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Designing User Interface & User Experience on Information System of Amil Zakat Institution Using Website-Based User Centered Design Method

Rismayada Baharudin[1], Popon Dauni[2], Purwadi[3]

[1,2,3]Department of Information System, Univ. Kebangsaan Republik Indonesia, Indonesia

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ABSTRACT

Amil Zakat Institution Yayasan Masyarakat Muslim Freeport Indonesian or better known as YMM FI is an institution that distributed to the community. However, even though it has been operating for a long time, YMM FI does not have a website as information media. The basis of good website is the existence of an attractive interface that is easily understood by users, therefore this study has designed a user interface and user experience using the user centered design method through its four stages, namely; the first stage is to understand the context of use, at this stage interviews are conducted with users, then the second stage specify user requirements is a description of the flow of the system that will run using a unified modelling language, then the third stage is the design solution at this stage the researcher has proposed a website interface design, then the last stage is evaluate against requirements. which is the evaluation stage of the proposed interface design. The evaluation stage is carried out to provide experience for users. Based on usability testing with pay attention to effective and efficient aspects. To get the value of the usability testing aspects, researchers used the cognitive walkthrough method and the system usability scale (SUS). In the effective aspect, an average value of 100% is obtained for the admin display and 96% for the Muzakkir display, then the effective aspect gets an average value of 100% for the admin display and 95% for the Muzakkir display, then the SUS average value is 76,5 almost close to 77 which gets a good grade.

Corresponding Author :

Rismayada Baharudin,
Information System Department, Faculty of Computer Science and Information Systems, Univ. Kebangsaan Republik Indonesia.
Jln. Terusan Halimun No.37 (Pelajar Pejuang 45) Bandung, Jawa Barat, Indonesia. 40614
Email: rismayada@gmail.com

1. INTRODUCTION

In Indonesia there are already many companies, agencies or institutions that implement technology in their operational processes[1][2], in amil zakat institutions there are already several institutions that use technology as a means of processing zakat funds and accessing information[3][4]. Zakat is a no-budget fund that is useful for poverty alleviation and overcoming socio-economic

disparities. One of the institutions engaged in the management of zakat funds is the Amil Zakat Institution of the Freport Indonesia Muslim Community Foundation or better known as YMM FI[1]. YMM FI is an Amil Zakat Institution located in Timika Papua, which has several programs that are run by managing zakat funds and alms from donors, but even though it has been operating for a long time YMM FI still manages zakat funds manually, YMM FI does not yet have a website to facilitate the process of transacting and managing zakat funds quickly and effectively. Currently YMM FI has a mission to disseminate information related to its programs in order to be better known by the wider community, therefore the website is an important thing to facilitate the dissemination of information.

The website itself is a collection of digital pages that contain information in the form of text, animation, images and videos that are connected to the internet and can be accessed by the public [1], while the Information System is a complex unit consisting of elements that interact with each other and are organized in a structured manner to achieve a certain goal [2][5][6]. The basis of a good website is the existence of an interface that is easily understood by users; therefore, this research will design User Interface & User Experience at Amil Zakat Institution using the User Centered Design method[7][8][9]. User interface includes physical appearance, use of color, animation display, to the communication pattern of a program with its users, while User Experience is the user experience when using the designed interface [3][10].

Furthermore, the User Centered Design method is a design that places the user at the center of a system development process. This method is suitable in designing the user interface of the Amil Zakat Institution information system because it has a special target user, namely people who want to pay zakat (Muzakkir) or give alms. This method has 4 stages, namely: Understand Context of Use, Specify User Requirements, Design Solution and Evaluate Against Requirements[11]. One of the advantages of this method is that it is an iteration in which at the end if there is still something that does not meet user satisfaction then an adventure can be done to overcome these problems [4]. To reveal imperfect parts in a User interface design can be tested by paying attention to aspects of Usability Testing. By using Cognitive walkthrough to measure the effectiveness and efficiency of the interface [5][12]. and System Usability Scale (SUS) to measure the level of user satisfaction. SUS is one of the most popular and effective usability testing tools. Because SUS has its own calculation formula based on user responses to the interface [6][13][8].

