USABILITY ANALYSIS OF THE CAREER SYSTEM AT JAMBI UNIVERSITY USING SUS AND HEURISTIC EVALUATION TO IMPROVE EMPLOYER SATISFACTION

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Abstract

The Career Information System at Jambi University play a crucial role in providing data on alumni education and career paths. This study evaluates the system's usability using the System Usability Scale (SUS) and Heuristic Evaluation (HE) to enhance employer and study program satisfaction. This research employs primary data collected from Jambi University alumni through questionnaires. The purposive sampling technique was used, with 50 respondents for the SUS method and 3–5 evaluators for HE. The evaluation results show a SUS score of 63.75, categorized as marginally acceptable with a 65th percentile ranking. The HE assessment yielded a 63% score, indicating that the system is functional but requires improvement. Additionally, the Net Promoter Score (NPS) reflects positive user feedback.This study provides insights for further system development to improve user satisfaction, particularly among employers and study programs at Jambi University

Keywords: Career System, System Usability Scale, Heuristic Evaluation, User Satisfaction

Introduction

The rapid advancement of technology has significantly impacted various aspects of human life. Technology can be defined as the development and application of tools or systems designed to assist humans in solving everyday problems (Fausa, 1995). One of the most widely used technologies in modern life is information technology, which has had a considerable influence across different sectors, including education. An example of technological implementation in higher education is the Career System.

The Career System serves as both a training center and a bridge between universities and the professional world. According to Cahyo Nugroho et al. (2018), universities produce thousands of graduates annually, making it their responsibility to equip students with the necessary skills for the workforce and industry. By collaborating with stakeholders, universities play a crucial role in supporting graduates in achieving career success. Career centers function as educational and training hubs designed for students and alumni, helping them develop not only academic knowledge but also essential competencies required in the job market.

However, not all universities have adequately integrated career development programs for their students and graduates. Two critical aspects that need attention are the learning process and career guidance, both of which are essential for providing students with a clear understanding of their future career paths. The Career System currently being developed relies on alumni participation for data collection. Therefore, it is crucial to evaluate whether this system is user-friendly, effective, and efficient in its implementation at Jambi University. A deeper analysis of the Career System's usability and performance is necessary to ensure its optimal functionality.

One approach to evaluating the system is through System Evaluation, which includes various assessment aspects such as System Acceptance Evaluation, System Quality Evaluation, User Satisfaction Evaluation, User Experience Evaluation, and System Success Evaluation. In this context, the Career System falls under System Acceptance Evaluation, given that it is a newly developed and recently launched system. Thus, testing is required to determine whether alumni can effectively adopt the system and assess its impact on improving employer satisfaction.

A fundamental method in System Acceptance Evaluation is usability measurement. Usability is defined as the degree to which a system can be used easily, effectively, and efficiently by specific users to achieve particular goals. According to ISO 9241-11, usability refers to the extent to which a product can be effectively and comfortably utilized within a given context (Bevan et al., 2015). Jakob Nielsen (2012) identifies five key aspects of usability: (1).Learnability – how easily new users can learn to use the system. (2). Efficiency – the speed at which users can complete their tasks. (3). Memorability – how well users can recall the steps after not using the system for some time. (4). Errors – the frequency and severity of user errors and how the system helps users recover from them. (5). Satisfaction – the overall user experience and satisfaction when using the system.

This study employs System Usability Scale (SUS) and Heuristic Evaluation (HE) methods as they are simpler, easier to understand, and still maintain high validity in usability measurement. According to Brooke (2013), SUS has four main advantages: (1). Ease of use in usability evaluation. (2).No complex calculations

required for analysis. (3). Freely available for use without licensing costs. (4). Proven validity and reliability, even with a small sample size.

Furthermore, the Heuristic Evaluation (HE) method is applied to assess efficiency, effectiveness, and interface usability based on Jakob Nielsen's ten usability principles, including Visibility of System Status, Match with the Real World, User Control and Freedom, Consistency and Standards, Error Prevention, Recognition Rather Than Recall, Flexibility and Efficiency of Use, Aesthetic and Minimalist Design, Help Users Recognize, Diagnose, and Recover from Errors, and Help and Documentation.

Through this evaluation, it is expected to gain insights into the usability level of the Jambi University Career System and provide improvement recommendations to enhance user satisfaction, particularly for employers and academic programs at Jambi University, as well as to improve the system's effectiveness in supporting alumni in entering the workforce.

