

A Usability Analysis of QODE: Qurbani Web Application System

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Abstract—Qurbani is an Islamic ritual animal sacrifice that is carried out during Eid-Adha; one of the two major Muslim holidays. In Indonesia, every village normally has one mosque that takes charge of organizing any related Qurbani activities, from collecting money, creating slaughter schedule, to distributing the meat for the recipients. The current management of these activities is done manually and by hand, which can potentially have errors. Therefore, this research aims to develop and evaluate the usability of a web-based application that will in part take care of Qurbani-related activities. This application is designed and developed using the Scrum methodology. The application as successfully developed and its functionalities are as expected based on design. The application was then evaluated using System Usability Scale (SUS) with 10 respondents. The application obtained the average score of 91.25 which falls into A or excellent category.

Keywords: *qurbani application, web-based, usability testing, usability analysis, system usability scale*

Abstrak—Qurban adalah salah satu acara keagamaan umat Islam yang dilaksanakan pada hari raya Idul Adha dengan menyembelih hewan qurban. Di Indonesia, prosesi qurban ini biasanya diselenggarakan di masjid desa, mulai dari pengumpulan dana qurban, pengaturan jadwal pelaksanaan, hingga mengorganisir pembagian daging qurban pada hari pelaksanaan. Pengelolaan qurban yang selama ini dilakukan masih secara manual, yang berpotensi terhadap kesalahan. Oleh karena itu, penelitian ini dimaksudkan untuk mengembangkan serta mengevaluasi usabilitas dari aplikasi web yang dapat digunakan untuk aktivitas Qurban, yang dinamakan QODE. Aplikasi web ini dirancang dan dikembangkan dengan menggunakan metode Scrum. Berdasarkan hasil evaluasi yang telah dilakukan, pengembangan aplikasi ini telah dikembangkan dengan fungsionalitas yang sesuai dengan rancangan. Selain itu, hasil evaluasi yang dilakukan dengan menggunakan Sistem Usability Scale (SUS) terhadap 10 responden menunjukkan bahwa QODE tergolong dalam kategori baik sekali dengan nilai SUS sebesar 91,25.

Kata kunci: *qurbani application, web-based, usability testing, usability analysis, system usability scale*

I. INTRODUCTION

Qurbani is an Islamic ritual animal sacrifice that is carried out by Muslims during Eid Adha; an Islamic feast that takes place on the 10th Dzulhijjah (in the Islamic lunar calendar) [1]. According to Fiqh, Qurbani is defined as a form of worship, where an animal that has to fulfill certain criteria is sacrificed and distributed to the poor [2]. The animals should be cattle, such as camels, cows, goats, and sheep. Generally, in Banda Aceh, Indonesia, the Qurbani begins right after the congregational prayer has been completed [3]. Most municipalities conduct Qurbani in the front yard of the local mosque. The mosque committee then portions the meat to distribute to those who are entitled to receive it.

Normally before Qurbani day, the residents in a certain municipality would go to the local mosque to donate cash for an animal or bring the animal in themselves.

Furthermore, on Qurbani day, local people will gather together in the mosque to participate and help during the sacrificial meat cutting process, and queue to take their ration. This way of conducting Qurbani has been limited since the Covid19 pandemic hit Banda Aceh. Mosques have been limited to visitors and other activities due to the regulations of the government. However, the mosques would still organize Qurbani in a strict setting where social distancing and health protocols are applied.

Thus, to support the Islamic ritual of animal sacrifice during the pandemic, a simple technology would be a solution to reduce the number of people coming into contact with each other within a municipality. This research aims to design and develop a simple web application that residents to register for Qurbani and the committee to manage the Qurbani. After the development is completed, the usability of this web application will also be tested.

