



Development of a WhatsApp-based Website Portal as a Communication Medium between Schools and Student's Parents

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ABSTRACT

Parental involvement is one of the important factors in supporting students' learning. Good communication between schools and parents can support learning and identify students' needs. One of the most common forms of communication between schools and parents is through the distribution of announcements/invitations to parent-teacher meetings and the provision of student permission slips. However, at SDN Wirogunan 01, this is still done using paper flyers that have to be distributed in person or through a class WhatsApp group. This method is considered ineffective, even though it is done through a WhatsApp group, because there is a risk that the group may not be opened or messages may be buried. Therefore, there is a need for a system that can minimize these risks. This study aims to develop a system using Python3 Flask programming language, MySQL as the database, and a WhatsApp gateway as the connection between the website portal and the WhatsApp application. The system design will use Rapid Application Development (RAD) because of the dynamic website portal development and relatively fast process. The objectives include enhancing the distribution of announcements and student permission slips through WhatsApp and integrating them directly into the information system. To assess the system's feasibility and usability, system usability testing will be conducted using the System Usability Scale (SUS). The expected outcome of this system is to improve communication between schools and parents by enabling efficient distribution of announcements and permission slips. By leveraging technology and streamlining the process, important information can be effectively delivered and seamlessly integrated into the school's information system. This system has the potential to enhance parent-school communication and contribute to better support for students' learning.

Keywords: *Online Announcements, Online Permits, WhatsApp Gateway.*

1. INTRODUCTION

There are several factors that play a crucial role in supporting student learning, and one of them is parental involvement [1]. Effective communication between parents and teachers is an essential aspect of parental involvement as it enables parents to understand the appropriate ways to support their child's learning process and address their individual needs. This, in turn, has a positive impact on the student's motivation to actively engage and achieve academic success.

In the context of communication between schools and parents, common forms include sharing information about student development and inviting parents to parent-teacher meetings. Conversely, parents often communicate with schools by submitting permission

letters when their child is unable to attend learning activities [2]. However, the current method of relying on students to deliver messages to their parents has its limitations and may result in important information being missed.

The emergence of the COVID-19 pandemic, declared as such by the World Health Organization (WHO) on March 11, 2020, has had a significant impact on various sectors, including education [3]. In response, Circular Letter No. 4 of 2020 was issued on March 24, 2020, mandating remote learning to prevent the spread of COVID-19. Consequently, strengthening communication between schools and parents has become even more crucial, as successful distance learning heavily relies on effective cooperation between parents and teachers [4].

Utilizing WhatsApp as a communication tool in education has proven to be highly beneficial, keeping up with the demands of the modern era. WhatsApp provides an effective means of communication, allowing teachers to share information, announcements, and reminders regarding assignments, even outside the physical school environment [5]. Given its ability to facilitate communication activities, particularly in the current era of globalization, WhatsApp usage is highly recommended as an information medium in the Indonesian educational context [6] [7].

Therefore, the purpose of this research is to develop and test the feasibility of a website-based information system that can assist schools and parents in delivering crucial information. Building upon previous research that utilized an SMS Gateway for message exchange via a website [2], this study focuses on developing a WhatsApp-based system, considering the increasing popularity of WhatsApp. The official WhatsApp website highlights various features that support the creation of a website portal as a communication medium between schools and parents, including the ability to send messages in the form of photos, videos, and other documents. This development, leveraging the features offered by WhatsApp, marks a significant departure from previous research that primarily relied on SMS for text-based communication. By incorporating a WhatsApp Gateway capable of sending, receiving, and processing WhatsApp messages, the researchers aim to enhance communication through a website-based application.

2. REVIEW OF THEORY

2.1. *WhatsApp-based Information System using API and Chatbot*

The information system using API and chatbot is a system that allows users to interact with applications or services through a text or voice-based user interface. Chatbot is a computer program that can interact with humans through text or voice messages and can be used for various purposes such as customer service, ticket purchasing, hotel reservations, and so on [12].

The information system using API and chatbot has several advantages, such as increasing user engagement, speeding up transaction processes, and reducing operational costs.

2.2. *The Important Role of Parents in their Child's Education at Elementary School*

Parental involvement is one of the most important factors in achieving maximum learning outcomes for children [13]. Parental involvement includes roles in supporting their children's education, there are four roles of parents during distance learning, namely as a home

teacher, facilitator (as a means for their children's learning), motivator (providing support to their children), and influencer (someone who can provide influence) [14].

