

# Usability Evaluation of Lecturer Information System using CTA, Performance Measurement and SUS

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**Abstract:** This research aims to provide a deeper understanding of the usability aspects of information systems, as well as help create more effective and efficient solutions in supporting academic activities in higher education. The ITB STIKOM Bali, Lecturer Information System is a system developed to assist lecturers in carrying out their academic responsibilities. This system has become a very vital tool in supporting various academic activities of lecturers. This research will be conducted using the Concurrent Think Aloud (CTA) method, Performance Measurement, and System Usability Scale (SUS) to assess effectiveness, efficiency, and user satisfaction of the system. The system was found effective, with a success rate exceeding 78%. Advanced users achieved a 95% success rate, while beginner users achieved 86%, with errors primarily in navigation-related tasks. User satisfaction analysis via SUS showed skilled users rated the system at 84.75 (Grade A, Acceptable), whilst beginner respondents scored 52.5 (Grades D, Marginal Low), reflecting usability challenges for beginners. Performance Measurement highlighted issues with small font sizes and unclear navigation, while CTA identified difficulties with the logout button, lack of search functionality, unreadable interface text, and unclear functional position menus. Recommendations include increasing font size to Arial 14, redesigning the logout button, adding search bars, and enhancing functional menus to include research and community service options. These improvements aim to enhance system usability and user experience across all proficiency levels.

**Keywords:** CTA, SID, SUS, Usability.

## INTRODUCTION

The development of technology and education are currently two things that are interrelated and continue to be in the spotlight. In the world of education, especially in higher education, the role of technology is increasingly important to support the smooth learning process (Susilo & Widiya, 2021). One of the challenges faced by the academic community is the limited face-to-face communication between lecturers and students, especially in situations that require distance learning (Gherheş et al., 2021). Therefore, the development of information systems that can be accessed anytime and anywhere becomes very important to ensure smooth communication and interaction between lecturers and students (Li, 2021).

The large number of students demands a more effective way for lecturers to monitor students' academic progress (Feriadin, 2022). In this context, the development of a system that can assist lecturers in carrying out their obligations as teachers, guardians, and student mentors is a relevant solution (Javaid et al., 2023). Along with the times, the need to have a system that supports the performance of lecturers is becoming increasingly urgent (Khan, 2021). The challenges that exist require lecturers to continue carrying out their duties outside the classroom (Hisbullah & Izzati, 2021). They also need to do this without time restrictions.

However, the development of information systems, especially web-based, cannot be done without clear guidelines regarding its usefulness (Wulandari et al., 2021). In order for the developed system to achieve its goals effectively, it is necessary to have clear parameters to measure the extent to which the system is beneficial to its users (Zhou et al., 2021). One of the key factors in measuring the success of a system is usability, which includes the extent to which the system is accepted and used properly by its users (Kesuma, 2021). To ensure the usefulness of the system, usability level measurements can be made using several important parameters, such as effectiveness,

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efficiency, and user satisfaction (Azis et al., 2023). This measurement will describe the level of system usefulness and user satisfaction in using it.

The usability aspect includes the process carried out by users in learning and using products to achieve the desired goals with high effectiveness, efficiency, and satisfaction (Ramadhan et al., 2022). The importance of analyzing usability aspects in the development of this system lies in its ability to ensure optimal use by lecturers and students (Zardari et al., 2021). It also has a positive impact on the efficiency and quality of the learning process (Kumar et al., 2021). Without proper measurement of the usability level, system development can risk producing products that are difficult to use (A. D. Putra et al., 2022). This ultimately reduces user effectiveness and satisfaction.

The urgency of this research is critical, given the challenges faced by lecturers and students in adapting to distance learning and more complex information systems. If this research is not carried out, then most likely, the information system development carried out will not meet the real needs of users and could cause a waste of time and resources. In addition, without adequate usability evaluation, lecturers may find it difficult to manage academic tasks and students, which in turn may adversely affect the overall quality of learning. Therefore, this research aims to provide a deeper understanding of the usability aspects of information systems, as well as help create more effective and efficient solutions in supporting academic activities in higher education.

## LITERATURE REVIEW

### Lecturer Information System

Information systems consist of two main elements, namely “system” and “information.” A system can be understood as a set of elements that are organized and work together to achieve certain goals (Wijaya & Hendrastuty, 2022). In this context, the system involves people working with rules, conditions, and boundaries that have been arranged in a systematic and structured manner (Sanjaya et al., 2024). Some of the main characteristics of a system include system components, system boundaries, system inputs and outputs, and processing carried out in the system (Setiawan et al., 2024).

