

Engineering Design Business Process Modelling Letter C Land Data Archiving System with Software Requirement Specifications Approach

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ABSTRACT

The Pandanarum Village area includes three hamlets, namely Pandanarum, Klampok and Sentul. The status of village land ownership rights is still in the form of Letter C. In 2023, land ownership will be recorded at more than 4,000. The process of collecting data, searching and changing Letter C is still done manually by recording it in the Letter C main book (Registration Book C). Meanwhile, the search process was carried out by flipping through the master book, which resulted in the book becoming torn and damaged. Almost every day some people need services regarding the letter C land data. With a manual process, recording and searching for data takes an average of 2-3 days. This is an obstacle for people who want this data urgently. The solution offered is the need to engineer a village letter C data collection and search system with business process modeling. System development is carried out using the Software Development Life Cycle (SDLC). In this research, the focus is on the initial stage of SDLC, namely Requirements with a Software Requirement Specification (SRS) approach following IEEE standards. This research aims to engineer a business model for data collection and land Letter C searches with the hope of improving the services of village officials in response to requests from the community who need services for data collection, search and changes to land rights they own. The results of this research are the identification of functional and non-functional system requirements analysis, system design in the form of business process models and use case diagrams. The results of this requirements design become the basis for continuing subsequent research.

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Introduction

Information systems play a vital role in the success of a business in this modern era. Not only a tool for processing data, information systems are also a business model that can embrace creativity and innovation. The business model of an information system process is a method that enables the development of efficient and effective information systems. With this model, business goals can be better achieved, resources can be optimized, and business decisions can be taken more accurately.

From August 2023 to September 2023, Balitar Islamic University again carried out a Student Real Work Lecture in Sutojayan District, and researchers were assigned to become Field Assistance Lecturers in Pandanarum Village. At the beginning of the KKN activity in the morning on August 21, 2023, the father of the sub-district gave a speech of direction and guidance regarding the priority scale in Sutojayan District, including those related to the payment of land and building taxes that have not yet been completed. In the process of carrying out KKN activities, especially in the field of institutional and information technology, the Head of Pandanarum village conveyed the obstacles faced by the village in recording and searching to serve the needs of residents regarding the letter C and hoped that there would be a change in data collection that was still manual to digitization. On this basis, this research emerged to continue the previous research theme and meet the needs of Sutojayan District, especially Pandanarum Village.

Pandanarum Village is one of the villages located in the southern part of Blitar Regency in the Sutojayan District area the northern geographical boundary is Plosorejo Village, Kademangan District, the south is Kedungbunder Village, Sutojayan District, the west is Ngeni Village, Wonotirto District, and the east is Wonotirto Village, Wonotirto District. The area of Pandanarum village is 369 hectares and consists of 4 villages and 7 wards in Sutojayan District, which is located in the southwest of the sub-district capital. The Pandanarum village area consists of residential housing, rice fields and yard land. The average land height in Pandanarum Village from sea level is 170 meters above sea level. The condition of water in Pandanarum Village is said to be abundant because jam has a water source and many residents have wells in the rice fields to irrigate it. The climate in Pandanarum Village, like other villages in Indonesia, has a dry and rainy climate. The total population in Pandanarum Village is 8300 people with 2561 families. Divided into 44 RT and 10 RW. Pandanarum village consists of 3 hamlets, namely Pandanarum Hamlet, Klampok Hamlet and Sentul Hamlet.

Based on the results of collecting preliminary data through interviews with village heads and three hamlet heads, information was obtained from approximately 4000 data on landowners, almost every day some submit data on land election rights to submit funds to the Bank. The data collection and search system is still carried out manually by recording and searching from the master book Letter C. Letter C is a traditional land certificate that states the ownership of land rights in an area (customary territory) for generations. The issuing institution related to land certificates is BPN (National Land Agency). Given the importance of registering customary property rights on land as proof of legal ownership of land rights by Article 23, Article 32, and Article 38 of the Basic Agrarian Law (UUPA), an obligation is given to register customary land, especially customary property rights (Indonesia, 1997). Letter C is made by the local village or ward officials. Its status is the same as that of girik land, that is, land without certificates (Negara, 1961). Even so, this document can still be used as proof of land ownership in buying and selling transactions. In addition to its weak legal status, another drawback of letter C land is that data information is considered incomplete and accurate. This letter C letter is not given directly to the community, because of its status as a village or ward land record. Therefore, the original letter C letter on the land is stored at the local village office or ward. What is given to the community or landowner is an excerpt from the letter C, in the form of a striated letter. To serve the demands of the community, the letter C data collection and search system takes a long time. Each submission is always promised 2-3 days of completion. So that the community's needs for submitting funds to the Bank cannot be served quickly.

