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Implementation of E-Government with the RESTFUL API Method on the Population Data Management System in Pasar Kemis District

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Abstract

Pasar Kemis currently uses a manual system for population data, leading to issues like slow data collection and difficulty searching. To improve efficiency, they propose a new web-based system built with PHP and CodeIgniter. This system will use Restful API for data exchange and be tested with Black Box Testing. Researchers gathered information through observation, interviews, and documents. UML will be used for system design, and prototyping with Adobe XD will help analyze advantages and disadvantages. The goal is to replace the traditional system with a computerized one for easier data entry, research, and report generation, ultimately benefitting the district government.

Keywords *— System, Web, Management Population Data, Pasar Kemis District.*

1. INTRODUCTION

The development of technology in the era of the industrial revolution 4.0 forces humans to use technology in various activities, which has facilitated many technologies to transform traditional systems into modern systems. The characteristics of the industrial revolution 4.0 are characterized by various applied technologies, such as advanced robotics, artificial intelligence, internet of things, virtual and augmented reality, additive manufacturing and distributed production, all of which have the potential to change production and business models in various industrial sectors [1], so people must be able to keep up with technological developments. The development of technology makes many people try to create a system that can be accessed easily by many people using computer technology.

Computer technology plays an important role in supporting data processing, the use of supporting application programs will make work fast, cost-effective and hassle-free, process data and produce quality information. Computer systems have been applied in various fields such as health, education, government and others. This is intended to improve and facilitate services to the community. Computer systems are the main source of convenience and satisfaction in collecting information. For example, computer systems are applied to an agency or business to process data and present information or reports as needed quickly, precisely and accurately. The realm of government in Indonesia uses an electronic system to serve the community known as E-Government.

E-Government is one form of service implementation that is able to improve the quality of public services based on technology and communication to meet the demands and needs of people who want fast data processing and precise information [2]. The Pasar Kemis District Office of Tangerang Regency processes population data by means of ordinary registration and data collection reports always using archive documents, if needed it will be difficult to find so that there is less preparation in providing services due to lack of time in collecting population information. As with the KTP making section, the sub-district does not have the latest data to determine the number of residents who do not have a KTP and have met the requirements to have a KTP and it is difficult to detect invalid population data. If there is an increase in KTP requirements, there are often gaps due to lack of preparation and sometimes the population data does not match the residential address in the family and their KTP card manipulates the welfare fund data so that the welfare fund is not on target. Therefore, to overcome these obstacles, it is necessary to update demographics based on demographics that can be accessed and obtained from the Tangerang DISDUKCAPIL Regional Demographic Database.

However, due to security reasons stipulated in PERMENDAGRI 7/2019 concerning securing population administration services, the population database cannot be obtained. The Pasar Kemis District Office lacks the demographic data needed to support services. Because of this, the authors make an article with the title "Implementation of E-Government with the RESTFUL API Method in the Population Data Management System in Pasar Kemis District". It is hoped that this system can be applied to provide solutions in obtaining citizen data that can be updated continuously and processing population data.

2. RESEARCH METHODOLOGY

2.1 Basic Concepts of Information Systems

Based on several quotes from the definition of an information system, it can be concluded that an information system is a component that interacts with each other to process data to produce information or reports that can be used to determine future decisions [3].

2. 2 Basic Concepts of MySql

MySQL is a DBMS that is distributed free of charge under a license from the general public license (GPL), where everyone is free to use it but may not be used as a closed source (commercial) derivative parent program. MySQL has several advantages including portability, open source, multi-user, performance tuning, column types, security, commander function, interface, localization, and others [4].

2. 3 XAMPP Basic Concepts

"XAMPP is free software, supports many operating systems, is a combination of many programs. XAMPP functions as a standalone server, consisting of the Apache HTTP Server program, MySQL database, and language translators written in the PHP and Perl programming languages. The name XAMPP comes from X (four operating systems), Apache, MySQL, PHP and Perl" [5].