3. RESEARCH METHODS

3.1. *Hardware and Software*

Hardware and software are important factors that affect the success of research. In this study, a Virtual Private Server is required to make the website portal accessible via the internet. The minimum specifications that can be used are: 2GB RAM, 1 Core CPU, and 100GB HDD/SSD. Meanwhile, the operating system used to run the website portal is Linux Ubuntu version 18.04 or higher with support for other applications such as Python version 3.7 or higher, MySQL DBMS, and a Web Server (Nginx / Apache).

3.2. *Research Data*

The research was conducted by conducting a semi-structured interview. An interview is a meeting of two people to exchange information and ideas through questioning and answering, so that meaning can be constructed in a certain topic [11]. Feasibility testing was carried out by distributing a questionnaire consisting of 10 questions from the System Usability Scale (SUS) template.

3.3. *Research Flow*

The type of research used is research and development (R&D). The research and development method is a research method used to produce a specific product and test the effectiveness of that product [11].

3.3.1. *Requirement Gathering*

At this step, a discussion is held between the developer and the client to discuss the necessary features, timeline, and maximum budget that the client can allocate. If both parties agree, then it can proceed to the next step.

3.3.2. *System Design*

The prototyping stage is carried out after the requirements planning has been obtained. At this stage, the developer will create an application quickly with the features and functions that may be needed. The prototype results will be presented to the client to identify which features and functions are required or not required by the client. After the prototype results are presented to the client, the developer will redesign the prototype based on the feedback given by the client.

This stage will be repeated until the client has given approval for the finalization of the product.

3.3.3. Implementation

After the client has given approval for the finalization of the product, the features and functions will be reviewed again by the client to ensure that the product meets their desired requirements. At this stage, it is possible to conduct testing if necessary.

3.4. Research Framework

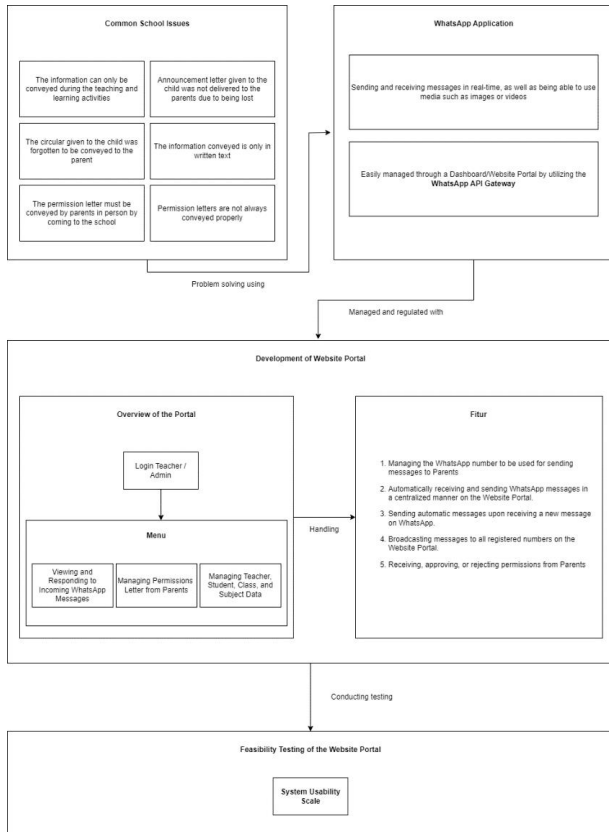


Figure 1 Research Framework.

3.5. Usability Test

After the website portal has been implemented, a feasibility test will be conducted using the System Usability Scale (SUS). The questions can be seen in Table 1. To calculate the value of the 10 System Usability Scale (SUS) questions, refer to Formula 1. And to interpret the SUS value, refer to Figure 2.

$$SUS = [(Scores_{OddNumbers} - 1) + (5 - Scores_{EvenNumbers})] * 2.5$$

Formula 1 The Formula for Calculating System Usability Scale Score.

Table 1. System Usability Scale Questions

| No | Question |
|----|--|
| 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. |

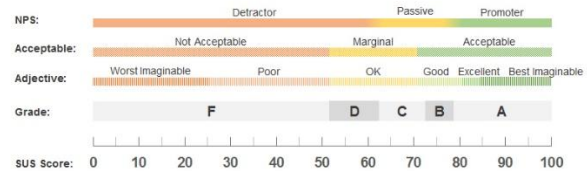


Figure 2 System Usability Scale Grade Scale.

