

Android Application for Baby Immunization Schedule

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Abstract: In this era, the usage of android phones is increasing. It is undeniable that people are more helped with the existence of mobile phones. It supports many aspects in life including health, for instance can be utilized to help patient, doctor, and government in coordination. Besides, it can decrease cost, time, and distance limitations. Most importantly, it can be the solution for the government immunization program. It is infrequently find out that both parents are working in the urban areas. Sometimes, this situation leads them ignore in taking care of their children. Therefore, an android application (app) for immunization would be very helpful, especially for parents in urban areas for providing a basic immunization schedule and its related information. The development of the app would be discussed further consisting the method, designs, and views of the app.

1 INTRODUCTION

Immunization is important for a person to fight against any dangerous deadly diseases, especially for children health's problems. The Indonesian government pays attention to this by carrying out several activities. One of them is by providing a practical handbook of immunization, and also doing socialization (Kemenkes RI Website, 2017). Immunization is usually given for several diseases in children on their early age, but it is depending on the type of immunization. Several types are not adequate if it is only given once thereby it should be done gradually. In fact, immunization still has great definitions that require a guide for parents to make well-implemented action.

According to data on Indonesian's health profile from the ministry of health, immunization coverage in Indonesia is 91.58%. Mandatory immunization coverage are 93% for measles, 92.2% for polio, 93.3% for DPT, 87.5% for hepatitis B, and 93% for BCG (Kemenkes RI, 2017). It means that most of immunization in Indonesia has reached more than 90% of target. Then, there are also few mandatory immunizations, which are still below 90%. The reason may be derive from the geographical obstacles because the program has not reached all areas. However, this situation still can be improved.

There are many things affecting immunization in this modern era. Mobility, as the example, has a high number in urban area due to the various needs of life. This also faces higher possibility of increasing congestion (Wijaya, 2018). Then, it is no infrequently find out both parents are working due to high cost of living. Furthermore in this global era, there is also an increasing number of career women especially in Surabaya (Laksmiwati, 2018) which can also support the case. The possibility is the parent leaving the children with baby sitter or nanny. This situation leads their ignorance of taking care children and incidentally forget the children's immunization schedule.

A practical handbook of immunization, which has been socialized, is focusing on maternal and child health titled "*Buku Kesehatan Ibu dan Anak*", abbreviated as BKIA. This book is provided by the government and expected also to help patient, doctor, and government. However, the risk of using a kind of book also needs to be considered because the use of paper may be wet due to water. It might be not practical because it could be left behind or missing. Due to this problem, mobile phone is more useful to be implemented. Moreover, many practical works could be done easily in one hand using mobile phone, which widely used by people in daily activities. Thus, additional practical handbook is built in android based mobile phone, for example, mDROID system is designed for health workers

(Kansal, 2014). This present study invention tries to follow this trend by making android application (app) for immunization. It is expected to provide a basic immunization schedule and its related information. Therefore, it would be very helpful, especially for parents in urban areas.

The purpose of the application is giving information about several mandatory immunizations and its schedule for children. It will be the guidance for parents as another form of practical handbook of immunization as well as help the government in succeeding their immunization program.

2 METHODOLOGY

This android application of immunization was analyzed and designed using Unified Modelling Language (UML). Thus, the designs were implemented using java-programming language in Eclipse Integrated Development Environment (IDE).

2.1 UML Diagram

Unified Modelling Language (UML) could be used for visualizing, specifying, and designing a program. It also has capability to connect with many programming languages, such as Java (Lethbridge, 2001). UML itself could be used to make different kinds of diagrams, for instance in smartphone development which can be used up to nine diagrams (Wang, 2011). Meanwhile, in this research only used three important diagrams, namely case diagram, activity diagram, and class diagram.

The use of case diagram shows the functionality of the application and the interactions of the system with the user. Besides, it can be used to describe the user's requirements and show the system process. It also contains an actor, and use case component which is represented in Figure 1. It shows that the user is able to access schedule, information, "QnA" (Question and Answer) of immunizations for a child. Then, there is also a view for further request about the application.

