



# Usability Analysis of Aruna Heroes Enterprise Resource Planning Apps Using Heuristic Evaluation and System Usability Scale Method (A Case Study at PT Aruna Jaya Nuswantara)

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## ABSTRACT

This research aims to analyze the level of usability of Aruna Heroes, ERP application PT Aruna Jaya Nuswantara. Usability is a key factor in the success of an application and user satisfaction. Through the use of the Heuristic Evaluation method based on the System Usability Scale, this research identifies usability issues and barriers in Aruna Heroes. Based on the conducted evaluation Aruna Heroes has achieved a good level of usability and successfully meets 9 out of 10 indicators from the Heuristic Evaluation variables and resulted in a SUS score that meets the standard, which is 75 points. In the context of usability and heuristic evaluation, Aruna Heroes still has room for improvement in their usability through the principles of Error Prevention, Help Users Recognize, Diagnose, Recovers From Errors, and Help and Documentation that need to be improved or continuously updated in order to enhance the usability of the application and satisfy users.

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## 1. INTRODUCTION

In the current digital era, technology plays a crucial role in the sustainability of businesses and industries. Industry that still faces challenges is the fishing industry in Indonesia. According to a study conducted by Nirmala (2017), it is known that trading practitioners in Indonesia still perceive the quality of infrastructure in Indonesia as low. This is also confirmed by the Indonesia Chamber of Commerce and Industry, which states that the logistics costs

borne by the industry are still high, accounting for 17% production costs. Moreover, based on research conducted by Ariani et al (2018), one of the reasons why the fishing industry in Indonesia encountering obstacles in growth is due to the behavior of Indonesian society living in agrarian environments, who tend to prefer consuming beef, chicken, eggs, and milk over seafood such as fish.

PT Aruna Jaya Nuswantara recognizes this as an opportunity. As reported on the Aruna Indonesia website, PT Aruna Jaya Nuswantara is a startup operating in the fisheries technology field that collaborates with over 30,000 fishermen, has 40 distribution centers, and 70 hubs spread across Indonesia. PT Aruna Jaya Nuswantara can be considered as a significant role in improving infrastructure to facilitate the distribution of marine catches in Indonesia and assisting in increasing fish consumption in the country. Based on interviews conducted with PT Aruna Jaya Nuswantara, they have revealed that as their business sector expands, the operational aspects they have to handle become increasingly burdensome. Therefore, PT Aruna Jaya Nuswantara has developed an Enterprise Resource Planning (ERP)-based application called Aruna Heroes.

Aruna Heroes is an ERP application developed by PT Aruna Jaya Nuswantara. This application assists field works, also known as Local Heroes, in recording and conducting transactions within the company's business processes. However, despite Aruna Heroes already having several features and benefits for the company's business processes, it is still crucial for the company to ensure that the application achieves a high level of efficiency and effectiveness for its users by doing a usability evaluation.

According to Tjandra (2012), usability evaluation aims to identify existing problems and make improvements to enhance the usability of a design or system. Furthermore, according to the same source, usability evaluation is also believed to provide advantages such as increased user comprehension of the application system, improved productivity, minimized time or process required to understand the system, and enhanced performance or outcomes.

Usability refers to the ability of a product, system, or application to be used easily, efficiently, and satisfactorily by its users. This includes factors such as ease of navigation, clarity of information, and responsiveness to user actions within the system. Therefore, it is important to analyze the usability of Aruna Heroes to ensure that it meets established usability standards and facilitates the company's business processes based on objective feedback from end-users. This usability analysis process will help identify specific issues and provide recommendations for improvement, ultimately enhancing the application's quality and satisfying the user needs (Nielsen, 1993).

This research aims to analyze the level of usability of Aruna Heroes using the System Usability Scale calculation system, and the 10 principles from the Heuristic Evaluation method as a reference for assessing the usability of the Aruna Heroes app.

Based on a similar research that conducted by Cristina et al (2021), the research findings revealed that the researchers discovered interface design flaws in the application, such as excessive content, outdated appearance, and deficiencies in the help menu and important navigation buttons. Similar results were also found in a research conducted by Jordan et al (2022), where the research identified room for improvement in terms of format and interface

design. Therefore, based on the existing research findings, the proposed hypothesis for this research is:

(H0). Aruna Heroes does not have a good level of usability.

