WAREHOUSE INFORMATION SYSTEM DESIGN USING MICROSOFT VISUAL BASIC 2010 AND MYSQL AT PT XYZ

Muhamad Riky Nurzetha
Piksi Ganesha Polytechnic
Bandung, Indonesia

Yuda Syahidin
Piksi Ganesha Polytechnic
Bandung, Indonesia

Abstract. PT. XYZ, a distributor of engineering tools based in Bandung, specializes in industrial machinery and workshop equipment. Currently, the warehouse management processes, including recording incoming and outgoing goods, generating goods entry and exit reports, and tracking inventory, are handled manually using Microsoft Excel.

To improve data accuracy and efficiency, this study involved direct observation of warehouse operations and interviews with warehouse staff to understand current challenges. The proposed warehouse information system, designed using an object-oriented methodology with Unified Modeling Language (UML), aims to streamline warehouse data management.

Developed with Microsoft Visual Basic 2010 and MySQL, this system will enable employees to process warehouse data, including tracking goods inflow, outflow, and inventory, with greater speed and accuracy. By reducing manual work, the system will enhance time efficiency in generating warehouse data reports, offering a comprehensive solution to optimize the warehouse's data processing workflow.

Keywords: *Warehouse management, Engineering tools distributor*

Introduction

The rapid advancement of science and technology, especially in computer-based systems, plays a crucial role in modern organizations and businesses. Computer-based information systems support employee performance and improve the overall operational quality of a company. At PT. XYZ, a distributor specializing in industrial machinery and workshop equipment, there is a growing need for a reliable computer-based information system to enhance employee efficiency in data management tasks.

Currently, warehouse operations at PT. XYZ are managed manually. Tasks such as recording incoming and outgoing goods, generating reports, and tracking inventory are handled in Microsoft Excel. This method has led to inefficiencies, including discrepancies between recorded inventory data and actual stock, lack of data categorization, and time-consuming report generation as employees must search through various types of data in a single sheet.

An effective warehouse information system would enable systematic tracking of goods, including details such as quantity, type, quality, manufacture date, brand, size, and price. This is especially crucial for standardized inventory practices, similar to those required for educational and government facilities, where inventory must be recorded meticulously in master and group inventory books.

To address these challenges, PT. XYZ requires a warehouse information system designed to streamline data processing. Based on these needs, the author has developed a final project titled: "Design of Warehouse Information System Using Microsoft Visual Basic 2010 and MySQL at PT. XYZ." This system is expected to improve data accuracy, efficiency, and reporting, ultimately enhancing warehouse management.

Main Issues

Based on the background above, the primary issue at PT. XYZ lies in its reliance on manual warehouse data recording, with Microsoft Excel as the main tool for tracking goods. This approach often results in discrepancies between the Excel data and the actual warehouse stock. Employees also struggle to locate specific information due to the lack of categorization or classification of goods, making it challenging to efficiently manage records. Additionally, generating reports on incoming and outgoing goods is time-consuming, as employees must sift through various types of data to compile accurate summaries.

Research Questions

Based on the main problems above, the author formulates the questions in this study as follows:

A. How is the warehouse data information system running at PT. XYZ?

B. What problems often arise in the warehouse data information system at PT. XYZ?

C. How is the design of the warehouse data information system at PT. XYZ?

Research purposes

General purpose

Based on the description above, the objectives of this study are as follows:

A. To find out the warehouse data information system currently running at PT. XYZ.

B. To identify inhibiting factors in the warehouse data processing process related to the system.

C. To design a warehouse data information system at PT. XYZ.

Benefits of research

In addition to the above objectives, it is expected that this study can provide benefits for the author, school organizations, and institutions.

A. For the Author, it is expected that the results of the study can analyze the problems that occur in the warehouse data information system at PT. XYZ.

B. For Institutions, as input and consideration for the development of a warehouse data information system at PT. XYZ.

C. It is expected that the results of this study will be a contribution of knowledge and reference material for other researchers, especially students of the Piksi Ganesha Bandung Polytechnic who will compile a Journal.

Scope of Problem Analysis

In order for the discussion and preparation of this final assignment to be carried out in a focused manner and to obtain a clear picture and to avoid mistakes, the author limits the problems that exist at PT. XYZ as follows:

1. Processing of incoming goods data and outgoing goods data

2. Making several reports, namely the overall stock report

Does not discuss the sale of goods but only processes incoming and outgoing goods data

Research Methods

Research Approach

According to Sugiyono (2017:2), “Research methodology is essentially a scientific approach to obtain data for specific purposes and uses.” Research methods vary depending on the objectives and familiarity with the study object. One method based on this experience level is the naturalistic or qualitative approach, which examines subjects in their natural environments.