2. METHOD

The UCD method is a method for developing interface design. The user-centered design method is based on the concept that the user is the center of system development, and that the goals, characteristics, context, and environment of the system are all based on the user's experience.

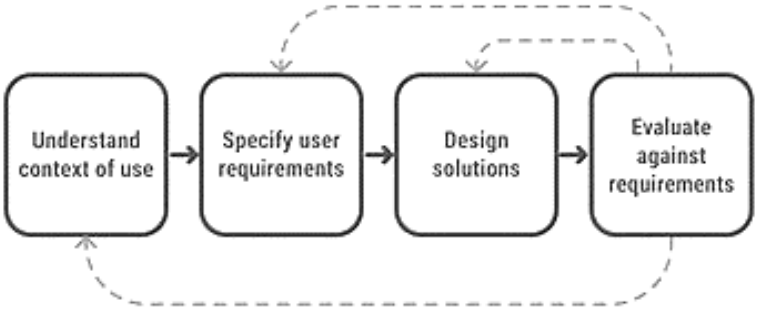

Figure 1. Stages of User Centered Design Method

The following is an explanation of Figure 1.2 which is a stage of the user centered design method: Understand context of use at this stage the design needs to understand the context of using the system, who will use the application, what the application is used for, and under what conditions. Then Specify user requirements Specify user requirements After understanding the use of the application, the designer can proceed to the next process: specifying user needs and system workflows. During this process, designers must be able to identify the needs of internal users and the goals they want to achieve.

Next, the Design solution is the stage of designing a solution design based on the user needs described in the previous process. the design process goes through several stages, starting from Mockup, Prototype to full design, and the last is Evaluate against requirements, which is the stage of evaluating the solution design that was previously proposed, to find out whether the design is appropriate. is in accordance with user needs or not and to measure the level of ease of use of the design [4].

3. RESULT AND DISCUSSION

In the first and second stages of the user centered design method are the analysis and design stages included in the MPPL method, the following are the analysis and design stages of the user centered design method.

3.1. Understand Context of Use

In this first stage is the analysis stage by understanding the user context, the researcher has interviewed YMM FI stakeholders as the main user and Muzakkir as the end user, the interview was conducted to collect data to then be able to identify system requirements based on the results of interviews related to problems and user needs, the following below is a User Persona which is a depiction of users and paint points as the core of user problems.

3.1.1. User Persona

Figure 2. User Persona Stakeholder

Figure 3. User Persona Muzakkir

3.1.2. Pain Points

Figure 4. Pain Points

3.2. Specify User Requirement

At this stage, a system design is made using several models from the unified modeling language (UML) to understand the system flow in more detail.

3.2.1. Use case Diagram

Figure 5 shows the use case from the admin side where the admin can manage zakat, can manage program news with add, edit and delete actions, can manage donations with add, edit, change status and delete actions, and can also manage Muzakkir data.

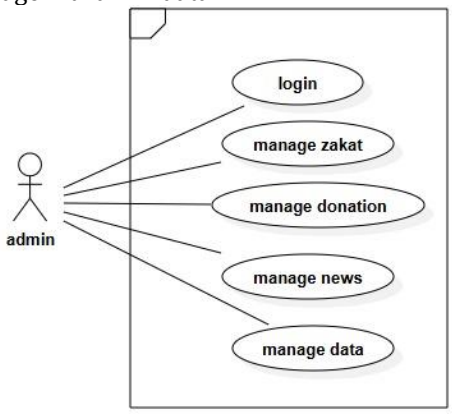

Figure 5. Admin Use case Diagram

The design of the use case diagram from the Muzakkir's side can see the home page display, can pay zakat, can see the program page, can participate in fundraising and can see the profile page.

