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Design and Development of a Village Information System with the Rapid Application Development Method

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Abstract: Tandem Hulu I Village is one of the villages located in the Hamparan Perak District area, North Sumatra, which was initially just an oil palm plantation area in which man workers from the oil palm plantation land were made into residence and finell the workers inhabit the area. From the past until now. Tandem Hulu I Village has always been the focus of attention in every discussion about the regional government system. because the village is a subsystem of the regional government system. This system was built using the RAD (Rapid Application Developmet) method, which was superior capabilities to previously developed components and can be used again in the development of new system. Researchers chose this method because it is considered easier to apply in system development that focuses on each development requirement. The system designed relles on internet technology to be accessible by users and admins the process

Keywords: Information System, Village Information System, Rapid Application Development

INTRODUCTION

Tandem Hulu I Village located in the area area Subdistrict Perak Expanse, North Sumatra which was the beginning formation just A area plantation coconut palm oil inside his start Lots workers from land plantation palm oil that's what was made place stay and finally the workers the inhabit area Then. appear system government a village called Desa Tandem Hulu I. With a total area of.

Tandem Hulu I Village is is One of the 11 hamlets in the sub- district with area of 316.3 Ha. With amount The population of Tandem Hulu I Village in 2017 was 12,297 people with details 6032 men and 6265 women with amount Head Family 3096 KK.

In general Tandem Hulu I Village administration of 11 hamlets with average height 240 – 300 meters above sea level Sea Level, with rainfall average annual rainfall is 145.00 mm, with level humidity 0.050, and daily average temperature around 29º degrees Celsius.

System in institution or institution government play role important Because help evaluate efficiency and effectiveness companies, formal and informal organizations, and institution government, no matter how much size. The efficient operation of a system requires collaboration among all constituent units. The term “system” is derived from the Greek word “sustema,” meaning “unity” or “whole.” A system can be conceptualized as a collection of interrelated components or a network of procedures that collaborate harmoniously to achieve a specific goal.

Pamungkas & Putranto describe a system as a collection of cohesive components that collaborate to achieve a common goal (Mawardi et al., 2023). According to Prehanto, Indriyanti & Nuryana, a system is a collection of interconnected components, both physical and non-physical, that work together harmoniously to achieve a certain goal (Prehanto et al., 2020). Ridwan also explains that the system is the basis of movement in all activities, and its existence is very important in various fields. Without the concept of a system, activities or work will be uncontrolled. Optimal system performance depends on the harmonious interaction of all its attributes to achieve predetermined goals (Oktaviani & Ayu, 2021). Therefore, it can be concluded that a system is a collection of interconnected components that collaborate harmoniously to achieve predetermined goals.

Information is a collection of processed data or facts that have important meaning for the recipient. Information is considered important because of its capacity to improve cognition, reduce ambiguity and the

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possibility of failure, and facilitate leaders in making appropriate and efficient decisions (Marpaung, 2020). Pamungkas & Putranto emphasized that information, especially data, is a primary resource for managers, in addition to human resources, materials, machines, and money. The category of physical resources includes human resources, materials, machines, and finances, while the category of conceptual resources includes information and data. Information can be managed effectively as a resource, and as company operations grow larger, managers increasingly rely on information and consider it their most valuable asset (Mawardi et al., 2023).

Arifin and his friends emphasized that information is the result of data transformation into a format that is more useful and valuable for the recipient of the information, especially in the context of decision making. Information has many main attributes, including accuracy, precision, relevance, and completeness, to meet the needs of the recipient (Arifin et al., 2023). Therefore, it can be concluded that information is the result of data collection and analysis with the aim of providing valuable insight or understanding.

Information has important value for decision makers because it can increase their knowledge. Information is also crucial because it provides managers with a better understanding of the objective conditions of the company. This information comes from processing data or facts collected using certain methods and methods (Anggiawan et al., 2018). In addition, information is also useful for improving the development and maintenance of the company, so that the planning process return can carried out effectively.

