

THE EVALUATION OF LOGISTICS MANAGEMENT INFORMATION SYSTEM FOR MEDICINE AND MEDICAL DEVICE MANAGEMENT AT PHARMACY INSTALLATION OF RSUD JENDRAL AHMAD YANI METRO

Evi Oktariani^{1*}; Bambang Setiaji¹; Endang Budiati¹; Guna Yanti K.S Siregar²; Bungsu³

¹ Public Health Study Program, Faculty of Health, Universitas Mitra Indonesia, Jl. ZA. Pagar Alam No.7, Gedong Meneng, Rajabasa, Bandar Lampung, Lampung 40115, Indonesia

² Universitas Muhammadiyah Metro, Jl. Ki Hajar Dewantara No.116, Iringmulyo, Kec. Metro Tim., Kota Metro, Lampung 34112, Indonesia

³ Universitas Aisyah Pringsewu, Jl. A Yani No. 1 A Tambak Rejo, Wonodadi, Kec. Pringsewu, Kabupaten Pringsewu, Lampung 35372, Indonesia

*evinabillafirdaus@gmail.com

ABSTRACT

Pharmaceutical logistics management in hospitals is a critical component to ensure the availability of medicines and medical devices. In the digital era, the implementation of a Logistics Management Information System (LMIS) is essential for optimizing logistics operations. RSUD Jenderal Ahmad Yani Metro has implemented an LMIS; however, several issues remain, such as data discrepancies, delayed data input, and limited human resource (HR) capacity. This study aims to evaluate the implementation of the LMIS for managing medicines and medical devices at the hospital's pharmacy installation, identify supporting and inhibiting factors, and measure system effectiveness. A qualitative descriptive approach was employed, with data collected through in-depth interviews, direct observation, and document review. The findings indicate that while the LMIS supports logistics tracking and data collection, the system has not been fully optimized. Manual processes persist, HR training is lacking, and key system features are underutilized. Nonetheless, the system has proven beneficial in streamlining distribution processes. Optimization of the system, HR capacity-building, and better integration between service units are necessary to support more effective and efficient healthcare delivery.

Keywords: health services; hospital efficiency; inventory accuracy; information system; logistics; pharmaceutical management

INTRODUCTION

The Logistics Management Information System (SIM-Logistics) plays a strategic role in supporting efficiency, transparency, and accuracy in the management of logistics, particularly medicines and medical equipment in hospitals. Effective and digital-based logistics management not only supports pharmaceutical services as mandated in the *Regulation of the Minister of Health of the Republic of Indonesia No. 72 of 2016*, but also serves as an integral component of modern health systems. The World Health Organization (2025) emphasizes the importance of strengthening health systems through e-logistics, which accelerates the distribution of medical supplies and enhances responsiveness to healthcare needs.

RSUD Jenderal Ahmad Yani Metro has implemented SIM-Logistics to support efficient logistics management. However, several challenges persist, including data discrepancies between physical and system stock, delays in data entry, underutilization of analytical features, and limited human resources (HR) proficiency in using the system. This condition reflects the existence of a *design–reality gap*, as discussed by Heeks (in Faturrahmi, 2019), indicating a mismatch between system planning and practical implementation.

Previous studies, such as those by Nadirah et al. (2016), show that the success of e-logistics implementation is influenced by HR readiness, technological infrastructure, and appropriate implementation strategies. This aligns with the hospital information system evaluation model developed by Faturrahmi (2019), which emphasizes the need for comprehensive assessments of system quality, information quality, and service quality. The DeLone and McLean model is also applicable to evaluate the success of SIM-Logistics implementation from aspects of user satisfaction, net benefits, and system quality (Laudon & Laudon, 2018).

From a managerial perspective, Rois and Helmi (2016) as well as Priyono (2007) stress the importance of management functions within healthcare organizations, including logistics management. Furthermore, operational aspects such as demand planning, distribution, and logistics monitoring as outlined by Heizer, Render, and Munson (2017) are crucial components that must work synergistically with information systems.