4. RESULT AND DISCUSSION

4.1. System Development

In the system development phase, the system design was carried out by creating Entity Relationship Diagram and Wireframe of the Website Portal that will be developed. An ERD (Entity Relationship Diagram) is used to map out the relationship between tables, that will making it easier to develop a website portal.

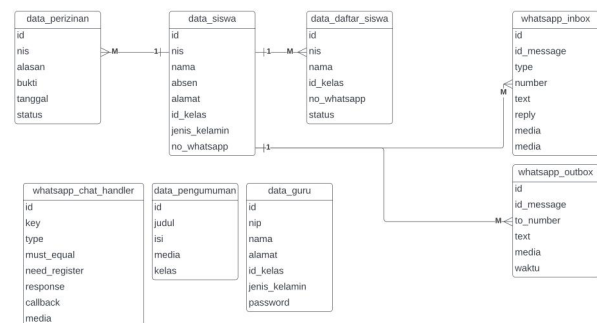


Figure 3 Entity Relationship Diagram.

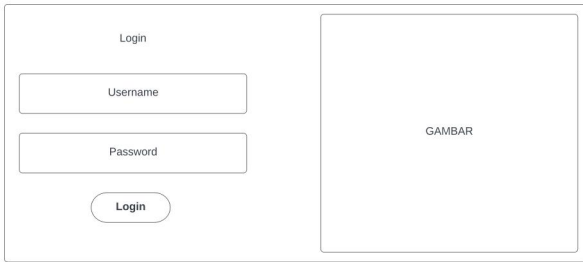


Figure 4 Login Page Wireframe



Figure 5 Content Page Wireframe.

4.2. System Implementation

When users first access the website portal, they will be directed to the login page as shown in Figure 6. After entering a valid username and password, the website portal will direct the user to the dashboard and they can access all the features on the website portal.

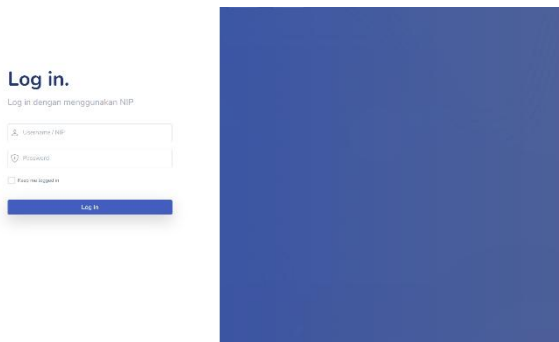


Figure 6 Login Page.

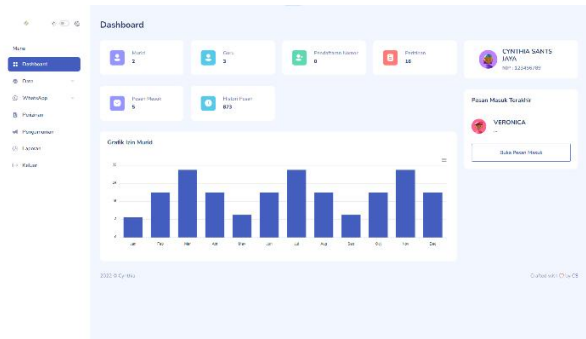


Figure 7 Dashboard Page.

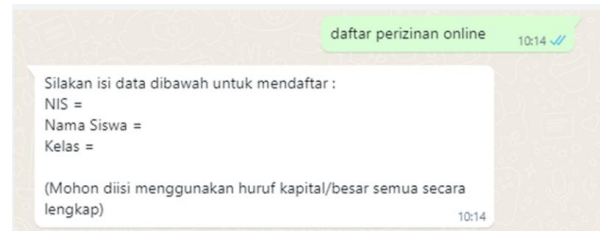


Figure 8 Register to Chatbot.



Figure 9 Request for permission to be absent from school through chatbot.