Based on these problems, efforts are needed to engineer a data collection system and search for village letter C to help the village officer service system for community needs be met immediately. One of them is by engineering business process modeling. Business process modeling is a method that enables the development of efficient and effective information systems. With this model, business goals can be better achieved, resources can be optimized, and business decisions can be taken more accurately. Information System Process is the process of developing and designing a business structure that integrates information systems to improve the effectiveness and operational efficiency of an organization. This information system process business model involves the use of information and communication technology to expose and optimize information flow, cooperation, and appointment of all organizational business processes (Aksan et al., 2020).

Problem-The solving approach in this study uses the Software Development Life Cycle (SDLC) approach. SDLC is the process used to build high-quality software. The software development life cycle is also known as the system development life cycle. The software development lifecycle features a framework that outlines the tasks to be performed at each stage of software development (Acharya & Sahu, 2020). The traditional system development method used by most organizations today is a structured SDLC, containing a sequence of sequential processes on which information systems are built. SDLC is also often said to be the stage involved in software development to produce the best product from the start of periodic planning and maintenance (Ali, 2017).

This approach begins with requirements, design, development, testing, planning, deployment, and maintenance. The reason for choosing the SDLC approach is because this technique can help ensure that the software produced is of high quality, meets user needs, and is delivered on time and within budget. In addition, using a well-defined SDLC can help reduce the risk of errors, improve communication and collaboration within the development team, and encourage consistency and reuse in the development process. However, in business engineering, the process model system that will be carried out only reaches the requirement stage. In the requirement stage, it is carried out with a Software Requirement System (SRS) model approach. SRS uses IEEE-established standards. IEEE standardization is a standard in determining the needs in preparing an SRS (ISO/IEC/IEEE15288, 2018; Rahayu, 2021).

Previous research related to legal studies that have been carried out states that a digitization system is needed for the Land Letter C Village register (Wahid & Rohadi, 2021). In addition, the research to be carried out is a follow-up research where in 2022 a prototype of the Letter C data archive management and security system has been produced (case study at the Gondang Village Office) (Setiawan & Santi, 2022). The research needs to deepen whether the prototype can be applied to different locations. In addition, research on informatics studies was also carried out by Soepandi 2022 which resulted in a web-based village C book land information system application in Satriyan Village, Tersono District, Batang Regency (Soepadi & Widodo, 2021). This study focuses on making applications where it is not explained in detail how the process of designing a good system is. Other research includes Book C data processing application in Bener Village Using Appsheet in Majenang District, Cilacapuga Regency conducted by R Suryani, DN Triwibowo (Suryani et al., 2022). Website-Based Village Letter C Data Recapitulation System, RF Wiharifin (Wiharifin, 2023), Website-Based Letter C Data Processing Application at Kuwu Village Office, Balerejo District, Madiun Regency by MP Astuti (Astuti, 2022), Complete Systematic Land Registration (PTSL) for Village Registration Land (Letter C) in Mangli Wetan Village, Tapen District, Bondowoso Regency by EPW Yurisa (Yurisa, 2022), Dynamic Website-Based Information System Loading for soil monitoring Letter C da Petok D (Case Study: Ward Karangbesuki) by N Hidayati (Hidayati, 2022), Archiving Land Book Letters at the National Land Agency of Madiun Regency Based on Website by FA Wicaksono (Wicaksono, 2023).