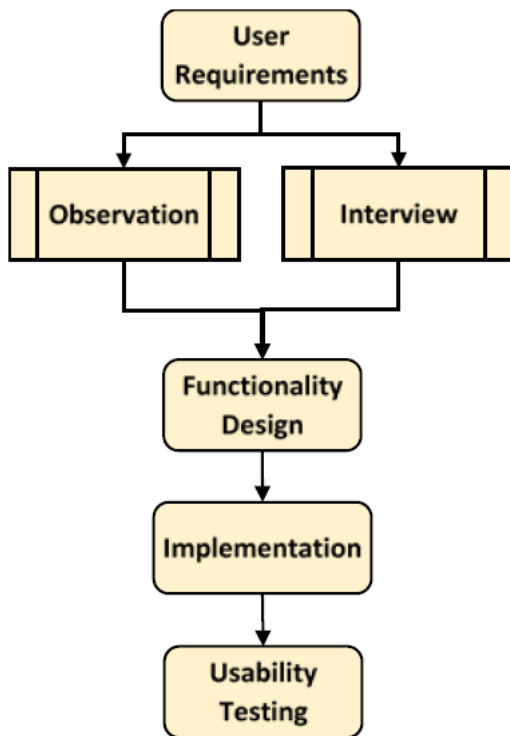


Fig. 1. Research protocol of qurban

II. METHODOLOGY

As seen in Fig. 1, this research protocol consists of four parts, namely: 1) user requirements; 2) functionality design; 3) implementation; and 4) evaluation. The user requirements conducted in this work are using qualitative research methodology. Qualitative research focuses on discovering the meaning and reasons behind phenomena and activities that take place in the daily lives of the user [4]. This methodology was chosen because this research's objectives require understanding how things work in the village office. Two user requirements techniques will be used in this work, namely observation, and interview. The data obtained from this step would be the starting point of building a simple technology that will help the employees of the village office. According to data collected from the observation and interview, the requirements can be modeled in a Unified Model Language (UML) diagram to define the functionalities of the system.

After the initial functionality design is completed, the implementation is conducted to produce the system. A bigger software development methodology is employed in this process, which is known as Scrum. Finally, the usability of the application will be measured by using the System Usability Scale (SUS) and Think Aloud Protocols.

A. Observation and Interview

Observation is the process of watching and recording a setting that is of interest that can be carried out in a laboratory or naturally in the subject's natural environment [5]. The observation being done is naturalistic observation,

in which the subject's manners and behaviors, as well as its everyday setting, are watched and recorded to provide rich data for the researchers [5]. This will allow the researcher to formulate the necessary questions for the interview session. The data obtained from observation will be confirmed by using the interview as the next technique of data collection.

The observation was carried out in the local village office of two Banda Aceh villages in Gampong Peurada and Gampong Pineung. This village office is the place where the local village government commences its daily operations, including implementing the law, governing the residents of the village, implementing development of the village, conducting community events and activities for its residents, and becoming the first point of the government body that is contacted by the residents for the marriage ceremony, births, deaths, disaster, pandemic and any other events [6]. The observation held in this research uses the AIEOU framework, where five components need to be observed: activities, interactions between the people in the observed location, the environment, the surrounding objects, and the user involved [7].

The interview is a focused interaction between two or more people to collect data [8]. In this work, the interview is conducted to confirm the data obtained from the observation period and is held by using an online video conferencing application and also a face-to-face interview. The interview will involve 2 staff members of the village office, 1 village headman, and 2 community members. These types of participants were selected using purposive sampling, where the researcher strategically chooses participants due to their nature or the objectives of the research [9]. The outputs of the interview will be used for designing the functionality in the next process.

B. Implementation Process

To implement the required functionality designed from the previous step, this work is implementing Scrum as the software development methodology, where cross-functional teams work together incrementally, and iteratively in blocks of time known as sprints [10]. In a sprint, each member of a team would be assigned to finish certain functionality of the system. Each sprint can be between at least 2 weeks long or up to 6 weeks long. This work uses 3 sprints that were 3 weeks long each. At the end of each sprint, there will be an increment of the final product. That means that this work has 3 increments, with the final one being the closest to what the user expected.

At the beginning of the first sprint, the team and users sat together to define the requirements and prioritize which requirements should be in the first iteration or the first increment of the product. These requirements are then organized in the product backlog that would be referred from time to time. Each member of the team is given tasks based on the requirements and convenes at the end of the sprint to discuss the increment of the product.

