

# Development Of A Village Information System Using The Spiral Method

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## ABSTRACT

Tomuan Holbung Village is a village located in North Sumatra. As a village, there is still information that has not been accessed by many others through public communication, namely the internet. For this reason, it is necessary to develop an information system. Technology changes human life into quick and easy access to information data. Technology contributes to the arrangement of management systems and work processes in government and private institutions. One of the applications of Information Technology in village life is the use of the Village Information System (SID). In the development of this web-based village information system using the spiral method in development which consists of analysis, design, coding and testing as well as entity relationship diagrams in designing the database. The existence of a website-based village information system can facilitate devices in processing village information data to be more effective and efficient in providing information about village government in Tomuan Holbung Village. In addition, researchers also added features of activities that were widely informed. The Village information system is equipped with a web-based display so that users can adjust the contents in the system such as a web-based village information system as a means of information in web development in Tomuan Holbung Village using the spiral method.

**Keywords:** *Tomuan Holbung Village, Spiral Method, Village Information System, Web Development, Web Based*

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## 1. INTRODUCTION

A community with significant agricultural potential is Tomuan Holbung Village, located in Bandar Pasir Mandoge District, Asahan Regency. Tomuan Holbung Settlement is a village in the Asahan Regency's Bandar Pasir Mandoge Subdistrict. Bandar Pasir Mandode Village, Gotting Sidodadi Village, Huta Padang Village, Bagasan Village, Sei Kopas Village, Silau Jawa Village, Village Suka Makmur, and Tomuan Holbung Village are the 8 villages that make up Bandar Pasir Mandoge Subdistrict. In Tomuan Holbung village, there are ten hamlets. The bulk of the locals are from the Batak, Javanese, and other ethnic groups. They are farmers, civil servants (PNS), and workers at PT. Bakrie Sumatra Plantation (BSP)[1][2]. Applications[3] make it simple for people to communicate and find systems[4] information available currently[5]. Tomuan Holbung Village[6] is one of the villages in the Bandar Pasir Mandoge sub-district that was created as a result of Padang Huta's development under the provisions of Asahan Regency Law Number 10 of 2008 about the Formation of Villages in Asahan Regency. Hamlet X is now the only part of Tomuan Holbung Village[7].

The population of Tomuan Holbung Village[8] which numbers 2,673 inhabitants consisting of 1,244 men and 1,429 women, has different religious beliefs, consisting of 1,762 Islamic, and 911 Christian[9]. The majority of the population is ethnic Javanese with an elementary school education level. The people of Tomuan Holbung Village still uphold the nature of mutual cooperation and kinship in their social life. This can be seen by the active organization of STM (trade unions) whose activities are visiting the sick or calamity regardless of their religious beliefs. In general, most of the people in Tomuan Holbung village, Bandar Pasir Mandoge District have a livelihood as farmers, private employees, some others work as construction workers, traders and only a small part of them work as civil servants. The most widely used means of transportation for the people of Tomuan Holbung village is a motorcycle. In this village, transportation facilities such as buses or public transportation are



not yet available, because the entrance to Tomuan Holbung Village is still not in the form of concrete roads paved by the government.

In previous research, building online media, of course, a method was needed in developing a web-based promotional media system [10]. As conducted by Wahyuni and Cahyani [11], in their research on web-based production scheduling system development where this research applies a spiral model [12] with the results of the study successfully applying the method to accelerate the distribution process of production schedules. In addition, this study uses UML tools in designing system processes. In addition to the information presented in promoting products/services, an attractive display is also needed in presenting information and images so that potential buyers/users are interested in buying and using the promoted product. As the study [13], this study produced a 3-dimensional spatial drawing and residential advertising using Virtual Reality Modelling Language (VRML). It is undeniable that the college must be able to assess the extent to which its performance has improved. Tomuan Holbung Village has implemented its village using the Village Information System which has been running for one year, but there are some problems and obstacles to the service features that exist in the service system that are incomplete, loading the system is incomplete. Based on the description above, this article aims to improve village services using the village information system in Tomuan Holbung Village using the spiral method.

## 2. RESEARCH METHODOLOGY

### 2.1 Stages of Research

In the management of administration and archives, it must be supported by information system-based infrastructure. Management information system is a system created to manage administrative systems. His philosophy is to use as little paper as possible and digitize documents. The benefits are increasing productivity, cost-effectiveness, space efficiency and reducing environmental impact. In the implementation of information systems and village management, it will realize the ideal of getting used to processing and reading documents in digital form, in other words, reducing the use of paper as a staple of document writing as it is now [16].

