The use of Usability Tests in Website-Based Student Report Value Processing Information Systems

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Abstract - The information system for processing student report cards based on the website is a system that provides information on student activity reports online in the form of grade reports and related student information based on the web, thus helping speed and quality in delivering information. Problems that occur in processing report cards at SMPN 2 Telagasari are currently still using report cards and inputting student scores is still manual. This study aims to build a value information system that makes it easier to check, record, and report computerized student grade data. In addition, by being web-based, data information can be accessed at any time. This website uses XAMPP as a web server for system design and MySQL as a database. The design of the login menu consisting of admins, teachers, and students has separate access when opening the application so that the security of the program is maintained. Testing this website using black-box testing and Likert scale usability testing to make it easier for authors to assess whether this online report card processing information system website can facilitate users.

Keywords: Information System, Value, Report Card, Website, MySQL

Abstrak - Sistem informasi pengolahan raport siswa berbasis website merupakan sistem yang menyediakan informasi laporan kegiatan siswa secara online berupa raport nilai dan informasi siswa terkait berbasis web, sehingga membantu kecepatan dan kualitas dalam penyampaian informasi. Permasalahan yang terjadi dalam pengolahan raport di SMPN 2 Telagasari saat ini masih menggunakan raport dan penginputan nilai siswa masih manual. Penelitian ini bertujuan untuk membangun sistem informasi nilai yang memudahkan pengecekan, pencatatan, dan pelaporan data nilai siswa secara komputerisasi. Selain itu, dengan berbasis web, informasi data dapat diakses setiap saat. Website ini menggunakan XAMPP sebagai web server untuk perancangan sistem dan MySQL sebagai database. Perancangan menu login yang terdiri dari admin, guru, dan siswa memiliki akses tersendiri saat membuka aplikasi sehingga keamanan program tetap terjaga. Pengujian website ini menggunakan pengujian black box dan pengujian usability skala likert untuk memudahkan penulis menilai apakah website sistem informasi pengolahan raport online ini dapat memudahkan pengguna.

Kata kunci: Sistem Informasi, Nilai, Rapor, Website, MySQL

I. PRELIMINARY

The use of technology and information is now also an aspect of life that is not only limited to the work environment. This is what makes technology and data very important for the survival of society. School is an environment that has used information technology.

Education is an institution that aims to provide services in the academic aspect that is used by many people in guiding a student. The school directs students to become people who can advance the nation. The school is one of the bodies devoted to guiding students in the monitoring of educators.

At the end of each semester, the school evaluates a student in one semester as a basis for measuring academic progress that has been passed. Each teacher will process these values and then will be given to each homeroom teacher respectively. Each homeroom teacher then collects and produces in one form an evaluation document, which results in a document known as a student report card.

The processing of report cards at SMP Negeri 2 Telagasari is arguably less efficient and not optimal. Each subject teacher gives grades to students which are then handed over to the homeroom teacher to be processed into a diploma (report). In the process of ensuring the student report card numbers continue to use the old method. Subject teachers share student grades with homeroom teachers using excel separately. This makes it difficult for the homeroom teacher to rework the information submitted by the teacher on the subject, as a result, the way the report card works is held back for each grade. The software used does not match the wishes of consumers as a result, it causes consumers to have difficulty in working on student report cards. This of course causes the process of processing information and making information, from the processing field not so optimal, it can limit the way of searching and presenting the required information.

To improve the quality of learning, increase the effectiveness of the duration and source of energy for schools, both in

guiding practice activities or school administration, such as in working on report cards, the use of information technology is highly desirable. In collecting, calculating student grades, and printing student report cards, this report card processing information system will greatly facilitate the process of making student report cards.

II. RESEARCH METHODS

A. Information Systems

An information system is a system that is produced by people who are divided into parts into a body to achieve the goal of presenting data [1].

B. Data processing

An information system is a system that is produced by people who are divided into parts into a body to achieve the goal of presenting data [2].

C. Website

Website or short for the web can be known as a group of pages that are divided into several pages that contain data in the form of virtual information in the form of text, paintings, films, audio, and other animations that are carried out via connection routes [3].

