Desktop-Based Population Data Information System to Support The Sumbawa Electronic Government in Rhee District

Muhammad Hidayatullah¹, Fery Hendrawan², Titi Andriani¹, Shinta Esabella², Nurhairunnisah³

¹Department of Electrical Engineering, Faculty of Engineering, Universitas Teknologi Sumbawa, Indonesia, 84371
²Department of Informatics, Faculty of Engineering, Universitas Teknologi Sumbawa, Indonesia, 84371
³Department of Educational Technology, Faculty of Education, Universitas Samawa, Indonesia, 84316

E-mail: mhidayat07@gmail.com

Abstract. This research aims to improve the population service system which is optimal in supporting electronic government in Sumbawa Regency. In software development using the waterfall model and desktop-based Programming with Visual Studio and SQL Server as a Database Management System. The system testing method uses the Black Box Method, a test that focuses on the functional requirements of the software. The results of the research can be used easily, quickly, and useful for processing population data so that it can provide optimal service. This system has been used at the Luk Village Office (Rhee District) in improving service to the community optimally.

Keywords: population service system, waterfall, Sumbawa e-government.

1. Introduction

Village or Village Level Government is the closest government to the community. Change continues along with the development of increasingly sophisticated science and technology [1]. The emergence of various technological products that can be utilized in various fields provides convenience to the government apparatus to improve the quality of services to the community, both at the village or urban level government services to the central level. Luk Village is one of the villages in the District of Rhee, Sumbawa Regency, located at Jln. Lintas Sumbawa - Tano KM.27 Desa Luk. The Luk Village office is a government agency that provides services to take care of the needs of the village of Luk. But in providing services to the community, the village government of Luk still uses the process of processing population by manual method, such as making books by hand writing and using semi-computerization with Microsoft Excel data processing software [2,3].

Desktop-based Population Data Management Information System in Petir Village, Rongkop Subdistrict by Waspodo Dumadi in 2011 was made to make it easier to help search for population data checking. The system is designed using the System Development Life Cycle (SDLC) which includes the design of system requirements, manufacturing and application to system maintenance. There are deficiencies in system maintenance which results in disruption of the system as a whole and there is a repeated restart of its application, so that it is necessary to update the method using the Waterfall
method which is tested to be more structured and collapsed to the stage of system maintenance without significant disruption [4].

Based on the above problems, the authors built a Village Population Information System that can process and regulate the flow of the process of managing population data and information stored digitally in a SQL Server base. The system is built using the desktop programming language, Visual Studio 2015 [5,6]. The results of the research become the Village Population Information System which can be used easily, quickly, and is useful for Population processing so that it can provide optimal services to the Luk Village community in order to support electronic government in Sumbawa Regency [7].

2. The Material and Method

The software development method used in this study is the waterfall method, because the waterfall software development process model implies a systematic and sequential approach to software development [8,9].

![Figure 1. Flowchart of the waterfall method](image)

Following are the stages in software development using the waterfall model (Figure 1):

a. System Engineering: In this step is the stage in forming the needs of all elements. System engineering is very necessary, because software is usually part of a larger system. Making a software can be started by looking at and looking for what is needed by the system. Of the system requirements will be applied to the software created.

b. Analysis: In this step is the process of gathering software requirements. To understand the basis of the program that will be created. In this stage the researcher looks for data and information at the Luk Village office to find out the scope of information, the functions needed, the performance capabilities to be produced and the design of the software user interface

c. Design: This step is a stage that focuses on four important parts, namely: Data structure, software architecture, procedure details, and user interface characteristics.

d. Program Writing (Coding): In this step the researcher writes the program code so that it can be understood and executed by the machine. If the design is correct and detailed, then writing the program can be achieved efficiently.

e. Testing: After writing the program code is complete, the researcher tests the program code that has been created by focusing on the part in the software. The aim is to ensure that all statements have been tested and also ensure that the inputs used will produce the appropriate output.

f. Maintenance: At this stage the researcher gives changes to the software that is new to the customer. If later an error can be encountered when it is run in the customer's environment. Or customers ask for additional new functions.
3. Result and Discussion

This section discusses how the system is built in desktop language by using Visual Studio 2015 based-on waterfall method.

3.1. System Design Result

The following is a system design carried out in the manufacture of the Population Information System of the District of Luk Village in Rhee:

3.1.1. Context Diagram. Context diagram serves to define the beginning and end of incoming data and output on a system [10,11]. The context diagram below explains that the user enters birth and death cover letters into the system, then the user will issue output in the form of birth and death letters. Then the birth and death letter will be submitted to the Village Head to be approved and the Village Head will hand it back to the user. The following is a context diagram of the information system of the Village Government (Figure 2):

![Figure 2. Context Diagram System](image)

3.1.2. Input Design

Form Login Design

![Figure 3. Form Login Design](image)

Figure 3 show a draft login form that displays the design process for inputting username and password to determine the system user access rights. In the design view above there are controls used in making the login form, namely the text box that functions as a place to enter the username and password and the command button is used for the login process and exit the application.

