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Analysis and Design of Web-Based Intelligent Livestock System Prototypes

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ABSTRACT

Smart Livestock System is a livestock platform that brings together farmers and investors. The emergence of the Smart Livestock System platform is due to the difficulty of farmers who want to spread their livestock business. The beef cattle population is still insufficient to meet domestic consumption needs and still depends on imported beef cattle. Smart Livestock System means a system that will be the solution to the conflict. The method used in testing the design of the Smart Livestock System is usability testing. This method tests the utilization of the system by the user. This method was chosen to determine the level of benefits generated by users from the solution offered by the Smart Livestock system. What will happen comes from the analysis and design in this paper is a documentation of analysis and design for the development of Smart Livestock System software, as a result it can be used by software developers to become acum and additional science certificates on making a software engineering development document.

KEYWORDS
Farm
Web Application
Sapi Potong
Intelligent Livestock System

1. Introduction

Livestock is part of the agricultural subsector which continues to be developed to meet the needs of animal protein. Cattle farming prune is a very important part of human life to meet daily needs and become a promising business because it is one of the main needs that is always expected by the people, especially cattle farms that have very many benefits, ranging from meat, milk, to the skin can be processed. Therefore, this livestock business must also be managed optimally to meet the needs of cows in the country.

In improving the quality and quantity of pruning cattle farms, there are important components that support business success. One of the supporting components is business capital. However, in work energy, productivity is still low so it is not efficient in the process of livestock development because there are still many farmers who lack business capital. Indonesia as one of the largest populations in the world requires a very large stock of cattle and is now still dependent on imported cattle, therefore the government has determined one of the regions in Central Java that has the potential to develop a prune cattle farming business in Kebumen Regency. Kebumen Regency has

huma to create a large population of pruned cattle, but has capital disputes that do not attract investors to invest in livestock.

The business process offered by the Smart Livestock System is that investors can determine which farms they will invest in for livestock development. This software system is web-based so that it is practically accessible to the user. Using this system is also to make it easier to connect between breeders and investors.

This intelligent livestock system is one part of industry 4.0 technology, in industry 4.0 it will facilitate management, because the system is automated. Web technology means technology that never decreases in usability and will always develop from time to time. This is because the web system can be accessed anywhere either via desktop or via mobile phone. RPL has stages in its development, one of which is analyzing and designing a software prototype to be designed. Analysis and design are carried out to facilitate the documentation process when making a software. So that in the future when the system development process will be practically carried out. In addition, before building a system and implementing a system, an analysis of a problem needs to be done, as a result of which the system can be made according to the initial analysis. In the future, development will be scheduled and structured. RPL and intelligent systems mean two fields that are able to collaborate with each other. This time intelligent system is one part of industry 4.0 technology, in industry 4.0 this technology will facilitate its management, because the system is automated. Currently, animal husbandry has various processes that are carried out from upstream to downstream processes. If the system is not automated, then handling will be very difficult and consuming when, to be efficient when and energy, the smart system means the right choice in livestock management. The intelligent livestock system to be developed is a system that is able to record the process of animal husbandry from the production process to distribution. Furthermore, this system will be developed using web technology. Web technology means technology that never decreases in usability. Web technology will always evolve over time. This is because the web system can be accessed anywhere either via desktop or via mobile phone.

In this paper, we will discuss the analysis and design of a prototype of a web-based intelligent livestock system. The stage to be carried out is an analysis. From the results of the analysis, a design will be made on the prototype to be designed. The result of this research is in the form of documentation, analysis, and design of website-based prototypes. In a study, it is hoped that support will occur - the results of pre-existing research related to using the research earlier. To produce an RPL document, it takes a systematics that reveals what parts of the RPL document will consist of. Systematics is arranged on a scheme that is generally provided in a pattern (template). This pattern itself has many uses, for example used for program code generators Software engineering documents are a crucial written document for relevant stakeholders to collaborate on the software development and engineering process (Arantes and Falbo, 2010) [3]. Arantes and Falbo, developed an infrastructure into a means for semantic document management, especially those processed from RPL documents. The news system is a system within an organization that brings together the needs of managing daily transactions, supporting operations, managerial, and tactical activities from an organization and providing certain external parties with the required reports, The system is an order (integration) consisting of a number of functional components (in units of functions and specific tasks) that are interconnected and together aim to fulfill a The development of smartphone-based mobile applications is increasing at any time. This condition can be seen from the number of users who access the internet via smartphones always increases from year to year. Each development method has different characteristics that require asynchronous treatment. In addition, in software development, the methods used must be synchronous using the form or type of software developed.

