

Evaluation of Usability and User Experience in the Design of the New Student Registration Information System (PMB)

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Abstract.. *The new student admission process is a critical administrative stage in higher education that determines the first experience of prospective students with an institution. This study evaluates the usability and user experience of the designed PMB information system prototype developed by Group 2, Perbanas University. Two established instruments were applied: the System Usability Scale (SUS) to measure interface usability, and the Short User Experience Questionnaire (Short-UEQ) to assess both pragmatic and hedonic quality dimensions. Data were collected from 15 respondents using purposive sampling. The SUS evaluation yielded a final mean score of 59.3, categorized under Grade F and Marginal Low acceptability, indicating that while the system is functionally operable, its navigational flow requires significant improvement. Short-UEQ results revealed a Pragmatic Quality score of 0.904, reflecting that users found the system adequate for completing registration tasks, and a Hedonic Quality score of 0.519, suggesting that the visual aesthetic and interface attractiveness remained below expectations. Overall UX benchmark positioning falls in the Below Average category when compared against the international UEQ dataset. These findings, corroborated by field interview data confirming the resolution of key operational pain points (such as automatic NIM generation and Virtual Account payment integration), provide a critical baseline and actionable redesign roadmap for future system development iterations.*

Keywords: System Usability Scale (SUS), User Experience Questionnaire (UEQ), New Student Admissions, Usability Evaluation, Human-Computer Interaction

INTRODUCTION

Higher education institutions, as a key pillar of the national education ecosystem, face increasing pressure to provide administrative services that are not only functional but also easy to use and provide a satisfying user experience. In the era of digital transformation towards sustainable development, integrity-based innovation in digital education services is a prerequisite for institutions to compete and remain relevant. One of the main gateways for prospective students' first interactions with an institution is the New Student Admissions (PMB) process. The quality of this process directly influences a prospective student's initial perception, trust, and even their final decision to join a campus.

In the context of increasingly massive digital transformation, universities worldwide, including Indonesia, are continuously striving to transition conventional, manual and error-prone administrative processes to more integrated digital platforms. The new student registration process is no exception. Various web-based

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systems have been developed, ranging from simple online forms to more sophisticated ones. with digital payment integration, automatic notifications, and instant academic identity issuance (Ariska, 2021).

However, a system that is technically sound may not necessarily be a good system from a user perspective. The concepts of usability and user experience (UX) arose from the realization that the success of a digital product is determined not only by its ability to perform technical functions, but also by how effective, efficient, and satisfying the product is for its users. its users (ISO 9241-11). A number of previous studies have shown that confusing interfaces, unintuitive navigation flows, and unattractive displays can significantly hinder system adoption by users, even though the system has been designed to solve real problems in the field.

This research group, consisting of Adelya Ramadhani, Akhdan Ijal, and Muhammad Rizky Azwan, designed a prototype PMB information system as part of their final assignment for the Human-Computer Interaction course. Based on direct interviews with the campus marketing department, which revealed various real operational constraints: from applicant data that often fails to enter the system, a file collection process that does not comply with regulations, to the issuance of Student Identification Numbers (NIM) that still requires manual intervention. The resulting system design was then empirically tested using two internationally standardized evaluation instruments: the System Usability Scale (SUS) to measure interface usability, and the Short User Experience Questionnaire (Short-UEQ) to measure the quality of user experience more comprehensively.

This study has two main objectives: (1) to evaluate the quality of usability and user experience of the PMB information system design using standardized SUS and Short-UEQ instruments, and (2) to produce data-based improvement recommendations that can be implemented in the next development iteration. The contribution of this study covers two dimensions: practically, this study produces a measurable redesign roadmap for the PMB system development team; academically, this study enriches the literature on usability and UX evaluation in higher education information systems in Indonesia, while also demonstrating how a data-based evaluation approach can support digital innovation that is integrated and oriented to real user needs—in line with the spirit of sustainable digital transformation.

LITERATURE REVIEW

New Student Admissions Information System

The new student admissions information system is a form of application of information technology in the higher education environment which aims to automate and simplify the registration administration flow.. (Ariska, 2021) In his research on web-based new student admissions applications, he emphasized that digitizing this process not only impacts the operational efficiency of academic staff but also facilitates access for prospective applicants who no longer need to physically attend campus locations just to obtain information or submit documents. The web-based system, designed using the PHP programming language and MySQL database, has proven capable of providing an interface that can be accessed from various devices and locations, thereby significantly increasing the reach of services.