Literature Review

Information System Evaluation

Evaluation is a process designed to identify problems, collect data, analyze the data, draw conclusions from the results, and interpret the findings to formulate policy recommendations. It provides information and recommendations for decision-making (Nilawati, 2022). According to Mumtahana & Riyanto (2019), Information System Evaluation is the process of assessing an operational system. The objective of this evaluation is to measure the usability of a system.

Evaluating information systems is a critical aspect in determining the success of an application implementation. The primary goal of such evaluations is to assess system accessibility, evaluate user interaction experiences, and identify problems within the system (Gutama, 2020). According to Habiburrahman (2016), the acceptance of an information system can be measured using various evaluation models developed today. Several evaluation models, such as PIECES (Performance, Information, Economy, Control, Efficiency, and Service), End User Computing Satisfaction (EUCS), Task Technology Fit Analysis (TTFA), Human Organizing Technology (HOT) Fit Model, and Technology Acceptance Model (TAM), can be used to measure the acceptance of an information system.

The system components include system quality, information quality, and service quality. In health service institutions, system quality concerns the interaction between system features, including system performance and user interfaces. Variables that assess system quality include ease of use, ease of learning, response time, usefulness, availability, flexibility, and security. Information quality is assessed using criteria such as completeness, accuracy, timeliness, availability, relevance, consistency, and data entry. Service quality focuses on the overall support received from the service provider of the system or technology, and it can be evaluated by response speed, assurance, empathy, and service follow-up (Habiburrahman, 2016).

Usability

The International Organization for Standardization (ISO) 9241-11 defines usability as the extent to which a product can be used by specific users to achieve their goals effectively, efficiently, and satisfactorily within its intended usage context (Bevan et al., 2015). Usability refers to the quality of a system that is easy to learn, easy to use, and encourages users to use it as a tool to positively assist in completing tasks. In this context, the system refers to software. Usability can also be understood as a measure of how well users can access a system's functionality in an effective, efficient, and satisfactory manner to achieve a specific goal (Handiwidjojo & Ernawati, 2016).

The primary focus of usability is to answer the question of whether the product meets the user's needs (Aelani & Falahah, 2012). According to ISO 9241-11 (Bevan et al., 2015), usability measurement should include three aspects:

1. Effectiveness – the level of accuracy and completeness achieved by users when performing a task.
2. Efficiency – the resources used in relation to the accuracy and completeness of the task completion.
3. Satisfaction – the user's freedom from discomfort and their positive attitudes toward using the product.

Jambi University Career System

The Career System at Jambi University is one of the systems officially introduced on October 15, 2022, and is still in use today. This system was developed from a previous version. The Jambi University Alumni Tracking System provides information related to alumni career opportunities and allows alumni to access job vacancy updates as well as update their tracer study data. The system was first used in 2017 and has since been upgraded to Version 2.0. Alumni can access this system through the website https://jejakalumni.unja.ac.id/.

System Usability Scale (SUS)

SUS is a method used to measure the usability of a system (Brooke, 2013), developed by John Brooke in 1986. SUS offers several advantages:

1. Ease of use: Results are expressed as a score ranging from 0-100.
2. Simplicity: No complex calculations are required.
3. Free availability: No additional costs are involved.

4. Proven validity and reliability, even with a small sample size.

SUS consists of a questionnaire with 10 questions (Brooke, 1996). Here are the questions used in the SUS method:

1. I think that I would like to use this system frequently.
2. I found the system unnecessarily complex.
3. I thought the system was easy to use.
4. I think that I would need the support of a technical person to use this system.
5. I found the various functions in this system were well integrated.
6. I thought there was too much inconsistency in this system.
7. I would imagine that most people would learn to use this system very quickly.
8. I found the system very cumbersome to use.
9. I felt very confident using the system.
10. I needed to learn a lot of things before I could get started with this system.

Respondents are asked to rate each item using a 5-point Likert scale (Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree). After data collection, scores are calculated based on specific rules:

1. Odd-numbered questions: subtract 1 from the user's score.
2. Even-numbered questions: subtract the user's score from 5. The final SUS score is the sum of all scores multiplied by 2.5.

Heuristic Evaluation (HE)

Heuristic Evaluation is an evaluation method in which usability experts are employed as evaluators to identify problems within a system. Developed by Jakob Nielsen and Rolf Molich, HE utilizes a set of relatively simple and general heuristics to critique the system. This can be applied to design specifications and is valuable for evaluating early design stages. HE involves a small group of evaluators who examine the user interface and assess its compliance with established usability principles (Nielsen, 1994).

