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Web-Based Information System at PT Panin Dai-Ichi Life Using Object-Oriented Analysis and Design

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ABSTRACT

In today's digital era, information systems play a strategic role in improving operational efficiency and competitive advantage, particularly in the financial services sector such as the insurance industry. This study proposes the development of a web-based information system due to its flexibility and ease of access. At PT Panin Dai-Ichi Life, the existing systems for agents, administrators, staff, and customers remain fragmented, leading to data duplication, lengthy processes, and inaccurate information. The objective of this research is to design a web-based information system for PT Panin Dai-Ichi Life using the Object-Oriented Analysis and Design (OOAD) approach as the system modeling and design methodology. The system will be implemented through a website (paninasuransi.my.id) accessible by administrators, staff, agents, and customers. This integration is expected to create an efficient, maintainable, and adaptive system that meets the company's needs. The system design is developed using Unified Modeling Language (UML), including Use Case, Activity, Sequence, and Class Diagrams, and validated through Black Box Testing. The research demonstrates that the proposed information system can resolve major issues in managing user, customer, policy, and claim data, ensuring structured and well-documented data processing across the organization.

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1. Introduction

The development of information technology has become the backbone of digitization in various business sectors, one of which is the insurance industry. With technological advances, the use of web-based information systems has become a primary requirement to facilitate data access, increase service speed, and minimize errors in company data management.

PT Panin Dai-ichi Life, as a life insurance company, faces challenges in managing policy and claim data, which is still largely done manually or using systems that are not fully integrated. This leads to the risk of data errors, delays in processing, and suboptimal customer service. Therefore, the implementation of a web-based information system that can support the business processes needed to improve company performance and customer experience [1-4]. The existence of an effective information system is very important to optimize data management and insurance claim processes, thereby accelerating service to

customers and minimizing human error. A system that is capable of managing and processing data well is also very helpful in management decision-making for more strategic and sustainable business development [5-8].

The development of web-based information systems has become a dominant trend due to their wide accessibility flexibility, ease of maintenance, and ability to be accessed from various devices and locations. Web-based systems enable better collaboration between departments, more efficient interaction with external partners, and even provide self-service to customers. In the context of information systems, web-based interfaces often serve as a bridge between different systems, presenting integrated data through a single user-friendly access point [9-11].

2. Method

The approach used in this study is Object-Oriented Analysis and Design (OOAD). OOAD is a system analysis and design method that focuses on objects. Objects are defined as entities that have identities, attributes (states), and behaviors [12-13]. The activities of an object are described through events or actions that it performs. Object identity analysis aims to show how an object can be distinguished from other objects. At the design stage, other objects must be able to recognize, access, and utilize an object according to its identity and function, so that interactions between objects can have an impact on the system.

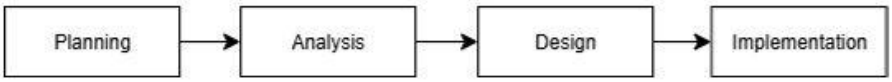

Figure 1. OOAD Method

1. Planning
   This initial stage involves identifying general problems and system requirements. Here, preliminary information is gathered from stakeholders to understand the system's objectives and existing limitations. This planning forms the basis for determining the scope of the system to be analyzed and designed, as well as the development activity schedule.
2. Analysis
   The analysis phase focuses on gathering more detailed and specific requirements and understanding the business domain issues to be resolved. At this stage, object-oriented analysis is performed through the identification of actors, use cases, classes, objects, attributes, and relationships between objects. Some UML diagrams that are often created are Use Case Diagrams, initial Class Diagrams, and Activity Diagrams. The main objective of the analysis is to understand what the system must do from the user's point of view and the system's interaction with the external environment.
3. Design
   The design phase converts the analysis results into technical details that are ready for implementation. At this stage, the details of class structure, attributes, operations, interfaces between objects, and interaction scenarios such as Sequence Diagrams are

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designed. This design must consider modularity, scalability, and efficiency so that the system can be easily developed and maintained in the future.

