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Design and Development of Data Input Application for Covid-19 Vaccination Recipients In Sukoharjo Regency Based on Website

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Abstract— Corona Virus Deseas 19 (Covid-19) is an infectious disease caused by acute respiratory syndrome coronavirus 2 (SARS-CoV-2). This disease was first identified in December 2019 in Wuhan, the capital of China's Hubei province, and since then Covid-19 has spread widely throughout the world including regions in Indonesia. One of the efforts of the World Health Organization (WHO) to break the chain of transmission of Covid-19 is to implement health protocols and carry out the Covid-19 vaccine program. Indonesia is one of the countries implementing the Covid-19 vaccination program in order to break the chain of transmission of Covid-19. Based on data from the Ministry of Health of the Republic of Indonesia on November 23, 2021, a total of 135,716,042 vaccinations were recorded for dose 1 and 90,520,201 for dose 2, while the vaccination target was 208,265,720. Sukoharjo Regency is one of the districts with quite high cases, and is one of the targeted districts for vaccination. To assist medical staff in determining vaccination targets and assisting the public in obtaining information on the distribution of vaccinations in the Sukoharjo area, a system is needed that provides an overview of the mapping of vaccination recipients in the Sukoharjo area. In this study a website-based mapping system was designed using webGIS which can help provide an overview of vaccination recipients in the Sukoharjo area. The expected result of this design is a WebGis-based covid-19 vaccination distribution map that can assist vaccination officers in the district area in obtaining information on the distribution of Covid-19 vaccinations.

Keywords : Mapping, covid 19 vaccination, Web-based GIS

I. INTRODUCTION

Covid-19 is an infectious disease caused by acute respiratory syndrome SAR-Cov-2 (Yunus & Rezki, 2020). Symptoms of Covid-19 include fever, muscle aches, decreased ability to smell and pneumonia (Crispo et al., 2021), (Rokhmah & Rozaq Rais, 2022). To break the chain of transmission of Covid-19, the World Health Organization (WHO) launched several efforts including maintaining health protocols and carrying out vaccination programs. Several types of Covid-19 vaccines used include Pfizer, Moderna and AstraZeneca (who, 2021). Indonesia is a country that is massively carrying out the co-19 vaccination program with a target of 208,265,720.

The target level is quite high for covid-19 recipients, requiring daily progress data on the number of recipients of the covid-19 vaccination. Therefore, a daily data input system is needed for the development of Covid-19 vaccination recipients to find out the number of Covid-19 vaccination achievements, especially in Sukoharjo Regency. The daily input data can cumulatively add recipients of the Covid-19 vaccination. One application that can be accessed easily is a website-based application, this website-based application allows it to be accessed anywhere, making it easier for officers to input data (Cahyo Utomo & Fadlilah, 2022).

A website is a collection of pages that display various kinds of information in the form of text, images, sound, visio or a combination of that information connected to a network of pages (Maulidda & Jaya, 2021), (Utomo et al., 2020). The website has several functions including being used for communication, to convey information, as a medium of entertainment and as a means for transactions. In addition, the website is also used as a suggestion for displaying input and displaying data. Inputting data using a website can help speed up data processing, so that data processing becomes effective and efficient and makes it easier to access (K.Wiyono, A.Siwi, F.Utami, 2021).

This research focused on daily data input, with a case study of vaccination data in the Sukoharjo district. With this research, it is hoped that it can assist vaccination officers in inputting data on recipients of Covid-19 vaccinations, so that information on the level of achievement of Covid-19 can be obtained according to what is targeted by the government.

II. RESEARCH METHODS

There are several stages in this research, to see the research flowchart can be seen in the picture

1. **Ancestral studies**

In this study, reference studies were carried out in the form of journals, books and other articles related to research. The journals used as references are journals that discuss the distribution of Covid-19 vaccination, website-based system and application design models. In addition, books and articles on system design models and website-based applications are used as references in writing this research.

2**. Data collection**

The data used in this study is data on the implementation of Covid-19 obtained from the Sukoharjo District Health Office. The data collection method was carried out by the interview method to obtain information related to the running data input system and the direct observation method of the input data for the Covid-19 vaccination.

3. **Data analysis**

The analysis stage is to analyze who is involved in the system, it is important to develop a website-based data input system for vaccination recipients. At this stage, an analysis of system requirements is carried out as a basis for the next stage, namely the system design stage.

4. **System design**

System design is a system design stage, at this stage the system design is carried out. the model that will be used to design the system in research using the Unifield Modeling Lamp (UML) model

5. **System implementation**

System implementation is the stage of implementing the design model that has been designed. Vaccination recipient data input applications are made using the PHP programming language and database creation using MySql.

6. System testing.

The system testing phase is the stage carried out to ensure that the system is running properly and no problems are found in the system. The approach taken in testing this system is to use the black box testing method. The blackbox testing method is a method used to test software without paying attention to software details. This test is done by looking at the output value based on each input. With this test it can be seen whether the software is in accordance with the requirements or not (Ningrum et al., 2019).

