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Information System Design Development "OKE ANIMAL" for Animal Clinic DISNAKKAN Kabupaten Ciamis Using The Prototype Method

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Abstract

This study presents a comprehensive investigation into developing and evaluating an information system designed to streamline administrative record-keeping within the veterinary clinic of DISNAKKAN Ciamis. The observation phase, involving in-depth discussions with veterinary clinic staff, underscored the need for an information system to enhance patient data management, medical records, and cirobis records. There are several problems in two business processes, namely the administration of veterinary clinic services faces challenges in managing patient examination data and data collection of cirobis activists from the community, which is currently still done manually. The prototype method was employed to guide the development process, commencing with extensive communication and quick planning. UML diagrams provided a roadmap for system functionality. The resulting prototype system, featuring login mechanisms, data entry forms, and data display components, was designed to elevate administrative efficiency. The deployment of the system and its usability assessment using the System Usability Scale (SUS) method shed light on the user experience. This research marks a significant stride in enhancing administrative record management at the veterinary clinic of DISNAKKAN Ciamis, improving data management and record-keeping while setting a valuable precedent for future system development in similar contexts.

Keywords: Website, Prototype, System Usability Scale, Animal Clinic

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I. INTRODUCTION

DINAS Peternakan dan Perikanan Kabupaten Ciamis (DISNAKKAN Ciamis) began operations in 2014 as a merger of the Ciamis District Marine and Fisheries Service Office with the Ciamis District Livestock Service Office, with the legal basis of Ciamis Regent Regulation Number 29 of 2014 and is currently led by Drs. Syarief Nurhidayat, M.Si. DISNAKKAN Ciamis has a business process of veterinary clinic services, large and small ruminant services, poultry health services, fish health services, animal entry/exit permit services, cirobis activist network, and rabies bite case report collection in Ciamis District. Based on observations made by interviewing drh. Intan Widianingrum as Head of the Animal Health Section on November 19, 2021, there are several problems in two business processes, namely the administration of veterinary clinic services faces challenges in managing patient examination data and data collection of cirobis activists from the community, which is currently still done manually.

Using efficient and integrated information technology is urgently needed to improve services at DISNAKKAN Ciamis. However, system users with veterinary backgrounds may not be fully accustomed

to or have a sufficient understanding of operating complex information technology systems. Therefore, it is essential to design and develop a system that is easy to understand, simple, and user-friendly so that the users can well adopt it.

A website-based information system is a computer system that processes data to produce information. This technology can provide users with information and services [1]. The same problem was found at Malang's House Of Pet Veterinary Clinic [2]. Making a system using Google Sites Media has also been carried out in other studies and is helpful by users. They were making the system easier for animal owners who do not have a copy of the patient's medical record card to know the history of their animal's illness. Animal owners also have difficulty understanding how to take the first countermeasure if something related to their pets happens before the veterinary clinic system [3][4].

Researchers used the prototype method and the System Usability Scale (SUS). Using the prototype method in user engagement activities allows one to formulate better solutions, avoid mistakes that could incur additional costs, and accelerate the overall product development process [5]. On the other hand, considering the cognitive limitations, instrument complexity, and accuracy in assessing usability, the simplified SUS method can effectively measure user experience in this population and support the development of more user-friendly products [6].

II. RESEARCH METHOD

The process of developing a website-based information system for recording medical records and recording cirobis data at the DISNAKKAN Ciamis veterinary clinic consists of several steps that are interrelated and carried out sequentially, as shown in Figure 1 of the research flow chart which also illustrates the methods used in this research.