D. Report Card

Report cards are information on the results of teaching participants' information while exploring teaching and learning activities and submitted at the end of the activity twice a year whose reporting, in this case, is the results of daily quizzes, daily obligations, midterm tests, end-of-semester tests, character, extracurricular along with the required records related to reporting cards [4].

E. Student

Students or students are those who are specially handed over by their parents to explore training activities held at the school, which aim to become a creature who has insight, skills, professionalism, character, has high morals, and is independent [5].

F. Teacher

The teacher or teacher is a person who guides and provides teaching because of his rights and obligations he is responsible for the learning of teaching participants [6].

G. School Administration

School administration is a sub-system of the body, in this case, it is a school body. The key activity is to take care of all forms of school administration, from correspondence to record keeping. So the rules of effort are not only related to correspondence activities but also relate to all explanatory materials and data in the form of scripts [7].

H. Anfield Modeling Language (UML)

UML (Unified Modeling Language) is a description that is widely used in industry to describe requirements, make system analysis and design, and describe systems in object-oriented programming [8]. The following are the types of UML:

1. Use Case Diagram
   Use Case Diagram is a model for data system actions to be made. Use case charts can be used to identify the uses of everything contained in the data system and who has the power to use those uses [9].
2. Class Diagram
   The class chart describes the state of the system usability and requirements related to important menus and database connections [10].
3. Activity Diagram
   Activity diagrams describe a workflow (activity movement) or activity (activity) of a system or business field [9].
4. Sequence Diagram
   Sequence diagrams describe the subject's actions against a use case by defining the duration of the subject's life and the notes to be sent and obtained by fellow-subjects [9].

I. MySQL

MySQL is a relational database management system. That is information that is managed through a database that will be placed in several separate tables so that dealing with information will be much faster. MySQL can also be used to manage databases from the smallest to the largest[11].

J. Database

A database is a collection of interrelated information, hidden in external funds and used as special software to manipulate it. The database is also a significant part of the information system because it acts as a data facilitator for its users [12].

K. Waterfall

The modified waterfall form is a sequential concept method, often used in software development methods, in its progress, it always flows to the bottom (like a waterfall) through the levels of communication, planning, modeling, construction, and deployment [13].

L. PHP

PHP is a scripting programming language that was originally developed to generate HTML statements. Moreover, programming developed with PHP one hundred percent is always shown in the form of HTML code [14].

M. CodeIgniter

Code Igniter is a framework from PHP that is open-source using the MVC (Visual Meteorological Condition) procedure to make it easier for developers or programmers to create an application with a website platform without having to make it from scratch[1].

N. Black Box Testing

Black Box Testing is centered on a functional element of the software. The tester can interpret the combination of an input situation and carry out tests on elements of a functional program. Black Box Testing is not an alternative solution to White Box Testing, however, an accessory for testing situations that are not covered by White Box Testing[15].

III. RESULTS AND DISCUSSION

To get an analysis of user needs for the system, Likert scale usability is needed as a method to be able to analyze user needs in using this system, the following steps are:

1. The Likert Scale Usability Test focuses on the convenience of consumers in using the student report card data system, as a result, the instrument used for this research is usability research. In the usability aspect, the test uses an evaluation sheet in the form of a questionnaire or questionnaire which will be distributed to respondents directly after trying the information system. The questionnaire used is the USE Questionnaire by Lund A.M (2001) which already has four criteria, namely usefulness, ease of learning, and satisfaction. In the calculation process,

the questionnaire has five scales that are used as benchmarks, including strongly agree (SS), agree (S), uncertain (RG), disagree (TS), and strongly disagree (STS). The following is a table of Likert scale usability questions:

Table 1 Questionnaire Likert Scale

No	Pernyataan	Skala Penilaian				
		SS	S	RG	TS	STS
	Usefulness					
1	Sistem ini membantu saya menjadi lebih efektif					
2	Sistem ini membantu saya menjadi lebih produktif					
3	Sistem ini bermanfaat					
4	Sistem ini memberikan dampak yang besar terhadap tugas yang saya lakukan dalam hidup saya					
5	Sistem ini memudahkan saya dalam mencapai hal-hal yang saya inginkan					
6	Sistem ini menghemat waktu ketika saya menggunakannya					
7	Sistem ini sesuai kebutuhan saya					
8	Sistem ini sesuai dengan apa yang saya					

