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Design a Website-Based Building Materials Inventory Information System at TB. Gilang Putra

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Abstract

TB. Gilang Putra is a business engaged in the sale of building materials. In the processing of building material supplies, TB.Gilang Putra uses manual processing. Then TB. Gilang Putra needs an optimal program to improve its performance. Design a building material inventory information system is a system that will be built to reduce problems contained in the building material inventory information system. The loss and destruction of some data that prevents the data from being inputted. The method used in this building material inventory information system is object orientation (OOAD) and uses the Rational Unified Processes (RUP) model and is supported by Unified Modeling Language (UML) for software engineering processes with good structure. The author draws the conclusion that the system in this design can be useful and alleviate the process of supplying building materials and is able to solve problems that occur so that the system that is run can be used anytime and anywhere.

Keywords: Information systems, inventory, OOAD, RUP, UML

1. Introduction

The development of information technology in the digital era has created many new efficient applications. Information Technology makes an activity very easy and fast. This technology also affects the system on the activities of a company. Information systems have become a very significant part of today's technological developments (Fichman, 2014).

The use of the website at this company is to overcome problems in managing building material inventories and make it easier for employees to work and improve employee performance more quickly and precisely in carrying out the building material inventory process (Pfeffer, 1998). Good data processing will produce accurate information, so that it can be used as a basis for the decision-making process. Likewise with the processing of material inventory data, because without material inventory the company cannot run its business. TB. Gilang Putra is a business engaged in the sale of building materials which is located at Jl. Durung Kidul Rt.04/Rw.05 Village. Bojong, District. Nagreg, Regency. Bandung.

Data processed by TB. Gilang Putra is very large because the stock of goods consists of several types of building materials. While data processing activities are in the form of procurement of goods, recording transactions, preparing reports, etc. This company uses a cash system, besides that this company has not maximized computers as a supporting facility in every sales activity. The goods being sold are: Cement, Wood, Pipes, Nails, Iron, Water taps, Cables, Ceramics, Paint, Red bricks, Doors, Lights, Farming tools etc. As well as the obstacles experienced by TB. Gilang Putra is a data processing system that is not good enough, in the sense that it is less efficient in terms of time, effort and cost. So it takes a long time because you have to open the archive which allows the risk of loss.

The author observes that there are several deficiencies in the supply of building materials, namely: The risk of duplication and loss of data is still very high because the data recording process still uses books. The difficulty of finding data when the data is needed. The report generation process takes a long time and cannot be done automatically. Based on the weaknesses above, the authors try to design and build an information system "Design Building Material Inventory Information System in TB. Gilang Putra.

2. Literature Review

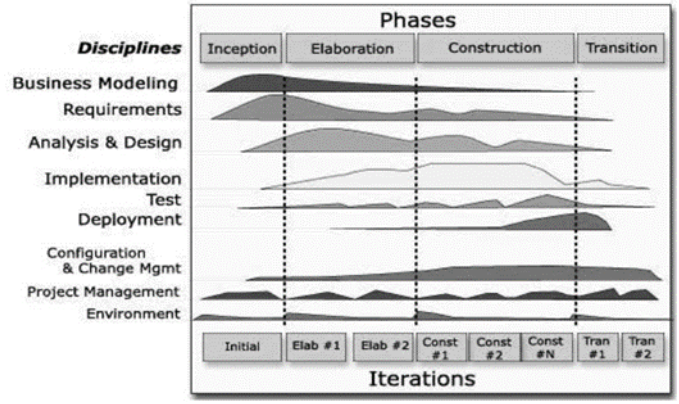
2.1. Development of Information Systems

Information system development is an activity which will produce a computer-based system to solve problems within the organization (Korpela, 2002).

Development of a new system compilation information system to replace an old system that has been made, or improve an existing system. In this case the existence of information systems will play an important role in a company. "System development can be defined as compiling a new system to replace the old system as a whole or improve an existing system" (Zeva, 2023).

2.2. Rational Unified Process (RUP)

Rational Unified Process (RUP) is an iterative software development approach, focused on architecture (architecture-centric), more directed according to use cases (use case driven). RUP is a software engineering method with well defined and well structured or good structuring. RUP provides a well-defined structure for the software process life cycle as a Figure 1.