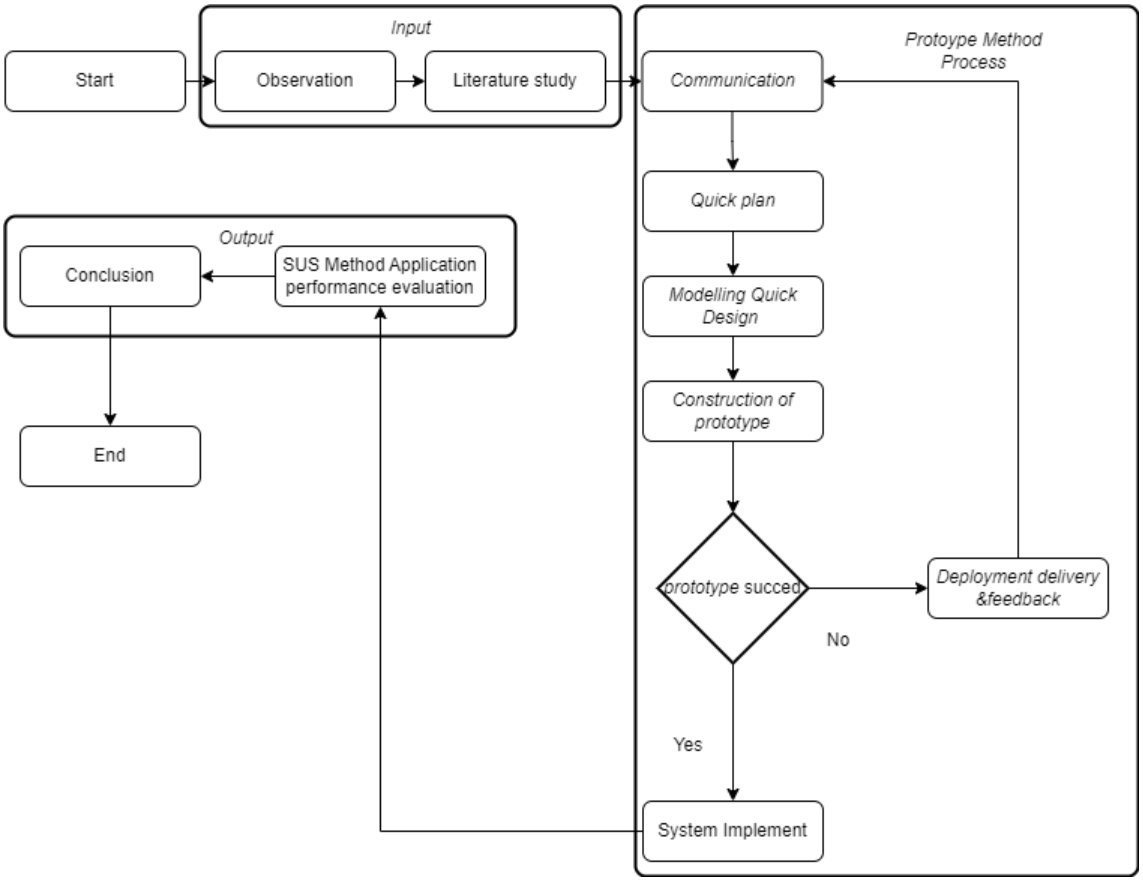

Fig. 1. Flow chart of Research

A. Observation

The initial step in this process is identifying the needs and data collection of the information system to be developed. This step involves an in-depth understanding of user needs, the intended use of the system, and the expected benefits of implementing the information system [7].

B. Literature Study

A literature study is conducted to adjust this research with previous research that contains the same topics and methods used in this research [8].

C. Prototype Method Process

The prototype method in this research will be limited to a maximum of 3 iterations. The first iteration considers the initial understanding of needs, gathering feedback, and improving design and functionality. In the second iteration, adjustments based on feedback and further testing. In the last iteration, validation, and finalization are then continued to the implementation stage[9].

1. Communication

Communication in this study was carried out between researchers as system developers and veterinarians from DISNAKKAN Ciamis [10].

2. Quick Plan

The quick plan stage is carried out to determine if the development plan can be carried out on schedule by meeting the solutions needed by DISNAKKAN Ciamis [11].

3. Modeling quick design

System design is needed to illustrate to the user how the system will be built [12].

4. Construction of Prototype

System prototype development begins when the design has been approved by DISNAKKAN Ciamis to be realized[13].

5. Deployment Delivery & Feedback

In the form of a prototype that has been built, the system will then be tested on its performance.

D. SUS Method Application Performance Evaluation

The SUS Method Application Performance has some steps below :

1. Compiling the questionnaire

The SUS method is tested on a scale of 1-5, from strongly disagree to strongly agree [14]. Shown in Table I.

TABLE I. SUS(SYSTEM USABILITY SCALE) QUESTIONNAIRE

No	Question	1	2	3	4	5
1	I think that I would like to use this system frequently.					
2	I found the system unnecessarily complex					
3	I thought the system was easy to use					
4	I think that I would need the support of a technical person to be able to use this system					
5	I found the various functions in this system were well integrated					
6	I thought there was too much inconsistency in this system					
7	I would imagine that most people would learn to use this system very quickly					
8	I found the system very cumbersome to use					
9	I felt very confident using the system					
10	I needed to learn a lot of things before I could get going with this system					

2. Distributing questionnaires

The questionnaires will be distributed in the third month of research in the fourth week when the prototype system can be tested. The target of distributing questionnaires will be carried out to the parties concerned at DISNAKKAN Ciamis, such as veterinary clinic employees and the veterinarians concerned. The target number is five people.

