

The Prototype Design of Population and Civil Registration Application for Public Services using M-Government Approach

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Abstract—Population and civil registration documents are mandatory documents that should be owned by every citizen. Due to its important key role in accessing all public services. However, there are still a lot of people who are negligent and reluctant to manage their population and civil registration documents. Those people come up with common reason that they live far from the relevant institutions. Therefore, this study aims to help public to obtain information on population data anywhere and anytime. This study intends to make an android-based mobile application for public services which will help public to be easier to obtain information and to make population document submissions and civil registration online without visiting the service place. The development of this application uses a prototype method so that the application can run properly because this method employs an application improvement right after getting feedback from users. The process will continuously repeated until users express satisfaction with the final results of the application. This public information system application will provide information on what public documents that have already owned by the public, in addition to provide features for the printing of the following items: id card, family card, child's identity card, birth certificate, mortality certificate, marriage certificate, divorce certificates, domicile certificates. The result gained from this public information system application can help and facilitate public to obtain public services in making civil registration documents. From the results of black-box testing, the percentage of produced output has reached 100%. It means that the functions in this application are appropriate and suitable for public and it will be easy for citizen's to obtain information on public services.

Keywords-population and civil registration documents; public services; mobile application;

I. INTRODUCTION

Public service is a benchmark for successful implementation of government tasks and performance measurement through bureaucracy [1]. If observing the government agencies, the good or bad quality of public service is depending upon the performance of government employees. When the performance of government employees is better, the quality of their work will high as well. Improving the quality of public services is one of the bureaucratic reform agendas. Starting from the bad reality of factual conditions, the quality of public services is largely determined by the quality of the attitude and character of government officials who some of them are not commendable, corrupt, and irresponsible [2].

Although having a population document is an obligation for every citizen, there are still many people who are negligent and reluctant to take care of the document. The reason that often arises is that residents domicile or residence is far from the relevant government offices. The problem is escalated for the residents who live in the non-asphalted road since the travel time needed to the nearest office can be longer not to mention also the problem of incomplete file requirement. In this case, residents should return home to retrieve the missing file and then return to the government office to submit the missing file to be further processed based on their residence document. It is very time, effort and cost consuming. At some events, residents understand their lack of requirements condition, so they will consciously return home to collect the files but it is also uncommon to find out an event where the residents are angry at the government officials. They consider that the officers are complicating their problem by telling them to go back and forth because they live in a remote area.

The rapid development of information and communication technology (ICT) has evoked a paradigm shift in society. ICT has played an important role in encouraging the increasing connectivity and socio-economic development throughout the world [3]. ICT can be utilized as a tool to facilitate the process of communication and transactions for citizens, business organizations, and also between government institutions towards community via e-government system [4]. E-Government is the integration of information technology to shorten government's decision-making process, to share information between various parts or to reveal free access public information for citizens, and to increase the efficiency of government services towards citizens [5]. Indonesian government, via the Department of Population and Civil Registration which is spread in every regency / city throughout Indonesia, still uses website to solve the previously mentioned problems. The following are some website-based public service application studies for handling population documents and civil registration: Yuniko, et al conduct research on how to design a website application for the Population and Civil Registration Service at Dharmasraya District with the aim of helping public to get public services [6]. It is made so that people can access public services for 24 hours, not only limited to working hours. Whereas Hayat et al designs a web-based information system to help people register easily for the management of their population documents [7]. Last, Noviyanto, et al designs a web-based application to make a simpler documents managements requests, such as: request a letter of identification for id card and family card, request letter for scholarship application, birth certificate request, mortality certificate request, marriage certificate request, residency certificate request and transfer certificate request [8]. But government websites are currently less attractive and accessible for public. Some of the reasons are: because the website display is less attractive, the loading display takes too long period of time, the lack of information updates and minimum display of information.

