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Quality Evaluation of The SITASI Final Project System using Selected McCall Software Quality Factors

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Abstract
The Final Project Information System (SITASI) was developed to support academic administration processes. However, performance and usability issues continue to hinder its effectiveness, particularly during peak usage. This study aims to evaluate the quality of SITASI using the McCall Software Quality Model by focusing on five relevant operational factors: correctness, reliability, efficiency, integrity, and usability. The research employed a descriptive quantitative approach by distributing a validated user perception questionnaire to 72 students with active experience using SITASI. The instrument was tested for validity and reliability, with data analyzed using descriptive statistical techniques to evaluate the quality of the SITASI system. The results show that usability scored the highest at 86%, followed by correctness at 67.6%, reliability at 64.2%, integrity at 50.8%, and efficiency at 43.5%. These findings reveal strong user interface performance but expose technical limitations in speed and data security. The study concludes that while SITASI performs well in terms of usability, it requires substantial improvements in system responsiveness and integrity features. The results offer a structured evaluation of software quality and provide practical recommendations for developers to optimize performance and strengthen data protection. This study contributes a replicable framework for evaluating academic information systems in higher education environments.

Keywords: final project management; mccall model; sitasi system; software quality evaluation; university information system

INTRODUCTION

The management of student final projects represents a complex academic process in higher education that requires careful coordination and oversight. A final project is a scholarly work that must be completed as a graduation requirement and a prerequisite for earning a bachelor's degree (Fitria et al., 2024). The completion process involves multiple stakeholders and several sequential stages, including title submission, supervisor assignment, the guidance process, proposal seminar scheduling, and ultimately, the thesis defense. Without a well-organized system, this process can become inefficient and time-consuming (Rahman & Ningsi, 2022). As a result, higher education institutions are increasingly adopting web-based information systems to support and streamline academic procedures (Zulfa et al., 2025). Universitas Islam Negeri Sultan Syarif Kasim Riau is one such institution that employs an integrated system powered by information technology. One of its web-based and mobile-accessible platforms is The Final Project Information System (SITASI).

SITASI is an academic information system developed specifically for the Information Systems Study Program at Universitas Islam Negeri Sultan Syarif Kasim Riau. This system is designed to support the management of the final project process for students (Fronita, 2023). SITASI facilitates various activities, including final project registration, supervision management, seminar and thesis defense scheduling, and the archiving of final project

documents. Through this technology, the final project registration process can be completed online via SITASI. However, based on interviews conducted with the Head of the Information Systems Study Program, several challenges remain, particularly those related to network and server performance. Since its implementation in 2019, SITASI has experienced a high volume of data, which has negatively affected system performance. The accumulation of data over the years has led to reduced processing speed and slower system response times.

A structured evaluation is essential to ensure the effectiveness and sustainability of information systems like SITASI, which support key academic processes such as seminars and thesis submissions. Despite its critical role, SITASI faces several user experience challenges. System performance remains suboptimal, with users reporting slow page loading during peak usage. These delays have disrupted academic workflows, including proposal approvals and supervision scheduling. Additionally, the interface is considered unintuitive, the notification feature often fails to provide real-time updates, and the search function requires overly specific keywords, limiting overall usability. These issues highlight the need for a systematic evaluation to identify weaknesses and support targeted system improvements.