Methods

This research methodology integrates a quantitative approach with the use of two comprehensive evaluation methods, namely the System Usability Scale (SUS) and Heuristic Evaluation (HE), designed to assess the usability and effectiveness of the Universitas Jambi Career System. The research begins with a preliminary phase that includes initial observations and problem identification within the system, focusing on how to evaluate the system to understand its usability level. In this context, SUS is used to measure user perceptions of the system's ease of use, while HE is used to assess the system's alignment with recognized usability principles, particularly those outlined by Nielsen's heuristic principles.

During the data collection phase, the researcher distributes questionnaires to selected respondents via online platforms, such as Google Forms. The sample is drawn using a purposive sampling technique, given the unknown population size, where the sample is selected based on specific characteristics relevant to the research's objectives. For the SUS method, the researcher determines the minimum sample size based on the number of question indicators, specifically 10 indicators, leading to the need for 50 respondents. On the other hand, for the HE method, the researcher follows the guidelines of Nielsen & Molich (1990), which suggest using 3-5 expert evaluators to assess the system's usability. These evaluators are expected to have backgrounds in web-based information system development and usability knowledge.

Subsequently, the collected data is analyzed using Microsoft Excel 2016 software, with the aim of processing and presenting the data in a manner that allows for further analysis to provide a comprehensive overview of the quality and performance of the Universitas Jambi Career System. Ultimately, based on the analysis results, this research will provide conclusions that summarize the findings from both evaluation methods, along with improvement recommendations aimed at enhancing the system's usability. These recommendations are expected to assist the system administrators in optimizing the functionality and user experience, thereby better supporting alumni in finding career opportunities through a more effective and efficient system.

Results and Discussion

The data obtained from the System Usability Scale (SUS) participants indicate that the majority of respondents were female, accounting for 37 individuals (74%) of the total sample, while male respondents comprised 13 individuals (26%). In terms of faculty distribution, the respondents were predominantly from the Faculty of Economics and Business (FEB) with 11 participants (22%), followed by the Faculty of Science and Technology (FST) with 10 participants (20%), the Faculty of Teacher Training and Education (FKIP) with 9 participants (18%), the Faculty of Law (FH) with 8 participants (16%), the Faculty of Animal Science (FAPET) with 5 participants (10%), the Faculty of Agriculture (FAPERTA) with 5 participants (10%), and the Faculty of Medicine and Health Sciences (FKIK) with 2 participants (4%).

Respondents who have visited the Career Information System of Universitas Jambi and are employers or study program representatives at Universitas Jambi are allowed to fill out the questionnaire. For example, the calculation with respondent 1: P1 = 4, P2 = 3, P3 = 3, P4 = 2, P5 = 3, P6 = 3, P7 = 3, P8 = 2, P9 = 3, P10 = 4. Using the formula: SUS Score = ((P1 – 1) + (5 – P2) + (P3 – 1) + (5 – P4) + (P5 – 1) + (5 – P6) + (P7 – 1) +

(5 – P8) + (P9 – 1) + (5 – P10))= ((4 – 1) + (5 – 3) + (3 – 1) + (5 – 2) + (3 – 1) + (5 – 3) + (3 – 1) + (5 – 2) + (3 – 1) + (5 – 4))= 22, and this result is multiplied by 2.5 to get the final SUS score: 22 × 2.5 = 55

Table 1. SUS Scores of Respondents (after the total is multiplied by 2.5)

No	Respondent	The result multiplied by 2.5
1	Respondent 1	55
2	Respondent 2	50
3	Respondent 3	62,5
4	Respondent 4	62,5
5	Respondent 5	62,5
6	Respondent 6	60
7	Respondent 7	52,5
8	Respondent 8	60
9	Respondent 9	50
10	Respondent 10	55
11	Respondent 11	45
12	Respondent 12	67,5
13	Respondent 13	75
14	Respondent 14	92,5
15	Respondent 15	92,5
16	Respondent 16	77,5
17	Respondent 17	45
18	Respondent 18	70
19	Respondent 19	67,5
20	Respondent 20	60
21	Respondent 21	65
22	Respondent 22	47,5
23	Respondent 23	95
24	Respondent 24	55
25	Respondent 25	95
26	Respondent 26	65
27	Respondent 27	57,5
28	Respondent 28	55
29	Respondent 29	87,5
30	Respondent 30	57,5
31	Respondent 31	62,5
32	Respondent 32	57,5
33	Respondent 33	77,5
34	Respondent 34	52,5
35	Respondent 35	62,5
36	Respondent 36	50
37	Respondent 37	70
38	Respondent 38	50
39	Respondent 39	55
40	Respondent 40	50
41	Respondent 41	80
42	Respondent 42	42,5
43	Respondent 43	77,5
44	Respondent 44	47,5
45	Respondent 45	70
46	Respondent 46	75
47	Respondent 47	47,5
48	Respondent 48	60
49	Respondent 49	50
50	Respondent 50	82,5
	Average	63,25

