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Design and Evaluation of User Interface Usability for Junior High School Websites in West Papua Province Using System Usability Scale

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Abstract
The primary emphasis of this study lies in utilizing the System Usability Scale (SUS) method to assess the User Interface (UI) and User Experience (UX) design. The objective is to enhance the accessibility of information at SMP YPK 01 Manokwari, a school currently facing challenges due to the absence of an official website. By concentrating on designing a user-friendly UI, this research aims to facilitate users' ease in accessing information. Through the SUS method, the UI/UX design is thoroughly evaluated to ensure optimal usability. Findings from the questionnaire, which involved 33 respondents, revealed a commendable SUS score of 83.26, categorizing the tested UI/UX design as "excellent." Consequently, the prototype UI/UX design of the SMP YPK 01 Manokwari website has been effectively developed, showcasing a high level of usability.
Keywords: *Design; System usability scale; User interface; User experience; Website.*

Abstrak
Penelitian ini difokuskan pada penggunaan metode *System Usability Scale* (SUS) untuk menilai desain Antarmuka Pengguna (UI) dan Pengalaman Pengguna (UX). Tujuannya adalah untuk meningkatkan aksesibilitas informasi di SMP YPK 01 Manokwari, sebuah sekolah yang saat ini menghadapi tantangan akibat ketiadaan situs web resmi. Dengan berfokus pada merancang UI yang ramah pengguna, penelitian ini bertujuan untuk memudahkan pengguna dalam mengakses informasi. Melalui metode SUS, desain UI/UX dievaluasi secara menyeluruh untuk memastikan penggunaan yang optimal. Temuan dari kuesioner, yang melibatkan 33 responden, mengungkapkan skor SUS yang memuaskan sebesar 83.26, mengkategorikan desain UI/UX yang diuji sebagai "excellent". Akibatnya, desain *prototype* UI/UX dari situs web SMP YPK 01 Manokwari telah berhasil dikembangkan, menunjukkan tingkat kegunaan yang tinggi.
Kata kunci: *Design; System usability scale; User interface; User experience; Website.*

1. Introduction

In the current digital era, the existence of websites has become crucial as one of the main means of providing information. Therefore, educational institutions such as schools have been actively developing their websites to disseminate various information to various parties [7]. The importance of this theme is researched because the utilization of information technology and good user interface design has a significant impact on improving information accessibility, efficiency, and comfort in the educational environment. By delving deeper into the role of UI/UX in the educational context, appropriate solutions can be found to enhance the learning and teaching experience in schools.

In the modern era of society, engagement with technology and access to information has become a crucial element in the phenomenon of globalization. The number of individuals using technological devices continues to rise, reflecting rapid developments. This indicates that easy access to technology and information has become a characteristic of significant progress [1]. Unlike in the past, technology now has a substantial influence on various aspects of human life, particularly in the social context and notably in the field of education. In education, technology plays a vital role in facilitating the teaching and learning process [2].

Therefore, to address this challenge of website creation, which is an issue at SMP YPK 01 Manokwari, West Papua, the school lacks a website to provide access to information for all

stakeholders. This creates a gap between the expectation of easy access to information and the reality on the ground, disrupting the teaching-learning process and communication among the school, students, parents, and the community [8][9]. Hence, the primary focus is on designing a user interface (UI) to allow users to easily access information within the school environment [10]. In the design process, UI becomes a crucial aspect to consider to meet users' needs in the system, and applications must be optimally designed to ensure users do not encounter difficulties in using them [5]. This issue underscores the need for a school website that adequately caters to the needs of all stakeholders.

High-quality user interface (UI) design and user experience (UX) on a website can create an attraction that encourages visitors to stay longer. Conversely, if the UI and UX design are unsatisfactory, visitors are likely to leave the website. It is important to realize that the user interface is a key element in computer-based systems or products [6]. The aim of this research is to present solutions that can enhance information accessibility for SMP YPK 01 Manokwari through good UI/UX design. The benefits include improving communication and efficiency among all school stakeholders, enhancing student learning experiences, and facilitating overall school growth.

