,5	0,7-0,9	0,7-0,95	HIMI Criterion	
Task Technology Fit	TTF1	0,900	0,762	0,906	0,845	Yes	
	TTF2	0,868					
	TTF4	0,850					
Confirmation	Conf3	0,924	0.720	0,843	0,748	Yes	
	Conf4	0,779	0,730				
Perceived Usefulness	PU1	0,952	0,865	0,950	0,931	Yes	
	PU2	0,973					
	PU4	0,862					
Continuance Intention	CI2	0,968	0,940	0,969	0,936	Yes	
	CI4	0,971					

#### Table 3: Result of the Measurement Model for the Constructs

#### Table 4: Path Coefficient

Hypothesis	Original Sample (O)	T-Statistics	P-Value	Result
Confirmation -> Continuance Intention	0,829	29,686	0,000	Significant
Perceived Usefulness -> Confirmation	0,006	0,094	0,925	Not Sign
Perceived Usefulness -> Continuance Intention	0,057	0,926	0,355	Not Sign
Task Technology Fit -> Confirmation	0,747	21,604	0,000	Significant
Task Technology Fit -> Perceived Usefulness	0,073	0,744	0,457	Not Sign

for all four constructs in this study. The remaining ruleof-thumb assessment criteria are based on guidelines suggested by Hair [17,18]. It can be seen in Table **3** that all criteria were met, providing evidence of measurement model that is both valid and reliable.

#### **Bivariate Analysis**

The results in Table **4** show that Confirmation significantly affects Continuance Intention, with a high T-statistic of 29.686 and a P-value of 0.000, indicating a strong and significant relationship. Similarly, Task-Technology Fit has a significant positive effect on Confirmation, with a T-statistic of 21.604 and a P-value of 0.000. The original sample values confirm these strong relationships: Confirmation positively influences Continuance Intention (0.829) and Task-Technology Fit positively impacts Confirmation (0.747). In contrast, the relationships involving Perceived Usefulness were not significant, as their P-values are high (0.925 and 0.355), indicating no substantial effect.

## DISCUSSION

The evolving nature of user perceptions significantly influences the adoption and assimilation of technology,

particularly in healthcare settings. Studies indicate that perceived usefulness is crucial during the initial stages of technology adoption, as it directly affects users' behavioral intentions to engage with the system [9,19]. Specifically, research on Hospital Management Information Systems (HMIS) highlights that perceived usefulness not only drives initial adoption but also mediates the relationship between behavioral intention and actual technology use [20]. This suggests that enhancing perceived usefulness can lead to more sustained engagement with HMIS in Hospital X, Padang. To develop a comprehensive conceptual model for promoting sustainable technology use, it is essential to integrate these insights, focusing on strategies that enhance perceived usefulness and address user concerns over time. This approach can facilitate a more effective assimilation of technology, ultimately improving healthcare delivery [21,22].

The relationship between perceived usefulness and sustainable technology use in hospital settings is significant, as evidenced by multiple studies. Perceived usefulness directly influences healthcare professionals' attitudes towards adopting sustainable technologies, which in turn enhances their actual usage. For instance, research indicates that when hospital staff recognize the benefits of sustainable technologies such as improved patient outcomes and operational efficiency—they are more likely to integrate these solutions into their practices [23]. Additionally, a study highlights that perceived usefulness is a critical factor in the acceptance of electronic health records, which are essential for promoting sustainability in healthcare [22]. However, some studies suggest that while perceived usefulness is important, it must be complemented by adequate training and support to ensure effective implementation [24]. Overall, fostering a strong perception of usefulness among healthcare professionals is crucial for the successful adoption of sustainable technologies in hospitals [25,26].

The relationship between confirmation and continuance intention in Hospital Information Management Systems (HIMS) is supported by multiple studies. Research indicates that user confirmation—defined as the perception that the system meets user expectations-

significantly influences the intention to continue using HIMS. For instance, Li et al. found that positive confirmation enhances user satisfaction, which in turn fosters a stronger continuance intention towards the system [27]. Similarly, Ayyoub et al. highlighted that users who experience high levels of confirmation are more likely to exhibit a commitment to ongoing system use, suggesting a direct correlation between these variables [28]. Furthermore, Li et al. emphasized that confirmation not only affects satisfaction but also mediates the relationship between perceived usefulness and continuance intention [29]. However, Al-Hattami and Almagtari noted that while confirmation is crucial, other factors such as system usability and support also play significant roles, indicating a multifaceted relationship that warrants further exploration [30]. Overall, the evidence strongly supports the assertion that confirmation is significantly related to continuance intention in HIMS.

