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Original Article

Indonesian Integrated Village Monograph Information System

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Abstract *- The purpose of this study is to build an integrated village monograph information system that displays all statistical data in a village. Data here include general data, villager data, financial data, authority data, and institutional data. The information in this monograph system is updated regularly and can be accessed by mobile devices. To achieve the purpose of this study, the authors began to conduct a literature study followed by a survey to find out the real conditions and needs in the field. The object of this study is Kota Baru Barat Village in Martapura Sub-district, one of the sub-districts in Indonesia. Based on the results of this survey, the authors began to design and develop a village monograph information system. The evaluation results show that the village monograph information system developed is acceptable and relevant in presenting information to the public*

Keywords *- Integrated village monograph information system, Village administration, Indonesia.*

1. Introduction

The development of an integrated village monograph information system is a public service carried out by a research team from Indo Global Mandiri University in the Higher Education Fundamental Research Grant (PDUPT). This research program was assisted by several students and supported by village officials in Martapura Sub-district, South Sumatra. Developing an integrated village monograph information system requires complete and valid data [1]. Data was obtained by asking for assistance from village officials and by conducting direct surveys of Kota Baru Barat villagers in Martapura Sub-district. The data survey will be carried out in several stages, starting from 2021 to 2022. Internally, developing an integrated village monograph information system aims to assist village governments in collecting village resource data, including general data, villager data, financial data, authority data, and institutional data [2].

As for external parties, they can be used as an example, comparison, or source of primary data for a study on a village [3]. With the existence of an integrated village monograph information system, it will be easier for village and sub-district governments to know village conditions in real-time. The data on the developed monograph information system will be updated regularly so that the data will be open to the public and can be seen directly from anywhere and anytime [4,5]. More specifically, the purpose of developing a monograph information system is to make it easier for village and sub-district governments to summarize village resource data that were previously scattered and difficult to obtain. The author hopes that the existence of this integrated village monograph information system can be useful for anyone who sees it, so they can find out the real conditions of the village that is the object of this study. Generally, this public service consists of three stages; the first stage discusses the problems village officials face in collecting and summarizing village resource data. So a solution is needed, so that village officials and the community get convenience when they want to find or find out village resource data. The second stage is to hold a meeting to formulate a plan for developing an integrated village monograph information system by involving all relevant parties. This meeting results from a cooperation agreement between the development team and village and sub-district officials who will use the integrated village monograph information system.

The development team began conducting surveys, and village and sub-district officials helped provide the data needed. In the third stage, the team started to make a design, followed by creating the program. The results of the development of the integrated village monograph information system are evaluated by involving the village, sub-district, and community officials to obtain feedback so that the system developed is in accordance with the needs of end-users. This study is also a continuation of a study that the authors have done previously [6,7].

2. Literature Study

The definition of a monograph based on the Great Dictionary of the Indonesian Language is the description of one part of a science or about a particular problem. In the regulation of the Minister of Home Affairs of the Republic of Indonesia Number 13 of 2012 Article 1 no. 10, a village or sub-district monograph is a collection of data collected by the village or sub-district government and compiled in a systematic, complete, valid, and integrated manner in the administration of government [8,9]. The village government collects five types of data to create a monograph. The five types of data are general data, villager data, financial data, authority data, and institutional data. General data consists of economic, social, public order, disaster, and regional. Villager data contains data on the village population and sub-district administration personnel. Furthermore, the authority data contains the authority possessed by the village government or sub-district government [10]. Institutional data contains institutional data of a village or sub-district. Financial data contains data on income, expenditure or expenditure, and wealth owned by the village [11]. There are four stages in creating a village monograph system. Each stage must be done systematically because each next stage is very dependent on the outcome of the previous stage.

