

Accounting Information System of Medicinal Supply in Pharmacy in Langkat District North Sumatra Indonesia

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ABSTRACT

The role of pharmacies is very important in developing human health and improving people's quality of life. The purpose of this research is to determine the influence of accounting and inventory management information systems on the operational performance of private pharmacies in Deliserdang district, North Sumatra. As well as knowing the perceptions of private pharmacy owners and employees regarding the use of accounting information systems in managing drug supplies. Quantitative methods were used by distributing questionnaires and conducting interviews with several respondents. Using multiple linear regression and SPSS to process research data. The research results found that AIS had a positive and significant effect on operational performance, and operational management had an effect on operational performance. Another pharmacy finding states that the accounting information system is very helpful in determining drug inventory policies to avoid risks, facilitate drug inventory management, and improve the performance of manual pharmacies, because, regarding the risks that will be faced, inventory management errors will also have a negative impact on customer safety. Medicines that have an expiry date, customer service, medicine stock, employee competence in using technology, and knowledge about medicines are also very important.

Keywords: Accounting Information System, Business Risk, Inventory Management, Operational Performance.

ABSTRAK

Peran apotek sangat penting dalam mengembangkan kesehatan manusia dan meningkatkan kualitas hidup masyarakat. Tujuan penelitian ini adalah untuk mengetahui pengaruh sistem informasi akuntansi dan manajemen persediaan terhadap kinerja operasional apotek swasta di Kabupaten Deliserdang, Sumatera Utara, serta mengetahui persepsi pemilik dan karyawan apotek swasta mengenai penggunaan sistem informasi akuntansi dalam pengelolaan persediaan obat. Penelitian ini menggunakan metode kuantitatif dan kualitatif melalui penyebaran kuesioner dan wawancara dengan beberapa responden. Analisis data dilakukan dengan regresi linier berganda menggunakan SPSS. Hasil penelitian menunjukkan bahwa sistem informasi akuntansi berpengaruh positif dan signifikan terhadap kinerja operasional, dan manajemen operasional juga berpengaruh terhadap kinerja operasional. Temuan lain menunjukkan bahwa sistem informasi akuntansi sangat membantu dalam menentukan kebijakan persediaan obat untuk menghindari risiko, mempermudah pengelolaan stok obat, serta meningkatkan kinerja apotek yang masih menggunakan sistem manual. Hal ini penting karena kesalahan dalam manajemen persediaan dapat berdampak negatif terhadap keselamatan pelanggan. Obat yang memiliki tanggal kedaluwarsa, pelayanan pelanggan, ketersediaan stok obat, kompetensi karyawan dalam penggunaan teknologi, serta pengetahuan tentang obat juga merupakan faktor yang sangat penting.

Kata kunci: Sistem Informasi Akuntansi, Risiko Bisnis, Manajemen Persediaan, Kinerja Operasional.

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INTRODUCTION

The role of the pharmacy is very important in developing human health, improving quality of life, and reducing the time spent staying in the hospital (Anderson, 2002; Blouin & Adams, 2017; Shen & Peterson, 2020). The pharmacy is a strategic element for health development, and with advancement in this role, it becomes part of the healthcare team, contributing to achieving the global Millennium Development Goals (Toklu & Hussain, 2013). However, pharmacies face many challenges, especially after the Covid 19 pandemic passed. This is shown by the increasing level of caution in maintaining health and the surrounding environment; pharmacies are showing that they can play an important role in the management of infectious diseases (Durand et al., 2022; Ramakrishnan et al., 2023). To keep medicines available at all times, pharmacies must monitor their stock of medicines, paying close attention to inventory levels by having an accounting system (Mason, 2020; Jobira et al., 2021; Kaur et al., 2023).

The imbalance between the level of demand for drugs and the availability of supplies of medicines and medical devices is one of the factors disrupting dispensary management. This can be caused by a poor accounting information system in pharmacy management (Mandala & Astika, 2019; Neumann et al., 2022). This condition is experienced by several private pharmacies in Stabat City, Indonesia, which still use manual reporting systems in processing business and financial transactions, and face obstacles in providing drug supplies.