This research involves testing the system to ensure usability. Usability is the software's ability to assist users in accomplishing desired tasks (ISO, 2010). There are various methods that can be used to evaluate software usability, one of which is the System Usability Scale (SUS) [4]. Through the application of the SUS method, this research can also provide a real overview of system usability, ensuring that UI/UX design can provide a satisfying and effective user experience. The SUS method is a questionnaire used as a testing tool to measure the usability level of computer systems based on user perceptions [5].

2. Literature Review

A study conducted by Melinda Nopita, Susan Dian Purnamasari, and Helda Yudiastuti titled "Evaluation of the Usability of SMA PGRI 2 Palembang Website Using System Usability Scale (SUS)" utilized the System Usability Scale (SUS) approach method with 10 test statements and two assessment determination methods. Validity and reliability test evaluations were conducted using SPSS version 25 software and Microsoft Excel 2016 to assist with data processing. The questionnaire was distributed manually using a survey to 90 respondents using Simple Random Sampling technique according to Slovin. After testing with 90 respondents, the results of the usability test of the SMA PGRI 2 Palembang website using the System Usability Scale method obtained a final score of 58.1. The acceptability ranges assessment categorized it as marginally low, the grade scale was in grade F, and the adjective rating was categorized as okay. From these results, it can be concluded that almost all respondents indicated that this website needs to be improved in its usefulness so that users can receive it well [11].

A study conducted by Rizka Dwi Cahyani and Aries Dwi Indriyanti titled "Application of User-Centered Design Method in Redesigning MAN 1 Pasuruan Website Design" revealed that the usability level of the MAN 1 Pasuruan website scored 27.35 with an "Awful" rating based on the evaluation using the System Usability Scale (SUS) method. Based on this evaluation, redesigning the MAN 1 Pasuruan website using the User-Centered Design (UCD) method is necessary. The redesign solution addresses identified issues such as improving menu functionality, merging PPDB and SPPDB menus, and redesigning the website. This resulted in recommendations for website improvement in the form of a prototype, which was then evaluated to assess usability enhancements. The prototype was evaluated using the System Usability Scale method and achieved a higher score of 88.333 with an "Excellent" rating, indicating that the MAN 1 Pasuruan website's appearance has improved and now meets user needs better [12].

A study conducted by Fahmi Khasan and Ghufron Zaida Muflih titled "Usability Measurement on the Website of SMK Ma'arif 3 Somalangu Kebumen Using the System Usability Scale (SUS)" found that the measurement and analysis using SUS, which included validity testing, yielded valid results with a calculated R-value greater than the critical value. Reliability testing also showed a result of 0.637, indicating reliability. The research results indicated that the score for the SMK Ma'arif 3 Somalangu website was 97.43, receiving an "A" rating, categorized as "Best Imaginable." Additionally, the level of visitor acceptance (feel) was categorized as marginally high. These findings suggest that the SMK Ma'arif 3 Somalangu website is considered effective, efficient, and satisfying for users/visitors, as well as easy to use [15].

This study proposes a new approach in user interface development, emphasizing ease of understanding and utility as an information medium. The addition of an interactive element such as a carousel display on the landing page aims to refresh user experience. The chosen research methods include using prototypes and system usability scale for evaluation, considered the most effective and suitable approach.

3. Research Methods

The research process in designing user interface (UI) and user experience (UX) is depicted through a flowchart. In this study, various stages are implemented to produce outputs that can be further developed. Here is the research flow.

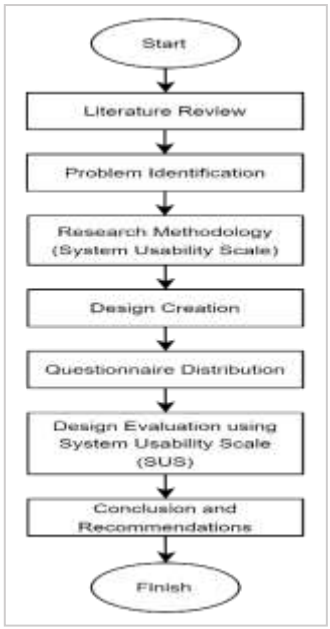

Figure 1. Research Flow

Figure 1 illustrates the stages of the research process. It commences with a review of relevant literature from applicable journals concerning the adopted methodology. Following this, identification of study-related issues is conducted, succeeded by the process of problem resolution to identify suitable solutions. Subsequent stages involve the creation of interface design and the implementation of user interface and user experience testing to assess whether the interface adequately meets the established criteria. The central focus of this research is on UI/UX design utilizing the SUS method, coupled with tailored design considerations to address user requirements.