This process is continued until the final sprint.

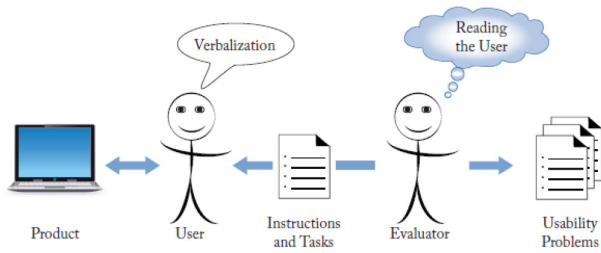


Fig. 2. Research protocol of Qoorban

The end-product is shown to the user and tested for its functionalities as well as its usability. Once completed, the team would then meet with the stakeholders and users to show the finished product. These stakeholders and users will then provide feedback for the next version of the software [10]. However, the sprints will be done within the team in this work. Additionally, to develop the system itself, Native PHP is chosen as the scripting language.

C. Usability Testing

Usability testing is when a user operates the product or software and verbalizes what he is doing to the observer. The observer will record and listen to their thoughts while operating the product or software [11]. Figure 2 explains how usability testing is set between users and testers. The user is placed in a neutral location and operates the product that is placed before him. The user is then given a series of instructions and tasks to complete. While doing so, the user will provide think aloud to the test to be recorded. These recordings will later be the basis for measuring the usability of the product. The tester will provide the tasks and instructions beforehand. These tasks and instructions reflect the test plan or the usability problems that the user may encounter [11].

1. Think Aloud Protocol: Think Aloud Protocol is one of the protocols that is usually used in usability testing that aims to dig for information from participants by asking them to verbalize their thought while they think, learn, or solve the problem [12], [13]. The protocol will be conducted in this experiment to gain feedback on what they think, do, and feel during the completion of the task application [14].
2. System Usability Scale: SUS is a Likert scale, where there is a scale from 1 to 5 that ranges from strongly disagree to strongly agree to define ten SUS questions given to the user (Fig. 3) [15]. SUS questions establish the grounds for usability, such as the need for support, training, and complexity. These factors in turn determine if the system is acceptable and valid for the users [15] based on SUS percentile rank as shown in Fig. 4.

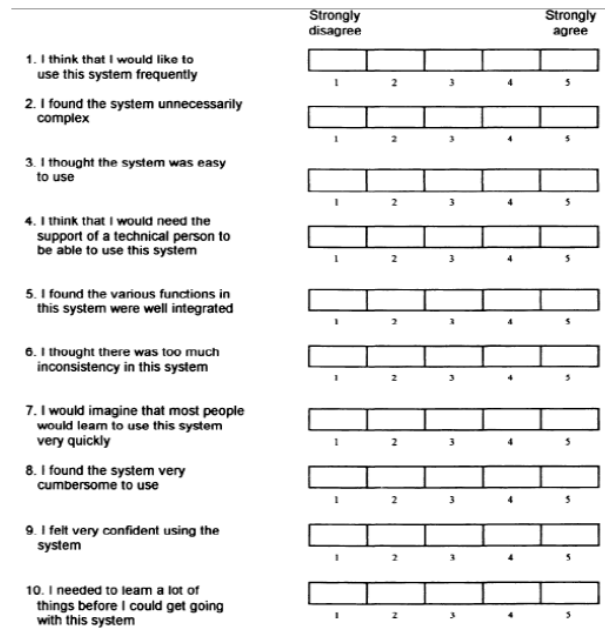


Fig. 3. Question list presented in SUS [15]

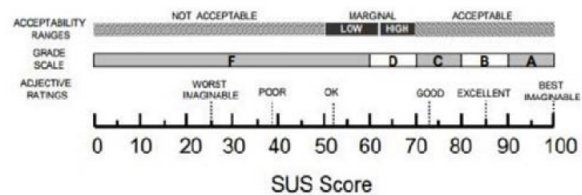


Fig. 4. SUS percentile rank [16]

III. RESULTS AND DISCUSSION

A. Collected Data

According to the observation and the interview held in two villages in Banda Aceh, it is known that there are three important parties involved in the process of organizing Qurbani, namely: 1) the committee; 2) the Shohibul Qurbani; and 3) the recipient.

