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Design and Build a Web-Based Building Materials Sales Information System at Family Jaya Stores

Ade Sutedi[1*], Asep Deddy[2], Andri Mochamad Rachman[3]
[1,2,3]Department of Informatics, Institut Teknologi Garut, Indonesia

***email:** adesutedi@itg.ac.id

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ABSTRACT

Toko Family Jaya is a store that supplies building materials located in the Cibatu area, such as paints, ceramics, tiles, and others, With the soaring development of information technology that is currently affecting various sectors, including the business of selling building materials. However, management at the family jaya store is still manual, which results in the risk of recording errors and inaccurate reports which include recording the entry of goods, the expenditure of goods, and the stock of goods. This research aims to design, build, and implement a sales information system to improve the efficiency of data recording and report making at Family Jaya Building Shop. The method used is the Rational Unified Process (RUP) which consists of several stages, namely Inception, Elaboration, Construction, and Transaction. The result of this research is a web-based sales information system that makes it easier for store owners to manage store data reports. This system is expected to increase efficiency and accuracy in supporting business processes at Toko Family Jaya.

1. INTRODUCTION

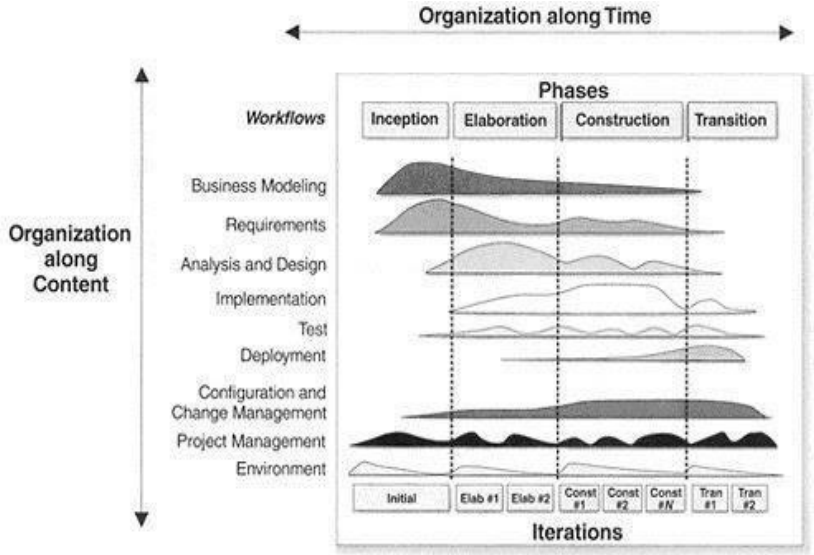
The development of the information system in the current era continues to experience very rapid progress along with the increasing human need for technology [1]. A sales information system is a business solution that focuses primarily on software programs to improve sales and investment rates simultaneously, and can be defined as a system that supports all aspects of the sales process from data management to reporting [2]. The use of this information system supports various aspects, including in the field of building material sales. Family Jaya is a store that is a supplier of building materials such as paint, ceramics, tiles, and others. The sales system at the Family Jaya building store is still carried out manually, especially the problems faced by TB. Family Jaya is often made in data recording and insufficient report making Efficiency and less accurate [3]. So it is hoped that with this system, the implementation of this web-based sales information system can make it easier to increase efficiency in overcoming the problems faced.

This problem prompted previous research that prompted research to find more effective solutions. Several previous studies have been used as references in this study. Research conducted by [4] The research entitled "Web-Based Bicycle Sales Information System Using the CodeIgniter Framework" has a web-based bicycle sales information system that uses the stages of communication, design, modeling, coding, and testing. Which aims to simplify the sales process and improve data management for the Bicycle Company at Orbit Station. The second study conducted by [5] entitled "Design of Goods Sales Information System at PT Asia Truk Pratama Jakarta" which builds a goods sales information system using the Unified Modeling Language UML. Which aims to overcome problems in the process of selling goods, ineffective manual systems and making reports and managing stock of goods that still use manual systems. The third research conducted by [6] entitled