4. Implementation
   At this stage, the design is converted into program code using an object-oriented programming language. In addition to coding, this stage also includes unit and integration testing to ensure that the system meets requirements and functions correctly. Implementation may involve design refinement if technical constraints are encountered during development.

Functional Requirements

Functional analysis is intended to determine the specifications and features that must be possessed by the web-based information system at PT Panin Dai-Ichi Life. The goal is to ensure that the system is capable of meeting the business and operational needs of the company, as well as overcoming problems arising from separate and unsynchronized systems. This analysis also serves as the basis for designing the interface and modules of the system developed using the OOAD approach. The main functions that must be available in this system include:

1. Admin
   The administrator can perform the following functions:
   a. The administrator can log in.
   b. The administrator can manage the dashboard.
   c. The administrator can add users.
   d. The administrator can add turnover data.
   e. The administrator can add employee salary data.
   f. The administrator can add policy data.
   g. The administrator can add claim data.
   h. The administrator can print policy and claim reports.
2. Operational Staff
   Operational staff can perform the following functions:
   a. Operational staff can add customer data.
   b. Operational staff can add claim data.
   c. Operational staff can verify documents.
   d. Operational staff can add document data.
   e. Operational staff can change claim status.
   f. Operational staff can track policy data.
3. Agent
   Agents can perform the following functions:
   a. Agents can register customers
   b. Agents can input customer forms
   c. Agents can view customer lists
   d. Agents can view policy lists
   e. Agents can view claim tracking and payments
   f. Agents can view commission dashboards

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g. Agents can print claim tracking and payments

4. Customers

Customers can perform the following functions:

a. Customers can view policy and premium summaries
b. Customers can view due premiums
c. Customers can upload claim documents
d. Customers can view claim submission status

3. Result and Discussions

User Login Access Page

Application login page, where users consist of 4 types (Admin, Staff, Agent, and Customer). Users who want to log into this information system must first input their username and password.