Source: (Glass, 2002)

Figure 1: Rational Unified Process (RUP)

The Rational Unified Process (RUP) is divided into four stages, as follows:

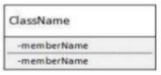
a. Inception, this stage begins with visualization in the form of data collection. Then, an analysis of system requirements is carried out, namely the needs desired and needed by the user. Data analysis was obtained in three ways, namely document analysis, interviews and field observations. Based on the results of the current system analysis, a new system suggestion is visualized by using the context diagram tool in visualizing a new system.
b. Elaboration, at this stage the system design will be carried out which is composed of database design, software architecture and interface design using UML. This stage changes the software requirements to a model to be translated into the next program.
c. Construction, this stage changes the system design to a software program using the concept of OOP (object oriented programming) and using the MVC (Model, view, Controller) software architecture. Or simply the process of coding.
d. Transition, this stage is a process of logical and functional software testing so that there are no errors in the software so that the information system can run as expected.

2.3. Class Diagrams

"Class Diagram is a form of structure that describes classes to create systems" (A. S & Salahuddin, 2016). Class diagrams are useful for interpreting system movements so that the scheme can be seen more thoroughly in the system. The following are the 2 components that the Class Diagram has: Attributes, are classes that have variables, and methods or operations, classes that have attributes and methods have the following properties: Private, can only call related classes. Protected, can only call related and their descendants. Public, can be accessed by anyone

The following are some symbols that are often used in class diagrams as a Table 1:

Table 1: Class Diagrams

No	Symbol	Explanation
1.	Class 	Class on the system structure.
2.	User *interface* 	Same with the interface concept in object-oriented programming.
3.	*assosiation*	Relations between classes with general meaning, associations are usually accompanied by multiplicity
4.	*Directed Assosiation*	The relationship between classes with the meaning of one class is used by another class, the association is usually accompanied by multiplicity.
5.	Generalisasi 	Inter-class relations with the meaning of generalization – specialization (general special).
6.	Kebergantungan	The relationship between classes with the meaning of dependence between classes

2.4. Definition of Hypertext Preprocessor (PHP)

PHP is a server-side scripting language, a programming language used to develop static or dynamic websites or web applications. PHP is a program language on a server that has access to a programmer to give commands - web server software commands (Apache, IIS, or whatever) will be executed before the command is sent by the page to the browser that requested it, for example, how to allow it to enter the current date on a web page every time a date display is needed (Ali, 2005).

2.5. Definition of Cascading Style Sheet (CSS)

(Sari; et al., 2019) CSS or Cascading Style Sheets is a language used to set the appearance of documents written in a markup language. In the context of the web, it is also interpreted as the language used to set the appearance / design of an HTML page.

3. Materials and Methods

3.1. Materials

TB. Gilang Putra is a business engaged in the sale of building materials which is located at Jl. Durung Kidul Rt.04/Rw.05 Village. Bojong, District. Nagreg, Regency. Bandung.

Research Methods - In compiling this Final Project, the author uses a descriptive method. Where this method is a data collection activity that is carried out sequentially and objectively in accordance with the actual situation.

The several data collection techniques used by the author are as follows:

a. Observation -The author collects and records data directly in the field, namely in TB. Gilang Putra.
b. Interview - The author collects data by interviewing to obtain data from informants who are related to the title taken.
c. Library Studies - The writer studies the basic theories that are relevant to the problem being researched to make it easier for the writer to obtain secondary data.
d. Document Study - The author collects the necessary data as information data material according to the research problem.

3.2. Methods

3.2.1 System Development Method –

In preparing this final project the author uses the concept of Object Oriented Analysis and Design (OOAD) with the development of the Ration Unified Process (RUP) model, and its activities focus on the Unified Model Language (UML). RUP has several stages such as inception, elaboration, construction, and transition.