Sugiyono (2017:9) defines qualitative research as: “A research method rooted in post-positivist philosophy, used to investigate natural settings where the researcher acts as the key instrument. Data collection is conducted through triangulation, and analysis is inductive, focusing on understanding rather than generalization.”

Sugiyono (2017:24) further notes that qualitative research is ideal when the research problem is still unclear, vague, or even unknown. In such cases, qualitative researchers engage directly with the subject, using exploratory questioning to clarify the problem.

Given these points, this study adopts a qualitative approach, as the research issues are initially unclear and may evolve through field observations, allowing for a deeper understanding as the study progresses.

Basic Theory

Data source sample

Discussing samples inherently involves understanding the population, as a sample represents a portion of a population. According to Sugiyono (2017:80), “Population is a generalization area consisting of objects or subjects that possess specific qualities and characteristics determined by the researcher for study and conclusion.” Sugiyono further defines a sample as “a subset of the population, reflecting its characteristics” (2017:81).

In qualitative research, the term “population” is not typically used. Instead, Spradley refers to the “social situation,” which consists of three key elements—place, actors, and activities—that interact dynamically within the study environment (Sugiyono, 2018:49).

Qualitative research commonly employs nonprobability sampling techniques, which do not provide equal selection chances for each population member (Sugiyono, 2017:218). Among these, purposive sampling and snowball sampling are frequently used. In this study, the author has chosen purposive sampling, defined as a sampling technique where sources are selected based on specific criteria (Sugiyono, 2017:219). Accordingly, the author will seek data from individuals who are highly knowledgeable about inventory management and influential within the study setting, ensuring a rich, relevant data collection.

2. Interview

"The interview was conducted as a data collection technique when the author wanted to conduct a preliminary study to find problems that need to be investigated" (Sugiyono, 2007: 231).

Different types of interviews according to Esterber, cited by Sugiyono (2017: 223), namely: "structured, semi-structured and unstructured interviews".

A. Structured Interview (Structured Interview)

B. Semi-structure Interview (Semi-structure Interview)

C. Unstructured Interview

3. Documentation

A document can be a person's writing, drawing, or monumental work that is a record of past events. "Research results will be more credible if they are supported by existing photographs or scientific papers and works of art" (Sugiyono, 2017:240).

4. Triangulation/Combination

Triangulation is a data collection technique that combines various existing data collection techniques and data sources. If the author conducts data collection through triangulation, then the author is actually collecting data that also “tests the credibility of the data, namely, checking the credibility of the data using various data collection techniques and various data sources” (Sugiyono, 2007: 241).

The data collection technique in this research, the author will combine the three techniques mentioned above, is called data triangulation, namely, a data collection technique that combines various existing data collection techniques and data

sources. The author wants to test the credibility of the data by collecting various data to obtain data from the same source.

Software Development Methods

Janner Simarmata (2019:53) there are several development models in software, namely: "...the waterfall model, and further with the prototype approach the spiral model..."

From this it can be concluded that the models in software development include: waterfall development model, prototype approach, spiral model.

1. Waterfall development model

This software development focuses on planning and control (Basili and Musa in Janner Simarmata, 2019:54). The emergence of the waterfall model is intended to help overcome the complexity created by software development projects (Boehm in Janner Simarmata, 2019: 54).

2. Prototypical approach

According to Janner Simarmata, 2019:62, it says: “A prototype is a part of the product that expresses the displayed logic and physical external interface.” The prototyping approach generally includes the following steps:

A. Gather and analyze requirements,

B. Rapid planning,

C. Build a prototype

D. Evaluation is done by consumers on prototypes,

e. If the customer is disappointed with the built prototype, repeat step 5 again and

F. If the customer is satisfied with the built prototype, large-scale product development can begin.

3. Spiral model

According to Janner Simarmata (2019:65), it says:

“The basic concept of this model is that every part of the product and every level involves the same sequence of each step (cycle). Starting from the middle of the spiral, it can be seen that each development stage (operational concept, software requirements, product design, detailed design and implementation) comprises one revolution (cycle) of the spiral."

Typically, prototyping is applied to system elements or alternatives that carry a high risk.

