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Assessing the Quality of a University SIM Website Through Equivalent Partitioning and System Usability Scale

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ABSTRAK: The System Information Management (SIM) website of Universitas Qamarul Huda Badaruddin BAGU serves as a digital platform designed to support academic and administrative services. This study aims to evaluate the quality of the website by combining functional testing using the Equivalent Partitioning technique and usability assessment through the System Usability Scale (SUS). Functional testing was performed on key features such as the login page, digital library (DILA), user profile, SISKA academic module, and e-money services. The results indicated that the login feature functioned as expected, while several weaknesses were identified in other modules, including the absence of input restrictions in DILA, incomplete validation in profile forms, and insufficient error handling in SISKA and e-money transactions. The usability evaluation involved 80 respondents from various study programs who completed the SUS questionnaire. The analysis yielded an average score of 46.91, corresponding to Grade D, which reflects low usability. While users appreciated the website's visual appearance and the ease of checking payments via e-money, concerns were raised regarding navigation, error handling, and the effectiveness of learning support features. Overall, the findings suggest that although the MIS website fulfills its basic functions, significant improvements are needed in terms of input validation, interface design, and user experience. This research contributes practical insights for enhancing the reliability and usability of university information systems and provides a foundation for future development aimed at creating more efficient and user-friendly platforms.

Kata Kunci : Equivalent Partitioning, SUS, Website, Testing, System Evaluation.

I. INTRODUCTION

The rapid advancement of information technology has significantly transformed various sectors, including education. Higher education institutions increasingly adopt digital solutions to enhance the efficiency and quality of academic and administrative services. One of the key implementations is the use of System Information Management (SIM), which serve as integrated platforms that facilitate data management, academic services, and communication among students, faculty, and administrative staff [1],[2]. SIM enables universities to achieve faster, more transparent, and efficient service delivery, thereby improving institutional performance and user satisfaction.

Universitas Qamarul Huda Badaruddin, as a developing higher education institution, has introduced its own SIM website to support academic and administrative processes. This platform provides essential features such as student login, a digital library (DILA), and user profile management. Despite its potential, preliminary observations and user feedback indicate that

several technical and functional limitations remain, including the absence of input restrictions in search fields, insufficient input validation in user profile forms, and a user interface design that is not fully optimized for usability. These shortcomings may reduce the effectiveness of the system and hinder its adoption among students and staff.

Previous studies have highlighted the importance of evaluating web-based systems using software testing methods. Black Box Testing, particularly the Equivalent Partitioning technique, has been proven effective for validating functional requirements, detecting bugs, and identifying system improvements [3][4]. Meanwhile, usability evaluation from the user's perspective is equally critical, as system functionality alone does not guarantee a positive user experience. The System Usability Scale (SUS) has been widely employed in both educational and information system contexts to measure usability, user satisfaction, and perceived efficiency [5],[6],[7]. Combining functionality testing with usability assessment provides a more holistic evaluation of a system's quality [8],[9].

In this study, the quality of the SIM website at Universitas Qamarul Huda Badaruddin Bagu is evaluated using a dual approach. The Equivalent Partitioning technique is applied to examine system functionality, while the SUS method is utilized to assess usability from the user's perspective. By integrating these methods, this research aims to identify system deficiencies and propose actionable recommendations for improving the SIM platform. The findings are expected to contribute to the enhancement of digital services in higher education, particularly in institutions seeking to optimize both system performance and user experience.

II. RELATED WORK

Numerous studies have investigated the application of software testing techniques, particularly Black Box Testing and its variants, to evaluate the functionality of web-based applications.

Wahyu and Afrizal [10] conducted Black Box testing using the Equivalent Partitioning method on the employee attendance system at Oby Computer. Their study aimed to validate the feasibility of the attendance application before deployment. The results showed that the system successfully met functional requirements, with all features operating as expected to support user needs.