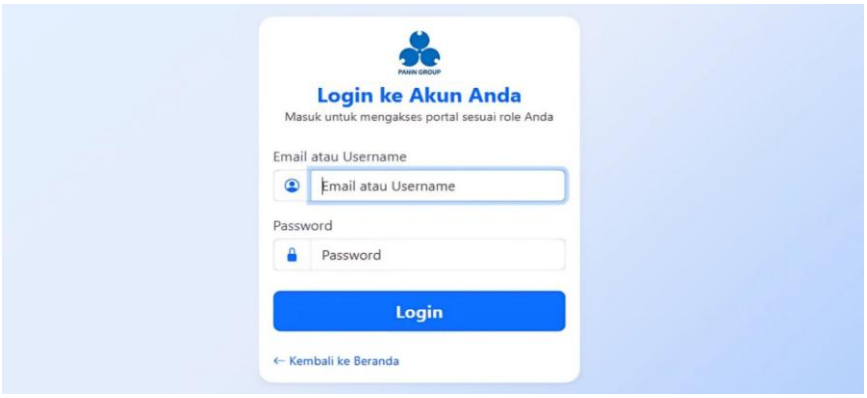

Figure 2. User Login Page

Admin Access Page

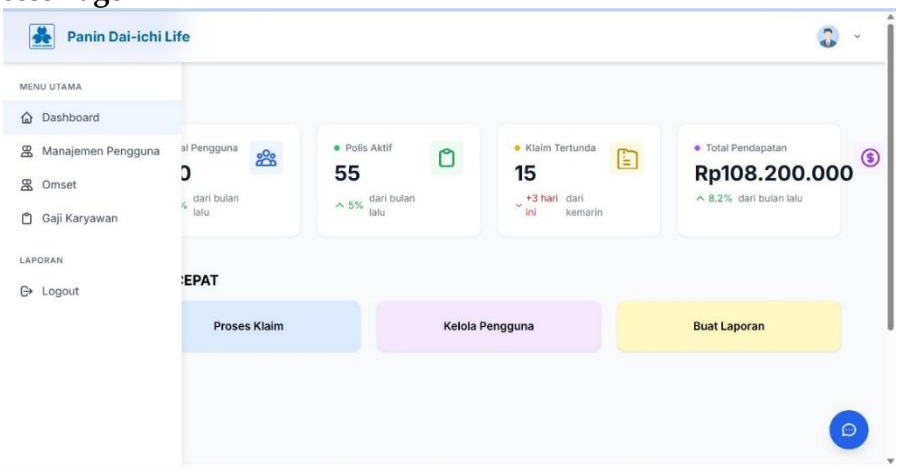

Figure 3. Dashboard Page

The admin dashboard displays a comprehensive summary of system information such as total customers, active policies, claims being processed, and other important reports. This feature makes it easier for admins to quickly monitor system operations.

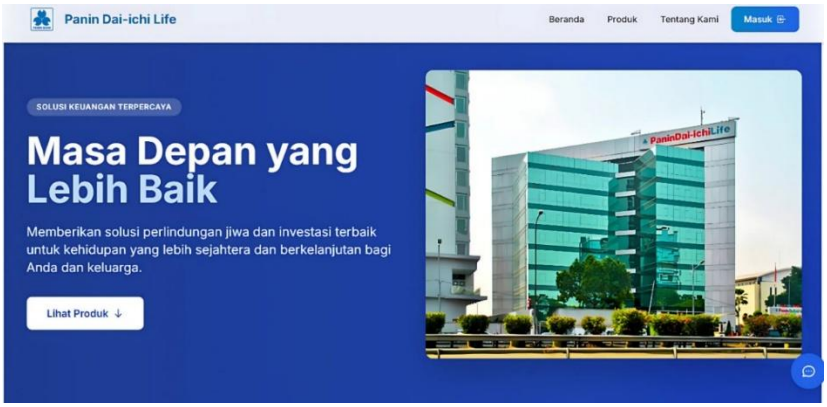

Figure 4. Home Page

The home page is the display that will appear after the user opens a page on the information system at PT Panin Dai-Ichi Life. On the main page, there is information related to PT Panin Dai-Ichi Life and its products and services.

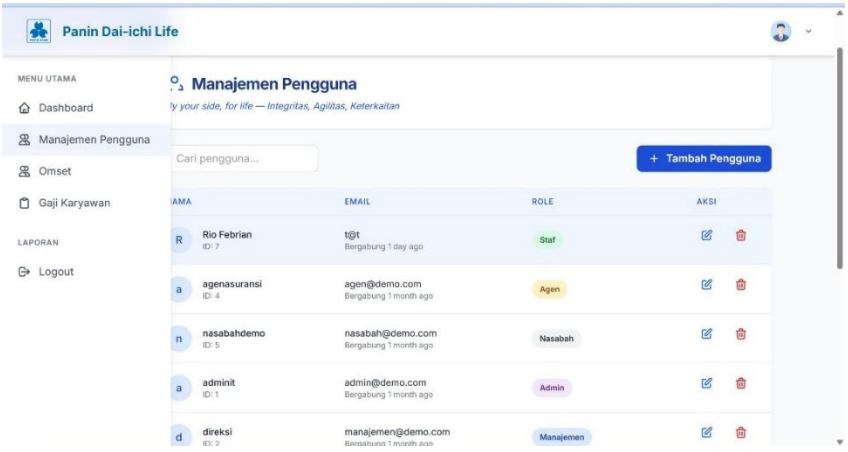

Figure 5. User Management Page

This page is used by administrators to manage the accounts of all system users. Administrators can add, edit, or delete users, as well as assign roles to each user.