(Ha). Aruna Heroes does have a good level of usability.

## 2. METHODOLOGY

### 2.1. Descriptive Variables Analysis

In this research, descriptive variables analysis is used to identify how often respondents provide specific answers in the questionnaire. The method of descriptive variables analysis involves observing the average value or mean of each variable, which will later result in decision formulas based on interval classes as mentioned by Durianto formula in 2001, as cited in Noviani (2022).

$$Interval = \frac{Highest\ Value - Lowest\ Value}{Number\ of\ Value}$$

Based on the formula above, the following are the results obtained:

$$Interval = \frac{4 - 0}{5} = 0,8$$

Thus, the calculated results above are used to calculate the average interval values, which will serve as a basis for determining decisions regarding each variable based on respondents' answers in the distributed questionnaire. The following are the results of the interval scale calculations:

**Table 1.** Interval Scale

Rating	Interval
$0 \leq x < 0,8$	Strongly Disagree
$0,8 \leq x < 1,6$	Disagree
$1,6 \leq x < 2,4$	Neutral
$2,4 \leq x < 3,2$	Agree
$3,2 \leq x \leq 4$	Strongly Agree

### 2.2. Heuristic Evaluation

In this research, Heuristic Evaluation will be used as the Usability Indicator (UI). The indicators used based on Heuristic Evaluation method are as follows:

**Table 2.** Heuristic Evaluation Usability Indicator

<b>Code</b>	<b>Indicator</b>	<b>Statement</b>
U11	<i>Visibility of System Status</i>	Aruna Heroes has provided clear information regarding the operation and specific actions I need to take within the system
U12	<i>Match Between System and the Real World</i>	The system employed by Aruna Heroes is not aligned with what exists in the field, making it difficult for me to understand the app
U13	<i>User Control and Freedom</i>	Operating the system and accessing data in Aruna Heroes is relatively easy, granting me satisfactory freedom and control as a user
U14	<i>Consistency and Standards</i>	The use of terms, modules, and buttons in Aruna Heroes is inconsistent and lacks proper standards
U15	<i>Error Prevention</i>	Aruna Heroes has implemented a good error

		prevention system to keep me from encountering errors
U16	<i>Recognition Rather Than Recall</i>	Aruna Heroes does not have provide sufficient information before I perform an action, making it difficult for me to understand the consequences of my actions within the system
U17	<i>Flexibility and Efficient of Use</i>	The system implemented in Aruna Heroes is flexible, allowing me to accomplish tasks or actions efficiently
U18	<i>Aesthetic and Minimalist Design</i>	The design of Aruna Heroes is overly complex and not minimalist, thereby disrupting my focus when using the system
U19	<i>Help Users Recognize, Diagnose, and</i>	Aruna Heroes has a well-designed system

	<i>Recovers From Errors</i>	to assist me in running the system and recovering from errors independently
UI10	<i>Help and Documentation</i>	Aruna Heroes lacks adequate help features and documentation, making it challenging for users to learn everything related to the system

### 2.3. System Usability Scale

System Usability Scale (SUS) is a measurement tool used to assess the level of usability of a product. SUS was developed by John Brooke in 1986 as a result of research conducted at the Alpert Computing Centre at the University of Southampton, England. According to John Brooke (1986), SUS is a measurement tool used to evaluate the usability of a system by assessing various aspects such as system comprehension, ease of use, problem-solving capability, and user satisfaction.

According to Stetson (2014); Brook (2014) in Aprilia et al (2015), SUS has been widely used as a tool to measure usability and has been proven to have several advantages, including: (1) Ease of use SUS, as its results are expressed on a scale of 0-100 (2) Ease of use of SUS without requiring complex calculations; (3) Availability of SUS for free without any additional costs; and (4) The validity and reliability of SUS have been demonstrated, even with small sample sizes.