Similarly, Ramdhani et al. [11] examined a web-based employee attendance system using the Equivalence Partitioning technique. Their research highlighted several errors in the system, underscoring the importance of early stage testing to ensure the software runs reliably and to guide further improvements.

In another study, Fahrezi et al. [12] applied Black Box Testing to an inventory management system at PT. AINO Indonesia. The purpose was to identify system errors that could disrupt workflow efficiency. Their findings indicated that the system performed well under test cases, thereby validating its usability in real operational settings.

Praniffa et al. [13] explored both Black Box and White Box testing methods for a web-based parking information system. Their research emphasized detecting failures within the system and

correcting them to ensure reliable performance. The results demonstrated that the system was valid and functional, meeting both user and system requirements effectively

Although previous studies have applied Black Box Testing and its techniques such as Equivalent Partitioning to validate the functionality of web-based applications, most of them focused primarily on operational systems such as attendance, inventory, or parking management. These studies successfully confirmed system feasibility but often overlooked comprehensive usability evaluations from the user's perspective. In contrast, the present research combines Equivalent Partitioning for functional testing with the System Usability Scale (SUS) for usability assessment. This integrated approach provides a more holistic evaluation of the System Information Management (SIM) at Universitas Qamarul Huda Badaruddin, addressing both technical reliability and user experience. Thus, this study contributes by bridging the gap between functional testing and usability evaluation in higher education information systems.

III. METHOD

This study employs a quantitative approach that combines Black Box Testing with the Equivalence Partitioning technique and the System Usability Scale (SUS). The research process begins with the identification of key features of the SIM website, namely the login page, the Digital Library (DILA), and the user profile page. Data collection was carried out through functional testing using test case partitions and through a SUS questionnaire distributed to 80 respondents. The testing procedure involved executing functional test cases and administering usability questionnaires after system use. Data were then analyzed in two stages: evaluating functional reliability through partition outcomes and calculating SUS scores to measure usability. The results from both approaches were integrated to assess the overall quality of the SIM website, followed by conclusions and recommendations for future system improvements. The overall workflow is depicted in Fig. 1 and is detailed below.

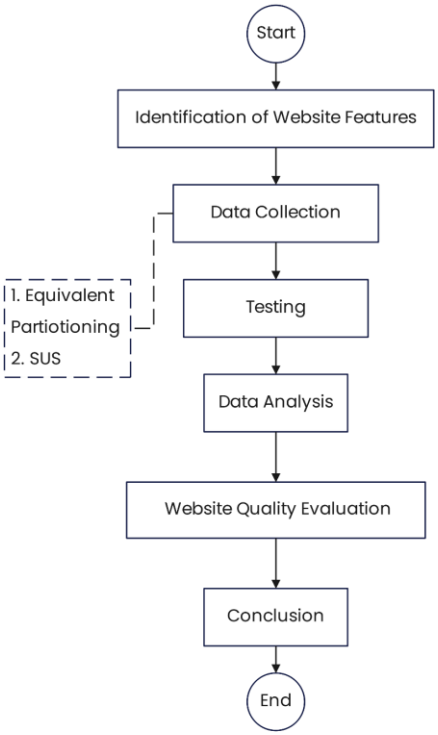

Figure 1. Step-by-step of research

A. Identification of Website Features

The first step of the research is to identify the core features of the SIM website to be tested. These include:

- **Login page**, which serves as the gateway for users to access the system.
- **Digital Library (DILA)**, which provides academic resources for students and faculty.
- **User profile page**, which allows users to manage their personal data.

These features were selected because they represent critical functions frequently accessed by users.

B. Data Collection

Data were collected through two primary methods:

1. **Functional Testing (Equivalence Partitioning):**

Input data were categorized into valid and invalid partitions to determine whether the system responded correctly under different scenarios. This method helps detect bugs, errors, and functional gaps within the system.