"Sales Information System in Harmonious TB Using the FAST method" this study builds a sales information system with the framework for the application of system thinking (FAST) which aims to improve the performance, effectiveness, and efficiency of TB harmoniously and produce a good book sales information system. The fourth research conducted by [7] entitled "Sales Information System by Sales Marketing at PT Erlangga Mahameru" this study builds a sales information system using the prototype method, this method is suitable for developing a device to be redeveloped. In this method, there are several stages, namely communication, planning, modeling, construction, and drawing conclusions. This research aims to develop a sales information system that can facilitate sales and marketing efforts, as well as enable online transactions for PT erlangga mahameru. The fifth research conducted by [8] entitled "Design and Build a Web-Based Sales Information System on Smooth Tee with the Waterfall method" In this study, two stages of completion were used, namely the data collection method consisting of observation, interview, and literature study. And the waterfall data development model consists of several steps, namely system needs analysis, design, code generation, and testing. This research aims to design and develop a web-based sales information system for smooth-tee stores and provide fast, accurate and effective information for users, as well as to solve problems faced in sales activities. Research [9] entitled "Implementation Rational Unified Process in Application Designing Inventory Management Web-based on PD. Hikmah" this research produces a web-based inventory management application that can provide convenience in monitoring stock of goods, faster and more accurate data input, and more effective report making. This research aims to create a system that produces a web-based building material sales information system in TB. Family Jaya and provides convenience to store owners and admins who manage in making data reports at the Family Jaya Building Shop. In creating this information system, a methodology or way of working is needed, namely by using the Rational Unified Process (RUP) method.

2. RESEARCH METHODOLOGY

To support this research, a methodology called Rational Unified Process (RUP) where in reference [10] This method is the method by which the software development approach is offered by IBM Rational. focus on discipline in carrying out duties and responsibilities within the organization and this RUP method has been combined by Rational Software Corporation by using UML (Unified Modeling Language). With this method, the development team can create high-quality software that can meet the needs of users with a predictable schedule and budget [11] . The stages carried out include inception, elaboration, construction, and transition.



Picture 1. Stages of the Rational Unified Process

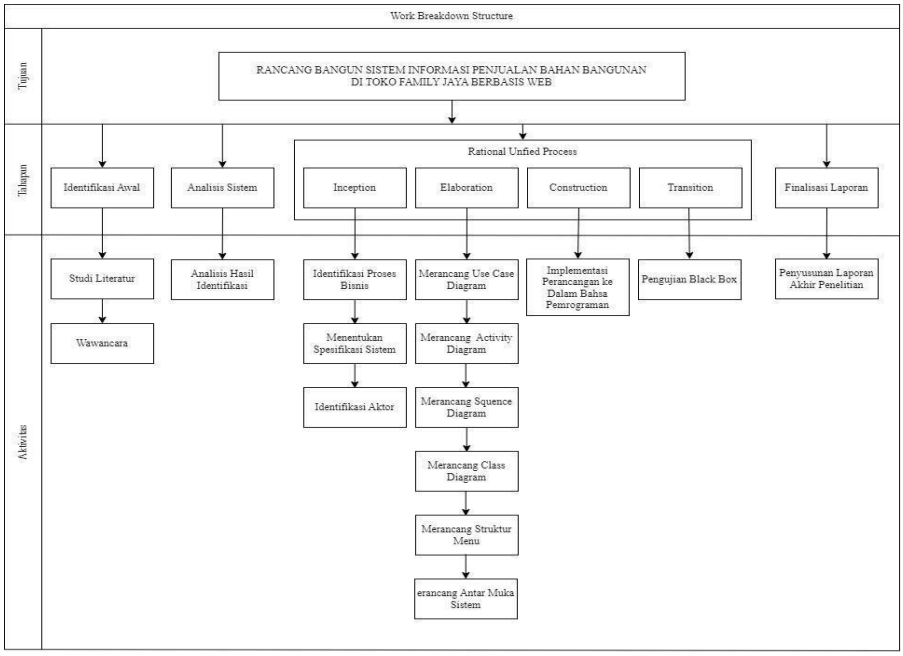
As for the references [12] which explains the stages of the methodology Rational Unified Process which is explained as follows:

1. Inception

In this phase, it is the initial stage that is carried out to determine the scope of the system (cost, time, and resources). In this phase, developers can also model business processes (business modelling) and define the needs or requirements of the system to be created (requirements).