VILLAGE MONOGRAPHY BOOK			
CONDITION IN DECEMBER 2021			
(The Regulation of the Minister of Home Affairs Number 13 of 2012)			
1. Village Name	:		
2. Year of Establishment	:		
3. Legal Basis of Establishment	:		
4. Region Code Number	:		
5. Postal Code Number	:		
6. District	:		
7. District	:		
8. Province	:		
A. GENERAL DATA			
1. Village Typology	:		
2. Village Development Level	:		
3. Area	:		
4. Territory Boundaries			
a. North	:		
b. South	:		
c. West	:		
d. East	:		
5. Distance from the Center of Government			
a. Distance from District Government Center	:		
b. Distance from City Government Center	:		
c. Distance from Regency Capital	:		
d. Distance from Provincial Capital	:		
6. Amount of Certified Land	:		
7. Village Cash Land Area	:	Ha	
8. Population	:	Person	
a. Male	:	Person	
b. Female	:	Person	
c. Age 0-15	:	Person	
d. Age 16-65	:	Person	
e. Age More Than 66	:	Person	
9. Employment			
a. Workman			
1. Civil Servants	:	Person	
2. Army/Police	:	Person	
3. Private	:	Person	
b. Merchant	:	Person	
c. Farmer	:	Person	

Fig. 1 Example of Village Monographic Book

1. The village head and village officials collect and fill in the required data using a monograph form at the beginning and middle of each fiscal year
2. The Village Head reports the village monograph in the form of a report book to the Regent or Mayor through the Sub-District head.
3. The Regent or Mayor shall then report the validated village monograph to the Governor.
4. The Governor submits a village monograph report on his territory to the Minister of Home Affairs.

Fig. 1 shows an example of a village monograph report used in Indonesia.

Fig. 1 shows the form that must be filled in to complete general data. This general data contains complete information on the establishment of the village, village boundaries, population size, and occupation of the villagers. Provisions regarding the data collected and needed to complete the village monograph have been regulated in the regulation of the Minister of Home Affairs of the Republic of Indonesia Number 13 of 2012. All work and provisions in preparing this village monograph have a valid legal basis.

The definition of an information system, in general, is a system that integrates real activities using computer technology to support management and operational activities [12,13]. The system is formed based on the relationship or interaction between data, information, computers, algorithms, and humans as end users [14]. The ultimate goal of developing an information system is to produce a computer-based product that contains relevant information [15]. A system must involve various types of data that can be processed so that it can be displayed and understood easily by end users. To display valid data, developers must meet three factors, first, the data must be accurate and relevant [16], efficient and timely, and third, right on target. If these three factors have been met, then the objectives of developing and implementing an information system will produce optimal and appropriate outcomes. After understanding the definition and purpose of information systems, the next discussion is on the main goals of information systems which are summarized as follows [17]:

1. Provide good quality information and provide experience in managing an information system in the correct sequence.
2. Increase work productivity at all levels of stakeholders.
3. Can analyze and predict failures and minimize economic losses.
4. Full accessibility to end users.
5. Fulfill organizational targets and objectives quickly and accurately based on valid and accountable information.

Based on the explanation of the definition and purpose of information systems in general, it can be concluded that the purpose of making a monograph information system is to provide complete and valid information about the object of monography. If it is narrowed to a narrower area, as in this study, then the system developed must be able to provide valid and relevant information about a village. Information that is always updated and easy to understand for anyone who sees it.

3. Methodology

In doing a study, it takes logical steps to achieve the research goals. The choice of methodology must be relevant to several things, namely the type of data to be used, the type of research (quantitative study or qualitative study), and the type of testing method to be used. External factors must also be considered, such as the ease of obtaining data, the time provided for conducting research, and various obstacles in the field, all of which must be considered in determining the research methodology. Fig. 2 shows the direction and systematic steps that the authors use to achieve the research goals:

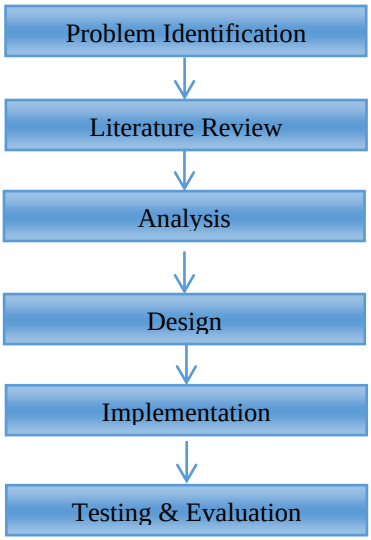

Fig. 2 Research Methodology

The detailed explanation of the steps in Figure 2 is as follows:

3.1. Problem Identification

Problem identification is needed to minimize the scope of the problem so that it is focused and directed. Problem identification is based on the actual problems found in the field [18]. The output of problem identification is in the form of a research question that must be answered through the research to be carried out.

