International Journal of Multidisciplinary Sciences and Arts
E-ISSN :2962-1658
Volume 5, **Number** 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

HOT-Fit Evaluation of a Laboratory Management Information System in Vocational Higher Education

A. Labib Fardany Faisal[1*], Aries Alfian Prasetyo[2], Akhmad Arif Kurdianto[3], Ahmad Mustofa[4]
[1,2,3,4]Politeknik Negeri Madura, Indonesia
[1]a.labib@poltera.ac.id, [2]aries@poltera.ac.id, [3]aak@poltera.ac.id, [4]mustofaahmad@poltera.ac.id

open access

***Corresponding Author**

Article History:
Submitted: 26-03-2026
Accepted: 31-03-2026
Published: 06-04-2026

Keywords:
HOT-Fit; information system evaluation; polytechnic; system adoption; system development.

ABSTRACT

The Laboratory and Workshop Information System named SIABEL at Politeknik Negeri Madura has been operational since January 2024, providing five core modules: Catalogue, Usage, Procurement, Inventory Verification, and Reporting. Despite more than one year of operation, active adoption remains at approximately 40% of institutional laboratory and workshop units. This study evaluates the factors influencing system adoption using the HOT-fit (Human, Organization, Technology–fit) framework, identifies functional and structural gaps, and proposes a phased system development plan grounded in evaluation findings. Data were collected via a structured five-point Likert-scale questionnaire administered to 119 respondents across four role groups — Students (74.8%), Laboratory Technicians (10.9%), Laboratory and Workshop Heads (8.4%), and Supervising Lecturers (5.9%) — drawn from four academic departments. The 44-item instrument was confirmed valid ($r = 0.793–0.921$) and reliable across all nine HOT-fit constructs (Cronbach's $\alpha = 0.901–0.937$). Descriptive analysis shows all constructs scored in the Good category (overall means 3.74–3.83), establishing that the adoption gap is not attributable to system quality failure but to three structural conditions: a configuration mismatch between the system and the Department of Health's laboratory workflows, functional gaps that reduce the net benefit perceived by Laboratory Technicians, and weak institutional governance. A 14-initiative, three-phase development plan is proposed, prioritizing a health laboratory configuration module, an automated notification engine, and a structured onboarding program as immediate interventions.

INTRODUCTION

Laboratories constitute the core infrastructure of vocational higher education institutions, as they serve as the primary environments for practice-based and competency-oriented learning. In polytechnic education, where the curriculum emphasizes applied skills and hands-on training, the effectiveness of laboratory management directly influences the quality of learning outcomes. The availability, traceability, and accountability of laboratory assets (including equipment and consumable materials) are therefore essential components of institutional performance and educational quality assurance (Creswell & Creswell, 2023; Guppy et al., 2022).

Effective laboratory asset management must ensure several critical aspects: (1) availability of equipment to support scheduled practicum activities, (2) accurate and real-time stock monitoring, (3) transparent borrowing and request procedures, and (4) proper documentation of consumable usage. These aspects are closely related to institutional governance, operational efficiency, and risk mitigation. Inadequate management practices may result in equipment shortages, discrepancies between physical and recorded stock, delayed practicum sessions, and even asset loss (Ahmad et al., 2023). Furthermore, weak documentation practices reduce institutional accountability and hinder data-driven planning for procurement and budgeting.

Despite the increasing digital transformation initiatives in higher education, many laboratories in developing-country contexts continue to rely on manual logbooks or semi-digital spreadsheet-based systems. Such approaches are prone to data redundancy, inconsistencies, and limited traceability. Manual approval workflows for borrowing and procurement often lead to inefficiencies and delays, particularly when multi-level authorization is required. Moreover, the absence of integrated reporting mechanisms restricts transparency and managerial oversight (Gkrimpizi et al., 2023; Saba et al., 2025). These challenges highlight the need for an integrated information system capable of supporting comprehensive laboratory governance.

International Journal of Multidisciplinary Sciences and Arts
E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

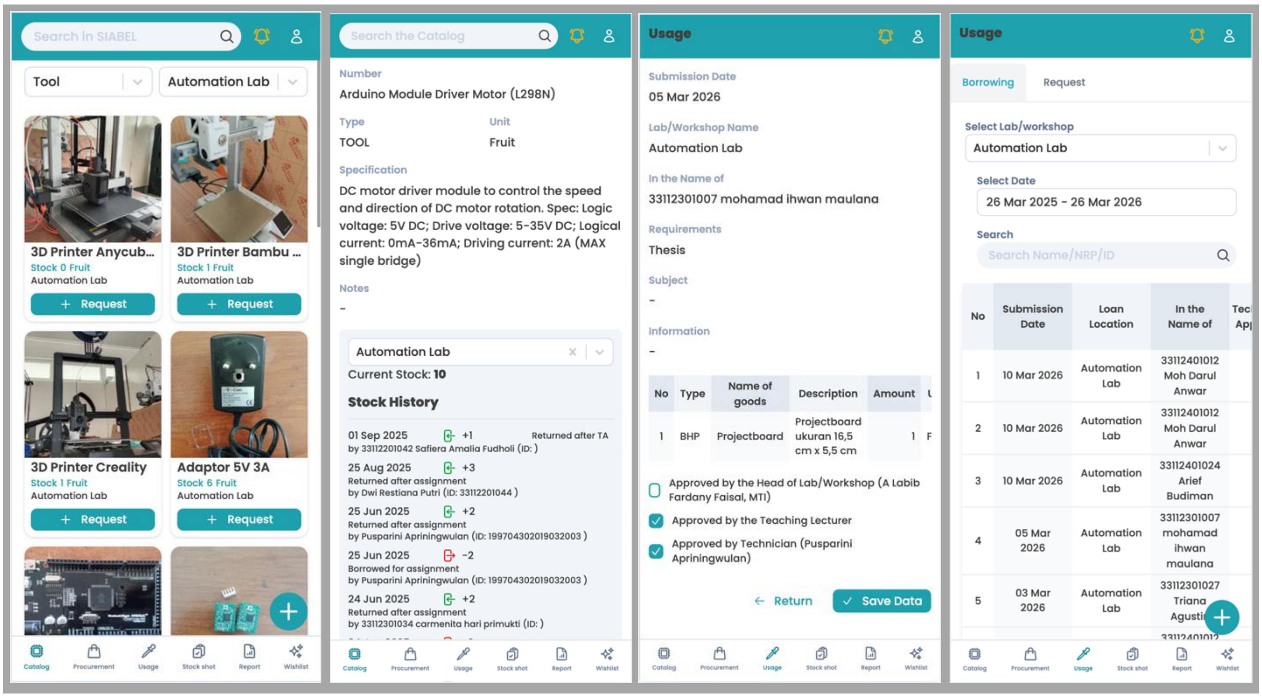

Fig. 1 Mobile view of SIABEL

To address these issues, a Laboratory and Workshop Information System named SIABEL was developed and deployed at Politeknik Negeri Madura in January 2024. Fig. 1 displays sample of user interface of this system which can be found at https://siabel.poltera.ac.id. The system was designed to digitalize and integrate core laboratory management processes through five primary modules:

a. Catalogue Management, which functions as a master data repository for equipment and consumables, supporting search, filtering, stock visibility, and usage history tracking.
b. Usage Module, which manages borrowing and consumable requests through a multi-level approval workflow.
c. Procurement Module, which handles purchase order submission and receiving processes with stock synchronization.
d. Inventory Verification Module, which supports periodic stock verification and adjustment with historical logging.
e. Reporting Module, which generates analytical reports on asset utilization and usage trends.