2. Elaboration
   In this phase, it focuses on the analysis, design, and design of the system architecture. The purpose of this phase is to identify possible risk items. In this phase, an analysis of the problem domain and project architecture is also made to get the basic form.
3. Construction
   At this stage, it is explained where the design that has been designed and validated during the elaboration phase is implemented into a real software product, with the main focus on building and integrating systems based on the established architecture, including the development of components, system features, coding, and testing so as to produce functional and ready-to-use software.
4. Transition
   In the transition phase where the RUP method seeks to implement the software into the production environment and check the readiness of the software for use by the end user which includes acceptance testing, user training, and initial maintenance after the software is launched. This ensures that the software that has been developed can be accepted and used properly.

With this research, it has successfully completed the creation of this sales information system that meets the requirements and technical specifications that have been set. After going through several stages starting from the stages of inception, elaboration, construction, and transition. Briefly, the stages that have been carried out can be seen in the Work Breakdown Structure in Picture 2.



Picture 2. Work Breakdown Structure

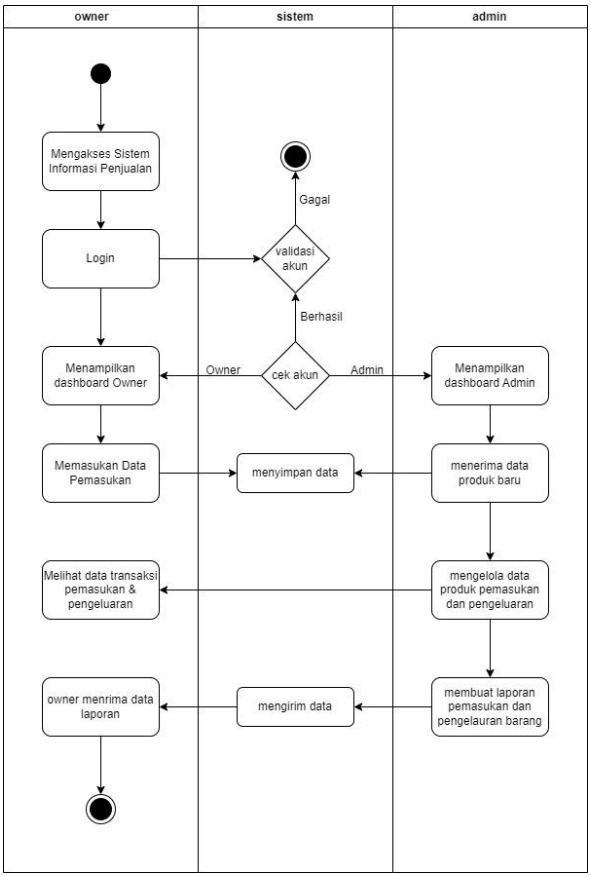
3. RESULTS AND DISCUSSION

In this section, the results of the research obtained are explained in detail, which can be expressed in the form of tables, program codes or graphs so that they are easy to understand.

3.1 Inception

The Inception stage is the initial stage that is carried out after collecting data and research materials from the interview process and literature study. At this stage, the activities carried out are modeling business processes, setting system specifications and identifying actors.

1. Identify Business Processes
   Identification of previous business processes that were carried out manually where the recorder still used books needs to be recorded manually. Meanwhile, the latest business process identification describes every activity carried out by users against the system to be built and is described with an activity diagram. The following is the business process of the web-based building material sales information system as seen in Picture 3.



Picture 3. Identify Business Processes

2. Specifying system specifications
   This stage describes the required system requirements, the details of the requirements including display requirements and display requirements.
   a. Interface/display requirements
      The requirements for this system display have an initial appearance such as a login display, dashboard, product data, printing the results of the report data by the admin, and logging out.
   b. System requirements
      1) Functional Specifications
         a) The system for owners provides login features, dashboards, input data of income items, can manage management user roles.
         b) The system for admins provides fitur login, manages stock data of goods, manages income and expenditure data, and prints report data.
      2) Non-Functional Specifications
         For software needs, this application is created using a web platform and using the PHP framework and programming language. Furthermore, hardware needs, a computer or laptop device is needed.

