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Web-Based Cash and Drug Inventory Information System Implementation Model at Ayah Bunda Pharmacy

Tia Oktavia[1], Erliany Syaodih[2], Ign. Wiseto P. Agung[3]
Postgraduate Master of Management, Universitas Adhirajasa Reswara Sanjaya, Bandung, Indonesia

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Abstract
Manual and semi-digital cash and medicine-recording processes in community pharmacies create risks of delayed reporting, duplicated entries, stock discrepancies, and weak managerial control. This study examined the implementation of a web-based cash and drug inventory information system at Ayah Bunda Pharmacy, Binjai, North Sumatra, by integrating the DeLone and McLean Information Systems Success Model with a Content Management System perspective. A qualitative case-study design was applied. Data were collected through semi-structured interviews, direct observation, and documentation involving the pharmacy owner, administrative personnel, cashiers, and pharmacy staff. Data were analyzed using the interactive model of reduction, display, and conclusion drawing. The findings indicate that the system provided accessible navigation, adequate speed and stability, integrated transaction and inventory data, responsive technical support, role-based access, and flexible content updating. Information quality was strong for cash and reporting functions but remained dependent on disciplined and complete stock input. Use intensity differed across functions: pharmacy staff used the system routinely, while some cashiers remained in transition from manual routines. Overall, the system improved reporting efficiency, stock visibility, transparency, and data-based decision making. The proposed implementation model emphasizes system integration, user discipline, technical readiness, continuous training, and governance controls as mutually reinforcing conditions for sustainable pharmacy digitalization

Corresponding Author:
Tia Oktavia
Postgraduate Master of Management, Universitas Adhirajasa Reswara Sanjaya
Email: drgtiaoctavia90@gmail.com

1. INTRODUCTION

Digital transformation has become a central operational requirement for healthcare and pharmaceutical organizations. Community pharmacies are no longer expected merely to dispense medicines; they must also maintain accurate inventory records, control cash flows, provide timely reports, protect sensitive information, and support managerial decisions. When these activities remain fragmented across handwritten invoices, notebooks, stock cards, and spreadsheets, information is often delayed and difficult to reconcile. A web-based information system offers an opportunity to integrate transactions, inventory, and reporting within a single platform that can be accessed in real time [1]-[4].

Ayah Bunda Pharmacy in Binjai, North Sumatra, faced this typical transition problem. Before the new system was implemented, sales transactions were recorded on invoices and expenditure books, while selected summaries were entered into Microsoft Excel. Drug receipts and stock movements were handled separately. This arrangement was familiar to staff, yet it created duplicated work and weakened traceability. Cash records could not always be compared immediately with inventory movements, data compilation required

additional time, and transaction histories were difficult to retrieve. Manual stock checking also increased the possibility of stock-outs, overstocking, expiration losses, and discrepancies between physical and recorded quantities [3], [5].

These operational weaknesses have managerial consequences. In a pharmacy, cash management and medicine inventory are interdependent: purchasing decisions affect liquidity, while inaccurate inventory information may tie up capital in slow-moving products or reduce service quality when essential medicines are unavailable. Sound pharmacy management therefore requires reliable information on revenues, expenditures, sales patterns, stock levels, and replenishment needs. Digital information systems can reduce repetitive work, strengthen internal control, and provide managers with current information for procurement and financial planning [6]-[8].

A web-based platform is particularly relevant for small and medium-sized pharmacies because it centralizes information without requiring users to install complex software on every device. Through authentication and role-based access, owners, administrators, cashiers, and pharmacy staff can access functions aligned with their responsibilities. A Content Management System (CMS) can further simplify development and maintenance by separating content, presentation, and access control. CMS architecture supports modularity, user management, content updating, and extension through additional features. In healthcare applications, these characteristics can improve flexibility and reduce dependence on advanced programming skills among end users [9]-[12].

Nevertheless, the availability of technology does not automatically guarantee successful implementation. A system may be technically functional but underused because staff continue to prefer manual routines. Data may be integrated yet inaccurate because users delay input. A secure platform may still fail to deliver benefits when hardware is outdated or technical support is unavailable. For this reason, success must be evaluated not only from the design of the application but also from the quality of information, service support, actual use, user satisfaction, and organizational benefits.

