Information System Design COVID-19 with Prototype Model

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Abstract—Coronavirus or COVID-19 is an epidemic that causes many people in parts of the world to die. This phenomenon has an impact on the weakening of the world economy and social restrictions in all countries. The factor that drives the high spread of this virus is due to the rapid transmission process between one individual to another individual. With the existence of this pandemic, condition encourages researchers to make innovations from various fields of science, especially in the fields of health science and information systems technology. Several COVID-19 cases in Indonesia, especially in the area of West Java Province is quite high and increasing every day. Existing information technology in West Java Province is not yet fully available. It can block to remote villages, thus impacting on the lack of public understanding related to the prevention and early anticipation of the spread of COVID-19. In this research, information system design is done using the Prototype method, aiming that the design of the system built can help the development of appropriate software, and can assist in the management of COVID-19 data.

Keywords—Information Systems, COVID-19, SDLC, UML, Prototype.

Abstrak—Virus Corona atau COVID-19 merupakan wabah penyakit yang menyebabkan banyak orang di belahan dunia meninggal. Fenomena tersebut berdampak pada, melemahnya perekonomian dunia dan pembatasan sosial di seluruh negara. Faktor yang mendorong tingginya penyebaran virus ini adalah karena proses penularannya yang sangat cepat antara individu seseorang ke individu lain. Dengan adanya kondisi pandemi ini mendorong para peneliti buntuk membuat inovasi dari berbagai bidang ilmu pengetahuan, terutama di bidang ilmu kesehatan dan teknologi sistem informasi. Sejumlah kasus COVID-19 di Indonesia khususnya wilayah Provinsi Jawa Barat cukup tinggi dan meningkat setiap harinya. Teknologi informasi yang ada saat ini di Provinsi Jawa Barat belum sepenuhnya tersedia dan dapat mengkafer ke pelosok-pelosok desa, sehingga berdampak pada kurangnya pemahaman masyarakat terkait dengan pencegahan dan antisipasi dini penyebaran COVID-19. Pada penelitian ini dilakukan desain sistem informasi dengan menggunakan metode Prototype, bertujuan agar perancangan system yang dibangun dapat membantu pengembangan perangkat lunak yang tepat guna, dan dapat membantu dalam pengelolaan data COVID-19.

Kata Kunci—Sistem Informasi, COVID-19, SDLC, UML, Prototype.

I. INTRODUCTION

March 2020 is one event that will not be forgotten by everyone in the world [1]. This is because of the emergence of one of the viruses that caused many people in various countries to die, the economic collapse and limit the movement of everyone. At first, this virus was known to originate from Wuhan City, China [2]. With so quickly, this virus attacks the entire country quickly [3]. Factors that encourage the high spread of this virus due to the transmission process that is very fast between individuals to other individuals [4].

Indonesia, which is one of the most populous people in the world, is inseparable from the COVID-19 virus transmission case. This phenomenon makes researchers competing to provide innovation from various fields of science, especially in the areas of health science and information system technology. West Java Province, with a population of 2.273.579 people (data BPS 2015). At present, the number of COVID-19 cases in West Java is quite high and is increasing every day. Information systems related to this case, especially in the area of West Java Province are not fully available. There are still regions or districts that do not have accurate information and even tend to be considered undetected by the available information systems so that the public cannot know in detail which areas and regions are positively categorized as COVID-19 [5].

The information system is designed so that the public can clearly know the total number of COVID sufferers, the number of patients recovered, the number of patients died. Also, the system also displays the location of the nearest checking health centre, the nearest referral hospital. The system also provides a means to find out ways to avoid (minimize) the spread of COVID, as well as to give a COVID-19 early detection questionnaire.

II. METHOD

SDLC (System Development Life Cycle) is one of the most popular information systems development methods in information systems. There are four stages in building or developing information systems using SDLC, namely: planning, analysis, design, and implementation. [6],[7]. As for the implementation of SDLC, various methodologies can be used. The use of methods will vary depending on the emphasis, whether on business processes or business supporting data [8]. In this study using a system development method using Prototype.

Prototype methods include planning, analysis, design, implementation [9]. The prototype model is used to define

everyday objects of software without specifying the input, process and output requirements [10].