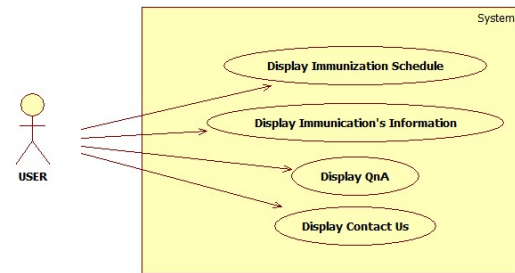


Figure 1: Use Case Diagram

Activity diagrams for this android application is used to describe the flow of various activities in using the application, how each flow begins, when decisions are made, and how the application ends. Activity diagrams also describe parallel processes occurred in some activities. An activity can be realized by one or more cases, which have been shown at use case diagram. An activity describes the running process, while the use case describes how the actor uses the system to perform the activity (Fowler, 2004).

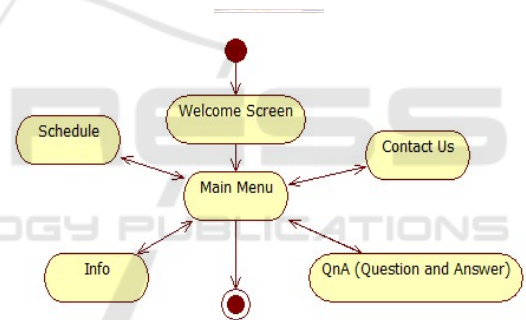


Figure 2: Activity Diagram

In Figure 2, the diagram activity presents the navigation of user interfaces in the android's application. After the application starts, it has a welcoming screen as a splash screen. After that, the main menu will be launched and the user can go to any other four views. They are schedule, information, "QnA" (question and answer), and about. The user is able to choose their interest view. Then, they can go back to the main menu.

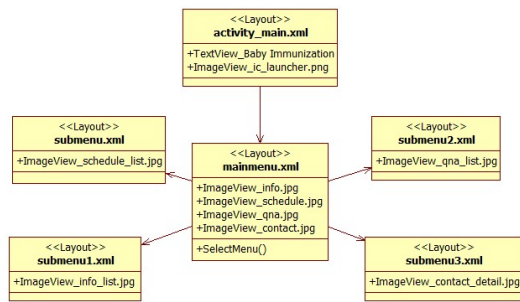


Figure 4: Class Diagram

Class diagrams are the visualization of the classes of a system, which categorized as the most widely used types of diagrams. This diagram shows the relationships between classes and details of each class in a system. The class object has three main fields, namely class, attributes, and operations. The name of class serves to give an identity to a class. The function of the attribute is to show the data belonging to a class. Lastly, operation is to assign any functions and procedures designed for the class (Wang, 2011).

There were 6 layouts in the designed application: (1) *activity_main.xml* which was shown for welcome screen; (2) *mainmenu.xml* for main menu; (3) *submenu.xml* for the immunization’s schedule; (4) *submenu1.xml* for information view; (5) *submenu2.xml* for question and answer view; (6) *submenu3.xml* for a view.

2.2 Java Android Programming

Java Android programming language, used in this work, is a programming language that can be run on various computers including mobile phones (Mednieks, 2012). Meanwhile, Android is an operating system for mobile phones based on Linux. The Java Android programming language is kind of Java language used specifically for applications in Android’s operating system. For the development, it is used an Android SDK (Software Development Kit) which provides tool kit for the compilation, and APIs (Application Programming Interface) as the library. Those were required for developers to create and develop applications for Android based mobile phones using common Java programming language (Safaat, 2012).