Fundamentally, the effectiveness of a digitalized PMB system rests on its ability to address real-world needs. In-depth needs analysis through direct observation and interviews is the key step before moving on to the technical design phase. If developers fail to identify key user issues, the resulting system is likely to be a sophisticated product with limited user adoption.

Usability and System Usability Scale (SUS)

Usability, in its most fundamental sense, is a measure of how well a given user can use a product to achieve a given goal effectively, efficiently, and with a reasonable degree of satisfaction. This definition aligns with the ISO 9241-11 standard. In the realm of software development, usability is not just an additional feature, but rather a core component of product quality that determines whether a system will be accepted and used continuously by its users or abandoned even though it is technically fully functional.

One of the most widely used instruments for measuring usability is the System Usability Scale (SUS), first developed by John Brooke. The SUS consists of ten items on a five-point Likert scale, alternating between positive and negative statements to minimize response bias. The final SUS score ranges from 0 to 100, and can be interpreted through several frameworks: Acceptability Ranges (Not Acceptable, Marginal, Acceptable), Grade Scale (A to F), Adjective Rating (from Worst Imaginable to Best Imaginable), and percentile comparisons based on a database of previous research. (Bangor et al., 2009). Study (Kharis,

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Santosa, PI, & Winarno, 2019) who evaluated the usability of the Indonesian Ministry of Manpower's Job Market Information System using SUS found a score of 58.4, which is categorized as Marginal Low and Grade F, a condition that indicates that the system has not been able to provide a satisfactory user experience for job seekers as its main users.

According to (Sauro, 2011), The average SUS score for the various products tested is 68. This number serves as a reference threshold: systems with scores above 68 are considered above average, while those below are considered below average. The minimum threshold for a system to be categorized as Acceptable is around 70, while scores below 50 generally place the system in the Not Acceptable category, requiring a complete re-evaluation.

User Experience and User Experience Questionnaire (UEQ)

The concept of user experience (UX) encompasses more than just usability. While usability focuses on the functional dimension—whether users can successfully complete tasks—UX also considers the emotional, aesthetic, and psychological aspects of a user's interaction with a product. (Hassenzahl, M., & Tractinsky, 2006). A user may successfully complete a task using a system, but still feel dissatisfied because of inconsistent displays, or a lack of elements that provide pleasure and stimulation in use.

The User Experience Questionnaire (UEQ), developed by Martin Schrepp and colleagues, is a standardized instrument designed to comprehensively measure UX quality. The full version of the UEQ measures six dimensions: Attractiveness, Perspicuity, Efficiency, Dependability, Stimulation, and Novelty. Scores for each dimension range from -3 to +3, with scores above 0.8 considered positive, between -0.8 and 0.8 considered neutral, and scores below -0.8 considered negative. (Schrepp, M., Hinderks, A., & Thomaschewski, 2017).

(Saepudin et al., 2023) In their research on the Ditonton App using UEQ, they found that most dimensions were in the Good to Excellent category when compared to international benchmarks, although the Stimulation and Novelty dimensions were still at the Good level and not Excellent. This finding underscores that the hedonic dimensions related to attractiveness, innovation, and enjoyment in use are often more difficult to achieve than the function-oriented pragmatic dimensions.

A condensed version of this instrument, the Short-UEQ, simplifies the measurement into two main dimensions: Pragmatic Quality, which encompasses functional dimensions such as clarity and efficiency, and Hedonic Quality, which encompasses aesthetics and stimulation. The threshold for a positive score in the Short-UEQ is 0.5 for each dimension.

Evaluation of Web-Based Systems and Their Relation to PMB

Several previous studies have explored usability evaluation of web-based information systems in educational and governmental environments. (Kharis, Santosa, PI, & Winarno, 2019) proves that the usability of the e-government system in the employment sector can be measured using SUS by involving 20 respondents, a number that is considered sufficient based on the 16±4 rule proposed by Alrooba and Mayhew (2014). (Ariska, 2021) regarding the application for accepting new students at SMK Yaspim Gegerbitung Sukabumi shows that the development of PHP and MySQL-based systems using the waterfall methodology can produce products that significantly increase administrative efficiency, although the usability evaluation was not carried out in detail in the study.

