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Design of Information System for Monitoring Risk Treatment Plan at PT. PLN Batam

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Abstract

In the era of advances in information technology, technological developments affect almost all aspects of life, including in monitoring activities for risk management. monitoring is an observation activity carried out to closely monitor certain conditions or circumstances, including ongoing behavior or activities. the use of sophisticated information systems allows real-time monitoring, which facilitates analysis and delivery of accurate and relevant information. with the technology that continues to develop, the system that is implemented increasingly supports faster and more precise decision making, thereby improving organizational performance. this research aims to design, test, and implement a risk treatment plan monitoring information system at PT PLN Batam. with this system, it is expected to create a more efficient solution in managing risks that previously required more time and effort. The method used in designing this system is the System Development Life Cycle (SDLC) approach with the waterfall method. SDLC is a structured framework arranged sequentially to guide the system (software) development process. this method has clear and structured stages, making it easier to manage system development projects. the result of this research is a web-based information system that replaces the previous method of managing risk data using excel files, with the aim of increasing efficiency, transparency, and accuracy in managing risk data. this system also allows more effective risk monitoring and simplifies the reporting process. in conclusion, this web-based information system can increase efficiency in managing risk data, as well as facilitate real-time monitoring and reporting of risk data, which is very useful for more precise and rapid decision making.

Keywords: Monitoring, Information System, Risk Data, SDLC, Waterfall Method

INTRODUCTION

In the era of information technology advancement like today, technological development is growing rapidly and affecting almost all aspects of life. one of the increasingly important and widely used applications of technology is in monitoring various activities, especially in risk management, operational efficiency, and better data-driven decision-making. with the existence of sophisticated information systems, activity or process monitoring can be done in real-time, allowing organizations to oversee every development and situation that occurs more effectively and efficiently.

According to Alfin Siddik (2021), the activity of observing is an action carried out to carefully observe a specific condition or situation, including the behavior or activities that are currently taking place. this observation aims to obtain in-depth information, which can then serve as a basis for making further decisions. in the context of monitoring, observation functions to track any changes occurring within a system or process, so that every piece of information obtained can be used to plan the necessary subsequent steps or actions.[1].

According to Mr. Abdul Arief, the risk management manager at PT. PLN Batam, the company does not yet have a dedicated website to store and manage risk management reports. although PT. PLN Batam has conducted risk identification and management, the process of reporting, recording, and storing risk data is still done in an inefficient manner. currently, risk

management reports are still stored in excel files, which makes it difficult to track changes or updates to the data efficiently.

In the design of this information system, the System Development Life Cycle (SDLC) is used with a waterfall approach. SDLC is a structured framework, organized sequentially to guide the system (software) development process. the waterfall method is a well-known and widely used approach by system developers in building software.[2].

The presence of a risk management website will simplify the process of storing and managing risk data, improve efficiency, and enhance the transparency and accuracy of the generated risk reports. this will be very beneficial in supporting faster and more accurate decision-making related to the company's risk management. therefore, information systems are crucial in a company. thus, the author conducts research and composes this report with the title Design of Information System for Monitoring Risk Treatment Plan at PT. PLN Batam.

RESEARCH METHOD

This research uses the waterfall method, also known as the waterfall model, often referred to as the classic life cycle model in software development. this model is actually known as the linear sequential model, which describes a structured, systematic, and sequential approach to software development.[3].

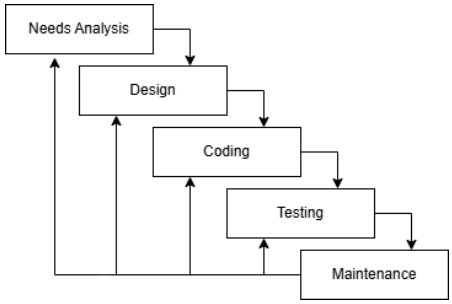

Figure 1 Waterfall Model. Source (Simatupang & Sianturi., 2019)

The following are the stages commonly performed in the waterfall method, which is a software development approach that follows a clear and structured sequence of steps in order.[2].

system requirements analysis is conducted to understand the needs required to support the design and development of the system, which includes understanding the ongoing business processes, identifying existing problems, developing the proposed system, and determining the necessary functionalities. based on the results of the requirements analysis, the design phase is carried out by designing the appropriate system interface. then, in the program coding phase, the system is implemented through the integration of the design created using PHP programming language and MySQL database. the next phase is system testing, which aims to evaluate feasibility and identify shortcomings, with the test results used as a basis for making improvements and further adjustments. system maintenance is the final phase, where the developed system can be modified and features can be added according to the ever-evolving needs of the users, as well as performing repairs if any issues or bugs that affect system performance are found.