Figure 2. Use Case Diagram

In Figure 2, it explains the features accessible by the admin and visitors involved in the system. These features include school profile management, news information, extracurricular activities, educator data, and contact information, including reports related to ongoing activities.

Meanwhile, visitors only have the right to access, obtain information, and provide suggestions on the website. The system is designed to interact to meet user needs.

3.1. Validity

Validity assesses the precision with which a research method can gauge the intended phenomenon. A high level of validity signifies the congruence between research findings and the actual attributes of the phenomenon being investigated, regardless of whether quantitative or qualitative methods are employed [17].

3.2. Reliability

Reliability evaluates the degree to which a measurement technique can generate consistent outcomes. If measurements can be reproduced using the same approach and conditions, resulting in similar outcomes, then the measurement is deemed reliable. Reliability coefficients, such as Cronbach's Alpha or Pearson Correlation, are utilized to gauge the test's ability to consistently measure [17].

3.2. System Usability Scale

In 1986, John Brooke created the System Usability Scale, a reliable, widely used, effective, and cost-efficient usability measurement tool [11].

The System Usability Scale (SUS) is a tool utilized to assess the usability level of a product. It comprises a questionnaire with 10 questions, each offering five answer choices: strongly disagree, disagree, neutral, agree, and strongly agree, scored from 1 to 5. For odd-numbered items (1, 3, 5, 7, and 9), the score contribution equals the chosen position minus 1, while for even-numbered items (2, 4, 6, 8, and 10), the contribution is 5 minus the chosen position. These scores are then utilized in the SUS score calculation. The SUS score ranges from 0 to 100. Additionally, codes such as R1, R2, R3, etc., represent each question on the SUS questionnaire, facilitating the calculation process [13]. The formula for calculating the SUS score is as follows:

Score SUS = ((R1 − 1) + (5 − R2) + (R3 − 1) + (5 − R4) + (R5 − 1) + (5 − R6) + (R7 − 1) + (5 − R8) + (R9 − 1) + (5 − R10)) × 2,5

The SUS method questionnaire consists of 10 (ten) questions that use a Likert scale from 1 to 5 as answer choices, where 1 indicates strongly disagree, 2 indicates disagree, 3 indicates uncertainty, 4 indicates agree, and 5 indicates strongly agree. These questions will be given to potential users or respondents. The list of questions is as follows:[14].

Table 1. List of SUS Method Questions (John Brooke 1986)[3]

	Questions
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 be able 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 going with this system.

The individual scores should be considered as complementary to the SUS score, and both results should be considered together to provide a more comprehensive picture of the overall usability of the product (Bangor et al., 2009) [13]. After that, the results of the SUS score measurement can be interpreted according to the guidelines provided as shown in Figure 3 below:

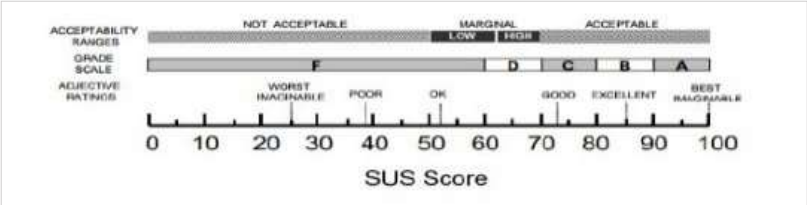

Figure 3. Rating Scale SUS Scores

4. Results And Discussion

4.1. Questionnaire Distribution

This study aims to evaluate the user experience of individuals using the SMP YPK 01 Manokwari website. The respondents targeted are teachers (civil servants/honorary), educational staff, and students. Respondents will be asked to access the user interface (UI/UX) prototype of the website to experience the user experience.