This research focused on bridging the gap between the system's technical success and user acceptance. Although the design of the Group 2 PMB system was based on field interview data, validation through the SUS and Short UEQ should not be neglected. This user evaluation will determine whether the system development investment delivers tangible benefits.

RESEARCH METHODS

Types and Approaches of Research

This research uses a descriptive quantitative approach with a questionnaire-based empirical evaluation method. This approach was chosen because it allows for standardized measurements and can be compared with international benchmark databases, allowing for an objective assessment of the PMB system design, rather than solely based on the researcher's subjective judgment. This research is evaluative, meaning its primary focus is on measuring the interface quality and user experience of the existing design, rather than developing new theories.

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Evaluated System Design

The object of evaluation in this study is the interface design (mockup) of the PMB Information System developed by the research group using the Figma platform. This design includes a series of core features identified through needs analysis, namely: (1) a prospective student account registration page; (2) a comprehensive personal data entry form; (3) a digital file upload feature; (4) payment flow integration through a banking Virtual Account; (5) an automatic email notification mechanism at each registration stage; and (6) automatic issuance of a Student Identification Number (NIM) after payment is verified. All of these designs can be accessed and interacted with through the Figma prototype by respondents before they fill out the evaluation questionnaire.

The evaluated system mockup represents a user interface that includes the registration flow from start to finish, so that respondents can experience the entire system usage experience in a simulated manner before providing a rating.

Data Collection Instruments

Two evaluation instruments were used simultaneously in this study:

First, the System Usability Scale (SUS) consists of 10 statements with a Likert scale of 1 to 5 (1 = Strongly Disagree, 5 = Strongly Agree). The SUS score is calculated using a standard formula: for odd-numbered items, the contribution score X response value is subtracted by 1; for even-numbered items, each contribution score = $5 - X$; then the total contribution score is multiplied by 2.5 to produce a score per respondent with a range of 0–100. The overall SUS score is the average of all respondents' scores.

Second, the Short User Experience Questionnaire (Short UEQ) measures two main dimensions: Pragmatic Quality and Hedonic Quality. Each dimension is measured using a series of bipolar adjective pairs on a scale of 1 to 7, which are then converted to a scale of -3 to +3 for analysis purposes. The average value of each dimension is compared against a positive threshold (+0.5) and against an international benchmark dataset from the UEQ Analysis Tool.

Population and Sampling Techniques

The population in this study were individuals who had or were currently undergoing the registration process at a university, thus providing a concrete reference for realistically assessing the PMB system. The sampling technique used was purposive sampling, with the following criteria: (1) having previously registered online at a university; (2) being familiar with using web-based applications; and (3) being willing to participate voluntarily. The number of respondents collected was 15 people.

Although this number is relatively small, referring to the guidelines cited in the study (Kharis, Santosa, PI, & Winarno, 2019), rule 16 ± 4 indicates that a sample size of 12 to 20 respondents is sufficient to produce a usability evaluation with a reasonable level of validity. Therefore, the 15 respondents used in this study fall in the middle of this range and can be considered representative for the purposes of this formative evaluation.

Data Collection Procedures

Data collection was conducted online using a pre-prepared Google Form. Respondents were also given access to a mockup of the PMB system via a provided Figma link, allowing them to form a comprehensive impression of the system before rating it. Respondents then completed the SUS and Short-UEQ questionnaires sequentially. This entire process took place in a single session without any tutorials or further explanations on how to use the system, ensuring that the assessment reflected the system's ability to guide new users independently.

Data Analysis Techniques

The collected data was analyzed through several stages. For the SUS, scores were calculated per respondent using a standard formula, then an overall average was calculated, which was then interpreted using the Acceptability Ranges, Grade Scale, and Adjective Rating framework. For the Short-UEQ, an average value per dimension was calculated, then interpreted based on positive/negative thresholds and compared with benchmark data. The analysis was complemented by a qualitative discussion that connected the quantitative findings to the system design context and field interview data.