3.2. Literature Review

After identifying the problem, the next step is to enrich knowledge and understanding of the problem to be studied by searching and reading books, articles, and journals related to the problem [19]. A literature review is also needed to find gaps between one study and another.

3.3. Analysis

After gaining a lot of knowledge and understanding about the gaps, shortcomings, and advantages of each solution, method, or mechanism used to solve problems, the authors began to analyze the real conditions of the problems in the field. It starts with a short survey to get a real picture of the problem that will be given a solution.

3.4. Design

After obtaining an overview of the actual problem and the proposed solution to solving the problem, the next step is to start compiling and assembling solution ideas for problem-solving in the form of computer-based designs. This design is an initial concept that is converted into a computer program. This design also serves as a guide for developers in developing information systems.

3.5. Implementation

The design results in the previous stage are converted into line-by-line code until it becomes a complete information system. In addition to code generation, storage in the form of a database is also created. The integration of all components, in the form of modules, is also carried out.

3.6. Testing and Evaluation

The information system is tested to determine whether the system is running properly. Tests are also carried out to find out errors or other anomalies that can reduce system performance when used by end-users.

4. Results and Discussion

Fig. 3 shows a diagram with two main actors' the admin (village officer) and end-user (village head, sub-district head, regent, Governor, minister of home affairs, and community), with some use cases between the two. Government and community leaders as end-users are associated with the home page, general, villager, financial, authority, and institutional data. At the same time, the Village officer as admin is associated with the login page, home, general data, villager data, financial data, authority data, institutional data, panel-master data, and logout. End-users do not need to log in to view statistical data related to general data, villager population, financial, authority, and institutional. Activities and facilities owned by end-users, such as viewing, sorting, searching data, printing data in the form of text, tables, or charts in the form of Pdf files or directly to the printer, while the admin is interested in inputting, updating, and deleting data. Input and update if there is the latest data or fix if there are errors. Delete if the data has expired. Data that is over 5 years old will be transferred to backup media as historical data but can still be viewed if needed. To be able to perform these various facilities, an admin is required to log in and log out when he has completed his activities.

Fig. 3 – Fig. 6 show the proposed village monograph information system design:

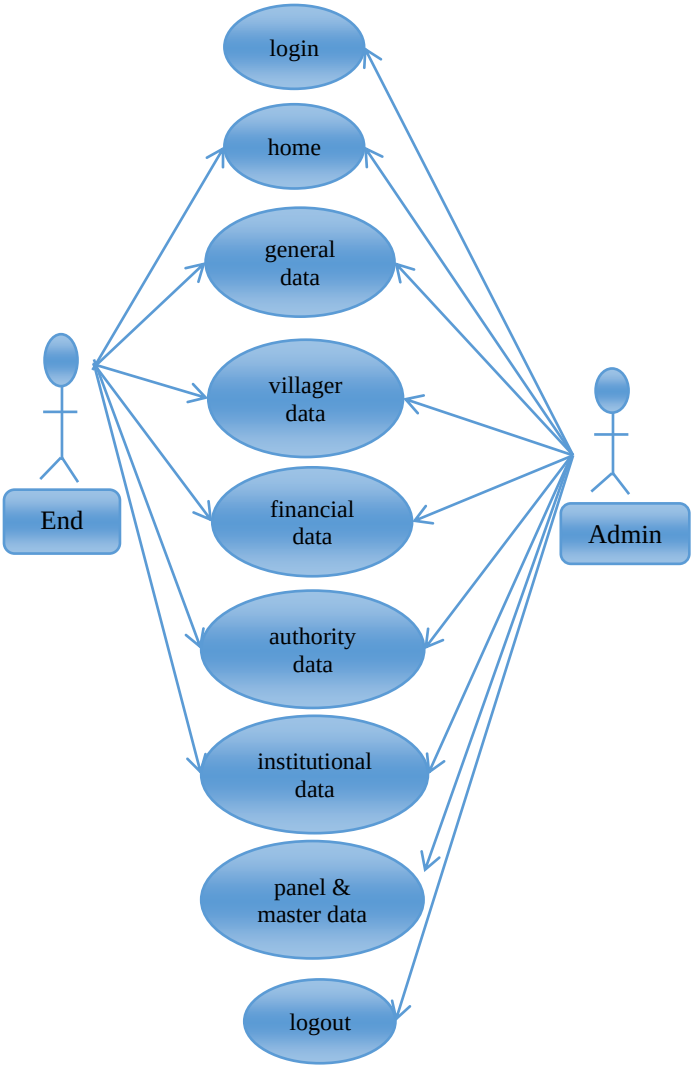

Fig. 3 Use Case Diagram

Activity diagram is the development of use case diagrams that have been submitted. In Fig. 4, end-user activity begins by accessing the index page. In the next activity, the end-user is given several options or conditions that can be accessed through the menu provided. Each condition provides an interface in the form of a page according to the end-users choice. The interface shown to the end user is in the form of content consisting of lines of text, tables, or interactive charts. In the end-user table, you can sort and search data according to their needs. For end-users, some of the interfaces provided in the activity diagram are the interface of home, the interface of the general, the interface of the villager, the interface of the financial, the interface of authority, and the interface of institutional. If the end-user wants to cancel his activity, he can choose to return to the main page. The activity ends when the end-user exits the system or opens another website.