The assertion that there is no relationship between Perceived Usefulness and Confirmation in hospital information management systems is supported by various studies. For instance, research by Herwati *et al.* indicates that while perceived usefulness is a critical factor in technology acceptance, it does not necessarily correlate with user confirmation in the context of hospital information systems [31]. Similarly, Kim *et al.* found that confirmation, which reflects the users' satisfaction with the system, does not significantly depend on their perception of its usefulness [9].

The findings of this research indicate that there is no relationship between Perceived Usefulness and Continuance Intention in Hospital Information Management Systems (HIMS). These results align with several studies exploring similar dynamics. For instance, Pejić Bach et al. suggest that while Perceived Usefulness is often linked to user satisfaction, its direct impact on continuance intention can vary significantly depending on contextual factors and user demographics [19]. Similarly, Luo et al. highlight that external variables, such as organizational support and user training, can mediate the relationship between perceived usefulness and continuance intention, potentially leading to inconclusive results in certain settings [22]. This suggests that while perceived usefulness is a vital component, it may not be sufficient on its own to predict continuance intention in HIMS, indicating a need for a more nuanced understanding of user behavior in this context.

Research indicates a significant relationship between Task Technology Fit (TTF) and Confirmation in hospital settings. TTF refers to the degree to which technology assists users in performing their tasks effectively. In a study by Chavarnakul et al., it was found that higher TTF leads to greater user satisfaction and confirmation of technology's effectiveness in healthcare environments, suggesting that when technology aligns well with user tasks, it enhances perceived usefulness and satisfaction [11]. Additionally, Cheng's research supports this by demonstrating that effective technology implementation in hospitals significantly influences user confirmation, reinforcing the importance of TTF in achieving positive outcomes [32]. Chen et al. further elaborate that when healthcare professionals perceive a good fit between their tasks and the technology provided, it leads to increased confirmation of the technology's value, ultimately improving patient care [12]. However, Ali et al. caution that while TTF is crucial, other factors such as organizational support and training also play significant roles in user confirmation, indicating a multifaceted relationship that warrants further exploration [33]. Overall, the evidence strongly supports the notion that TTF is a key determinant of confirmation in hospital technology use.

The relationship between Task Technology Fit (TTF) and Perceived Usefulness (PU) in Hospital Information Management Systems (HIMS) appears to be complex and context-dependent. Research indicates that while TTF is often posited to enhance PU, some studies suggest that this relationship may

not be significant. For instance, one study found no substantial correlation between TTF and PU, indicating that other factors might play a more critical role in influencing user perceptions of usefulness in HIMS [12,32]. Additionally, another investigation highlighted that the effectiveness of HIMS could be influenced by user training and system design, which may overshadow the impact of TTF on PU [19]. Furthermore, contrasting findings from different healthcare settings suggest that the context of use significantly affects the TTF-PU relationship, implying that results may vary based on specific organizational characteristics and user experiences [11,33,34]. Thus, while TTF is an important concept, its direct influence on PU in HIMS may not be universally applicable.

## LIMITATION OF STUDY

The limitations of this study primarily stem from its reliance on specific contextual factors and user demographics within a single healthcare setting, Hospital X in Padang. The findings related to perceived usefulness, confirmation, and continuance intention may not be generalizable across different hospital environments or healthcare systems with varying levels of technological infrastructure and support. Additionally, the study's cross-sectional design limits the ability to capture the dynamic nature of user perceptions and behavior over time. Another limitation is the potential bias introduced by self-reported data, which may not fully reflect actual usage patterns or the complex interactions between technology and user tasks. Future research should consider longitudinal studies and include diverse healthcare settings to validate and expand upon these findings.

Future research is expected to implement longitudinal studies with broader coverage across various healthcare services, as well as incorporate variables such as system usefulness, organizational support, and individual user characteristics (age, digital literacy, and job roles) to provide a more comprehensive understanding of long-term factors affecting technology adoption and system continuance intention.

## CONCLUSION

The implementation of HIMS demonstrates complex relationships between perceived usefulness, confirmation, and continuance intention. The success of technology adoption in hospitals depends not only on system utility but is also influenced by Task Technology Fit (TTF), ease of use, and organizational support. These interconnected factors play a crucial role in determining the long-term success of HIMS implementation in healthcare settings.

To enhance HIMS effectiveness, hospitals should focus on several key improvement areas including regular system evaluations, development of userfriendly interfaces, and better inter-departmental integration. Priority should be given to regular training sessions, establishing dedicated technical support teams, and implementing reward systems to increase user motivation. Additionally, hospitals should conduct regular system audits, monitor user satisfaction, and plan for systematic upgrades while maintaining sufficient development budgets. This comprehensive approach ensures sustainable technology adoption while maintaining focus on improving patient care and operational efficiency.

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## STATEMENT OF AUTHORSHIP

All authors certified fulfillment of ICMJE authorship criteria.

## AUTHOR DISCLOSURE

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