The DeLone and McLean Information Systems Success Model provides a comprehensive framework for such evaluation. The updated model comprises six interrelated dimensions: system quality, information quality, service quality, use or intention to use, user satisfaction, and net benefits [13], [14]. System quality concerns usability, reliability, speed, flexibility, integration, and security. Information quality addresses accuracy, relevance, completeness, consistency, and timeliness. Service quality reflects the responsiveness and reliability of technical support. Use indicates the extent to which the system is incorporated into work routines, whereas user satisfaction captures users' overall evaluation of their experience. Net benefits represent the effects on efficiency, productivity, service quality, control, and decision making.

Previous pharmacy information-system studies have generally reported improvements in inventory recording, transaction speed, and reporting accuracy after web-based systems were introduced [2], [4], [15]. Other studies have emphasized that technology adoption can remain uneven when users are insufficiently trained or when system performance differs across devices [16], [17]. Research on CMS-based medical applications has also demonstrated the value of flexible interfaces and modular content management, although security vulnerabilities require regular updates, access controls, and monitoring [9], [11]. These findings suggest that implementation is simultaneously a technological, behavioral, and managerial process.

The novelty of this study lies in combining the DeLone and McLean success dimensions with CMS implementation characteristics in a community-pharmacy setting. Rather than treating CMS only as a development tool, this study examines how integration, flexibility,

security, and content management shape the six success dimensions. It also focuses on the transition from manual and semi-digital routines to a centralized web-based system, allowing the study to identify both realized benefits and remaining implementation gaps.

Accordingly, this study aimed to develop an implementation model for a web-based cash and drug inventory information system at Ayah Bunda Pharmacy. Specifically, it examined system quality, information quality, service quality, use, user satisfaction, and net benefits; analyzed how CMS-based integration supported these dimensions; and formulated managerial priorities for sustainable implementation. The study is expected to contribute theoretically to information-system success research in pharmacy management and practically to digitalization strategies for small healthcare organizations.

2. RESEARCH METHOD

This study employed a qualitative case-study design. A qualitative approach was selected because the research sought to understand how users experienced the system, how implementation altered work processes, and why certain benefits or obstacles emerged. The case-study strategy was appropriate because the system was examined within its actual organizational context, where technology, work routines, user behavior, and managerial control could not be separated cleanly [18].

The research was conducted at Ayah Bunda Pharmacy, Binjai, North Sumatra, from October to December 2025. The pharmacy has operated since 1987 and provides services for general customers, National Health Insurance participants, and privately insured patients. Its daily operations include over-the-counter sales, prescription dispensing, compounding, inventory management, cash administration, and financial reporting. Eleven personnel work in the pharmacy, including the owner, pharmacist in charge, pharmacy technicians, pharmacy staff, administrative staff, and cashiers.

Participants were selected purposively because direct involvement in the system was required to provide relevant information. Seven key informants represented the owner or manager, administration, cashier, and pharmacy functions. The sample size followed the principle of information saturation: data collection continued until the main explanations became repetitive and no substantially new implementation theme emerged. Informant identities were protected through role-based codes.

Data were collected through semi-structured in-depth interviews, direct observation, and document review. Interviews explored user perceptions of system speed, usability, integration, information accuracy, technical support, access security, frequency of use, satisfaction, and operational benefits. Observations focused on actual system use during transaction processing, stock input, reporting, and high-volume periods. Documentation included screenshots of the web platform, stock pages, cash and transaction reports, role configurations, and operational records.

The researcher functioned as the principal instrument, supported by an interview guide, observation checklist, and documentation protocol. Triangulation was achieved by comparing statements across roles and by comparing interview evidence with observed practices and system records. Member checking was conducted by clarifying interpretations with relevant participants, particularly when perceptions differed regarding speed, stock accuracy, and frequency of use.

Data analysis followed the interactive model of Miles and Huberman: data reduction, data display, and conclusion drawing [19]. Interview transcripts and field notes were coded according to the six DeLone and McLean dimensions. Additional CMS-oriented codes captured integration, flexibility, role-based access, content updating, and technical maintainability. Data reduction identified recurrent meanings; data displays were prepared

in matrices that compared informants, evidence, and interpretations; and conclusions were iteratively verified against the complete data set.

Trustworthiness was strengthened through source triangulation, methodological triangulation, systematic coding, an audit trail of decisions, and the use of direct but concise participant statements. The study did not attempt statistical generalization. Instead, it sought analytical generalization by relating the case findings to established information-system success concepts and by specifying contextual conditions relevant to similar pharmacies.