Scientific Study

A. System Concept

According to Sutabri (2015:28), a system is a group of elements that are closely related and work together to achieve certain goals.

System according to Sutanta (2013:74) In general, a system can be defined as “a collection of things or activities or elements or subsystems that work together or are connected in a certain way to form a single unit to perform a function to achieve a goal”.

According to Sutanta (2013:714), a system has the following characteristics:

1. Has components (components)

System components are everything that makes up the system. System components can be real or abstract objects. System components are called subsystems, they can be people, objects, things or events involved in the system.

2. Have boundaries

System boundaries are required to distinguish one system from another system. Without system boundaries, it is very difficult to explain a system. System constraints limit the scope of review of the system.

3. Have an environment

The system environment is everything that is external to the system. The system environment can be beneficial or harmful. Generally, a favorable environment is always maintained to maintain system continuity. In the meantime, care is taken to ensure that a harmful system environment has as little influence as possible even if it is possible to eliminate it.

4. Have an interface between components. Interface ports are system components, namely, anything that has the role of bridging relationships between components in the system. The interface is a means that allows each component to interact and communicate with each other to perform the functions of each component. In the world of computers, interfaces can be in the form of various screen dialog displays that allow someone to easily operate the computer application system they are using.

5. Have input (input)

Input is a system component, namely, anything that needs to be input into the system as material to be further processed there to produce a useful output. In management information systems, inputs are called data.

6. Has Processing

Processing is a system component whose primary role is to process inputs to produce outputs useful to its users. In management information systems, processing takes the form of computer application programs designed for specific purposes. The application program is capable of receiving inputs, processing inputs and displaying processed results according to user requirements.

7. Has Output

Output is a system component in the form of various forms of output produced by processing components. In management information systems, output is information produced by application programs that is used by users as material for decision making.

8. Has Objectives and Goals

Every component in the system needs to be maintained to work together in the hope of achieving the system's goals and objectives. Objectives are different from goals. System goals are what the system wants to achieve in a relatively short period of time. Meanwhile, goal is the end state/end result that the system wants to achieve over a long period of time. In this case, objectives are the results at each individual stage that support the efforts to achieve the objectives.

9. Have control

Every component in the system must always be maintained so that it continues to function according to its respective role and function. This is possible when there is a part that plays a role in maintaining it, which is the control part. The main role of the control part is to ensure that the processes in the system can run normally within predetermined limits. In a management information system, control can be in the

form of input validation, process validation or output validation, which can be designed and developed programmatically.

10. Feedback is required from the system control department to check process deviations in the system and return them to the normal state.

B. Information

To understand information, you must first understand the data. “Data is a representation of a fact modeled in the form of images, words and/or numbers” (Witarto, 2014: 8). Data is often collected or recorded. The data collected or recorded does not necessarily correspond to the facts. This deviation must be avoided so that it does not occur in data recording. Therefore, verification activities are required so that the recorded data is correct and appropriate and actually represents a valid representation of the facts. Data can be numbers, letters, images or other forms of recording that are accessible to humans, can be entered into a computer and processed or transmitted through digital channels. Computers represent data in the form of binary code. Useful data is complete data that supports the formation of information and is accurate and up-to-date because it is always verified and updated according to the evolving facts.

A set of data that is of a temporary nature depending on time can surprise or surprise those who receive it. This is called information. The intensity and duration of surprise caused by information is called information value. Information that has no value is usually due to incomplete or outdated records.

Good and new information can correct and confirm previous information. Information can also be referred to as processed data that is of value for actions or decisions. The use of information is to reduce uncertainty in the decision-making process about a situation. Information used in an information system is generally used for multiple purposes. "The value of information is determined by two things, namely the benefits and the costs of obtaining it. "Information is considered valuable when the benefits are greater than the costs of obtaining the information" (Ladjamudin, 2015: 9).

The Methodology part (including new procedures and protocols, as well as well-established approaches) should be discussed in enough detail for others to replicate and build on the published results. This part shows how the researcher carried out the research. It contains details about the sample, procedures, equipment (if any), and the study population.

This part should be written in the past tense. It consists of the following elements: Respondents/Participants/Artifacts, Instrumentation, Validity and Reliability of Instrument, and Statistical Treatment of Data.

Researches involving animals or humans, as well as other studies requiring ethical permission, must include the authority or review board that granted the approval and the ethical approval code.