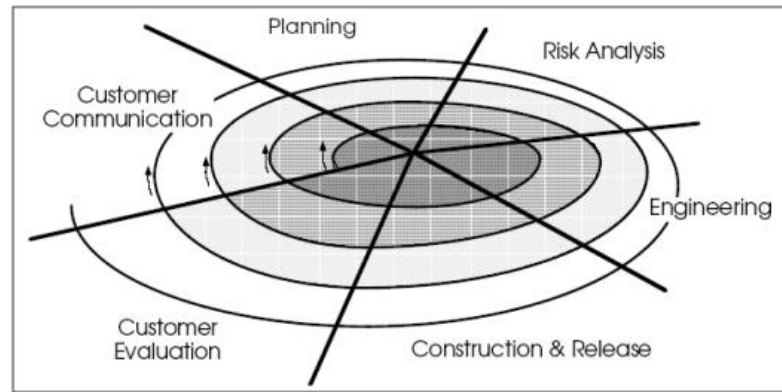


**Figure 1.** Flow of Research in Village Information System Development

The first stage of research [1] is to identify the problem in the research to be researched, then look for a problem formulation that is in accordance with the problem identification. After that, look for literature studies or references to be used as reference material in research. Furthermore, observation with interviews and conducting questions and answers to village officials. The results of the interview are then analyzed data and data processing so that the problems that have been identified can be concluded for system development and *the implementation of spiral* methods as a solution in developing village information systems. The data that has been analyzed and developed and the results will be known then used as material for reports and recommendations from the implementation of the information system that has been built, then produce a village information system.

### 2.2 Model Spiral

In research [14] metode used to create this information system using the spiral method. The spiral method is an evolutionary software process model that connects the iterative properties of prototypes through the control and system aspects of a linear yield model. This model has the potential to develop other versions of the software quickly. In the *spiral* model [11], software is developed gradually. During the initial iteration, additional releases can be paper models or *prototype*. In subsequent iterations, a more complete version of the engineering system was produced.



**Figure 2.** Spiral Method

The spiral model has stages[11] namely *customer communication, planning, risk analysis, engineering, construction & release, customer evaluation*. In previous studies[15] that explained the following:

#### 1. *Customer Communication*

At this stage, communication between the customer and the customer's desired request is carried out, namely what is needed in the system. Such as data collection in the form of observations and interviews, user needs and systems, . Data collection techniques are the most important thing in research, because the main purpose of research is to obtain data without understanding the data collection technology, so it will not obtain appropriate data[16].

#### 2. *Planning*

Planning activities that set the goals to be achieved and methods to achieve them such as determining the time of work, resources and other information needed such as hardware & software specifications used.

#### 3. *Risk Analysis*

This risk analysis activity is carried out to analyze technological and technical risks of management. System design uses modeling in the form of interface design, *Unified Modelling Language (UML)*, *Entity Relationship Diagram (ERD)* and *Logical Record Structure (LRS)*. ERD is an entity relationship diagram as a model for explaining relationships in a database based on an understanding of the word object[17]. LRS is an ER diagram model that follows certain modeling rules related to LRS[18]. UML is a standard specification language used to describe, define and build software. UML is an object-based system development method as well as a tool that supports system development[19].

#### 4. *Engineering*

Activities are required to build 1 or more representations of those applications. There may not be at this stage a process model that also uses an iterative approach, but it is only done on a spiral model. If the user finds the update function or fixes errors when using the system, maintenance will be carried out. This information system will be created with PHP, the *odeigniter c framework* and *the bootstrap library* as programming languages. PHP (abbreviation: *hypertext preprocessor*) is a web-based Programming language. Therefore, PHP is a programming language usually used to create web-based applications (websites, blogs or web applications)[20]. *Bootstrap* is a ready-made application package for the *front-end* website. In other words, *Bootstrap* is a functional Web design *template*. *Bootstrap* was created to simplify the web design process at all levels, from beginners to experienced users. Basic knowledge of HTML and CSS, you can use *bootloader*[20]. *Codeigniter* is an *open source* application in the form of a *framework* with an MVC model (model, view, controller), used to create a dynamic website[21].

#### 5. *Contruction & Release*

Activities required for software development, testing, installation and provision of user or customer support, such as software usage training and documents such as software manuals. Testing is carried out in terms of functionality such as hardware, software and *Blackbox* testing. *Blackbox Testing* or *Blackbox Testing* is a black box test designed to verify functional requirements without understanding how the inside of the program works. Black box testing technology focuses on software information, and generates test cases by dividing inputs and outputs from the program including comprehensive testing[22].

### 6. Customer Evaluation

To obtain the desired activity according to user or customer evaluation during the presentation of the software in the engineering phase, or implementation during software installation as well as the construction and release phases, feedback to the user or customer.

## 3. RESEARCH RESULT

In this section will be explained the results of a comprehensive study and discussion. The results can be presented in the form of detailed images and specifications to make it easier for readers to understand them. This chapter contains the stages of the spiral method to be applied.