Table 1. Informant Profile and Analytical Contribution

Code	Organizational Role	Primary Contribution
P1	Pharmacy owner	Managerial monitoring, integration, decision use
A1	Administrative staff	Cash records, reporting, data connectivity
K1-K3	Cashiers	Transaction use, speed, adaptation, satisfaction
F1-F2	Pharmacy staff	Drug input, stock accuracy, routine use, flexibility

3. RESULTS AND DISCUSSION

3.1. Organizational Context and Digital Transition

The digital transition at Ayah Bunda Pharmacy began from an operational need rather than from a technology-driven initiative. Manual and semi-digital procedures had become increasingly difficult to maintain as transaction volumes, product variety, and reporting demands grew. Sales, expenditure, and stock information were stored in different media, producing a fragmented information environment. Staff had to reconcile invoices, notebooks, stock cards, and spreadsheets before management could obtain a complete picture of operations.

The web-based system changed this arrangement by placing cash transactions, medicine data, stock movement, and reporting in a common environment. The CMS-based structure allowed content and user functions to be managed centrally. Each role could access designated modules, while the owner could review integrated information. This transition reduced the physical separation between pharmacy, cashier, and administration activities, although differences in user adaptation meant that the system was not immediately utilized at the same intensity across all functions.

Figure 1 summarizes the implementation model emerging from the case. CMS architecture forms the technical foundation. The six DeLone and McLean dimensions represent the evaluative mechanism, while user discipline, hardware readiness, training, and governance influence whether technical capabilities become organizational benefits. The model therefore treats successful implementation as a sequence of mutually reinforcing conditions rather than as a one-time software installation.

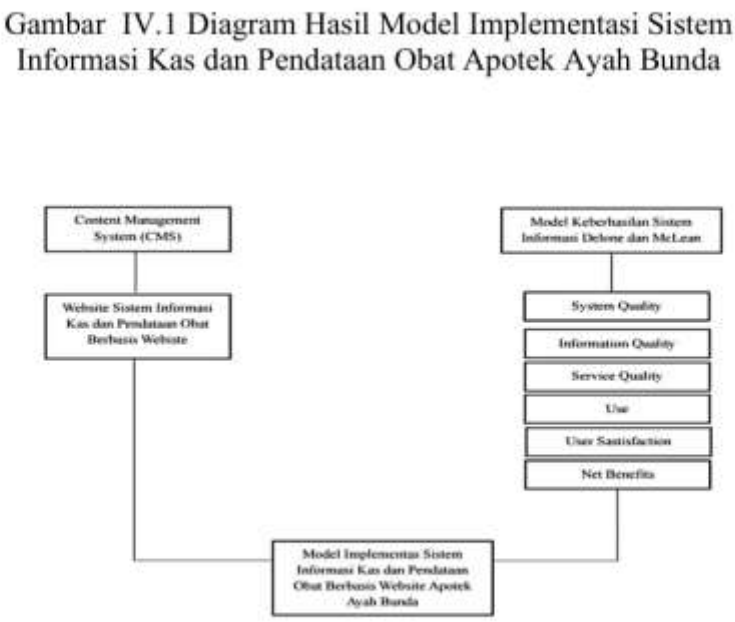

Figure 1. Web-Based Cash and Drug Inventory Information System Implementation Model

3.2. System Quality

Most participants assessed the system as easy to understand and sufficiently stable for routine work. The interface used Indonesian terminology, menu categories were recognizable, and users could locate transaction or stock functions without complex instructions. The owner emphasized that employees could identify medicine availability without counting every item manually. Administrative staff reported that transaction records were easier to prepare, while pharmacy staff valued visibility of incoming and outgoing products.

Speed and stability were generally adequate, but performance was not uniform under all conditions. One cashier observed that input became slower during busy periods, and another user experienced delays associated with an older device. These findings distinguish system performance from infrastructure performance. The application itself was considered stable, yet the experience of speed depended on transaction volume, network conditions, and hardware capability. This distinction is important because dissatisfaction attributed to the system may actually originate from device limitations.

Integration was the strongest aspect of system quality. Participants described the platform as connected across transaction, inventory, and reporting functions. The owner used integrated data as a reference for decision making; administrative staff confirmed that modules were connected; and pharmacy staff could compare medicine sales with warehouse availability. In the DeLone and McLean framework, integration strengthens reliability and ease of use because users no longer need to reconcile disconnected sources manually [13], [14].