1. The Committee: The committee is responsible for organizing, monitoring, and ensuring the Qurbani event runs successfully in a certain village. All the event processes, such as the registration of contributors, the procuring of the sacrificial animal, and the distribution process are the responsibility of the committee.
2. The Shohibul Qurban: The Shohibul Qurban is a group of people or individuals who contribute to the sacrificial animal themselves or simply donate the money to perform the Qurbani worship.
3. The Recipient: The sacrificial animals received by the committee from the Shohibul Qurban will be distributed to the recipients who are the villagers of a certain village.

Furthermore, several problems usually occurred at the time of the Qurbani period which are listed below:

- A long registration queue for the Shohibul Qurban
- Error during data collection of urban givers and

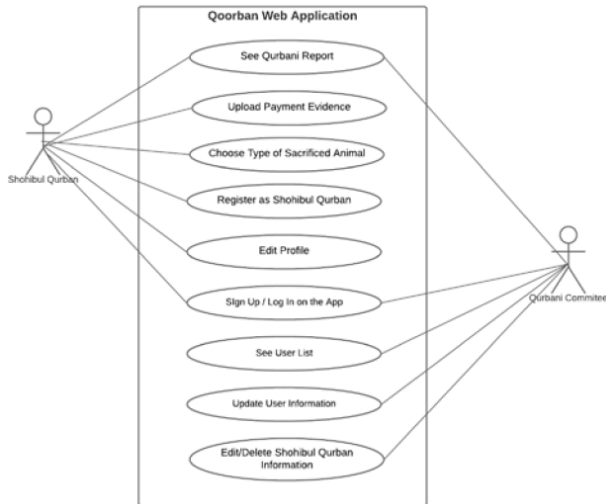


Fig. 5. Use case diagram



Fig. 6. Landing page of QODE

recipients

- Uneven distribution of Qurbani meat

B. Functionality Design

After specifying the problems, the functional design is constructed to define the general specification of the whole system to meet user goals and needs. The functionality design in this study is defined in a use case diagram as depicted in Fig. 5. In the figure, it can be seen that two users will be involved in the system, the Shohibul Qurban, and the Qurbani committee. Both users are required to have an account to access the system and play their roles. The Shohibul Qurban at first must register as Shohibul Qurban in the system, meanwhile, the committee account is set by the admin. In that role, the Shohibul Qurban can choose the type of sacrificed animal, upload the proof of payment, and edit their profile. On the other hand, the Qurbani committee has the access to see all Shohibul Qurban list registered in the system, updated their information, as well as remove their account from the system.

C. Design System

In this study, the system is designed as a web application developed in PHP native. This system is called QODE, which stands for Qoorban Desa. The designs are depicted in Fig. 6-17. As shown in the figures, QODE is



Fig. 7. Page “Hukum Qurban”



Fig. 8. Page “Tentang Kami”

implemented in Bahasa as the targeted user is Indonesian. The first-time user accesses the web, it is directed to the landing page as in Fig. 6. Users can register or log in to the system by clicking the button “Masuk” to log in, and “Daftar” to register. On the landing page, there are also two tabs on the top, namely “Hukum Qurban” which links to the page containing the Islamic law of Qurban information (Fig. 7), and “Tentang Kami” which directs to website information (Fig. 8).

