Validate Field Survey Data through Mobile Application (Case Study in Ministry Social Integrated Welfare Data)

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Abstract— The objective of the study is to construct an application model of overcoming Indonesia's Government problems in validating data resulted from field data survey in the case of social welfare data of the Ministry of Social Affairs. Since decades, there have been issues on the big gap data of invalid citizen number of eligible fund transfers from the government. The main problem is a lack of application codifying the citizen data. The research method of the study is using extreme programming software engineering methodology to build mobile application by using its features and also connected to cloud computing systems to process and calculate the data. The finding of the study construct an application of mobile model that can validate field data survey of Ministry's Integrated Social Welfare Data continuously and timely.

Keywords— mobile apps, data validation, Social Integrated Welfare Data

1 Introduction

Rapid information and technology development provide governments with a wide opportunity to access, manage, and utilize information in a timely and accurate manner according to their development priority. Technology development is helpful to attain efficient and effective government administration, in addition to giving value-added to the governments in interacting with various stakeholders. This condition seems to transform the paradigm of regional government administration in many levels of decision-making [1], [2].

As a result of the technology development, the government begins to put its efforts to implement technology to change the service pattern and minimize the risk and costs [3]. These efforts can be seen from the birth of e-government to improve its service quality, effectiveness, and efficiency [2], [4], [5]. E-government is seen as an opportunity by majorities of countries around the world, especially the developing countries, to solve socioeconomic [6] and public service issues [7]. A study of e-government in Afghanistan proves that it plays a role in solving IT and social issues [8]. In Zimbabwe, the previous study [9] identifies the factors affecting gaps in e-government service. Another study reports the socio-technical effect on the e-government service improvement in Rwanda. Meanwhile, based on the study in South Africa, it is asserted that a proper framework should be prioritized before implementing e-government. It is also asserted that, based on the implementation of e-government in the financial sector in Ghana, the system implementation requires legal and public sector support.

In Indonesians context, the government uses e-government based on Law no. 25 of 2004, Law no 17 of 2007, Law no. 23 of 2014, and Law no. 14 of 2018, on development plan to make the development system accountable. The implementation of these policies face hindrances, including poverty alleviation, one of the goals UNDP has set through the SDGs, has become one of the main programs of the Indonesian government. Indonesia as a developing country still has many problems related to poverty. Based on data from the Central Statistics Agency (BPS) the number of poor people in Indonesia in the beginning of 2020 reached 26.42 million people or around 9.78% of the total population [10]. To reduce poverty, the Government of the Republic of Indonesia has been and is working towards the Acceleration of Poverty Reduction through various programs carried out by the relevant Ministries and Institutions.

The government has a variety of integrated poverty reduction programs ranging from poverty reduction programs based on social assistance, poverty reduction programs based on community empowerment and poverty reduction programs based on small businesses empowerment, which are run by various Government elements both in central and regional level. To run these programs, the government needs a database that stores data of the poor citizen in Indonesia. Therefore, the Government of Indonesia created a centralized data collection database for social assistance programs containing socio-economic and demographic information from around 40% of the population in Indonesia with the lowest welfare status. These 40% populations of the lowest socio-economic

conditions represent around 24 million households, or around 96 million individuals [10]. The government has set 14 criterias so that a person is categorized as poor, including the physical condition of the house they live in. One of the main challenges in building centralized data collection for social assistance programs is to identify precisely the target group that will receive the benefits of the program based on the criteria for participation and program objectives. This means that the accuracy of sorting out groups of people who are entitled or not entitled to be program participants becomes very important [11]. Existing literature showed that the centralized data collection in several areas is not well targeted [12], [13], while program attempts to alleviate poverty by giving aid to around 26.42 million households (9.78% of the total population),

Data and information are among the important aspects for evaluating the regional development plan. They are used as the foundation to formulate the development policy and plans. Since the current development data are considered inadequate, efforts are made to update the data gradually and by shifting from manual to electronic mechanisms. Along with the technology and communication advancement, smartphone becomes almost every individual's primary needs due to is ease-of-use and benefits. The community's increased smartphone usage should be viewed as an opportunity to solve the problems currently faced by the government [14].

Several studies have solved issues in government programs to improve its accuracy using smartphone technology [15]–[17]. One of the studies implements mobile government in Malaysia, offering governmental service in any sector to improve user satisfaction [18]. Another study also reports the benefits of implementing mobile government, particularly related to the social promotion in municipal level [19]. Studies have also identified the factors and frameworks of mobile government implementation to figure out factors leading to easier and more comfortable access [20], [21]. In developing a robust mobile government program, four important factors should be taken into consideration, including trust, awareness, perceived response time, and perceived compatibility. These four factors can improve the mobile government application acceptability among the public [18], [22], [23]. The present study contributes to the poverty issues in Indonesia by developing a mobile e-government application.

This study is organized into several sections. Section 2 describes research methodology. The next section (Section 3) discusses the results of the study. In the last section, the conclusion of the study is drawn.

2 Research Methodology

The objective of the study is to construct an application model of overcoming Indonesia's Government problems in validating data resulted from field data survey in the case of social welfare data of the Ministry of Social Affairs. In developing the model application, the development process should be selected properly as the process may significantly affect the duration and the cost. Among various methods to manage the application development is extreme programming agile method, which is commonly used for its gradual and iterative process, thus it is considered suitable for developing the mobile application that help government to address poverty issues in Indonesia [24], [25].

As a recent development technology of mobile smartphone [15], by utilizing the features contained in the device, it can be used to validate data of citizen that recorded in the centralized database, to identify people that is indeed worthy of getting assistance in poverty alleviation programs or not. The focus of the research is to develop application to validate data of Unified Database for Social Protection Programs conduct by Indonesia's government. The methodology used in this research is shown in Figure 1.