On the other hand, information refers to data that has been processed in such a way that it becomes more meaningful and useful to the recipient (Tjahjanto et al., 2022). Information serves to reduce uncertainty in decision making by providing clearer insight into a situation. Thus, an information system can be defined as a structured combination of people, hardware, software, communication networks, and data resources that work together to collect, process, and disseminate information in an organization. The main function of information systems is to support various organizational processes, from decision making to operational management.

The ITB STIKOM Bali Lecturer Information System (*Sistem Informasi Dosen/ SID*) is a system developed to assist lecturers in carrying out their academic responsibilities. This system was introduced in 2013 and since then has continued to undergo various developments, both in terms of features and functionality, with the aim of making it easier for lecturers to carry out their duties anytime and anywhere.

In addition to assisting lecturers in their role as teachers, SID also supports several other important functions inherent in the duties of lecturers, such as guardian lecturers, supervisors, coordinating lecturers, and examining lecturers. With the available features, SID makes it easy for lecturers to carry out their administrative and academic obligations. The main users of this system are all active lecturers registered at ITB STIKOM Bali. The system is most often used at the beginning, middle, and end of the semester, during which period lecturers tend to be more active in managing various aspects of academic administration related to their roles.

Over time, SID has evolved to cover various aspects that can improve the efficiency and effectiveness of lecturers in carrying out their duties, both as teachers and as academic advisors. Therefore, this system has become a very vital tool in supporting the smooth running of academic activities at ITB STIKOM Bali, as well as improving the quality of educational services provided to students.

### Usability Evaluation

Usability refers to the quality of a system that is easy to learn, easy to use, and can encourage users to utilize the system positively in completing the task at hand (Hasibuan & Putri, 2022). In this context, the system in question is software. In general, usability can be understood as a measure of the extent to which users can access the functionality of a system effectively, efficiently, and satisfactorily in achieving the desired goals (Putri et al., 2024).

Several definitions of usability can be found in various literatures, both from international standards institutions and from individuals. One reference that is often used in this research is the definition from the International Organization for Standardization (ISO), which defines usability as the level at which a product can be used by a particular user to achieve its goals effectively, efficiently, and satisfactorily (I. N. G. A. Y. Putra et al., 2023). This definition emphasizes three main aspects in measuring usability, namely effectiveness, efficiency, and satisfaction (Arslayandi et al., 2024). Effectiveness measures accuracy and completeness in achieving a particular goal. It relates to the user's ability to complete tasks correctly using the system (Manurung et al., 2024). The main indicator

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to measure effectiveness is the number of errors that occur during the use of the application. The fewer errors made by users, the higher the effectiveness of the system. Efficiency refers to the effort or resources expended by users to achieve certain goals. Efficiency criteria are often measured based on the time it takes to complete a task (Aufar et al., 2023). Usually, this measurement compares the time taken by advanced users with the time taken by beginner respondents. The less the time difference between the two groups, the higher the efficiency of the system. Satisfaction refers to the level of user comfort and satisfaction when interacting with the system. It includes how users feel free from discomfort in using the system and the extent to which they experience positive experiences. User satisfaction also reflects how well the system meets user expectations in terms of ease of use and goal achievement.

Usability testing is a process for measuring the extent to which users can use a system effectively, efficiently, and satisfactorily (Saputra et al., 2022). This process involves direct observation of the way users interact with the system to identify problems that arise during use. Through usability testing, developers can gain valuable insights into aspects that need to be improved to enhance the user experience, as well as to ensure that the developed system meets the needs and expectations of its users.

**METHOD**

ITB STIKOM Bali has developed a website designed to assist lecturers in managing their various obligations as lecturers, academic trustees, supervisors, and student examiners. Although this system has been used in various activities, until now there has been no measurement related to the effectiveness, efficiency, and level of user satisfaction of the site. Therefore, it cannot be ascertained whether this site is operating optimally and meeting the expectations of its users.