	Ease of Use					
9	Sistem ini mudah digunakan					
10	Sistem ini praktis untuk digunakan					
11	Sistem ini mudah dipahami					
12	Sistem ini hanya memerlukan langkah-langkah singkat dalam menggunakannya					
13	Sistem ini dapat disesuaikan dengan kebutuhan					
14	Tidak ada kesulitan dalam menggunakan sistem ini					
15	Saya dapat menggunakan tanpa instruksi tertulis					
16	Saya melihat sistem ini sudah konsisten ketika dipergunakan					
17	Baik pengguna yang jarang maupun yang rutin akan suka menggunakan sistem ini					
18	Saya dapat kembali dari kesalahan dengan cepat dan mudah					
19	Saya dapat menggunakan sistem ini					

	Ease of Learning					
20	Saya belajar menggunakan sistem ini dengan cepat					
21	Saya mengingat penggunaan sistem ini dengan mudah					
22	Penggunaan sistem ini mudah dipelajari					
23	Saya mahir menggunakan sistem ini dengan cepat					

	Satisfaction					
24	Saya puas dengan sistem ini					
25	Saya akan merekomendasikan aplikasi ini kepada teman					
26	Aplikasi ini menyenangkan untuk digunakan					
27	Aplikasi ini bekerja seperti yang saya inginkan					
28	Aplikasi ini sangat bagus					
29	Saya merasa saya harus memiliki aplikasi ini					
30	Aplikasi ini nyaman untuk digunakan					

2. Data analysis techniques are used to determine the level of achievement of the objectives of the research based on the data that has been collected. Testing this usability aspect by using Likert scale quantitative data analysis. The Likert scale contained in the USE Questionnaire instrument can use answers on a scale of five or scale seven, in this study using a scale of five. According to Sugiyono (2009), the answers to each instrument using a Likert scale have a gradation from very positive to negative. The value of 1 is the smallest while the value of 5 is the largest.

Table 2 Likert Skala Scale Classification

No	Kategori	Nilai
1	Sangat Setuju (SS)	5
2	Setuju (S)	4
3	Ragu-Ragu (RG)	3
4	Tidak Setuju (TS)	2
5	Sangat tidak Setuju (STS)	1

the total value obtained is then calculated by the following formula.

$$persentase\ (\%) = \frac{total\ value}{Maximal\ value} \times 100\%$$

Information :
Total value = total value obtained from respondents' answers
Maximum value = number of statements x number of respondents x 5
After getting the results of the calculations, the values obtained will then be converted into qualitative values in the percentage assessment table. Before knowing the percentage assessment table first, look for the interval distance rating of the Likert scale using the following formula.
Interval = 100/Total Score (Likert)
= 100/5
= 20
From the calculation of the interval above, it can be seen that the result of the distance interval for the assessment percentage table is 20, so the percentage assessment table can be seen in Table 3.

Table 3 rating percentage

No	*Persentase* pencapaian	*Interpretasi*
1	0% - 19,99%	Sangat Tidak Baik
2	20% - 39,99%	Kurang Baik
3	40% - 59,99%	Cukup
4	60% - 79,99%	Baik
5	80% - 100%	Sangat Baik

3. Furthermore, the results of testing data from the four tables are collected and accumulated so that it will produce a summary of the usability testing of the student report card processing information system with a total score that can be seen in the following table.

Table 4 Results of Usability Test Accumulated Data

No	Nama Reponden	Useful-ness	Ease of Use	Ease of Learning	Satisfa-ction	Skor Total	Skor Mak...
1	Tiwi Purbandari	37	48	17	32	134	150
2	M. Reza Primadi, M.Pd	37	50	18	33	138	150
3	Tuti Lestari	32	39	14	28	113	150
4	Satria Aji S.Kom	40	43	15	24	122	150
5	Eko Prasetyo	35	44	16	29	124	150
6	Eko Febriyanto	33	44	16	28	121	150
7	Himatul Muniroh, S.Pd	32	44	16	28	120	150
8	Sumanto, A.Md	32	43	16	28	119	150
9	Budi Prasetyo	31	43	16	28	118	150
10	Neni Supiyanti	36	45	18	30	129	150
11	Dra. Inuk Inggit Merdekawati	32	47	16	32	127	150
12	Drs. Fadlan	33	45	17	29	124	150
13	Nurningsih, S.Ag	35	44	16	34	129	150
14	Susi Hartini, S.Pd	30	40	16	28	114	150
15	Siti Khotijah	37	49	17	30	133	150
16	Estri Wiyani	38	54	20	34	146	150
17	Mimin Sukaesih, S.Pd	35	46	18	32	131	150
18	Maryanto, S.Pd	35	47	18	32	132	150
19	Dra. Shoimah	37	47	16	29	129	150
20	Wahyu Sanjaya	38	48	17	32	135	150
Jumlah						2538	3000

