ANALYSIS OF THE HOSPITAL MANAGEMENT INFORMATION SYSTEM IN THE PHARMACY DEPARTMENT USING THE TASK-TECHNOLOGY FIT (TTF) METHOD

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ABSTRACT

The implementation of information technology in hospitals plays an important role in supporting the effectiveness and efficiency of healthcare services, including pharmacy services. This study aims to evaluate the implementation of the Pharmacy Information System at Hospital Y using the Task-Technology Fit (TTF) model. A qualitative descriptive approach was employed from September to December 2025. Data were collected through in-depth interviews, direct observation, and documentation involving pharmacy personnel selected using purposive sampling. Data analysis was conducted through open coding using OpenCode and the Miles, Huberman, and Saldaña framework. The findings indicate that Task Characteristics and Technology Characteristics positively and significantly support Task-Technology Fit. Furthermore, Task-Technology Fit supports system Utilization, which subsequently contributes to User Satisfaction. The Pharmacy Information System has been routinely utilized to support prescription services, medication management, data processing, and work efficiency. However, several limitations remain, including manual processes, double data entry, limited system features, network instability, and insufficiently structured user training. Therefore, improvements in system integration, infrastructure, system features, and user training are needed to enhance task-technology alignment, optimize system utilization, and improve user satisfaction and the quality of pharmacy services.

KEYWORDS

Pharmacy Information System; Task-Technology Fit; Hospital Information System; Utilization; User Satisfaction.

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INTRODUCTION

Digital transformation in the healthcare sector has encouraged hospitals to utilize information technology as an essential component in supporting operational activities and patient services. One of its applications can be found in pharmacy units through the use of a Hospital Management Information System (HMIS), which is integrated with a Pharmacy Information System (PIS). These systems play an important role in assisting pharmacy personnel in managing various activities, including monitoring drug inventories, ordering and distribution, prescription validation, and reporting processes. The utilization of information systems is expected to improve the speed, accuracy, and efficiency of pharmacy service management compared with processes that are still carried out conventionally (Triputra et al., 2023; Astuty et al., 2024) (Triputra & Mulyanti, 2023; Astuty et al., 2024; Andriani et al., 2022).

Nevertheless, the implementation of information systems in pharmacy units does not always operate in accordance with users' needs. One of the problems that may arise is a mismatch between the technological capabilities available and the characteristics of the tasks that pharmacy personnel are required to perform. Such a mismatch may result in suboptimal system utilization and cause users to remain dependent on manual processes to complete their work (Anggraiani & Rizki Fauzi, 2022). In addition to task-technology fit, technical factors such as network instability, limited server capacity, and insufficient system documentation and user guidelines may also become obstacles to the implementation of information systems in hospital environments (Novitri et al., 2024) (Afianty et al., 2022; Novitri et al., 2024).

These problems indicate that the successful implementation of an information system is determined not only by the availability of technology but also by the extent to which the technology is capable of meeting users' work requirements. To measure this fit, Goodhue and Thompson developed the Task-Technology Fit (TTF) model. The TTF model explains that the effectiveness of technology in supporting work is influenced by the fit between task characteristics and technology characteristics. This level of fit is subsequently associated with technology utilization and the impact of system use on user performance. The TTF model is considered a relevant approach for evaluating information systems because it provides an understanding of the extent to which the technology being used is capable of meeting users' actual needs in completing their tasks (Marikyan, 2025; Melia Afianty et al., 2021) (Goodhue & Thompson, 1995; Jeyaraj, 2022; Chavarnakul et al., 2024; Adhyka et al., 2025).

In the context of this study, Hospital Y has utilized an information system to support healthcare service activities, including activities within its pharmacy unit. The use of this system involves personnel with different duties and responsibilities in the processes of healthcare services and medication management. However, its implementation still requires evaluation to determine whether the characteristics of the available technology are consistent with the characteristics of users' tasks. Such an evaluation is important because the fit between the system and work requirements may influence the intensity of system utilization as well as users' satisfaction with the technology being used (Latifa et al., 2026; Ferdiana & Pramono, 2024; Herwati et al., 2023).