The CMS architecture supported this integration by maintaining a centralized content and data structure. Modular design allowed different functions to share the same database while presenting role-appropriate interfaces. This finding is consistent with research

demonstrating that CMS-based medical applications can improve maintainability and data coordination [9], [10]. However, system quality should be monitored through response-time logs, error reports, and periodic load testing, particularly during peak transactions.

Kualitas sistem dapat dikategorikan baik, ditinjau dari berbagai dimensi sistem informasi. Apabila dilihat dari aspek kemudahan penggunaan (*ease of use)*, pengguna melaporkan bahwa tampilan yang disediakan oleh sistem memudahkan

Figure 2. Main Interface of the Ayah Bunda Pharmacy Web-Based System

3.3. Information Quality

Information quality was strongest for cash transactions and reporting. Administrative staff considered the reports orderly, complete, and easier to compile than manual summaries. Automated records reduced repeated calculation and provided a clearer audit trail. Users could retrieve transaction histories and prepare periodic reports with less dependence on scattered invoices. These outcomes indicate improvements in completeness, timeliness, and accessibility.

Stock information presented a more complex picture. The system was technically capable of updating inventory in real time, but the accuracy of the displayed quantity depended on complete input. One participant estimated that recorded information was approximately 80% accurate, while pharmacy staff explained that some items had not yet been entered. Another participant stated that information became real when the input was completed correctly. Thus, the residual stock discrepancy was primarily a data-governance problem rather than a calculation failure.

This finding confirms that information quality is jointly produced by system design and user behavior. Integrated architecture can prevent duplication and automatically connect sales with inventory, but it cannot compensate fully for omitted or delayed source data. The pharmacy therefore needs standard operating procedures defining when stock receipts, sales, adjustments, and returns must be entered; who verifies them; and how physical counts are reconciled with system balances.

The implication is that data quality should become an explicit managerial responsibility. Useful controls include mandatory fields, validation rules, duplicate detection, exception reports, and scheduled stock reconciliation. Performance indicators may include the percentage of items updated on time, discrepancy rates, unresolved exceptions, and report completion time. These controls would transform information quality from an informal expectation into a measurable organizational process.

informasi yang konsisten dan mencerminkan kondisi operasional yang sesungguhnya.

Gambar IV. 3 Tampilan Halaman Stok Obat di Apotek Ayah Bunda

Sumber : Website Apotek Ayah Bunda

Figure 3. Drug Inventory Page and Stock-Monitoring Function

3.4. Service Quality and Data Security

Technical support was perceived as responsive. Participants stated that the developer could be contacted directly and generally responded quickly when errors occurred. This support helped users continue their work and reduced the duration of disruptions. Administrative personnel specifically associated technical assistance with faster report preparation, while pharmacy staff noted that problems in the stock module were addressed promptly.

Despite the positive assessment, dependence on an external developer remained a vulnerability. Internal staff possessed limited capability to diagnose technical issues, manage backups, or modify configurations. If external support were temporarily unavailable, operational recovery could be delayed. Sustainable implementation therefore requires at least one internal system administrator or super-user who understands routine troubleshooting, user management, data backup, and escalation procedures.

Security mechanisms included usernames, passwords, and access rights based on organizational role. Cashiers used personal or role-specific accounts, pharmacy personnel accessed stock functions, administrative staff handled reports, and the owner retained broader monitoring rights. Role-based access strengthened accountability because activities could be associated with particular users. It also limited the possibility that staff could alter information outside their responsibility.

CMS security nevertheless requires continuous governance. Research has shown that outdated CMS components and plugins may expose systems to cross-site scripting, unauthorized file access, malware injection, or other vulnerabilities [11]. The pharmacy should therefore establish password standards, routine updates, backup schedules, audit-log review, account deactivation procedures, and periodic vulnerability assessment. Data security should be treated as part of service quality because users' trust depends on both support responsiveness and confidence that information is protected.

3.5. System Use and User Adaptation

Use intensity varied by organizational function. Pharmacy staff used the system almost every day because stock receipts and releases formed part of their routine work. Administrative personnel used it periodically, generally when compiling or checking records. By contrast, some cashiers reported limited or inconsistent use and continued to rely partly on manual methods. This pattern indicates that implementation had progressed further in functions where the system was indispensable and produced immediate benefits.