Manually reporting the inventory system will result in many mistakes and errors in inventory counting. In particular, the manual medicine inventory system, during transactions, causes errors in the inventory recording, resulting in problems in monitoring the availability of drugs and pharmacy medical supplies. The lack of a control system for the availability of medicines and medical devices can cause slow distribution of medicines and medical devices and will affect pharmacy turnover (Boyd et al., 2019; Nartey et al., 2020). Therefore, it is necessary to use good accounting information systems in pharmaceutical management (Ying et al., 2021; Tarigan et al., 2025). Therefore, every business organization needs an information system that has become a tool for every company to increase the effectiveness and efficiency of business performance (Aydiner et al., 2019; Tjahjadi & Soewarno, 2019). The accounting system is expected to be useful for the company in managing its finances and supporting day-to-day activities.

Although effective inventory management is recognized as vital for optimizing cash flow, preventing stockouts, and reducing operational costs, pharmacies in smaller contexts still struggle to adopt systematic practices (Febreani & Chalidyanto, 2016; Satibi et al., 2019; Pratiwi & Aisyah, 2023). Prior studies have shown that collaboration between Accounting Information Systems (AIS) and inventory management can improve accuracy, identify demand patterns, and support better decision-making (Hidayat & Saleh, 2020; George & Elrashid, 2023; Mervita et al., 2024). However, limited research focuses on how AIS integration specifically supports pharmacies in developing regions. This gap highlights the need for further investigation into aligning inventory practices with strategic goals and customer demands (Yoshikuni et al., 2023; Carolina & Ansar, 2025).

This study aims to evaluate how implementing AIS and effective inventory management can improve the operational performance of private pharmacies. The objectives are to explore the role of inventory practices in enhancing cash flow, minimizing risks of overstocking or expiration, and improving customer service. The research also seeks to identify how information technology can be leveraged for real-time monitoring and decision-making, ensuring resilience against fluctuations in supply and demand. Ultimately, the study intends to provide practical insights and academic contributions for strengthening pharmacy management in line with long-term strategic goals.

LITERATURE REVIEW & HYPOTHESIS DEVELOPMENT

Accounting Information System and Inventory Management

The system consists of smaller subsystems that work together. Subsystems are designed to achieve one or more organizational goals. Subsystems are primarily designed to deliver towards one or more organizational aims. A change to a sub-system cannot be made without consideration of its impact on other sub-systems and on the overall product. Data are facts collected, recorded, stored, and processed by business information systems that are necessary to collect several types of data, such as the activities that occur, the resources affected by the activity, and the people who participate in the activity. Collected and processed data that is used to assign significance and to help in the decision-making process is called information correctly (Alanazi et al., 2018; Parajuli et al., 2022; Ravikumar et al., 2022). As the quantity and quality of information increases, the accounting information system has a drug inventory accounting process so that drug supplies can run properly and information systems can reduce errors in either the sale or dispensing of drugs (Koyama et al., 2020; Mutair et al., 2021).

Inventory management is a system for managing inventory. and that's very important. for optimal supply policies in health services (Saedi et al., 2016; Basha et al., 2020). Reducing costs by reducing inventory, production will stop, and customers will become dissatisfied when there are drugs that are not available but exist in the data system. The objective of inventory management is to determine and consider the relationship between inventory investment and customer service. The accuracy of inventory records is a prerequisite for inventory management.

Operational Performance Theory

Pharmacy operational performance is the intention to take various actions that result in a stable, exclusive and positive relationship with the pharmacy. Ravikumar et al. (2022) found that facing challenges when implementing an accounting information system and also without training it is difficult to use the system. In addition, there is a risk of losing information due to hackers, and many viruses. Another condition that interferes with performance is that errors in recording the availability of medical stock will make it difficult to know the stock. lack of features such as warnings due to a lack of available medical materials and tools (Salah et al., 2020; Van Dung, 2020). Therefore, the accounting information system affects a person's performance, especially in terms of the services provided, can affect the mentality of users of information systems, both employees, pharmacists and business owners (Monteiro & Cepêda, 2021). The purpose of using an accounting information system is, for example, practicality, increasing work efficiency error rate (Mustofa et al., 2021; Setiyorini & Susilawati, 2021). Businesses must avoid out-of-stock situations for drug inventory control without incurring high inventory costs to meet customer demand. Business performance means a set of skills and business resources and their application, converted into strengths and weaknesses (Pauji & Prihanisetyo, 2024). Accounting information systems offer several benefits in terms of presenting and analyzing information.