The system supports two main roles (manager and student) while operationally accommodating laboratory technicians and heads of laboratories within the managerial workflow. Through this architecture, SIABEL aims to improve transparency, accountability, and efficiency in laboratory asset governance. However, although SIABEL has been operational since early 2024, its adoption rate has reached only approximately 40% of all laboratories within the institution. This figure indicates that system utilization remains suboptimal and uneven across departments. Limited adoption may be influenced by multiple factors, including user acceptance, organizational readiness, workflow complexity, technological usability, and institutional policy alignment. Prior studies emphasize that successful information system implementation in higher education is not determined solely by technological quality, but also by human and organizational dimensions (Saba et al., 2025; Kosasih et al., 2023).

Therefore, a systematic evaluation of SIABEL is required to identify the key limiting factors affecting its adoption and effectiveness. Such evaluation is essential not only to assess current system performance but also to formulate a structured and evidence-based development roadmap. By analyzing the interplay between technological, organizational, and human factors, this study aims to provide strategic recommendations for improving system utilization and expanding implementation across all laboratories at Politeknik Negeri Madura.

Research Problems

Despite the institutional rollout of SIABEL, uneven implementation across laboratories indicates the presence of structural and behavioral gaps that require systematic investigation. In information system research, implementation success is typically measured not only by system availability but by the extent of actual usage, integration into daily workflows, and perceived institutional value (Creswell & Creswell, 2023; Guppy et al., 2022). A discrepancy between system deployment and effective utilization suggests that deeper evaluative analysis is necessary.

In organizational settings, limited adoption may stem from multidimensional factors, including user perception,

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

managerial commitment, process alignment, governance structures, and system adaptability. Without empirical assessment, it is difficult to determine whether the primary constraint lies in technological design, organizational readiness, or user acceptance behavior. Furthermore, partial implementation may create operational fragmentation, reducing the overall institutional impact of the system.

Accordingly, this study formulates the following research questions:

a. What is the current adoption profile of SIABEL and how do active users perceive the system across Human, Organization, and Technology dimensions?
b. What functional and structural gaps within the HOT-fit dimensions account for the suboptimal adoption of SIABEL across operational units?
c. What phased system development plan can be formulated to address the identified gaps and improve institutional integration of SIABEL?

These research problems aim to move beyond descriptive reporting and toward an analytical understanding of implementation effectiveness.

Research Objectives

This study pursues three interrelated objectives that together constitute a comprehensive post-implementation evaluation of SIABEL. The first objective is to evaluate user perceptions of the system across the Human, Organization, and Technology dimensions of the HOT-fit framework, using a validated 44-item questionnaire instrument administered to 119 respondents representing four role groups: Students, Laboratory Technicians, Laboratory and Workshop Heads, and Lecturers, drawn from four academic departments at Politeknik Negeri Madura. This objective establishes the empirical foundation of the study by characterizing how different user groups perceive system quality, organizational support, and personal benefit, and by identifying inter-group variation that aggregate scores alone cannot reveal.

The second objective is to identify the functional and structural gaps that account for the approximately 40% active adoption rate across institutional laboratory and workshop units. Rather than treating low adoption as a symptom of user resistance or system quality failure, this objective directs the analysis toward the specific configuration mismatches, feature deficits, and institutional governance weaknesses that the HOT-fit evaluation framework is designed to surface. The intent is to move beyond descriptive reporting and toward a theoretically grounded diagnosis of why the system has not achieved full institutional penetration despite being positively perceived by its active users.

The third objective is to propose an evidence-based, three-phase system development plan comprising prioritized technical and organizational interventions directly derived from the evaluation findings. This objective ensures that the study produces not merely an academic diagnosis but a strategically actionable output: a structured roadmap that addresses identified deficits across all three HOT-fit dimensions simultaneously, and that provides institutional decision-makers with a clear, sequenced, and measurable improvement strategy for expanding SIABEL adoption across all laboratory and workshop units.

Research Contributions

This research contributes to the literature and practice in several ways. From a theoretical perspective, the study enriches the discourse on information system evaluation by contextualizing established IS success models within laboratory governance in vocational higher education. The application of a multidimensional evaluation framework provides evidence of how human, organizational, and technological factors interact in an asset-intensive academic environment.

From a methodological standpoint, the study integrates usage analysis and perceptual evaluation to provide a comprehensive assessment of implementation effectiveness. This approach strengthens empirical rigor compared to purely descriptive system reporting.

From a practical perspective, the research produces a structured and evidence-based development roadmap that can serve as a strategic reference for institutional decision-makers. The roadmap offers prioritized interventions rather than generic improvement suggestions.

Finally, the study presents a contextual case relevant to polytechnic institutions in developing countries undergoing digital transformation. As many similar institutions face comparable governance and adoption challenges, the findings may provide transferable insights for broader implementation strategies. research.

LITERATURE REVIEW

HOT-Fit Framework for Information Systems Evaluation

Evaluating deployed information systems is a well-established concern in IS research. DeLone and McLean (Saba et al., 2025) organized IS success into six dimensions — system quality, information quality, use, user satisfaction, individual impact, and organizational impact — later refined by adding service quality and consolidating impacts into a single net benefits construct (Saba et al., 2025). While this updated model provides the conceptual basis for assessing whether a deployed LMIS delivers institutional value (Saba et al., 2025), it does not offer a structured

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

diagnostic lens for understanding why adoption falls short across diverse operational units.

The Human, Organization, and Technology-Fit (HOT-fit) model by Kosasih et al. (2023) directly addresses this gap. HOT-fit proposes that IS success is determined by the degree of fit among three dimensions: the human dimension (system use, user satisfaction, attitudes toward technology), the organization dimension (institutional structure, top-management support, IS strategy), and the technology dimension (system quality, information quality, service quality). All three must achieve mutual fit to generate Net Benefit (Kosasih et al., 2023). This structure maps directly onto the present study's research questions, making HOT-fit the primary evaluative framework. HOT-fit has been validated across IS evaluation studies; Rifarsih et al. (2022) confirmed that both Human and Technology components significantly influenced net benefits in an electronic medical record (EMR) context, with Technology as the dominant factor, while a broader review found the model consistently surfaces actionable barriers that simpler frameworks miss (Suryo et al., 2023).