Based on the SUS score calculations from each respondent, it can be seen that the highest score obtained is 95, the lowest score is 42.5, while the most frequent score is 50

The SUS score obtained in this study is 63.25, which, when correlated with NPS, falls into the "Passive" classification. This indicates that respondents tend to be passive, meaning they provide positive feedback when satisfied and are likely to reuse the system when needed. The classification results of this study are presented in Table 2 below.

Tabel 2. *SUS Score Interpretation*

Grade	SUS	Percentile Range	Adjective	*Acceptable*	NPS
A+	84,1 –100	96 – 100	Best Imaginal	*Acceptable*	NPS
A	80,8 – 84,0	90 – 95	Excellent	*Acceptable*	Promoter
A-	78,9 – 80,7	85 – 89	Good	*Acceptable*	Promoter
B+	77,2 – 78,8	80 – 84	Good	*Acceptable*	Promoter
B	74,1 – 77,1	70 – 79	Good	*Acceptable*	Passive
B-	72,6 – 74,4	65 – 69	Good	*Acceptable*	Passive
C+	71,1 – 72,2	60 – 64	Good	*Acceptable*	Passive
C	65,0 – 71,0	41 – 59	Ok	Marginal	Passive
C-	62,7 – 64,9	35 – 40	Ok	Marginal	Passive
D	51,7 – 62,6	15 – 34	Ok	Marginal	Detractor
F	25,1 – 51,6	2 – 14	Poor	Not acceptable	Detractor
F	0 – 25	0 – 1,9	Worst Imaginable	Not acceptable	Detractor

The results obtained from the evaluation of the Career Information system at Jambi University using Heuristic Evaluation can be summarized in the following tables:

1. Evaluation Results X1: Visibility of System Status

Table 3. X1 Visibility of System Status Results

Number of Evaluator	Evaluator	P1
1	E1	3
2	E2	2
3	E3	5
4	E4	5
5	E5	4
Amount		19
Total		19

Based on Table 3, X1 Visibility of System Status received a total of 19 out of an ideal score of 25, with a percentage of 76%, thus categorizing X1 as "Good."

2. Evaluation Results X2: Match Between System and the Real World

Table 4. X2 Match Between System and the Real World Results

Number of Evaluator	Evaluator	P2	P3
1	E1	2	2
2	E2	2	3
3	E3	4	5
4	E4	4	4
5	E5	3	4
Amount		15	18
Total			33

Based on Table 4, X2 Match Between System and the Real World received a total of 33 out of an ideal score of 50, with a percentage of 66%, placing X2 in the "Satisfactory" category, indicating that the system uses language and terms familiar to users.

3. Evaluation Results X3: User Control and Freedom

Table 5. X3 User Control and Freedom Results

Number of Evaluator	Evaluator	P4
1	E1	2
2	E2	1

3	E3	5
4	E4	3
5	E5	4
Amount		15
Total		15

Based on Table 5, X3 User Control and Freedom received a total of 15 out of an ideal score of 25, with a percentage of 60%, placing X3 in the "Satisfactory" category, indicating that the system functions as expected.

4. Evaluation Results X4: Consistency and Standards

Table 6. X4 Consistency and Standards Results

Number of Evaluator	Evaluator	P5
1	E1	2
2	E2	3
3	E3	5
4	E4	4
5	E5	2
Amount		16
Total		16

Based on Table 6, X4 Consistency and Standards received a total of 16 out of an ideal score of 25, with a percentage of 64%, categorizing X4 as "Satisfactory," meaning the system is relatively easy for users to use.

