

Development of 'Sejadah Pintar' using Design Thinking Process Model

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Abstract: The *Sejadah Pintar* is a device that can count the number of *rakaat* in prayers. This product can help to reduce the problem of forgetting number *rakaat* in prayers. This product will produce the output at every time the prostration is performed in the prayer. Two times of the prostration will produce one *rakaat* and the amount of *rakaat* will increase at every two times the prostration movement is done. Determination of components in the circuit were performed and drawn using the Proteus 8 Professional software. This study was focused for the adults aged 30 years and over to assist in fulfilling their prayers. Methodology selected for implementing this project using the Design Thinking Process model. The push plate switch is used as a signal probe for the prostration movement and the 7segment display is used to display the number of *rakaat* in the prayer. The Arduino Wemos D1 Micro controller is used to control the entire circuit. As a result of this project, it was achieving the desired output. In conclusion, this product can help the adults aged 30 years and over who often face the problem of forgetting number *rakaat* in prayers besides, can improve the quality of their prayers.

Keywords: Device To Count The Number Of *Rakaat* In Prayers, Arduino Wemos D1, Application On The Smartphone

1. Introduction

Prayer worship is a foundation and a pillar of all kinds of worship in Islam. The size of a person's strong hold and his religious understanding can be generally assessed through his understanding of the importance of prayer and daily prayer practice. According to Ismail (2010) Rasullullah insisted that the prayer was a pillar of religion and that anyone who left it was actually demolished. According to Che Mood, Mohd Zainal Abidin, Ab Rahaman, Mohd Aminuddin, Mohd Bisri, Nurul Huda & Ali. (2012) prayer worship is a mass of worship that brings the servant closer to his Lord and the strong bond of

being with his creator. According to Shari'ah the prayer can be defined as "some words and deeds that begin with the interpretation and are greeted with greetings and with the terms specified".

The perfection of prayer is also very important in performing prayers including the number of rakaat performed in one prayer time. This is because, sometimes the number of prayer prayers performed is insufficient or even beyond the prescribed prayer time. This problem is caused by Alzheimer's disease which is a disease commonly referred to as dementia. This suggests that brain disorders and a phase in which short-term memory impairment is caused by Alzheimer's disease (Varghese, Tinu, Sheelakumari, James, Jija, Mathuranath, 2013). According to Widiastuti (2009), patients with Alzheimer's disease will experience behavioral changes due to the disrupted nervous system and disruption of daily routine activities. In addition, brain disorders also cause a decline in all senses such as the individual's vision, memory and identity. This causes problems for the emotions of the individual and his or her family

1.1 Problem statement

For the past two and three decades we have been seeing diseases that can be contagious at various stages of life. At an early age, young people should not be exposed to the disease that is common in older people 60 years and older. Women are more likely to develop Alzheimer's disease than men (Samiadi, 2018). The development of diseases such as Alzheimer's is widespread among adults over the age of 30 due to work or mental health problems. The disease is common in young people due to genetic or genetic factors. In addition, nutrition is also considered a contributing factor to Alzheimer's disease today.

An early symptom that a patient may notice is a lack of ability to remember or learn something new. It is also related to the development of Alzheimer's disease that initially occurs in the brain which is involved in the learning process. According to Allert Noya (2017), Alzheimer's symptoms at a young age have some symptoms such as memory loss, difficulty in finding the right words, difficulty remembering time and place, and difficulty making decisions and difficult tasks or tasks. This is especially true when the researcher associates the cause with the person having trouble forgetting the prayer performed. In this regard, Muslims in Malaysia who mistakenly believe that prayer is overrated or undervalued should be reconsidered (Firdaus, n.d.).

1.2 Research objective

The objective of this study to:

- i. To develop a method that can calculate the amount of rakaat in prayer
- ii. To test the functionality of a prayer that can calculate the amount of rakaat in prayer

2. Purpose of Study

The purpose of this product was designed and developed to solve the problems that are often encountered by users over the age of 30 who have Alzheimer's disease when performing prayers. For example, the problem of forgetting the *rakaat* count in prayer. This product is a *rakaat* counters tool that works to detect *rakaat* counts in prayers. The product is also aimed at introducing more effective, quality innovation products and facilitating user experience. In addition, this product can help reduce anxiety and increase concentration while performing prayers. In addition, this product also enhances its functionality in delivering products to users such as communicating the amount of cakes through smartphones.

3. Methodology

In developing a quality and beneficial product, then the selection of a good methodology plays a very important role (Basri, 2015). After doing more in-depth research, the researcher chose to use the

prototype model as a product design development guide for *Sejadah Pintar*. This model was chosen because the work procedure fits well to the design phase for *Sejadah Pintar*.