III. RESULT AND ANALYSIS

1. System analysis

The system analysis stage is the stage for analyzing the requirements of the system, both data requirements and object requirements. This analysis stage is also the stage of understanding the problem before the system design stage is carried out. System analysis is based on data obtained from the Sukoharjo district health office.

a. Data needs analysis

The data needed in the website-based input application for receiving the Covid-19 vaccination recipient data is vaccination site data, vaccination schedule data, health workers vaccination data, general public vaccination data and children's vaccination data.

b. Analysis of database requirements

From the results of the data obtained can be used as a basis for designing a database. In the analysis of the needs of this database can be obtained information on the number of columns, data types and other needs in making the database.

c. System requirement analysis

From the data obtained, it can be developed into a system requirement design. At the system requirements analysis stage, an understanding of the input, process and output requirements of the system is carried out.

From the results of this analysis, an analysis was carried out according to the need in making a website-based application for inputting data on recipients of the Covid-19 vaccination. The results of this analysis also form the basis for designing the system model.

2. Model

After the analysis phase, the design stage was then carried out to obtain a system model from mapping the distribution of vaccinations in the Sukoharjo district. At this stage using the UML model. The designs used are use cases and activity diagrams.

a. Use case diagram

Use case diagram is a design that describes the interaction of some or all actors on the system. The use case diagram provides a brief description of the relationship between actors, use cases and the system (Kurniawan, T. Bayu, 2020). To see the use case model in this research, see Figure 1.

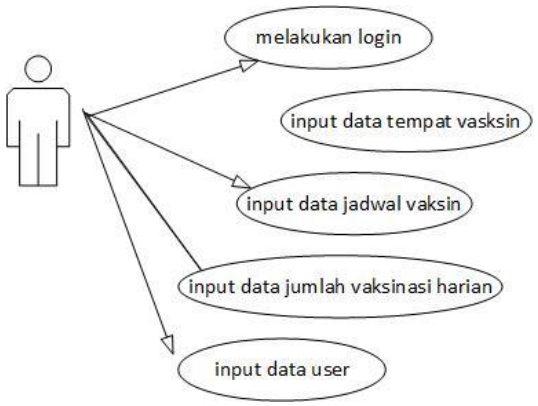

Figure 1. Use Case Diagram input vaksinasi

From the picture it can be seen that the admin interacts with the system including logging in before entering the system, inputting vaccination site data, inputting vaccination schedule data, inputting vaccine recipient data per day and conducting user data. From data on daily vaccine recipients and data on vaccine locations, this is used as the basis for displaying data on the distribution of vaccination recipients in the Sukoharjo district per sub-district. Meanwhile, actor users can see a map of the distribution of vaccinations in the Sukoharjo district.

b. Avtivity Diagram

Activity diagram is a digram that describes various activity flows in the system being designed. The activity diagram contains the processes that have been described in the use case diagram (Sonata, 2019). The activity diagram for the covid-19 vaccination distribution mapping system can be seen in Figure 2.

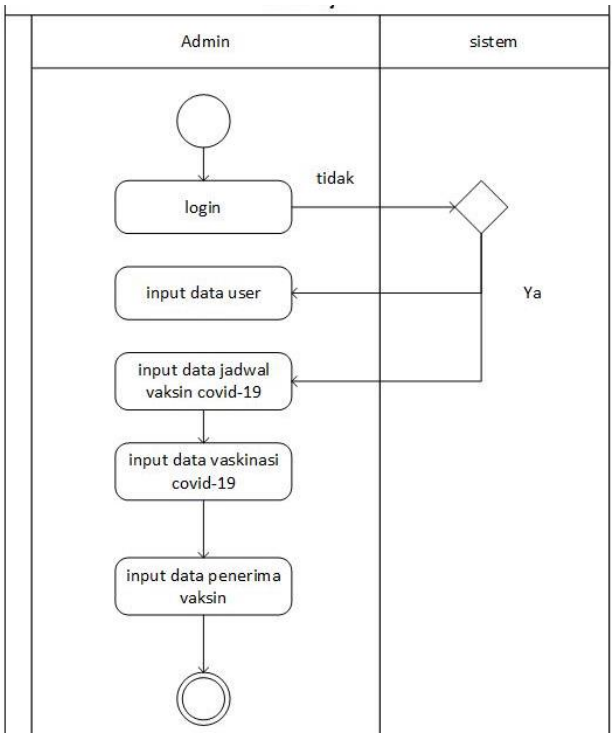

Figure 2. Activity diagram data input application for co-19 vaccination recipients

c. Implemtation system

At this stage, the implementation of the system that has been designed is carried out. Development of data input applications for vaccination recipients in Sukoharjo district using the PHP and MYSQL programming languages as software for building databases.

1. Database
   a. Table schedule vaksin
      This table is used to input the vaccine schedule that has been determined by the co-19 vaccination organizer. This table contains vaccine_schedule id, date, start_hour, finish_hour, type_vaccine, type_vaccine, id_vaccine place. To see the vaccine schedule table display, it can be seen in Figure 3.