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RESULTS AND DISCUSSION

Validation of Functional Requirements of Field Interview Data-Based System

Before detailing the evaluation results, it's important to first emphasize that the design of the new student admissions system being evaluated wasn't based on mere assumptions or imagination. It was built on a solid foundation of data from direct interviews with internal campus stakeholders, particularly marketing staff, who are operationally most involved in the new student registration process.

The interviews revealed several pain points that have hampered the smooth running of the PMB process. First, the problem of data not being input into the system: situations where applicants have completed forms but their data is not properly recorded in the database, resulting in confusion for both staff who must manually track the data, and prospective students who feel the process is not running smoothly. Second, the problem of document submission that does not comply with regulations: many prospective students upload documents in the wrong format or size because there is no automatic validation on the system side. Third, the issuance of Student ID Numbers (NIM) which still relies on manual confirmation: ideally, NIMs should be issued automatically after payment via a bank Virtual Account is confirmed, but in practice, human involvement is still required, creating bottlenecks and potential delays.

The PMB system design developed by Group 2 directly addresses all three issues. The digital file validation feature (FR-01) ensures that only documents that meet specifications can be uploaded, thereby reducing the volume of non-compliant files. The automatic email notification system at each stage (FR-02) provides real-time transparency to prospective students regarding their registration status from initial registration confirmation and file verification to notification of successful selection. The integration of a banking virtual account (FR-03) creates a payment path that is synchronized directly with the system, allowing payments to be verified instantly without the need for manual processing. And the automatic student ID number (FR-04) feature, which generates a student ID based on a combination of year code, major code, and registration order, completely eliminates the risk of human error while drastically speeding up the administrative process.

Thus, before delving into the usability and UX dimensions, it can be asserted that this system design has successfully addressed the functional needs identified from real-world conditions. This is a crucial foundation: a system built to solve the wrong problem will be worthless, even if its interface is beautiful and easy to use. Conversely, a system that addresses the right problem but has a poor interface still has potential for improvement and development, as will be discussed in the next subsection.

System Feasibility Assessment Through SUS Evaluation

The System Usability Scale evaluation involved 15 respondents who had integrated the PMB system mockup through Figma before filling out the questionnaire, the following are the SUS scores obtained from each respondent.

No. Respondent	SUS Score
Respondent 1	62.5
Respondent 2	100
Respondent 3	67.5
Respondent 4	65
Respondent 5	40
Respondent 6	27.5
Respondent 7	65
Respondent 8	65
Respondent 9	42.5
Respondent 10	62.5

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Respondent 11	42.5
Respondent 12	62.5
Respondent 13	62.5
Respondent 14	62.5
Respondent 15	62.5

TABLE 1. Distribution of SUS Scores Per Respondent

The table above shows significant variation among respondents. Respondent 6 achieved the lowest score with a score of 27.5, a figure that falls into the Not Acceptable category and reflects a very difficult user experience. Respondent 2, on the other hand, scored a perfect 100, indicating that at least one user found the system to be truly excellent. This wide variation from 27.5 to 100 indicates that the system design still produces inconsistent experiences across different user types, an important signal that the interface is not yet universal enough to serve all user segments equally.

The average SUS score obtained was 59.3. Referring to the interpretation framework developed by (Bangor et al., 2009) and (Sauro, 2011), this places the system in several categories at once:

- **Acceptability Range:** Marginal Low: The system is in the borderline zone that cannot yet be categorized as Acceptable, although it is not completely Not Acceptable. This means that users experience significant obstacles in its use, but the system is still operable to complete basic tasks.
- **Grade Scale:** Grade F is the lowest category on the SUS rating scale. This doesn't mean the system is completely useless, but rather that its usability quality falls short of expected standards and requires substantial improvement before it can be considered suitable for full implementation.
- **Adjective Rating:** OK Interestingly, despite being a Grade F, the adjective rating indicates the system is OK, not Poor or Awful. This indicates that the system's basic structure is sound and operable, but it doesn't provide sufficient comfort.
- **Percentile Comparison:** Below Average score of 59.3 is below the global SUS average (68), placing this system in the lower half of the systems tested worldwide.