The previous research discussing the Software Requirement System was conducted by RA Serafintino with the title Software Requirement Specification (SRS) Document Marketing Information System for Printing and Advertising Services Business (Harsono, 2007; Serafintino & Susilowati, 2022). C Rawis' research, SDS Karouw, examined the Software Requirement Specification of the Academic Information System of Sam Ratulangi University (Rawis et al., 2021). N Widjiyati, E Pramono researched the Analysis of Software Requirement Specification Stages in Accreditation Information System Design Using MDI and TOE Methods (Case Study: XYZ University)(Widjiyati et al., 2022). MW Rezkita, Y Kurniawan, Software Requirement Specification Management Information System for Manufacturing Companies with ISO/IEC/IEEE 29148:2018 Standard (Rezkita & Kurniawan, 2022).

Based on the background and some previous research as well as the needs of the problems faced by Pandanarum Village, this research focuses on the Business Process Model of the Data Collection and Search system for Letter C Land of Pandanarum Village. The novelty of this research is that the design model used is UML while the previous research was with structured programming (DFD). The system development method used is SDLC using the SRS approach, while the previous research used the SDLC prototype approach.

By creating this engineering design, it is hoped that it can help Pandanarum village officials in the process of collecting data, searching and mapping land letter C more quickly and efficiently.

Method

Research Method and Design

The problems to be analyzed by researchers are socially dynamic problems. For this reason, researchers choose to use descriptive research methods where the stages carried out start from collecting data, processing and then analyzing the research data that has been obtained. Descriptive research is used to understand the real problems that occur in the social environment of society. One way of data collection is done by in-depth interviews with resource persons so that the core of the problem being faced is found. In this case, the resource persons in question are the Head of Pandanarum Village and the Head of Pandanarum, Klampok and Sentul Hamlets. In addition, there are also village secretary and village chief devices. The stages of the Research method follow Figure 1 below:



Figure 1 Stages of Research Methods

SDLC Stages

The stages of SDLC can be presented as in Figure 2 below:

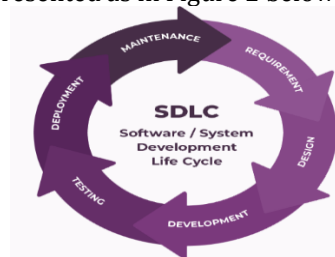


Figure 2. SDLC Stages

Figure 2 stages of SDLC shows there are 6 stages of SDLC including Requirement, Design, Development, Testing, Deployment and Maintenance. This research will focus on the first stage of SDLC, namely Requirements. At the same time, the next stage in SDLC is like being material in further research. In the early stages of Requirements / Needs Analysis, this stage is led by seniors with input from stakeholders. At this stage the development team will collect and analyze user needs, to be formed into requirements or requirements and desired standards. Requirements will be compiled in the SRS (Software Requirement Specifications) documentation.

Results and Discussions

Data Collection P Results

This research begins with the data collection stage. Data collection techniques are carried out by Observation, on the letter C data collection business process applicable in Pandanarum village and interviews are conducted with the village head, and village officials in charge of managing the letter C data collection process between Village Chief, Head of Pandanarum Hamlet, Head of Klampok Hamlet and Head of Sentul Hamlet.

From the results of data collection, the conditions for the existence of registration book C as in Gambar 3 are obtained below:



Figure 3. condition of registration book C

In addition to the condition of the registration book C, a map of the location of the Pandanarum area is also obtained as shown in Figure 4 below:

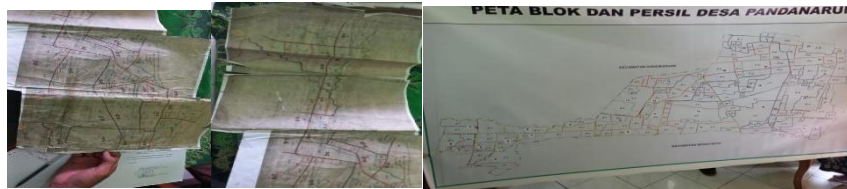


Figure 4. Map of the location of the land

The results of further data collection from the interview results obtained the procedure of the data collection system and letter C search that is currently running in Pandanarum village. Where the data collection system involves landowner actors, village officials, BPN and banks, the stages in this business process can be presented as shown in Figure 5 below.