Technology Acceptance and Laboratory Management Systems in Vocational Higher Education

HOT-fit has since been extended to educational IS contexts, where organizational readiness and top-management commitment are frequently cited as limiting factors in net benefit realization (Windari et al., 2023). Within the Human dimension, TAM constructs provide additional precision: Al-Emran and Granić (2022) confirmed through a systematic review that perceived usefulness and perceived ease of use remain the most validated determinants of system acceptance in educational contexts, with ease of use consistently acting as a causal antecedent to usefulness — a distinction particularly relevant in multi-role systems where technicians, laboratory heads, and students interact with different feature sets under varying levels of digital literacy.

In Indonesian vocational higher education, studies at Universitas Muria Kudus and Politeknik Negeri Ketapang by Larasati et al. (2025) and Darmanto et al. (2022) confirm that LMIS deployment addresses measurable operational inefficiencies, while a post-implementation evaluation of a web-based laboratory booking system reported a task completion rate above 95% and a System Usability Scale score of 83.6 (Dwipanilih et al., 2025). These cases collectively establish that LMIS deployment is both technically feasible and organizationally beneficial in this context, yet underscore that deployment alone is insufficient without systematic post-implementation evaluation to identify and address adoption gaps.

Adoption Barriers and Strategic IS Refinement in Higher Education Institutions

IS adoption in higher education institutions is persistently constrained by organizational inertia, inadequate leadership support, and resistance to workflow change (Singun, 2025), compounded in Indonesian HEI contexts by the absence of IS governance policy and inconsistent cross-unit implementation (Gkrimpizi et al., 2023). In general, post-implementation reviews should directly translate utilization and satisfaction data into prioritized feature improvements, treating low-utilization modules as evidence of workflow misfit or inadequate training. In the polytechnic laboratory context, this implies that a HOT-fit evaluation must culminate not merely in diagnosis but in an actionable development roadmap that simultaneously addresses Human, Organization, and Technology deficits to achieve the institutional integration the LMIS was designed to enable.

METHOD

Research Design

This study employs a quantitative descriptive research design to evaluate the SIABEL deployed at Politeknik Negeri Madura. The evaluation is structured around the Human, Organization, and Technology-Fit (HOT-fit) model (Kosasih et al., 2023), which serves as both the theoretical lens and the instrument blueprint for the study. HOT-fit was selected because its three-dimensional structure (Human, Organization, and Technology) maps directly onto the three research questions: measuring system utilization (RQ1), identifying adoption factors (RQ2), and informing strategic refinements (RQ3). The study adopts a post-implementation evaluation stance, meaning that the SIABEL under investigation was already operational at the time of data collection, having been deployed in January 2024 and used across a subset of the institution's laboratory units.

Data were collected through two complementary methods. First, a structured questionnaire survey was administered to capture user perceptions across the Human, Organization, and Technology dimensions of HOT-fit on a five-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Second, system log data extracted from the SIABEL database were analysed to produce objective utilization metrics—including module-level transaction frequency, adoption rate per operational unit, and approval workflow completion rates—corresponding to RQ1. The triangulation of perceptual survey data with objective log data strengthens the validity of findings by cross-verifying self-reported use against actual system behavior (Saba et al., 2025). Table 1 summarizes the overall research phases and their corresponding outputs.

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

Table 1. Research Phases and Output

Phase	Activity	Output
1	Literature review & framework mapping	HOT-fit instrument blueprint
2	Instrument development & validity/reliability testing	Validated Likert-5 questionnaire
3	Purposive sampling & data collection (survey + system log)	Primary dataset from 3 respondent groups
4	Quantitative analysis (descriptive statistics)	Utilization metrics; cross-group HOT-fit construct means and thematic findings
5	Interpretation & gap identification	HOT-fit dimension gap profile
6	Development roadmap formulation	Strategic IS refinement plan

Population, Sampling, and Respondents

The population of this study consists of all active users of the SIABEL at Politeknik Negeri Madura, drawn from the institution's 18 laboratory units. At the time of data collection, approximately 40 percent of these units had adopted the system, yielding a bounded population of users concentrated within the active units. Purposive sampling was applied to ensure that respondents possessed direct and relevant experience with the system, as uninformed responses from non-users would introduce noise into the HOT-fit constructs (Creswell & Creswell, 2023). Three respondent groups were defined in accordance with the two role categories established in the SIABEL: (1) Laboratory Technicians, who hold the Manager role and are responsible for daily inventory management, equipment loan confirmation, and inventory verification; (2) Laboratory Heads, who also hold the Manager role and serve as the second-tier approver in the usage workflow; and (3) Students, who hold the Student role and interact primarily with the Catalogue and Usage modules for equipment borrowing and consumable requests. This role-stratified sampling approach allows the analysis to detect inter-group variation in HOT-fit dimension scores, which is essential for formulating targeted recommendations in the development roadmap.

Research Instruments

The primary instrument is a structured questionnaire developed based on the HOT-fit model constructs. Seven constructs were operationalized: System Use and User Satisfaction (Human dimension); Organizational Structure/Support and Organizational Environment (Organization dimension); System Quality, Information Quality, and Service Quality (Technology dimension); and Perceived Net Benefit as the dependent construct. Each construct is measured by three to five indicator items adapted from validated HOT-fit instruments in prior IS evaluation studies (Kosasih et al., 2023; Rifarsih et al., 2022) and contextualized to reflect the specific modules and workflows of the SIABEL (e.g., the multi-step approval process in the Usage module and the procurement and inventory verification functions accessible to Manager-role users). All items are measured on a five-point Likert scale. Table 2 presents the construct mapping across HOT-fit dimensions.