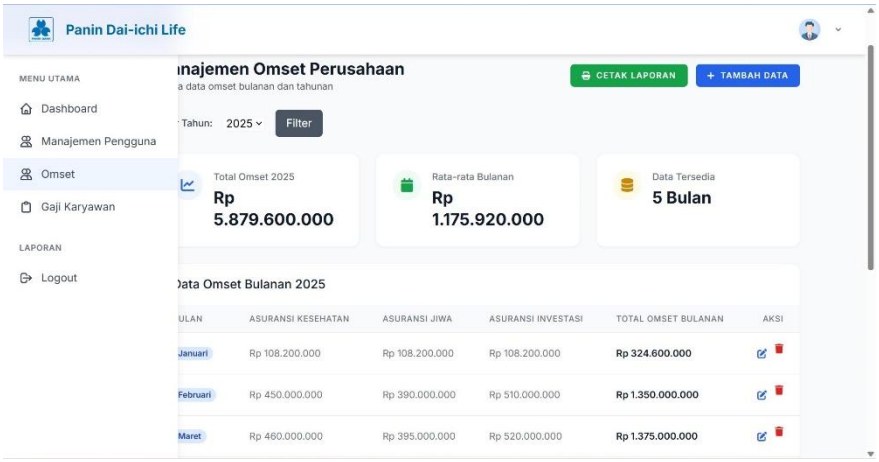

Figure 6. Company Revenue Management page

This page displays all the profits and losses for each year or month that the company will earn. The admin can view and record the total turnover earned by Panin Dai-Ichi Life. The admin can also print turnover reports and add up the total turnover for the year and month.

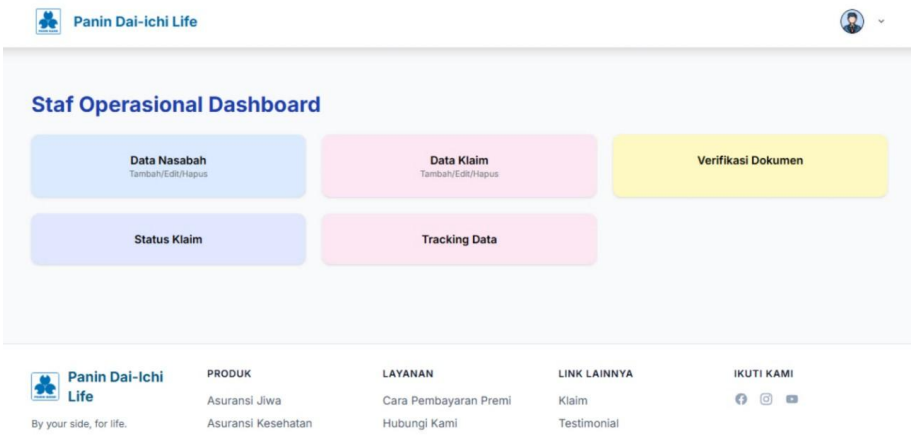

Figure 7. Staff Dashboard Page

The development of the Operational Staff Dashboard page uses the Object Oriented Analysis and Design (OOAD) approach so that each feature, such as Customer Data, Claim Data, Document Verification, Claim Status, and Data Tracking, can be modeled as structured objects. Thus, the system becomes easier to understand and manage, and enables the development of new features without having to change the entire system.

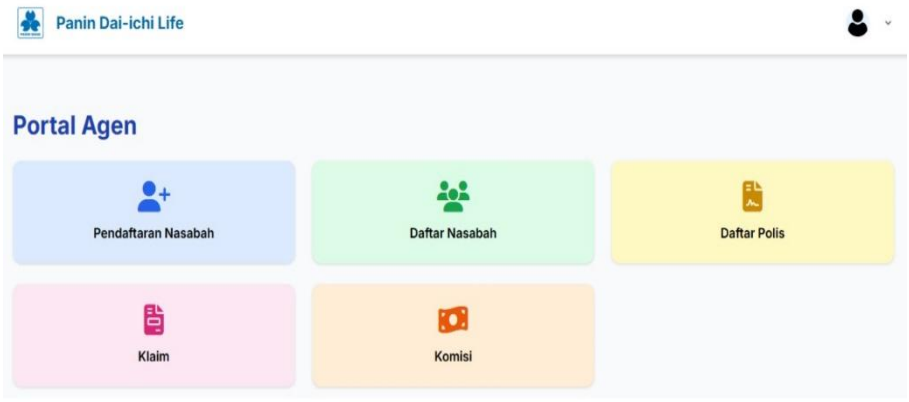

Figure 8. Agent Dashboard Page

The Agent Dashboard page provides main menus such as customer registration, customer list, policy list, claims, and commissions, which make it easier for agents to manage data and activities related to customers.