3. *Result management*

The test results will be managed by researchers to be considered for conclusions regarding the performance of the system that has been built. The results of this SUS method test will evaluate system usability based on considerations of small sample size, time, and cost [15].

III. RESULTS AND DISCUSSION

A. *Observation & Literature Study*

The observation was carried out through interview discussions with veterinary clinic staff and resulted in several conclusions:

1. There is a need for an information system for recording patient and medical records and census data to facilitate better data archives.

2. Veterinary clinic officers have a veterinary background. Therefore, it is hoped that users can easily understand and adopt the system.

Based on the literature study that has been done, the information system for administrative records can minimize duplicate or missing data records because the data will be recorded digitally in the database.

B. *Prototype Method Process*

In this research, the system design uses the prototype method with the following steps:

1. *Communication*

Communication is done online and on-site. In this phase, we get an overview of user needs and detailed descriptions of the data needed. Based on observations made by interviewing Dr. Intan Widianingrum as Head of the Animal Health Section and other veterinary clinic employees, Mr. Nunung Rustendi on November 19, 2021.

2. *Quick Plan*

At the quick plan stage, researchers made UML diagrams from previous discussions with veterinary clinic staff. The UML diagrams are as follows in Fig. 2. The use case diagram below shows how the actor can do in the system, such as filling in data pegiat cirobis, viewing data pegiat cirobis, filling in data rekam medis pasien, viewing data rekam medis pasien, filling in data pasien and lastly viewing data pasien :