Table 2. HOT-fit Construct and Indicator Mapping

Dimension	Construct	Indicator Items (Examples)
Human	System Use	Frequency of module access; completion of approval workflows
	User Satisfaction	Satisfaction with system features; overall experience rating
Organization	Structure & Support	Institutional policy on system use; leadership encouragement
	Environment	Inter-unit coordination; availability of training and guidance
Technology	System Quality	System reliability, response time, ease of navigation
	Information Quality	Accuracy, completeness, and timeliness of data outputs
	Service Quality	Responsiveness of technical support; system update adequacy
Net Benefit	Perceived Net Benefit	Perceived improvement in lab management efficiency and oversight

Before administering the questionnaire to the full sample, instrument validity and reliability were assessed. Construct validity was evaluated using Pearson product-moment correlation, computed as

$$r = \frac{\sum_{i=1}^{n}(X_i-\bar{X})(T_i-\bar{T})}{\sqrt{\sum_{i=1}^{n}(X_i-\bar{X})^2 \cdot \sum_{i=1}^{n}(T_i-\bar{T})^2}} \quad (1)$$

where X_i is the respondent's score on a given item and T_i is their total score across all items in the same construct. Items whose correlation coefficient r exceeded the critical value at a significance level of $\alpha = 0.05$ were retained for analysis (Sugiyono, 2022). Internal consistency reliability was measured using Cronbach's Alpha, computed as

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} s_i^2}{s_T^2}\right) \quad (2)$$

where k is the number of items in the construct, s_i^2 is the variance of each item, and s_T^2 is the variance of the construct total score. A threshold of $\alpha \geq 0.70$ was considered acceptable for social science research instruments (Sekaran & Bougie, 2023). Items failing either criterion were revised or removed prior to the main data collection phase. System log data, as the secondary data source, required no psychometric validation; instead, data integrity checks were performed to ensure completeness and consistency of transaction records across the study period (January 2024 to the time of data collection).

Data Analysis Method

Data analysis proceeded in two stages corresponding to the two data sources. For the system log data, descriptive analysis was applied to compute the SIABEL adoption rate across operational units (expressed as the proportion of laboratory units with recorded active transactions), module-level transaction frequency, and approval workflow completion rates within the Usage module. These metrics directly address RQ1 and provide the quantitative baseline against which HOT-fit dimension scores are interpreted.

For the questionnaire data, a two-stage analytical approach was employed. In the first stage, descriptive statistics — including mean scores and standard deviations per HOT-fit construct — were computed by summing the Likert scores for all items within a construct and dividing by the number of items, yielding a construct mean on the original 1–5 scale. Mean scores were categorized using the following interval: 1.00–1.80 (Very Poor), 1.81–2.60 (Poor), 2.61–3.40 (Moderate), 3.41–4.20 (Good), and 4.21–5.00 (Very Good).

In the second stage, the questionnaire data were analyzed through two complementary approaches to address RQ2 and RQ3. Cross-group descriptive comparison was conducted by disaggregating construct means by respondent role group (Student, Lab Technician, Lab Head, and Lecturer), enabling identification of inter-group variation in perceptions of the Human, Organization, and Technology dimensions and Net Benefit. Differences in construct means across role groups were interpreted in relation to each group's operational interaction with the system — specifically, the frequency, volume, and nature of system tasks performed by each role — to generate theoretically grounded explanations of observed score patterns. Thematic analysis was applied to the three open-ended questionnaire items (most helpful features, improvement suggestions, and adoption barriers), using an inductive coding procedure (Braun & Clarke, 2022) in which responses were grouped into recurring themes, each supported by representative verbatim statements. The integrated findings from log analysis, cross-group descriptive statistics, and thematic analysis together form the evidence base for the Results and Discussion section and directly inform the development roadmap presented in the subsequent chapter.

RESULT

Respondent Profile

A total of 119 valid responses were collected from SIABEL users at Politeknik Negeri Madura, spanning four academic departments and four user roles. Respondents comprised 89 students (74.8%), 13 laboratory technicians/staffs (10.9%), 10 laboratory heads (8.4%), and 7 lecturers (5.9%). Figure 2 presents the complete respondent profile. By department, the largest group was Health (52.9%), followed by Mechanical Engineering (18.5%), Electrical Engineering (16.0%), and Maritime Engineering (12.6%). With respect to system experience, 37.0% of respondents had used the SIABEL for more than 12 months and 30.3% for three to six months, indicating that the majority of the sample had sufficient operational familiarity with the system to provide reliable evaluative judgments.

Two characteristics of the sample are important for subsequent interpretation. First, students constitute nearly three-quarters of all respondents (74.8%), meaning that overall construct means are substantially weighted toward the student user experience, which centers on the Catalogue browsing and Usage (loan/request submission) modules.

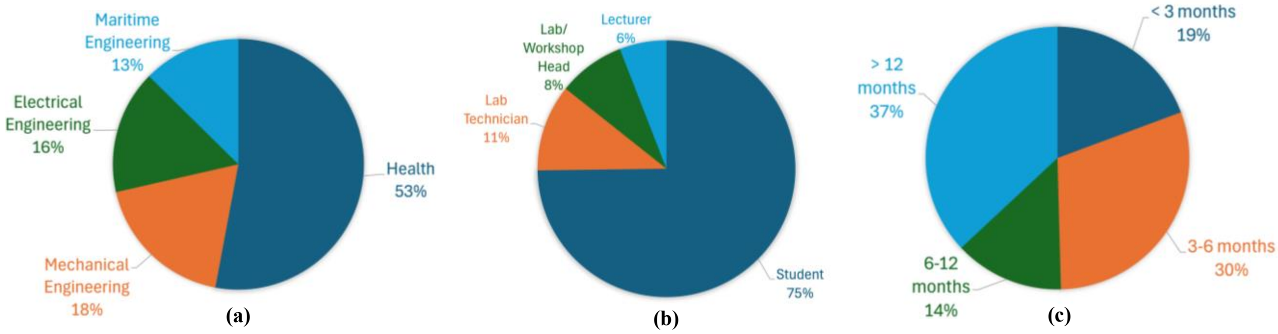

Fig. 2 Respondent profile (n = 119): By department (a), by role (b), by usage time (c)

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

Second, the Department of Health is the single largest departmental group (52.9%), yet this department is the primary context of non-full adoption: the system's current configuration does not accommodate health laboratory inventory workflows, rendering it structurally non-adoptable for several units within this department regardless of user perceptions. Both features must be held in view throughout the interpretation of construct scores, as they simultaneously moderate overall averages toward student-level perceptions and include a respondent group whose partial engagement reflects structural rather than preference-based barriers.

Instrument Validity and Reliability

All 44 questionnaire items were subjected to validity and reliability testing on the full augmented sample (n = 119). Construct validity was assessed using Pearson product-moment item-total correlation, with a threshold of r > 0.30 at significance level alpha = 0.05 (Sugiyono, 2022). Every item substantially exceeded this threshold: item-total correlations ranged from r = 0.793 (H2 item 1, User Satisfaction) to r = 0.921 (H2 item 5), confirming that each item measures its intended construct with adequate discriminant validity. Internal consistency reliability was evaluated using Cronbach's Alpha, with an acceptable threshold of alpha >= 0.70 (Sekaran & Bougie, 2023). All nine constructs exceeded this threshold, with alpha values ranging from 0.901 (H1 System Use) to 0.937 (NB Net Benefit), placing all constructs comfortably within the good-to-excellent reliability range. The full summary is presented in Table 3. All constructs remain well above the minimum threshold, and the instrument is confirmed as valid and reliable for HOT-fit evaluation of the SIABEL across the broader user population.