These issues disrupt academic workflows and reduce overall user satisfaction, highlighting the urgent need for a comprehensive system quality assessment. This study applies the McCall Software Quality Model as a solution to evaluate SITASI systematically (Farisi & Saputra, 2022; Farisi & Teguh, 2024; Khairul et al., 2023; Saputra et al., 2024). The model offers a structured framework for assessing software based on key quality dimensions, including product operation, product revision, and product transition (Ramadhan et al., 2024; Ramulu & Murhtyr, 2020). Specifically, this research focuses on the product operation perspective, which includes correctness, reliability, efficiency, integrity, and usability. These factors are directly aligned with the practical challenges faced by users of the SITASI platform and offer a targeted way to assess its operational performance (Andini & Fitriana, 2022). A system can be considered high-quality and well-functioning if evaluated from the end user's perspective, focusing on their satisfaction (Pratama et al., 2021). Previous studies have primarily focused on assessing the security aspects of the SITASI platform (Fronita, 2023), with limited attention to a comprehensive evaluation based on standardized quality models. Consequently, critical dimensions related to system performance and user experience remain underexplored. This gap presents an opportunity to refine the system through a structured, model-based evaluation that addresses both technical and experiential shortcomings.

This research is important to conduct because it offers a comprehensive assessment of SITASI's operational quality and supports efforts to improve its usability and effectiveness. Without such evaluation, the system risks continued inefficiencies, reduced user engagement, and increased strain on institutional IT resources. The purpose of this research is to identify the key strengths and weaknesses of SITASI by focusing on operational quality factors and to provide practical, evidence-based recommendations for system improvement. The outcomes are expected to support developers in enhancing the platform's performance and usability, streamline academic processes, and offer a replicable evaluation model for similar systems in higher education settings.

METHODS

This study focuses on evaluating the SITASI a web-based platform developed to assist users in managing and monitoring final project activities. As shown in Figure 1, the landing page serves as the primary access point for users such as students and supervisors. After logging in, users are directed to the main dashboard, illustrated in Figure 2, which integrates key features including title submission, supervisor assignment, seminar scheduling, and progress tracking. These functionalities are designed to streamline and centralize the academic project workflow for both students and academic staff.

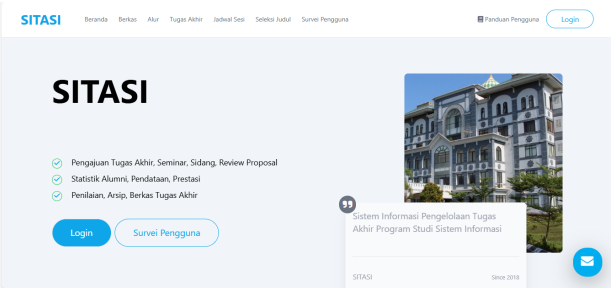

Figure 1. Landing page of sitasi

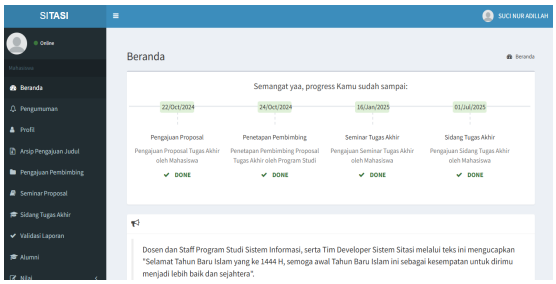

Figure 2. Main features of sitasi

This study adopts five software quality factors from McCall Software Quality Model under the Product Operation perspective (Asfa & Gandomani, 2023), namely correctness, reliability, efficiency, integrity, and usability, which are relevant to current issues in SITASI (Mitha et al., 2024). A descriptive quantitative approach was used, focusing on evaluating system quality based on user perceptions. Data analysis involved calculating equally weighted scores for each factor, converting them into percentages, and interpreting them using predefined feasibility categories.

The sample consisted of 72 students, determined using the Slovin formula from a population of 252 active students in the Information Systems Study Program at Universitas Islam Negeri Sultan Syarif Kasim Riau. A 10% margin of error was applied due to time constraints and limited access. Purposive sampling targeted students with direct experience using SITASI. Despite the limited scope, the sample met statistical requirements and provided valid insights into system performance and usability. Data were collected using a questionnaire that was pre-tested for validity and reliability. The instrument yielded a Cronbach's Alpha value of 0.919, indicating strong internal consistency. The data were analyzed by summing the weighted scores of each criterion under every quality factor. All criteria were given equal weights for five items to ensure objective evaluation based on user perceptions. The resulting score was then converted into a percentage using equation 1.

$$Percentage = \frac{Obtained\ Score}{Maximum\ Score} x100\% \quad (1)$$

After obtaining the individual scores for each quality factor, the overall software quality score was calculated by aggregating the results. This was done by combining the total scores of all five quality factors, each given equal weight due to their equal importance in evaluating product operation. The aggregated score was then compared to the maximum possible score and expressed as a percentage.