This study involves 53 respondents who are users of the information system at Hospital Y. The respondents were selected because they are involved in using the system for work activities related to pharmacy services and the management of pharmaceutical information. Based on these respondents, the study is conducted to obtain empirical evidence regarding the relationships among Task Characteristic (TC), Technology

Characteristic (TEC), Task-Technology Fit (TTF), Utilization (UTIL), and User Satisfaction (US).

Based on these conditions, this study aims to analyze users' task characteristics, the characteristics of the technology being used, the level of fit between tasks and technology, system utilization, and user satisfaction with the information system at Hospital Y. This study also examines the effect of Task Characteristic on Task-Technology Fit*, the effect of Technology Characteristic on Task-Technology Fit, the effect of Task-Technology Fit on Utilization, and the effect of Utilization on User Satisfaction. The findings of this study are expected to provide data-based evidence regarding the level of system fit with users' needs and serve as a consideration for Hospital Y in evaluating and developing its information system to better meet operational requirements, increase system utilization, and support the quality of users' work performance.

RESEARCH METHOD

This study employed a descriptive qualitative approach aimed at gaining an in-depth understanding of the experiences, perceptions, and practices of pharmacy personnel in using the Pharmacy Information System (PIS) to support medication management. The study was conducted at the Pharmacy Installation of RS Y during the period from September to December 2025.

Data were collected using three triangulation techniques: (1) in-depth interviews using a semi-structured interview guide; (2) direct field observations conducted in the outpatient and inpatient pharmacies on December 12–13, 2025; and (3) documentation studies involving policy documents, Standard Operating Procedures (SOPs), stock reports, and medication procurement records, which were conducted on December 16, 2025. The application of methodological triangulation was intended to compare and verify the consistency of information obtained through various data collection methods.

The research subjects were selected using purposive sampling based on the inclusion criteria, namely pharmacy personnel who had actively used the PIS for at least the previous six months and were willing to participate in the study. The research informants consisted of the Head of the Pharmacy Installation, practicing pharmacists, pharmacy technicians, and pharmacy administrative staff. The exclusion criteria included pharmacy personnel who were on leave or were still undergoing an orientation period.

The research variables or constructs referred to five main constructs in the Task-Technology Fit (TTF) model, namely task characteristics, technology characteristics, task-technology fit, utilization, and performance impact. Data analysis was conducted through an open coding process assisted by OpenCode software. The stages of analysis included data reduction, data presentation, and conclusion drawing and verification, following the data analysis framework developed by Miles and Huberman. The coding process also employed an in vivo coding approach to preserve the meaning and terminology used directly by the informants (Goodhue & Thompson, 1995; Miles et al., 2014).

Data validity was established through source triangulation, member checking, and peer debriefing. Source triangulation was conducted by comparing information obtained from various informants, namely pharmacists, pharmacy assistants, and system administrators, to identify similarities and differences in their perceptions regarding the use of the Pharmacy Information System. The interview findings were then compared with the results of observations and documentation studies to obtain a more comprehensive understanding of the implementation of the PIS. The Head of the Pharmacy Installation served as the triangulator in the process of examining and strengthening the validity of the research data.

RESULT AND DISCUSSION

Research Results

Respondent Profile

This study involved 53 respondents who were users of the information system in the pharmacy department of Hospital Y. The respondents were directly involved in prescription services, medication management, inventory control, recording, and reporting. The research instrument consisted of 20 statement items measuring Task Characteristic (TC), Technology Characteristic (TEC), Task Technology Fit (TTF), Utilization (UTIL), and User Satisfaction (US).