Descriptive Analysis of HOT-Fit Constructs

Table 4 presents HOT-fit construct mean scores disaggregated by role group, interpreted across five intervals from Very Poor (1.00–1.80) to Very Good (4.21–5.00). All nine constructs across all four groups fell within the Good category (overall means 3.74–3.83), with the sole exception of Lecturer Net Benefit (4.23, Very Good).

Table 3. Instrument Validity and Reliability Summary (n = 119)

Code	Constructs	Item	r Item-Total (min-max)	r Min.	Cronbach α	Description
H1	System Use	4	0.858 - 0.889	0.858	0.901	Valid & Reliable
H2	User Satisfaction	5	0.793 - 0.921	0.793	0.918	Valid & Reliable
H3	Authentication & Authorization	6	0.806 - 0.866	0.806	0.920	Valid & Reliable
O1	Org. Structure & Support	5	0.820 - 0.874	0.820	0.907	Valid & Reliable
O2	Org. Environment	5	0.838 - 0.869	0.838	0.907	Valid & Reliable
T1	System Quality	5	0.827 - 0.908	0.827	0.923	Valid & Reliable
T2	Information Quality	5	0.852 - 0.887	0.852	0.921	Valid & Reliable
T3	Service Quality	4	0.854 - 0.914	0.854	0.909	Valid & Reliable
NB	Net Benefit	5	0.867 - 0.909	0.867	0.937	Valid & Reliable

Table 4. HOT-Fit Construct Mean Scores by Respondent Group (n = 119)

Code	Construct	Students (n=89)	Lab Technician (n=13)	Lab Head (n=10)	Lecturer (n=7)	Overall	Category
H1	System Use	3.71	3.83	3.88	3.86	3.74	Good
H2	User Satisfaction	3.77	3.65	4.06	4.06	3.80	Good
H3	Auth. & Authorization	3.74	3.90	4.02	4.05	3.80	Good
O1	Structure & Support	3.70	3.80	3.96	3.94	3.75	Good
O2	Org. Environment	3.75	3.77	3.84	4.00	3.77	Good
T1	System Quality	3.71	3.69	4.02	3.91	3.75	Good
T2	Information Quality	3.74	3.78	4.08	4.03	3.79	Good
T3	Service Quality	3.72	3.69	3.92	4.00	3.75	Good
NB	Net Benefit	3.80	3.74	3.92	4.23	3.83	Good*

*Net Benefit for Lecturers (4.23) falls in the Very Good category; all other cells are in the Good category.

No dimension registered Adequate or below, confirming that active users hold a uniformly positive system perception. The adoption challenge is therefore not one of system quality failure, but of organizational reach and functional depth.

Within the Human dimension, H1 System Use (3.74), H2 User Satisfaction (3.80), and H3 Authentication and Authorization (3.80) all scored Good.The most significant pattern is the User Satisfaction gap between Lab Technician (3.65) and Lab Head (4.06), a 0.41-point difference — the second largest inter-group gap in the study — reflecting an asymmetry of operational burden: Lab Heads engage primarily in oversight tasks well-supported by existing features,

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

while Technicians execute intensive data entry and inventory workflows without features that would improve their efficiency. H3 scores indicate that managerial roles (3.90–4.02) rate access design more favorably than students (3.74), with friction concentrated at the Microsoft SSO login stage.

Within the Organization dimension, O1 Organizational Structure and Support (3.75) and O2 Organizational Environment (3.77) both scored Good. Lecturers rated both highest (3.94; 4.00), while Students gave O1 the lowest score (3.70), a gradient reflecting role-level awareness of governance. The lowest-rated individual items within O1 concerned institutional policy mandates and inter-unit coordination, consistent with qualitative findings that the Department of Health has received insufficient implementation support.

Within the Technology dimension, T1 System Quality (3.75), T2 Information Quality (3.79), and T3 Service Quality (3.75) all scored Good. T3 was the jointly lowest construct overall, with Lab Technicians and Students rating it 3.69 and 3.72 respectively, reflecting perceived deficits in technical support responsiveness — the most frequently raised theme in open-ended responses. Laboratory Heads rated all Technology constructs most favorably (T1: 4.02; T2: 4.08; T3: 3.92).

Net Benefit (NB, overall 3.83) was the highest-scoring overall mean. The 0.49-point spread between Lecturers (4.23) and Lab Technicians (3.74) represents the largest intra-construct inter-group gap in the study, capturing the fundamental data quality risk discussed in the next section.

Table 5. HOT-Fit Dimension-Level Summary

Dimension	Construct	Mean Students	Mean Lab Technician	Mean Lab Head	Overall Dimension	Category
Human	H1, H2, H3	3.74	3.79	3.99	3.78	Good
Organization	O1, O2	3.73	3.79	3.90	3.76	Good
Technology	T1, T2, T3	3.72	3.72	4.01	3.76	Good
Net Benefit	NB	3.80	3.74	3.92	3.83	Good

Inter-Group Variation and Structural Patterns

A consistent hierarchical pattern of system perception is evident across all nine constructs: Lecturer, Laboratory Head, Lab Technician, and Student in descending order. The largest inter-group spread is Net Benefit between Lecturer (4.23) and Lab Technician (3.74), a gap of 0.49 points. This asymmetry represents a structural data quality risk: Lab Technicians are the operational backbone of SIABEL — maintaining inventory accuracy, executing procurement entries, and confirming loan returns — yet perceive substantially lower net benefit than those who consume that data at the oversight level. If this asymmetry suppresses motivation for thorough data entry, it degrades the reporting quality that Lecturers and Lab Heads depend on. Targeted feature development for technicians is therefore a data quality risk management imperative, not merely a usability improvement.

The Technology dimension reveals an equally important contrast. Lab Technicians scored T1 System Quality and T3 Service Quality both at 3.69 — the two lowest construct scores in the entire study — while Lab Heads scored the same constructs at 4.02 and 3.92 respectively. This reflects different modes of system engagement: Technicians operate under high-frequency, high-volume data entry conditions where pagination resets after loan confirmation and unexpected inventory count increments during cross-lab loan processing are immediately disruptive, whereas Lab Heads access the system infrequently for supervisory tasks where such friction rarely surfaces. These specific T1 and T3 pain points represent targeted technical fixes with disproportionate impact on the group most critical to system data integrity. Table 5 presents the HOT-Fit dimension-level summary, highlighting the inter-group variation patterns discussed above.

Qualitative Findings: Open-Ended Response Analysis

Open ended responses from all 119 respondents were analyzed thematically across three questions covering most helpful features, improvement suggestions, and adoption barriers. Table 6 presents the dominant themes and representative verbatim responses.