Based on the results of the accumulated usability test data in Table 4.33, a total score of 2538 points was obtained from a maximum possible score of 3000 points. From the results obtained, the percentage of eligibility is calculated based on the data obtained. The calculation of the percentage of eligibility based on the data is as follows.

$$(\%) = \frac{Total\ Score}{Maximal\ Scorel} \times 100\%$$
$$= \frac{2538}{3000} \times 100\%$$
$$= 84,6\ \%$$

The result of calculating the percentage of eligibility is 84.6% so it can be concluded that the student report card processing information system meets the usability standard with the "very good" category when viewed in the feasibility percentage table contained in CHAPTER 3. A usability test is a test used in beta testing is a stage last in the construction process. With input and suggestions, the student report card processing information system will continue to be developed based on user evaluations so that this student report card processing information system can achieve the maximum level of feasibility.

After getting the results of the Likert scale usability testing related to data requirements to determine the level of user interest, the next stage is the development and design of the system following the stages in making the system:

1. In designing this system using a Use Case Diagram as a modeling system, which was created using UML (Unified Modeling Language). describe in building a system program. It is used as a medium that has a function to design the system and describe the interaction between the actor and the system. The following is an example of a System Diagram Use Case design:
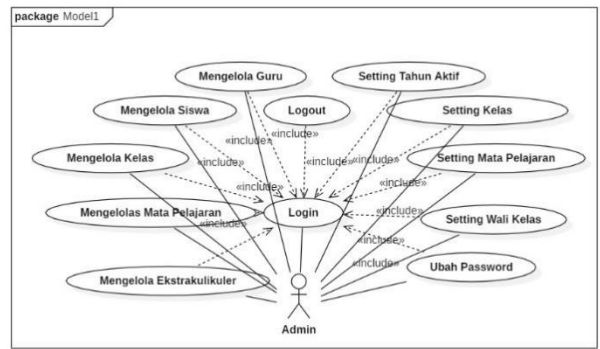

Figure 1 Use Case Diagram

2. Activity diagram of system capital is useful in describing the workflow on the system such as describing login activities, data management activities, modifying data, and deleting data. The following is an example of an activity diagram that has been created.
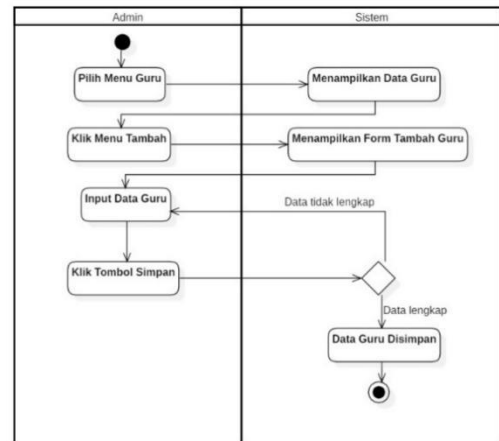

Figure 2 Activity Diagram

3. Squance Diagrams are useful for compiling the steps of messages sent to find out the flow of the relationship between objects because the sequence is the most useful diagram for dividing the use case model into a Barangin system specification. The following Squance Example Diagram for designing a Goods Lending System can be seen below.
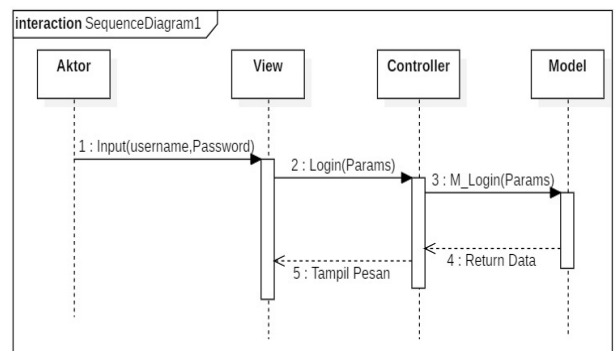