The variation also reflects differences in habit and confidence. Staff who had worked for a long time with manual procedures sometimes perceived manual entry as faster, particularly during busy periods. Such perceptions are common in technology transitions: familiar routines may feel more efficient even when they generate hidden costs in reconciliation, error correction, and reporting. Training therefore needs to demonstrate the complete workflow benefit rather than focusing only on how to operate individual menus.

CMS flexibility facilitated adaptation. Users could update medicine data, edit content, and adjust information without advanced technical knowledge. The owner described the system as flexible when new operational needs emerged, and pharmacy staff generally found updates easy. One editing difficulty was linked to a tablet cursor rather than to the application, again illustrating the role of hardware readiness.

To increase consistent use, management should define the web system as the official source of operational records. Parallel manual systems should be reduced gradually after a controlled transition period, because prolonged duplication weakens data integrity and discourages full adoption. Usage dashboards, minimum-use requirements, refresher training, and coaching during peak hours can support this transition.

intensitas penggunaan antar bagian ini menggambarkan bahwa pemanfaatan sistem berjalan efektif, namun belum merata di seluruh unit, terutama pada bagian yang masih membutuhkan proses adaptasi.

Gambar IV. 4 Penggunaan Fitur Kasir Oleh Staf Kasir

Gambar IV. 5 Penggunaan Fitur Input Data Stok Obat Oleh Staf farmasi

Figure 4. System Use by Cashier and Pharmacy Staff

3.6. User Satisfaction

Overall user satisfaction was relatively high but not uniform. Administrative staff appreciated easier report preparation, cashiers recognized that the system could accelerate work, and pharmacy personnel valued the simple interface and stock visibility. Users who experienced direct reductions in repetitive work expressed the strongest satisfaction.

Lower satisfaction was associated with three factors: preference for manual routines, slow devices, and occasional stock-module inconsistencies. One cashier considered manual work faster, while a pharmacy user reported delays caused by an outdated laptop. These

statements show that satisfaction is not determined by software alone. It emerges from the interaction between system design, device quality, workload, competence, and previous work habits.

The findings support the DeLone and McLean proposition that system quality, information quality, and service quality influence satisfaction [13]. Where the system was stable, information was complete, and support was responsive, users evaluated the experience positively. Conversely, incomplete stock input or device limitations reduced confidence and convenience. Satisfaction should therefore be managed through a combined strategy of technical optimization, user development, and process standardization.

Management can monitor satisfaction through short periodic surveys, issue logs, and structured feedback meetings. Feedback should be linked to corrective action so that users can see that reported problems are addressed. Visible improvement reinforces trust and reduces resistance to digital work practices.

3.7. Net Benefits and Managerial Value

The system generated clear operational benefits. Stock information became easier to view, administrative reports were produced more quickly, and pharmacy staff spent less time tracing medicine movements. Automated records reduced the risk of lost documents and improved the transparency of cash and inventory processes. These benefits were strongest in activities that had previously required repeated manual compilation.

Managerial benefits were also evident. The owner could monitor transactions and stock status more directly, use integrated information to evaluate operations, and identify issues without waiting for separate reports from each function. Better visibility supports purchasing decisions, cash planning, and internal control. In this respect, the system developed from an operational recording tool into a management-information resource.

Not all potential benefits had been realized. Cashier efficiency remained situational during high customer volumes, hardware differences affected speed, and incomplete stock input reduced the reliability of inventory analysis. Long-term benefits such as profitability improvement, reduced expiry losses, better demand forecasting, and stronger customer service were not yet measured systematically. Future evaluation should therefore incorporate objective indicators before and after implementation.

A useful performance framework would include transaction-processing time, report preparation time, stock discrepancy rate, expired-stock value, stock-out frequency, system downtime, user adoption rate, and number of unresolved errors. Financial outcomes might include inventory turnover, working-capital utilization, gross margin, and operational-cost reduction. Combining qualitative user feedback with these indicators would provide a more rigorous evaluation of net benefits.