Oktaviani & Ayu define the information cycle as a comprehensive procedure where raw data is processed to produce valuable information that can be utilized by consumers. Each piece of information produced serves as a basis for producing other information, and perpetuates this cycle indefinitely (Melinda et al., 2018). The process begins by capturing data as input, then the data is processed through a model to produce output in the form of information. Furthermore, users utilize this information as a basis for producing appropriate decisions and carrying out operational actions that produce new data. The newly obtained data will become input for the next information cycle, which will then repeat itself continuously to form an information cycle. Below is an illustration that describes the information cycle:

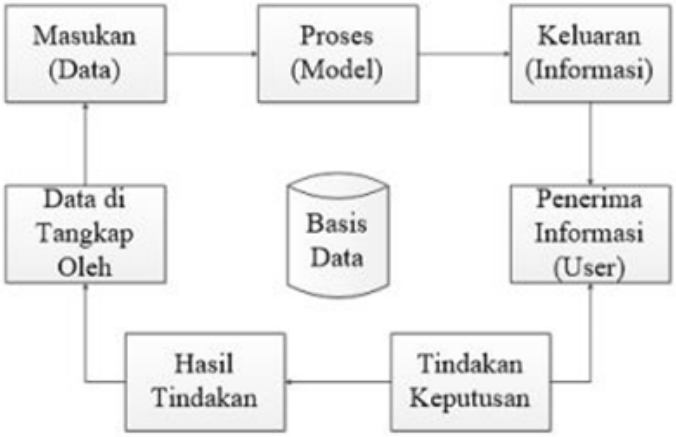

Figure 1. Cycle Information

Information systems are complex systems consisting of software, hardware, and human resources that effectively transform information into valuable outputs, thereby facilitating the achievement of specific organizational goals. Arifin and his colleagues define information systems as formal and informal systems that offer verbal and written information about the past, present, and anticipated future of a company in relation to its activities and environment (Ridwan et al., 2021). Information systems are specifically developed to provide management with fast and accurate information about the organization's external environment and its internal operational activities. The goal is to support the planning, monitoring, and decision-making processes.

This information system will be built using a website as its foundation. A website is a compilation of web pages located under One domain or subdomain. It provides information that can accessed via the World Wide Web (www) on the internet. Web pages are often HTML document that can accessed use HTTP protocol. Protocol This allow information from the website server to sent and displayed to user via web browser.

System Information is a method that is structured use give a the right information time For related management with the environment outside organizations and activities operation inside a organization that aims For provide planning and monitoring processes as well as support the decision-making process decision.
Smart Village is used as Supporter in Smart District development is a approach in breakdown problem through openness access extensive information So that can increase opportunity for public For do effective and efficient

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activities with reduce cost operational, more productive and growing in a sustainable area. The implementation of smart villages is also able to overcome problem in a way smart / intelligent with ability source the power available at a villages/sub-districts that utilize technology information and communication as well as directed innovation for the repair process performance and involvement public.

Smart village is utilization progress technology information and communication to in a bunch community managed services village in to do various activity so that more effective and efficient with based on 4 dimensions, namely smart resources, smart technology, smart institutions, and smart service chains.

The evolution of website interfaces has undergone very significant development from time to time driven by the insights formed from logging to the server on most websites, due to protocol used For transferring data on website applications does not provide information interactive user in a way Details to the server. The development of Java script- based user interfaces, as well as system Extensible Markup Language (XML) based data exchange that has having less logging on the server side capable satisfying desire user in surfing using the website. Modern web page design has change and be able divert visualization users, so that add knowledge user with method display web page with a typical transition in a way historical and interactive involving a number of data transfers on the client side in one single web.

Functionality complexities that dynamic web has used For various matter for example just For low latency input validation, progress reports, dynamic menus, and provide users with a multimedia experience in a website. Improvement complexity interface from old concept, making logging more evenly so that can give bait come back to the end user. Dynamic web developed with notice usage information in a way comprehensive based on data. Information in the form of the data functioning For to inform design page, focus marketing, and business strategy community. Interaction with feature interface dynamic use client -side scripting callback system for handle users using mouse and keyboard in the interaction use dynamic web application

PHP is abbreviation from Hypertext Preprocessor namely Language programming used in a way wide For Handling creation and development a website and can used together with HTML. PHP was created by Ramus Leodropt first time in 1994. Initially PHP was abbreviation from “Personal Home Page Tools” next replaced to FI (“From Interpeter”).