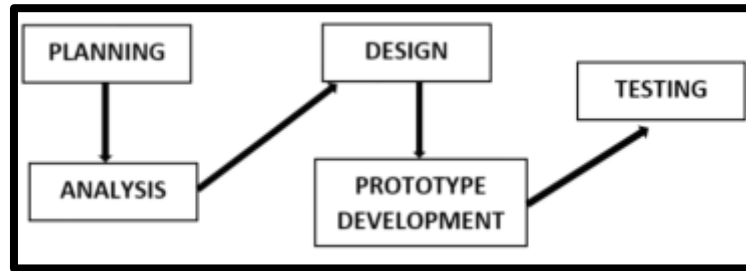


Figure 1: Prototype development model.

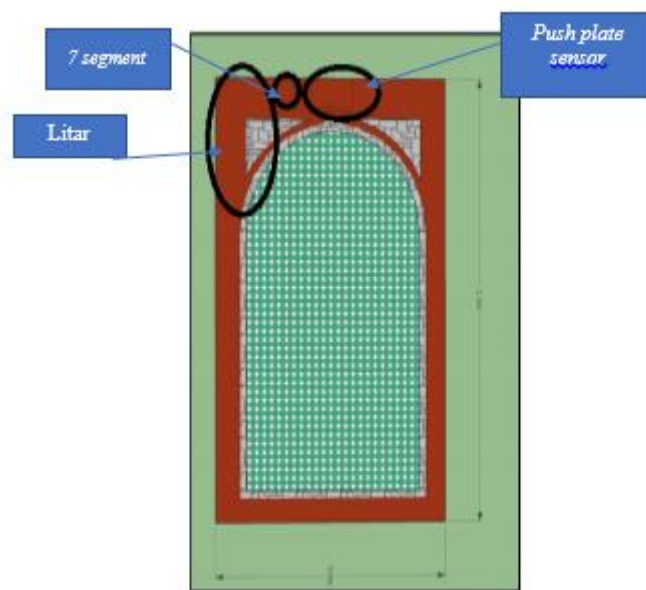


Figure 2: Top view of *Sejadah Pintar*

3.1 Flowchart of *Sejadah Pintar*

The flowchart of the prototype of *Sejadah Pintar* shows the appearance of the actual function which provides display rakaat number after done *solat*. The flow chart of the development product process using Arduino Wemos D1