Table 2. Summary of Findings, Risks, and Managerial Priorities

Dimension	Principal Finding	Remaining Risk	Priority Action
System quality	Easy navigation, stable operation, integrated modules	Peak-hour delays and device limitations	Load testing and hardware standardization
Information quality	Accurate cash reports and real-time potential	Incomplete stock input	SOP, validation, and reconciliation
Service quality	Responsive developer and role-based access	Dependence on external support	Internal super-user and security governance

Use	High routine use in pharmacy function	Uneven adoption among cashiers	Mandatory workflow and targeted coaching
User satisfaction	Generally positive due to efficiency	Manual preference and hardware frustration	Feedback cycle and usability improvement
Net benefits	Faster reporting, stock visibility, transparency	Long-term outcomes not measured	Performance dashboard and periodic evaluation

3.8. Proposed Implementation Model

The proposed model consists of five connected layers. The first layer is the CMS-based technical foundation, including centralized data, modular functions, role-based access, backups, and update capability. The second layer is information-system success, represented by the six DeLone and McLean dimensions. The third layer comprises enabling conditions: adequate devices, network reliability, technical support, training, and leadership commitment. The fourth layer is data and process governance, including mandatory input rules, verification, reconciliation, audit logs, and performance monitoring. The fifth layer is organizational value, expressed in efficiency, transparency, stock control, financial control, service quality, and evidence-based decision making.

The model assumes reciprocal relationships. Improved system and information quality increase use and satisfaction, but frequent and disciplined use also improves information completeness. Responsive service strengthens trust, while feedback from users guides system refinement. Net benefits reinforce management commitment and justify further investment. Conversely, weak hardware, incomplete input, or continued parallel manual systems can interrupt these relationships and prevent benefits from becoming sustainable.

Implementation should therefore follow a staged process. First, management should establish governance, assign roles, and define the official data source. Second, master data and user access should be validated. Third, users should receive role-specific training and supervised practice. Fourth, system use should be monitored during a transition period while manual duplication is reduced. Fifth, operational and managerial indicators should be reviewed regularly, and system improvements should be prioritized based on evidence. This staged approach converts the proposed model into an actionable roadmap.

3.9. Implementation Roadmap and Governance Implications

A sustainable implementation roadmap should begin with governance clarification. Management must determine who owns the system, who is responsible for master data, who authorizes access, who verifies reports, and who responds when discrepancies occur. Without this division of responsibility, users may assume that data quality is solely a technical matter. In practice, the pharmacy owner should act as executive sponsor, an appointed super-user should coordinate daily administration, and each operational role should be accountable for the completeness and timeliness of its own entries. These responsibilities should be documented in standard operating procedures and reviewed during staff meetings.

The second stage concerns data preparation and process standardization. Before full implementation, medicine master data should be checked for duplicate names, inconsistent units, missing purchase prices, expiration information, and category errors. Transaction procedures should be mapped from receipt of goods through storage, sale, return, adjustment, and financial reporting. Each process should have a clear digital recording point. This step is essential because digital systems can reproduce and accelerate poor procedures

if the underlying workflow is not standardized. A clean master-data structure and agreed workflow provide the foundation for reliable information.

The third stage is role-specific capacity building. General demonstrations are insufficient because the owner, administrator, cashier, and pharmacy staff use different functions and face different risks. Cashiers require practice in fast transaction entry and correction procedures during crowded periods. Pharmacy personnel need training in receiving, stock adjustment, expiration control, and reconciliation. Administrative staff need proficiency in report generation and exception review, while the owner needs to interpret dashboards and audit trails. Training should combine explanation, supervised practice, scenario-based exercises, and competency verification.

The fourth stage is controlled operational migration. During the initial transition, manual records may be retained temporarily for validation, but the duration and scope of duplication should be limited. A prolonged dual system encourages users to choose the method they find most comfortable and creates competing sources of truth. Management should set a formal cutover date, specify which records remain legally necessary in physical form, and define the web system as the primary operational database. Daily reconciliation during the first weeks can identify errors early without institutionalizing permanent duplication.

The fifth stage is continuous performance management. Implementation success should be reviewed through a balanced set of technical, behavioral, and managerial indicators. Technical indicators include uptime, response time, error frequency, backup success, and security incidents. Behavioral indicators include active-user rates, completeness of required fields, delayed entries, and training completion. Operational indicators include transaction time, stock discrepancy, stock-out frequency, expired inventory, and report preparation time. Managerial indicators include decision speed, purchasing accuracy, working-capital efficiency, and perceived transparency. Regular review connects system use with organizational objectives.

Governance also requires a formal change-management mechanism. Users should have a structured channel for requesting new features, reporting defects, and proposing workflow improvements. Requests should be prioritized according to operational impact, patient safety, regulatory relevance, cost, and technical feasibility. This mechanism prevents ad hoc modification and ensures that system development remains aligned with pharmacy strategy. It also helps distinguish between issues requiring software changes and those better addressed through training or process discipline.