Accounting Information Systems and Operational Performance

Accounting Information Systems (AIS) are critical in supporting decision-making and improving efficiency within organizations, particularly in pharmacies where drug inventory management is complex. As stated by Ravikumar et al. (2022), pharmacists perceive AIS as a vital tool to streamline operations, enhance accuracy, and reduce errors in supply processes. Similarly, Monteiro and Cepêda (2021) emphasize that AIS significantly contributes to operational performance by providing accurate information for resource allocation and financial management. In the context of pharmaceutical operations, errors in inventory recording and a lack of timely data can disrupt service delivery, but AIS minimizes these risks through automation and integration of data (Mutair et al., 2021). Moreover, Mustofa et al. (2021) and Setiyorini and Susilawati (2021) highlight that AIS helps in fraud prevention and improves service quality, thereby directly

impacting customer satisfaction. From a broader perspective, Velayutham et al. (2021) argue that AIS also strengthens supply chains by improving transparency and accountability, particularly relevant during crises such as the COVID-19 pandemic. The combined evidence suggests that AIS is not only a technical tool but also a strategic resource that influences performance outcomes, efficiency, and sustainability in pharmacies. Thus, based on the literature, the following hypothesis is proposed:

H1: Accounting information systems have a significant effect on operational performance.

Operational Management and Operational Performance

Operational management is essential for ensuring efficiency, continuity, and service quality in pharmacies. According to Firdaus et al. (2022), effective operational management enables organizations to balance cost efficiency with customer satisfaction, which is particularly vital in health-related sectors. Saedi et al. (2016) note that poor management of drug inventory can lead to shortages, resulting in dissatisfied customers and interrupted healthcare services. Similarly, Basha et al. (2020) highlight that strong operational management practices help pharmacies adapt to challenges such as supply chain disruptions and unexpected demand fluctuations. In pharmaceutical contexts, George and Elrashid (2023) found that inventory management as part of operational practices significantly improves supply chain performance and reduces costs, ensuring resilience during uncertain conditions. Hidayat and Saleh (2020) also emphasize the importance of operational management in minimizing the risks of overstocking and expiration, which directly affect both financial performance and patient safety. Furthermore, operational management fosters better coordination among staff, enhances decision-making, and supports customer-focused outcomes (Boyd et al., 2019; Hutahayan, 2020). Thus, operational management plays a dual role in ensuring internal efficiency and external service excellence. Based on the reviewed literature, the hypothesis is proposed:

H2: Operational management has a significant effect on operational performance.

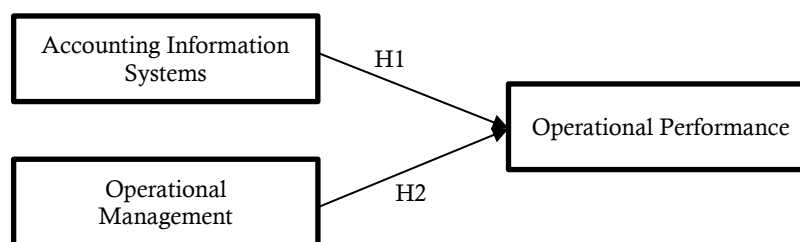


Figure 1. Conceptual Framework

Figure 1 displays a conceptual framework depicting the relationship between independent and dependent variables. There are two independent variables, namely Accounting Information Systems and Operational Management, each of which is linked by an arrow to the dependent variable, Operational Performance. This indicates that both accounting information systems and operational management have a direct influence on operations. In other words, this model emphasizes that successful operational performance improvement in an organization, particularly in the pharmaceutical sector, can be achieved through the implementation of an effective accounting information system and sound operational management.

RESEARCH METHODS

This research is a quantitative research to find out the management of drug supplies with a focus on accounting information systems that are implemented in pharmacies located in Langkat Regency, North Sumatra. The type of data in this study is primary data in the form of observations and interviews with pharmacists, owners and employees at the Batara pharmacy, which is related to accounting information systems with the aim of holding accounting for drug supplies that supports the implementation of a good accounting information system and can increase efficiency and operational stabilization, especially in the drug supply section. The population of this study included all pharmacies in Langkat Regency, North Sumatra, totaling 37 privately owned pharmacies, and the research respondents were pharmacies that provided complete information to researchers. Based on the results of data collection, complete information was obtained for 32 respondents, while the rest had not used the application for drug supplies, and the answers were incomplete. Data analysis used SPSS tools.