Figure 3. Table schedule vaksin

   b. Table vaccine site
      This table contains data on where the covid-19 vaccine will be carried out. Data was taken per sub-district and taken from data from the sub-district health center. This table contains the columns id_kecamatan, nama_kecamatan. To see a table where vaccines can be seen in Figure 4.

Figure 4. Table vaccine site

   c. Table vaccine recipient
      This table contains data on the addition of daily vaccines. This table contains several columns including recipient_id, vaccine_place, vaccine_type, vaccine_date, daily_amount. To see the table structure of vaccine recipients, see Figure 5.

Figure 5. Table vaccine recepient

   d. Table add user
      This table serves to add users who can access this system. In this table there are several columns including id, name, email, password. The user addition table structure can be seen in Figure 6.

Figure 6. Table add user

2. Development of a website-based data input application for recipients of the Covid-19 vaccine.

   At this stage of making the application there are several forms that are made including

   a. Login Form.

To be able to access the data input application for vaccination recipients, the user and admin must log in first. The display of the login page can be seen in Figure 7.

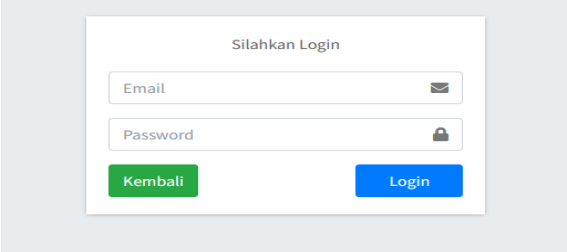

Figure 7. page login input data vaccine

b. Vaccine place data input form.

Making this form is based on data input needs. This form is the data input media where the vaccination is carried out. The data input form where the vaccine is located can be seen in Figure 8

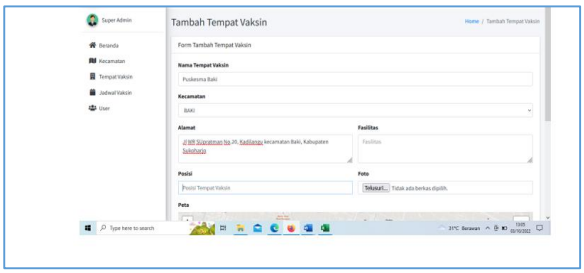

Figure 8. Form input

c. Vaccine recipient data input form
This form is a form provided to input the number of daily vaccine recipients, this data will then be accumulated to become the total number of vaccine recipients. The daily vaccine recipient data input form can be seen in Figure 9.

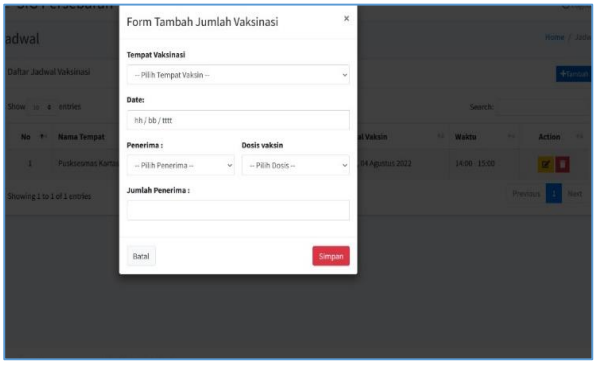

Figure 9. Enter the number of vaccine recipients

IV. TESTING WITH THE BLACKBOX METHOD

The information system for marketing raw food ingredients has been tested using the blackbox method and the results are documented in Table 1 for the admin level, Table 2 for the user level. The testing process is carried out so that the output of the system matches the user's input and is expected to provide a satisfying experience for users at each level of access.

Table 1. Result testing black level admin

Action	Test scenario	Expected results	status
Login	Correct email and password	Successfully logged in and redirected to admin page	Valid
	Incorrect email and password	Login failed and Return to login page	valid
Add a place vaksin	Adding vaccines	Can add vaksin holder	valid
Edit vaccine site	Change the place of the vaccine	Appearing popups can change the information	Valid
Delete the vaccine holder	Remove the vaccine holder	A popup appears and can delete the vaccine holder	Valid
Add vaccine schedule	Added vaccine schedule	Fill out the vaccine schedule	Valid
Edit vaccine schedule	Edit vaccine schedule	A popup appears and can change vaccine schedule information	Valid
Delete vaccine schedule	Delete the vaccine schedule	A popup appears and can delete the vaccine schedule	Valid
Increase the number of vaccine recipients	Increase the number of vaccine recipients	Fill in the number of vaccine recipients	Valid
Edit the number of vaccine recipients	Changing the number of vaccine recipients	A popup appears and can change vaccine recipient data	Valid
Delete the data for the number of vaccine recipients	Deleting data on the number of vaccines	A popup appears and can delete the number of vaccine data	valid

VI. CONCLUSION

From this study it was concluded that vaccination is a program launched by the government to break the rope of the spread of Covid-19. To make it easier to access information, we need a page that can be accessed widely by using the website. In order for data processing to be faster and more efficient, a data input system is needed using a website, so that data processing becomes effective and efficient and information on the Covid-19 vaccine can be accessed by the wider community.

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