Four improvement themes emerged with sufficient frequency to constitute clear development priorities. The most widely requested capability was automated notification, specifically push notification or WhatsApp API alerts, to inform users when borrowing requests advance through the multi-stage approval chain from Student to Lab Technician to Lab Head to Lecturer, or when borrowed items are approaching their return deadline. This request directly addresses the most operationally consequential gap in the current system: without proactive alerts, progress through the approval chain depends on users actively monitoring the system, creating bottlenecks that most severely affect the Lecturer approval stage and reduce the system's reliability from the student perspective. The second priority was data export functionality in Excel or PDF format, consistently requested by Lab Technicians and Lab Heads for semester end institutional reporting on usage, borrowing patterns, and consumable materials (BHP) consumption, tasks currently requiring manual recompilation outside the system. Third, barcode and QR code scanning was proposed by multiple Lab Head respondents as an accelerator for physical inventory, directly addressing the high time burden of manual item by item entry in laboratories with large consumable materials (BHP) inventories. Fourth, photo attachment during

E-ISSN :2962-1658
Volume 5, Number 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

procurement entry was requested by Lab Technicians to document item condition and support audit trails, reducing the need for post entry editing.

Table 6. Thematic Analysis of Open-Ended Responses (n = 119)

Category	Dominant Theme	Representative Respondent Quotes
Most Helpful Features	Loan & Request module; Catalogue & consumables (BHP) search; Physical inventory (Physical Inventory); BHP data summary	"Much simpler and faster than the manual sign-off process" (Student); "Not every technician knows the BHP across all labs - the catalogue helps" (Lab Technician); "BHP items found quickly" (Lab Head)
Improvement Suggestions	Push/WhatsApp notifications; Excel/PDF data export; Barcode/QR scanning; Semester usage reports; Photo on procurement entry; System stability	"Barcode feature to enter item quantities" (Lab Head); "Convert to Excel for end-of-semester reporting" (Lab Technician); "Notifications directly to phone" (Lab Head); "Add notification or reminder feature" (Student)
Adoption Barriers	Health labs not yet accommodated; Large volume of manual BHP entry; Fear of data loss (historical incident); Student SSO accounts; Unstable network connection	"Our needs are not accommodated by this system" (Health Lab Technician); "Entering BHP data takes long because there is so much" (Lab Head); "Fear that data already entered will be lost" (Lab Technician)

The most structurally significant adoption barrier identified in the qualitative data is the non-accommodation of the Department of Health laboratories in the current SIABEL configuration. Multiple respondents from this department, including Lab Technicians, Lab Heads, and Lecturers, explicitly stated that the system's item categorization, laboratory unit structure, and borrowing workflow logic do not correspond to health laboratory operational realities. Health laboratories handle medical consumables, sterilization supplies, and clinical instruments requiring different categorization schemas, regulatory documentation, and usage patterns than the engineering and technical laboratory inventory for which the system was originally designed.

This structural mismatch renders the LMIS effectively non-adoptable for the health department without targeted system configuration or feature additions, directly accounting for a major portion of the institution's adoption gap, which is particularly significant given that health department respondents constitute 52.9% of the total sample. A secondary qualitative barrier is concern over data loss, explicitly raised by at least one Lab Technician who referenced a prior incident and expressed ongoing reluctance to invest in full data entry. While aggregate Technology construct scores rate system reliability as Good, single high-impact reliability incidents produce persistent behavioral resistance that mean scores do not capture, a finding with direct implications for the communication and trust building strategy that must accompany the system development roadmap.

DISCUSSION

Evidence from 119 respondents across four departments, analyzed through the HOT-fit framework (Kosasih et al., 2023), yields a strategically actionable diagnosis. SIABEL is not a deficient system: all HOT-fit dimensions score Good, measurement reliability is excellent across all nine constructs, and Lecturers (the most engaged users) report Very Good Net Benefit. The adoption challenge therefore stems not from system quality failure, but from three analytically distinct fit deficits.

A Technology-Organization fit deficit exists because the system's configuration does not accommodate the health laboratory inventory context, the institution's largest department, requiring configuration-level extension rather than generic feature development. A Technology-Human fit deficit disproportionately affects Lab Technicians, whose absence of notification automation, data export, barcode scanning, and photo documentation creates a workload asymmetry reflected in the lowest scores for T3 (3.69) and NB (3.74). An Organization-Human fit deficit in policy mandates, onboarding, and inter-unit coordination leaves adoption fragile and difficult to scale.

Human dimension scores are uniformly positive across all role groups (means 3.74–3.80), confirming that user motivation is not a barrier. The development roadmap must therefore simultaneously address configuration extensibility for the health department, targeted features for Lab Technician workflows, and institutional governance for scalable adoption.

System Development Plan

The system development plan presented in this chapter is structured around the three root conditions identified through the HOT-fit evaluation (Chapter IV). Condition 1 (C1) is a Technology-Organization structural mismatch: the current system configuration does not accommodate the operational and inventory characteristics of the Department of Health's laboratories, rendering the LMIS non-adoptable for this department without targeted configuration extension. Condition 2 (C2) is a set of Technology-Human functional gaps: the absence of notification automation, data export, barcode scanning, photo documentation, and approval delegation reduces the net benefit perceived by Lab Technician

(NB: 3.74) and creates operational friction that suppresses motivation for consistent data entry. Condition 3 (C3) is an Organization-Human governance gap: without a formal institutional man-date, structured onboarding, and inter-unit coordination, adoption remains a voluntary individual decision, producing fragile and uneven penetration across departments. These three conditions are not independent. Resolving C1 without C3 extends the system's reach without ensuring uptake; resolving C2 without C1 improves features for active users while leaving the largest non-adopting group structurally excluded. The plan therefore addresses all three in a phased sequence in which organizational and technical interventions reinforce one another.

Development Roadmap

Table 7 presents 14 development initiatives organized across three implementation phases. Each initiative is mapped to the condition(s) it addresses, rated on a three-level impact and effort scale, and assigned a priority level derived from the impact-effort balance weighted toward adoption urgency. Initiatives rated High impact with Low-to-Medium effort receive High priority regardless of phase. Four of the five Phase 1 initiatives are rated High priority with Low-to-Medium effort, indicating that the most impactful near-term changes require relatively modest development investment. This is explained by the nature of C3, where the highest-return interventions — institutional directives and onboarding programs — require organizational action rather than software engineering. Within the technical stream, the notification engine (Initiative 1) and data export (Initiative 3) leverage existing data structures and require new output channels rather than structural database changes, keeping their effort ratings at Medium and Low respectively.