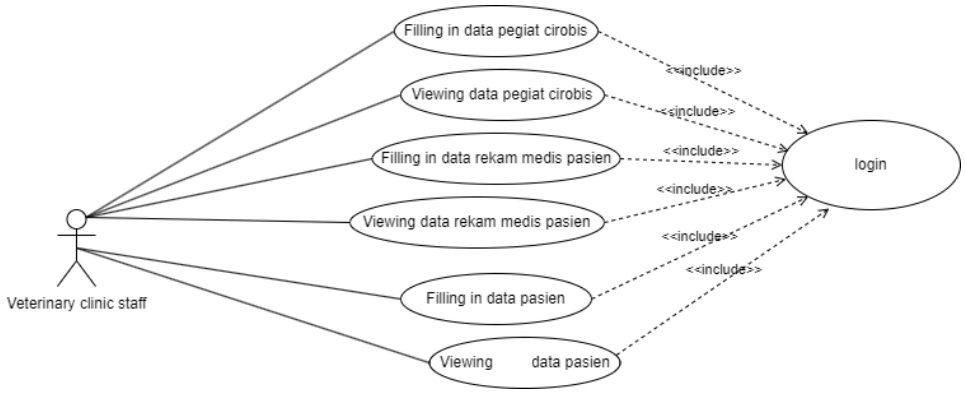

Fig. 2. Use case diagram

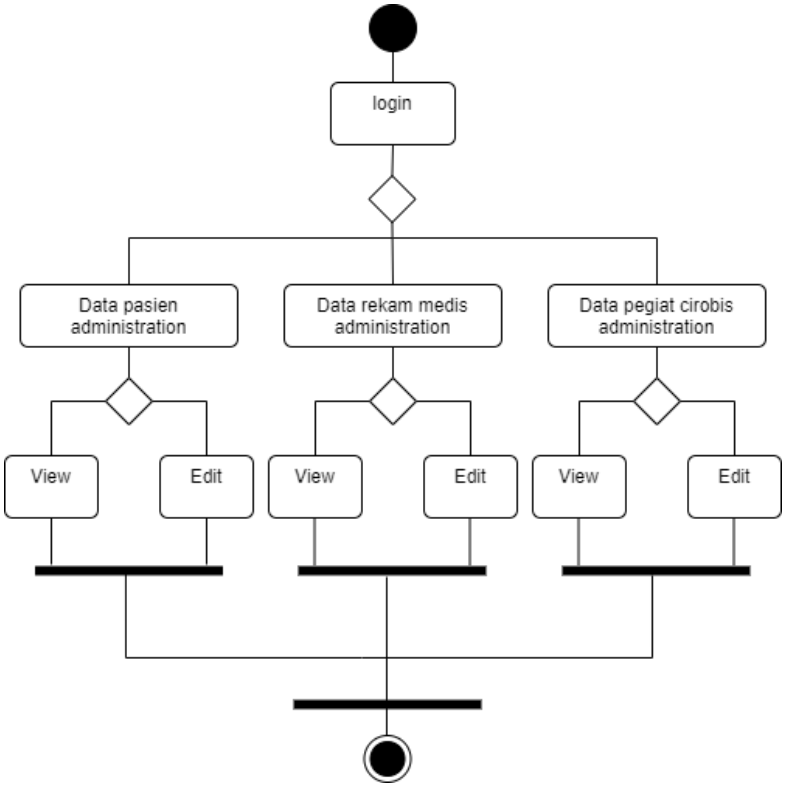

Fig. 3. Activity diagram

Fig. 3 above is the activity diagram that shows data pasien administration, data rekam medis administration, and data pegiat cirrhosis administration, which is the activity of each view and edit data. The Fig. 4 sequence diagram below starts from the actor: the veterinary clinic staff selecting the patient data content menu and filling in the data pasien. When sent to the system, it will be recorded in the database.