1. Information Needs Test

According to Ladjamudin (2015:11), there are four tests to explain a specific message in information, namely:

a. To whom (decision maker) the information is intended

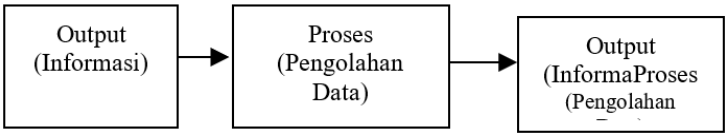
b. For what specific decision is the information intended

c. To what extent can information be used to detect and solve problems

d. To what extent (when) is the level of decision making.

2. Information Cycle

To obtain useful information for the recipient, it is necessary to be clear about the cycle that occurs or is needed in producing information. According to Ladjamudin (2015:11) the information cycle is as follows



Gambar Siklus Informasi

3. Information quality

According to Ladjamudin (2005:11-12), the quality of information is greatly influenced by the following three things:

a. Relevance, how far the level of relevance of the information is to the reality of past events, today's events, and future events.

b. Accuracy

Information is said to be of quality if all the information needs have been conveyed (completeness), all the contents of the message are correct/appropriate (correctness), and the message conveyed is complete or only the system desired by the user (security).

c. Timeliness

Various processes can be completed on time, the required reports can be delivered on time.

d. Economy The information produced has high selling power, and the operational costs to produce the information are minimal, the information is also able to provide a broad impact on the rate of economic growth and information technology.

e. Efficient (efficiency)

Quality information has simple syntax or sentences (not convoluted, not poetic, even romantic), but is able to provide deep meaning and results, or even shake anyone or anything that receives it.

f. Trustworthy (reliability)

The information comes from a reliable source. The source has also been tested for its level of honesty. For example, the output of a computer program can be categorized as reliable, because the computer program will provide output according to the input given, and the output is never influenced by the lure of a position, or a pile of rupiah.

4. Information and Management Level

According to Ladjamudin (2005:13), based on the level of management, information can be grouped based on its users, namely as follows:

a. Strategic Information

Used to make long-term decisions, including external information (competitor actions, customers), company expansion plans and so on.

b. Tactical Information

Used to make medium-term decisions, including sales trend information that can be used to prepare sales plans.

c. Technical Information

Used for daily operational needs, stock inventory information, sales returns and daily cash reports.

C. Data and Information Concepts

Data can be defined as “information about real events or facts formulated in a group of certain non-random symbols that indicate the amount, action or thing”. (Sutanta, 2013: 219).

While information is defined as “data that has been classified or processed for use in the decision-making process”. (Sutabri, 2015: 273)

Information is defined as “the result of data processing so that it becomes an important form for the recipient and has a use as material in decision-making that can be felt directly at that time or indirectly in the future”. (Sutanta, 2013: 170).

D. Information System Concept

An information system is “a set of interrelated components that function to collect, process, store and distribute information to support decision making in an organization”. (Sutanta, 2013: 76).

E. Information System Design Concept

Basically, there is no perfect information system for an infinite period. The existence of new needs, growth of business organizations, technological developments, and other external influences require the development of new information systems to balance the dynamics of the organization where the information system is established. (Sutanta, 2013: 199).

F. Information System Design Concept

Basically, there is no perfect information system for an infinite period. The existence of new needs, growth of business organizations, technological developments, and other external influences require the development of new information systems to balance the dynamics of the organization where the information system is established. (Sutanta, 2013: 199).

G. System Analysis

The stages in analyzing the system are stated by Ladjamudin (2005:2728) as follows:

a. Define the problem (including defining the input, process, and output of the running system and the system to be built).

b. Understand the running system and define it (define the input, process, and output).

c. What alternatives are available to achieve the goal by considering the modification of the system. The alternatives offered must consist of several forms by showing the advantages and disadvantages of each alternative.

d. Choose one of the alternatives that have been formulated in the previous stage.

e. Implement the selected alternative from the alternatives that have been offered.

f. Evaluate the impact caused by the changes that have been made to the system.

Ladjamudin (2015:28) also describes some of the basics of system theory by experts and its importance for information system design,

People who analyze systems by studying the problems that arise and determining user needs and identifying reasonable solutions to problems (better understanding aspects of business and computer technology) are called system analysts or system designers, business analysts programmers, information system engineers, software engineers, system consultants, information system engineers. While programmers are people who write program code for a particular application based on designs made by system analysts (better understanding computer technology.