Document Description A document is a file that contains data and functions as useful information and can be used as a reference for decision making. The following are important documents in this system:

1. Goods Item Data
Function : To find out the data item items
Source : admin
Distribution : Admin
Attributes : item id, item code, barcode, item name, category id, unit id, supplier id, stock, minimal stock, purchase price, sell price

2. Supplier data
Function : To find supplier data
Source : Suppliers
Distribution : Admin
Attributes : id_supplier, code_supplier, supplier_name, address_supplier, tel_supplier, fax_supplier, email_supplier, bank, account, on behalf of_name

3. Employee Data
Function : To find employee data
Source : Employees
Distribution : Admin
Attributes : employee_id, employee_code, employee_name, employee_type, employee_telp, employee_email, employee_status, birth_place, birth_date, login_date, address

4. Category Data
Function : To know category data
Source : admin
Distribution : Admin
Attributes : id_categories, categories

5. Unit Data
Function : To find unit data
Source : admin
Distribution : Admin
Attributes : id_unit, unit

3.2.2 Identification of User Needs

When identifying user needs, the information obtained has not been properly organized, therefore the information system will provide conveniences with an organized structure so that users can use it as needed. Here are the requirements that the user needs. The work that users do is easier by using the system, the system is made to have security so that there are barriers to accessing data. Only the employee concerned can access the system, the system can display reports and print work results according to the data entered. Searching for data by users is easier by using the system. The system makes it easy for users to input building material supplies at tb.gilangputra.

3.2.3 Information Requirements

Information needs must meet good qualifications. This building material information system must provide convenience to users in order to create user comfort when using the system. The following is the information needed, namely as Table 2:

Table 2: Information Needs

No.	Name	Objective	Frequency
1	Goods Inventory Report,	Admin, Owner	If data is needed
2	Sales Report	Admin, Owner	Daily
3	Purchase Report	Admin, Owner	Daily
4	Damaged Goods Report	Admin, Owner	If data is needed

3.2.4 Use Case Diagrams

Use Case Diagram is an illustration of the results of adjusting environmental interactions to the system to be used as Figure 2.

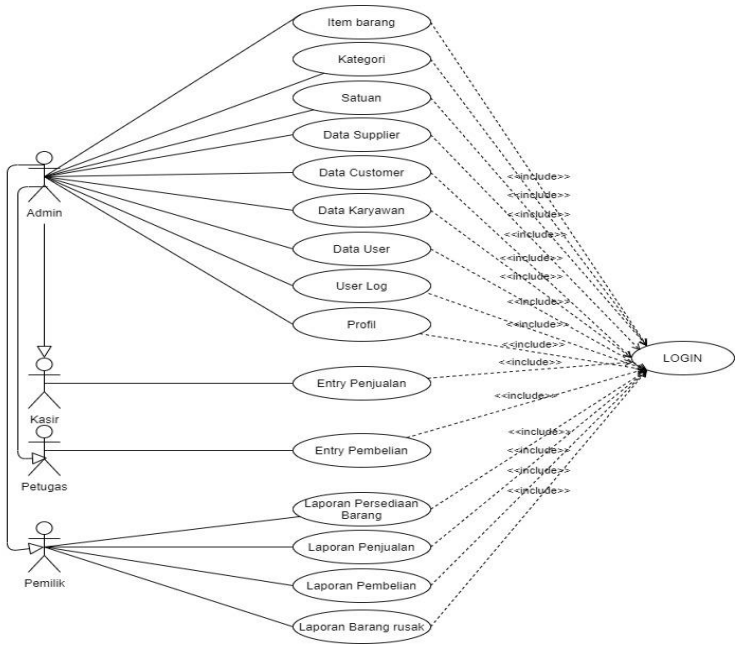


Figure 2: Use Case Diagram

3.3.4 Flow of Event

Flow of Event is a goal that explains clearly what will be done on the system from the results of use case logic records. The following is the Flow of Event in the building material inventory application as given in the Table 3:

Table 3: Flow of event login

Identification	
No *Usecase*	**A1**
Name *Usecase*	***Login***
Description	The process for displaying the Login page before entering the main page
Actor	Admin
Main Scenario	
Initial Conditions	Halaman website belum ditampilkan
Action of Actor	**Response System**
1. Enter the Website Page	1. The *Login form displays*
3. Fill in the username and password then click Login	4. The system checks the data, if it is correct the main page will appear and if it is wrong it will show the message "Login failed"
Final Conditions	Admin page is displayed

3.3.5 Activity Diagrams

Activity Diagram is the flow of an activity that is described with the contents of choices and opportunities. This activity is an illustration of a system in business modeling as given in the Figure 3.