The data processing method in the research titled "Design of Information System for Monitoring Risk Treatment Plan at PT. PLN Batam" begins with the planning stage, which starts with direct observation at the research site. after that, an analysis is conducted to evaluate whether the existing system is facing problems or no longer functioning properly. the results of this analysis are used as a basis for system improvement. next, in the design phase, a general system design is carried out, also known as logical or conceptual system design, with the aim of providing an overall picture to the users about the information system to be developed. the final stage is system implementation, where the designed and tested system is then applied and operated.

This research also applies Unified Modeling Language (UML) modeling design. Unified Modeling Language (UML) is a standard modeling language for designing software, serving as a

blueprint in its development (pressman). UML is used to describe, detail, and document various components within a software system in a clear and structured manner.[4]. a use case diagram illustrates the functionalities that will be applied to a system that is to be built. a use case focuses on what the system can do, not how the system operates within a process. use cases also serve to represent an interaction between the user and the system.[5]. an activity diagram illustrates the flow of functionality within an information system. specifically, the activity diagram defines where the workflow starts, where it ends, what activities occur during the workflow, and the sequence of these activities. the activity diagram also provides an approach for modeling parallel processes. for those familiar with traditional structural analysis and design, this diagram combines the concepts underlying data flow diagrams and system flow diagrams.[6]. according to Rosa & Shalahuddin (2018), a sequence diagram illustrates the interaction between objects in a use case by showing the sequence of time and the messages sent and received by these objects. therefore, to create a sequence diagram, it is necessary to identify the objects involved in the use case as well as the methods of the classes that generate these objects. the sequence diagram is also useful for analyzing the scenarios within the use case.[2]. a class diagram illustrates the structure of a system by defining the classes needed to build the system, providing a comprehensive overview of how the system will work by identifying the key elements that make it up. each class in the class diagram has two main and essential elements: attributes, which are used to store data or information related to the objects generated by the class, and methods or operations, which describe the functions or actions that can be performed by the class to carry out various processes or manipulate data in an organized and efficient manner. this diagram also shows the relationships between the classes that interact with each other.

RESULTS AND DISCUSSION

NEEDS ANALYSIS

This is the needs analysis stage, where an in-depth identification and understanding of the system's functional and non-functional requirements are conducted. the goal is to gather clear information regarding user needs, existing constraints, and how the system operates efficiently and effectively, so that the final outcome can meet the expectations and desired objectives. with a clear understanding of these requirements, the author can design a system that is suitable and aligns with user expectations.

DATA PROCESSING

The data processing process conducted by the author allows for the analysis of research on the design of an information system for monitoring the risk treatment plan at pt. pln batam. the author also identifies problems that indicate the shortcomings of the current system. based on this, the author designs a better information system.

SYSTEM ANALYSIS

System analysis is the process of studying and understanding the components that make up a system, as well as how these components interact to achieve a specific goal. by conducting a thorough system analysis, we can optimize the system's functions to make it more efficient and effective in supporting the organization's objectives.

Functional requirements analysis refers to the design stage related to the flow of information patterns, including the design of diagrams and process flows using Unified Modeling Language (UML) to support the design of the information system for monitoring the risk treatment plan at PT. PLN Batam. non-functional requirements refer to criteria or conditions that are not directly related to the main functions of a system but are crucial to ensure the system's performance, security, and overall quality are optimized. these requirements govern how the system should operate, not what it should do. they include hardware and software that support the smooth operation and stability of the system efficiently. the specifications of the operating system, software, and hardware that support are as follows:

The author uses windows 11 in the development of the information system for monitoring the risk treatment plan at pt. pln batam, with the help of microsoft edge to search for information and references that facilitate the research process. additionally, the author uses draw.io to design uml diagrams, a web-based platform specifically designed to illustrate diagrams online with an intuitive interface and comprehensive features. all of these activities are carried out on a laptop, a device designed to manage, store, and generate multimedia data, controlled through a system with a user account manually. the laptop, often referred to as a portable computer, allows users to easily access and operate it in various locations.

SYSTEM DESIGN

System design is the stage of overall system planning, which includes all components and how they work together to achieve both business and technical goals. at this stage, selecting the right technology is crucial to ensure the system can be successfully implemented. the main goal of system design is to ensure that all components work together efficiently, effectively, and are easy to maintain. a good design will help the system evolve according to future needs and provide maximum benefits to the users. below is the system design for the information system for monitoring the risk treatment plan at PT. PLN Batam.