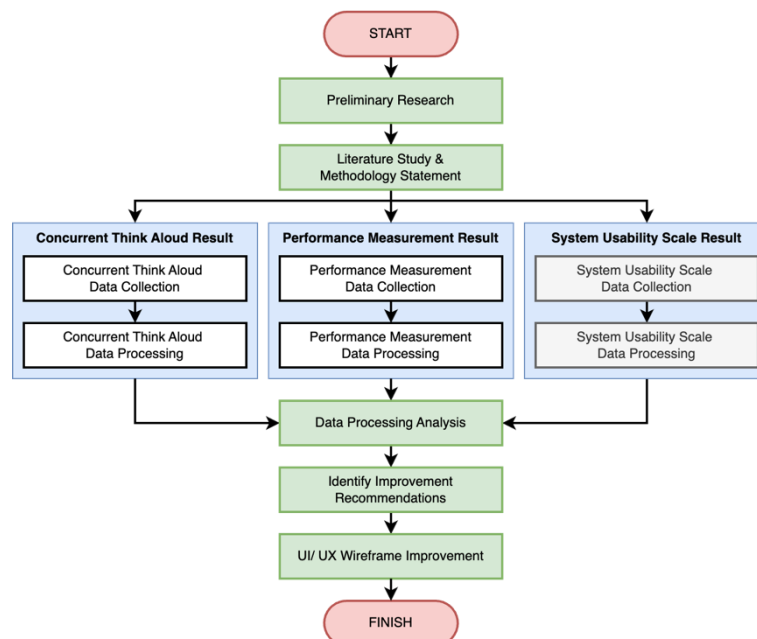


Fig. 1 Research Flowchart

The first step in this research is to determine the information system that will be the object of analysis, namely the ITB STIKOM Bali Lecturer Information System (SID), which can be accessed through the address <https://sid.stikom-bali.ac.id>. Furthermore, data will be collected using observation and interview methods conducted to all respondents involved in using this system.

The type of research used in this study is user-based survey research. The method chosen for this research is descriptive analysis method. This method aims to describe the object under study by providing a clear picture based on the data collected. The data obtained from respondents will be processed and analyzed to obtain conclusions that describe the extent to which this system meets user expectations.

This research will analyze the use of STIKOM Bali ITB Lecturer Information System (SID) from the usability aspect, by referring to the parameters in ISO 9241-11, namely effectiveness, efficiency, and user satisfaction. Assessment of these three parameters will provide a more comprehensive picture of how the system is used, the extent to which the system is effective in supporting lecturers' tasks, efficient in its use, and the level of satisfaction felt by its users.

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This research will be conducted at ITB STIKOM Bali, which is a higher education institution that uses the Lecturer Information System (SID) as a tool to support various academic activities of lecturers. This campus has one main campus that is the operational center of this system, and all data needed for this research will be collected from users who are directly involved in the use of SID. The research time will be conducted during a predetermined period, to ensure that all necessary data can be collected and analyzed properly.

Data collection methods are an important aspect of research, because through these methods, researchers can obtain the information needed to achieve research objectives. The collected data will be processed into more useful and useful information, so that it can support the analysis carried out in the research. In this study, several data collection methods used to test the usability of the ITB STIKOM Bali Lecturer Information System (SID) were observation, interview and questionnaire.

Observation is a data collection method carried out by directly observing user activities while using the system. Researchers systematically record user behavior and interactions with the ITB STIKOM Bali Lecturer Information System (SID). This observation process aims to obtain relevant data regarding how users interact with the system in a real context. Notes were made on aspects related to the effectiveness and efficiency of using the system, such as errors that occur, the time needed to complete tasks, and the obstacles faced by users.

The interview method was used to dig deeper information about users' experiences and views regarding the use of the system. In the interview, the researcher asked a number of questions to respondents who were users of the ITB STIKOM Bali Lecturer Information System (SID). With interviews, researchers can directly monitor and assess the information provided by respondents, and explore the answers obtained. This interview also allows researchers to use the concurrent think aloud technique, where respondents are asked to think and express their opinions verbally while using the system, to measure the level of user satisfaction with the system. An interview guideline that has been prepared specifically for lecturers as SID users will be used to ensure that the interview goes according to the research focus.

The questionnaire method is used to collect data quantitatively from a large number of respondents. The questionnaire will include questions that focus on usability aspects such as effectiveness, efficiency, and user satisfaction. Using a Likert scale, respondents can provide an assessment of various features and functionality of the system, which is then analyzed to measure how well the system meets the expectations and needs of its users.