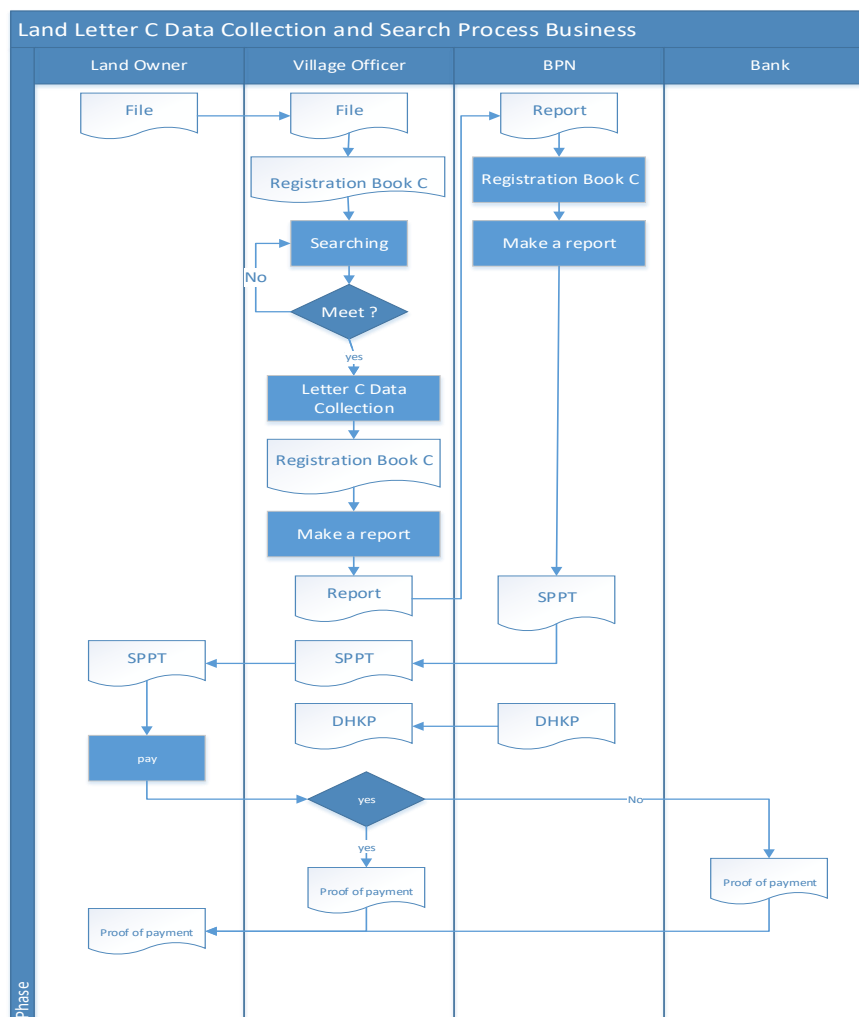


Figure 5. Letter C logging and search system that is running

Figure 5 shows that in the letter C data collection system, the search and payment process involves landowners, village officials, BPN and banks. When there are residents who need urgent data, residents must come to the village office. Meanwhile, officers cannot search for data quickly and in a

short time because the search process is still carried out by flipping through the registration book C. This is a weakness of the data collection system and searching for letter C data, in addition to the process is still done manually by flipping through books, another weakness is the absence of an information system that makes it easier for officers to serve residents who need letter C data information on the book registration C. while another drawback is that residents who need information about letter C must come to the village office.

Based on the weaknesses mentioned above, it is necessary to have an information system that can carry out the process of collecting and searching letter C data. In addition, residents will get letter C information with a fast time. The following picture is the business result of the process of collecting, searching and mapping letter C land in Pandanarum village.

The stages of the business process carried out in the data collection information system and the search for letter C land data can be described in Figure 6 below.