Table 1. Feasibility category

Percentage (%)	Category
81-100	Very Good
61-80	Good
41-60	Fairly Good
21-40	Poor
< 21	Very Poor

Table 1 shows feasibility categories serve as a reference for interpreting the results in percentage form. This study uses detailed analyses and weighted score tables to assess each quality factor of SITASI, providing a clear comparison across system features. This comprehensive approach helps identify key areas for improvement and ensures recommendations align with user needs.

RESULT AND DISCUSSION

Result

The validity test was conducted to ensure that the questionnaire used in this study accurately measured the intended variables. The Pearson product–moment correlation (bivariate) method was employed with a significance level of 5 percent ($\alpha = 0.05$). The test involved 72 respondents and resulted in an r-table value of 0.229. A total of 30 questionnaire items were tested, and all r-count (Pearson correlation) values for each item were greater than the r-table value of 0.229 at the 5 percent significance level, indicating that all items are valid. The validity test results are presented in table 2.

Table 2. Validity test result

Code	*r* count	*r* table	Conclusion	Code	*r* count	*r* table	Conclusion
P1	0.613	0.229	Valid	P16	0.685	0.229	Valid
P2	0.516	0.229	Valid	P17	0.781	0.229	Valid
P3	0.596	0.229	Valid	P18	0.818	0.229	Valid
P4	0.629	0.229	Valid	P19	0.749	0.229	Valid
P5	0.655	0.229	Valid	P20	0.817	0.229	Valid
P6	0.454	0.229	Valid	P21	0.804	0.229	Valid
P7	0.548	0.229	Valid	P22	0.711	0.229	Valid
P8	0.614	0.229	Valid	P23	0.608	0.229	Valid
P9	0.535	0.229	Valid	P24	0.581	0.229	Valid
P10	0.698	0.229	Valid	P25	0.653	0.229	Valid
P11	0.729	0.229	Valid	P26	0.632	0.229	Valid
P12	0.735	0.229	Valid	P27	0.733	0.229	Valid
P13	0.669	0.229	Valid	P28	0.597	0.229	Valid
P14	0.695	0.229	Valid	P29	0.612	0.229	Valid
P15	0.598	0.229	Valid	P30	0.646	0.229	Valid

The result shows that all 30 questionnaire items have r count values ranging from 0.454 to 0.818, exceeding the r table value of 0.229 at a 5 percent significance level. This confirms that all items are valid and appropriately measure the intended constructs, making the instrument suitable for assessing user perceptions of the SITASI system. The reliability test resulted in a Cronbach's alpha value of 0.919. According to standard reliability criteria, an instrument is considered reliable if the Cronbach's alpha value is equal to or greater than 0.60. Therefore, the data obtained from this questionnaire can be considered reliable, and the statements and responses are deemed suitable for further analysis.

The analysis of McCall's quality factors in the SITASI system focuses on five main components: correctness, reliability, efficiency, integrity, and usability. Each factor is evaluated using specific criteria, weighted and scored based on user perceptions gathered through a questionnaire. Each item in the questionnaire was rated on a 5-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The total value of each factor (Fa) is calculated and the results are converted into percentages using Formula 1. This conversion method enables a standardized interpretation of scores across all quality factors.