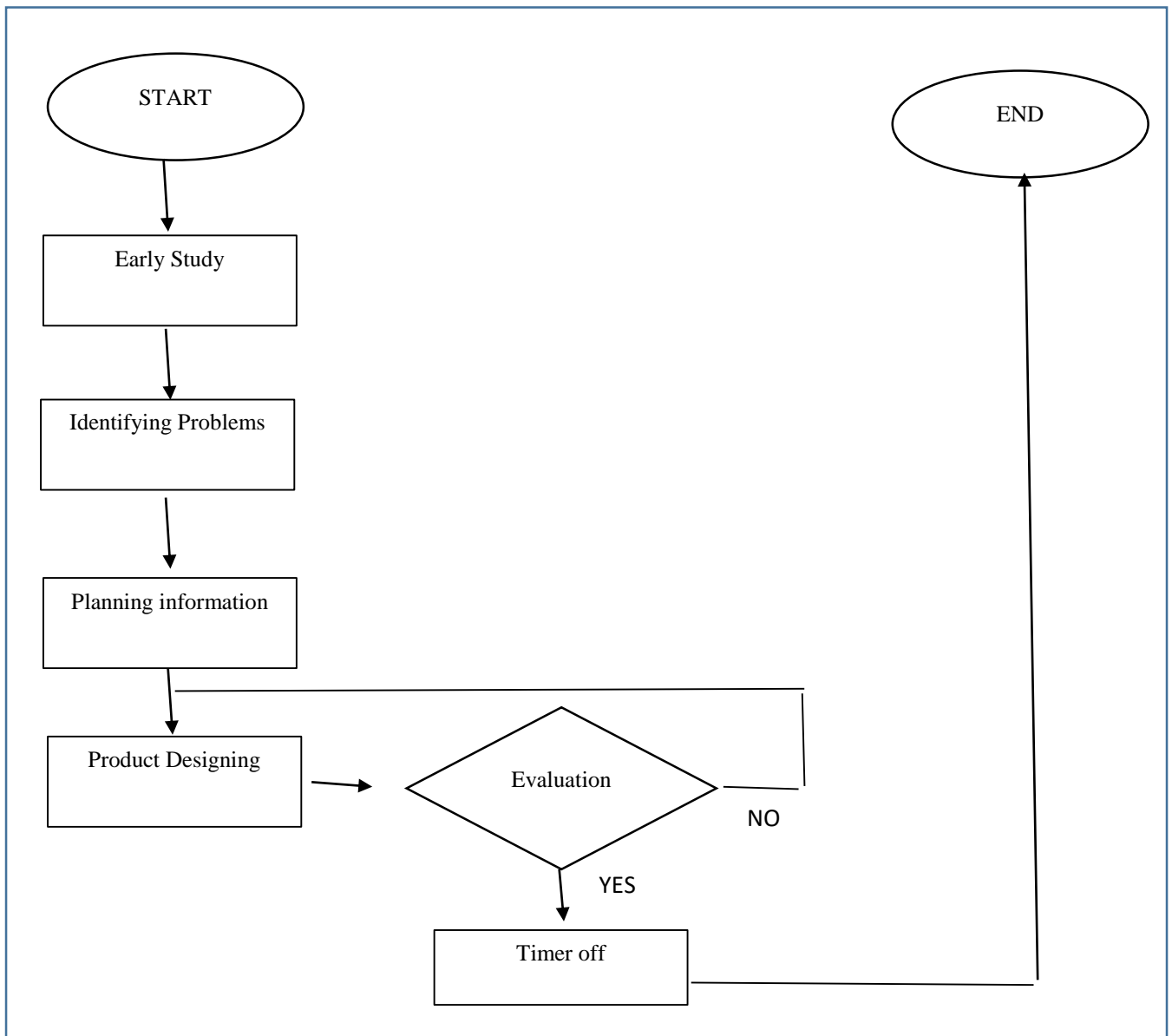


Figure 3: Flowchart of *Sejadah Pintar*

3.2 Research Instrument

The product evaluation checklist is an instrument developed by the researcher to evaluate the functionality of the prototype of *Sejadah Pintar*. Furthermore, this product evaluation checklist was distributed to those who are experts in the related field. Researcher distributed this product evaluation checklist to three experts.

The product evaluation checklist contains questions related to the prototype of *Sejadah Pintar* which is about the design aspect, suitability aspect, functionality aspect and suggestion for the *Sejadah Pintar*. Besides, the researcher used the nominal scale for this evaluation checklist which is Yes and No. Plus, there are also open questions in this evaluation checklist.

4. Results and Discussion

The design produced is compatible for the use of adults over 30 years of age. The position of the generated circuit will be placed at the top left and hidden in the *Sejadah*. The zip is attached to the back of the socket for the purpose of placing the circuit and ensuring the safety of the circuit from exposure. Design analysis is done to ensure that the design developed is appropriate and safe to use as planned. Figure 4 shows a design drawing of the product's development using Sketchup software and Figure 5 shows the prototype of the product.

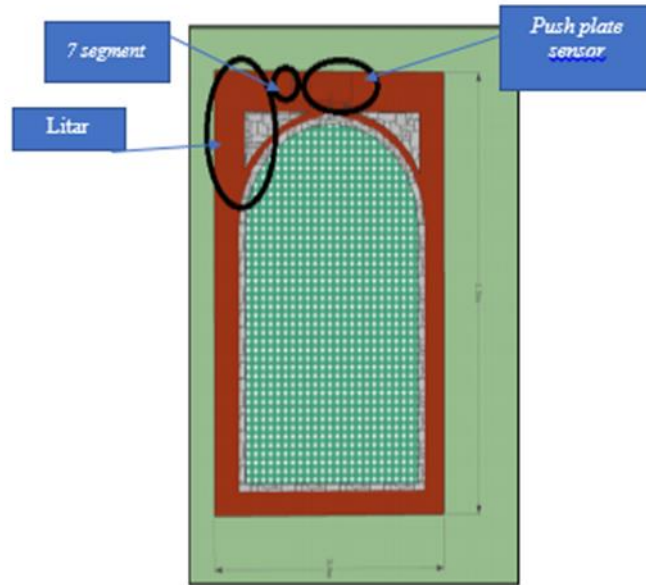


Figure 4: A design drawing of the product development using Sketchup software



Figure 5: The prototype of the product

4.1 Analysis 7 segments display

The display will function and display the number 8 when supplied with power, as shown in Figure 4. This shows that each foot of the 7 segments works well. If a power supply is provided but the 7-segment LED does not turn on, it means that the 7-segment legs are damaged.