3. Identification of actors
   At this stage, the main focus is to identify target users or actors who play a role in the system being developed. Actors that have been identified include store Owners and Admins. Each actor has different roles and access rights, designed to meet specific needs and functions in this sales information system. For the activity activities that will be carried out by the user (actor) will be presented as shown in table 1.

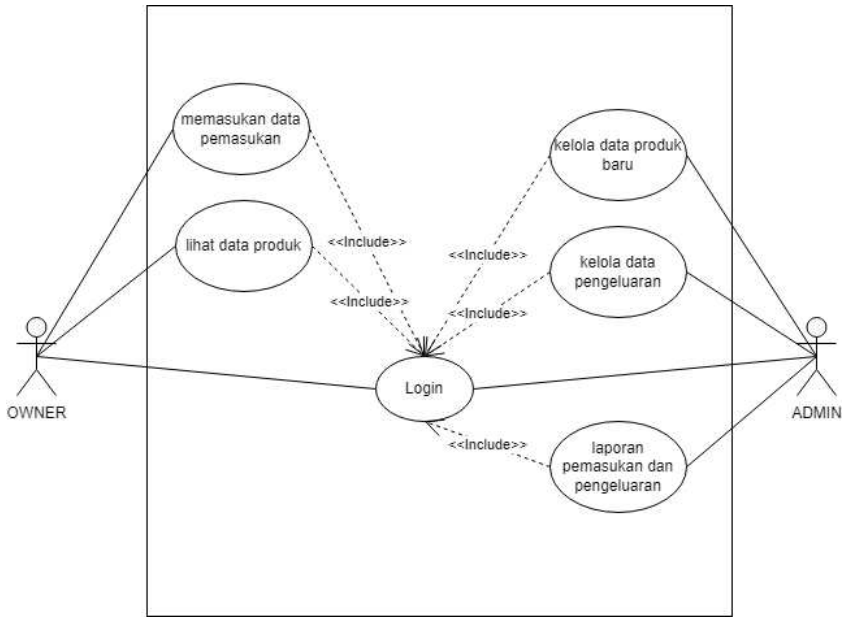
Table 1. Identify the Actor

Actor	Description
Owner	Actors in this case as people who can enter goods and view product data.
Admin	Actors in this case as people who can manage all kinds of various features in the sales information system such as managing product data, transactions, and managing systems, printing reports.

3.2 Elaboration

This phase focuses on designing the system architecture according to the activities contained in the diagram. First, design is carried out which is modeled in the form of use case diagrams, activity diagrams, sequence diagrams and class diagrams, designing menu structures, and designing interface systems.

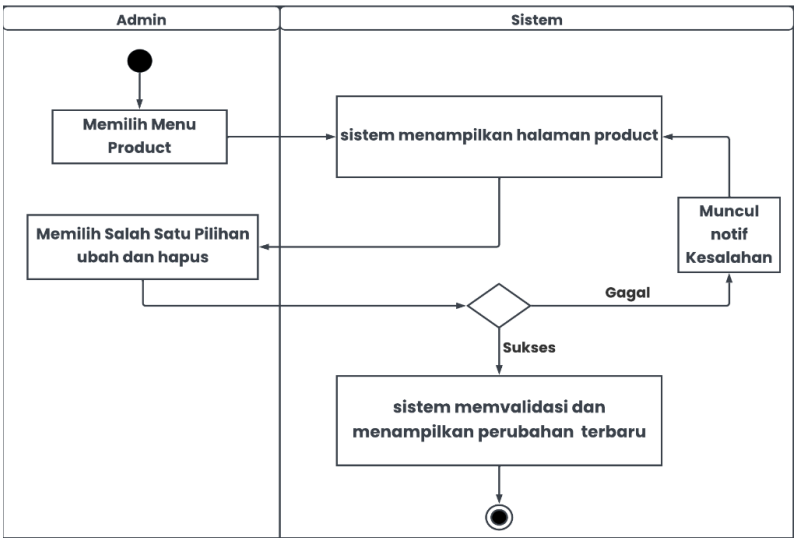
1. Use case Diagram
   A use case diagram is used to present the interaction between the user (actor) and the system. The following is a use case diagram of the building material sales information system at TB family jaya as seen in Picture 4.