2. **Usability Testing (System Usability Scale):**

A structured questionnaire based on the SUS framework was distributed to 80 respondents, consisting of students and staff. The questionnaire was designed to capture user perceptions of usability, comfort, and efficiency.

C. Testing Procedure

The testing procedure was carried out in the following stages:

- Execution of test cases on identified features using the Equivalence Partitioning method.
- Distribution and collection of SUS questionnaires after respondents interacted with the system.

- Recording of functional errors, input validation issues, and user feedback.

D. Data Analysis

Data analysis was conducted in two parts:

- **Functional Test Results**: The outcomes of Equivalence Partitioning were analyzed to identify whether each partition was processed correctly by the system. This analysis focused on determining system reliability and error detection.
- **Usability Evaluation**: SUS scores were calculated by aggregating responses from all participants. The average SUS score was then interpreted using established benchmarks to classify the system's usability level.

E. Website Quality Evaluation

The results of functional testing and usability evaluation were integrated to provide a comprehensive assessment of the SIM website. The combination of these findings highlighted both the technical performance and the user experience, enabling a balanced evaluation of system quality.

IV. RESULT AND DISCUSSION

This section describes the research methodology employed to evaluate the System Information Management (SIM) website, including functional testing using the Equivalent Partitioning technique and usability assessment through the System Usability Scale (SUS).

A. Functional Testing Results with Equivalent Partitioning

The functional testing was conducted on five key features of the SIM website, namely the login page, the digital library (DILA), the academic information system (SISKA), the e-money feature, and the user profile page. The Equivalent Partitioning technique was applied to validate input handling by categorizing test cases into valid and invalid partitions.

Table 1. Functional Testing Result

Feature	Test Scenario	Expected Result	Actual Result	Conclusion
Login	Enter valid username "5920121025" and password "mahasiswa123", then click login.	Data detected; system displays "login successful…" and grants access to dashboard.	As expected	Valid
Login	Enter invalid username "2511022" and password "siswa123".	Data not detected; system displays "username not registered".	As expected	Valid
Login	Enter incorrect username "2511022" and	System rejects input and displays	As expected	Valid

	correct password “mahasiswa123”.	“username not registered”.		
Login	Enter correct username “5920121025” and incorrect password “siswa123”.	System rejects input and displays “incorrect password”.	As expected	Valid
DILA	Search with valid keyword “teknologi informasi”.	System processes and displays relevant results.	As expected	Valid
DILA	Search with random keyword “cbeax”.	System displays “0 results, try another keyword”.	As expected	Valid
DILA	Leave search field empty.	System prompts user with “please fill in this field”.	As expected	Valid
DILA	Enter special symbols “@#$%”.	System displays “0 results, try another keyword”.	As expected	Valid
DILA	Enter excessively long keyword (1000 characters).	System restricts input.	Error occurred; no restriction applied.	Invalid
Profile	Fill in correct data and click save.	System saves and displays profile data.	As expected	Valid
Profile	Leave all fields empty and click save.	System rejects input; prompts “fields must be filled”.	As expected	Valid
Profile	Enter incorrect data types (numbers in text fields, invalid email without “@”).	System prompts error messages.	Some fields failed validation (e.g., NIK, NISN, postal code, NPWP).	Invalid
SISKA	Leave all fields empty and click save.	System rejects input with warning messages.	System allowed saving without input.	Invalid

SISKA	Fill in all fields correctly and click save.	System saves data successfully.	As expected	Valid
SISKA	Enter title but leave description and keywords empty, then save.	System should reject and prompt user.	System allowed saving without warnings.	Invalid
E-Money	Enter title and description but leave keywords empty, then save.	System should reject and prompt user.	System allowed saving without warnings.	Invalid
E-Money	Enter keywords without separator (semicolon).	System should reject input.	System allowed saving without warnings.	Invalid
SISKA (Payment)	Fill input fields correctly and click "continue to payment".	System saves data and proceeds to payment.	As expected	Valid
SISKA (Payment)	Leave input fields empty and click "continue to payment".	System rejects and warns user.	System auto-generated payment amount without warnings.	Invalid