As Shohibul Qurban, users need to register to QODE by filling in the registration form as in Fig. 9, or log in if the user already has the account (Fig. 10). Once it logs in, it will be directed to the Qurbani report page (Fig. 11). This page shows the report of the user. In Fig. 11 it can be seen that there is a table of the user’s transaction list. The table consists of six columns, namely “Tanggal” for transaction date, “Nama Shohibul Qurban” for the user’s name, “Jenis Hewan Qurban” for the type of the sacrificial animal, “Jumlah Bayar” for the amount paid, “Bukti Bayar” for the proof of payment, and “Keterangan” for the confirmation status confirmed by Qurbani committee. On the top of the page, there are the “Beli Qurban” tab which is used for online transactions, and “Profil” to edit the user profile, and logout. In the “Beli Qurban” tab, the user can choose the type of sacrificial animal, and it is shown with its price

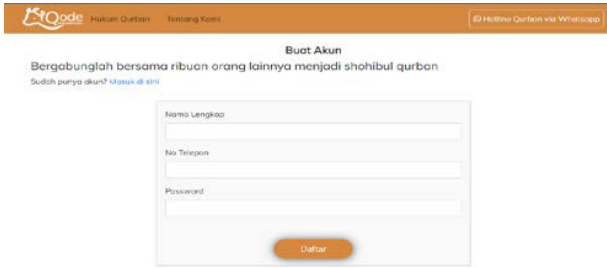


Fig. 9. Sign up page

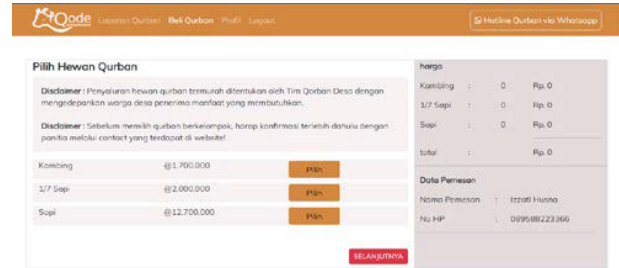


Fig. 12. Choose qurbani animal

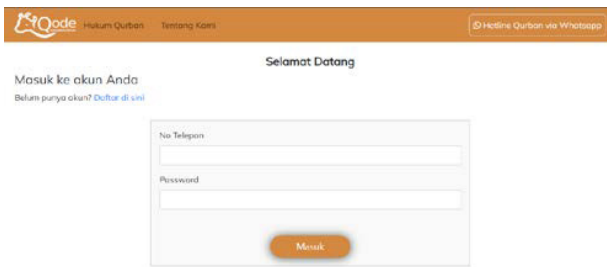


Fig. 10. Log in page

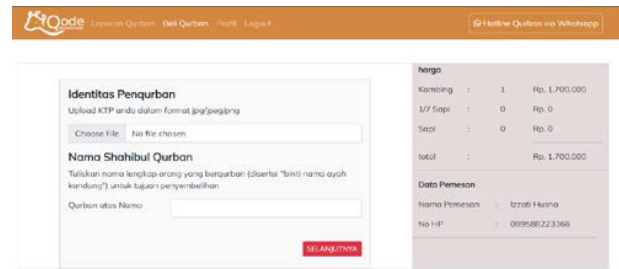


Fig. 13. Form to buy qurbani animal

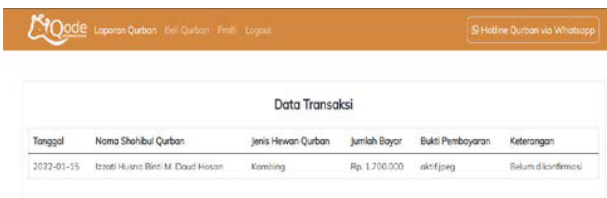


Fig. 11. Qurbani report page accessed by shohibul qurban

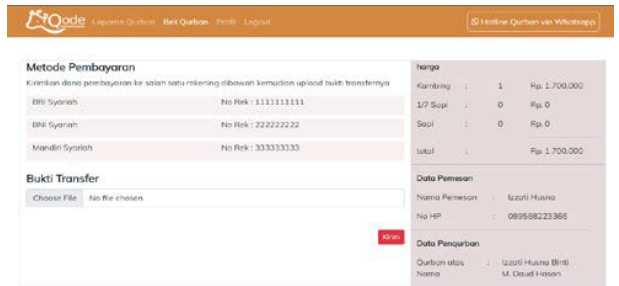


Fig. 14. Transfer the receipt page

(Fig. 12). On the right side of the page, there is also the detail and the total order. To complete the order, the user must click the “Selanjutnya” button with the red color, and it is linked to the page in Fig. 13. On this page, the users have to fill in the identity form, upload the identity card, and click the red button to continue to upload transfer proof as in Fig. 14. The Shohibul Qurban can edit their profile from the “Profil” tab on the top and it is directed to the page as seen in Fig. 15.