This requirement is caused by not all methods suitable for the type of application to be developed. There are many types of software including application systems, application software engineering / scientific software, open world computing, ubiquitous computing, netsourcing, data mining, grid computing, and cognitive machines, in addition to data / information as the focus of qualitative studies. So more clearly, the news obtained will affect the results of the study. Using so, the better the quality of the data / info obtained, the better the consequences of permission.

2. Method

This research uses the problem study method. The study of problems in research methodology is defined as a process of searching and examining many phenomena in concrete life. Problem studies are carried out by exploring a particular phenomenon (problem) in a time and activity and collecting detailed and in-depth information using a myriad of data collection mechanisms during an exclusive period. The resulting origin comes from the case study method can be used as a reference for evidence and excavation of issues. Through the literature study conducted, data and various sources related to the topic of research and development of this software were collected. Literature studies can be done by examining from various sources such as journals, books, documentation, reports, and libraries. The data obtained from the literature study will be used as a basis for software design. various data collection mechanisms over a given period. The origin obtained from the case study method can be used as a reference for evidence and extracting information. Through the literature study conducted, data and various origins related to using the topic of research and development of this application were collected. Literature studies can be done by studying various origins such as journals, books, documentation, reports, and libraries. The data obtained from the literature study will be used as a basis for conducting application design.

a. Functional Needs

According to the observation of the feud that has been analyzed, ten functional forms are obtained as features in the Smart Livestock System application. Functional Needs are shown to solve problems in increasing slaughter cattle stock in Kebumen District at the National Seminar on Electricity, Engineering and Informatics (SNEKTI) 2020.Functional needs derived from STC can be seen in the Table 1.

Table 1. System Requirements Analysis

Kode	Fungsionalitas
K1	Mendaftar
K2	Mengirim Pesan
K3	Menerima Pesan
K4	Bertransaksi Investasi
K5	Menerima Laporan
K6	Menerima Panduan Beternak

b. Planning

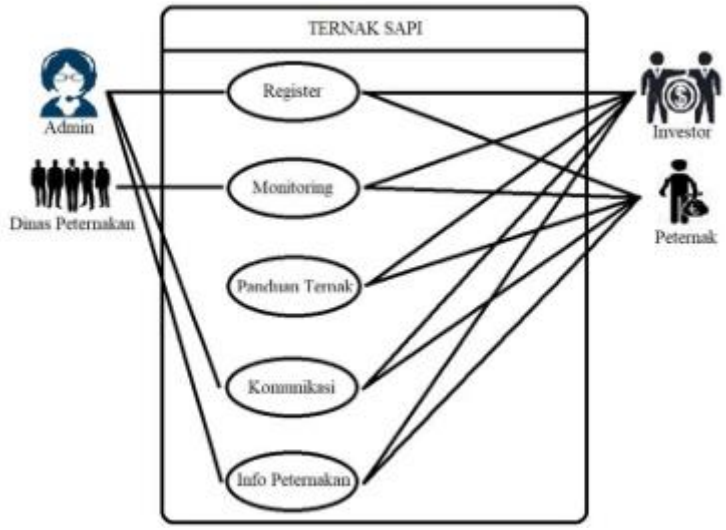

Figure 1. Contex Diagram

In system design, applications place system requirements from both hardware and software using to create a holistic system architecture. Application design is carried out by identifying the unformed basic system of the application and its relationships. [1] For design, it is described how the characteristics of the system use modeling claimed by Unified Modelling Language (UML) as a form that is a reference and standard in designing, visualizing images, as well as documenting derived software systems. of the six similar functional requirements in Table 1, the correlation between actors and Jaja functionality is represented in a Use Case diagram shown in Figure 1. in the Use Case Diagram, there are four actors, namely Investors, Breeders, Admins, and Livestock Agencies.