2.4 Basic Framework Concepts

A framework is a frame or set of files that have been included, which contain program code instructions and basic functions to perform certain tasks. Visually, frameworks are pieces of program code or functions that are ready to use. The advantage of building a web with a framework is that the creation process is faster, web applications are easier to develop, security is better maintained, and others [6].

2.5 CodeIgniter Basic Concepts

CodeIgniter is a framework created using the PHP programming language that aims to make it easier for web programmers to create or develop web-based applications. According to the documentation of CodeIgniter, the purpose of using CodeIgniter is to make project development faster than writing code from scratch because CodeIgniter already provides specialized libraries for several tasks commonly performed by web application developers. The main examples of frequently performed tasks are such as creating database connection files, setting dates, form validation, security and others [6].

2.6 UML Basic Concepts

According to statements [7], the author draws the conclusion that UML (Unified Modeling Language) is a modeling method used to describe or document the development of an object-oriented system. The purpose of using UML is to provide a modeling language that is free from various programming languages and engineering processes, unify best practices in modeling, and provide ready-made models that are easy to understand. Types of diagrams in UML include [8].

1. Use Case Diagram

This diagram depicts external actors and their relationships with use cases provided by the system. Use cases are descriptions of the functionality provided by the system in text form as use case icon documentation, but embedded in activity diagrams.

2. Class Diagram

A class diagram is a static view of an application. Class diagrams not only visually depict, but also describe and document various aspects of the system, as well as the construction and implementation of the code in the application software. Class diagrams are used to categorize the essence of each process to be performed. All processes are included in each layer and linked to other interconnected classes.

3. Activity Diagram

This diagram describes a series of activity flows in a dynamic system, this diagram is used to describe the activities formed in an activity so that it can be used for other activities such as use cases or interactions.

4. Sequence Diagram

This diagram depicts the interactions between several dynamic objects. Its use is to display the series of messages sent to objects as well as the interactions between objects that occur at any given time during system execution.

3. RESULTS AND DISCUSSION

In developing a demographic data management system, system requirements analysis and system design are carried out using the UML method with various diagrams. The author uses Visual Paradigm 16.2 Enterprise Edition software to describe the use case diagram, activity diagram, sequence diagram, and class diagram.

A. Use Case Diagram

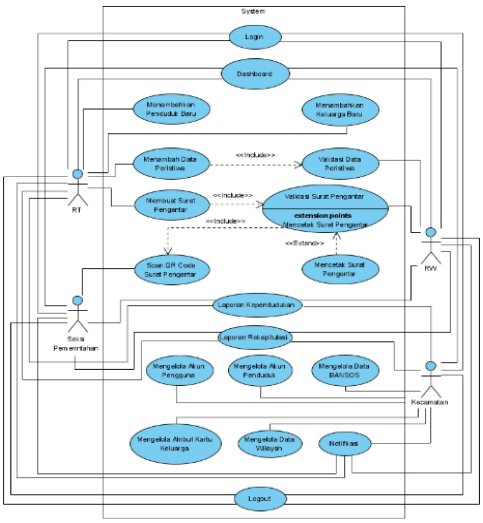

Figure. 1 *Use Case Diagram of* Proposed Resident Data Management System

Based on Figure 1, in the use case diagram, the proposed Pasar Kemis District Office Population Data Management System includes: (1) 1 system that covers all population data management activities at Pasar Kemis Subdistrict Office, (2) 4 (four) actors who carry out activities, namely RT, RW, Dinas and Kabupaten, (3) 19 (ten nine) actors who carry out general use case activities.

B. Activity Diagram

Based on Figure 2, in the *Activity Diagram of* user account management there are: (1) 2 (two) swim lanes, to group sub-processes according to their responsibilities, (2) 1 (one) initial node as the initial object, (3) 2 (two) decision nodes, objects that state yes or no, (4) 1 (one) fork node, objects that describe branching, (5) 2 (two) join nodes, objects that describe merging, (6) 14 (fourteen) actions, systems that reflect the execution of an action including: Login, Display Dashboard Page, Select User Account Data Menu, Display User Account Page, Delete Account, Account Detail, Add Account, Edit Account, Display Form, Fill Form, Validate Input, Display User Detail, Save Data, Delete Account Data, (7) 1 (one) final state, object that ends the activity.