Table 2. Respondent Data

Variable		Total
Gender	Male	4 (12%)
	Female	29 (88%)
Age	< 17 Year	17 (53%)
	18 - 34 Year	2 (6%)
	35 - 44 Year	7 (22%)
	45 - 54 Year	3 (10%)
	> 55 Year	3 (9%)
Occupation	Teacher (Civil Servants)	12 (35%)
	Teacher (Honorary)	5 (15%)
	Student/College Student	17 (50%)

Table 2 contains information about the respondents, including their gender, age, and occupation, who filled out the questionnaire.

4.2. Design Implementation

Figure 4. Admin Dashboard UI

Figure 4 displays all the admin dashboard design pages of the SMP YPK 01 Manokwari website. These pages showcase various features such as school data input, school information input, vision-mission input, organizational structure input, news input, educator input, and contact input. This indicates that the admin dashboard provides full access and control over the management of various information and content related to the school.

Figure 5. Homepage UI

Figure 5 displays the main page of the SMP YPK 01 Manokwari website, which includes features, navigation bars, and information related to the school system's workflow. The information presented includes the number of students and teachers, brief news, extracurricular activities, and information about educators. This allows for effective monitoring of the system's workflow structure.

Figure 6. General Information UI

Figure 6 displays a page from the SMP YPK 01 Manokwari website containing information about the school. It includes the school's history, teacher's code of ethics, Pancasila profile, and student regulations. This provides a comprehensive overview of the background, values, and rules that form the basis for activities at SMP YPK 01 Manokwari.

Figure 7. Vision Mission UI

Figure 7 displays a page from the SMP YPK 01 Manokwari website containing information about the school's vision, mission, and objectives. It includes a description explaining the school's vision, mission, objectives, and motto. This provides a clear understanding of SMP YPK 01 Manokwari's direction and commitment to providing education to its students.

Figure 8. Organizational Structure UI

Figure 8 displays a page from the SMP YPK 01 Manokwari website providing an overview of the school's organizational structure. The structure includes positions ranging from the principal and vice-principal to the school board/committee, administrative department, library, laboratories, and other departments. This provides a clear understanding of the arrangement and parts involved in managing SMP YPK 01 Manokwari school.

Figure 9. News UI

Figure 9 displays a page from the SMP YPK 01 Manokwari website containing information about school activities or news related to activities in the school. It includes information about various activities, events, and the latest news happening at SMP YPK 01 Manokwari. This allows website visitors to stay informed about the school's developments and activities held within it.

Figure 10. Staff UI

Figure 10 displays a page from the SMP YPK 01 Manokwari website containing a list of information about teachers or educational staff working in the school environment. It provides an overview of the identity and qualifications of each teacher or educational staff at SMP YPK 01 Manokwari, allowing website users to easily access this information.

Figure 11. Contact UI

Figure 11 displays a page from the SMP YPK 01 Manokwari website containing information about the school's location, contact details, and social media links. Additionally, there is a feedback box that allows website visitors to provide feedback or suggestions. This provides convenience for website users to know the school's location, contact the school, and interact through social media. Furthermore, the feedback box serves as a means for website visitors to actively participate in providing feedback to the school.

4.3. Testing Prototype

This stage aims to test the previously created prototype by gathering assessments and feedback from respondents on the website that has been developed.

Testing is conducted on respondents to ensure they can use the design without difficulty and to ensure the effectiveness and validity of the testing results [16]. Usability testing is performed using the Figma platform's prototype section to assess respondents' experiences with the user interface design. Here is the URL for the Admin User Interface (UI) design: (https://shorturl.at/drzNX). Visitors can access it through: (https://shorturl.at/mopuz).

4.4. Validity Test

Validity was assessed using statistical software, specifically SPSS, with a sample of 33 respondents. The outcomes of the validity assessment are presented in Table 5, employing Pearson Correlation.