Form of Input Identity Card Data Design

![Figure 4. Form of Input Identity Card Data Design](image)
Figure 4 show the design of the Identity Card (KTP) data input form that displays the design process that allows users to fill in the text box control, full name, place of birth, address, village / sub-district, district, district, province and combo box gender, date of birth, religion, education, employment, marital status, citizenship, household, and RW to be saved to the database.

Design of Initial Family Card Menu Form

![Figure 5. Design of Initial Family Card Menu Form](image)

Figure 5 show a draft form of the KK initial menu that displays the design process that allows users to view, add, delete and perform KK data searches. In the initial Family Card menu form design there are controls used for the process of processing KK data, namely ADDED, DELETE and SEARCH / FILTER data for Family Card control.

Design of Family Card Data Input Form

![Figure 6. Design of Family Card Data Input Form](image)

Figure 6 show a design for the family card data input form (in Bahasa called “Tambah Data Kartu Keluarga” form) that displays the process design that allows the user to fill in the text box control, number (“Nomor KK”), and name of the family head (in Bahasa “Nama Kepala Keluarga”) to be saved to the database. There are two bottom “Simpan” (Save) and “Keluar” (Exit).

Form of the Initial Birth Data Menu Design

![Figure 7. Form of the Initial Birth Data Menu Design](image)

Figure 7 show a draft birth data (in Bahasa called “Data Kelahiran”) menu form that displays the process design that allows users to process KK data. In the design of the birth data initial menu form there are several function keys that are used in the process of processing birth data, namely
ADDITIONAL ("Tambah"), CHANGE ("Ubah"), DELETE ("Hapus") and SEARCH / FILTER birth data functions.

Design the Form of Input Data Birth Menu

Figure 8 (a) Design the Form of Input Data Birth Menu, and (b) Design the Form of Early Death Data Menu

Figure 8(a) show a draft birth data input form that displays the design process that allows users to fill in the control text box birth number, card number, head name, full name, place of birth, o'clock, baby's weight, baby length, father's name, mother's name and combo box gender, date of birth, type of birth, birth to birth and birth attendants to be saved to the database. Figure 8(b) show the design of the initial death data menu form that displays the design process that allows users to be able to see, add, change, delete and search death data in the design of the initial data death menu form there are several function keys used in the process of processing death data, namely functions ADDEDITION, CHANGE, DELETE and SEARCH / FILTER Birth data.

Print a birth certificate (Figure 9)

Figure 9. Design of Print a birth certificate
Print a Death certificate (Figure 10)

![Death certificate image]

**Figure 10.** Design of Print a Death certificate

Print a Population Report (11)

![Population Report image]

**Figure 11.** Design of Print a Population Report

3.1.3. Program Implementation.

Implementation is a continuation of the design of Population Information System in Luk Village. It has been created and carried out using the Visual Studio 2015 programming language with the database used is SQL Server 2014. Visual Studio 2015 can be run on Microsoft Windows operating system platforms and various hardware devices, but the implementation is only done on Notebook hardware with Microsoft Windows operating system.

3.1.4. Application Display.

The program display in the Population Information System Application in Luk Village, Rhee-Based Desktop District is as follows:
a. Login Form Display
The display of Login Form for Population Information System Application Desktop-Based in Luk Village, Rhee District is as follows:

![Figure 12. Login Form Display](image)

The Figure 12 show is the initial display and will appear when the user first starts the application.

b. Main Menu Display
The display of the Application Main Menu Display is as follows:

![Figure 13. Main Menu Display](image)

Figure 13 show the main display form menu of the Information System. Of the six menus contained in the main menu have their respective functions such as the home menu, when the click process is carried out it will display the added sub-menu of the user, where the user sub-menu adds when the user clicks it, the user will add the form. Then the data menu, when the click process is done, it will display sub-menus, namely the KTP sub menu and KK sub-menu, where when the user clicks on the KTP sub-menu, it will display the KTP data form and when the user processes click on the sub menu KK, it will display the KK data form. Then menu residents, when the click process is done it will display the Population form. Then the birth menu, when the click process is done it will display the birth data form. Then the death menu, when the click process is done it will display the death data form.

c. Initial Identity Card Data Form
The display of the Initial Form of Identity Card Data on the Population Information System is as follows:
Figure 14. Initial Identity Card Data Form Display

Figure 14 show a display of the initial KTP data form. In the display above there are several function keys used in the process of processing user data, namely the function added, change, and delete.