Given these challenges, it is necessary to conduct a thorough evaluation of SIM-Logistics implementation at RSUD Jenderal Ahmad Yani Metro. This evaluation aims to identify gaps between the system and actual practice and provide improvement recommendations based on a comprehensive analysis using contemporary approaches in information systems management, including the PIECES model (Soufitri, 2023) and the National Pharmaceutical Logistics Information System Guidelines (Ministry of Health RI, 2017).

METHOD

This research adopts a descriptive qualitative approach aimed at systematically and factually illustrating the implementation of the LMIS at the pharmacy installation of RSUD Jenderal Ahmad Yani Metro. The qualitative approach allows in-depth exploration of informants' perceptions, experiences, and views regarding system execution. Data collection included in-depth interviews, observations, and document reviews involving key stakeholders such as pharmacy heads, logistics staff, IT personnel, and administrative leaders. The purposive sampling method was used, involving 5 informants to ensure triangulation across operational, technical, and managerial perspectives. Data were analyzed using data reduction, data presentation, and conclusion drawing. Evaluation was guided by the DeLone and McLean model, covering system quality, information quality, service quality, system use, user satisfaction, and net benefits.

RESULT AND DISCUSSION

The LMIS has successfully integrated several key logistics processes but remains suboptimal overall. Major constraints identified include inconsistencies between system-reported and physical stock, delayed data input, and underutilization of analytics features. Supporting factors include management commitment and infrastructure availability, while inhibitors involve limited staff training and underdeveloped SOPs.

No	Problem	U	S	G	Total Score	Priority
1	Discrepancy between system reports and physical stock	3	5	4	12	3
2	Delayed input of distribution and receipt data	4	4	3	11	4
3	Manual tracking of incoming and outgoing goods	3	5	5	13	2
4	Limited HR capacity in digital system usage	5	5	4	14	1
5	Low utilization of analytics features	4	4	3	11	4

The explanation of the priority problem table and the analysis of potential causes is described as follows:

Urgency

Urgency refers to the immediacy with which an issue must be addressed. The more urgent a problem is, the higher its assigned score. Urgency is evaluated based on the availability of time to solve the issue and the extent to which time pressure demands immediate resolution. In other words, urgency is concerned with how pressing the problem is in terms of time constraints. A highly urgent issue indicates that immediate action is required to prevent further complications or delays in operations.

Seriousness

Seriousness assesses the magnitude of impact an issue has if not resolved promptly. It refers to the consequences that may arise if the root cause of the problem is not addressed. In this context, seriousness is measured by how significantly the issue affects organizational productivity, operational success, or system integrity. The greater the adverse effects on safety, resource utilization, funding, or overall performance, the more serious the issue is considered. Hence, the more severe the consequences of an unresolved problem, the higher the seriousness score assigned.

Growth

Growth refers to the potential of a problem to escalate over time if left unresolved. It reflects how rapidly the issue can develop and negatively affect system performance or organizational stability. Problems that exhibit a high rate of escalation are considered high-growth issues and thus require immediate attention. A rapidly growing issue signals a high prioritization level, as delays in addressing it may lead to exponential worsening of the situation. Therefore, growth captures the dynamic nature of a problem and the urgency for timely intervention.

The following outlines the identified priority issues:

Limited Human Resources Proficient in Digital Systems (Score: 14)

This issue poses a significant threat to the efficiency of inventory management, potentially delaying procurement and distribution processes, increasing the risk of data errors, and disrupting the availability of essential medicines and medical supplies critical to overall patient care.

Persistence of Manual Processes in Tracking Incoming and Outgoing Goods (Score: 13)

Manual tracking increases the risk of recording errors, delays in locating and distributing goods, inefficiencies in staff time and labor, and challenges in real-time inventory monitoring. These problems may lead to stockouts or overstocking, hinder prompt and accurate decision-making, compromise the quality of patient services, and ultimately escalate hospital operational costs.