RAD, abbreviation from Rapid Application Development, is technique development device software that emphasizes rapid and iterative development processes (Rauf, 2017). The RAD strategy seeks to create application with cycle concise development, requires Work The same active between developers and users, as well as prioritize making rapid prototyping and iteration. The RAD methodology consists of four main phases: requirements planning, system design, development process and feedback gathering, and product implementation or completion (Fanani & Setiawan, 2022).

The advantages of the RAD approach include faster development, flexibility in changing requirements, and ease of involving users in the development process. However, this approach may not be suitable for projects that require requirements stability and tight control, and have a high level of complexity (Mustanir, 2019).
The RAD approach has become popular in software development because of its goals of speeding up the development cycle, increasing user involvement, and producing more applications efficient in accordance with need.

METHOD

Methods applied in the research process this, namely:

1. Observation (Observation)Direct)

Writer collect data through observation directly in Tandem Hulu Village, District The Silver Expanse of Deli Serdang Regency. This data will become reference important For build and create system, as well as For compile report study.

2. Interview

In order to collect the necessary data For development system information office village use increase efficiency organization government village, done interview to head village, secretary village, and head hamlet in Tandem Hulu I Village, District Silver Hampan , Deli Serdang District.

3. Library Research Methods

In the approach this, writer Lots to quote relevant reading with Topic research. Data cited can in the form of hypothesis or sourced opinion from various books and literature used in lectures. The purpose is For strengthen runway theory with enter reference from books and literature that can accessed in the library, including material lessons and related resources with eye lesson.

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RESULT

An interface is a display model that functions as connector between users and systems used.

1. Appearance User Login

Before accessing the dashboard, users are required to log in on the main page display. If the username and password provided do not match, the system will provide an error notification and ask for another attempt. However, as long as the data provided is accurate, the user will be redirected to the main page. Before accessing the service, individuals who do not have an account are required to begin the registration process by selecting the "Register" option.

The following image shows the resident login display, including:

Figure 2. Display Log in Resident

2. Appearance Dashboard

a. Display Dashboard Admin

On the dashboard display, the admin can see the display in the form of a text of congratulations data in the application for submitting letters to Tandem Hulu I Village. After the dashboard, the admin can also see the display for user data, population data, letter submissions, reports, and logout. Here This admin dashboard view.

Following image showing Admin dashboard display, including:

Figure 3. Display Admin Dashboard

b. Appearance Dashboard Resident

On the dashboard display, residents can see appearance in the form of text safe data in the application submission Tandem Hulu Village letter I. After the dashboard, residents can also see appearance For submission letter, submission status letter, requirements and logout. Here image showing Resident dashboard display, including:

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Figure 4. Display Population Dashboard

3. Appearance Submission of Population Letter

a. Submission Act Birth

On the form registration deed birth this, the population requested For fill in a number of information important like date submission, name head family, name mother, name baby, type sex, place birth date birth, day, time birth, type birth, helper birth, weight baby, long baby, number parent population mother and father, and attach Photo marriage book and photos letter information birth. After fill in all required information, user can save data with Clicking " Save " button and back to dashboard page with Clicking "Back" button.

The following image shows the appearance of a birth certificate application, including:

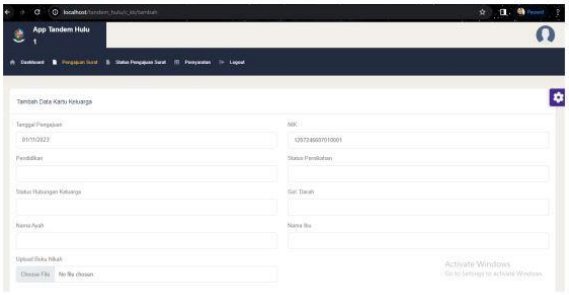

Figure 5. Display Submission Act Birth

b. Submission Act Death

On display submission deed death This there is a number of form that must be filled by population, namely date submission, nik deceased, day, date death, place death, cause death, letter photo information death, photo card family deceased, and photo of resident identity card deceased. After filling in all the data, press the "Save" button to save it and press the "Back" button to return to the main page.