Table 7. System Development Roadmap and Priority Matrix

No.	Initiative	Condition Addressed	Impact	Effort	Priority	Phase
Phase 1 — Immediate (0–3 Months)						
1	Automated notification engine (WhatsApp/push) for approval-chain state changes	C2	High	Medium	**High**	P1
2	Health laboratory configuration: new item schema, consumption mode, sub-unit mapping	C1	High	Medium	**High**	P1
3	Data export (Excel/PDF) for usage, procurement, and inventory verification reports	C2	High	Low	**High**	P1
4	Visible data backup status indicator + formal backup SOP communication	C2	Medium	Low	**High**	P1
5	Structured onboarding program and digital SOPs for non-adopting units	C3	High	Low	**High**	P1
Phase 2 — Short-term (3–6 Months)						
6	Barcode/QR scanning for physical inventory verification and loan return	C2	High	Medium	**High**	P2
7	Photo attachment on procurement entry for condition documentation	C2	Medium	Low	**Medium**	P2
8	Approval delegation mechanism for unavailable approvers	C2	High	Medium	**Medium**	P2
9	Dean/Director-level institutional usage mandate	C3	High	Low	**High**	P2
10	Batch SSO account provisioning for students at enrollment	C2	Medium	Medium	**Medium**	P2
Phase 3 — Medium-term (6–12 Months)						
11	Operational KPI dashboard (utilization rate, critical stock, overdue loans)	C2, C3	Medium	Medium	**Medium**	P3
12	Mobile-responsive interface / Progressive Web App (PWA)	C2	Medium	High	**Medium**	P3
13	Inter-department consumables transfer module	C1, C2	Medium	High	**Low**	P3
14	Automated quarterly adoption reports to department heads	C3	High	Low	**Medium**	P3

Phase 1 — Immediate Interventions (0–3 Months)

The notification engine (INI-01) addresses the most frequently cited improvement request across all 119 respondents. Without proactive alerts, progress through the four-stage approval chain depends on users actively monitoring the system dashboard, creating bottlenecks — particularly at the Supervising Lecturer stage — and directly driving the T3 (Service Quality) construct to the lowest score among Lab Technician (3.69). The engine shall be implemented as an asynchronous queue-based service delivering alerts via WhatsApp Business API and in-system push notifications, decoupled from the core approval transaction so that delivery failure cannot block or roll back an approval action. Message templates shall be configurable per event type and include a direct link to the relevant transaction.

E-ISSN :2962-1658
Volume 5, **Number** 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

The Health Laboratory Configuration Module (INI-02) is the most structurally significant initiative in the roadmap, as it directly resolves C1 — the single largest contributor to the adoption gap. Health laboratories manage medical consumables, sterilization supplies, and reagents under a consumption-on-use model that differs fundamentally from the loan-and-return model on which the current system was designed. The module introduces a parallel item category schema with regulatory attribute fields (expiry date, lot number, MSDS reference), a per-item consumption mode attribute that determines whether stock is decremented on usage confirmation rather than loan return, and a sub-unit mapping configuration for health laboratory structures. Implementation shall follow a co-design protocol with Health Department Lab Technician and Lab Heads prior to the development sprint, and all changes must be backward-compatible with existing engineering and maritime laboratory data.

Data export (INI-03) requires adding XLSX and PDF export endpoints to the existing report module — no structural database changes — and directly addresses the reporting workflow gap cited by Lab Technician and Lab Heads. The data backup status indicator (INI-04) addresses the persistent behavioral resistance identified qualitatively: a visible last-backup timestamp on the Lab Technician dash-board, paired with a formal IT communication documenting backup schedules and recovery procedures, is the minimum intervention necessary to rebuild institutional trust in system data persistence following the historical incident referenced by respondents. Structured onboarding (INI-05) com-prises a mandatory 4-hour role-specific workshop for Lab Technician and Lab Heads in non-adopting units, complemented by in-system guided tour overlays and PDF quick-reference guides, to ad-dress the O1 (Organizational Structure and Support, 3.75) deficit.

Phase 2 — Short-term Enhancements (3–6 Months)

Barcode and QR code scanning (INI-06) eliminates the manual item-by-item entry burden during physical inventory verification — the most operationally time-consuming Manager-role task cited in open-ended responses — by adding a camera-based client-side scanner that auto-populates inventory verification and loan return forms on item scan. Approval delegation (INI-08) prevents approval-chain stalling when designated approvers are unavailable, by allowing each Lab Head and Supervising Lecturer to assign an acting delegate for a specified date range with automatic routing of pending approvals. The institutional usage mandate (INI-09) — a Director or Dean-level directive formally re-quiring system use for all procurement, loan, and inventory verification transactions — transforms adoption from a voluntary decision to an enforced institutional practice, which research consistently identifies as among the strongest predictors of sustained IS adoption in educational institutions. This mandate is scheduled for Phase 2 rather than Phase 1 to allow health laboratory accommodation and onboarding to be in place first, ensuring that compliance expectations are achievable for all units.

Phase 3 — Medium-term Integration (6–12 Months)

Phase 3 extends the system's value from operational workflow management to institutional decision-support. The KPI dashboard (INI-11) aggregates system data into a management-facing summary covering utilization rate, critical stock alerts, and overdue loan lists, directly addressing the Net Benefit asymmetry between Lab Technician (3.74) and Lecturer (4.23) by making the system's contribution to operational decisions more visible at the technician level. The Progressive Web App implementation (INI-12) improves mobile usability, and the automated quarterly adoption report (INI-14) institutionalizes ongoing monitoring by distributing per-unit adoption metrics to Department Heads, closing the accountability loop opened by the Phase 2 mandate.

Success Metrics

Three measurement levels are defined for post-implementation evaluation. At the adoption breadth level, the target is to increase active-unit adoption from the baseline of approximately 40% to 55% by end of Phase 1, 70% by end of Phase 2, and 85% by end of Phase 3 — with the Phase 2 threshold contingent on the health laboratory module being operational. At the utilization depth level, the approval-chain completion rate is expected to improve materially following notification engine deployment. At the user satisfaction level, a post-Phase 2 HOT-fit re-survey using the same validated 44-item instrument (n = 119 baseline) shall target a Lab Technician Net Benefit score of 4.00 or above (baseline: 3.74) and an overall T3 (Service Quality) score of 3.90 or above (baseline: 3.75), confirming that the Phase 1 and Phase 2 interventions have produced measurable gains in the constructs most directly affected by the identified functional gaps.

CONCLUSION

This study evaluated the Laboratory Management Information System at Politeknik Negeri Madura named SIABEL using the HOT-fit framework across a sample of 119 respondents representing four user roles and four academic departments. All 44 instrument items were confirmed valid (r = 0.793–0.921) and all nine constructs reliably measured (Cronbach's α = 0.901–0.937), establishing a sound measurement basis for the evaluation findings.