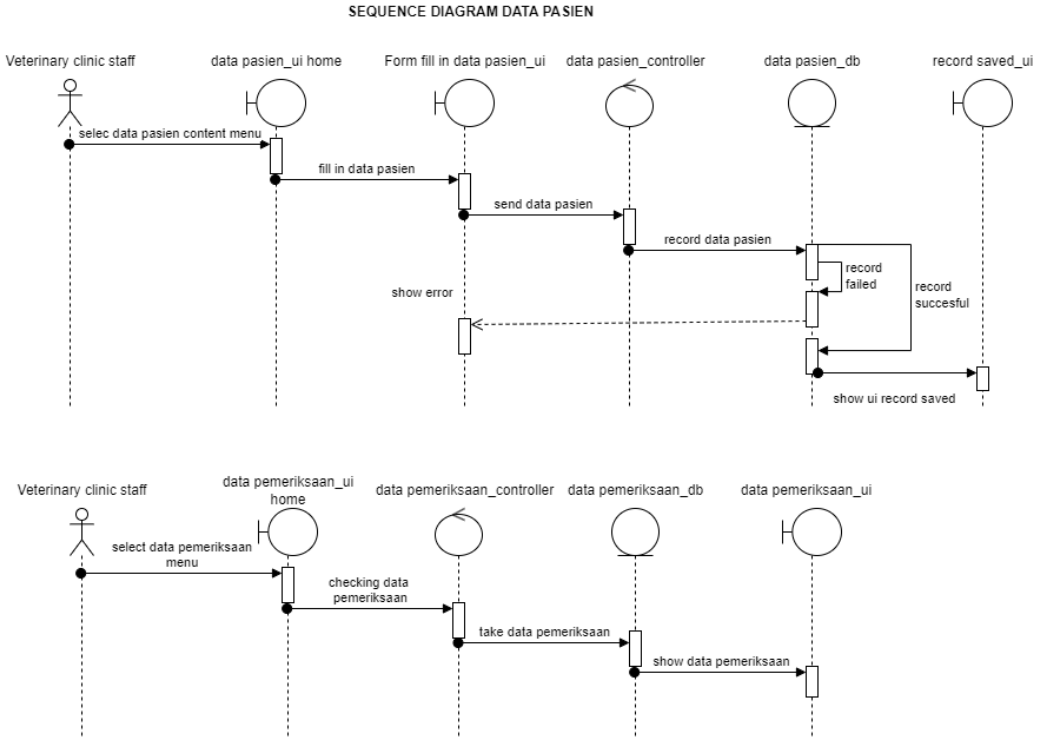

Fig. 4. Sequence diagram

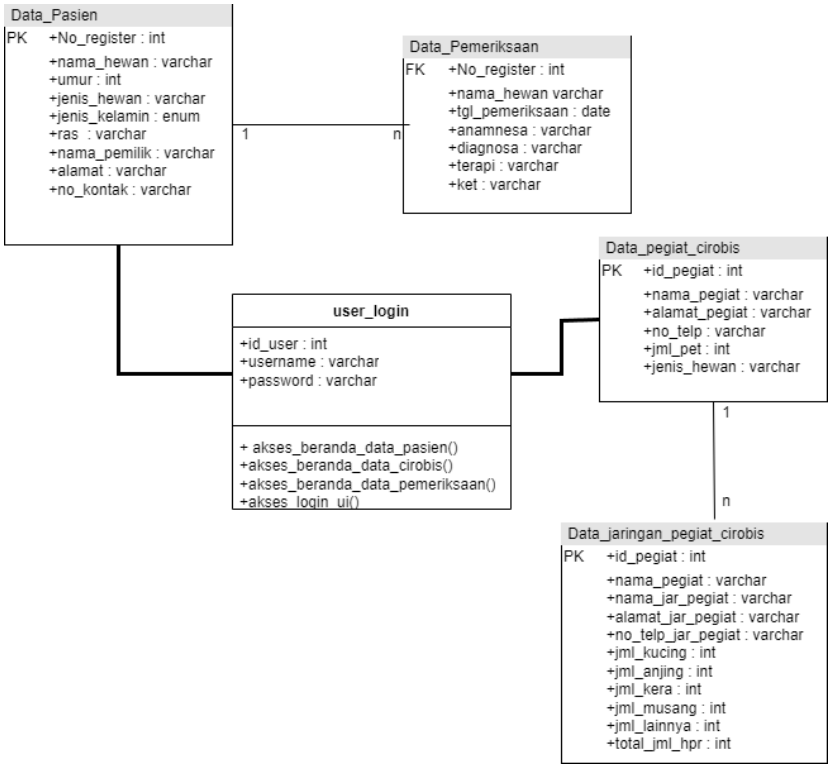

Fig. 5. Class diagram

Last, on UML diagrams, there is a class diagram that shows classes that are used in the system, such as data_pasien, user_login, data_ pemeriksaan, data_pegiat_cirobis, and data_jaringan_pegiat_cirobis. The details are in Fig. 5 above.

3. Modeling quick design

an overview of the Quick design demonstrated to potential users is as follows in Fig. 6. Which shows the data pasien quick design from login to view data, and Fig 7. Also show quick method from login to view data for data pegiat. Both quick designs are made in Figma software.