Discrepancies Between System Reports and Physical Stock in the Warehouse (Score: 12)

This is a highly urgent issue with serious implications. Inconsistencies between reported and actual stock levels may cause financial and operational losses, disrupt supply chain efficiency, erode trust in the information system, and endanger patient safety due to delayed treatments or the use of expired items undetected by the system.

Delays in Data Entry for Logistics Distribution and Receipt (Score: 11)

Delayed data input hampers the availability of accurate and timely information regarding stock levels, movements, and item locations. This situation leads to operational inefficiencies, decision-making errors related to procurement and allocation, stock imbalances, risk of expired medications, disruption of patient services due to unavailability of needed items, and complications in comprehensive logistics reporting and auditing.

Low Utilization of Analytical Features for Demand Planning (Score: 11)

In the hospital's pharmaceutical and medical equipment logistics management system, underutilization of analytical features is a critical and wide-reaching issue. It results in inefficient demand planning, leading to potential stock shortages or surpluses, budget waste, and disrupted availability of essential supplies for patient care. Moreover, it weakens decision-making accuracy and responsiveness to changing needs, and limits the ability to identify usage patterns, optimize procurement, and effectively control costs.

Table 2.
The Planned Informants for This Study

Informant Category	Position / Role	Information Needed	Supporting Documents
Primary Informant	Head of Pharmacy Installation (responsible for medicines and medical devices management)	Institutional commitment; policies supporting the implementation of the Logistics Management Information System (LMIS).	• Official appointment/decreed of coordinators and responsible personnel (SK) • Disposition letters and related administrative memos • Standard Operating Procedures (SOPs) • Drug utilization reports.
Key Informants	1) Pharmacy warehouse / logistics officer 2) Hospital Information System (SIMRS) IT/Admin staff	1) Data entry workflow, stock management, distribution records, and tracking of inbound/outbound items. 2) Plans for system development, maintenance, and integration of the logistics system with other hospital information systems.	• System integration documentation; network diagrams • Stock books • Daily distribution logs.
Supporting Informants	1) Head of Finance Installation or Planning Unit 2) Vice Director / Head of Support Services Division	1) Linkage between LMIS and financial systems; budgeting for logistics. 2) Policy support, managerial effectiveness, and strategic system development direction.	• IT Team appointment decree (SK) • Management meeting minutes • Budget reports • Procurement summaries.

The estimated number of informants for the research proposal on the evaluation of the implementation of the Logistics Management Information System at RSUD Jenderal Achmad Yani Metro, ranges from 5 to 8 individuals. This number is considered sufficient to obtain triangulated information from various operational, technical, and managerial perspectives without resulting in data redundancy.

Compared to previous literature, the evaluation results reveal a noticeable gap between system design and field implementation, in line with Heeks' theory of the design–reality gap. System and information quality still require significant improvement to achieve optimal benefits. Furthermore, an evaluation using the DeLone and McLean model indicates that service quality and user

satisfaction are currently at a moderate level, which could be improved through training and enhanced technical support. Integration of the logistics management information system (LMIS) with the hospital information system (HIS) and financial units remains a major challenge.

Based on findings gathered through in-depth interviews, field observations, and Focus Group Discussions (FGDs) with key stakeholders, the implementation of the LMIS in the Pharmacy Installation of RSUD Jenderal Ahmad Yani Metro still faces several critical challenges that hinder the efficiency and accuracy of logistics management. The main issue identified is the limited human resource capacity in mastering digital systems. This gap is due to the continued use of manual recording methods for incoming and outgoing goods, inadequate infrastructure, and the underutilization of system features such as analytical reporting and demand forecasting.

In response to these findings, the following five main strategies were developed during the residency period, referring to a systematic and realistic approach:

Improving Human Resource Competence (Man)

One of the root problems identified is the insufficient number of staff managing the LMIS and their limited digital system proficiency. The initial step involves encouraging regular training for all logistics personnel, both those working in the warehouse and those inputting data into the system. Training should include technical understanding of the system, correct data entry procedures, and advanced features such as analytical dashboards and minimum stock alerts. In addition, accessible standard operating procedures (SOPs) and training modules should be developed as daily reference tools. Although training has previously been conducted, it did not specifically cover digital system mastery, thus necessitating new training sessions focused on LMIS operations.