d. Add Identity Card Form
Display of Add KTP Form on Population Information System is as follows:

Figure 15. Add Identity Card Form Display

The display in Figure 15, there are several function keys that are used in the process of processing the new Identity Card data plus the save and return functions. The save function button functions to add new KTP data and the function key is used again to return to the initial KTP menu form.

e. Family Card Data Initial Form
The display of Family Card Data Initial Form in the Population Information System is as follows:

Figure 16. Family Card Data Initial Form Display

The display showed in Figure 16 has several function keys that are used in the process of processing KK data, namely the function added, delete, search or filter and return.
f. Initial Form of Birth Data
The display of Initial Form of Birth Data in the Population Information System is as follows:

![Figure 17. Initial Form of Birth Data Display](image)

Figure 17 show a display of the initial form of birth data from the Population Information System in the Desktop District of Luk Rhee District. In the above display there are several function keys that are used in the process of processing birth data, namely the function of adding, changing, deleting, searching or filtering and returning.

g. Form Initial Death Data
The display of Form Initial Death Data in the Population Information System is as follows:

![Figure 18. Form Initial Death Data Display](image)

Figure 18 show several function keys that are used in the process of processing death data, namely the function added, change, delete, search or filter and return.

3.1.5. Testing.
Testing is an important part of the software development cycle. Testing is done to guarantee the quality and also to know the weaknesses of the software. The purpose of this test is to ensure that the software that is built has a reliable quality, which represents the principal study of specifications, design analysis and coding of the software itself.

3.1.6. Test Plan.
Testing the software on the Population Information System application on the Village of Luk District based on Desktop Rhee is by using black box testing. Black box testing focuses on the functional requirements of the software created.

4. Conclusions
With this Population Information System, it has become one form of service to the community (electronic government). Where, the processing that was initially carried out conventionally has now become computerized, such as the process of input, update and search for Population, which makes birth certificates and death certificates. Digitizing with the data has been able to minimize errors in the process of adding data and simplifying the process of finding Population.
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6. References

[1] Sofya N D, Esabella S and Rodianto R 2017 Rancang Bangun Aplikasi Kamus Bahasa Sumbawa Berbasis Android *MATRIK J. Manajemen, Tek. Inform. dan Rekayasa Komput.* 17 36–45

[2] Surantalla R 2017 PERANCANGAN SISTEM INFORMASI DAN PENDATAAN IKATAN PELAJAR MAHASISWA SUMBAWA-YOGYAKARTA (IPMSY) BERBASIS WEB *J. TAMBORA* 2

[3] Setiawan P 2015 TA: Rancang Bangun Aplikasi Pengolahan Data Evaluasi Proses Belajar Mengajar Berbasis Web Pada Stikes Yayasan RS. Dr. Soetomo Surabaya (Institut Bisnis dan Informatika Stikom Surabaya)

[4] MZ M M K 2016 Pengujian Perangkat Lunak Metode Black-Box Berbasis Equivalence Partitions Pada Aplikasi Sistem Informasi Sekolah *MIKROTIK J. Manaj. Inform.* 6

[5] Imam 2015 Aplikasi WPF (WindowsPresentation Foundation) dengan Visual Basic (Jakarta: Elex Media Komputindo)

[6] Nurhayani 2016 Implementasi Bahasa Pemrograman Visual Basic pada Pengolahan Data Reservasi , , Juli 2016. *J. IPTEK* 7 47–57

[7] Anwar T and Utomo Y W 2017 IMPLEMENTASI PAPERLESS OFFICE PADA SISTEM MONITORING DAN EVALUASI PROGRAM KERJA ORGANISASI MAHASISWA *MATRIK J. Manajemen, Tek. Inform. dan Rekayasa Komput.* 17 56–65

[8] Pressman R S 2002 Rekayasa Perangkat Lunak Pendekatan Praktisi (Buku Satu) *Yogyakarta Andi*

[9] Esabella S 2017 PERANCANGAN APLIKASI SURAT KETERANGAN TANDA LAPOR KEHILANGAN PADA KANTOR KEPOLISIAN RESOR SUMBAWA BERBASIS ANDROID *J. TAMBORA* 2

[10] Wardhana H and Hasanaah B D U 2016 APLIKASI MONITORING PENERIMA BEASISWA BIDIKMISI BERBASIS WEB, ANDROID DAN SMS GATEWAY *MATRIK J. Manajemen, Tek. Inform. dan Rekayasa Komput.* 16 22–32

[11] Astuti T, Kusumastuti G and Fitriyanto R 2017 PEMANFAATAN ANALYTICAL HIERARCHY PROCESS (AHP) PADA E-VOTING PEMILIHAN KETUA OSIS *MATRIK J. Manajemen, Tek. Inform. dan Rekayasa Komput.* 17 95–104