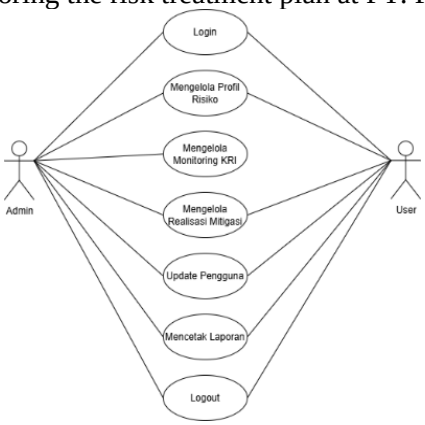

Figure 2 Use Case Diagram of the Information System

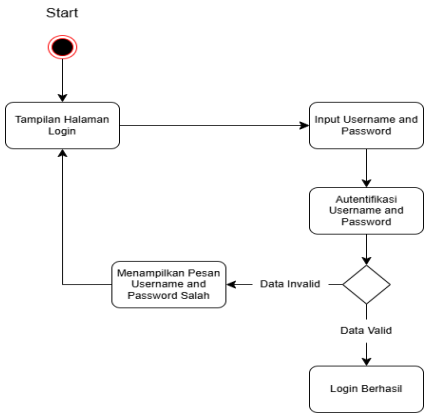

Figure 4 Login Activity Diagram

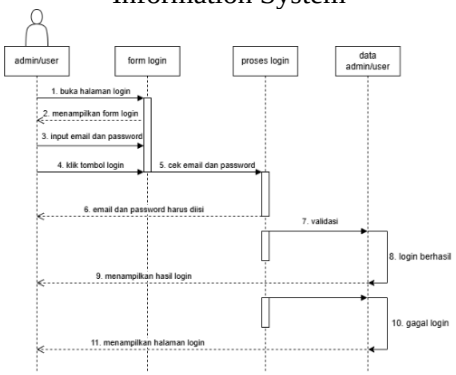

Figure 3 Login Sequence Diagram

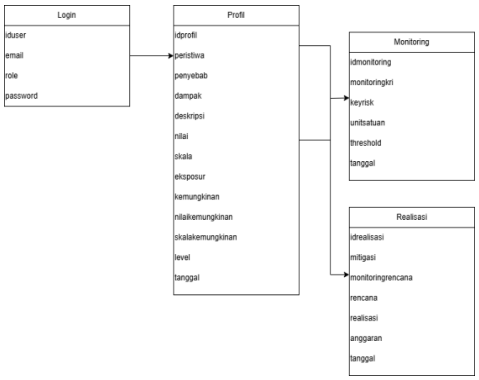

Figure 5 Database Class Diagram

PENERAPAN PROGRAM

The implementation of the information system for monitoring the risk treatment plan at PT. PLN Batam involves the application of various components and features designed to support the monitoring process efficiently and effectively. these features make it easier for users to access information and monitor risk status more quickly. below are the views and menus available in the system, designed to be user-friendly and assist users in performing tasks optimally. with a user-friendly interface, this system ensures that every user can operate it easily and efficiently.