The initial stage was collecting secondary data, i.e., centralized database for Social Protection Programs (BDT), followed by developing the mobile application using extreme programming agile method. The initial process of mobile application development was system requirement analysis, comprising of user requirement and system

process analysis. Once the analysis is done, the next step was the interface design development and source code development. The final stage was testing and evaluating application before deploying application for real use.
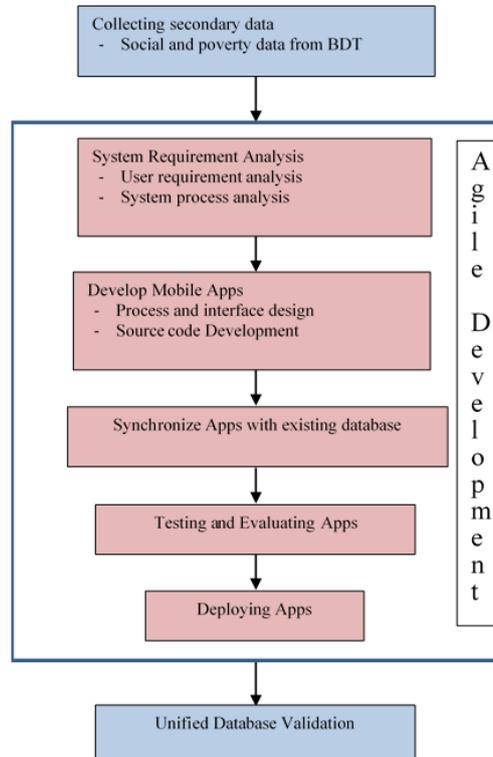
Figure 1. The Research Methodology

2.1   System Requirement Analysis

System requirement analysis is the process of studying various problems that are planned to solve through information systems. This stage determines the problem, identifies the various causes, specifies the solution and identifies the information needs that must be met by the solution. The application was developed to resolve data validation problem of social unified database collected by government. From the system process analysis, that there was an existing system that deployed a database that integrated with the social sector database by adding some information to identify poverty data. The problem of social data collected by government is to identify precisely the target group that will receive the benefits from the government's programs. The design system model of the developed application is shown in Figure 2.
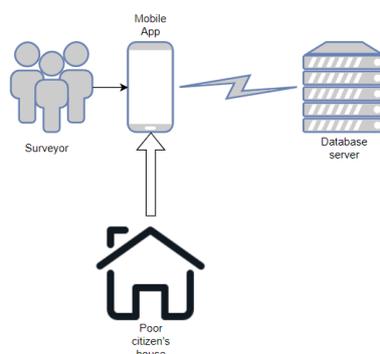
Figure 2. Design system model of developed application

2.2 Development of mobile application

Process and interface design are mainly to facilitate the need for validation process of poverty data by field officers (surveyor). The process allows field officers to record data and send data directly using Mobile Apps to the server. However, if there is no active internet connection, temporary data will be stored in the mobile phone memory and data can be sent to the server at any time if the internet connection is available.

The data that needs to be added during field validation process is photo captured by mobile camera which record the condition of the poor citizen's house and also the coordinates of data being surveyed.

2.3 Testing and evaluating application

Testing and evaluating application conducted through functional testing that verifies all functional process could be run. After running the application, application's initial menu page appear, where the user is asked to perform a login or authentication process before validating, or checking data and entering the system. After successfully login the application, the surveyor was asked to enter the ID DBT data to be validated. When the data has been inputted and the search button is pressed, the data will be sent to the application server for verification, whether the data is recorded in the database. If the data is found, it will be sent from the server to the application so that the data and information in the application will appear in accordance with the IDBDT. Then the surveyor is asked to select the update menu, to update the data, in the form of the location or coordinates of the participant's residence and a photo of the participant's residence. The process of updating this data must be carried out in the field, at the participant's place of residence, because the process of updating the location of the coordinates and photos of the place of residence will be carried out online and in real time. After pressing the update button, the application will go to the next page, namely the data update page.

On this page, surveyors are asked to update the location data for the coordinates of their residence, and also to document photos of the participant's residence. Photos that are recorded and stored can be several photos at once. If the data is verified then the updated data summary will appear on the Uploaded Data List.

3 Result and Discussion

The developed mobile application was created to validate data and at the same time take photos of the physical condition of the poor citizen's house recorded in the Unified Database (BDT), along with the location or coordinates of the residence. This application was developed using Android Studio and was named "Sutasoma" which stands for "Social Data Application for the Community", which is an application used to validate data for the social benefit of the community. This application is about 7 MB in size. The minimum requirement to install this application is a Smartphone device with the Android 4.4 (Kitkat) operating system.

The application was usefully developed and used for data validation by Kediri Regency Government, East Java, Indonesia. Verification has been carried out on 4100 data contained in the database by 30 surveyors. The

results of the validation process are sent to the database server and displayed via a web application containing detailed data of poverty on Social Unified Database (BDT).

From the website, we can verifies data by comparing photos sent by mobile application and data from Social Unified Database. We can also verifies the location of the citizens and his house by clicking pin map of citizen's address, based on intensive observation and analysis, by comparing the data sent by the mobile application and the data contained in the Social Unified Database.

4 Conclusion

The purpose of this research is to develop a mobile application to validate a unified database for Social Protective Program collected by government. This application was developed using Android Studio and was named "Sutasoma" which stands for "Social Data Application for the Community", which is an application used to verify data for the social benefit of the community. The application was usefully developed and used for data validation on 4100 data of Social Unified Database of Kediri Regency by 30 surveyors.

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