The scope of activities of the Prototype development model are :

1. Define the object as a whole and identify the needs that have been identified
2. Doing design quickly as a basis for making prototypes.
3. Test and evaluate the Prototype and then make additions and improvements - improvements to the Prototype that has been made. In Figure 1 is the plot of Prototype [3]:
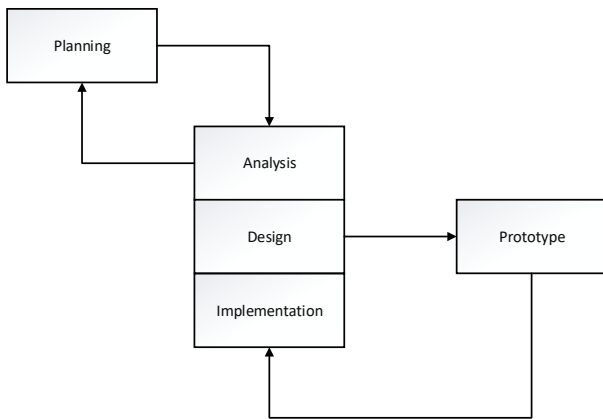

Fig 1 : Flowchart of Prototype System Development [10].

The design in the construction of this system includes several UML diagrams; each diagram depicting the processes running on information systems [11],[8],[12].

The following diagrams are used in analyzing the program:
1. Use case diagrams
2. Class Diagram
3. Activity diagram
4. Sequence diagram [13].

III. RESULT AND DISCUSSION

The system is designed using modelling use case diagrams and used to find out what functions can be accessed by each actor. Meanwhile, to find out the flow of user interaction is described using the activity diagram [14]. To design the process flow system is made using sequence diagrams, The use case diagram. Following are the results of COVID-19 information system design:

A. Use case Diagram of COVID-19 Information System

In this discussion, the activities that will be carried out by users on the system to be built are made in this discussion. The following is the result of the Use case diagram design in the COVID-19 information system shown in Figure 2:
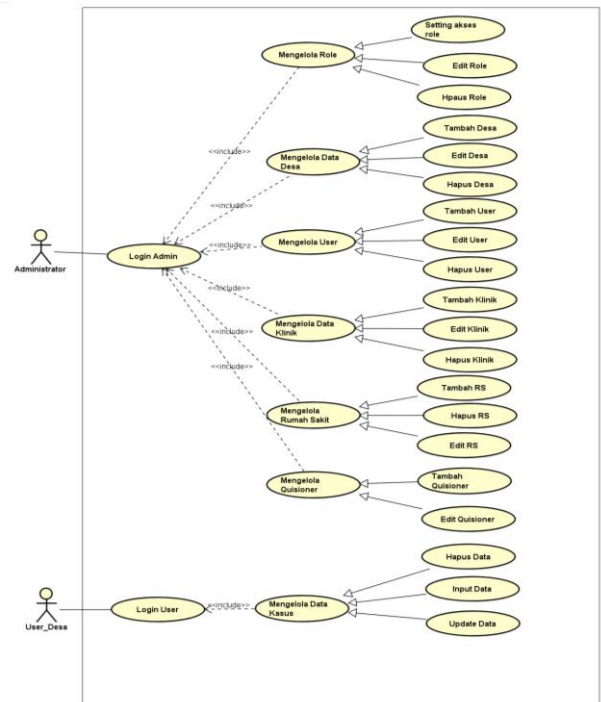

Fig 2 : Use Case Information System COVID-19

The diagram used in the design of this system consists of two actors namely user/community and admin as the officer who manages the system, some activities can be carried out by the actor, managing user data, managing hospital data, managing village data, managing clinical data, managing questionnaire data and managing case data. There are more specific functions in it, such as changing data, deleting data, and changing data.