Picture 4. Use case Diagram

   Picture 4. Show a use case Diagram of a sales information system involving 2 actors, namely Owner and Admin. Each actor has a Use case Diagram that describes their business processes and their specific interactions with the system. This diagram explains how each actor interacts with various features and functions in the system, ensuring that the needs and roles of each actor are optimally met in the system.

2. Activity Diagram
   After the design of the use case diagram is done, then design an activity diagram. An activity diagram formulates a series of activity flows on the system being designed. The following is presented an activity diagram of the building material sales information system shown in Picture 5.



Picture 5. Activity Diagram manage new product data

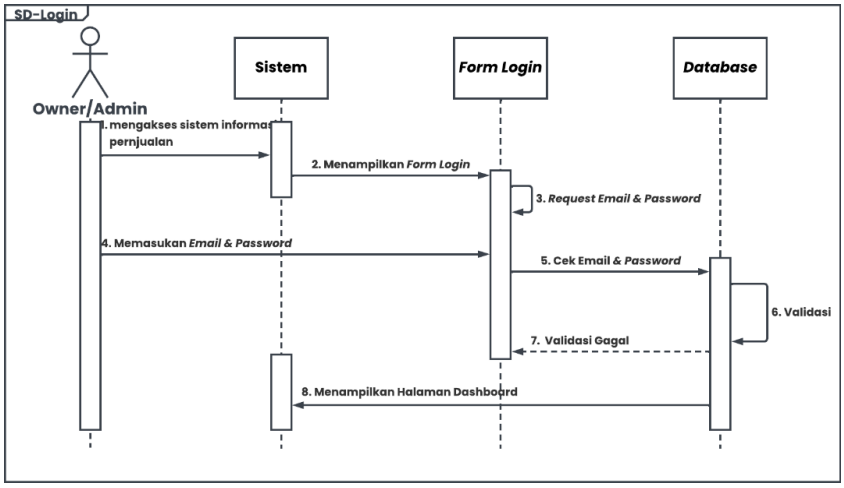
Explanation for the activity, activity diagram to manage new product data in detail will be explained in table 2.

Table 2. Activity Diagram

Yes	Activity	Description
1	Display product menu	Admin selects the product menu
2	Displaying product pages	The system will display the product page
3	Choose one of the change or delete options	Admins will select one of the change or delete options to manage it
4	Error notification appears	The system will display an error notification if there is an error in the calculation
5	Validate and display the latest changes	The system will validate and display the latest changes on the product page

3. Designing Sequence Diagrams

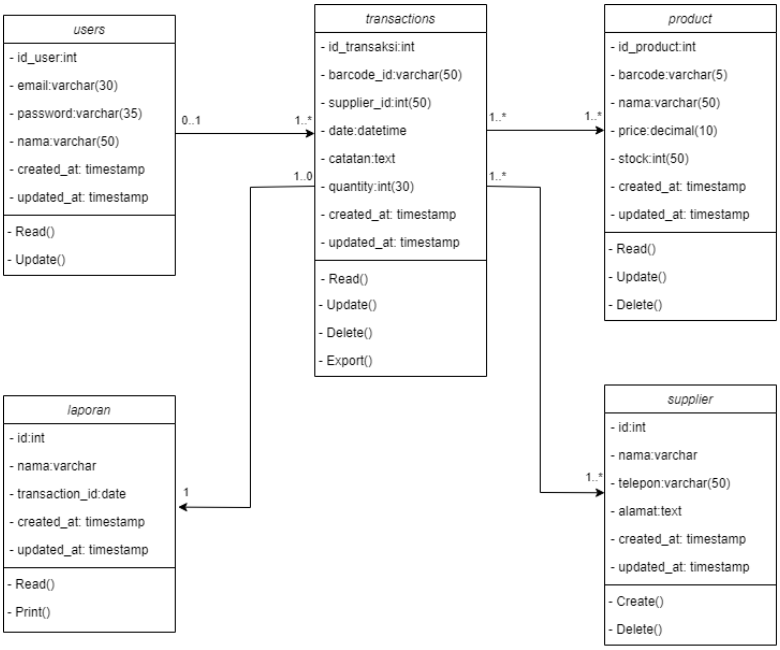
Sequence diagrams function to visualize how objects interact with each other in a certain scenario or process. The following is a sequence diagram of the information system for the sale of building materials at the family jaya store as seen in Picture 6.