These data collection methods were chosen to provide a comprehensive picture of user experiences in using the Lecturer Information System (SID). The collected data will be analyzed to identify areas that require improvement in the system and to provide recommendations that can improve the usability of the system for its users.

## RESULT

### Result of the Concurrent Think Aloud Method

In the Concurrent Think Aloud method, respondents were asked to verbalize their thoughts while using the Lecturer Information System (SID). The data collected reveals various issues or difficulties encountered by users. Some of the most frequent problems include Synchronization Delays or Errors, Navigation and System Interface Issues, Technical Issues like Loading Times and Session Duration. From the overall data, it can be concluded that users primarily struggled with navigation difficulties, short session durations, and poor synchronization between the system and the data. The following are the results of the Concurrent Think Aloud from system users, conducted by 10 advanced respondents (code: ADV) and 10 beginner respondents (BGN), excluding minor issue conditions.

Table 1. Concurrent Think Aloud Results Data for SID Advanced and Beginner Respondents

Resp. Code	Feature/Aspect	Problems or Difficulties Encountered
ADV02	Approve Thesis Title, Student Advisor (Study Period, GPA), View Certificate, Academic Calendar	Delay in uploading academic documents, teaching schedule not synchronized, academic calendar not uploaded.
ADV03	Teaching evaluation, Student search, Lecturer search	Loading delays that hinder selecting menu/options (such as semester, year, etc.).
BGN02	Teaching history, Lecturer evaluation results, Lecturer profile	Left menu too cluttered (needs to be hidden), no search column to easily find desired menus.
BGN03	Rare use, Only accesses Academic Advisor	UI lacks dynamism (different from other systems like SION), menu names do not match the targeted pages.
BGN04	Student search, Lecturer search	Some menu button names do not match the page title they lead to.
BGN05	Teaching Certificate, Teaching history, Student search	Too many systems besides SID, lacks centralization. Rarely use SID, as it is less complete; more often access SINAK.
BGN07	Student search, Teaching history, Lecturer search, Lecturer profile	The appearance needs improvement, as the user is not accustomed to the current system design. Text is too small and cramped. No search column for menus.

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BGN08	Update profile, Teaching Certificate, Teaching history	UI is unattractive, difficult to adapt.
BGN09	Teaching history, Teaching evaluation results	Not yet familiar with using the system. Page title does not match the name of the left menu. Logout button is hard to find (color is the same as the username).

**Result of Performance Measurement Method**

The Performance Measurement method assessed the efficiency of using the system by recording the time taken by respondents to complete specific tasks. Two respondent groups were involved: beginners and advanced respondents. The beginner respondents showed a significant variation in task completion times. On average, the time required to complete each task was as follows:

Table 2. Beginner Respondents Group Assignment Completion Time

Resp Code	Task Completion Time (Seconds)									
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
BGN01	10.17	12.86	13.87	11.27	11.00	8.26	Error	3.26	2.00	2.00
BGN02	15.00	32.96	Error	Error	35.82	11.85	26.00	18.00	9.00	4.19
BGN03	10.71	12.00	20.8	33.00	84.97	14.91	23.06	2.94	Error	5.00
BGN04	16.98	31.07	41.97	21.15	24.00	14.00	14.00	Error	16.00	2.97
BGN05	8.17	18.00	24.00	8.00	30.00	17.11	13.20	3.00	7.00	3.05
BGN06	8.00	19.00	27.00	Error	Error	10.78	14.00	2.23	86.00	1.25
BGN07	8.11	17.78	Error	Error	30.23	17.00	27.00	Error	2.00	3.83
BGN08	14.15	15.86	29.05	15.00	39.00	8.00	14.13	2.19	1.00	4.82
BGN09	16.20	33.23	21.00	53.07	58.15	20.27	Error	Error	7.00	31.17
BGN10	13.16	27.14	Error	Error	29.91	18.92	22.00	2.00	8.80	1500
Avg	12.06	21.99	25.38	23.58	38.12	14.11	19.17	4.80	15.42	7.32

Some beginner respondents also encountered errors or issues that impacted task completion time, such as in Tasks 3 and 4. The advanced users generally completed tasks more quickly than beginner users, although not consistently faster for all tasks. The average time for each task was as follows:

Table 3. Advanced Respondents Group Assignment Completion Time

Resp Code	Task Completion Time (Seconds)									
	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
ADV01	8.12	31.92	14.17	11.02	16.07	69.05	19.01	3.03	4.85	7.81
ADV02	3.88	35.07	17.12	Error	7.98	6.23	17.18	6.01	6.13	3.03
ADV03	14.00	11.01	11.09	6.92	12.01	9.87	9.88	6.96	2.06	1.80
ADV04	5.90	14.00	7.00	Error	21.21	8.71	30.75	3.00	6.93	2.99
ADV05	8.28	11.94	18.90	Error	27.91	7.09	20.28	Error	4.90	0.94
ADV06	7.19	9.06	12.85	5.05	15.00	6.87	12.02	2.90	3.21	1.88
ADV07	9.10	27.94	18.72	17.76	15.00	6.96	16.77	2.11	4.88	4.18
ADV08	10.87	15.11	53.00	31.75	11.00	6.00	17.73	2.22	5.00	2.72
ADV09	10.21	19.00	11.75	Error	30.89	8.00	15.83	6.00	19.03	3.00
ADV10	6.12	13.79	15.99	8.01	6.99	8.18	15.82	1.89	1.26	2.99
Avg	8.37	18.88	18.06	13.42	16.41	13.70	17.53	3.79	5.83	3.13

The difference in completion times between beginner and advanced users generally indicates that advanced users are more efficient at navigating and understanding the system. The Mann Whitney U Test was used to examine differences in efficiency between beginner and advanced respondents. Based on the statistical results, the Mann Whitney U Test showed the following results:

Table 4. Output Test Statistics of SID Respondent Data Processing

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Mann-Whitney U	23.000	36.500	42.000	41.000	22.500	15.500	44.000	38.000	43.000	29.000
Wilcoxon W	78.000	91.500	97.000	96.000	77.500	70.500	99.000	93.000	98.000	84.000
Z	-2.041	-1.021	-0.606	-0.703	-2.080	-2.609	-0.454	-0.911	-0.530	-1.588
Asymp. Sig. (2-tailed)	0.041	0.307	0.545	0.482	0.037	0.009	0.650	0.362	0.596	0.112
Exact Sig. [2*(1-tailed Sig.)]	.043 <sup>b</sup>	.315 <sup>b</sup>	.579 <sup>b</sup>	.529 <sup>b</sup>	.035 <sup>b</sup>	.007 <sup>b</sup>	.684 <sup>b</sup>	.393 <sup>b</sup>	.631 <sup>b</sup>	.123 <sup>b</sup>

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From the statistical output, it can be concluded that there are some tasks where advanced users demonstrated higher efficiency, while for others, there was no significant difference between the two groups. The suggestions provided by respondents mainly focused on the development and improvement of the SID system. Some of the key suggestions include data synchronization, session duration, developer coordination, and User Interface (UI) improvement. Overall, these suggestions reflect the need for improving user experience and system efficiency, both in terms of functionality and appearance, to better support lecturers in managing various administrative tasks.

After distributing the questionnaire to the respondents, the next step is to calculate the score using the System Usability Scale (SUS), which aims to assess user satisfaction with the lecturer information system. Based on the compilation of assessments from 20 respondents, who are users of the SID system using the System Usability Scale (SUS), the obtained SUS scores, after being processed, showed the following results:

Table 5. SUS Score Results After Processing for Advanced and Beginner Respondents

Resp. Code	Question Answer Value (After Processing: Odd n-1   Even 5-n)									
	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10
ADV01	4	3	4	4	3	3	3	4	4	3
ADV02	4	4	4	4	4	4	4	4	4	4
ADV03	4	3	3	3	3	3	4	4	3	2
ADV04	4	3	4	4	3	2	3	3	4	1
ADV05	4	3	3	4	3	2	2	4	3	3
ADV06	4	4	4	4	4	4	4	4	4	4
ADV07	3	3	3	3	3	3	3	3	3	3
ADV08	3	3	3	3	3	3	3	3	3	1
ADV09	3	3	4	3	4	3	3	3	3	3
ADV10	4	4	4	4	4	4	4	4	4	4
BGN01	3	1	4	1	3	1	3	1	4	1
BGN02	3	2	2	3	3	3	3	3	3	1
BGN03	3	1	2	1	2	1	2	2	2	1
BGN04	4	0	2	0	2	1	2	2	2	1
BGN05	3	1	4	3	3	3	3	2	4	1
BGN06	4	3	3	3	4	3	3	3	3	1
BGN07	3	2	3	3	3	2	2	2	3	1
BGN08	3	1	2	1	3	2	2	2	1	1
BGN09	4	1	1	0	1	1	2	2	1	1
BGN10	4	1	2	1	2	0	2	2	2	0