Each actor has an asynchronous function according to the functional needs table described earlier. Admins have similar functionality to receive messages, and send feedback on responses from users provided. then the Investor has functions such as communicating with farmers, informing investment plans to farmers, and notifying investment offers to farmers. ad interim, farmers have the functionality to get bids and make offers from investors, and the Livestock Office also gets reports from farmers about the condition of livestock and their populations and the admin publishes the report. STC's ability to manage reports also involves managing databases.

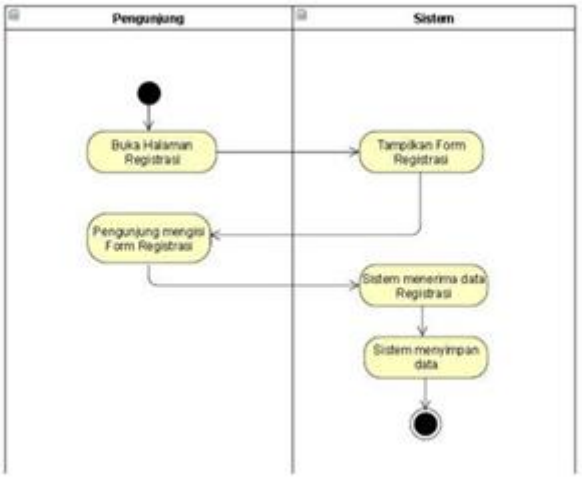

Figure 2. Functional Diagram 1

The activity diagram derived functionality conveys access to perform registration in figure 2. The process starts from the user accessing the initial page in the STC software, first of all here the user's access is limited because those who are given freedom are those who have registered after registering then the user will be able to access all the features available in the STC software earlier.

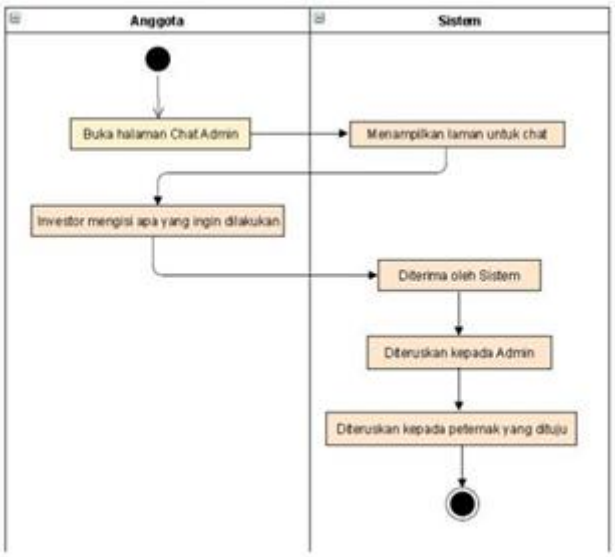

Figure 3. Activity Chart 1

Activity diagram derived from this functionality conveys the access of farmers and investors to communicate and inquire about their farms in Figure 3. This process starts from users, namely potential investors and farmers, accessing the communication features on this intelligent livestock system software until finally farmers can make potential investors interested in investing their money into their farms. And this is one solution to facilitate investment in animal husbandry.

3. Results and Discussion

In addition to forming various kinds of use case designs, activity diagrams, and user interface designs, STC has been tested by only a few users to find out the extent to which the functional is

designed and also testing the STC software interface using creative, interesting, and informative impressions.