Data protection must be integrated into everyday governance rather than treated as a one-time technical configuration. User accounts should not be shared, passwords should be changed periodically, inactive accounts should be disabled promptly, and access rights should be reviewed whenever responsibilities change. Backups should be automated and tested through periodic restoration exercises. Audit logs should be reviewed for unusual changes, and sensitive reports should be accessible only to authorized roles. These controls are particularly important because financial and inventory data can be exploited through unauthorized access or manipulation.

Finally, leadership behavior will determine whether the system becomes institutionalized. When managers consistently use digital reports in meetings, request evidence from the system, and recognize disciplined data entry, employees receive a clear message that the platform is central to organizational work. Conversely, when leaders continue to make decisions from informal notes or tolerate incomplete records, users have little incentive to change. Digital transformation is therefore not merely a technology project; it is an organizational-development process requiring consistent leadership, accountability, learning, and reinforcement.

3.10. Theoretical and Practical Implications

Theoretically, the findings extend the DeLone and McLean model by illustrating how CMS characteristics operate as enabling mechanisms within the success dimensions. Integration and modularity primarily strengthen system quality; structured data and centralized updating support information quality; role-based access and maintainability contribute to service quality; flexible editing reduces barriers to use; and transparency reinforces satisfaction and net benefits. The case therefore suggests that platform architecture should not be treated as external to information-system success but as a contextual mechanism shaping relationships among the dimensions.

The study also highlights the recursive nature of information quality and use. Traditional interpretations often position quality as an antecedent of use, but the case shows that use discipline is itself an antecedent of quality. When users enter data promptly and completely, the system produces reliable information; reliable information then increases trust and encourages further use. Incomplete use has the opposite effect, producing discrepancies that reduce confidence and may drive users back to manual methods. This feedback cycle is especially relevant in inventory-intensive settings.

Practically, the model offers a realistic digitalization pathway for small pharmacies with limited technical resources. Such organizations do not necessarily require large enterprise systems, but they do require integration, role clarity, security, training, and measurable governance. A flexible web platform can deliver substantial value when it is supported by standardized processes and management commitment. The findings caution against evaluating success solely by whether software is installed or operational; success should be judged by whether the system becomes the trusted basis for daily work and managerial decisions.

For pharmacy managers, the immediate priority is to reduce the gap between technical capability and actual utilization. The system already possesses many required functions, but inconsistent use and incomplete stock input prevent full value realization. Targeted interventions should therefore focus on data discipline, cashier adoption, hardware readiness, and internal support capability. These priorities are likely to generate greater short-term benefits than adding numerous new features before existing functions are used consistently.

For system developers, the findings indicate the importance of designing for operational pressure. Interfaces should minimize the number of steps required for common transactions, provide clear confirmation and error messages, and support quick correction without compromising audit trails. Stock modules should include validation, alerts for missing information, duplicate-item detection, minimum-stock notifications, and expiration warnings. Developers should also provide simple system-health dashboards and documentation that enable internal staff to resolve routine issues.

4. CONCLUSION

The implementation of a web-based cash and drug inventory information system at Ayah Bunda Pharmacy produced meaningful improvements in operational integration, reporting efficiency, inventory visibility, transparency, and managerial access to information. System quality was generally good because the platform was accessible, stable, and easy to navigate. CMS-based integration connected transactions, stock, and reports, while role-based access supported accountability and security.

Information quality was strong for cash and reporting functions but remained dependent on timely and complete stock input. Service quality benefited from responsive developer support, although internal technical capacity was still limited. Use was embedded in

pharmacy activities but less consistent among cashiers who remained attached to manual routines. User satisfaction was generally positive and was highest where the system reduced repetitive work; it declined when hardware was slow or stock information was incomplete. Net benefits included faster reporting, reduced manual-recording risk, improved stock monitoring, and better support for managerial decisions.

The study concludes that sustainable implementation requires more than a functional website. Successful digitalization depends on the alignment of CMS architecture, the six DeLone and McLean dimensions, user discipline, hardware readiness, technical support, training, leadership, and data governance. Ayah Bunda Pharmacy should formalize the system as the primary operational record, strengthen stock-input procedures, appoint an internal super-user, standardize devices, apply security controls, and evaluate performance through measurable indicators. Future studies should compare multiple pharmacies, incorporate quantitative system logs and financial outcomes, and assess long-term effects on inventory turnover, service quality, and organizational competitiveness.

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