System Usability Scale (SUS) utilizes a Likert scale format comprising 10 statements, where respondents are asked to provide scores ranging from 1 to 5 for each statement. The overall SUS score is derived from calculations based on the scores of each statements. The SUS score can indicate the level of usability of a product within a range 0 to 100. The details for the Likert scale used in the System Usability Scale are as follows:

**Table 3.** System Usability Scale Likert Scale

Likert Scale	Explanation
1	Strongly Disagree
2	Disagree

3	Neutral
4	Agree
5	Strongly Agree

Based on Table 3, each item’s contribution score in the SUS method will range from 0 to 4. This is because the calculation method is as follows:

1. For each statement with an odd number, subtract 1 from the SUS Score.
2. For each statement with an even number, subtract the SUS score from 5.

Thus, the equation can be derived as follows:

$$f(x) \begin{cases} a - 1, & \text{if } (x\%2) \neq 0 \\ 5 - a, & \text{Otherwise} \end{cases}$$

**Source:** (Sulistiya et al., 2021)

**Explanation:**

$f(x)$  = Question number

$a$  = SUS Score

$(x\%2) \neq 0$  = Odd

3. The results of the previous calculation for the SUS score in points 1 and 2 will be summed and then multiplied by 2.5.
4. To obtain the average score for each respondent, add up all the scores and divide by the number of respondents.

Therefore, the average SUS score can be calculated using the following formula:

$$\bar{x} = \frac{\sum x}{n}$$

**Source:** (Nielsen, 1994)

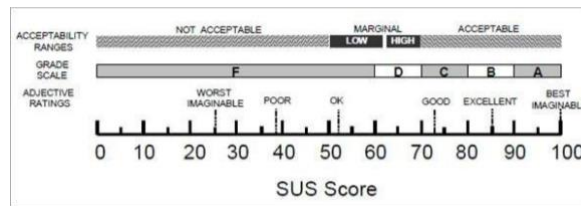
**Explanation:**

$\bar{x}$  = Average Score

$\sum x$  = Sum of SUS Scores

$n$  = Number of respondents

After the calculation process has been completed, the obtained scores can be interpreted into several categories, such as the following:



**Figure 1.** System Usability Scale Scoring

Based on Figure 1, it can be concluded that Acceptability is used to measure the extent to which users accept a product, Grade Scale is used to assess the quality levels of a product, and Adjective Rating is used to evaluate the rating of a created product. In general, the average SUS score obtained is 68. Therefore, if a product obtains a SUS score above 68, it can be said that the usability of the product is above average.

The SUS questionnaire is distributed via Google Chat to all 32 users of Aruna Heroes. According to Sugiyono (2017), the use of the entire population as a sample is referred to as saturation sampling. Saturation sampling is typically employed when the population under study is relative small, less than 30, or when study aims to make generalizations with minimal errors.

### 3. RESULT AND DISCUSSION

#### 3.1. System Usability Scale

Based on the questionnaire results distributed to 32 users of Aruna Heroes, the following are the obtained results:

**Table 4.** System Usability Scale Raw Scores

No	Raw Scores									
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	5	3	4	2	5	1	5	1	2	4
2	5	2	5	3	4	1	5	2	2	2
3	4	3	5	4	4	3	4	2	3	2
4	4	2	3	2	3	2	4	2	3	4
5	5	2	4	1	4	2	5	1	2	2
6	4	1	3	2	2	2	4	2	2	3
7	5	2	5	1	4	3	5	2	3	3
8	5	1	4	2	4	3	4	4	3	2
9	5	1	5	2	4	2	4	1	3	2
10	4	1	5	1	4	1	4	1	2	2
11	3	2	5	1	4	2	5	2	2	4
12	5	2	5	2	4	2	4	2	3	3
13	5	1	3	3	4	2	4	1	2	2



14	4	1	5	2	4	2	5	1	3	3
15	5	2	5	1	5	1	4	1	3	2
16	4	2	4	1	4	2	4	1	2	2
17	4	2	5	1	4	1	5	1	3	3
18	5	2	5	2	4	1	4	2	2	2
19	4	1	4	1	4	3	4	1	2	2
20	4	1	4	1	4	2	4	1	3	4
21	5	2	5	2	4	2	1	1	2	2
22	4	1	4	1	3	2	5	2	2	2
23	4	2	4	1	4	2	4	1	3	3
24	3	1	4	2	4	1	3	2	2	2
25	4	2	4	1	4	2	2	1	2	3
26	5	1	5	1	4	1	4	1	2	2
27	4	1	4	2	3	1	4	2	3	3
28	4	2	3	2	3	2	3	2	2	2
29	4	1	5	1	4	2	5	1	3	2
30	4	1	4	1	4	1	4	1	4	3
31	4	1	5	2	4	3	5	2	3	4
32	4	1	4	2	4	2	4	2	2	2