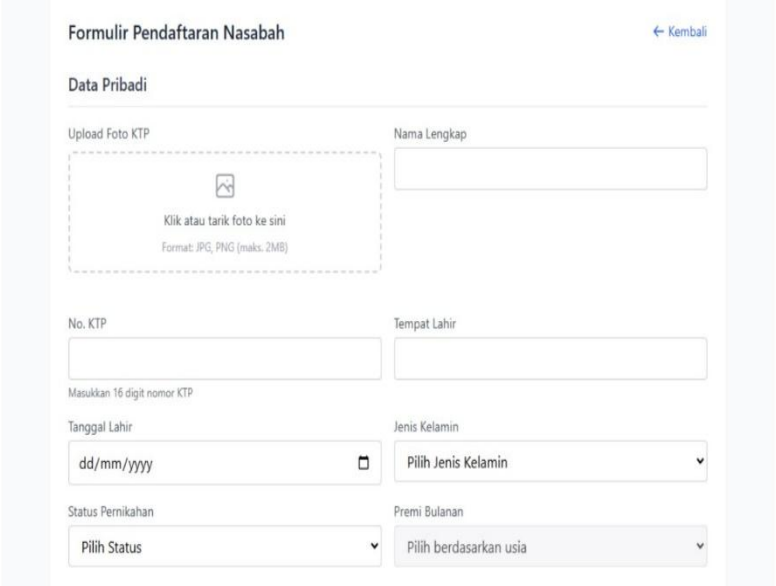

Figure 9. Customer Registration Page

The customer registration form page on the agent dashboard is used to enter prospective customers' personal data, as well as automatic monthly premium options based on the prospective customer's age, so agents do not need to search for the appropriate premium amount.

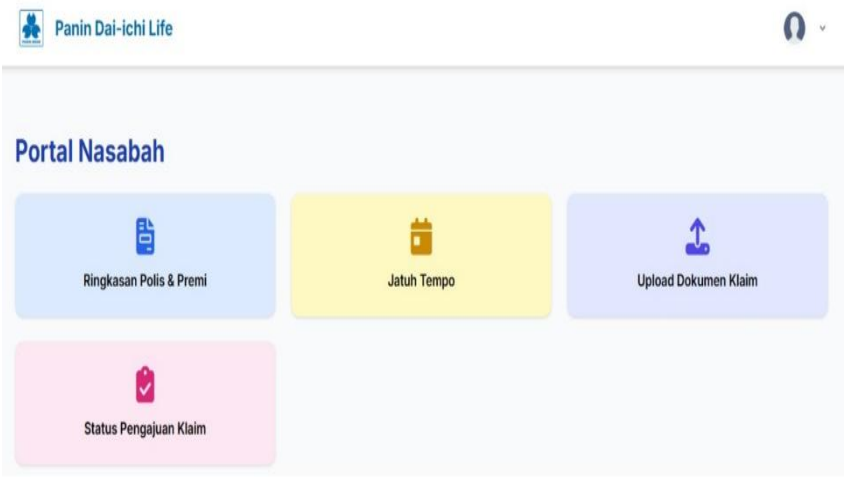

Figure 10. Customer Dashboard Page

The customer dashboard page displays the main menu, such as policy & premium summary, due dates, claim document uploads, and claim submission status, making it easy for customers to access policy information, make premium payments, and monitor the claim process.