Dimensions of Interpretation	Results	Information
Average SUS Score	59.3	Below the global average (68)
Acceptability Range	Marginal Low	Not yet in the Acceptable zone
Grade Scale	Grade F	Needs significant improvement
Adjective Rating	OK	Basic walking function, less comfort
Net Promoter Score (NPS)	Detractor/Passive	Low recommendation probability

TABLE 2. Summary of Interpretation of SUS Score 59.3

User Satisfaction Mapping Through Short-UEQ

While the SUS method is used to measure usability aspects from a functional perspective, the Short-UEQ instrument provides a more in-depth analysis by examining the user experience through two interrelated core dimensions: Pragmatic Quality and Hedonic Quality. The results of the Short-UEQ measurement on the PMB system prototype are presented as follows:

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UEQ Dimensions	Average value	Interpretation	Status
Pragmatic Quality	0.903846154	Positive (>0.5)	Adequate
Hedonic Quality	0.519230769	Neutral-Positive Boundary	Needs Improvement
Overall	0.71	Below Average	Below commercial average

TABLE 3. Results of the short-UEQ Evaluation of the PMB System Design

Pragmatic Quality Analysis (Pragmatic Quality = 0.904)

The pragmatic quality value is 0.903846154 or rounded to 0.904 is one of the findings that provides important validation for this design. This score is above the positive threshold (0.5), indicating that users generally perceive the system as capable of supporting the completion of technical registration tasks. They felt they could, though not always easily, understand how the system worked, find the features they needed, and complete the registration flow to a certain point.

This relatively good Pragmatic Quality can be explained by several design factors. First, the system is designed based on a registration flow that is already familiar to most prospective students, so the user's mental model is not too conflicted by the provided structure. Second, core features such as the registration form, file upload, and payment status are positioned logically within a sequential flow, providing implicit guidance for users on what steps to take next.

However, this score of 0.904 should be treated with caution. On the Short-UEQ scale, the ideal pragmatic score for a truly superior system should be closer to 1.5 or above. While a score of 0.904 is positive, the margin between 0.904 and 0.5 (the minimum positive threshold) is actually quite small, indicating that the task-solving experience still feels less than completely smooth and efficient. This finding aligns with the SUS score of 59.3, which describes the system as functional but not yet convenient.

Hedonic Quality Analysis (Hedonic Quality = 0.519)

While Pragmatic Quality paints a relatively manageable picture, Hedonic Quality, with a score of 0.519, presents a far more worrying picture. While technically still above the 0.5 threshold, this score is actually only 0.019 points shy of the neutral threshold. This is a clear signal that the hedonic dimension, encompassing visual aesthetics, interface aesthetics, visual appeal, and feelings of enjoyment or motivation when using the system, is the most critical weakness in the existing design.

Low hedonic quality has deeper implications than just aesthetic concerns. In the UX literature, strong hedonic dimensions have been shown to contribute to the formation of positive first impressions, which in turn influence users' perceptions of the quality of the entire system even before they have a chance to experience its technical functions. (Hassenzahl, M., & Tractinsky, 2006). In the context of PMB, where prospective students who are interacting with the campus system for the first time will form an initial impression of the institution based on the quality of its appearance, an unattractive interface can indirectly reduce the trust and enthusiasm of prospective students.

Refers to study (Saepudin et al., 2023) who evaluates The Ditonton App uses the full UEQ, the Stimulation dimension scored 1.484 (Good) and the Novelty dimension 1.469 (Good), significantly higher than the hedonic condition of this PMB design. This comparison underscores the significant gap between commercially polished products and designs still in the academic prototype stage. To achieve truly competitive hedonic quality, this PMB design requires significant design development, not just color or typography adjustments, but a thorough review of the visual identity concept, information hierarchy, and micro-interactions that provide an interactive and enjoyable feel.

Overall UX Benchmark Position

When the overall results of the Short-UEQ are compared against an international benchmark dataset that includes data from thousands of respondents on hundreds of commercial digital products, the PMB system falls below average. This finding must be understood in its proper context: the products used as the basis for the benchmark are those that have undergone professional design, iterative testing, and regular refinement based on real-world feedback from thousands of active users.