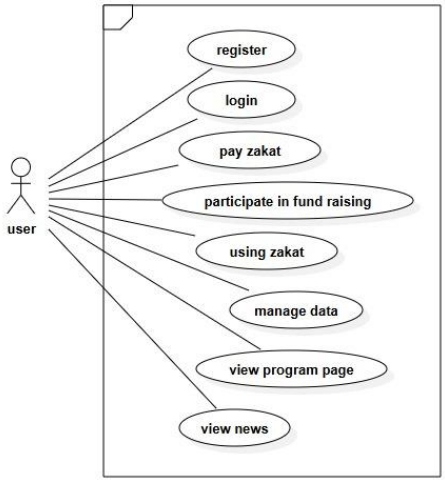

Figure 6. Muzakkir Use case Diagram

3.2.2. Wireframe

The researcher has designed a wireframe as a blue print of the interface design framework.

Figure 7. Login Wireframe

Figure 7 shows that after entering the website application, the admin will first log in to be able to access the website page as an admin. On this display, there is a form that will contain information related to the admin username and password. Then there is a login button that, when clicked, the admin will immediately enter the website as an admin.

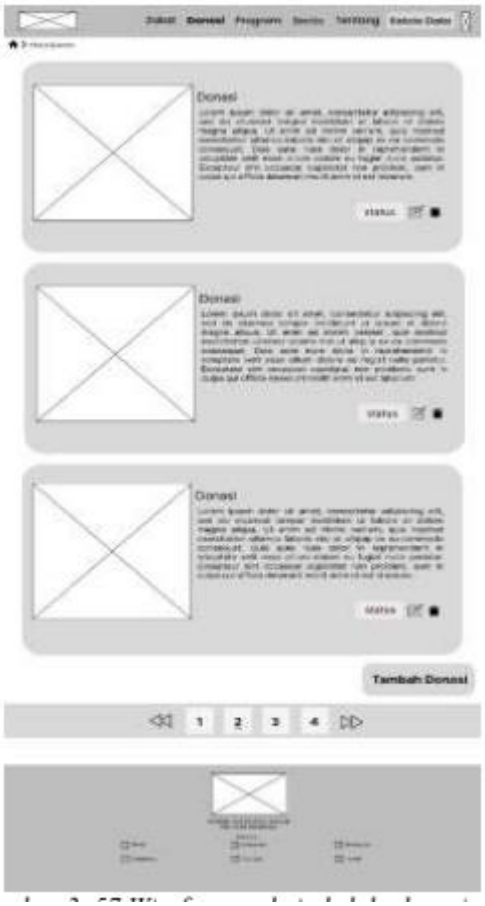

Figure 8. Manage Donation Wireframe

Figure 8 shows the donation management page that can be done by the admin, in this Wireframe display there is a row of donations that have been raised by the admin, there is an add donation button that when clicked the admin will be directed to the donation input form when you want to add the latest donation, there is also a status button that illustrates that the admin can edit the status of the donation whether it is complete or has a time limit or even wants to extend the fundraising period, there is also a pencil and paper icon which means edit the admin can edit information related to donations that have been uploaded and there is a trash can icon which means delete when the admin wants to delete the donation data that has been created.

3.3. Design Solution

This is the final result of the proposed interface based on the design that has been made. In figure 9 is the login interface, there is a form containing the username and password. The admin must enter the appropriate username and password so that the admin can log in. The login page display is dominated by green and white which gives a relaxed impression when viewed by the eye. In the box for the username and login filling form, a green and white gradient color is given to give a more casual and attractive impression.

Figure 9. Login Interface

Figure 10 shows the donation management interface, where there are several donations that have been raised by the admin. Then, for each donation, there is a status button that can change the donation status. There are delete and edit icons and an add donation button to add a new donation.