Along with the development of information technology, website-based technology will be replaced by the existence of mobile application technology because at present time, many existing government websites are less attractive and less accessible for people who need information and services [9]. The development of device technology based on mobile communication technology is very fast. It is relatively easy to be used and comes with more affordable prices when it is compared to computer / Non Mobile devices [10]. According to Republika.co.id, Indonesia is one of 12 countries in the world where smartphone usage is higher than computer usage with a ratio of 28 percent to 15 percent and currently, Indonesia also occupies one of the top ranks in the world about exclusive internet access from smartphones. It is ranked first in Asia and ranked third in the world [11]. Therefore, in implementing e-government system, Indonesian government implements a new strategy by using mobile government or m-government. M-government services can be divided into four levels [12]: information applications; interactive services; transactional services and applications for electronic document submission; services and applications for reciprocal communication between citizens and government officials. The concept of m-government for population services has been previously implemented in South Africa [13]. The service involves

activities that include storing data and records relating to every aspect of the citizen from birth to death.

In 1981, civil service in Singapore is computerized. By implementing e-government, the Government of Singapore recognizes the establishment of "world-class e-government", where residents and businesses have the opportunity to participate and access online services [14]. Technological advances in Korea have finally turned the government website from a simple online information portal into a service portal [5]. Koreans can now handle online businesses in a simpler way. Previously, they have to visit government offices, such as for paying taxes, obtaining population registration transcripts and other government documents. In Malaysia, around 349 government institutions have been integrated with m-government system to improve the public services [15].

Also found are several studies that have implemented mobile applications in designing applications for managing population documents and civil registration. As research conducted by Akbar [16] this study has used a mobile application but the features of this application are incomplete because in this application it can only manage population administration such as birth reporting, death reporting, transfer requests, KTP cover letter making, and making SKTM. Gunawan, et al. [17] conducted a study in 2017 to design an android-based public service application that contained the socialization of making e-KTP. In 2014, a research design for demographic document service applications that had been based on mobile had been carried out, but the management features of the population documents were not yet complete [18]. Because in this application only serves the making of birth certificates, making mortality certificates, making KK (Family Card), Changing KK (Family Card), making KTP (Identity Card), extending KTP (Identity Card). These studies successfully solved the problem of managing population documents and civil registration based on mobile applications, but the service features in the study were incomplete. Because a very good application is an application that has many service features and can meet all user requirements.

To overcome the problems, several districts or cities in Indonesia begin implementing an Android-based public service application. However, the invented mobile applications from each district / city also still have many weaknesses. Some of these weaknesses are: its features are incomplete because it only displays the submission requirements; there are no features to submit a population document making requirement; there are already mobile application based, but if users are going to submit a population document, they will be directed to the website page; in addition, there also applications that can be used for submitting population documents but they do not cover all population and civil registration documents.

II. METHODOLOGY

The method which used for solving the problem in this population and civil registration application design is prototype model. This method be accepted with the purpose that the application can run well. Because in this method there is an application improvement after getting feedback from the user. And that process will keep repeating until the user be satisfied

with the final result of the application. The description of the prototyping model as shown in Figure 1.

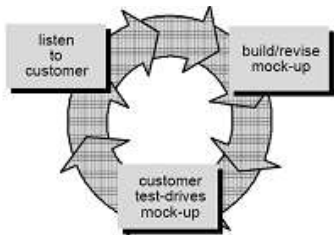


Figure 1. Prototyping model [19]

The model of this method is start with aggregation requirements. The activity stage of the prototyping model consist of :

- Identify user requirements based on the result of aggregation data and information related to the application to be built.
- Design the prototype or develop the prototype
- Test and evaluate the prototype then make an improvements to the prototype according to user requirements.
- This process will keep repeating if the result of the test are still unsatisfactory. If the user is satisfied with the result, then this process will stop at the prototype testing stage.

III. RESULT

A. Requirements Identification Phase

The analysis of user needs based on the above problems are as follows:

- The population information system based on mobile application should feature not only viewing the requirements for submitting residence documents, but also include a feature to process the complete submission of population documents which includes the printing of id card, family card, child identity card, birth certificate, mortality certificate, divorce certificate, marriage certificate, and domicile certificate. This application functions as an interface between the community and related agencies in the matter of submitting a population document and civil registration document. By utilizing this application, it is expected that the application will facilitate public in submitting population documents and civil registration online without having to come directly to the relevant government offices. Citizen’s could simply register as users and then log in to use the application. Next, continue the registration process of population document by uploading the supporting files. If the application process has been approved, the officer will send a notification via e-mail to the residents to let the residents come directly to the Population and Civil Registration Service by bringing the original requirements to be submitted to the officer so that the population documents can be further issued.
- The information system of population data checking. This application enables an easier process for public to check their population data. People are required only by

entering their family card number and then entering on the id number button, then the application will display the population data and population documents that they may already have or may not been have by the citizens.