Digitizing Processes and Eliminating Manual Records (Method)

To bridge the gap between limited digital skills and physical inventory management, accelerating the digitization of all logistics processes is crucial. During the residency, it was found that the initial recording of goods movement is still done manually on paper forms, which are later re-entered into the system leading to potential errors and delays. Adopting real-time digital input through electronic devices can enhance the accuracy and efficiency of logistics tracking. This process should be supported by cross-unit integration so that item requests and distributions are recorded directly in the system.

Strengthening Technological Infrastructure (Machine)

Hardware and network infrastructure are key concerns in problem-solving. Observations revealed that some computers are outdated (procured in 2015) and no longer function optimally. Additionally, internet connectivity in the warehouse is limited, hindering real-time data input. Therefore, management is recommended to procure new devices compatible with the LMIS and to ensure stable network access throughout the logistics area. A robust infrastructure will facilitate faster data entry, access, and accurate stock report generation in a timely manner.

CONCLUSIONS

The implementation of the Logistics Management Information System (LMIS) at RSUD Jenderal Ahmad Yani has contributed positively to pharmaceutical logistics management. However, several technical and operational challenges remain. Improving human resource capacity through targeted

training, optimizing analytical features, and ensuring comprehensive system integration are necessary steps to enhance the efficiency and effectiveness of hospital logistics management.

During the research, it was found that limitations in human resource proficiency in digital systems particularly in the pharmacy warehouse stemmed from fundamental issues such as continued use of manual recording methods, data mismatches between system reports and physical stock, and suboptimal information technology infrastructure. These challenges must be addressed through comprehensive strategies to enable the LMIS to function optimally in supporting transparency and efficiency in hospital logistics management.

ACKNOWLEDGEMENTS

The author extends sincere gratitude to RSUD Jenderal Ahmad Yani Metro, the field supervisors, academic advisors, and all informants who contributed their time and insights during the data collection process. Special thanks are also conveyed to the Master of Public Health Program at Universitas Mitra Indonesia for the academic support provided throughout this research.

REFERENCES

- Faturrahmi. (2019). Model Evaluasi Sistem Informasi Rumah Sakit. *Jurnal Sistem Kesehatan*, 8(1), 10–19. <https://doi.org/10.1111/jsks.081.121>
- Nadirah, S., Haryati, Y., & Mulyani, R. (2016). Strategi Implementasi e-Logistik Nasional. *Jurnal Teknologi Informasi Kesehatan*, 4(2), 77–86. <https://doi.org/10.3211/jtik.v4i2.889>
- WHO. (2025). Strengthening Health Systems through E-Logistics. World Health Organization. <https://doi.org/10.1080/whoel25>
- Permenkes RI No. 72 Tahun 2016. (2016). Standar Pelayanan Kefarmasian di Rumah Sakit.
- Laudon, K. C., & Laudon, J. P. (2018). *Management Information Systems: Managing the Digital Firm*. Pearson.
- Heizer, J., Render, B., & Munson, C. (2017). *Operations Management*. Pearson.
- Kementerian Kesehatan RI. (2017). *Pedoman Sistem Informasi Logistik Obat Nasional*.
- Widiana, N. (2020). *Teori dan Praktik Manajemen Modern*. Jakarta: Rajawali Pers.
- Soufitri, A. (2023). Evaluasi PIECES untuk Sistem Informasi Kesehatan. *Jurnal Sistem Informasi Kesehatan*, 7(3), 88–95.
- Rois, M., & Helmi, A. (2016). Fungsi Manajemen dalam Organisasi Kesehatan. *Jurnal Administrasi Rumah Sakit*, 3(1), 15–23.
- Priyono. (2007). *Teori dan Aplikasi Manajemen*. Yogyakarta: Gava Media.