5. Evaluation Results X5: Error Prevention

Table 7. X5 Error Prevention Results

Number of Evaluator	Evaluator	P6
1	E1	2
2	E2	3
3	E3	5
4	E4	3
5	E5	4
Amount		17
Total		17

Based on Table 7, X5 Error Prevention received a total of 17 out of an ideal score of 35, with a percentage of 68%, categorizing X5 as "Good."

6. Evaluation Results X6: Recognize Rather than Recall

Table 8. X6 Recognize Rather than Recall Results

Number of Evaluator	Evaluator	P7	P8
1	E1	1	3
2	E2	2	4
3	E3	4	2
4	E4	4	4
5	E5	4	4
Amount		15	17
Total			32

Based on Table 8, X6 Recognize Rather than Recall received a total of 32 out of an ideal score of 50, with a percentage of 64%, placing X6 in the "Satisfactory" category. The system is easy to use and its features are functioning properly.

7. Evaluation Results X7: Flexibility and Efficiency of Use

Table 9. X7 Flexibility and Efficiency of Use Results

Number of Evaluator	Evaluator	P7	P8
1	E1	2	3
2	E2	1	1
3	E3	4	4
4	E4	4	4
5	E5	3	4
Amount		14	16
Total			30

Based on Table9, X7 Flexibility and Efficiency of Use received a total of 30 out of an ideal score of 50, with a percentage of 60%, placing X7 in the "Satisfactory" category, meaning the system provides convenience and comfort for both new and experienced users.

8. Evaluation Results X8: Aesthetic and Minimalist Design

Table 10. X8 Aesthetic and Minimalist Design Results

Number of Evaluator	Evaluator	P11
1	E1	1
2	E2	2
3	E3	4
4	E4	4
5	E5	4
Amount		15
Total		15

Based on Table 10, X8 Aesthetic and Minimalist Design received a total of 15 out of an ideal score of 25, with a percentage of 60%, placing X8 in the "Satisfactory" category, meaning the system provides relevant information and an interface that meets the needs of the website system.

9. Evaluation Results X9: Help Users Recognize, Diagnose, and Recover from Errors

Table 11. X9 Help Users Recognize, Diagnose, and Recover from Errors Results

Number of Evaluator	Evaluator	P12	P13
1	E1	2	2
2	E2	2	1
3	E3	5	4
4	E4	3	3
5	E5	4	3
Amount		16	13
Total			29

Based on Table 11, X9 Help Users Recognize, Diagnose, and Recover from Errors received a total of 29 out of an ideal score of 50, with a percentage of 58%, placing X9 in the "Satisfactory" category.

10. Evaluation Results X10: Help and Documentation

Table 12. X10 Help and Documentation Results

Number of Evaluator	Evaluator	P14	P15
1	E1	1	1
2	E2	2	2
3	E3	5	4
4	E4	4	4
5	E5	5	4
Amount		17	15
Total			32

Based on Table 12, X10 Help and Documentation received a total of 32 out of an ideal score of 50, with a percentage of 64%, placing X10 in the "Satisfactory" category.

Based on the results from all the tables above, each variable (X1, X2, X3, X4, X5, X6, X7, X8, X9, and X10) falls into the "Satisfactory" category, and the percentage results can be depicted in the following graph:

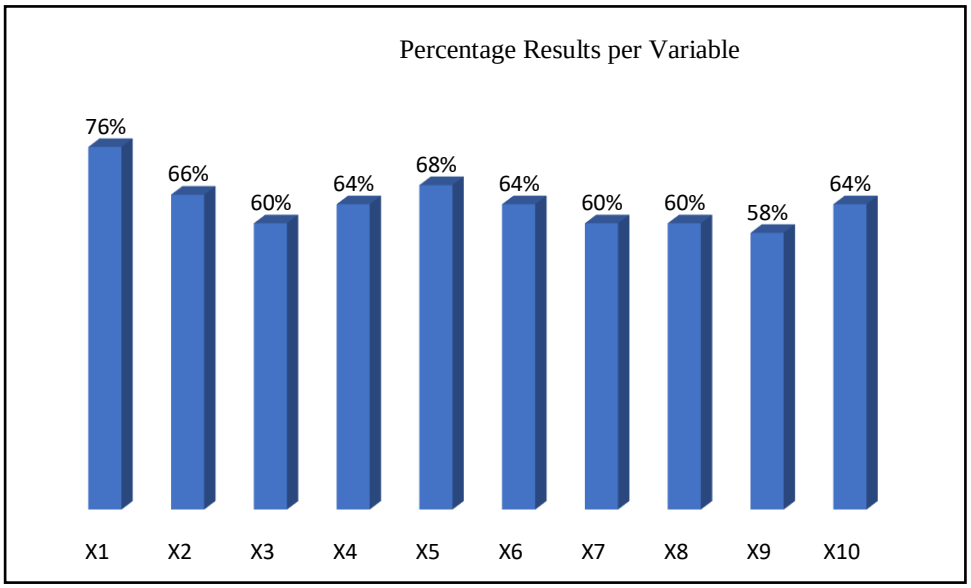

Figure 1. Percentage Results per Variable

The graph above shows the percentage results for each of the 10 Heuristic Principles. After calculating each variable, the total score index is summarized in the table.

Table 12: Recap of the Results from the 10 Heuristic Evaluation Principles

No	Variabel	Total Score	Ideal Score	Percentage	Note
1	X1	19	25	76%	B
2	X2	33	50	66%	C
3	X3	15	25	60%	C
4	X4	16	25	64%	C
5	X5	17	25	68%	B
6	X6	32	50	64%	C
7	X7	30	50	60%	C
8	X8	15	25	60%	C
9	X9	29	50	58%	C
10	X10	32	50	64%	C
	Total	238	375	63%	C

Based on Table 12, it can be seen that 2 variables fall into the "Good" category and 8 variables fall into the "Satisfactory" category. The total score is 238 out of an ideal score of 375, with a percentage of 63%. The total score is obtained by the formula:

$$\text{Total Score} \times 100\% = \frac{\text{Total Score}}{\text{Ideal Score}} \times 100\% = \frac{238}{375} \times 100\% = 63\%$$

Thus, with a percentage of 63%, the results of the Heuristic Evaluation for the Career Information System at Jambi University fall within the "Satisfactory" interval.

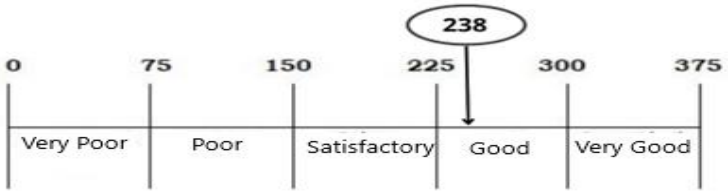

Figure 2. Final Total Score

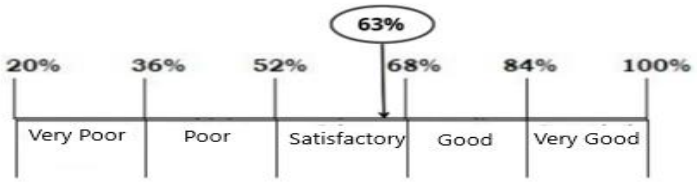

Figure 3. Final Percentage Score

Based on the final results obtained from the 10 Heuristic Principles, the total score is 238, and the percentage is 63%. The total score falls into the "Good" category, and the percentage falls into the "Satisfactory" category. This indicates that the system is suitable for use and its features are functioning properly.

Conclusion

Based on the data calculations and discussions in the research conducted, it can be concluded that the Career Information System of Universitas Jambi has a satisfactory level of usability (OK) in the adjective ratings, meaning the respondents assessed the system as suitable for use in terms of functionality, with a grade scale at grade C indicating a "satisfactory" SUS score. Furthermore, the level of acceptability is at a marginal level, which means respondents are willing to accept and use the Career Information System of Universitas Jambi. Additionally, the NPS level is passive, meaning respondents will give positive feedback when they are satisfied, while the percentile ranks are in the range of 62.7 – 72.5, indicating a score below average but within the satisfactory category, with a SUS score of 65.

For the Heuristic Evaluation method, which involved experts as evaluators, it can be concluded that the Career Information System of Universitas Jambi has a total score of 238 and a final percentage of 63%, where the total score falls into the "good" category, and the percentage falls into the "satisfactory" category, meaning the system is usable, and its features are functioning as intended. Based on this evaluation, the following recommendations for the Career Information System of Universitas Jambi are provided:

1. Improvement of User Interface: This includes simplifying the display, improving navigation, and enhancing the overall user experience.
2. User Training Enhancement: Development of a comprehensive and easily accessible training program for users.
3. Development of Additional Features: Addition of features that can help users achieve their goals more effectively.
4. Improvement of the Lottery Feature: The function of the feature is not working as intended.

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