The following image shows the appearance of a death certificate application, including:

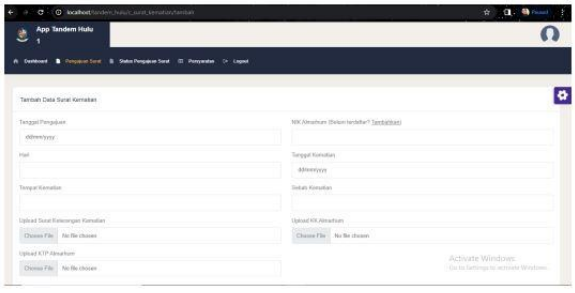

Figure 6. Display Submission Act Death

c. Submission Card Family

In addition to the display of birth certificate and marriage certificate applications, there is also a family card application. On the family card application display, there are several forms that must be filled in by residents, namely the date of application, Population Identification Number, education, marital status, family relationship

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status, blood type, father's name, mother's name, upload marriage certificate. After the data is entered, select the save button to save the information and use the back button to navigate back to the dashboard page.
The following image shows the appearance of the family card application, including:

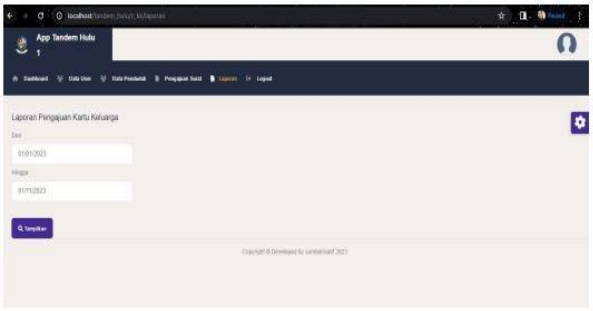

Figure 7. Display Submission Card Family

d. Submission of Letter of Transfer Go out
The following is the final letter submission form, namely the application for a transfer letter. In the transfer letter submission interface, residents are required to complete various columns, including the submission date, name of the head of the family, family card number status, and destination family card number. Tandem Hulu Dashboard Application Letter Delivery Status Delivery Terms and Conditions For the logout process, the following information is required: head of family population registration number, name of the destination head of the family, date of arrival, and destination address. After selecting the data, continue by clicking the save button to save the data, then click again to navigate back to the dashboard page.
The following image shows the appearance of the submission of the letter of transfer out, including:

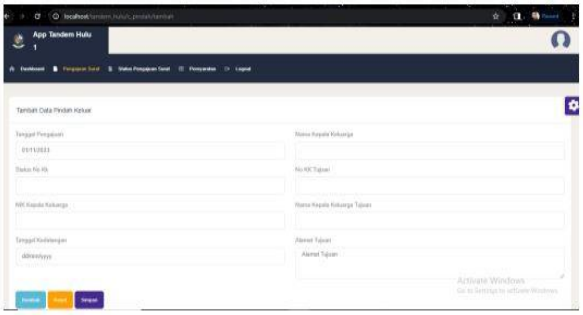

Figure 8. Display Submission Moving Letter Go out

4. Appearance Condition Submission of Letter
On display condition submission letter This there are several texts condition if resident want to do submission. Following image showing appearance condition submission letters, including:

Figure 9. Display Condition Submission of Letter

Principle Work system built with "Analysis and Design System Web- Based Village Information Using the Rapid Application Development (RAD) Method (Case Study of Tandem Hulu I Village)" namely: (1) System This made For do population data collection in Tandem Hulu I Village. (2) System store and process submission letters sent by residents. (3) The system allows village officials to access and download reports on letter submission data