A system analyst and programmer have their respective duties and responsibilities. A system analyst must have extensive knowledge and special skills. Ladjamudin (2015:30) states that several analysts agree that the following knowledge and skills are essential for a good system analyst

H. Database Management System

One of the objectives of a DBMS is to provide facilities/interfaces to users to view/enjoy data (which are more user friendly/user oriented). For this reason, the system hides details of how data is stored and managed. For this reason, the data previously viewed by the user is often different from the data physically stored. Data abstraction is a level of display of data in a database system. Fathansyah (2007:13) states that there are three levels of data abstraction:

A. Physical level (Physical level)

B. Logical/Conceptual level (Conceptual level)

C. Appearance level (View level)

DBMS is an intermediary for users with databases on disk. The way of interaction/communication between users and the database is governed by a special language specified by the DBMS vendor. We can call this language as database language which consists of a set of commands (statements) which are formulated and can be given by the user and recognized/processed by the DBMS to perform certain actions/work. Examples of database languages are SQL, dBase, QUEL etc. A database language can usually be divided into two forms:

A. Data Definition Language (DDL) and

The database structure/schema which describes/represents the entire database design is specified using a special language called Data Definition Language (DDL). Using this language we can create new tables, create indexes, alter tables, specify table storage structures and so on. The result of compiling DDL commands is a collection of tables stored in a special file called data dictionary.

The data dictionary consists of metadata (superdata) i.e. data which describes the actual data. This data dictionary is always accessed in a database operation before the actual data file is accessed.

B. Data Manipulation Language (DDL)

It is a form of database that is useful for manipulating and retrieving data in a database. Data manipulation can take the following forms:

1. Inserting/adding new data to a database

2. Deleting data from a database

3. Modifying data from a database

Data Manipulation Language (DML) is a language that aims to make it easier for users to access data represented by a data model. There are two types of DML, namely:

A. Procedural requires users to determine what data they need and how to obtain it

B. Non-procedural, which allows users to determine what data they need without specifying how to obtain it

A database management system (DBMS) is divided into modules, each of which is responsible for forming the overall system structure. A database management

system (DBMS) generally consists of a number of functional components (modules), such as:

A. File manager, which manages the allocation of disk space and the data structures used to represent the information stored on the disk. Actually, the operating system (where the DBMS is enabled) also has a file manager module, but the file manager in the DBMS is more focused on storage efficiency and effectiveness.

B. Database manager, which provides an interface between low-level data in the database with application programs and queries to the system.

C. Query processor, which translates commands in the query language into low-level commands that can be understood by the database manager. In addition, the query processor converts user queries into a more efficient form so that queries become more effective.

D. DML precompiler, which converts DML commands added in an application program into normal procedure calls in the host language. This precompiler interacts with the query processor.

e. DDL compiler that converts DDL commands into a set of tables of metadata. These tables are then stored in a data dictionary.

Theories about the issues discussed

1. Definition of Warehouse

A warehouse can be defined as a place that has the mission of storing goods used in production until the goods are requested according to the production plan.

In trade, warehouses serve to serve several different customers and usually have sufficient staff and equipment. In storage distances for the purpose of consumer or user satisfaction, storage is done for long or short periods of time depending on consumer needs. The advantages of commercial warehouses are flexibility and professional management.

In addition, as a storage of finished products, the warehouse has several missions or tasks. In the marketing distribution network, the warehouse has several tasks, namely:

A. Maintain inventory, which serves as a balance and buffer against fluctuations between production planning and demand.

B. Warehouse as a delivery warehouse in an order area with the shortest transportation distance to quickly respond to customer requests.

C. Warehouses are used as places to accumulate and strengthen products in production and distribution activities. Warehouses as product storage locations to quickly satisfy customer demand have several functions between receiving and shipping products. The main functions of the warehouse are as follows:

A. Receiving (receiving) and shipping (delivery)

B. Identifying and sorting (identifying and filtering)

C. Shipping (delivery)

D. Order picking (order selection)

e. Storing (storage)

F. Order assembly

G. Packaging (packaging)

2. Warehouse Information System

Considering the meaning or definition explained above, the author can understand that a warehouse information system is an information system used to enter, store and process data from every transaction that passes through the warehouse.

The data processed by this information system is data of goods received and goods issued from the warehouse so that the monthly report can show how many goods have been received, how many goods have been issued and how many goods are left in the warehouse in order to minimize errors in data entry which was previously done manually and to simplify the work of employees in different warehouses so that time efficiency can be achieved.