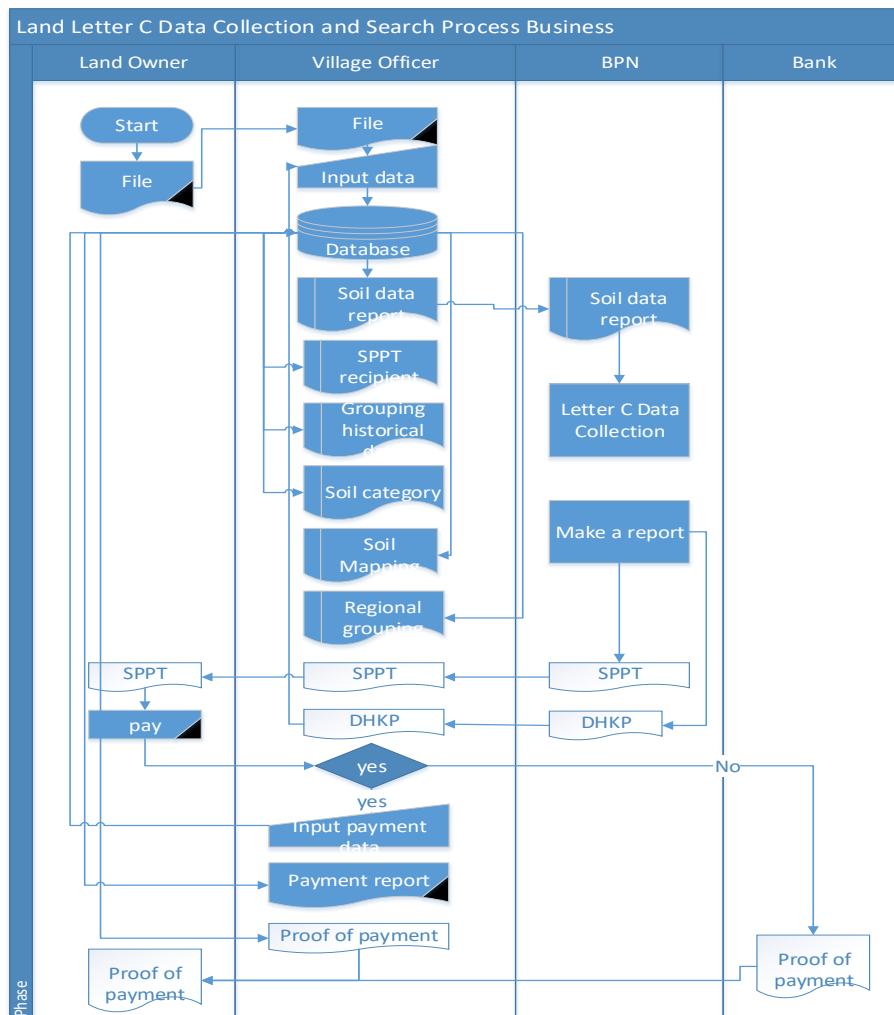


Figure 6. Business Process Information System Data Collection and search Letter C land

In Figure 6 of the data collection and search information system letter C land, it is illustrated that village officers in the process of data collection, search and reporting use an information system that is built where every process has been carried out by digitization starting from data collection, search and report-making process.

The proposal of a letter C registration information system can be compared in Table 1 below.

Table 1. Comparison of 2 systems from drawings and drawings

No	Information	Legacy System	Proposed system	Results to be achieved
1	Logging	Residents must come to the village office	Can be done anywhere and anytime	Save time and money
2	Search	Done by flipping through the Registration C book	Conducted through information system applications	Faster search and C Registration book is not Corrupted
5	Location mapping	Done by drawing yourself and done in a printing house	Conducted through information system applications	Location mapping can be displayed automatically
6	SPPT Report	Created reporting through the Excel app	Conducted through information system applications	Faster reporting

Requirement Requirement Analysis SRS (Software Requirement Specifications)

a. General Description

1) Perspective

This Letter C Information System is the main website for collecting and searching for Letter C land in Pandanarum village. This website contains the availability of Login features, letter C logging, Letter C Search, History List and Location Mapping of letter C areas

2) Usability

This Web-based information system has the use of assisting village officers (admin) in registering letter C land into the Register C book. With this web system, it is hoped that admins can access the system so that it will facilitate the search for information related to letter C land. This web system has 1 user, namely Admin (village officer) as the service provider of the Pandanarum village website.