The research was implemented through two distinct stages to obtain comprehensive data related to the use of accounting information systems in pharmacy management. In the first stage, respondents were asked to complete a structured questionnaire prepared by the researchers. The questionnaire included questions concerning the length of time they had been running the pharmacy business, their age, and their level of knowledge and experience in the pharmaceutical sector. These aspects were considered important to understand the respondents' background and capability in managing pharmacy operations. Responses to the questionnaire were recorded using a five-point Likert scale, consisting of Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree. This scale was chosen because it is simple, practical, and allows respondents to provide answers quickly while reflecting the intensity of their opinions.

In the second stage, in-depth interviews were conducted with several pharmacy owners and employees who were willing to participate. The interviews explored more detailed information on the accounting system applied in drug supply management, along with its weaknesses and strengths. The insights obtained from the respondents were highly valuable in supporting the achievement of the study's objectives.

RESULTS

The demographic profile of respondents in Table 1 shows that the majority were female (59.4%), while males accounted for 40.6%. In terms of age distribution, most respondents were between 36 and 45 years old (46.9%), followed by those aged 45–50 years (21.9%) and above 51 years (18.8%), with only a small proportion aged 25–35 years (6.3%). Regarding business tenure, almost half of the respondents had run their business for more than 10 years (46.9%), 37.5% had been operating for 6–9 years, and 15.6% for 2–5 years. In terms of educational background, the largest group had a diploma (50.0%), while 31.3% had a bachelor's degree and 18.8% had completed high school or its equivalent. This indicates that most respondents are experienced business owners with a relatively high level of education.

Table 1. Respondent Demographics

Characteristic	Category	Number	Percentage (%)
Gender	Male	13	40.6%
	Female	19	59.4%
Age	25–35 years	2	6.3%
	36–45 years	15	46.9%
	45–50 years	7	21.9%
	>51 years	6	18.8%
Business Tenure	2–5 years	5	15.6%
	6–9 years	12	37.5%
	>10 years	15	46.9%
Education	High school or equivalent	6	18.8%
	Diploma	16	50.0%
	Bachelor's	10	31.3%

Based on Table 1, most of the respondents are female, where women are more inclined to work in the pharmaceutical sector, and the majority of respondents are of productive age, are involved in carrying out business operational activities, and have formal education. The average business owner is based on education in accordance with his business field. Although there are some respondents who have a general education, they pursue the field of medicine based on business experience while working in the field of medicine. The length of time the respondents have been engaged in the pharmaceutical business, on average, is long enough; it can be said that the respondents are able to manage the business well.

Table 2: Validity Test

Variable	No	r-count	r-table	Result
Operational Performance	1	0.546	0.329	Valid
	2	0.724	0.329	Valid
	3	0.544	0.329	Valid
	4	0.666	0.329	Valid
	5	0.495	0.329	Valid
	6	0.776	0.329	Valid
	7	0.764	0.329	Valid
	8	0.846	0.329	Valid
Accounting information system	1	0.674	0.329	Valid
	2	0.826	0.329	Valid
	3	0.894	0.329	Valid
	4	0.676	0.329	Valid
	5	0.758	0.329	Valid
Inventory Management	1	0.442	0.329	Valid
	2	0.830	0.329	Valid
	3	0.482	0.329	Valid
	4	0.386	0.329	Valid
	5	0.511	0.329	Valid
	6	0.812	0.329	Valid
	7	0.702	0.329	Valid
	8	0.820	0.329	Valid

Table 2 shows the results of the validity test of the research instrument for three variables, namely Operational Performance, Accounting Information System, and Inventory Management. All statement items in the three variables have an r count value greater than r-table (0.329), so all items are declared valid. In the Operational Performance variable, there are 8 items with r-count values ranging from 0.495 to 0.846, the Accounting Information System variable consists of 5 items with values between 0.674 to 0.894, while the Inventory Management variable consists of 8 items with values 0.386 to 0.830. Thus, all indicators are suitable for further analysis.