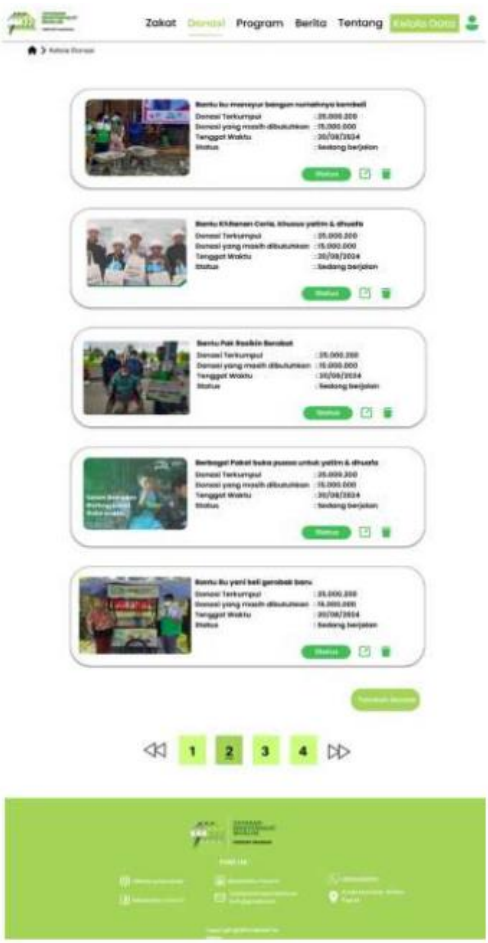

Figure 10. Manage Donation Interface

3.4. Evaluate Against Requirements

It is an evaluation stage to measure whether the interface that has been made has met the needs of users or not and to measure the experience of users on the interface. In this evaluation stage, it is carried out using two methods, namely the cognitive walkthrough method to measure the effectiveness and efficiency of the interface display and the system usability scale method to measure the experience value.

3.4.1. Cognitive Walkthrough

To evaluate the appearance of the interface that has been proposed, researchers use the cognitive walkthrough method to evaluate how efficient the interface is designed with user needs whether it is appropriate or not, at this stage it is divided into three stages, namely effective and efficient, the following are the results.

A. Effective

The effective value results are obtained from calculating the completion rate. Completion rate is the percentage of task scenarios that are successfully completed correctly by respondents. If the respondent successfully completes the task correctly, it will be given a value of 1, but if the respondent fails to carry out the task, it will be given a value of 0. The following below is the result of the completion rate calculation.

Table 1. complete rate of admin view

Respondent (R)	Task scenario (ST)										
	ST1	**ST2**	**ST3**	**ST4**	**ST5**	**ST6**	**ST7**	**ST8**	**ST9**	**ST10**	**ST11**
R1	1	1	1	1	1	1	1	1	1	1	1
R2	1	1	1	1	1	1	1	1	1	1	1

R3	1	1	1	1	1	1	1	1	1	1	1
R4	1	1	1	1	1	1	1	1	1	1	1

In table 1, it explains that the results of the meal assessment can be concluded based on the formula completion rate then the results below can be found.

Table 2. Result of complete rate of admin view

	Description	amount
1 =	Succes Task	39
0 =	Failure	0
Total task	39	
Completion Rate	**100%**	

Table 3. Completion rate of Muzakkir view

Respondent (R)	Task Scenario (TS)								
	ST1	ST2	ST3	ST4	ST5	ST6	ST7	ST8	ST9
R1	1	1	1	1	1	1	1	1	1
R2	1	1	1	1	1	1	1	1	1
R3	1	1	1	1	1	1	1	1	1
R4	1	1	1	0	1	1	1	1	1

From the assessment results above, it can be concluded that based on the completion rate formula, the results below can be found.

Table 4. Complete rate results of Muzakkir display

	Description	amount
1 =	Succes Task	31
0 =	Failure	0
Total task	32	
Completion Rate	**96%**	

This completion result is obtained based on the formula, namely by dividing the success task by the total task or total tasks then multiplying by 100%. The results on the admin display resulted in a completion rate of 100% because all respondents successfully completed the task correctly, then on the Muzakkir display resulted in a completion rate of 96% due to respondent 4 not doing the task on st4 correctly, but the average value of the success of effectiveness is 78% therefore the admin display and Muzakkir display have met the criteria with a rate of 100% and 96%.

B. Efficiency

The results of the efficiency assessment are obtained by calculating using time-based efficiency, namely by calculating the total time of all respondents completing the task scenario. Time-based calculation of task completion time aims to get the efficiency value of a system in this case is the Prototype website of the Amil Zakat Institution.