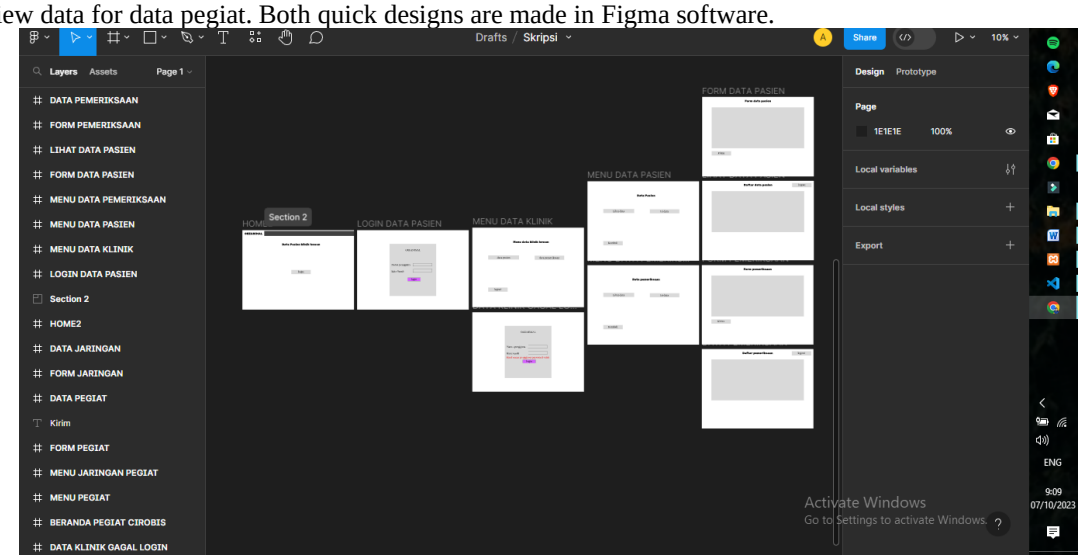

Fig. 6. Figma quick design I

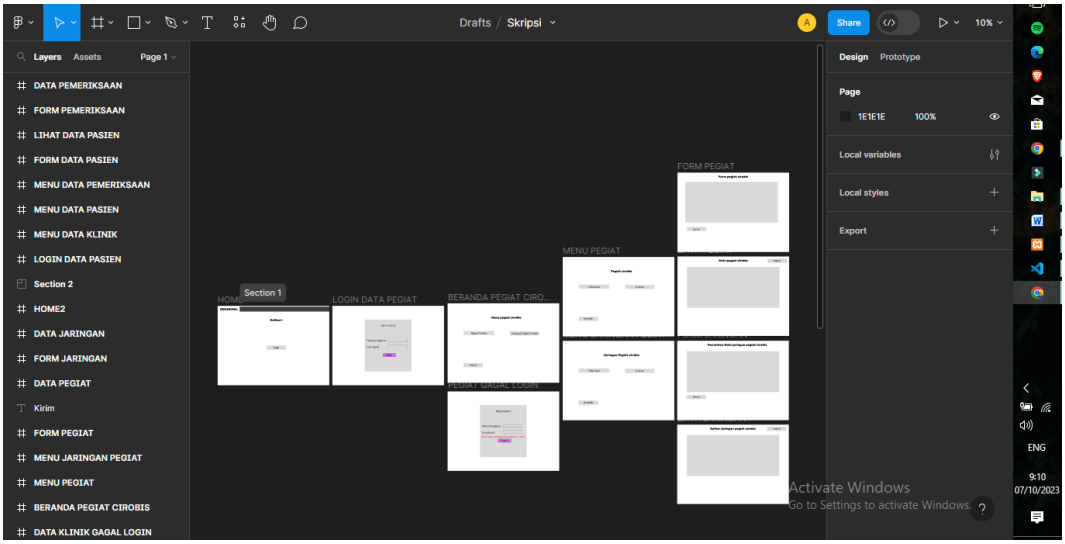

Fig. 7. FigFigma quick design II

4. *Construction of Prototype*

The development of a prototype system is carried out to facilitate the administration of recording patient data. The details are described as follows in Fig. 8. The login interface, which the actor must fill in a username and password to be able to log into the system:

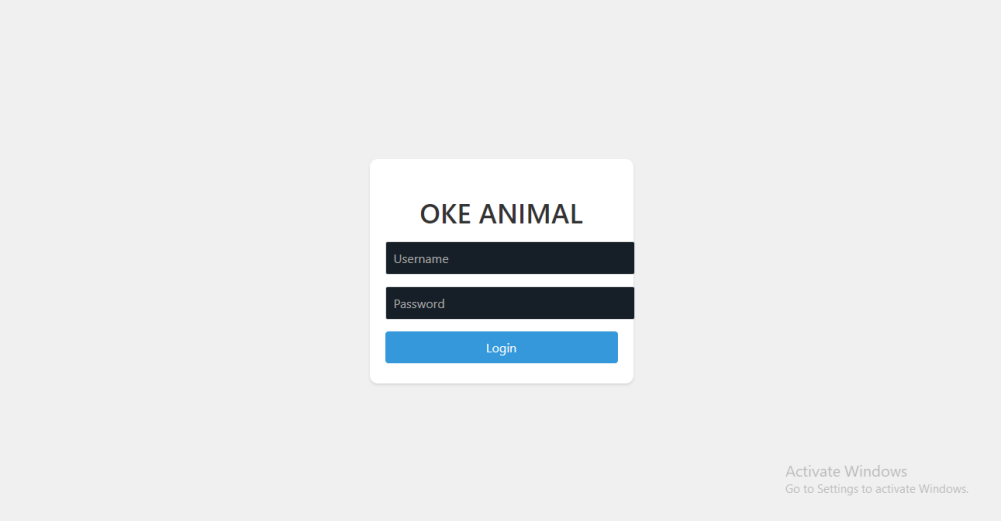

Fig. 8. Login Prototype

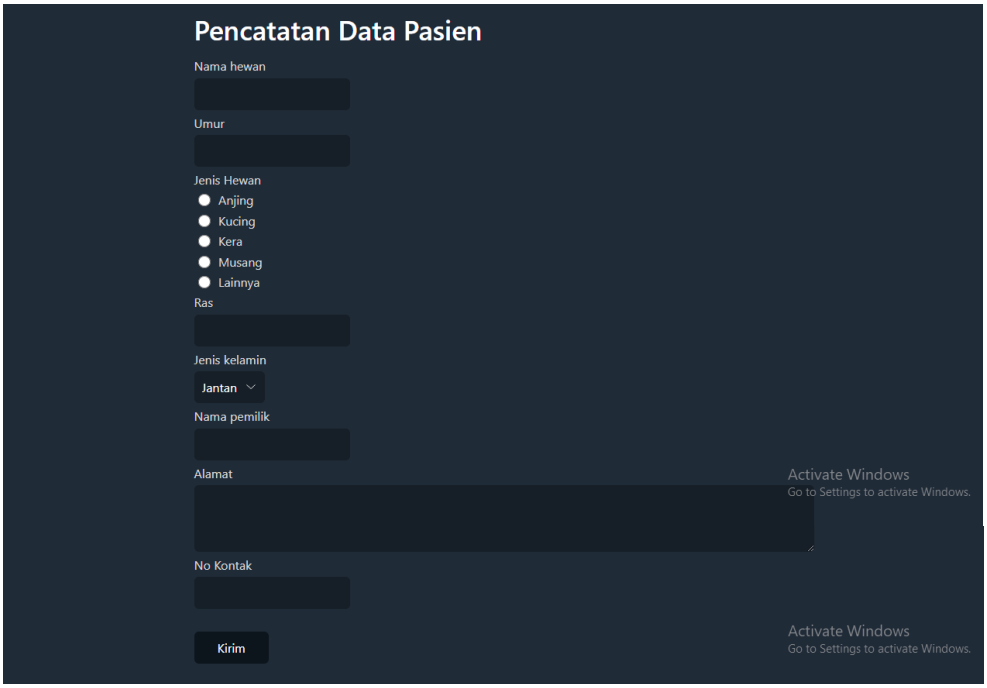

Fig. 9. Form Prototype

Fig. 9 is the user interface of the form that the actor needs to fill out when they enter some data into the system. When they finish filling that, they are required to click the Kirim button, which means the system will record the data on the database. The actor can view the data recorded by the system on the data pasien display menu, as Fig. 10 shows.

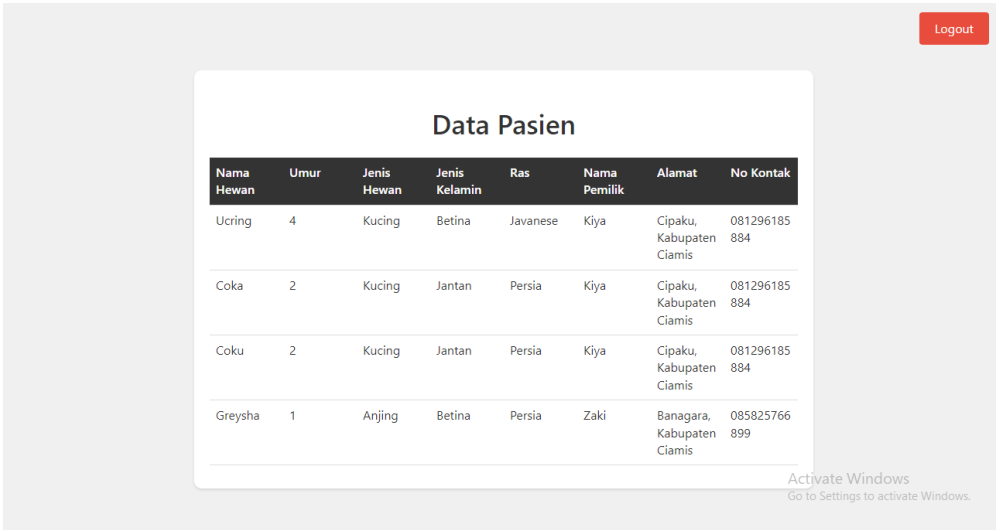

Fig. 10. Data Display Prototype

5. Deployment Delivery & Feedback

Deployment has been implemented and will be evaluated using the SUS(System Usability Scale) method. Afterward, conclusions will end this research and be considered a reference for the subsequent development.

C. SUS Method Application Performance Evaluation

System usability testing uses the SUS (System Usability Scale) method, with the following data in Table II representing the results of a System Usability Test (SUT) conducted using the System Usability Scale (SUS) method. The respondents (1 to 5) rated ten questions (Q1 to Q10) on a Likert scale. Questions Q1 to Q4 are negatively phrased, indicating potential difficulties, while Q5 to Q10 are positively phrased, reflecting positive user experiences. Respondent 1, for instance, demonstrated moderate agreement with negative statements and generally positive agreement with positive statements. The overall SUS score, calculated from these ratings, is a comprehensive measure of the system's perceived usability. Below are the details:

TABLE II. SYSTEM TEST RESULT DATA

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	4	2	4	2	5	1	5	1	4	4
2	4	2	4	2	4	2	4	2	4	3
3	4	1	4	2	4	1	5	1	5	2
4	4	2	4	2	4	3	4	2	3	1
5	5	1	4	3	5	1	5	1	4	5

Table III displays the transformed scores for each question from the System Usability Test using the System Usability Scale (SUS) method. Odd or positive questions (Q1, Q3, Q5, Q7, Q9) were transformed using the formula X-1, while even or negative questions (Q2, Q4, Q6, Q8, Q10) were transformed using 5-X. For example, respondent 1's scores are uniformly 3 for negatively phrased questions and range from 4 to 1 for positively phrased questions. This transformation standardizes the scores, facilitating the calculation of an overall SUS score to assess the system's perceived usability.