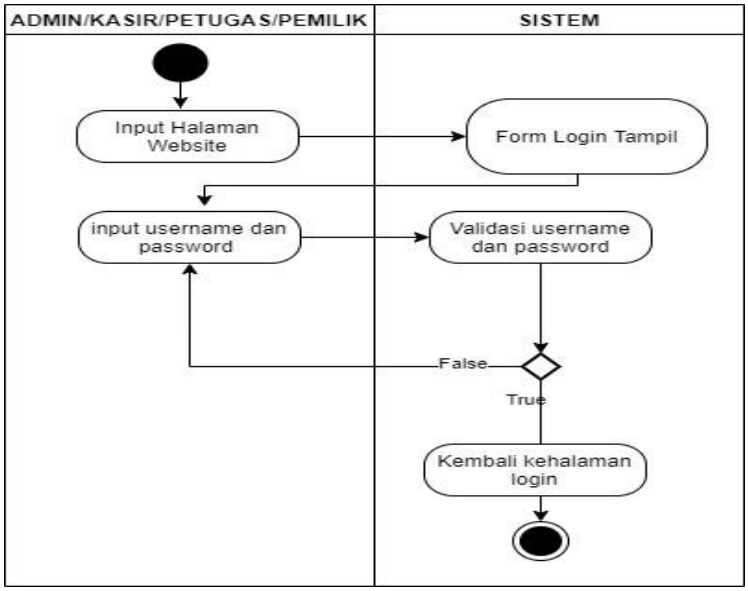


Figure 3: Activity Diagram Login

4. Results and Discussion

4.1. Sequence Diagrams

Sequence Diagrams are used to describe behavior in a scenario. Sequence Diagram is a diagram to help describe the behavior of the system to an interaction between classes based on time sequence. This diagram shows a number of object examples and the messages that are placed between these objects in the use case. The following is a sequence diagram of the building materials inventory information system as given in the Figure 4:

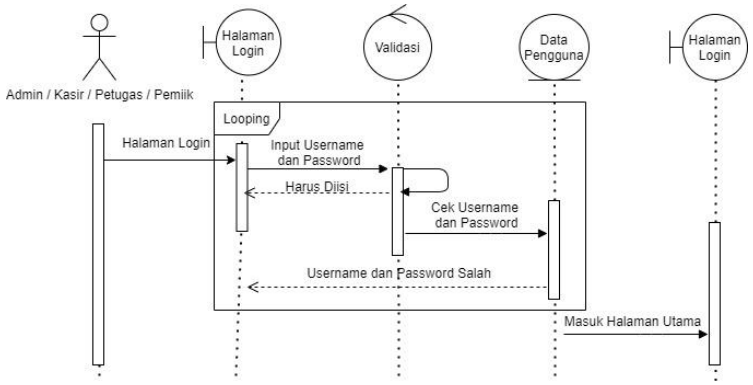


Figure 4: Sequence Diagram Login

4.2 Class Diagrams

Class Diagram describes the static structure of the classes in the system. Class describes something handled by the system. Class Diagram is also a description of a group of objects with the same properties, behavior (operations) and relationships. Class Diagrams are very helpful in visualizing the class structure of a system to provide a global view of a system as given in the Figure 5.