Based on Table 4, further calculations are performed based on the rules outlined in the SUS method, resulting in the following scores:

**Table 5.** Calculated SUS Scores

No	Calculated Scores										Sum	Sum x 2.5
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10		
1	5	3	4	2	5	1	5	1	2	4	30	75
2	5	2	5	3	4	1	5	2	2	2	31	77.5
3	4	3	5	4	4	3	4	2	3	2	26	65
4	4	2	3	2	3	2	4	2	3	4	25	62.5
5	5	2	4	1	4	2	5	1	2	2	32	80
6	4	1	3	2	2	2	4	2	2	3	25	62.5
7	5	2	5	1	4	3	5	2	3	3	31	77.5
8	5	1	4	2	4	3	4	4	3	2	28	70

9	5	1	5	2	4	2	4	1	3	2	33	82.5
10	4	1	5	1	4	1	4	1	2	2	33	82.5
11	3	2	5	1	4	2	5	2	2	4	28	70
12	5	2	5	2	4	2	4	2	3	3	30	75
13	5	1	3	3	4	2	4	1	2	2	29	72.5
14	4	1	5	2	4	2	5	1	3	3	32	80
15	5	2	5	1	5	1	4	1	3	2	35	87.5
16	4	2	4	1	4	2	4	1	2	2	30	75
17	4	2	5	1	4	1	5	1	3	3	33	82.5
18	5	2	5	2	4	1	4	2	2	2	31	77.5
19	4	1	4	1	4	3	4	1	2	2	30	75
20	4	1	4	1	4	2	4	1	3	4	30	75
21	5	2	5	2	4	2	1	1	2	2	28	70
22	4	1	4	1	3	2	5	2	2	2	30	75
23	4	2	4	1	4	2	4	1	3	3	30	75
24	3	1	4	2	4	1	3	2	2	2	28	70
25	4	2	4	1	4	2	2	1	2	3	27	67.5
26	5	1	5	1	4	1	4	1	2	2	34	85
27	4	1	4	2	3	1	4	2	3	3	29	72.5
28	4	2	3	2	3	2	3	2	2	2	25	62.5
29	4	1	5	1	4	2	5	1	3	2	34	85
30	4	1	4	1	4	1	4	1	4	3	33	82.5
31	4	1	5	2	4	3	5	2	3	4	29	72.5
32	4	1	4	2	4	2	4	2	2	2	29	72.5
Sum											958	2395
Average Score											74.84	

Based on the calculations in Table 5, the sum of the converted data is found to be 958. According to the SUS calculation guidelines, the sum is multiplied by 2.5, resulting in a total of 2395. After obtaining the multiplied value of 2.5, then it divided by the number of respondents, which is 32, resulting in a score of 74.84, rounded to 75.

$$\bar{x} = \frac{\sum x}{n}$$

$$\bar{x} = \frac{2395}{32} = 74,84 \text{ (rounded to 75)}$$

Based on the calculations conducted, the final SUS score obtained is 75 from 32 respondents. According to the SUS interpretation guidelines in Figure 1, it can be concluded that a score of 75 falls within the Acceptability Ranges category and is considered Acceptable. In terms of the Grade Scale category, the user acceptance level is graded as C. Additionally, based on Adjective Ratings category, Aruna Heroes application is considered good.

### 3.2. Descriptive Variables Analysis

**Table 6.** SUS Scores Distribution

Code	Answers Distribution					Mean
	0	1	2	3	4	
UI1	0	0	2	18	12	3.3
UI2	0	0	2	14	16	3.4
UI3	0	0	4	13	15	3.3
UI4	0	1	2	14	15	3.3
UI5	0	1	4	25	2	2.9
UI6	0	0	5	17	10	3.2
UI7	1	1	2	18	10	3.1
UI8	0	1	0	14	17	3.5
UI9	0	17	14	1	0	1.5
UI10	0	5	9	18	0	2.4

Based on the distributions of answers in Table 6, the following are the conclusions that can be drawn for each aspect of usability heuristics:

#### 1. Visibility of System Status

With a mean score of 3.3, respondents tend to strongly agree that the system has provided good visibility of system status. This means that the system has effectively provided users with information about what is happening and the current conditions.