TABLE III. SYSTEM TEST RESULT DATA EACH QUESTION SCORE

Respondents	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
1	3	3	3	3	4	4	4	4	3	1
2	3	3	3	3	3	3	3	3	3	2
3	3	4	3	3	3	4	4	4	4	3
4	3	3	3	3	3	2	3	3	2	4
5	4	4	3	2	4	4	4	4	3	0

Table IV presents each respondent's System Usability Scale (SUS) scores, calculated by summing up individual question scores and multiplying the total by 2.5. For instance, respondent 1 achieved an SUS score of 80. The average SUS score across all respondents is 78.5. To interpret these scores, a system grade scale is applied: A (>90 - 100), B (>80 - 90), C (>70 - 80), D (>60 - 70), and F (0-60). Accordingly, respondents 3 and 5 fall into grade A with scores of 87.5 and 80, respectively, while respondents 2, 4, and the overall average fall into grade B with scores ranging from 72.5 to 78.5. This classification provides a concise overview of the system's perceived usability, with higher grades indicating better usability.

TABLE IV. AVERAGE VALUE

Respondents	SUS Score	Description
1	80	
2	72,5	Average
3	87,5	value=Total
4	72,5	SUS
5	80	score/Number
SUS Score Total	392,5	of
Average value	78,5	respondents

The SUS method calculation is continued by determining the system grade scale as follows:
A = >90 - 100
B = >80 - 90
C = >70 - 80
D = >60 - 70
F = 0-60

The acceptability ranges are as follows:
Acceptable = >60 - 100
Not acceptable = 0 - 60.

Details of the SUS score for each acceptability range and grade scale can be seen in Figure 11 below.

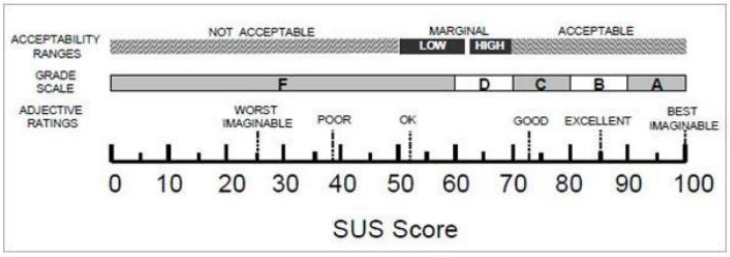

Fig. 11. SUS Score[15]

Based on the entire series of SUS method calculations, the final result is 78.5. Then, adjusted for system testing, it can be concluded to be on a scale of C and acceptable.

IV. CONCLUSION

In conclusion, the research encompassed observation, literature study, and the application of the SUS (System Usability Scale) method to evaluate the performance of a system developed for administrative records in the veterinary clinic of DISNAKKAN Ciamis. The key findings and outcomes are as follows: The observation phase, which included discussions with veterinary clinic staff, revealed the need for an information system to record patient data, medical records, and cirobis data for better data archiving. Given that veterinary clinic officers have a veterinary background, the system was designed to be easily understood and adopted by users. The literature study highlighted the potential for minimizing duplicate or missing data records through digital recording in a database. The research utilized the prototype method, which included several steps, from communication to the deployment of the prototype system. UML diagrams, such as use case, activity, sequence, and class diagrams, were created during the "Quick Plan" stage to define the system's functionality. Quick design modeling was demonstrated to potential users. The prototype system, including login forms, data entry forms, and data display components, was constructed. Deployment was implemented, and the system's usability was evaluated using the System Usability Scale (SUS) method. The SUS method was used to assess the system's usability, and the results from respondents were tabulated and analyzed. The SUS scores for each question and each respondent were calculated and summarized. The average SUS score was determined to be 78.5, indicating that the system falls within the "C" grade scale, which is considered acceptable. Overall, the research successfully developed a system for administrative records in the veterinary clinic of DISNAKKAN Ciamis. The system demonstrated acceptable usability and promises to improve data management and record-keeping in the clinic. This research outcome can reference future system development in similar contexts.

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