3) User Characteristics

User characteristics, namely as an admin will affect the functionality of the letter C land website information system, namely the admin category facility can access adding letter C land data, searching for letter C land data, editing letter C land data, deleting letter C land data, and displaying letter C land area mapping

4) Limitations

Some limitations exist in the letter C land information system web. These limitations may affect the operation of a website. These limitations include: (a) Admin must log in before getting access to the next menu, (b) To be able to access this website Admin gets an automatic username and password, (c) The software uses Pycharm IDE version 2023.2.4, Python programming language version 3.8.0

5) Assumptions and Dependencies

The assumption and dependence of the Land Letter C website information system are related to the operation of the website, including only the admin can access the Land Letter C website,

b. Requirement Specifications

1) Functional Needs

Analysis of functional needs in the information system data collection search reporting and mapping letter C land can be seen in Table 2 below:

Table 2. Analysis of the functional needs of Information systems

No	User	Information
1	Officer	Can sign in can see land history data information from the village Registration C book that has been inputted into the Letter C application can search for land history data from the village Registration C book that has been inputted into the Letter C application Can view the history of letter C land

Analysis of external interface requirements in the letter C land information system can be seen in Table 3 below:

Table 3. The external interface needs analysis

No	Display	Actor	Process	Information
1	Home page	Admin	Login	Admin login system by entering user name and password
			Show the home page	Admins can view the home page
2	Input data letter C	Admin	Login	Admin login system by entering user name and password
			Display data input form	Admin goes to the data input page
			Data input	Admin inputs letter C data
3	Find letter C data	Admin	Login	Admin login system by entering user name and password
			Display data search form	Admin, ask the search data page
			Select data	Admins select data
			Edit data	Admins edit data
			Clear data	Admin deletes data
4	History Letter C	Admin	Login	Admin login system by entering user name and password
			Show the home page	Admins can view the home page
5	Area loc mapping	Admin	Login	Admin login system by entering user name and password
			Show the home page	Admins can view the home page
			Select data	Admins select data
			Edit data	Admins edit data
			Clear data	Admin deletes data

2) Performance Needs

a) Analysis of non-functional needs

The following is an analysis of non-functional needs for the information system for data collection and search for letter C land as presented in Table 4 below:

Table 4. Non-functional needs analysis

No	Component	Kind	Information
1	Hardware	Laptop	Processor : Intel® Core™ i5-1035G1, RAM: 4 GB, OS : 64-bit
2.	Software	Pycharm	Version 2023.2.4
		Python	Version 3.8.0
		Windows 11 operating system	Version 22H2

3) System Design

With the identification of the business process of the letter C data collection and search system, a use case diagram is made to illustrate what processes will be carried out by actors, in this case, village officers. Use case diagrams that will be carried out by village officer actors who in this case are referred to as admins carry out several activities including: System login, Letter C Registration, Letter C History and Letter C Mapping.