Figure. 2 *Activity Diagram of* Proposed User Account Management

Based on Figure 4, in the Social Worker Data Management activity chart there are: (1) 2 (two) swim ways, to group sub processes according to their responsibilities, (2) 1 (one) initial node, as the initial object, (3) 2 (two) decision nodes, which are objects that indicate yes or no, (4) 2 (two) branch nodes, branching object descriptors, (5) 2 (two) connecting nodes, merging object descriptors, (6) 17 (seventeen) actions, a system that reflects the performance of an action, including: Login, View Dashboard Page, Select Social Support Data Menu, View Social Support Page, Delete Social Support, Social Support Details, Add Social Support, Edit Social Support Benefits,View form, Fill out form, Validate entry, View benefit details, View beneficiary data, Delete beneficiary data, Save social welfare data and Delete beneficiary social level, (7) 1 (a) termination status, the subject stops operating.

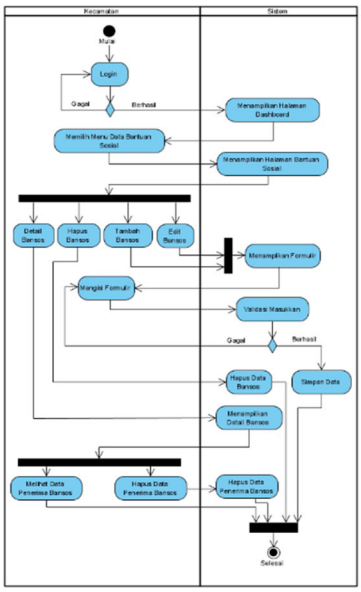

Figure. 4 *Activity Diagram of* Proposed Social Assistance Data Management

Based on Figure 5, the *Activity Diagram of* regional data management has: (1) 2 (two) *swim lanes*, to group sub-processes according to their responsibilities, (2) 1 (one) *initial node,* as the initial object, (3) 2 (two) decision n*odes, objects* stating yes or no, (4) 3 (three) branching nodes, objects describing branching, (5) 2 (two) participation nodes, descriptions of merging objects, (6) 20 (twenty) actions, systems that reflect the performance of an action include:Login, View Dashboard Page, Select Region Data Menu, View Village Data Page, Add Kelurahan, Edit Kelurahan, Kelurahan Detail, View RW Region Data Page, Add RW, Edit RW, RW Detail, Assign RW Head, Show RT Region Data Page, Add RT, Edit RT, Assign RT Head, Show Form, Fill in Form, Validate Import and Save Data, (7) 1 (a) end state, an object that completes an operation.

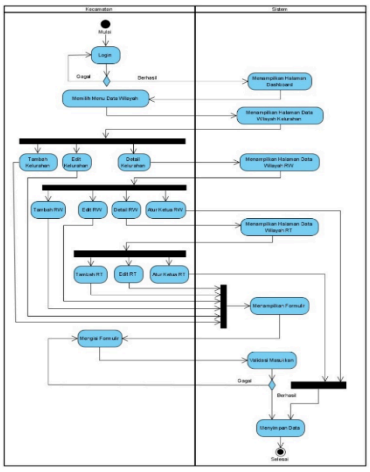

Figure. 5 *Activity Diagram of* Proposed Area Data Management

Based on Figure 6, in the *Activity Diagram of* managing family card attribute data there are: (1) 2 (two) *swim lanes*, to group sub-processes according to their responsibilities, (2) 1 (one) start node, as the initial object, (3) 2 (two) decision nodes, objects stating yes or no, (4) 2 (two) branch nodes, branch descriptor objects, (5) 2 (two) join nodes, combining descriptor objects, (6) 16 (twenty) actions, the system reflects the implementation of an action including: Login, View Dashboard Page, Select Family Card Attribute Data Menu, View Family Card Attribute Data Page, Select Religion Attribute Data, Select Attribute Data Menu, Select Job Type Properties Attribute Data Menu, Select Marital Status Attribute Data Menu, Select SHDK Property Data menu, display selected attribute data, add attribute data, change attribute data, display form, form filling, input validation and data saving, (7) 1 (one) final state, object that ends the activity.