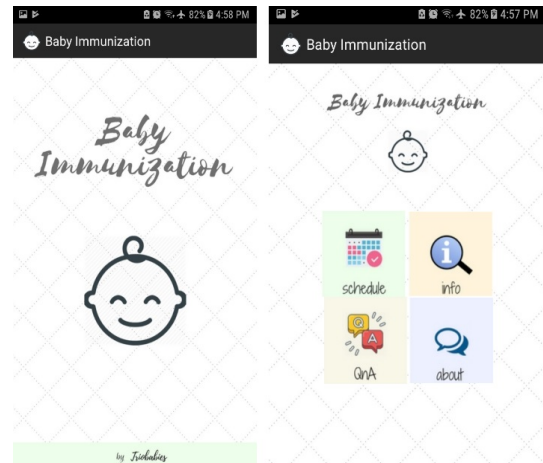


Figure 3: Welcome Screen and Main Menu Layout

3 RESULT AND DISCUSSION

The first window of the application is a welcoming screen. The view is the first one shown up once the user launches the application and contains the application name and logo.

The main menu layout contains four image buttons, which has been described before at UML diagrams. Each button activated another screen following its purpose. The schedule contains the list of mandatory immunization which parent must have for their children at specific age. The information cover the detailed information of any particular immunization, for example the purpose of measles’s immunization. Besides, the “QnA” (question and answer) provide common questions and answers about immunization. Lastly, the contacts detail is mentioned to give a

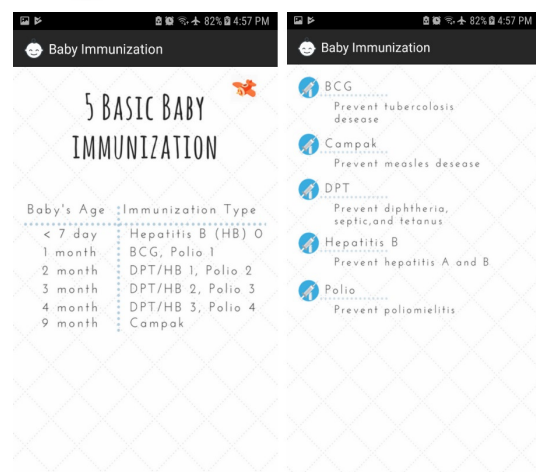


Figure 5: Schedule and Info Layout

contact developer directly for any critics or suggestions.

Figure 5 shows the schedule and info's layout. If the user chooses the schedule on menu, they will get basic immunization schedule. It contains pair of baby's age and the immunization type that parent should give for their children. Then, info layout contained the purpose of immunization as well as its related information.

The "QnA" layout is list of common questions and answers related to the immunization in form of general explanation to answer common assumptions on immunization. It is not displayed on the information layout, for example the explanation about safety immunization. Lastly, "About" layout contains the developer's email thereby user can send critics or suggestions for the application's improvement.

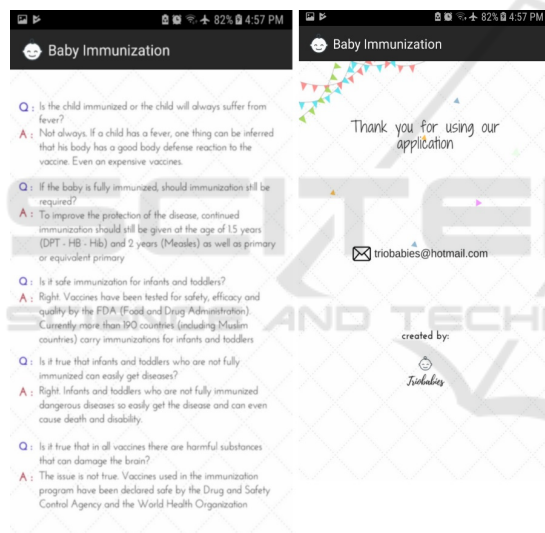


Figure 6: QnA and About Layout

4 CONCLUSION

Immunization's information is important to be socialized to increase the awareness of people to take part in immunization. Nowadays, the best method by is creating android application. The application has been realized in this work and provided a basic schedule as well as related information of mandatory immunizations as a practical handbook of immunization. It would help parents to understand the importance of immunization for their children, and achieve more about related information easily.

The development of the android application has been discussed. It utilized UML diagrams for the designs and implemented using Java Android. Six views of the application has been shown and explained. The application has also been published on google play store and the contacts detail has been put also at one of its view. The improvement of application could be following to user's input in the future.

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