Table 1. Characteristics of Research Respondents (n = 53)

No.	Characteristics	Frequency	Percentage
1	Pharmacists	12	22.6%
	Pharmacy Assistants	32	60.4%
	Administration/Warehouse Staff	9	17.0%
2	Work experience ≥ 3 years	28	52.8%
	Work experience ≤ 3 years	25	47.2%
3	Bachelor's Degree/Professional Pharmacist	15	28.3%
	Bachelor's Degree in Accounting	6	11.3%
	Diploma III in Pharmacy	32	60.4%

Based on the table, the largest proportion of respondents consisted of pharmacy assistants (60.4%), respondents with work experience of ≥ 3 years (52.8%), and respondents with a Diploma III in Pharmacy (60.4%).

Instrument Testing

Validity Test

The validity test was conducted using Bivariate Pearson correlation with the assistance of SPSS. With 53 respondents, the degrees of freedom were df = n − 2 = 51. At a 10% significance level for a two-tailed test, the r-table value was approximately 0.228. An item was considered valid if the calculated r-value was greater than the r-table value. The results of testing the 20 statement items showed that all items had calculated r-values greater than the r-table value. Therefore, all items were declared valid.

Reliability Test

Table 2. Reliability Test Results

Variable	Cronbach's Alpha	Description
Task Characteristic (TC)	0.856	Reliable
Technology Characteristic (TEC)	0.701	Reliable
Task Technology Fit (TTF)	0.685	Reliable
User Satisfaction (US)	0.755	Reliable

All Cronbach's Alpha values were above 0.60; therefore, the instrument was considered reliable.

Normality Test

The normality test results showed a significance value of 0.350. Since 0.350 > 0.10, the research data were declared to be normally distributed.

Simple Linear Regression and Hypothesis Testing

Table 3. Summary of Hypothesis Testing Results

Hypothesis	Relationship	Regression Equation	t-value	Sig.	Decision
H1	TC → TTF	Y = 13.458 + 1.159X	5.356	0.000	Accepted
H2	TEC → TTF	Y = 16.133 + 1.331X	4.058	0.000	Accepted
H3	TTF → UTIL	Y = 0.699 + 0.224X	6.157	0.000	Accepted
H4	UTIL → US	Y = 5.858 + 0.743X	5.178	0.000	Accepted

H1. Task Characteristic on Task Technology Fit
Task Characteristic has a positive and significant effect on Task Technology Fit. The equation Y = 13.458 + 1.159X indicates a positive direction of influence. The significance value of 0.000 < 0.10 indicates that H1 is accepted.

H2. Technology Characteristic on Task Technology Fit
Technology Characteristic has a positive and significant effect on Task Technology Fit. The equation Y = 16.133 + 1.331X, with a significance value of 0.000 < 0.10, indicates that H2 is accepted.

H3. Task Technology Fit on Utilization Task
Technology Fit has a positive and significant effect on Utilization. The equation Y = 0.699 + 0.224X, with a significance value of 0.000 < 0.10, indicates that H3 is accepted.

H4. Utilization on User Satisfaction
Utilization has a positive and significant effect on User Satisfaction. The equation Y = 5.858 + 0.743X, with a significance value of 0.000 < 0.10, indicates that H4 is accepted.

Correlation Coefficient Test

Table 4. Correlation Coefficient Test Results

Relationship	r	Category
TC → TTF	0.600	Moderately strong
TEC → TTF	0.494	Moderately strong
TTF → UTIL	0.653	Strong
UTIL → US	0.587	Moderately strong

The strongest relationship was found between TTF and Utilization, with a correlation coefficient of 0.653, while the lowest relationship was found between Technology Characteristic and Task Technology Fit, with a correlation coefficient of 0.494.

Coefficient of Determination Test

Table 5. Coefficient of Determination Test Results

Relationship	R^2	Contribution
TC → TTF	0.360	36.0%
TEC → TTF	0.244	24.4%
TTF → UTIL	0.426	42.6%
UTIL → US	0.345	34.5%

TTF is explained by 36.0% by TC and 24.4% by TEC. Utilization is explained by 42.6% by TTF, while User Satisfaction is explained by 34.5% by Utilization. The remaining variation is attributed to other factors outside the model.