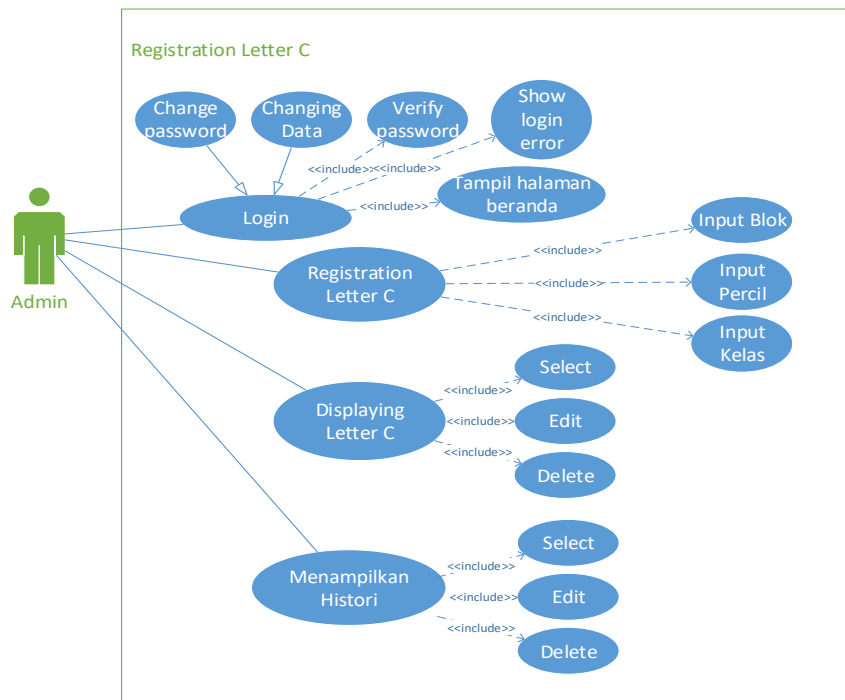


Figure 7. Use Case Diagram Registration C

In Figure 7 the admin performs 4 main processes, namely login, Letter C registration, displaying letter C and displaying history. The use case diagram of mapping the location of letter C land can be seen as shown in Figure 8 below:

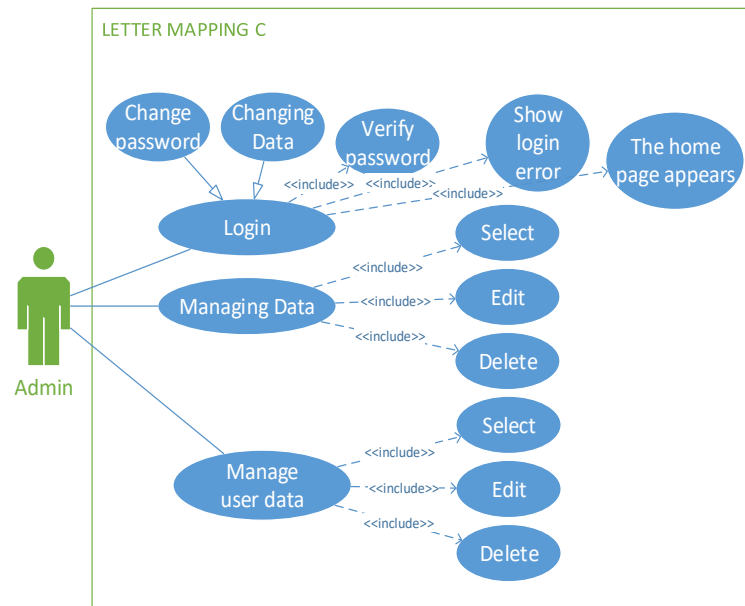


Figure 8 Use Case Location Mapping

Figure 8 use case mapping the location of letter C land shows that the admin performs 3 main activities namely login, managing letter C data and managing user data. For the login process, there is a process of changing passwords, changing data, and verifying passwords. In addition, there is also a

process for displaying login errors and displaying the home page. Meanwhile, the process of managing data and managing user data is the process of selecting data, editing data and deleting data.

After the use case diagram is built, it will then describe the activity diagram of each use case including the login activity diagram, registration C and letter C area mapping, and the following activity diagram of the login process as shown in Figure 9 below