System planning

At the system design stage, a UML (Unified Modeling Language) which served to describe the procedure and work process of the application was employed. The use of case diagram was an activity of a mutually continuous interaction between actors and also the system or in other words techniques which were generally used to develop software or information systems in order to obtain the functional needs of the existing system [20]. The use case diagram utilized two main actors namely admin and user. The user’s use case diagram design can be seen in Figure 2.

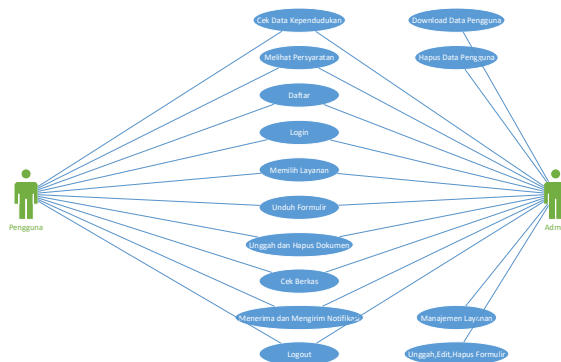


Figure 2. Use Case Diagram Application

In designing the population system application, the two actors who played a role within the android-based application system, namely were users and admin. Users were people who needed services. User can opened and run the contents on the application. Users could check their residence data by simply entering their family card number. However, users should register or log in before could proceed to register the submission of residence documents. After that, users could choose the offered services, downloaded the form, uploaded and deleted the application document, received and send notifications to the system admin, and checked the application file to monitor the process results for the submitted application document.

The admin was the person who managed the application service and uploaded the form as a requirement for the document application. The admin job was also verifying users’ uploaded data. Furthermore, he could manage users’ data, downloaded users’ data, uploaded, edited, and deleted forms, and also received and send notifications to users.

Business process

The following was one of the business processes for the application of population and civil registration documents via mobile application, which started with checking users’ population data. Users simply wrote the family card number (KK) on the population data check menu and then clicked search, there would be a list of family members and they were asked to choose one. If wanted to know the information about one particular family member, then just clicked on id number to display the information. The information on family members’

population data could be seen easily, including the data on population documents that had already owned. At system development stage, if the integration of public services was going to be implemented, the population information from other ministries / institutions / agencies could also be displayed on this menu. If the data had been integrated, for example, the background information about somebody's educational background would be appear. Furthermore, if had been married, the information would be appeared also on the display of number of the marriage certificate or even own document of marriage certificate. Furthermore, the integrated application could also provide information on citizen's passport number, citizen's vehicle certificate, citizen's NPWP number, citizen's BPJS number, and so on. Moreover, if the husband's data did not include a birth certificate document, and wanted to submit a birth certificate document, all the user had to do was just clicking the login button to continue. The register button was intended for new users while the login button was made for the already submitted users. After logging in successfully, the application would display the main page services that could be selected by users. Services that could be selected were such as, the Citizen Identity Card (KTP) service, Child Identity Card (KIA), Family Card, Marriage Certificate, Divorce Registration, Birth Certificate, Mortality Certificate, and Domicile Certificate. If users had chosen the service, the system would display the requirements page and form that should be uploaded. The examples of the mechanism for the process of requesting documents through population and civil registration applications can be seen in the activity diagram in Figure 3.