Table 3 presents the results of SITASI's evaluation based on McCall's quality factors, which include correctness, reliability, efficiency, integrity, and usability. SITASI performs well in correctness (67.6%) and reliability (64.2%), both rated as good. Efficiency (43.2%) and integrity (50,8%) are categorized as fairly good, indicating areas for improvement. Usability received the highest score at 86%, reflecting a very good level of user satisfaction. The

following section presents the results of SITASI's quality analysis based on the McCall model. Each factor (correctness, reliability, efficiency, integrity, and usability) is evaluated using user questionnaire data to identify strengths and areas for improvement.

Table 3. Results of mccall quality factor calculations

Quality Factors	Percentage	Feasibility Category
Correctness	67,6%	Good
Reliability	64,2%	Good
Efficiency	43,5%	Fairly Good
Integrity	50,8%	Fairly Good
Usability	86%	Very Good

Table 4. Correctness factor analysis

Factor (Fa)		Criteria and Parameters	Weight	Score
Correctness	C1	Completeness		
	P1	SITASI can display information appropriately on each menu provided.	0.4	3.8
	P2	SITASI can display the appropriate information on each menu.	0.3	3.9
	P3	The availability of information in SITASI is in accordance with user needs and is always up to date.	0.4	3.4
	C2	Consistency		
	P4	SITASI has a consistent appearance design, including colors, fonts, and layout, which remains uniform on every page.	0.3	4.2
	P5	The language used in SITASI is consistent on every page.	0.3	4.2
	P6	The form features and buttons on each SITASI page are similar.	0.2	3.7
	C3	Traceability		
	P7	SITASI can display search results for all content in the system.	0.4	3.8
	P8	SITASI can track errors made by users.	0.4	3.2

The correctness factor of SITASI scored 67.6% as shown in Table 1, indicating as Good rating. Table 4 presents the analysis of the Correctness factor in the SITASI system, evaluated through three criteria: Completeness, Consistency, and Traceability. According to Table 4, while completeness scored well, the currency of information was lower (3.4), signaling a need for more frequent updates to maintain data relevance. Traceability also scored 3.5, with error tracking rated lowest at 3.2, reflecting the absence of features such as error logs, activity tracking, and user feedback. These gaps weaken not only correctness but also usability, which is a key aspect in determining interface quality through ease of use and user trust. The low efficiency score (43.5%) further suggests performance issues like slow response times, which may lead users to question data accuracy. This highlights the interconnection between efficiency, correctness, and integrity.

The efficiency quality factor of SITASI scored 43.5%, as shown in Table 1, and is classified as Fairly Good. Table 5 presents the analysis of the Efficiency factor in the SITASI system, evaluated through two criteria: Execution Efficiency and Conciseness. According to

Table 5, the system demonstrated relatively adequate performance in certain efficiency sub-criteria, such as information presentation with a score of 4.1 and the use of concise language with a score of 4.2 Both of these aspects contribute to ease of navigation. However, the overall efficiency score is significantly limited due to low performance in data processing speed, which received a score of 3.6. Further analysis indicates that one of the main causes of this low data processing speed is the system's inconsistent response time, especially during peak usage. This inefficiency not only reduces perceived speed but also affects correctness due to doubts about data accuracy or updates and usability by disrupting interaction flow and increasing user effort.

Table 5. Efficiency factor analysis

Factor (Fa)		Criteria and Parameters	Weight	Score
Efficiency	C1	Execution Efficiency		
	P16	SITASI has high time efficiency in processing data and presenting information quickly.	0.4	3.6
	P17	Service menus, functions, and data on SITASI have been tailored to user needs	0.3	4.1
	C2	Conciseness		
	P18	The language used in SITASI is easy to understand quickly	0.4	4.2