B. Activity Diagram of COVID-19 Information System

In this discussion, the activities carried out by the user of the system to be built. The following is the result of the Activity diagram design on the COVID-19 information system shown in Figure 3, Figure 4, Figure 5, and Figure 6:
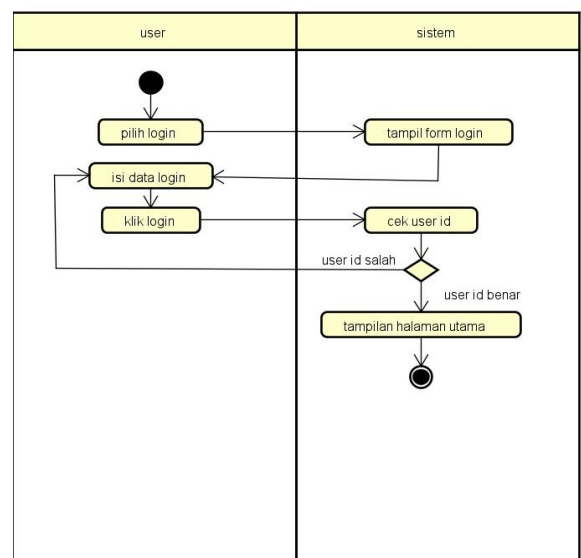
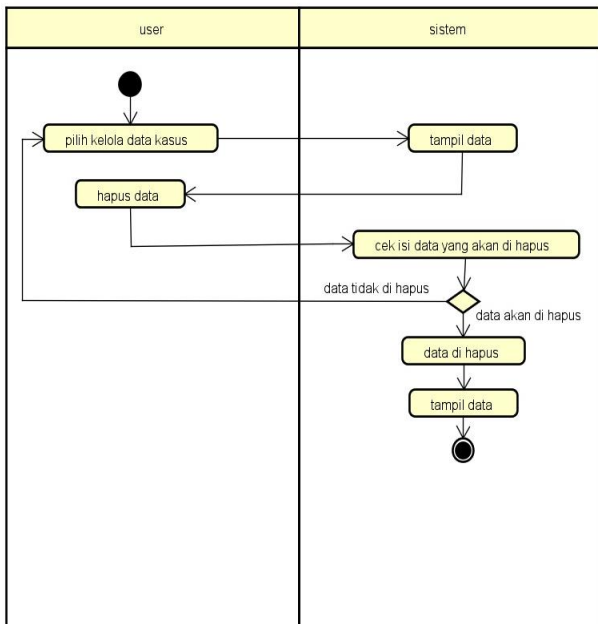

Fig 3: Login Activity diagram
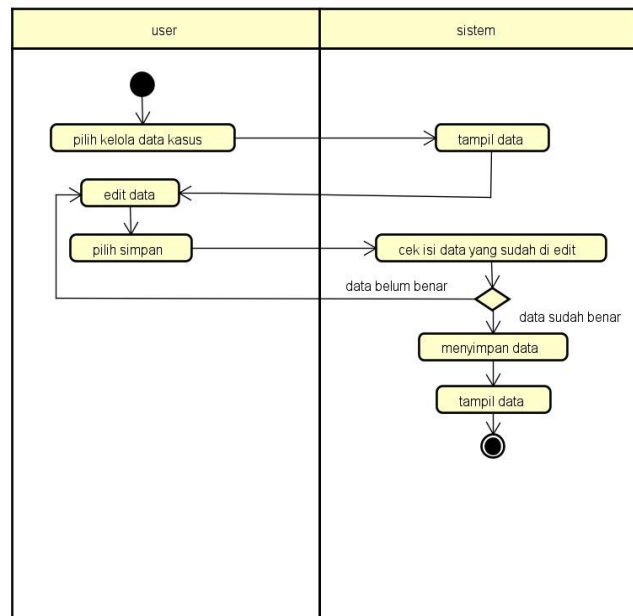
Fig 4: Activity diagram delete case data