Table 3. Reliability Test

No	Variable	r-Count	r-Critical	Result
1	Operational Performance (Y)	0.758	0.6	Reliable
2	Accounting Information System (X1)	0.837	0.6	Reliable
3	Management Inventory (X2)	0.763	0.6	Reliable

Based on exposure, the reliability test results presented in Table 3 show that all statement items have a mark Cronbach's alpha > 0.6, so thereby it can be concluded that all statement items in the research are reliable. Based on the results of the normality test for 36 data, the mean value was 0.000000 and the standard deviation was 2.91392050. The Most Extreme Differences value showed an absolute number of 0.093 with a positive value of 0.093 and a negative value of -0.069. Meanwhile, the results of the Kolmogorov-Smirnov test produced a significance value of Asymp. Sig. (2-tailed) of 0.200. Because this value is greater than 0.05, it can be concluded that the residual data is normally distributed and meets the assumptions of the normality test. Is known mark Asymp.Sig.

(2tailed) on the Kolmogorov Smirnov test of 0.200. That matter state that marks more data significance big from 0.05. Then assume normality is fulfilled.

The results of the multicollinearity test indicate that the Accounting Information System and Inventory Management variables have a tolerance value of 0.910 and a VIF value of 1.199. Since the tolerance value is greater than 0.10 and the VIF is less than 10, it can be concluded that there are no symptoms of multicollinearity between variables in the regression model used. The respective VIF values do not bigger of 10 is worth 1.199 and 1.199, for tolerance values above 0.1 are worth 0.910 and 0.910, then there are no symptoms of multicollinearity between variables on the regression model of this study.

Table 4. Correlation Coefficient Test of Determination (R²)

Model	R
1	1
R	0.751 ^a
R Square	0.559
Adjusted R Square	0.540
Std. Error of the Estimate	0.522
Durbin-Watson	0.75073

Based on table 4, R -squared value of 0.559 = 55.9%. This matter shows that the total variation of operational performance variables that are caused or influenced by variables Accounting Information System, Inventory Management, 54.9%, meanwhile the rest, namely 44.1% (100%-55.9%), is explained by independent variables that are not included in the research model.

Table 5. Simultaneous Test Results (F Test)

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	50.706	2	20.353	2.360	0.012 ^b
Residual	297.283	30	9.0		
Total	347.989	32			

Table 5 shows that with a calculated F value of 2.360 (with direction positive) and a sig value (significance) of 0.012 < 0.05, meaning that the Application System Information Accounting and Management Operational in a way simultaneous and significantly influential on Operational Performance. Shows that inventory management and information systems as a whole have an influence on operational performance where the significance value is less than 0.05, indicating that accounting information systems and inventory management will have an impact on the operational performance of pharmaceutical businesses.

Table 6. Partial Test Results (t Test)

Model	Unstd. Coef. B	Std. Error	Std. Coef. Beta	Q	Sig.
(Constant)	29.538	4.662		6.339	0.000
Accounting information system	0.201	0.360	0.098	0.671	0.032
Inventory Management	0.233	0.127	0.035	1.782	0.024

Table 6 indicate the coefficient of two variables, namely the accounting information system, which has an influence on operational performance because it has a significance value of 0.032 < 0.05. Inventory management has an influence on operational performance because it has a significance value of 0.024 < 0.05. The regression results indicate that the constant value is 29.538 with a standard error of 4.662 and a significance level of 0.000, suggesting it is statistically significant. The variable Accounting Information System has an unstandardized coefficient (B) of 0.201 with a standard error of 0.360, a standardized beta of 0.098, a t-value of 0.671, and a significance value of 0.032, indicating that it has a positive and significant effect on the dependent variable. Meanwhile, Inventory Management shows an unstandardized coefficient (B) of 0.233 with a standard error of 0.127, a standardized beta of 0.035, a t-value of 1.782, and a

significance level of 0.024, which also demonstrates a positive and significant influence. Both independent variables significantly contribute to the model, with Inventory Management showing a relatively stronger effect compared to the Accounting Information System.