The descriptive analysis reveals that active LMIS users hold a uniformly positive perception of the system, with overall construct means of 3.74–3.83 — all *Good* — and Supervising Lecturers rating Net Benefit at 4.23 (*Very Good*).

E-ISSN :2962-1658
Volume 5, **Number** 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

The approximately 40% adoption rate is therefore not attributable to system quality failure, but to three structural conditions. First, the system configuration does not accommodate the Department of Health's laboratories (52.9% of respondents, near-zero unit adoption), which require a different item schema and consumption model. Second, the absence of notification automation, data export, and barcode scanning creates a functional asymmetry: Lab Technician — most responsible for data quality — score the lowest Net Benefit (3.74) and System Quality (3.69) in the study. Third, the lack of a formal institutional mandate and structured onboarding leaves adoption to individual unit discretion, producing uneven penetration across departments.

These three conditions map onto Technology-Organization, Technology-Human, and Organization-Human fit deficits within the HOT-fit model, and jointly explain the adoption gap more precisely than aggregate satisfaction scores alone could. The uniformly positive Human dimension scores confirm that user motivation is not a barrier, and that the development challenge is one of extension and optimization rather than remediation.

Recommendations

For the "development team", three immediate priorities are recommended. First, the health laboratory configuration module should be developed through co-design workshops with Health Department Lab Technicians and Lab Heads, ensuring that the new item schema, consumption mode, and sub-unit mapping reflect actual operational practice. Second, the automated notification engine — the most widely requested feature across all respondent groups — should be deployed as an asynchronous WhatsApp Business API service integrated into the existing approval-chain state machine. Third, data export (Excel/PDF) and a visible backup status indicator should be released in the same phase; both require minimal development effort while directly addressing the two most persistent behavioral barriers: inability to generate institutional reports and fear of data loss.

For "institutional leadership", a formal director or dean-level directive mandating system use across all procurement, loan, and inventory verification transactions is recommended, timed for Phase 2 once health laboratory accommodation and onboarding are in place. The mandate should be supported by role-specific digital SOPs and a 4-hour onboarding workshop for non-adopting units, addressing the Organization-Human fit deficit that Likert scores alone do not fully surface.

For future research, a post-implementation HOT-fit re-survey using the same validated 44-item instrument is recommended following Phase 2 completion, targeting a Lab Technician Net Benefit score of 4.00 or above and overall adoption breadth of 70%. Comparative studies across other Indonesian polytechnic LMIS implementations would further contribute to the limited literature on IS adoption in vocational higher education.

REFERENCES

Ahmad, S., Mohd Noor, A. S., Alwan, A. A., Gulzar, Y., Khan, W. Z., & Reegu, F. A. (2023). eLearning acceptance and adoption challenges in higher education. *Sustainability*, *15*(7), 6190. https://doi.org/10.3390/su15076190

Al-Emran, M., & Granić, A. (2022). Educational technology adoption: A systematic review. *Education and Information Technologies*, *27*(7), 9801–9829. https://doi.org/10.1007/s10639-022-10951-7

Braun, V., & Clarke, V. (2022). *Thematic analysis: A practical guide*. SAGE Publications.

Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches* (6th ed.). SAGE Publications.

Darmanto, D., Wahyudi, E., Pratiwi, M., & Sari, C. N. (2022). Implementasi sistem informasi dalam upaya optimalisasi pengelolaan laboratorium komputer jurusan teknik informatika Politap. *Applied Information Technology and Computer Science (AICOMS), 1*(1), 1–8.

Dwipanilih, R., Annisa, E., & Ikhwan, M. (2025). Enhancing academic service efficiency: Design, implementation, and evaluation of a web-based laboratory booking system. *MALCOM: Indonesian Journal of Machine Learning and Computer Science, 5*(4), 1242–1252.

Gkrimpizi, T., Peristeras, V., & Magnisalis, I. (2023). Classification of barriers to digital transformation in higher education institutions: Systematic literature review. *Education Sciences*, *13*(7), 746. https://doi.org/10.3390/educsci13070746

Guppy, N., Verpoorten, D., Boud, D., Lin, L., Tai, J., & Bartolic, S. (2022). The post-COVID-19 future of digital learning in higher education: Views from educators, students, and other professionals in six countries. *British Educational Research Journal*, *48*(5), 828–848. https://doi.org/10.1002/berj.3814

Kosasih, A., Wiweka, I. B. S., Wulandari, D., & Putra, R. P. (2023). Evaluation of hospital management information systems using the human organization and technology fit model. *International Journal of Health Sciences, 7*(S1), 166–179. https://doi.org/10.53730/ijhs.v7nS1.14166

Larasati, et al. (2025). Pengembangan sistem informasi manajemen laboratorium (SIMLAB) sebagai upaya optimalisasi pengelolaan laboratorium. *Jurnal Nasional Komputasi dan Teknologi Informasi (JNKTI), 9*(1).

E-ISSN :2962-1658
Volume 5, **Number** 2, April 2026
https://doi.org/10.47709/ijmdsa.v5i2.8214

Rifarsih, D. K., Purwani, F., & Zulfikar, D. H. (2022). Management information system success rate on Pusri Palembang Hospital using HOT-FIT models. *Journal of Information Systems and Informatics, 4*(1), 167–190. https://doi.org/10.51519/journalisi.v4i1.232

Saba, P., DeLone, W., Ul-Ain, N., Harfouche, A., Ben Nasr, I., Biot-Paquerot, G., & Mallek, S. (2025). The DeLone and McLean information systems success model: What is the future evolution for its foundations, components, and applications? *Communications of the Association for Information Systems, 57*, 878–898. https://doi.org/10.17705/1CAIS.05738

Sekaran, U., & Bougie, R. (2023). *Research methods for business: A skill-building approach* (8th ed.). Wiley.

Singun, A. J. (2025). Unveiling the barriers to digital transformation in higher education institutions: A systematic literature review. *Discover Education, 4*(1), Article 37.

Sugiyono. (2022). *Metode penelitian kuantitatif, kualitatif, dan R&D* (3rd ed.). Alfabeta.

Suryo, B., Putro, Y., & Hidayat, N. M. (2023). Systematic review of hospital information system evaluation using HOT-Fit framework. *Jurnal Teknologi dan Sistem Komputer, 11*(1), 41–48. https://doi.org/10.14710/jtsiskom.11.1.2023.41-48

Windari, A., Kismartini, K., Luqman, Y., & Wijanarko, B. (2023). Organizational effect on the implementation of hospital management information systems in hospital: A systematic review. *Journal of Health Policy and Management, 8*(1), 13–22. https://doi.org/10.26911/thejhpm.2023.08.01.02