The Equivalent Partitioning test shows that most core features—login, search (DILA), and profile—generally function as intended. However, several issues were identified:

- DILA lacks restrictions for excessively long input.
- Profile form has incomplete validation for certain fields.
- SISKA and E-Money modules allow saving incomplete or incorrectly formatted input.
- the payment function in SISKA automatically generates amounts without sufficient explanation to users. These findings indicate that while the system operates correctly under valid conditions, improvements in input validation and error handling are required to enhance reliability and user trust.

B. Usability Evaluation Results with System Usability Scale (SUS)

The usability evaluation was carried out using the System Usability Scale (SUS), which was distributed to 80 respondents across various study programs. Each respondent answered 10 items on a 5-point Likert scale, and the results were converted into SUS scores. Instead of presenting all 80 individual responses, a summary of the statistical results is provided below.

Table 2. Respondent

No	Program Studi	Responden
1	S1 Teknologi Informasi	17
2	S1 Ilmu Komputer	8
3	S1 Pendidikan Bahasa Inggris	13
4	S1 Pendidikan Bahasa Sastra Indonesia	15
5	S1 Keperawatan	5
6	D3 Rekam Medis	6

7	S1 Pendidikan Ekonomi Koprasi	11
8	S1 Matematika	2
9	S1 Teknik Sipil	3
	Total	**80**

Table 3. Summary of SUS Scores (N=80)

Statistic	Value
Minimum Score	35
Maximum Score	65
Mean Score	46.91
Median Score	47.50
Standard Deviation	6.85
SUS Grade	D

The results in Table 3 show that the average SUS score obtained from 80 respondents is 46.91, which falls into Grade D on the SUS benchmark scale (Bangor et al., 2009). This indicates that the usability of the system is below average and requires significant improvements. The scores ranged from 35 to 65, with a median of 47.5. Most respondents' evaluations clustered around the median, suggesting that while some features are usable, critical aspects of functionality and user experience still need enhancement.

C. Discussion

The findings of this study reveal that the SIM website at Universitas Qamarul Huda Badaruddin Bagu performs adequately in handling basic functions, particularly the login and digital library search features, as confirmed through Equivalent Partitioning tests. However, several weaknesses were identified, including insufficient input validation in the profile form, lack of restrictions on excessively long keywords in DILA, and incomplete errors handling in SISKA and e-money modules. These issues highlight gaps in system reliability that could negatively impact user trust. The usability evaluation further emphasizes these limitations, with the average SUS score of 46.91 (Grade D) indicating that the system is perceived as less effective and user-friendly. Although users valued the e-money feature and website appearance, frequent errors and underutilized learning support functions weakened the overall experience. These results suggest that improving input validation, error handling, and learning-related features should be prioritized to enhance both functionality and usability in future system development.

V. CONCLUSION

This study evaluated the SIM website of Universitas Qamarul Huda Badaruddin Bagu through functional testing using the Equivalent Partitioning method and usability assessment with the System Usability Scale (SUS). The functional tests confirmed that most core features, including the login and digital library search, operated as intended. However, notable weaknesses were identified, such as insufficient input validation in the DILA search, profile form, and SISKA module, which may compromise data integrity. The e-money feature also appeared confusing due to the automatic generation of payment values without adequate explanation. The SUS evaluation involving 80 respondents yielded an average score of 46.91 (Grade D), indicating low usability. Key issues included non-intuitive navigation, limited error feedback, and inconsistencies in interface design. These findings highlight the need for comprehensive improvements in both technical functionality and user experience. Future development should prioritize enhancing input

validation, refining interface design, and optimizing error handling, ensuring that the MIS website can deliver more reliable, efficient, and user-friendly services.

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