Table 6. Usability factor analysis

Factor (Fa)		Criteria and Parameters	Weight	Score
Usability	C1	Operability		
	P22	The system can be operated easily	0.4	4.3
	P23	SITASI menus and information displayed can be understood well	0.4	4.1
	P24	SITASI provides the information needed easily and quickly	0.4	4.1
	P25	Overall this system is able to provide satisfaction and comfort to users	0.4	4
	C2	Training		
	P26	The availability of a help menu makes it easier for users to understand and use SITASI.	0.3	3.3
	P27	Information, such as online help and other documentation, is clearly presented and easily accessible to users.	0.4	3.9
	P28	The availability of a feature to contact the call center allows users to easily submit suggestions, criticisms, and complaints.	0.3	3.2
	P29	SITASI conveys a clear message, helping users understand the steps that need to be taken to address the problem.	0.3	3.7
	C3	Communicativeness		
	P30	SITASI has an attractive, well-structured, and simple design that is user-friendly.	0.4	4.2

The usability factor of SITASI scored 86% as shown in Table 1, indicating a Very Good rating. Table 6 presents the analysis of the Usability factor in the SITASI system, evaluated through three criteria: Operability, Training, and Communicativeness. According to Table 6, the operability aspect performed well, with high scores reflecting ease of use, clarity, and overall user satisfaction. Intuitive and responsive interfaces are known to enhance user experience. However, the training aspect showed weaknesses, particularly in help center availability and complaint services, which scored only 3.2. The low score for live support indicates limited access to real-time assistance, impacting users' ability to resolve technical issues promptly. Inadequate support further compounds the effects of low system efficiency, especially when users need help navigating delays or unclear processes. This reveals a link between usability, efficiency, and correctness, as poor support can reduce system trust.

Table 7. Reliability factor analysis

Factor (Fa)		Criteria and Parameters	Weight	Score
Reliability	C1	Accuracy		
	P9	SITASI can display accurate and relevant data according to the keywords searched.	0.4	3.5
	P10	The system provides data and information that accurately meets the needs of users	0.4	4
	P11	The information provided by the system is accurate and error-free	0.4	3.6
	P12	Users can obtain the information they need in a timely manner	0.4	3.7
	C2	Simplicity		
	P13	The menus in this system are easy to understand and do not cause difficulties	0.3	4
	P14	Information available on SITASI is easy to understand without causing difficulties	0.3	4.1
	C3	Error Tolerance		
	P15	If an error occurs, SITASI can provide clear notification messages on the steps to be taken to resolve the issue.	0.4	3.2

Table 8. Integrity Factor Analysis

Factor (Fa)		Criteria and Parameters	Weight	Score
Integrity	C1	Access Control		
	P19	Users can access and use SITASI features in accordance with the access rights they have been granted.	0.4	4.1
	C2	Security		
	P20	The login process can run smoothly and in accordance with user expectations	0.4	4.3
	P21	SITASI can control user access by limiting access rights according to user roles or levels.	0.4	4.3

The reliability factor of SITASI scored 64.2% as shown in Table 1, categorized as Good. Table 7 presents the analysis of the Reliability factor in the SITASI system, evaluated through

three criteria: Accuracy, Simplicity, and Error Tolerance. According to Table 7, accuracy emerged as a strength, with the system providing timely and precise information that supports user confidence. Simplicity also rated well, reflecting a user-friendly interface. However, the error tolerance component scored lower at 3.2, indicating a need to improve error messages and feedback. Clear and informative error messages are essential for enhancing reliability and user confidence. The lack of such features also affects usability, especially for new users, and can lead to longer task completion times, thus reducing efficiency. This highlights the close link between reliability, usability, and efficiency.

The integrity factor of SITASI scored 50.8%. as shown in Table 1, classified as Fairly Good. Table 8 presents the analysis of the Integrity factor in the SITASI system, evaluated through two criteria: Access Control and Security. According to Table 8, access control performed well, with high scores for role-based access (4.1) and login processes (4.3), reflecting effective Role-Based Access Control (RBAC), which limits access by user role and enhances system security. Delayed response times, as seen in low efficiency, may further erode trust in security processes like login validation or permission updates. These findings highlight the interconnection between integrity, efficiency, and usability.