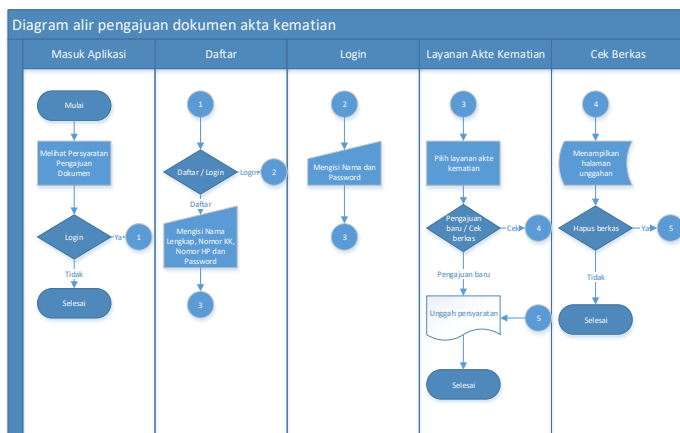


Figure 3. Activity Diagram

After all of the requirements had been uploaded by users, users were asked to wait for the file to be verified by the system admin. If the files uploaded by the applicant met the requirements and passed verification process, the administrator would send an email to the applicants. The e-mail contained an appeal for the applicants to come to the relevant government offices to retrieve the printed population and civil registration documents and to submit the original documents which had been uploaded by the applicants. But if the files that had been uploaded did not meet the requirements and did not pass verification process, then the admin would send a rejection email. It would mention the reason why the requirements file could not be processed. Furthermore, the administrator would

give an advice to complete the requirements file first so that the requirements file could be processed further.

B. Mock Up Design

This application which based on mobile application be expected can be used by citizen's for facilitate and speed up submission public document and civil registration online process without must come to the service place. So there is no reason for citizen negligent to attend the public document with reason the domicile so far away from the relevant institution.

In Figure 4, there is a facility to check a population data.



Figure 4. The menus that provided by the application

In Figure 4 there are menu icons which if clicked, the required requirements will appear to submit the population and civil registration documents.



Figure 5. Display of family card data search result

In this view, the family member data appears according to the family card number which is entered in the population data check menu in Figure 4.



Figure 6. Husband’s data as a head of family

In Figure 6 information on population data appears as shown on the family card and what documents that the user have. The picture shows if the user doesn't have a birth certificate. Then click login to continue registration. After login by entering username and password, user will be directed to choose the icon for make a submission of population documents as needed.



Figure 7. Data upload view

After clicking the birth certificate icon then the menu for uploading data will appear.

C. System Testing

The testing which used for test this application prototype is by using black box testing methods. This testing focuses on the functions which built from the application. Testing is done by entering actions from the user. The test is successful if the output of the application complies with the specified specifications. Application testing procedures can be seen in Table 1.

TABLE I. APPLICATION TESTING WITH THE BLACK-BOX METHOD

Process	Functions	Expected Output	Result
Checking population data	Displaying population data	A list of family members within 1 mutual household will be appearing.	OK

Process	Functions	Expected Output	Result
Checking population information	Displaying someone's data and what type of documents that already has.	The user's data appears in accordance with family card and the documents that already has.	OK
Seeing the requirements for submitting population documents	Showing what kinds of requirements needed by users to upload for submitting population documents	A list of requirements for submitting population documents is displayed	OK
User registry	Helping to provide user's data for the registration process	The registration form appears in order to be able to enter the application.	OK
User login	Helping users to access the main menu	Login form appears and can enter the data	OK
Main Menu	Displaying the main menu for submission of the printing of id card, family card, child's identity card, birth certificate, death certificate, marriage certificate, divorce certificate, and domicile certificate	Users can choose the service that wants by selecting one by one on the main menu	OK
Uploading document	Displaying a menu to make it easier for users to upload the requiring documents for publishing their population documents.	Users can upload the required files.	OK
Exit Application	Helping the user to exit by clicking logout	Users can exit the application.	OK

IV. CONCLUSION

After going through the stages in designing a prototype for population and civil registration system applications, the results of the research could be concluded as follows: this population information system application would provide information on what population documents that have already owned by citizens. In addition to provide features for the printing of id card, family card, child's identity card, birth certificate, mortality certificate, marriage certificate, divorce certificate, and domicile certificate. The result of this population information system application are helping and facilitating public in obtaining public services in printing the population and civil registration documents. From the results of black-box testing, the percentage of output produced has reached 100%. Then, the functions offered in this application could be assumed as appropriate and function well. Furthermore, it could be concluded also that the results of the design and the system design can be implemented properly.

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The suggestion that can be submitted for the development of the upcoming system is the prototype to display the history of citizen data. For further system development, one's data history module can be added. For example: just entering on the id number, citizen's history can be retrieved easily, if the person moved to a new domicile, or if the person made an adjustment data on his/her ID card data, etc. Thus, the correct information about one's data can be presented in a complete and accurate manner.

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