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A Below Average ranking doesn't mean the design is fundamentally failing, but rather indicates that compared to current market standards, there's still a significant gap to be bridged before the system is ready to be implemented as a competitive product. Particularly on the hedonic dimension, the improvements needed aren't incremental, but rather comprehensive: a more comprehensive visual redesign that delivers a strong visual identity, good design consistency, and elements that make the sign-up experience enjoyable, not just filling out a form.

Synthesis of Findings: Building a Bridge between Function and Experience

Combining all the evaluation findings, a fairly typical illustration of a system design in its early stages of development is evident: conceptually and functionally robust, but still in need of significant refinement in terms of interface and user experience. The following table summarizes the position of the PMB system design based on all the evaluation instruments used:

Evaluation Aspects	Instrument	Results	Status
Functional Requirements Conformity	Field Interview	All FR answered	Good
Interface Usability	SUS	59.3 (Grade F, Marginal Low)	Needs Improvement
Pragmatic Quality (Task Support)	Short-UEQ	0.904 (Positive)	Pretty good
Hedonic Quality (Aesthetics/Attraction)	Short-UEQ	0.519 (Neutral Limit)	Need Redesign
Overall UX Benchmark	Short-UEQ Benchmark	Below Average	Below commercial standards

TABLE 4. Comprehensive Evaluation Summary Matrix of PMB System Design

From the matrix above, a clear pattern emerges: the more an aspect relates to technical functionality and meeting needs, the better its score. Conversely, the more an aspect relates to visual quality, aesthetics, and emotional appeal, the more room there is for improvement. This is a common situation in the early prototype stage, where the development focus is more on ensuring the system works correctly than on making it look and feel beautiful.

Based on these findings, improving the visual quality of the interface is a top priority for further development. This can be achieved through selecting a color scheme that aligns with the institution's identity, hierarchical typography, strategic use of whitespace, and providing feedback elements related to registration status. Furthermore, optimizing navigation aspects such as clear breadcrumb layout, visible progress indicators, and educational error messages are projected to significantly improve SUS scores in the next phase.

CONCLUSION

This research successfully conducted a comprehensive evaluation of the New Student Admissions Information System (PMB) design developed by Group 2. This evaluation used two international standard instruments, namely the System Usability Scale (SUS) and the Short User Experience Questionnaire (Short-UEQ), and was strengthened by field interview data to ensure the functional alignment of the system with the operational needs of the campus.

The analysis yielded several key conclusions. First, from a functional perspective, the PMB system design successfully addressed operational challenges identified during interviews, such as data input failures, non-compliant document collection, and manual student ID card (NIM) creation. The four key features—digital file validation, automatic email notifications, Virtual Account integration, and automatic NIM creation—proved to be immediate solutions to these challenges.

Second, the SUS test yielded an average score of 59.3, which falls into the Grade F category with a Marginal Low acceptability level. This result indicates that although the system is functional, it is not yet comfortable

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to use; users can still complete basic tasks but require additional effort. The Adjective Rating predicate "OK" indicates there are no fatal design flaws, but the navigation and user instructions need significant improvement.

Third, the Short-UEQ results indicate a quality gap: a Pragmatic Quality score of 0.904 validates that the system effectively supports the completion of the registration process. Conversely, a Hedonic Quality score of only 0.519 confirms fundamental weaknesses in the visual aesthetics and attractiveness of the interface. The overall benchmark position, which is below the commercial average, demonstrates that while the system is conceptually promising, significant design improvements are needed before it is ready to compete with the standards of digital products in the market.

Based on the above findings, this study recommends three main points of improvement for the next stage of development:

- Conducting a complete visual redesign of the interface with an emphasis on consistency of visual identity, clarity of information hierarchy, and strengthening aesthetic elements to boost hedonic appeal.
- Optimize the navigation system by implementing clear progress indicators, informative breadcrumbs, and contextual filling guides at each stage.
- Conduct repeated usability testing involving more respondents from various segments of prospective new students to test the effectiveness of improvements.

This research provides a tangible contribution to the development of the relevant PMB system, while also enriching academic and practical references regarding the application of usability and UX evaluation in higher education information systems in Indonesia. Going forward, the combination of quantitative evaluation methods (SUS and UEQ) with qualitative approaches such as usability testing based on think-aloud protocols is expected to provide a deeper understanding of specific pain points that should be prioritized in system improvements.

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