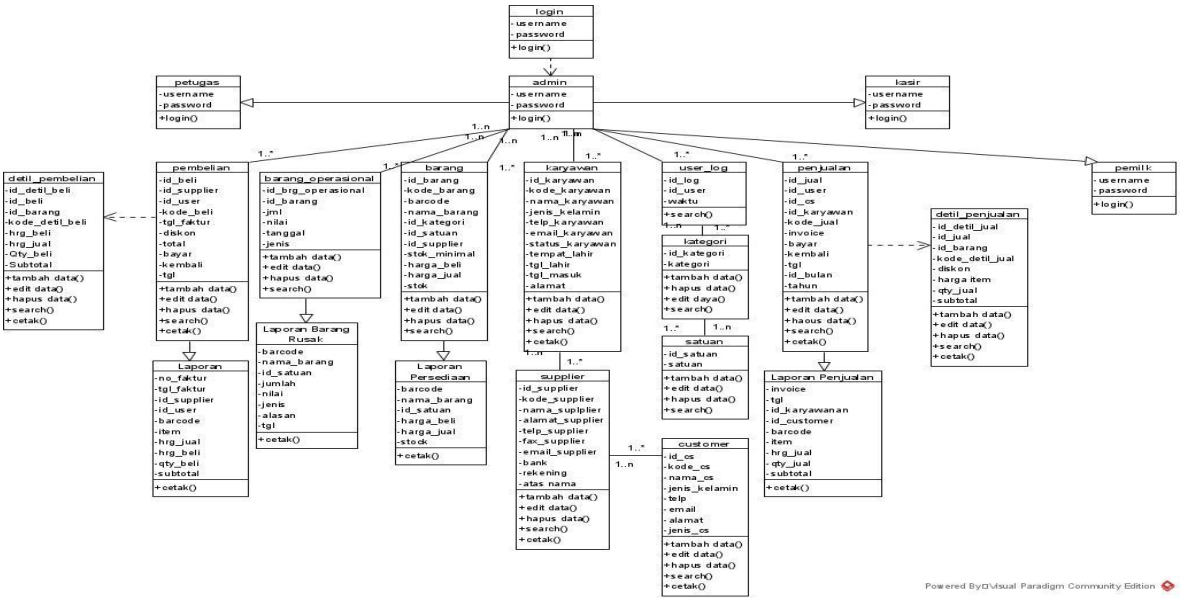


Figure 5: Class Diagram

4.3 User Interface

The design of the user interface in the design of a website-based building material inventory information system is as figure 5:

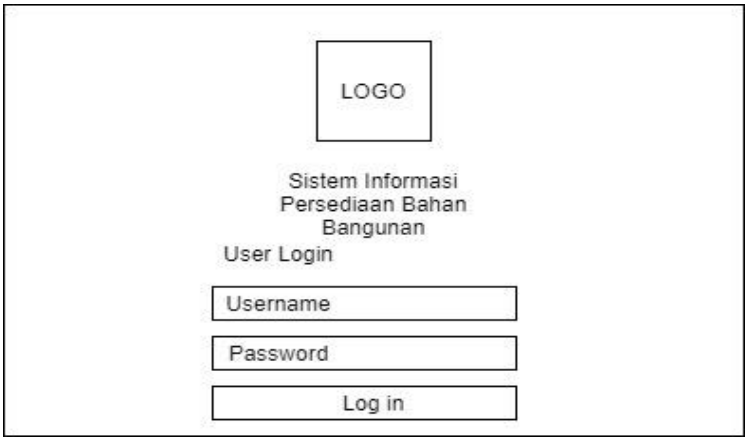


Figure 5: User Interface Login

4.4 Hardware Configuration

Hardware configuration is a description of the structure and relationships between components of the overall physical system. Images can be seen in the following Figure 6:

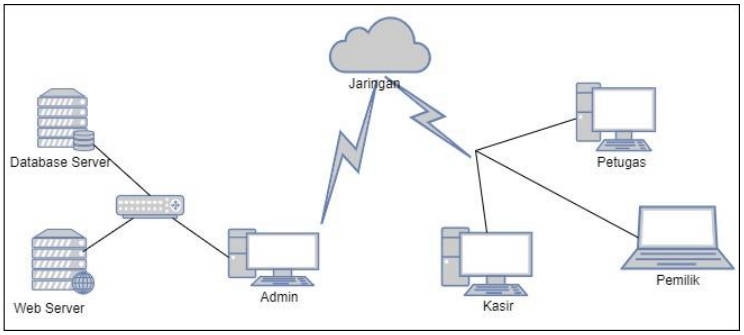


Figure 6: Hardware Configuration

The hardware used in the design and implementation has a minimum specification for the use of the hardware. The specifications are: Monitors 12 inc, USB keyboards, USB mice, Dual Core Processor, 320 GB hard drive, Memory 1GB, VGA Card 512 MB, Standard ADSL Modem, Printer Dot Matrix LX-300 Or the next series.

4.5 Software Specifications

The software used has the following specifications: Windows 10 as an operating system. Mozilla Firefox as a web browser. XAMPP as a local web server. Visual Studio Code as a visual design editor and web programming code. MySQL (SQLyog Enterprise 8.05) as database processing software. Filezilla as File Transfer Protocol (FTP). Visual Paradigm 16.2 as a diagram model processor. Microsoft Word 2010 as a report processor. Microsoft PowerPoint 2010 as a presentation tool.

5. Conclussion

Based on the explanation that I have conveyed, the following conclusions can be drawn: 1. Can minimize duplication and data loss, 2. Can make it easier for users to search data anytime and anywhere, and 3. Can make the process of making reports automatically in a shorter time.

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