### Effectiveness Analysis Using Performance Measurement Method

The effectiveness was analyzed by assessing the number of errors or failures committed by the respondents while completing each task assigned, based on the results from the performance measurement conducted. Below are the effectiveness results of the respondents based on different user categories from the Lecturer Information System (*Sistem Informasi Dosen/ SID*). The data processed from the Performance Measurement on respondents of the Lecturer Information System (SID), shows that errors were committed by both advanced and beginner respondents, as illustrated in Table below. The list of respondents who did not find any errors is not displayed in the table, and the total tasks for each group are 10 tasks and the number of respondents for each group is 10 respondents.

Table 6. Error Incidents Data of Advanced and Beginner Respondents

Group	Task ID	No. of Participants	No. of Errors	Percentage of Errors	Avg
Advanced Respondents	Task 4	10	4	40%	5%
	Task 8	10	1	10%	
Beginner Respondents	Task 3	10	3	30%	14%
	Task 4	10	4	40%	
	Task 5	10	1	10%	
	Task 7	10	2	20%	
	Task 8	10	3	30%	
	Task 9	10	1	10%	

Based on the performance measurement data obtained, the Lecturer Information System (SID) at ITB STIKOM Bali can be considered effective, as the success rate exceeds 78%. The errors are caused by several factors, as outlined in Table below.

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Table 7. Causes of Errors in SID Users

Task	Error Causes
Task 3	Respondents were confused when searching for the class teaching menu and had difficulty filtering the class data (not understanding the data filtering process) due to loading issues that hindered selecting the desired options (such as odd/even semester, year, etc.).
Task 4	Respondents were confused when searching for the Teaching Certificate menu because they were not yet accustomed to using the system. The page title was inconsistent with the menu name on the left. The logout button was hard to find (its colour was the same as the user name).
Task 5	Incorrectly clicked the lecturer menu. The left menu was too cluttered, and there was no search bar to help find the desired menu.
Task 7	Respondents were confused when searching for the lecturer evaluation menu because they couldn't find the menu, and were unfamiliar with the system's display. The text was too small and cramped. There was no search bar for the menu.
Task 8	Respondents were confused when searching for functional position information because it was not in the menu and was presented only as text. The information should have been supplemented with the number of completed research and service activities, the required points/files for a promotion, and the current position in the functional position hierarchy.
Task 9	Respondents were confused when searching for information on the number of students supervised for theses because they couldn't find the menu and were unfamiliar with the system's display. The text was too small and cramped. There was no search bar for the menu.

**Efficiency Analysis Using Performance Measurement Method**

From the data presented in Table 4, it is observed that the p-values for each task are as follows: 0.041 for Task 1; 0.307 for Task 2; 0.545 for Task 3; 0.482 for Task 4; 0.037 for Task 5; 0.009 for Task 6; 0.650 for Task 7; 0.362 for Task 8; 0.596 for Task 9; and 0.112 for Task 10. In order to draw conclusions from the data processing, the p-value for each task is compared with the significance level ( $\alpha$ ) set at 0.05. If the p-value is greater than 0.05, the null hypothesis ( $H_0$ ) is accepted, whereas if the p-value is smaller than 0.05, the alternative hypothesis ( $H_1$ ) is accepted.

Based on the statistical data analysis, it can be concluded that the p-values for Tasks 2, 3, 4, 7, 8, 9, and 10 are greater than the predetermined alpha value of 0.05. Therefore, the decision is to accept  $H_0$ , indicating that there is no significant difference in the task completion time between advanced and beginner respondents for these tasks. Conversely, the p-values for Tasks 1, 5, and 6 are smaller than 0.05, leading to the acceptance of  $H_1$ , which implies a significant difference in the task completion time between advanced and beginner respondents for these tasks.

From the processed data, it can be stated that the SID at ITB STIKOM Bali can be considered sufficiently efficient, as the number of tasks for which  $H_0$  was accepted exceeds those for which  $H_1$  was accepted.