Discussion

The SITASI system achieved a "Good" rating in correctness with a score of 67.6%, primarily driven by its strong operability to supports academic processes with relatively accurate data. Nevertheless, inconsistencies like delayed status updates and a lack of immediate system feedback were noted. To improve overall quality, SITASI needs to focus on regular content updates, better error tracking, and backend infrastructure optimization, which are essential for enhancing accuracy, responsiveness, and user trust. Meanwhile, in terms of reliability, SITASI was rated “Good” with a score of 64.2% as it showed stable performance in most tasks but lacked adequate mechanisms for error tolerance. SITASI currently lacks clear notification messages to guide users in resolving errors when they occur. These weaknesses reduce the system’s accountability and users’ confidence in its reliability. Such findings reflect concerns raised by MaySarah et al. (2024) and Zieglmeier & Lehene (2021), who emphasized that digital platforms in academia must prioritize system transparency and dependable performance feedback. Strengthening interactive feedback and error-handling mechanisms is essential to improve system trust.

Efficiency was the lowest-performing factor, scoring 43.5% and classified as Fairly Good, indicating critical issues related to system responsiveness and task processing speed. Users frequently encountered delays when accessing the platform, especially during peak times, such as final project deadlines or proposal seminar periods. These delays were attributed to the absence of backend optimizations, including unrefined database queries, the lack of caching mechanisms, and no implementation of load balancing strategies. Furthermore, SITASI does not incorporate task prioritization or queue management, resulting in severe slowdowns under high user load. Several workflow stages still require manual handling, such as supervisor assignment and document verification, further diminishing the system’s efficiency. These issues are consistent with the findings of Wahyuni et al. (2023) and Yusuf et al. (2023), who argued that slow system response times negatively impact user satisfaction and trust. Improving server responsiveness through optimized database queries and the implementation of caching mechanisms should be prioritized to enhance overall efficiency, which in turn will strengthen the functional reliability of SITASI and improve user satisfaction.

The integrity factor scored 50.8% and classified as Fairly Good, reflecting weaknesses in the system’s ability to safeguard user data and prevent unauthorized access. Although SITASI applies basic access control based on user roles, it does not implement more advanced security features such as two-factor authentication, data encryption, or audit trails to monitor

changes and access patterns. This lack of layered security increases the vulnerability of academic data, especially in a multi-user environment where data sensitivity is high. The findings support the argument presented by Nocera et al. (2023), who emphasized that academic systems must integrate adaptive and robust security mechanisms to ensure data protection without compromising usability. Despite having a clear role-based permission system, the current safeguards in SITASI remain insufficient to address evolving security risks in higher education platforms. Strengthening layered security features is essential to protect user data in SITASI.

In contrast, usability emerged as the strongest factor with a score of 86% and classified as Very Good. Users found the system intuitive and visually clear, supported by well-structured menus and task flows. The strengths of usability are consistent with Fergo & Ratnasari (2023), who emphasized that high usability enables users to complete tasks efficiently, thereby enhancing comfort and encouraging continued use of the system. However, SITASI lacks integrated support features such as real-time help, interactive tutorials, or contextual guidance, which limits the full potential of its usability. This limitation aligns with the observations of Khalida & Pamungkas (2023), who argued that usability must go beyond interface design and include responsive assistance to meet users' informational and technical needs. To enhance usability, it is recommended to improve help and support services in the SITASI system.

CONCLUSION

The SITASI system's overall quality is rated "Very Good" based on the McCall Software Quality Model, but it struggles with efficiency and integrity, which can hinder academic operations and user trust. This highlights that good usability isn't enough; responsive performance and strong data security are also crucial. Future improvements should focus on the system's technical infrastructure and security. A limitation of this study is its reliance only on user opinions, so future research should include more objective technical evaluations for a comprehensive assessment.

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