Discussion

Task Characteristics and Medication Management

Research findings indicate that the tasks performed by pharmacy staff encompass prescription services for outpatients, inpatients, and emergency patients, as well as stock management, ordering medications from the warehouse, and reporting. Complexity is compounded by the need for double data entry between the Hospital Management Information System (HMIS) and the Pharmacy Information System (PIS), while certain processes are still carried out manually. This situation supports the first hypothesis (H1), confirming that task characteristics are associated with technology fit.



Figure 1. Medication Management Flow

The pharmaceutical information system workflow for medication procurement and disposal at Hospital Y comprises the following steps: (1) Medication Planning – determining medication requirements based on usage data, disease patterns, and budget. (2) Medication Procurement – purchasing medications from approved suppliers in accordance with the procurement plan. (3) Medication Receipt – verifying the quantity, type, quality, and documentation of received medications. (4) Medication Storage – storing medications according to storage standards, including temperature, humidity, and security requirements. (5) Medication Distribution – supplying medications to service units—such as outpatient, inpatient, and emergency departments—based on needs. (6) Medication Monitoring – periodically monitoring medication usage, inventory levels, expiration dates, and operational activities. (7) Medication Reporting – compiling periodic reports on medication usage, inventory levels, and requirements. Medication disposal is carried out for damaged medications, those failing to meet quality standards, expired medications, and medications no longer fit for use, in accordance with established procedures.

Prescription Service Process

Meanwhile, the outpatient medication dispensing workflow comprises: (1) Patient System/E-Prescription – based on visitor data or medical history from the hospital information system (e-RS). (2) Prescription and Patient Data Input – entering or retrieving the medical record number and displaying the prescription in the pharmacy system. (3) Prescription Verification by Pharmacist – verifying prescription details, dosage, and completeness. (4) Medication Preparation – separating ready-to-use medications and preparing those requiring compounding according to the prescription. (5) Medication Labeling – labeling and preparing the medication. (6) Medication Handover to Patient –

providing patient counseling, handing over the medication, and completing the pharmacy payment process.



Figure 2. Prescription Service Process

Inpatient Drug Dispensing Flow

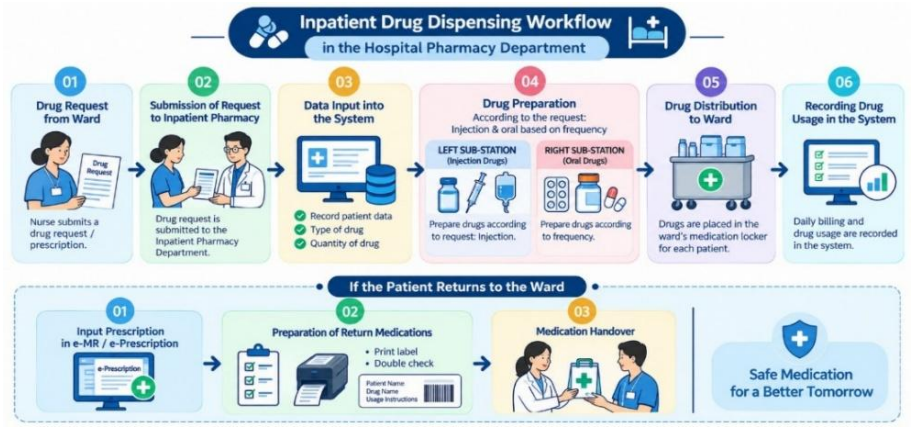


Figure 3. Inpatient Drug Dispensing Flow

The medication retrieval process for inpatients involves the following steps: (1) Medication Request from the Ward – a nurse submits a medication request or prescription. (2) Submission of Request to the Inpatient Pharmacy – the request is forwarded to the inpatient pharmacy department. (3) Data Entry into the System – recording patient details, medication types, and quantities. (4) Medication Preparation – preparing medications according to the request, including injectables or oral medications based on administration frequency. (5) Medication Distribution to the Ward – medications are placed in distribution lockers corresponding to their respective locations. (6) Recording Medication Usage in the System – daily billing and medication usage are logged in the system. If a patient returns to the ward, the process includes entering the prescription into the e-MR/e-prescribing system, preparing the returned medication, and handing over the medication.