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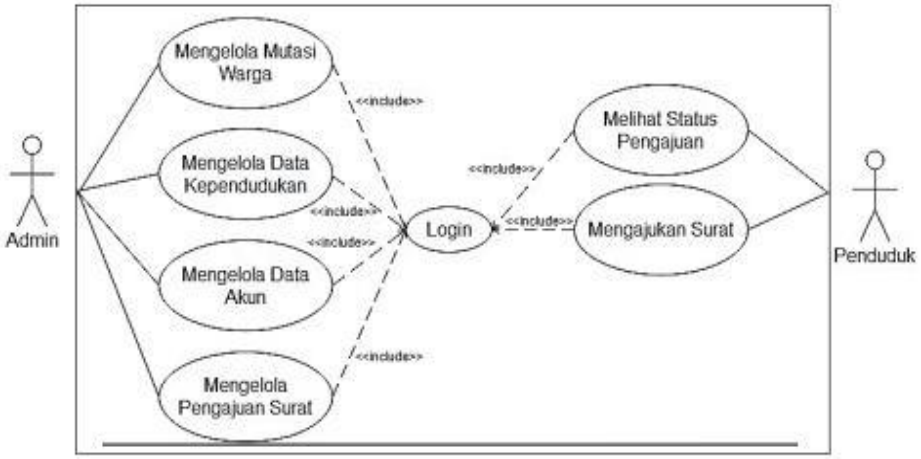
and population data in Tandem Hulu I Village. (4) The system makes it easier for residents to take care of administrative letters at the village office. (5) This system relies on internet technology to be accessed by users and admins in the process.

DISCUSSIONS

User resident can log in and do submission as well as fill in the required data on the menu choice category letter For Then submission This is considered by the admin for accepted or rejected. If submission letter introduction the accepted, then resident Can direct go to office village For take letter without must wait queue and provide the required data again. However if submission letter rejected, then resident must see status why submission the rejected, thing This Can happen because of two factors, the first because data such as address entered No in accordance or No residents of Tandem Hulu I Village, or the second resident the Not yet complete personal data.

Following Use Case Diagram form of study This:



Gambar 10. Use Case Diagram

Activity diagram used as visual representation for describe flow activity sequentially in business process or case usage. Graph This illustrate the beginning a series activity, possibility point decisions, and peaks end in development device soft. Activity diagram offer description comprehensive about sequence of processes, but No covers details specific about each phase.

a. Activity Diagam Login

login activity diagram illustrates order steps taken when user trying to login. After logging in, the system navigates to the dashboard page, where the user is prompted to enter his/her username and password. If the entered credentials are accurate, the user gains access to the dashboard page. However, if the username or password is incorrect, the system generates a login failure message and requires the user to repeatedly enter the correct username and password until successful.

Following Log In Activity Diagram form study This:

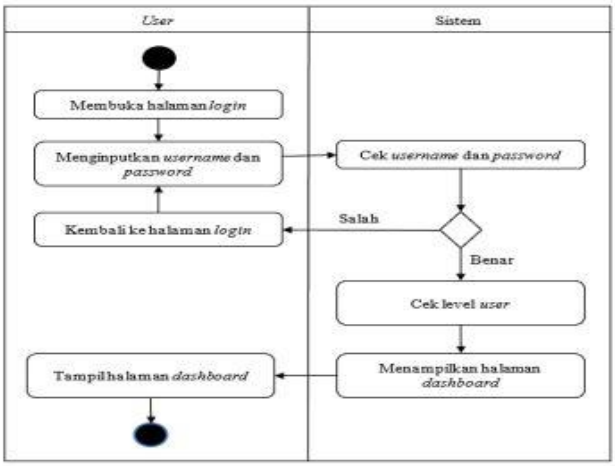


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Figure 11. Activity Diagram Log In

b. Activity Diagram Manage Account Data

Diagram depicting channel activity The "Manage Account Data " procedure involves administration account user in system information population. During this procedure, the administrator has the ability to enter, delete, and change account information.

Following Activity Diagram form Manage Account Data from study This:

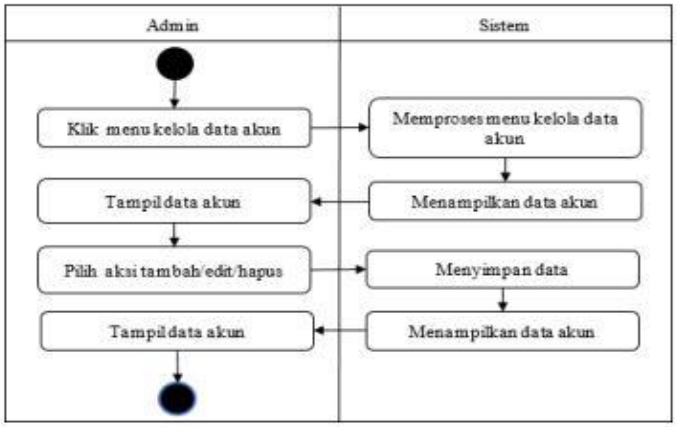

Figure 12. Activity Diagram Manage Account Data

c. Population Data Management Activity Diagram

Activity diagram presented describe steps procedural for citizens Tandem Hulu I village, where manager have ability For add, change, and delete population data