Figure 6 Login Page

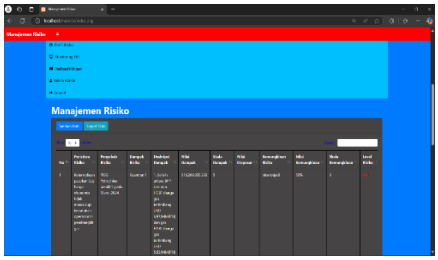

Figure 7 Risk Profile Page

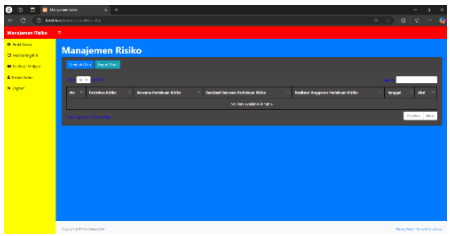

Figure 8 Mitigation Realization Page

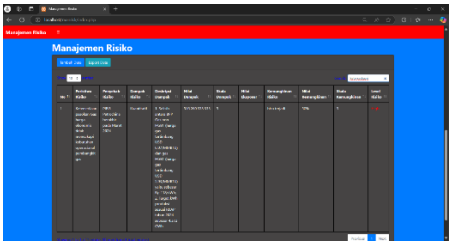

Figure 9 Search Menu

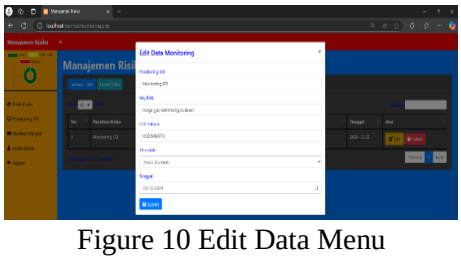

Figure 10 Edit Data Menu

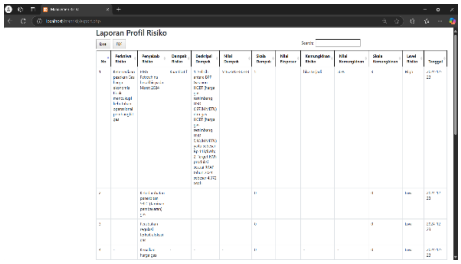

Figure 11 Data Export Page

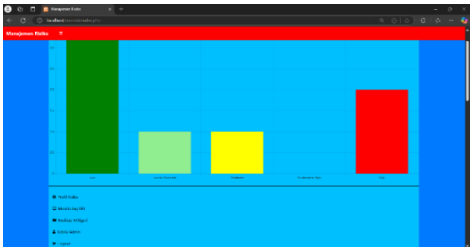

Figure 12 Main Page

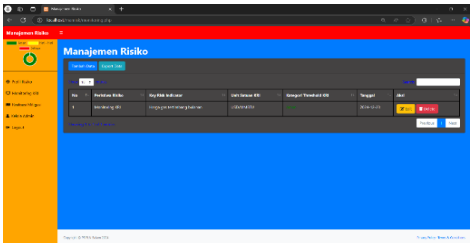

Figure 13 KRI Monitoring Page

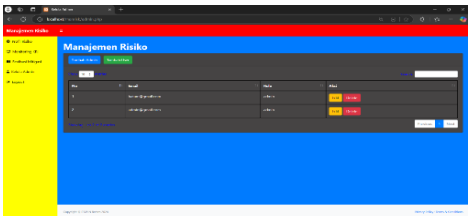

Figure 14 Admin Management Page

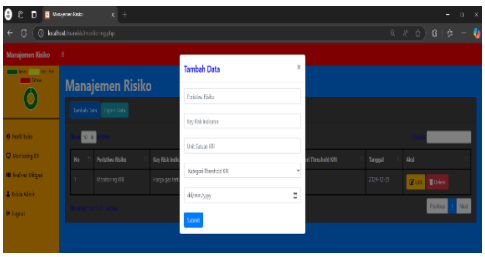

Figure 15 Add Data Menu

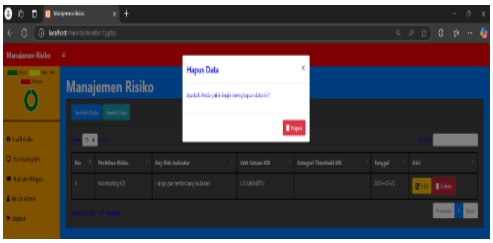

Figure 16 Delete Data Menu

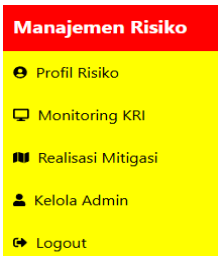

Figure 17 Logout

CONCLUSION

Based on all the discussions presented and the results of the research implementation, the following conclusions are obtained:

This research aims to design and implement a web-based information system to replace the method of risk data management that still uses excel files, as well as to improve the efficiency of storing, recording, and reporting risk data at PT. PLN Batam. The importance of a web-based risk management information system at PT. PLN Batam is to enhance efficiency, transparency, and accuracy in storing and managing risk data, which will support faster and more accurate decision-making.

SUGGESTIONS

The system development process that has been carried out still has many shortcomings and is far from perfect. This system can still be further developed, so the researcher provides several suggestions for improvement in the future, including:

To enhance the user experience, the web interface design should be adjusted to make it more appealing and varied. adding more dynamic design elements such as images, graphics, or higher interactivity can make the website more attractive and facilitate easier access to information. it is recommended to perform regular maintenance, such as updating the system and fixing any issues or bugs that may arise after prolonged use.

ACKNOWLEDGEMENTS

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