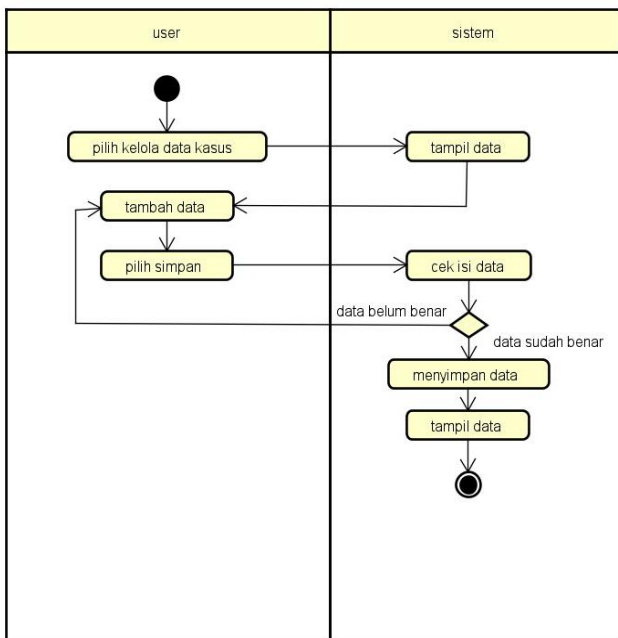Fig 6: Activity diagram edit case data

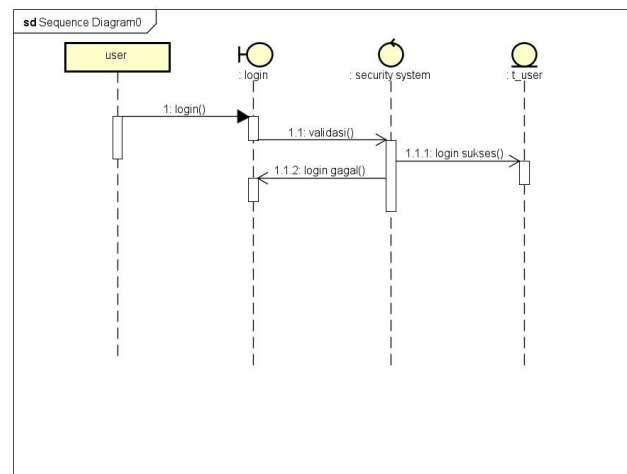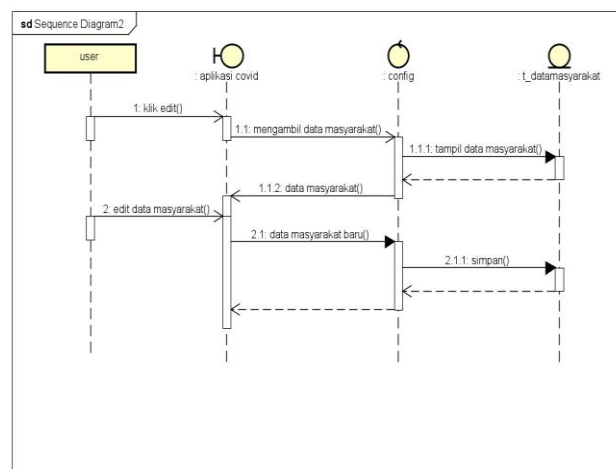Fig 5: Activity diagram plus case data