Picture 6. Sequence Diagram login

4. Designing Diagram Class

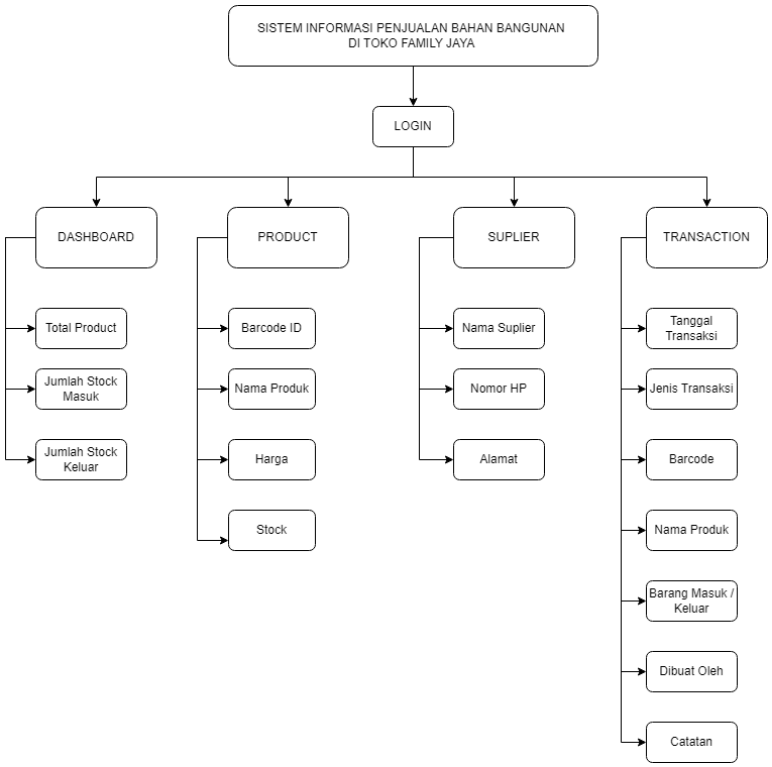
A class diagram is needed to describe the structure of the system from the side of defining the class that will be created later. The following is a class diagram of the web-based building material sales information system at the family jaya store as seen in Picture 7.



Picture 7. Class Diagram

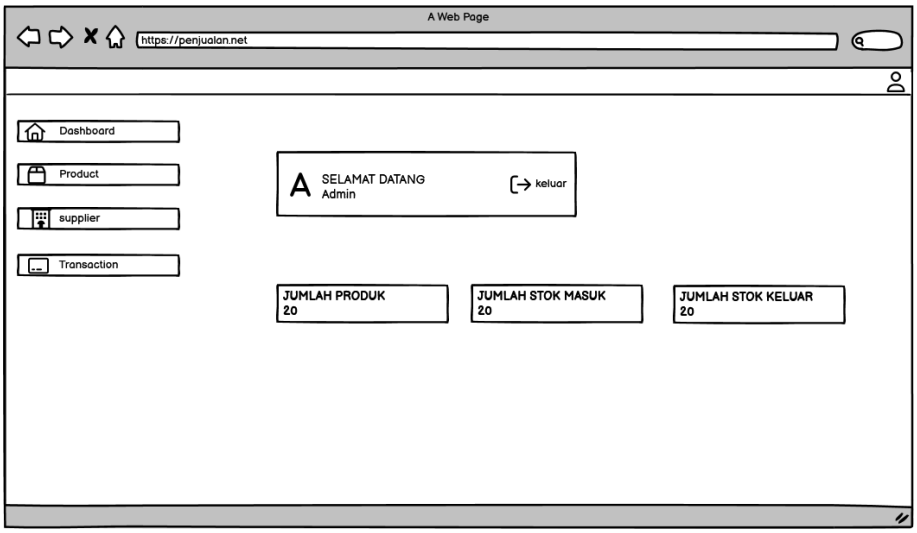
5. Menu structure

The menu structure needs to be designed to provide the flow that will be generated as well as the flow that will be generated. The following is a design of the menu structure of the web-based building material sales information system.