Figure 6: The display will function and display the number 8

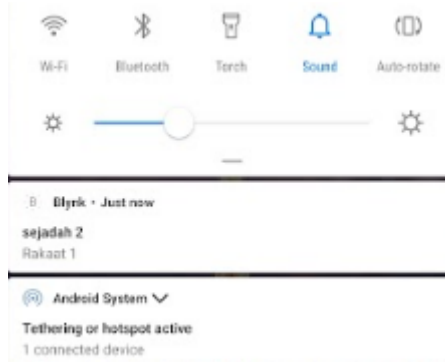
Table 1 shows the results of the analysis of 7 segments display when the push plate sensor is pressed.

Table 1: Display segment analysis 7

Segments display							Display	
a	b	c	d	e	f	g	0=HIGH	1=LOW
1	1	1	1	1	1	1		



0 1 1 0 0 0 0



Sending notifications to the phone

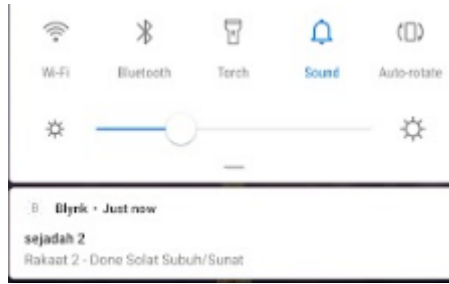
1st Rakaat

1 1 1 1 1 1 1



1 1 0 1 1 0 1





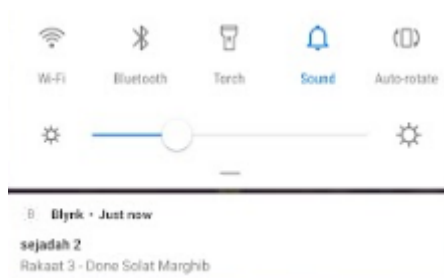
Sending notifications to the phone

2nd Rakaat

1 1 1 1 1 1 1



1 1 1 1 0 0 1



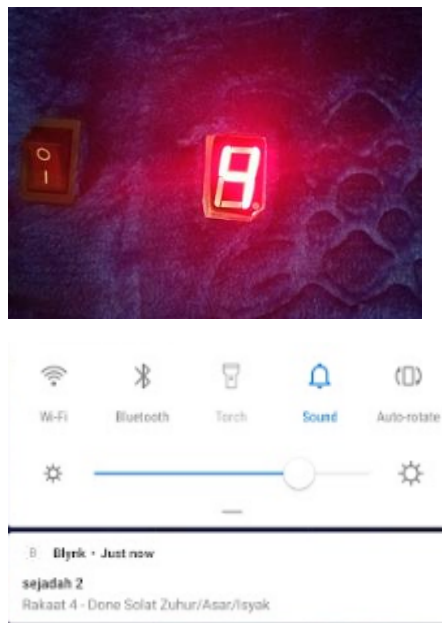
Sending notifications to the phone

3rd Rakaat

1 1 1 1 1 1 1



0 1 1 0 0 1 1



Sending notifications to the phone

4th Rakaat

Creating a product requires careful planning and order for the process to go smoothly. Based on this discussion, researchers can find out the advantages and disadvantages of producing the product. The discussion is based on the objectives of the study. During the development of this product, there are some difficulties in obtaining good results. The difficulty of this product development is in making a translation. The code used encountered an error when it was included in the arduino software. However, researchers are trying to create new codes for good results. A variety of codes before reaching the best results. Also, the components used are often replaced because of the suitability of each component. For example, initially the nano microcontroller was used in the development phase, but this micro controller cannot accommodate the 7-segment display because this type of micro controller can only handle small components. Therefore, the researcher has converted the Arduino nano-type micro controller to Arduino Wemos.

Besides, ultrasonic detector planning is used to detect prostrations in the early stages. However, there are some errors when using this type of detector. Using this type of detector, a problem occurs if the long-received prosthetic signal causes the detector to continue reading the prostration signal and the

display on the 7-segment continues to rise. Therefore, to solve the problem the researcher has transferred the ultrasonic detector to the push plate sensor as a component to detect the movement of the prostrate in prayer.

5. Conclusion

The production of this Sejadah Pintar prototype includes design phase, development phase and testing the functionality. At the stage of design, material selection and appropriate devices to guarantee the success of the prototype is done. Design phase at the outset to do the next process, namely the development phase of the prototype. Development of the prototype includes developing the circuit, developing a hardware prototype and the development of applications on the phone. The prototype development phase took some time and research should be focused on security while the development of this prototype was carried out. Although the prototype produced has achieved its objective, this prototype still needs to be improved from the aspect of the hardware design, circuit design and application design so as to guarantee the quality of this prototype. Overall, the prototype was produced and the intended functionality of Sejadah Pintar is verified by experts.

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