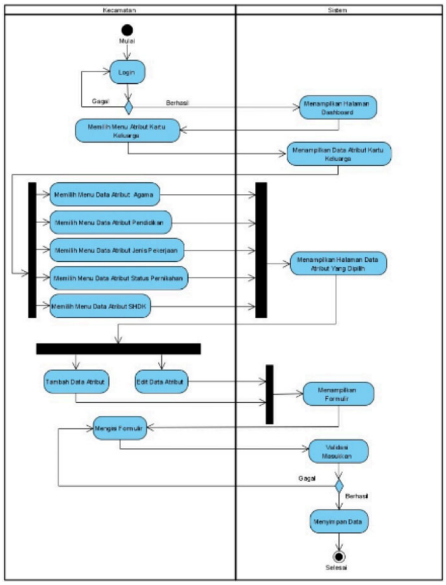

Figure. 6 *Activity Diagram of* Proposed Family Card Attribute Data Management

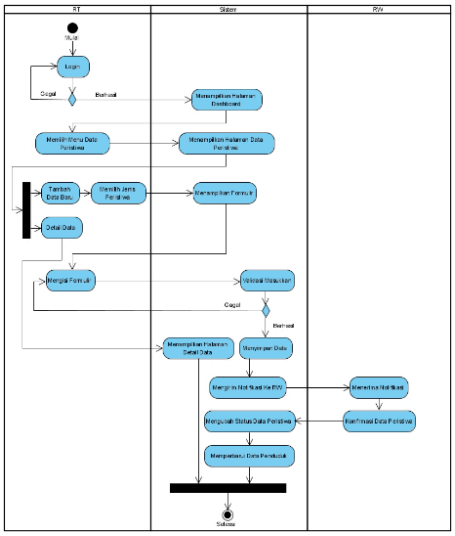

Figure. 8 *Activity Diagram of* Proposed Event Data Management

Based on Figure 8, in the Event Data Management activity diagram there are: (1) 3 (two) paths, to group sub processes according to their responsibilities, (2) 1 (one) start node, as the initial object, (3) 2 (two) decision nodes, one object indicating yes or no, (4) 1 (one) fork node, one object depicting branching, (5) 1 (one) join node, one object depicting merging, (6) 17 (seventeen) actions, systems that reflect the implementation of an action include: Login, View Dashboard Page, Select Event Data Menu, View Event Data Page, Add New Data, Select Event Type, Data Detail, View Form, Fill in Form, Validate Entry, View Data Detail Page, Save Data, Send Notification to RW, Receive Notification, Confirm Event Data, Change Event Data Status and Update Resident Data, (7) 1 (a) end state, object disabled.

C. Program View

Dashboard Page Display This page displays summarized information on population data and population event data.

Figure. 19 *Dashboard* page

4. CONCLUSION

1. The population data management system at the Pasar Kemis Subdistrict office that is currently running is still conventional using paper and *Microsoft Excel* as processing population data so that it takes a long time and limited information obtained. So a system is needed that allows the head of the RT to directly manage population data in his area quickly and the data obtained is in accordance with what is needed by the Pasar Kemis District office.
2. By creating a *website-based* population data processing system application with the *Restful API* method that can speed up the management of population data, reduce costs in the management of population data. The application can be integrated using *APIs to* other service applications that require population data.
3. Based on the results of user testing on the SIPEDAP application using the *BlackBox Testing* method, it can be concluded that it is feasible to use because after testing each of its functions it can run and operate as expected.

5. RECOMMENDATION

1. The need to increase human resources in the field of technology and the need for socialization & training for the heads of RT, RW and government sections so that the system can run well.
2. It is necessary to develop a new system in the future so that the system can keep up with future technological developments.
   For the future, researchers who take the same title are expected to develop this application to be better by using up to *date* technology.

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