Table 8. Summary Results of Mann Whitney Hypothesis Testing

Task	pValue	Significance (Asymp. Sig. (2-tailed))	Criteria	Decision
T1	0.041		NS pValue < 0.05	$H_0$ Rejected, $H_1$ Accepted
T2	0.307		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T3	0.545		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T4	0.482		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T5	0.037		NS pValue < 0.05	$H_0$ Rejected, $H_1$ Accepted
T6	0.009		NS pValue < 0.05	$H_0$ Rejected, $H_1$ Accepted
T7	0.650		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T8	0.362		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T9	0.596		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected
T10	0.112		NS pValue > 0.05	$H_0$ Accepted, $H_1$ Rejected

Conclusion: More tasks accepted  $H_0$  (7) than  $H_1$  (3), indicating that the system is classified as efficient.

**Efficiency Analysis Using Performance Measurement Method**

The analysis of user satisfaction was conducted by examining the responses obtained from a questionnaire filled out by the respondents. The responses were then analyzed using the System Usability Scale (SUS) questionnaire to measure the user satisfaction variables when using the system. The calculation method for the SUS questionnaire results is as follows:

Figure 1 illustrates the average SUS score for user satisfaction with the lecturer information system (SID) among advanced respondents. The resulting score was 84.75, which falls within the Acceptability Range category of "Acceptable," indicating that the users accepted the SID system. Furthermore, the Percentile Rank score of 84.75 places it in the "Grade A" category. The interpretation of this SUS score suggests that it is classified as "very good," as it exceeds the threshold value of 68. Based on the obtained data, it can be concluded that the lecturer information system (SID) is accepted (Acceptable) by advanced respondents. In terms of their satisfaction with

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the system's use (Adjective Ratings), a score of 84.75 was achieved, which corresponds to a Grade A rating, indicating "Very Satisfied."

Figure 2 shows the average SUS score for user satisfaction with the lecturer information system (SID) among beginner respondents. The resulting score was 52.5, which falls within the "Marginal Low" Acceptability Range category, indicating lower acceptance of the SID system. The Percentile Rank score of 52.5 places it in the "Grade D" category. The interpretation of this SUS score suggests that it is classified as "poor," as it is below the threshold value of 68. Based on the obtained data, it can be concluded that the lecturer information system (SID) is not accepted (Non-Acceptable) by beginner respondents. Their satisfaction with the use of the system (Adjective Ratings) yielded a score of 52.5, which corresponds to a Grade D rating, indicating "Dissatisfied."