Picture 8. Menu Structure

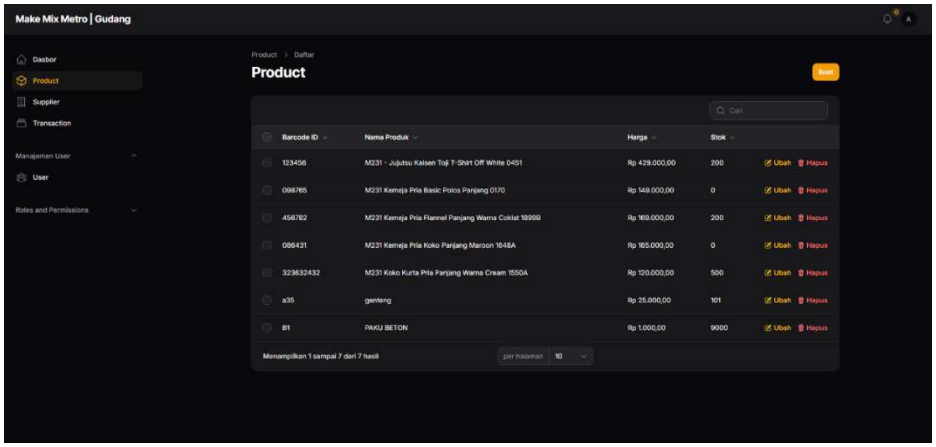
6. Designing the System Interface
   The interface design is a sketch of the application to be built. Designing interfaces is useful for work efficiency when implementing to programming languages. The interface will be displayed in Picture 9.



Picture 9. Dashboard Interface Design

3.3 Construction

At this stage, the activity carried out is to implement the design results into the programming language. The following is the result of the implementation of a web-based building material sales information system at the family jaya store using the PHP programming language, the text editor used is Visual Studio Code and Laragon functions as a web server.



Picture 10. Implementation to Programming Languages

Picture 10 shows the implementation to the Programming language on the product page. There is a list of available items and there is also an option to change or delete product data.

3.4 Transition

In the transition phase, the activity carried out is system testing using the black box testing method, which is system testing on the functionality or usability of a system regarding the coding structure or internal workings of the system built. The results of the tests carried out on the building material sales information system at the web-based family jaya store are presented in table 3.

Table 3. Black Box Testing

Activity	Testing class	Test scenarios	Desired results	Results that appear
Login	Pressing the login button without filling in the data	Not entering email/password	A please fill in notification appears	Suitable
	Log in by filling in the data correctly	Enter the correct email and password	The system receives login access, then displays the dashboard page	Suitable
Input of goods	Pressing the create button on the transaction menu pad	Enter data on the form displayed	The latest item data is successfully added and stored in the database	Has it been true
Manage product data	Pressing the edit button on the product data	Select one of the product data to be edited	Product data was successfully changed	Has it been true
	Pressing the delete button on product data	Select one of the product data to delete	Product data was successfully deleted from the database	Has it been true
Report	Press the export button on the transaction menu	Select the form displayed and press the export button	Income and expenditure report data was successfully downloaded	Has it been true

4. CONCLUSION

This research successfully designed and built an effective and integrated information system for the sale of building materials in the Family Jaya building store. This system makes it easy to manage goods data and reports for store owners and admins on duty. In this study, the Rational Unified Process methodology is applied through four stages, namely inception, elaboration, construction, and transition. By using several technologies in building the system such as a database using phpMyAdmin and the programming language using PHP with the Laravel framework for web-based systems.

From the results of this research, there are several suggestions for the development of a better building material sales information system in the future; adding a Product Display feature for customers where customers can see the goods being sold. The development of a mobile version to make it easier for users to access and use the system while they are doing activities outside and are more practical.

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