Fig 8: Sequence login diagram
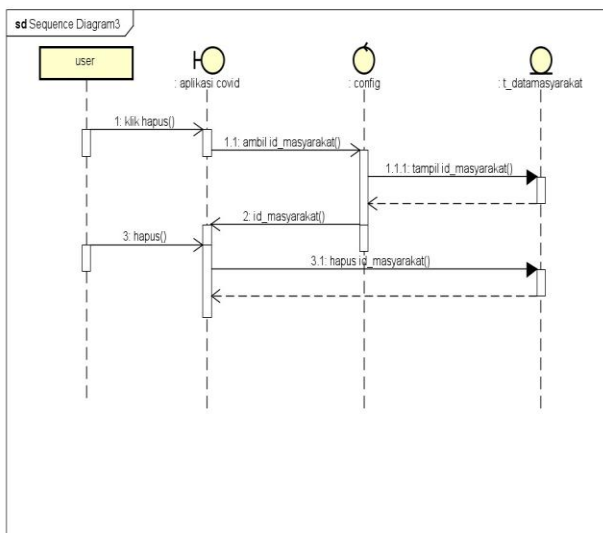

Fig 9: Sequence diagram editing village user data

Fig 10: Sequence diagram delete village user data

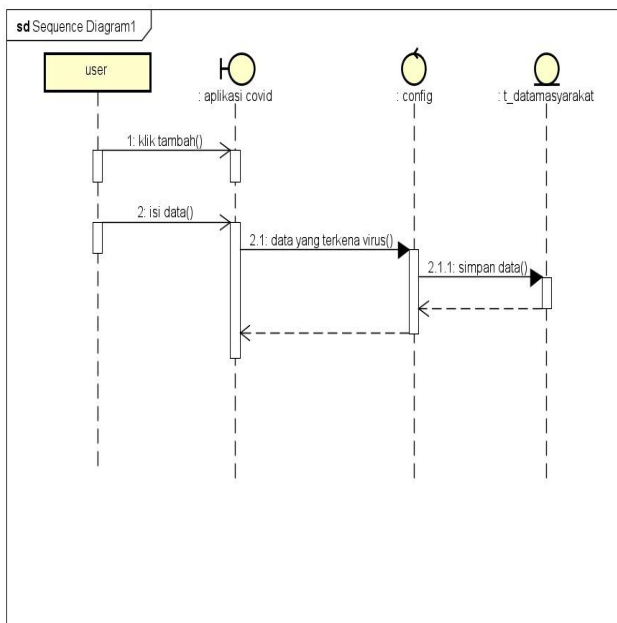

Fig 11: Sequence diagram plus case data

C.   System interface design

Interface description of the application that will be created. In the design, some several pages and menus can be accessed by the admin and user [15]. This design illustrates the flow of the application SI-COVID 19. The following is the result of the interface design, shown in Figure 12, Figure 13, Figure 14, Figure 15, Figure 16 and Figure 17:
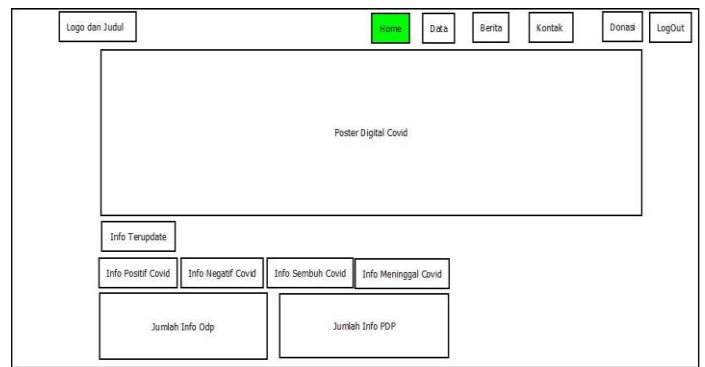

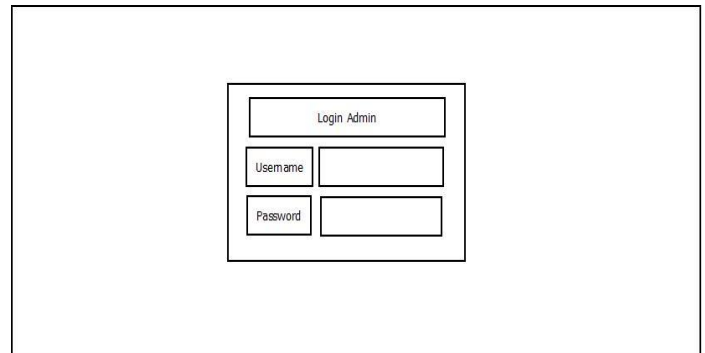Fig 12: Main Menu Menu Design (HOME)

Fig 13: Design Admin Login Menu

Fig 14: Design User Login Menu
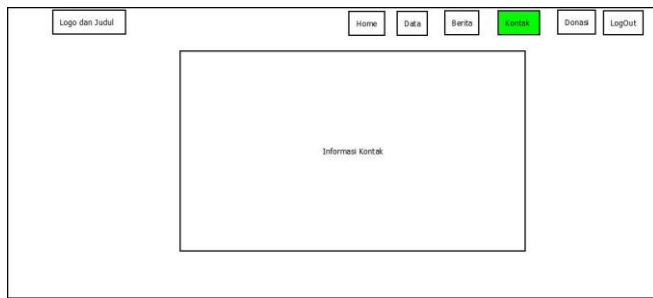

Fig 15: Design Menu News

Fig 16: Contact Menu Design

Fig 17: Donation Menu Design

CONCLUSION

Can contribute an idea in making applications related to the COVID-19 information needed by the public at this time. The system is always updated (update) will display the movement of cases that occur both the number of cases, the number of cures, the number of dead, the number of patients under surveillance and people under supervision.

The Early Detection Questionnaire page will display the results of a hypothesis (provisional estimate) in the form of an answer to the input provided by the public (user). This is a means by which the system and users can interact with each other which produces output to the user, so the most crucial goal is to minimize and even be able to control the spread of the COVID-19 virus.

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