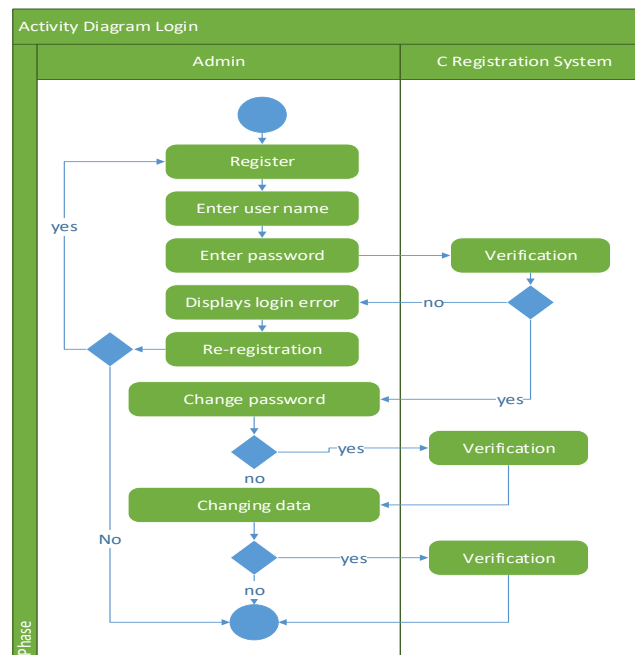


Figure 9. Activity diagram Login process

From Figure 9 it can be seen that the admin can carry out the registration process by adding a username and password. After getting verification, the admin can also make changes to the data or not. If the password does not match the user name, the system will notify you that the password entered has an error.

Next, an activity diagram for the C registration process will be displayed as shown in Figure 10 below.

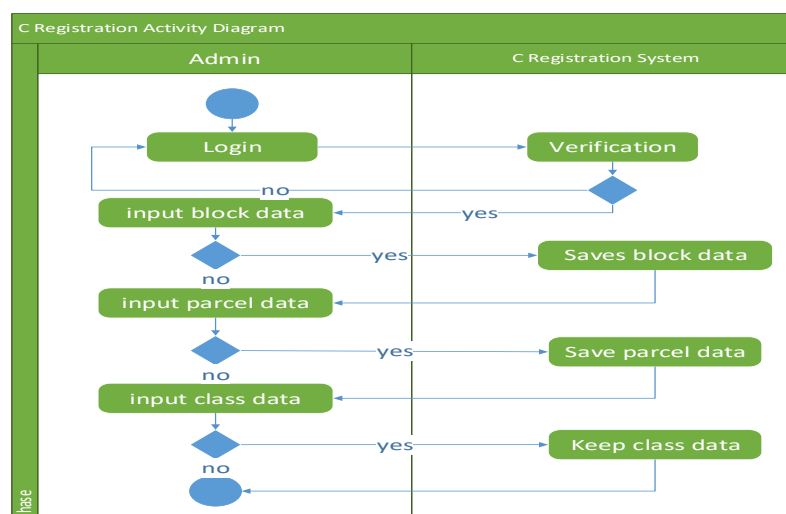


Figure 10. activity diagram of registration process C

Figure 10 shows that the admin in carrying out the registration process of letter C by entering complete letter C data is lined with block data, percel data and class data. Furthermore, the activity diagram for the process of mapping land areas according to the letter C can be presented in Figure 11 below.

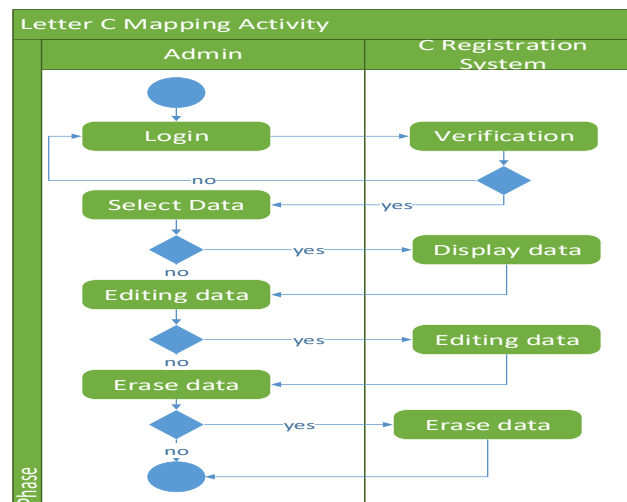


Figure 11. Letter C area mapping

Figure 11 is an activity diagram for the process of mapping the second area with the letter C of the village where based on the C registration activity diagram, the admin can carry out the process of mapping areas adjusted to flat land, rice fields and yards.

Conclusions

This research resulted in an engineering design for a data collection, search and mapping system for letter C lan in Pandanarum village. This design uses the SDLC model with the SRS Requirements approach. The results of this reasearch are the basis for further research where the results of this business engineering will be continued with design and real implementation so that the system will be built and will help village officials in serving the needs of the village communities.

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