Table 5. Validity Test Results

Questions	$R_{calculated}$	R_{table}	Description
Q1	0.805	0.344	Valid
Q2	0.824	0.344	Valid
Q3	0.805	0.344	Valid
Q4	0.772	0.344	Valid
Q5	0.762	0.344	Valid
Q6	0.701	0.344	Valid
Q7	0.799	0.344	Valid
Q8	0.862	0.344	Valid
Q9	0.83	0.344	Valid
Q10	0.708	0.344	Valid

4.5. Reliability Test

Reliability was examined utilizing Cronbach's Alpha, deemed dependable if surpassing 0.7. The reliability assessment outcomes from SPSS are outlined in Table 6. The findings reveal that the Cronbach's Alpha coefficient for the 10 questionnaire items is 0.911, surpassing the threshold of 0.7, hence affirming the questionnaire's reliability.

Table 6. Reliability Test Results

Reliability Statistics		
Cronbach's Alpha	N of Items	Description
0.911	10	Reliable

4.6. Testing The System Usability Scale

After the prototype testing, respondents were given 10 questions using a questionnaire adapted to the SUS testing, involving the participation of 33 respondents. The SUS questionnaire was tailored to align with users' subjective evaluations of the product's ease of use [16]. Here are the details of each respondent:

Table 3. Assessment Results of Respondents on UI Design

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R1	5	2	5	4	5	4	5	2	5	4
R2	5	1	5	3	5	1	5	3	5	5
R3	4	2	4	2	4	2	4	2	4	2
R4	4	2	4	2	4	2	4	2	4	4
R5	4	1	4	4	4	2	4	2	4	4
R6	5	2	5	2	4	2	4	2	4	2
R7	5	1	5	1	5	1	5	1	5	2
R8	5	1	5	1	5	1	5	1	5	1
R9	1	5	1	5	1	5	1	5	1	5
R10	5	1	5	1	5	1	5	1	5	1
R11	5	2	5	5	1	4	4	3	3	5
R12	5	2	5	4	5	1	5	1	5	4
R13	5	1	5	1	5	1	5	1	5	1
R14	5	1	5	1	5	5	5	1	5	1
R15	4	2	5	2	4	2	5	1	4	4
R16	5	2	5	5	5	4	5	1	5	4
R17	5	1	5	1	5	1	5	1	5	5
R18	5	2	5	4	5	4	5	2	5	4
R19	5	2	5	4	5	4	5	2	5	4
R20	5	2	5	1	4	1	5	2	4	1
R21	5	2	5	2	4	3	5	2	5	2
R22	5	2	5	2	4	3	5	2	5	2
R23	5	1	5	1	4	1	5	2	5	3
R24	5	2	5	1	4	1	5	1	5	1
R25	5	1	5	1	5	1	5	1	5	1
R26	5	2	5	1	4	1	5	1	5	1
R27	5	1	5	2	4	1	5	1	5	1

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
R28	5	1	5	1	5	1	4	1	5	1
R29	5	2	5	1	5	1	4	2	5	1
R30	5	2	5	2	4	1	5	1	4	2
R31	5	1	5	1	5	1	5	1	5	1
R32	5	1	5	2	5	1	5	1	5	1
R33	5	1	5	2	5	1	5	1	4	1

Table 3 displays the evaluations provided by 33 respondents regarding the 10 questions presented by the system. These values are graded on a scale of 1 to 5, where 1 signifies a significant disagreement, 2 signifies disagreement, 3 signifies uncertainty, 4 signifies agreement, and 5 signifies a significant agreement.