### 3.1 Functional Needs

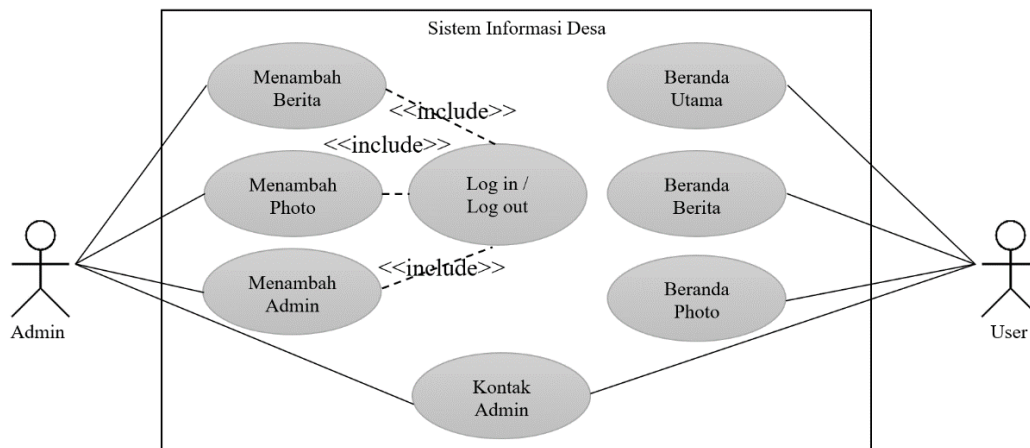
At this stage, it is used to analyze the needs in the development and creation of the system to be developed and created. The menu to be developed is as in table 1.

**Table 1.** Functional Needs

No	Name of Need	Description
1	Home Main	Main Page of the Village Information System view
2	News Home	Pages containing news on the village information system
3	Home Photo	Page containing photos on the village information system
4	Admin Home	Pages containing admin access
5	Home Add News	Add news page
6	Home Add Photo	Add photo page
7	Add Admin Home	Page tambah admin
8	Admin Contact Home	Admin contact page

### 3.2 Use Case Diagram Design

The design of the village information system development is made with the object-oriented system method, namely UML.



**Figure 2.** Use Case Diagram Design

This use case consists of one sub-system, namely the system being designed. In this sub-system, admin actors must first log in to enter the system in order to manage admin data, manage photos, manage admins, and input news and can log out after logging in.

### 3.3 Village Information System Interface Development Design

In this section, it will be shown how the design of the village information system development.

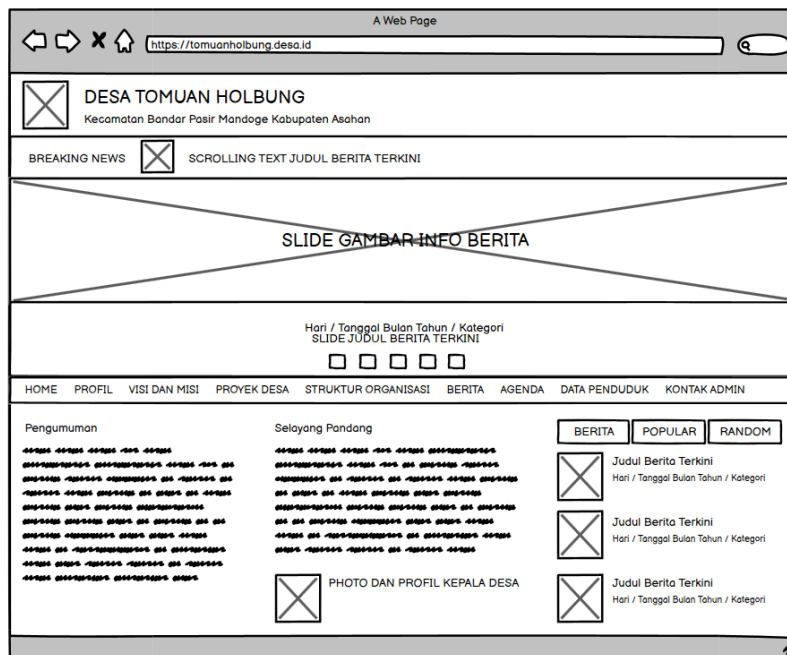


Figure 3. Main Home Display of Village Information System

Figure 3 shows the initial view or main homepage display which will later become the development of the village information system. Then with it there will be a change in the initial appearance of the previous village information system.

## 4. CONCLUSION

After the design and development of a web-based integrated fast Village Information System in Tomuan Holbung Village, Bandar Pasir Mandoge District, Asahan Regency with development using a spiral model can be making it easier for villages to compile digital data and information about the objective condition of the village, compile village development plans based on detailed and real data, direct village development work systematically, measurably, directed, sustainable, and focus on priorities for the use of village funds, in accordance with the needs of village citizenship and territoriality to accelerate the achievement of village information disclosure by developing a village information system using the spiral method, achieving 18 goals. The village will be achieved and implemented and can integrate the data that has been recorded so that it can form an information report that accurately and automatically the village apparatus and village community will be helped with information disclosure so that the web-based services developed will be effective and efficient.

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