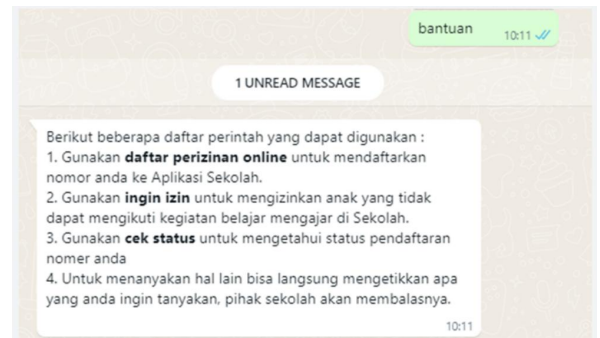


Figure 10 Help command chatbot.

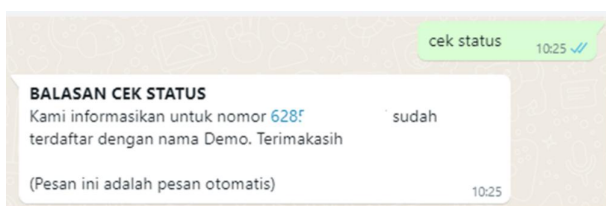


Figure 11 Check status through chatbot.

4.3. System Usability Test

This study involved 20 participants, including 5 teachers and 15 parents. The researcher collected data by administering a System Usability Scale (SUS) questionnaire consisting of 10 questions to all 20 respondents. The obtained data is presented in Table 2.

From the assessment of 20 respondents in Table 2, an average score of 92.125% was obtained. Thus, if matched with the grade scale in Figure 2 that already used by [15], it can be categorized as NPS Promoter, meaning that the respondents are willing to recommend the researcher's website portal to other parents. The website portal also received an "Acceptable" rating, indicating that the website portal is acceptable and suitable for use by the respondents. The Website Portal also received an Adjective Rating of "Best Imaginable", which means that the respondents gave a perfect score for the website portal. Based on these three aspects, it can be concluded that the website portal received a grade of "A".

Table 2. System Usability Scale Feasibility Test Results

| R | SCORE / QUESTION | | | | | | | | | | SCORE |
|----|------------------|---|---|---|---|---|---|---|---|----|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| 1 | 4 | 1 | 5 | 1 | 4 | 2 | 4 | 1 | 5 | 2 | 87.5 |
| 2 | 5 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 5 | 2 | 92.5 |
| 3 | 5 | 1 | 4 | 2 | 5 | 1 | 4 | 1 | 5 | 2 | 90 |
| 4 | 5 | 1 | 4 | 2 | 4 | 1 | 4 | 1 | 5 | 2 | 87.5 |
| 5 | 5 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 5 | 1 | 95 |
| 6 | 5 | 1 | 4 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 97.5 |
| 7 | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 1 | 4 | 2 | 92.5 |
| 8 | 5 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 4 | 2 | 90 |
| 9 | 5 | 1 | 5 | 1 | 5 | 1 | 4 | 1 | 5 | 1 | 97.5 |
| 10 | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 1 | 4 | 1 | 95 |
| 11 | 4 | 1 | 4 | 2 | 5 | 1 | 4 | 1 | 4 | 3 | 82.5 |
| 12 | 4 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 4 | 2 | 87.5 |
| 13 | 5 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 4 | 1 | 92.5 |
| 14 | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 1 | 4 | 1 | 95 |
| 15 | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 1 | 4 | 1 | 95 |
| 16 | 5 | 1 | 4 | 2 | 5 | 1 | 5 | 1 | 5 | 2 | 92.5 |

| | | | | | | | | | | | |
|----|---|---|---|---|---|---|---|---|---|---|------|
| 17 | 5 | 1 | 5 | 2 | 5 | 1 | 5 | 1 | 5 | 2 | 95 |
| 18 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 5 | 1 | 100 |
| 19 | 5 | 1 | 4 | 2 | 5 | 1 | 4 | 1 | 5 | 2 | 90 |
| 20 | 4 | 1 | 5 | 2 | 5 | 1 | 4 | 1 | 4 | 2 | 87.5 |

5. CONCLUSION

Based on the research, the WhatsApp-based School Web Portal effectively delivers real-time information and enables convenient parental permission granting. However, the Portal Website has limitations, including the inability for parents with multiple children in the same school to use the same WhatsApp number for registration. Manual WhatsApp number verification and the requirement for Android or iOS-based smartphones for permission granting are additional constraints.

With a feasibility score of 90.5% from teachers, 92.67% from parents, and an overall score of 92.125%, this web portal proves to be feasible and valuable in addressing common challenges faced by schools and parents in information delivery and parental permission communication.

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