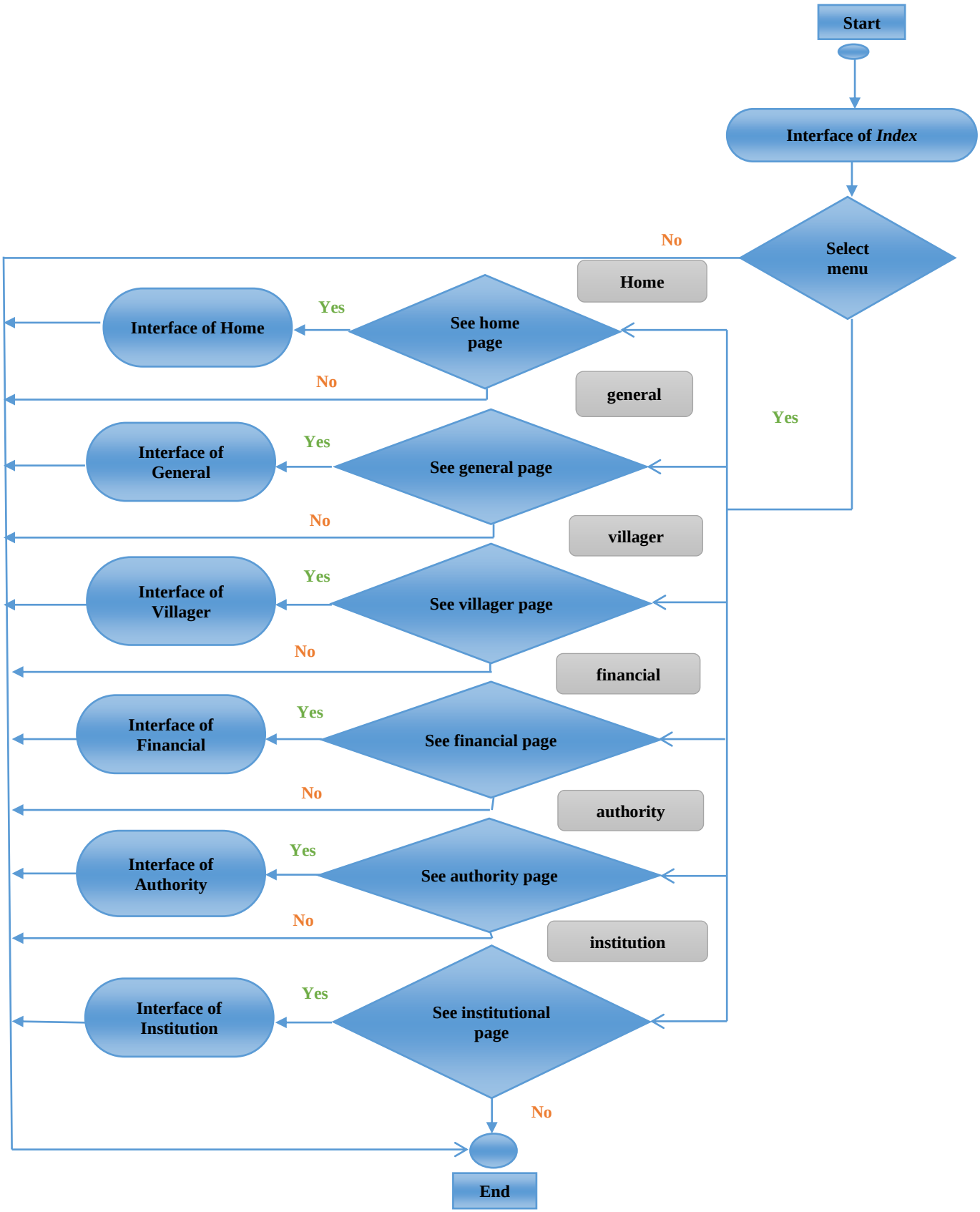

Fig. 4 End-user Activity Diagram

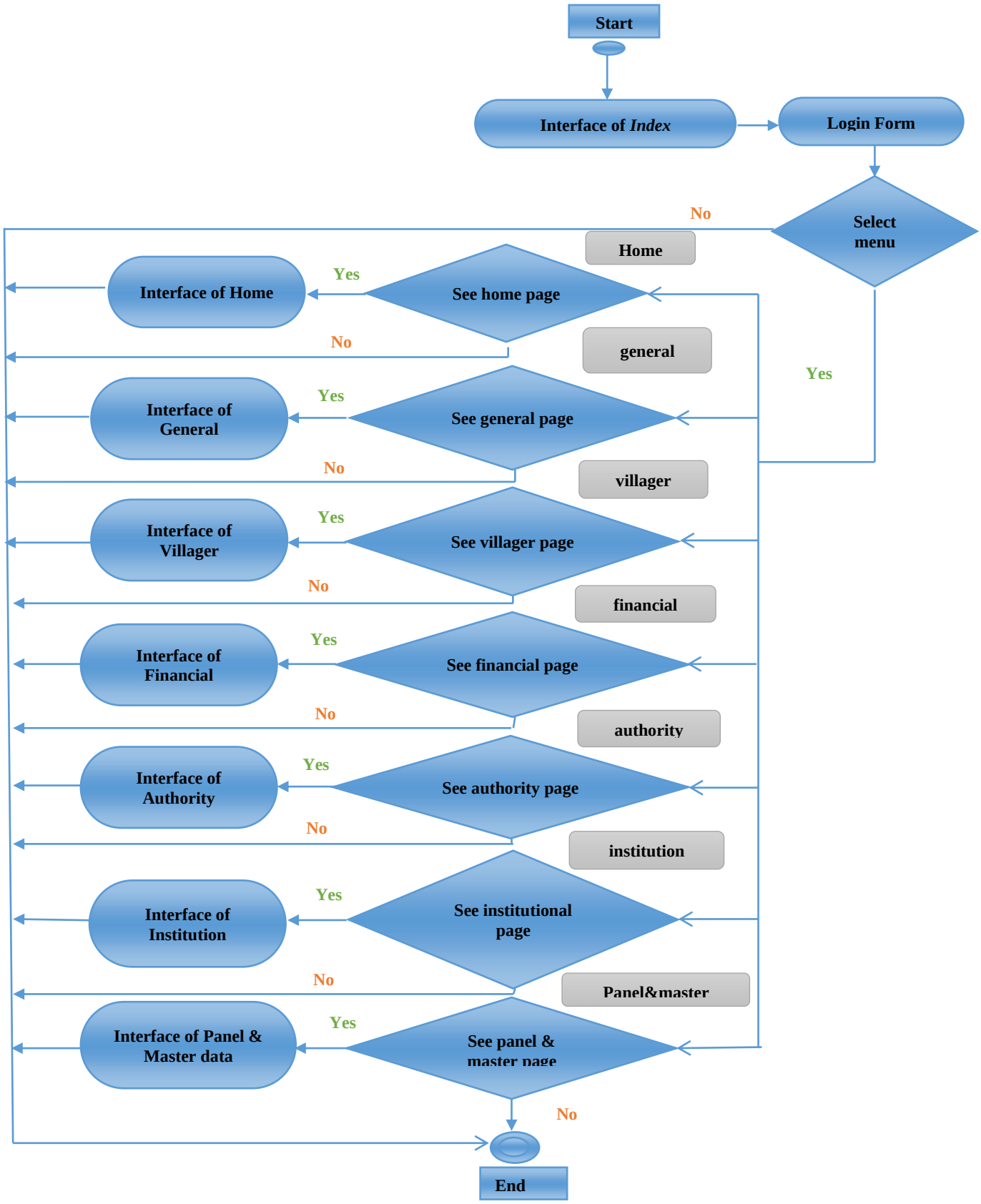

Fig. 5 Admin Activity Diagram

VILLAGERS POPULATION DATA BY EDUCATION LEVEL									
Sub-District	xxxxxxxxxxxxx								
District	xxxxxxxxxxxxx								
Province	xxxxxxxxxxxxx								
Years	Not School Yet	Graduate from Elementary School	Junior High School	Senior High School	Diploma	Under Graduate	Post Graduate (Master)	Post Graduate (Doctor)	Grant Total
xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx
xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx	xxxxx

Fig. 6 Report of villagers population data by education level

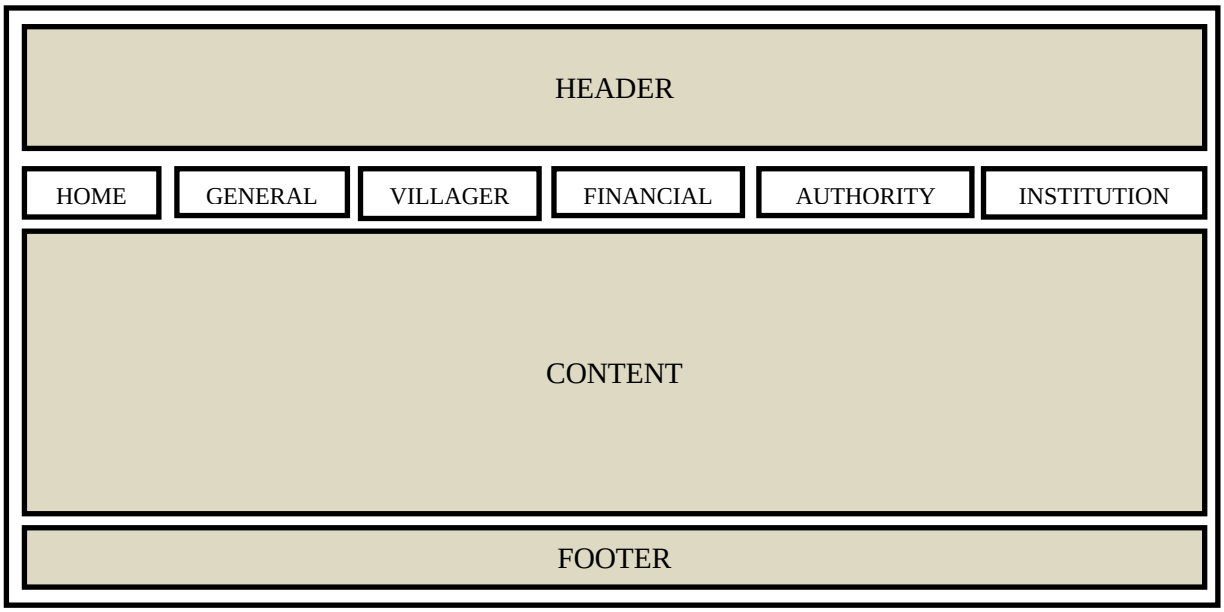

Fig. 7 Homepage design

Fig. 5 shows admin activity started by accessing the index page. The next activity is logging in through the form on the index page so that you can perform activities only available to an admin. Admin is given several options or conditions that can be accessed through the available menus. Each condition provides an interface in the form of a page according to the admin's choice. The interface shown to the admin is in the form of content consisting of lines of text, tables, or interactive charts. In the end-user table, you can sort and search data according to their needs. An admin can perform manipulation activities such as deleting, adding, and changing data. Some of the interfaces provided for admins in the activity diagram are the interface of home, the interface of the general, the interface of the villager, the interface of the financial, the interface of authority, and the interface of institutional. If the admin wants to cancel his activity, he can choose to return to the main page by clicking logout. An admin can view the entire data through the panel and master data facilities. This facility cannot be accessed by end-users (community). The activity ends when the admin exits the system or opens another website.