Following form Population Data Management Activity Diagram image from study This:

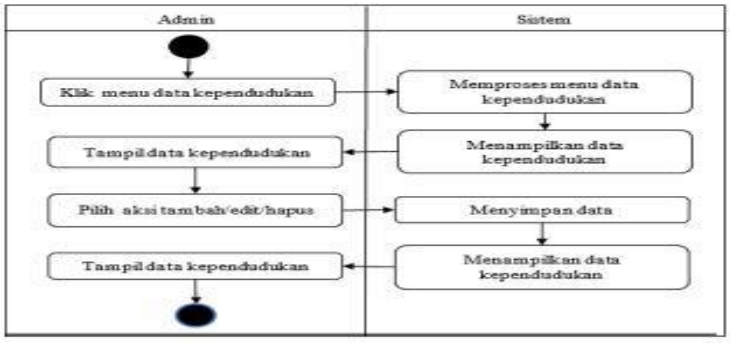

Figure 13. Population Data Management Activity Diagram

d. Activity Diagram Manage Mail

Activity Diagram depicted describe procedure Where an administrator supervises reception letter from resident a hamlet. During procedure Here the administrator has ability For give information latest about the application status letter moment this , including whether application the currently in process, has completed , or has rejected .

Following form Activity Diagram image Manage Letter Data from study This:

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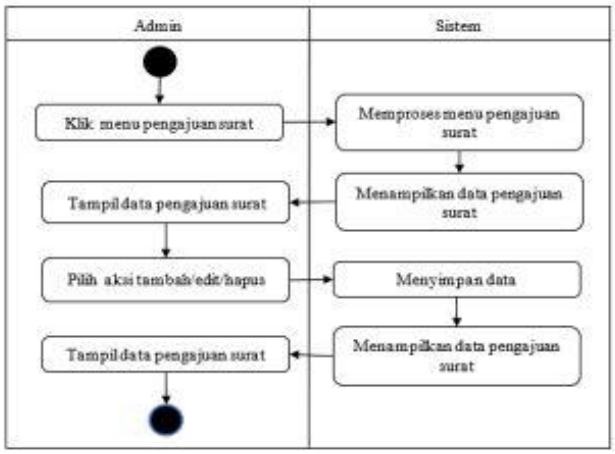

Figure 14. Activity Diagram for Managing Letter Data

e. Activity Diagram Registration

This activity diagram show steps taken by residents who have not own account For do registration to be able to submit letter In this process, residents will enter Number Parent Population (NIK), username, and password as part from the registration process account.

Following form Activity Diagram Registration image from study This:

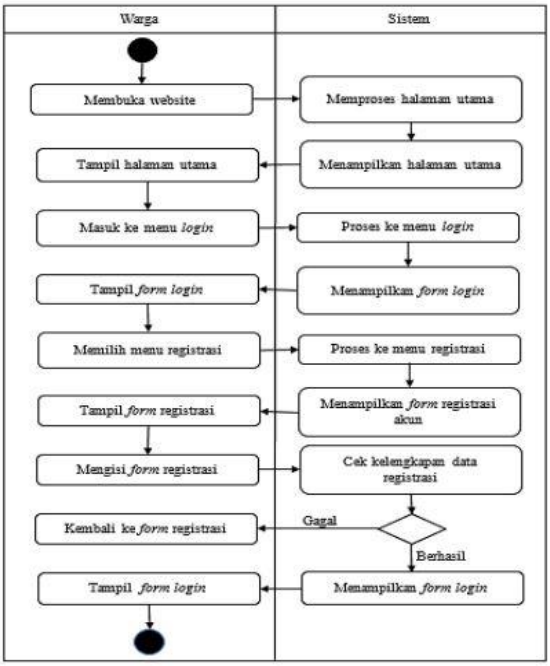

Figure 15. Registration Activity Diagram

Class Diagram describe characteristics or quality a system and offers functionality For supervise characteristics This through method or function. Here is a Class Diagram that describes system information population used at the Tandem Hulu I Village Office.