Table 4. SUS Calculation Results

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Score (Total × 2.5)
R1	4	3	4	1	4	1	4	3	4	1	29	72.5
R2	4	4	4	2	4	4	4	2	4	0	32	80
R3	3	3	3	3	3	3	3	3	3	3	30	75
R4	3	3	3	3	3	3	3	3	3	1	28	70
R5	3	4	3	1	3	3	3	3	3	1	27	67.5
R6	4	3	4	3	3	3	3	3	3	3	32	80
R7	4	4	4	4	4	4	4	4	4	3	39	97.5
R8	4	4	4	4	4	4	4	4	4	4	40	100
R9	0	0	0	0	0	0	0	0	0	0	0	0
R10	4	4	4	4	4	4	4	4	4	4	40	100
R11	4	3	4	0	0	1	3	2	2	0	19	47.5
R12	4	3	4	1	4	4	4	4	4	1	33	82.5
R13	4	4	4	4	4	4	4	4	4	4	40	100
R14	4	4	4	4	4	0	4	4	4	4	36	90
R15	3	3	4	3	3	3	4	4	3	1	31	77.5
R16	4	3	4	0	4	1	4	4	4	1	29	72.5
R17	4	4	4	4	4	4	4	4	4	0	36	90
R18	4	3	4	1	4	1	4	3	4	1	29	72.5
R19	4	3	4	1	4	1	4	3	4	1	29	72.5
R20	4	3	4	4	3	4	4	3	3	4	36	90
R21	4	3	4	3	3	2	4	3	4	3	33	82.5
R22	4	3	4	3	3	2	4	3	4	3	33	82.5
R23	4	4	4	4	3	4	4	3	4	2	36	90
R24	4	3	4	4	3	4	4	4	4	4	38	95
R25	4	4	4	4	4	4	4	4	4	4	40	100

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Total	Score (Total × 2.5)
R26	4	3	4	4	3	4	4	4	4	4	38	95
R27	4	4	4	3	3	4	4	4	4	4	38	95
R28	4	4	4	4	4	4	3	4	4	4	39	97.5
R29	4	3	4	4	4	4	3	3	4	4	37	92.5
R30	4	3	4	3	3	4	4	4	3	3	35	87.5
R31	4	4	4	4	4	4	4	4	4	4	40	100
R32	4	4	4	3	4	4	4	4	4	4	39	97.5
R33	4	4	4	3	4	4	4	4	3	4	38	95
Average Score												**83.26**

Table 4 displays the total calculated scores based on the SUS, with an average score of 83.26. This score is classified as "excellent" in assessing the user experience of the SMP YPK 01 Manokwari website design.

The System Usability Scale method allows for a thorough and structured analysis of system usability needs. In this testing, the SUS score for each question filled out by respondents is calculated, where questions with odd numbers signify positive aspects, while those with even numbers denote negative aspects.

4.7. Analysis of System Usability Scale

SUS is an evaluation of usability factors (effectiveness, efficiency, and satisfaction) perceived subjectively by users. The SUS score serves as an indicator of user acceptance levels. For it to be classified as Acceptable, the SUS score needs to surpass 70 (Brooke 2013).

In this study, the SUS score received an "excellent" rating in evaluating the user experience of the SMP YPK 01 Manokwari website design.

The SUS method facilitates a thorough and organized examination of the system's usability requirements. In this assessment, odd-numbered questions signify positive aspects, while even-numbered questions signify negative aspects.

5. Future Research Directions

As recommendations for future research, it would be to further refine the UI/UX design of the SMP YPK 01 Manokwari website that has been developed with the aim of implementing it as an actual website system. This is anticipated to offer users a deeper comprehension of its strengths and weaknesses firsthand.

6. Conclusion

In this research, UI/UX design was conducted using Figma tools, and usability evaluation was performed on the SMP YPK 01 Manokwari website using the System Usability Scale method. The evaluation process aimed to enhance the usability of the system. After the design phase, testing was conducted where respondents tested the completed prototype UI/UX design and filled out questionnaires. The SUS questionnaire was tailored to subjective evaluations of usability. From the calculation results of the questionnaires filled out by 33 respondents, including the school principal, teachers, and students of SMP YPK 01 Manokwari, a score of 83.26 was obtained. This result falls into Grade B with an "excellent" rating. Based on this rating, it can be inferred that the UI/UX prototype design of SMP YPK 01 Manokwari has been effectively developed, indicating a high level of usability. Therefore, it can be determined that the current design is ready for implementation and can be further refined for future enhancements.

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