Fig. 16 and 17 shows the page that can be accessed by the Qurbani committee, which are the “Pengguna” tab and the “Laporan Qurban” tab. Once the committee logs in to the system, they will be directed to the “Pengguna” page to view the user list of the Shohibul Qurban. The committee can also make changes to the registered users and delete their profiles. On the “Laporan Qurban” tab, the committee can see the list of the Shohibul Qurban that already donate to the event and their detailed information. From the table in Fig. 17, it can be seen that the committees have to confirm the donation after the Shohibul Qurban transaction is done by clicking the “Konfirmasi” button.

D. Usability Results and Think-a-Loud Findings

The usability testing was conducted with 10 people via online video conference. The participants were asked to complete some tasks both as Shohibul Qurban and Qurbani committee, then fill out the SUS questionnaire as

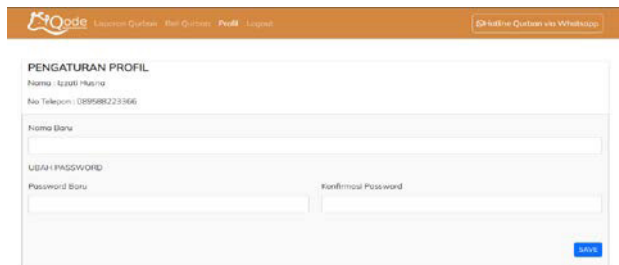


Fig. 15. Profile page

well as being part of the think-a-loud protocol. The SUS results are exhibited in Table 1. As can be seen in the table that the average score of the system is 91.25. According to the SUS percentile rank in Fig. 4, the system is in the grade scale A.

IV. CONCLUSION AND FUTURE WORKS

To conclude, QODE was successfully developed for its version. QODE was developed using the Scrum methodology and was designed using the native PHP language. Its average usability score was 91.25 which falls in the excellent category according to Fig. 4. This suggests that the application was designed according to what was obtained in the observation and interview phase. This result also suggests that the QODE has the minimum

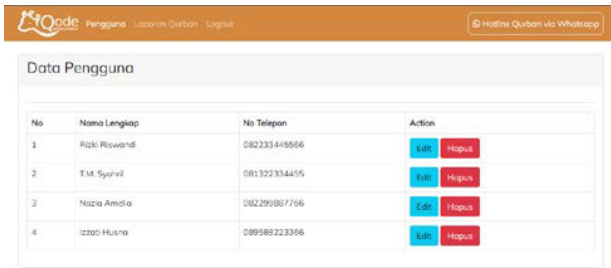


Fig. 16. User list page

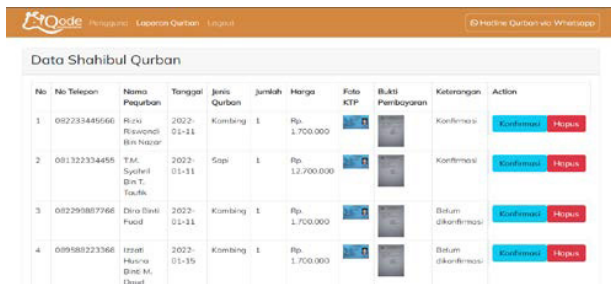


Fig. 17. Qurbani report accessed by committee

viable product. Further research that can be carried out for QODE is to develop a mobile application version and test its usability by using other methodologies.

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Tabel 1. SUS results

Respondent	SUS Score
1	90
2	70
3	100
4	95
5	77.5
6	90
7	92.5
8	100
9	97.5
10	100
Average	91.25

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