#### 2. Match Between System and the Real World

With a mean score of 3.3, respondents tend to strongly agree that the system reflects the extent to which it is aligned with the real world and designed to be easily understood and used by users.

#### 3. User Control and Freedom

With a mean score of 3.3, respondents tend to strongly agree that the system has provided users with good flexibility to control and regulate their interactions with the system.

#### 4. Consistency and Freedom

With a mean score of 3.3, respondents tend to strongly agree that the system has maintained consistency in the use of design elements and standards, allowing users to feel comfortable and familiar due to the consistency displayed.

**5. Error Prevention**

With a mean score of 2.9, respondents agree that the system has made efforts to prevent errors. Although the mean value falls within the agreement range, there is room for further improvement in terms of preventing and reducing user errors.

**6. Recognition Rather Than Recall**

With a mean score of 3.2, respondents agree that the system reflects the extent to which it enables users to recognize information rather than relying on recalling previously learned information. This means that users find it easier to recognize the required information rather than having to rely on their memory to recall it.

**7. Flexibility and Efficient Use**

With a mean score of 3.1, respondents agree that the system allows users to efficiently use the system and provides flexibility in its usage. This means that the system has been designed considering various user needs and abilities.

**8. Aesthetic and Minimalist Design**

With a mean score of 3.5, respondents strongly agree that the system has an aesthetic and minimalist design. This means that the system has visually appealing visuals and emphasizes simplicity in its design.

**9. Help Users Recognize, Diagnose, and Recover From Errors**

With a mean score of 1.5, respondents disagree that the system has provided support in recognizing, diagnosing, and recovering from errors. This indicates that there are shortcomings in the system's ability to assist and guide users in handling errors.

**10. Help and Documentation**

With a mean score of 2.4, respondents agree that the system has provided sufficient and adequate help and documentation. Although the mean score falls within the agreement range, there is still room for improving the availability and quality of the assistance and documentation provided to users.

Overall, the evaluation results indicate that the system has strengths in terms of real-world correspondence, consistency, and aesthetic design. However, there are also areas that need improvement, such as providing clearer system status information, enhancing user control and freedom, preventing errors, providing assistance in recognizing and recovering from errors, as well as offering better help and documentation.

**4. CONCLUSION & RECOMMENDATIONS**

Based on the conducted research, it can be concluded that Aruna Heroes still has room for improvement in several heuristic usability indicators. This is in line with the study conducted by Cristina (2021), which used the Heuristic Evaluation method to assess the user interface and enhance the user experience. The research identified errors in the application interface, such as excessive content, outdated visuals, and deficiencies in the help menu and important navigation buttons. These findings align with the researcher's own findings, where several usability issues were identified in the Aruna Heroes application. However, there are

differences between Cristina's (2021) study and the current research, even though both utilized heuristic evaluation. The difference lies in the fact that Cristina's study titled "*User Interface Evaluation to Enhance User Experience Using Heuristic Evaluation and Think Aloud Method*" only utilized 7 out of the 10 indicators in the heuristic evaluation method, whereas this research employed all the principles of the heuristic evaluation method to assess the usability of the Aruna Heroes application.

Furthermore, another study by Jordan (2022) titled "*Usability Analysis Using Heuristic Evaluation and End User Computing Satisfaction on the Infobegkel Website*" indicated that users expressed satisfaction while using the website. However, there is still room for improvement in terms of formatting and interface design. These findings also align with the present research, where it was found that the Aruna Heroes application also requires improvement in terms of usability, particularly in the aspects of Error Prevention, Help Users Recognize, Diagnose, recovers from Errors, and Help and Documentation. The journal also emphasizes the importance of websites or applications incorporating the aspects of usability principles to enhance user experience when interacting with the design or system. This aligns with the current research, which emphasizes the significance of usability evaluation in identifying existing issues and making improvements to enhance the usability of a design or system.

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