Figure 3 Sequence Diagram

4. A class Diagram is a modeling of the system design structure contained in the database. Class Diagram also aims to describe the functions needed in designing and creating systems. The following is an example of a Class Diagram for designing a Goods Lending System, which can be seen below:
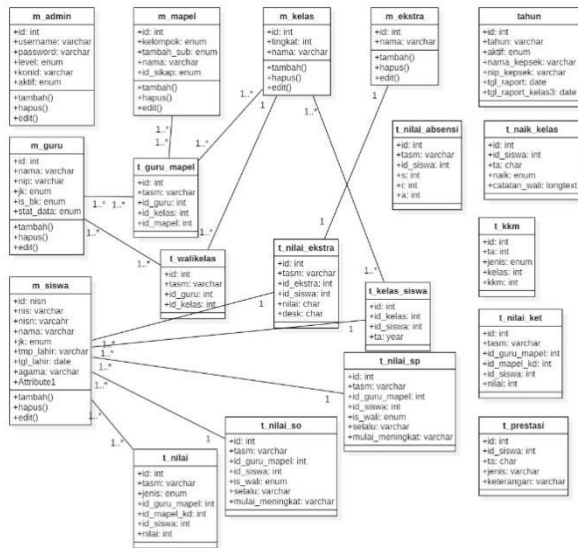
Figure 4 Class Diagram

5. System Interface Design

In designing this User Interface, it is designed using a pencil application. User interface design aims to describe the appearance of the system to be created. the following is the user interface design of the Goods Asset Inventory System:
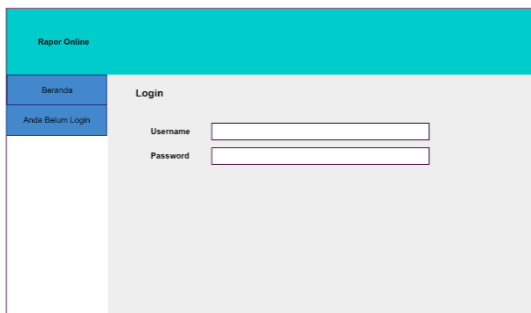
- Login Interface Design

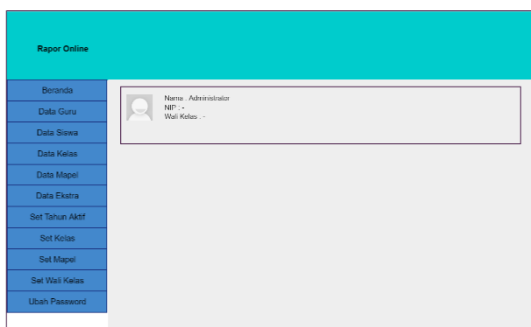Figure 5 Login Interface Design

Figure 6 Admin Interface Design
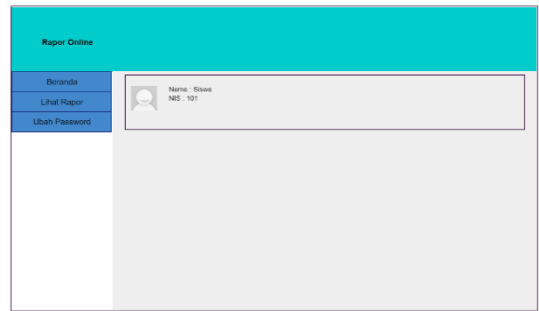

Figure 7 Teacher Interface Design

Figure 7 Student Interface Design

IV. CONCLUSION

Based on the results of research and discussion, the following conclusions can be drawn:

1. 1. The student report card processing information system uses the waterfall development model from Pressman with the stages of communication, planning, modeling, construction, and deployment. The information system developed has features to manage teachers, manage students, manage classes, manage subjects, manage grades, and print student report cards.

2. The developed information system has carried out tests that focus on usability aspects with the calculation results in the very good category, the product is developed to facilitate the user's work so that the objectives of the research are achieved.

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