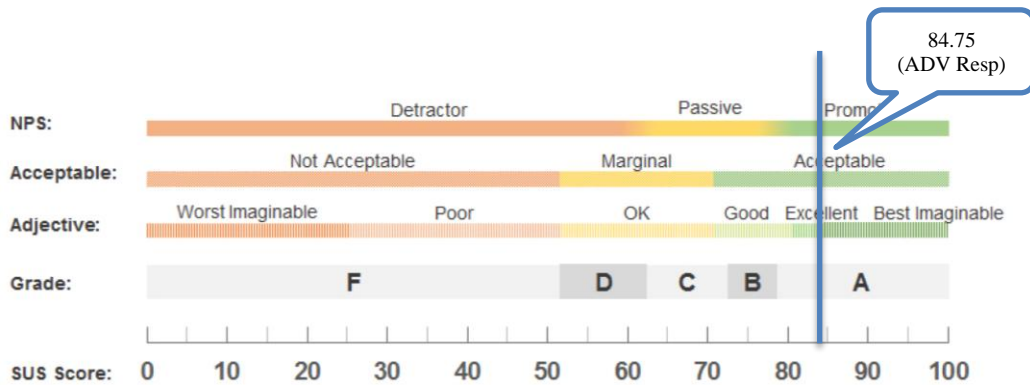


Fig. 3 SUS Meter for Advanced Respondents

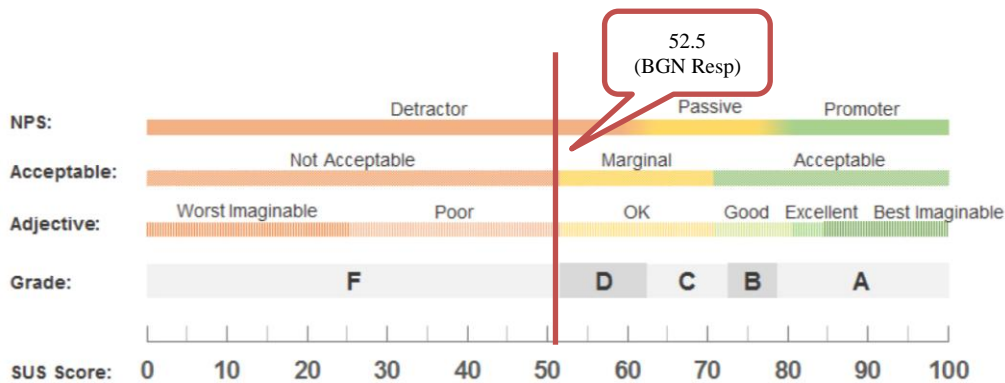


Fig. 4 SUS Meter for Beginner Respondents

## DISCUSSIONS

### User Challenges During System Usage

The data obtained from the Performance Measurement method on the lecturer information system (SID) revealed several difficulties and issues faced by participants while using the system. The issues or challenges experienced by the respondents using SID, such as difficulties in finding or viewing certain menus, which led to failures in performing tasks like searching for teaching schedules, student biodata, evaluation results, and functional position information. These challenges typically resulted from incorrect menu clicks or not noticing certain menus. This highlights the need for a system design that prioritizes usability, as emphasized in the background, to ensure that users can navigate and access critical functions effectively.

The data from the Concurrent Think Aloud method also identified several user challenges while using the lecturer information system (SID). The issues encountered by the respondents are the problems included difficulty in locating the logout button, which blended with the username color, small and cramped menu text on the left side, lack of a search feature, and a need for additional information in the functional position menu. These challenges contributed to delays and inefficiencies in completing tasks. The findings underscore the importance of measuring and addressing usability parameters such as effectiveness, efficiency, and user satisfaction to ensure the system supports academic processes seamlessly.

### Improvement Recommendations

Based on user feedback from the Performance Measurement method, it was found that most users faced difficulties with unclear menus, making it challenging to find and use the desired functions. The most significant

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recommendation involves adjusting the font type and size for the left-side menu to improve readability and ease of navigation. The proposed change is to switch the font to Arial with a size of 14px, replacing the previously used Trebuchet MS font at 11px. This adjustment aims to enhance legibility and user experience, as Arial is known for its clarity and is commonly used in both online and print media. This recommendation aligns with the background's emphasis on usability as a critical factor in system design and development.

User suggestions from the Concurrent Think Aloud method further highlighted specific areas for improvement. The first recommendation is to redesign the logout feature, transforming it into a distinct button to improve visibility and usability. The second recommendation also addresses the font issue, proposing the same switch to Arial with a 14px size for better readability. The third recommendation involves adding a search feature across all pages to allow users to easily find menus. Finally, the functional position menu should be expanded to include details about the research and community service the lecturer has conducted. This addition would help lecturers track their qualifications for functional position advancements. These recommendations ensure the system is designed to meet the real needs of users, reducing the risk of inefficiencies and dissatisfaction, as pointed out in the background.

In terms of practical improvements, the logout feature was changed from a link to a button for better recognition, while the font adjustment and search feature addition were made to enhance navigation efficiency. These updates aim to address the primary user frustrations and improve the overall system experience. By implementing these changes, the system can better fulfill its role in supporting academic activities and addressing the challenges outlined in the background.



Fig. 3 Example of Font Improvement in SID



Fig. 4 Example of Menu Improvement in SID

### CONCLUSION

The usability analysis of the Lecturer Information System (SID) at ITB STIKOM Bali, using Concurrent Think Aloud (CTA), Performance Measurement, and System Usability Scale (SUS), assessed effectiveness, efficiency, and user satisfaction. The system was found effective, with a success rate exceeding 78%. Skilled users achieved a 95% success rate, while beginner respondents achieved 86%, with errors primarily in navigation-related tasks.

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Efficiency was demonstrated by a higher acceptance of null hypotheses ( $H_0$ ) for most tasks, indicating that the system effectively supports task completion. User satisfaction analysis via SUS showed skilled users rated the system at 84.75 (Grade A, Acceptable), while beginner respondents scored 52.5 (Grade D, Marginal Low), reflecting usability challenges for beginners. Performance Measurement highlighted issues with small font sizes and unclear navigation, while CTA identified difficulties with the logout button, lack of search functionality, unreadable interface text, and unclear functional position menus. Recommendations include increasing font size to Arial 14, redesigning the logout button, adding search bars, and enhancing functional menus to include research and community service options. These improvements aim to enhance system usability and user experience across all proficiency levels.

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