Following form Class Diagram image of study This:

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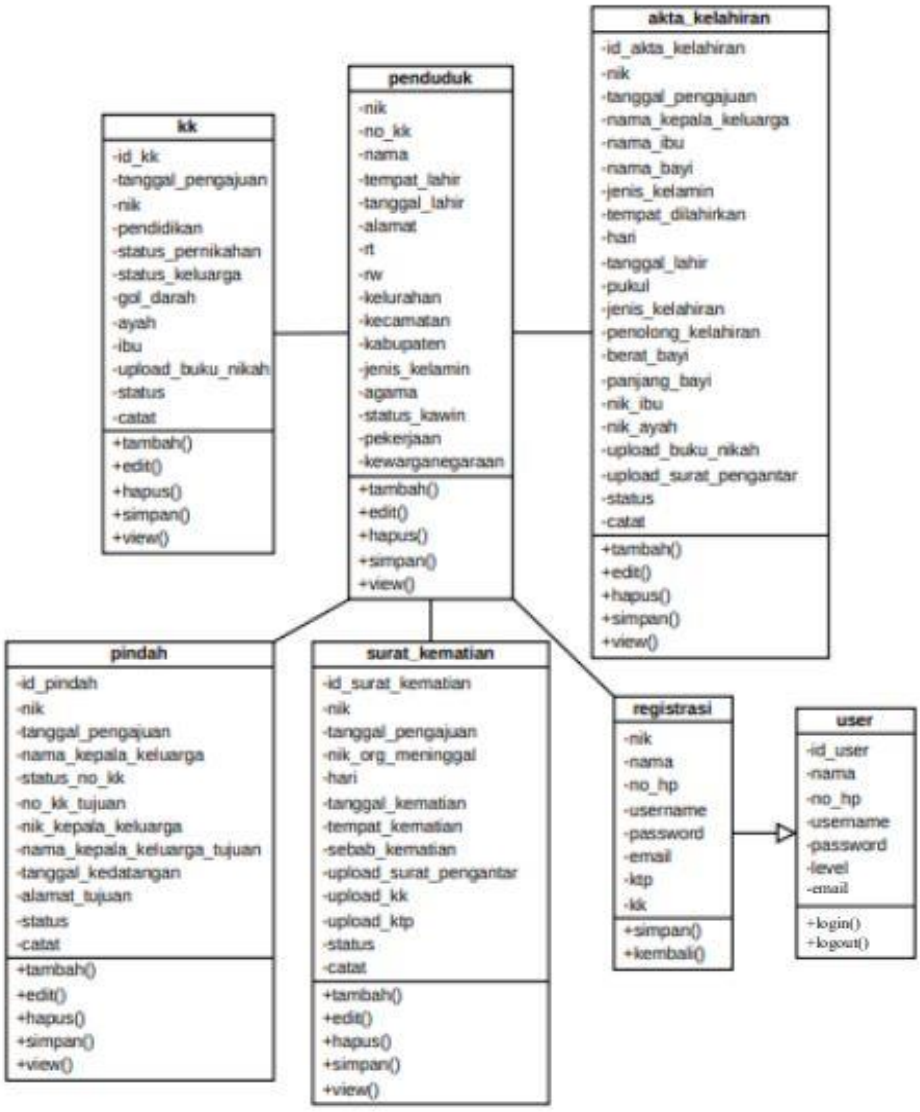

Figure 16. Class Diagram

CONCLUSION

The conclusion of the analysis and evaluation of the thesis entitled "Analysis and Design of Web-Based Village Information Systems Using the Rapid Application Development (RAD) Method (Case Study of Tandem Hulu I Village)" is (1) Utilization of web-based village information systems can improve the efficiency and effectiveness of public services, encourage openness in village government, and encourage community involvement. (2) The RAD method can be used to develop web-based village information systems quickly and according to user needs. (3) The system can run and be accessed by residents and village officials to provide convenience in processing population data and managing village administrative letters.

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