Technology Characteristics of the Pharmacy Information System

Interview results indicate that the pharmaceutical service system includes features for prescription handling, medication ordering, user management, and billing integration. Although the system is relatively user-friendly, it lacks features such as automated

reporting, expiration-based inventory control, minimum stock notifications, and audit logs. Furthermore, the separation of the Pharmacy Information System server from the Hospital Management Information System server can lead to operational disruptions (system downtime). These conditions reinforce the interpretation of results regarding the second hypothesis (H2), that technology characteristics have a positive and significant effect on task-technology fit.



Figure 4. System Features

Based on Figure 4, the hospital pharmacy system includes menus and features related to pharmacy transactions, patient data, prescription data, medication management, electronic prescribing, reporting, and other pharmacy-related activities.

Task-Technology Fit

The TTF is considered to have a limited scope. While the system is adequate for prescription and medication ordering services, it is not yet optimal for reporting, analytical functions, prescription transcription, or data-driven decision-making. Although it supports direct service operations, the system is not yet sufficient for managerial functions.

Technology Utilization

The pharmaceutical service system has become an integral part of daily operations and is utilized routinely. However, its utilization is not yet optimal, as training remains sporadic and lacks systematic structure. While the level of utilization is high, improvements are still needed regarding training, the alignment of user understanding, and system development.

There are several factors facilitating and hindering system usage in the hospital, namely: 1. The need for technical improvements; 2. A lack of formal system training; 3. User orientation toward the system; 4. Electronic prescribing training; 5. Ad-hoc training; and 6. Suboptimal system performance. Meanwhile, aspects of system utilization include: 1. High intensity of system usage; 2. User comfort; and 3. Variation in system usage based on roles.

Performance Impact and User Satisfaction

Observations and interviews indicate positive impacts from the system's implementation, including improved service speed, efficiency, service quality, data

validity, and patient safety, as well as a reduction in complaints. However, user satisfaction remains suboptimal due to manual reporting, duplicate data entry, limited system development, and an incomplete system transition.

Level of User Satisfaction with the System: 1. User comfort in using the system; 2. User satisfaction level; 3. System transition not yet optimal. Impact of System Use on Staff Performance: 1. Suboptimal impact; 2. Limited system development; 3. Improved patient safety; 4. Increased work efficiency; 5. Improved service quality; 6. Increased data validity; 7. Reduced patient complaints (Alhendawi, 2024; Sukumaran, 2023; Pribadi, 2025). Recommendations for Work Improvement: 1. System evaluation and improvement; 2. System integration with user needs; 3. User management; 4. Addition of IT staff; 5. Addition of pharmacy staff; 6. Improved infrastructure and maintenance (Laurier et al., 2025).

Research Implications

Overall, results from 53 respondents indicate that Task Characteristics and Technology Characteristics are positively associated with Task-Technology Fit (TTF), TTF is positively associated with Utilization, and Utilization is positively associated with User Satisfaction. These findings reinforce the need for system integration, the reduction of duplicate data entry, automated reporting, inventory control, audit logs, infrastructure upgrades, SOPs and user guides, as well as structured training (Gehrmann & Beyan, 2024).

CONCLUSION

This study concludes that the implementation of the Pharmacy Information System at Hospital Y has supported pharmacy service activities and medication management. The results show that Task Characteristic and Technology Characteristic have a positive and significant effect on Task-Technology Fit. Furthermore, Task-Technology Fit has a positive and significant effect on Utilization, while Utilization has a positive and significant effect on User Satisfaction.

The findings also indicate that the system has been routinely utilized by pharmacy personnel and provides benefits in supporting prescription services, medication management, data processing, and work efficiency. However, several limitations remain, including manual processes, double data entry, limited system features, network instability, and insufficiently structured user training. Therefore, improvements in system integration, infrastructure, system features, and user training are needed to increase the suitability of the system to users' tasks, optimize system utilization, and improve user satisfaction and the quality of pharmacy services.

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