Figure 4. Farm Page 1

Figure 4 displays the STC livestock gossip page, on this page users are given some information about livestock news, especially beef cattle farming, similar to any type of cattle that is often cultivated in Indonesia.

Table 3. Average-Homogeneous 1

No	Pernyataan System Usability Score	Rata-Rata
1	Saya berpikir untuk menggunakan sistem ini lagi	7.1
2	Saya merasa sistem terlalu rumit padahal dapat dibuat lebih sederhana	5.3
3	Saya merasa sistem ini mudah untuk digunakan	7.2
4	Saya merasa perlu bantuan orang lain atau teknisi dalam menggunakan sistem ini	5.6
5	Saya menemukan bahwa terdapat berbagai macam fitur yang terintegrasi dengan baik dalam sistem ini	5.15
6	Saya rasa terdapat banyak hal yang tidak konsisten dalam sistem ini	4.35
7	Saya rasa mayoritas pengguna akan dapat mempelajari sistem ini	6.95
8	Saya menemukan bahwa sistem terlalu rumit untuk digunakan	5.00
9	Saya merasa dapat menggunakan sistem ini dengan baik	6.05
10	Saya perlu terbiasa terlebih dahulu dalam menggunakan sistem ini	4.99

The table above shows the average results of homogeneous fillings from 15 respondents who are close friends of home and workers. the origin of the data is shown the average of each question and displayed in a graph and can be concluded that STC has a problem in statements numbers 5, 6 and

10. Features that have not been able to run should, state that they are not consistent too and users must first get used to this system.

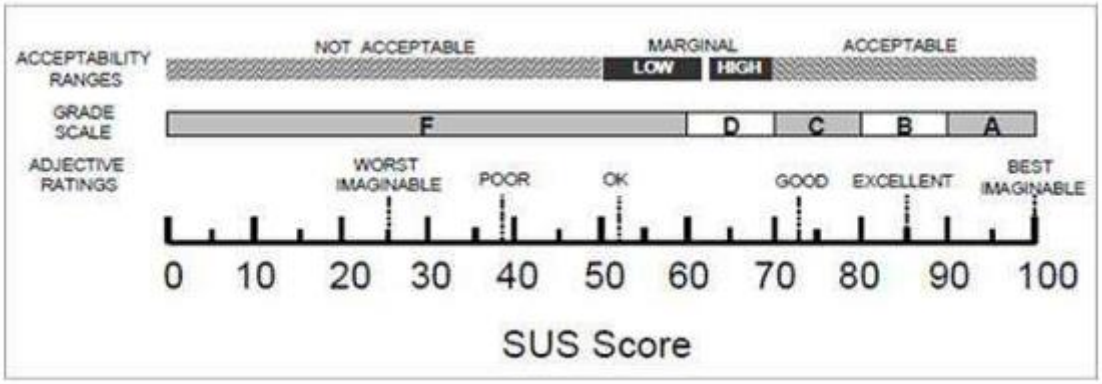

Figure 5. SUS Score 1

If there will be 15 correspondents, it receives an average result of 57.69, which means it is still in the category between OK and GOOD using entering the Marginal value range. Therefore, STC is needed to develop and features continue to be improved so that users are comfortable using this STC application and facilitate investment in beef cattle farming and form beef cattle stock for Indonesia relatively.

4. Conclusion

In the era of the Industrial Revolution 4.0, there are still many breeders who have difficulty finding capital, even though in this era sophisticated technology makes it easy to find investors using simple. But limited capabilities in the field of news technology make farmers a very complicated obstacle. Therefore, it is hoped that a platform that can overcome this problem is to easily connect investors and breeders, especially for breeders in Kebumen Regency, Central Java. In this barber cattle farm investment has obstacles, namely there are several types of cows that are rather difficult to breed, therefore we will work with the livestock office to solve the problem. When the cow is ready to be slaughtered, farmers report what will happen to their beef cattle to indicate how effective the management of the prune cattle is in order to attract investors to invest in trim cattle farming.

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