DISCUSSION

The results of the hypothesis test found that the AIS variable (X1) has a significant influence on the operational performance of the Pharmacy and are in accordance with the research hypothesis. This study strengthens that the accounting information system factor is important in the operational activities of a pharmacy, and is part of determining the survival of the pharmacy. Based on the literature review, the findings confirm that a well-designed AIS adds value by improving service quality, reducing costs, and enhancing efficiency. AIS enables pharmacies to manage drug data and transaction processes more effectively, supporting better decision-making related to drug management (Adilla & Armel, 2024). This study highlights the importance of AIS in strengthening operational activities and improving overall performance. It also contributes to understanding the benefits for pharmacies that have not yet adopted AIS. Furthermore, the results emphasize the need for a deeper analysis of operational performance between pharmacies with and without AIS implementation (Hutahayan, 2020). To ensure operational efficiency and patient safety. Interviews with respondents revealed that AIS plays a significant role in supporting inventory management by simplifying operational activities and improving service to customers. The integration of information technology facilitates accurate recording, monitoring, and control of drug stock, while still requiring manual warehouse checks to address discrepancies between recorded data and physical availability. This dual approach enhances safety by preventing stockouts or expired drug distribution. Furthermore, AIS helps pharmacies maintain safe stock levels, manage diverse drug types, and improve the speed of service. Employees reported that the system provides ease in handling purchase and sales transactions, supported by reliable and secure data storage, user-friendly applications, and adequate computer facilities. AIS also minimizes errors in drug inventory calculation, thereby reducing risks associated with stock mismanagement (Velayutham et al., 2021). These findings align with prior research highlighting that AIS enhances pharmacy operations, strengthens data accuracy, and mitigates inventory-related risks in healthcare facilities (Ravikumar et al., 2022). Thus, the adoption of AIS in pharmacy management ensures efficiency, accuracy, and continuity of pharmaceutical services (Ramakrishnan et al., 2023).

The results of the hypothesis test found that the Operational Management variable (X2) has a significant influence on the operational performance of Pharmacy and is in accordance with the research hypothesis. This study strengthens that the accounting information system factor is important in the operational activities of the pharmacy, and is part of determining the survival of the pharmacy. In the discussion of operational management, using the transformation process, effectiveness, achievement of certain performance measures, and achievement of goals are used as proxies for the stability and ability of the company to avoid risks in the operation and development of the pharmacy in the short and long term. This finding is consistent with the results of previous studies which show that operational management has a positive and significant impact on Operational performance. In line with George (2020), who stated that the implementation of operational management ensures that there is no out-of-stock and is able to control fluctuations in pharmaceutical demand and supply. Good service support in drug rotation helps pharmacies make accurate supply decisions. However, challenges arise from the imbalance between public demand and available drug supplies, which disrupts pharmacy management and highlights the need for effective inventory control. Interview results show that inventory management duties are not separated, with dual responsibilities still present in drug control. The study suggests that pharmacies should address these issues by assigning clearer roles and ensuring competent employees through continuing education and training to strengthen overall drug management performance.

CONCLUSION

This study confirms that Accounting Information Systems (AIS) and inventory management significantly influence the operational performance of pharmacies. The main findings indicate that AIS improves accuracy in drug supply policies, reduces the risk of stockouts and errors, and supports efficiency in managing transactions. At the same time, effective inventory management helps pharmacies maintain safe stock levels and respond to fluctuations in demand, thereby ensuring business continuity and customer satisfaction. Interviews further highlighted the role of employee competence and the need for direct supervision in complementing the system, especially regarding expired or damaged drugs.

From a practical perspective, the results suggest that pharmacies should adopt AIS to enhance service quality and operational stability, supported by staff training and continuing education. Integrating digital systems with manual oversight is essential to minimize risks and strengthen decision-making in drug management. Theoretically, this study contributes to the literature by reinforcing the positive relationship between AIS, inventory management, and operational performance, while also providing insights into how technology adoption shapes performance outcomes in small-scale pharmaceutical businesses. However, this research has limitations. The sample was restricted to private pharmacies in Langkat District, which may limit the generalizability of the results to other regions. In addition, the reliance on self-reported data and interviews may introduce subjective bias. Future research should expand the scope to include larger and more diverse samples, examine longitudinal data to capture performance over time, and explore advanced technologies such as real-time monitoring systems and artificial intelligence in drug inventory management. These directions would provide a deeper understanding of how AIS can continuously improve pharmacy operations in dynamic healthcare environments.

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