Fig. 6 shows an example of a village population data report in tabular form. The village population data report consists of the reporting year, the number of people who have not attended school, graduates from elementary school, junior high school, senior high school, diploma, undergraduate, postgraduate (master), postgraduate (doctor), and the total number of villager's population data based on education level. The village will validate this report. A valid report will be published through a monographic information system so that it can be seen and known by the public. Reports are also sent to higher levels of government, the mayor and the Governor.

Fig. 7 shows the homepage design of the integrated village monograph information system. The choice of this design model is because it is familiar to the eyes of end-users. Layouts with horizontal and vertical crosses are widely recognized by end-users worldwide. End-users can immediately understand the location of each homepage component with just one look without having to search first. This homepage vertically consists of a header, a menu set, content, and a footer.

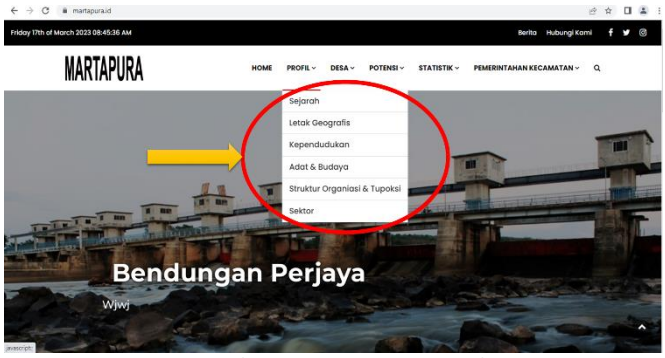

Fig. 8 The homepage of the village monograph information system

Table 1. Testing Results

No	Criteria	Validator			
		Expert		End-user	
		Valid	No Valid	Valid	No Valid
1	Easy-to-understand interface	√		√	
2	Menus and buttons can work	√		√	
3	Content according to the title on the menu	√		√	
4	Relevant and updated information	√			√
5	The data in the table can be read	√		√	
6	The data in the table can be sorted	√			-
7	There are no broken links		√	√	
8	Fast website loading		√	√	

Horizontally consists of home, general, villager population, financial, authority, and institutional data. Each menu that is displayed leads to a new page, according to the title on the menu. The homepage is made as light as possible so that it does not require large bandwidth during initial loading, so the waiting time is faster. This is very important because, based on several studies [20], waiting time (loading time) is one of the important assessments of end-users when visiting a website. The author does not want to make the end-user bored and bored because the loading time is too long. The trick is that the developer slices large images without reducing the quality of the images displayed on the homepage. The choice of color and typeface must also be considered so that end-users are comfortable and feel at home in visiting this monograph information system website.

The results of the design and development of the village monograph information system were then tested with reference to several criteria. Expert validators are taken from developers, while end-users are taken from the general public. The results of the validity test are shown in Table 1.

The test results show that validators from both expert and end-user circles agree that the monographic information system interface developed is easy to understand. Likewise, the available menus and buttons can function properly. The test results on the content displayed according to the title on the menu, expert validators, and end-users were declared valid. There is a difference in assessing the relevance of the information displayed. This can be understood because the data collected has not been fully displayed on the website page and has not been validated by the village head. For expert validator testing, the data in the table can be read and sorted properly during the assessment from the end-user because the sorting feature has not been displayed and cannot provide the assessment results. For validation, whether there is a broken link or not, the two groups of validators agreed to state that there is no broken link. Finally, expert validators and end-users stated that there was no problem with the website loading. The loading time was very fast, so it did not require a long waiting time.

5. Conclusion

This study aims to build a village monograph information system that can provide valid and updated information. The study begins with several preliminary stages and then enters the main part of designing and implementing a web-based platform. The web-based platform developed is in the form of a monographic information system that is ready to be tested. Testing involves experts and the community as end-users. The test results show that the village monograph information system developed is valid and relevant.

Acknowledgments

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