Table 5. Time based efficiency Admin view

Respondent (R)	**Task Scenario (ST)**										
	ST1	**ST2**	**ST3**	**ST4**	**ST5**	**ST6**	**ST7**	**ST8**	**ST9**	**ST10**	**ST11**
R1	6 *s*	2 *s*	10 *s*	8 *s*	5 *s*	9 *s*	12 *s*	15 *s*	6 *s*	3 *s*	2 *s*
R2	8 *s*	3 *s*	13 *s*	9 *s*	7 *s*	5 *s*	10 *s*	8 *s*	5 *s*	4 *s*	2 *s*
R3	7s	3 *s*	9 *s*	10 *s*	5 *s*	3 *s*	9 *s*	6 *s*	5 *s*	4 *s*	3 *s*
R4	5 *s*	2 *s*	10 *s*	9 *s*	6 *s*	2 *s*	7 *s*	7 *s*	8 *s*	2 *s*	2 *s*
Total	**26** *s*	**10** *s*	**42** *s*	**36** *s*	**23** *s*	**19** *s*	**38** *s*	**36** *s*	**24** *s*	**13** *s*	**9** *s*
Total	**276** *second*										
Time successful task	**26** *s*	**10** *s*	**42** *s*	**36** *s*	**23** *s*	**19** *s*	**38** *s*	**36** *s*	**24** *s*	**13** *s*	**9** *s*
Total	**276** *second*										

Table 6. Time based efficiency of Muzakkir display

Resp	**Task Scenario (ST)**

onden (R)	ST1	ST2	ST3	ST4	ST5	ST6	ST7	ST8	ST9
R1	10 *second*	5 *second*	3 *second*	18 *second*	10 *second*	10 *second*	30 *second*	50 *second*	28 *second*
R2	8 *second*	6 *second*	4 *second*	15 *second*	15 *second*	11 *second*	45 *second*	60 *second*	35 *second*
R3	9 *second*	5 *second*	3 *second*	12 *second*	9 *second*	14 *second*	25 *second*	43 *second*	37 *second*
R4	10 *second*	7 *second*	2 *second*	10 *second*	20 *second*	9 *second*	29 *second*	70 *second*	23 *second*
Total	**37** *second*	**23** *second*	**12** *second*	**55** *second*	**54** *second*	**44** *second*	**129** *second*	**223** *second*	**123** *second*
Total					**700** *second*				
Time successful task	**37** *second*	**23** *second*	**12** *second*	**55** *second*	**24** *second*	**44** *second*	**129** *second*	**223** *second*	**123** *second*
total					**670** *second*				

Based on the timebased efficiency formula, it can be calculated by the total time of task success divided by the total processing time of all tasks then multiplied by 100%, namely for the admin display is 276/276 * 100% and for the muzakki display is 670/700 * 100%, it can be concluded that the assessment for the admin display is 100% and the assessment for the muzakki display is 95%, based on these results it is efficient because it meets the standard of 50%.

3.4.2. System Usability Scale

Table 7. Time based efficieny of muzakki display

Respondent(R)	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	total	total * 2,5
R1	4	4	4	3	3	3	4	4	2	3	34	85
R2	4	4	4	2	4	4	4	4	4	3	37	92,5
R3	2	1	3	2	3	2	3	3	3	1	23	57,5
R4	3	3	3	3	3	4	3	4	3	3	32	80
R5	3	1	4	1	4	3	4	2	3	1	26	65
R6	4	3	3	2	3	3	3	3	3	1	28	70
R7	3	1	2	1	3	2	2	0	3	1	18	45
R8	3	2	3	3	2	2	2	3	3	2	25	62,5
R9	3	3	4	0	4	2	2	2	2	0	22	55
R10	3	1	3	1	3	2	2	2	3	2	22	55
R11	4	2	4	4	3	4	2	4	4	4	35	87,5
R12	3	3	4	4	3	3	2	4	4	3	33	82,5
R13	4	3	3	3	2	4	4	4	4	3	34	85
R14	4	4	4	4	3	4	3	3	3	4	36	90
R15	4	4	4	4	4	4	4	4	4	4	40	100
R16	3	4	4	2	3	3	3	4	4	3	33	82,5
R17	2	3	3	3	3	3	4	3	4	4	32	80
R18	4	3	2	4	3	4	2	4	4	4	34	85
R19	3	3	3	4	3	4	3	4	4	4	35	87,5
R20	3	4	3	4	4	4	3	4	3	4	36	90
R21	4	3	4	3	4	3	4	3	4	3	35	87,5
R22	3	3	3	0	3	3	4	3	3	2	27	67,5
R23	4	3	4	2	3	3	4	4	4	3	34	85
R24	4	4	4	4	4	4	4	4	4	4	40	100
R25	4	2	3	3	2	1	1	0	1	1	18	45
R26	3	3	2	4	4	4	2	4	4	4	34	85
R27	3	0	4	0	3	1	3	3	3	2	22	55
R28	2	3	4	4	3	3	2	2	3	4	30	75
R29	3	4	3	4	4	4	2	4	3	4	35	87,5
R30	3	3	4	3	4	3	4	3	3	3	33	82,5
R31	3	2	3	4	3	4	3	4	2	3	31	77,5
R32	3	3	4	4	3	3	2	4	3	4	33	82,5
R33	1	2	3	4	3	4	4	3	3	3	30	75
R34	3	4	3	2	3	4	3	3	2	3	30	75
R35	3	3	4	4	4	3	3	3	3	3	33	82,5
R36	2	2	2	2	2	2	2	2	2	2	20	50