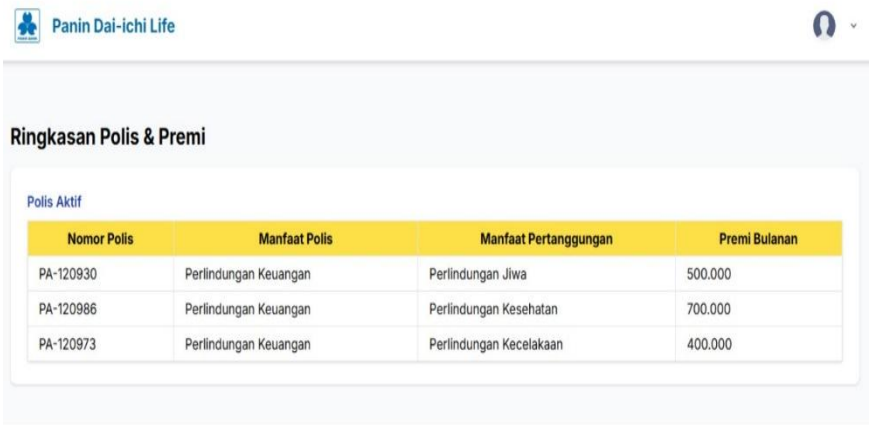

Figure 11. Policy and Premium Page

The policy & premium summary page displays active policy information such as policy number, policy benefits, coverage benefits, and monthly premiums, making it easy for customers to monitor policy details and payment obligations quickly and clearly.

Test Results

Admin Page Testing

Tabel 2. Admin Page Testing

No.	Testing	Expected Results	Conclusion
1	Login page display	Display dashboard page	Successful
2	Managing and editing menu data user management	Users can be managed (added, changed, and deleted) as well as edited or updated	Successful
3	Manage and edit menu data sales	Turnover data is managed (added, changed, and deleted), as well as edited or updated	Successful
4	Manage and edit payroll menu data	Salary data can be managed (added, changed, and deleted) as well as edited or updated	Successful
5	Managing and editing policy menu data	Policy data can be managed (added, changed, and deleted) as well as edited or updated	Successful
6	Manage and edit claim menu data	Claim data can be managed (added, changed, and deleted) as well as edited or updated	Successful
7	Managing and editing menu data policy reports	Police report data can be exported	Successful
8	Manage and edit menu data claim reports	Police report data can be exported	Successful

Staff Page Testing

Table 3. Staff Page Testing

No.	Testing	Expected Results	Conclusion
1	Login page display	Display dashboard page	Successful
2	Manage and edit data customer data menu	Customer data is managed (added, changed, and deleted) as well as edited or updated	Successful

Insurance Agent Page Testing

Table 4. Insurance Agent Page Testing

No.	Testing	Expected Results	Conclusion
1	Login page display	Display dashboard page	Successful
2	Manage and edit data customer registration menu	Customer data can be managed (added, changed, and deleted) as well as edited or updated	Successful

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Customer Page Testing

Table 5. Customer Page Testing

No.	Testing	Expected Results	Conclusion
1	Login page display	Display dashboard page	Successful
2	Enter data in the upload menu for claim documents	Document data can be uploaded to the database	Successful
3	View the data in the status menu of the claim submission	The status of the customer's document data has been received	Successful

4. Conclusion

This research successfully designed and implemented a web-based information system at PT Panin Dai-Ichi Life using the Object-Oriented Analysis and Design (OOAD) approach. The application of the OOAD method facilitated the process of requirements analysis, object design, and interactions between actors in the system, resulting in a modular, easily developed, and efficient design. This system integrates various operational functions that were previously separate, including user data management, customer management, policy management, claims management, and reporting, into a single centralized web platform that can be accessed by administrators, operational staff, agents, and customers. The results of testing using Black Box Testing show that all key features, such as data management, reporting, and claims processing, are functioning in accordance with the specified functional requirements. The implementation of this system has proven to reduce data duplication, speed up administrative processes, and improve the accuracy of information circulating between departments. In addition, the responsive and integrated web interface supports easy real-time data access for both internal parties and customers. Thus, the development of this web-based information system contributes to improving operational efficiency, data transparency, and customer service quality at PT Panin Dai-Ichi Life. Further research is recommended to add data-based analytics modules and external API integration to expand the system's capabilities in supporting the company's strategic decision-making.

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