R37	3	3	3	3	3	3	4	3	3	4	32	80
R38	4	2	3	3	4	3	2	3	3	3	30	75
R39	3	3	3	3	3	3	4	4	4	4	34	85
R40	4	3	3	2	3	4	3	3	3	3	31	77,5
R41	2	3	3	3	4	3	3	4	3	4	32	80
R42	0	1	0	0	0	2	4	4	2	4	17	42,5
R43	1	2	3	3	3	3	3	3	3	4	28	70
R44	4	4	4	4	4	4	4	3	4	4	39	97,5
R45	3	2	1	2	1	2	1	2	3	3	20	50
R46	4	3	3	3	2	3	4	3	4	3	32	80
R47	4	3	3	2	3	3	2	3	3	4	30	75
R48	4	4	4	4	4	4	4	3	4	4	39	97,5
R49	3	3	4	3	4	4	3	4	4	4	36	90
R50	4	3	3	4	3	4	3	4	3	4	35	87,5
					Score SUS							**76,75**

In table 7 above, it explains that based on the scores obtained, the appearance of the website interface of the amil zakat institution for the Admin and Muzakkir display is included in grade B with percentiles 76.75 which means that 76% of the score is included in the good category in adjective ratings, the acceptable category is marginal and the Net Promoter Score (NPC) is in the Passive category. That way it can be said that the sus score on the Admin and Muzakkir display is included in the good category and can be continued.

4. CONCLUSION

Based on the results of the research conclusions, the researcher has designed a website interface for the amil zakat institution at the Yayasan Masyarakat Muslim freeport Indonesia or YMM FI, this interface design is needed because YMM FI does not yet have a website system, a good website is to pay attention to the interface design whether it is easy to use or not. The user centered design method is the method that has been used in this research, this method has four stages.

The first is to understand the context of use at this stage the researcher has conducted interviews with YMM FI stakeholders and one of YMM FI's Muzakkir; after conducting interviews the researcher has made paint points to accommodate user complaints, then made identification of needs that have been adjusted to user needs. Specify User Requirements is the second stage, at this stage the researcher has designed a unified modeling language to describe what the system process flow will be like and create a Wireframe design as a blueprint for describing the interface to be created.

Next is the design solution, this stage is the third stage where the researcher has proposed an interface design that will be proposed, the researcher has made a Mockup and Prototype to provide a website experience to users, the last stage is evaluate against requirements, this stage is quite important, the evaluation stage is carried out based on three aspects of usability testing, namely effectiveness and efficiency. To get the value of the three aspects, researchers used the cognitive walkthrough method. The effectiveness value of the admin and Muzakkir display is 100% and 96% and the efficiency value for the admin display is 100% and for the Muzakkir display is 95%. Then to measure user satisfaction researchers have used the System Usability Scale (SUS) method and get a value for the admin and Muzakkir display is 76.75 which this value is obtained from the calculation of the average value based on 50 respondents, obtained grade B (good).

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