Understanding of the Program

According to Novian (2014:51), a program is "a collection of statements that are arranged and stored in one document so that they can be run in one unit of time (simultaneously)". Programs are divided into two bases, namely command-oriented bases and object-oriented programs

An object is something that has properties (properties), which can be commanded or given tasks (methods), and responds when it finds an event (event).

History of Microsoft Visual Basic 2010

Microsoft Visual Basic (often abbreviated as just VB) is an event-driven programming language that provides a visual integrated development environment (IDE) for creating application programs based on the Microsoft Windows operating system using the Common Object Model (COM) programming model.

In 1992, Visual Basic version 2.0 was released to improve and enhance the performance of Visual Basic version 1.0. In 1993, Microsoft released the latest version of Visual Basic, namely Visual Basic 3.0, which added data controls that served to access databases, and Jet Engine version 1.1 was also available, which was used as a database connection tool through DAO (Data Access Object). .

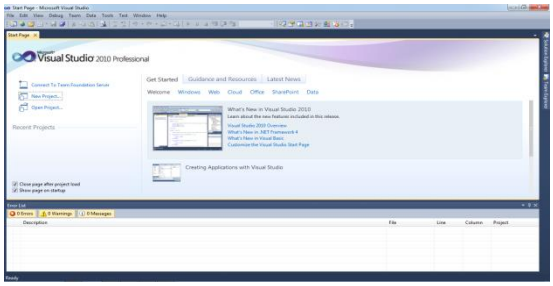
In 1995, Visual Basic 4.0 was released and included OLE (Object Linking Embedding) technology as well as the ability to create your own controls (OCX). In 1997, Visual Basic 5.0 was released, which included new technology that supported COM and allowed the creation of one's own ActiveX controls or DLLs.

In 1998, Visual Basic 6.0 was released with further improved technology, especially in accessing SQL Server and with ADO (ActiveX Data Object) which was intended to improve performance when accessing databases in large enterprises.

In 2000, Microsoft first introduced .Net technology, but it did not generate much interest. By 2002, Microsoft released Visual Studio .NET 2002, which was packaged with Visual Basic .NET, Visual C++ .NET, Visual C# .NET and Visual J# .NET.

In 2003, Visual Studio 2003 was released to improve the performance of Visual Studio 2002 by introducing .NET Framework version 1.1. By 2009, Visual Studio was already in version 2010, with Visual Basic 2010 using .Net Framework 4.0 and the default database (built into the system) being Microsoft SQL Server 2008 Express. Visual Basic 2010 is a Visual Basic development of Visual Basic 2008.

Microsoft Visual Basic 2010 Initial View



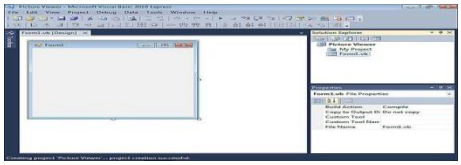
Microsoft Visual Basic 2010 Interface Display

Forms or resources used in application programs

Solution Explorer **Microsoft Visual Basic 2010**

4. Forms

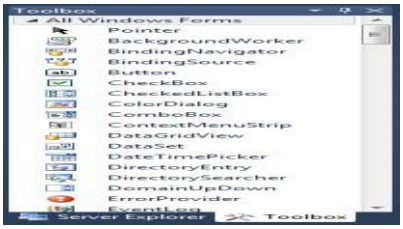
Form Designer is an object used to design the appearance of the program. The Form Designer can also be called the main object of Visual Basic programming, because in this form the toolbox components and controls are placed and arranged according to the requirements of the program being created.



Forms **Microsoft Visual Basic 2010**

5. Toolbox

ToolBox is a place where controls and components are represented by icons. Controls and components are very helpful in designing form displays during program creation. Controls and components are placed in tabs according to their use.

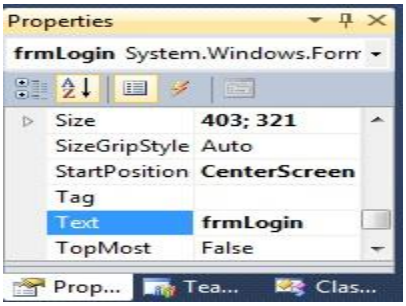


Tool Box **Microsoft Visual Basic 2010**

6. Properties

The function of the Properties window is to provide information about the currently active object. The name of the currently active object is displayed at the top of the

Properties window. Properties are also used to change property values or properties of the active object.



***Properties* Microsoft Visual Basic 2010**

MYSQL Database Management System (DBMS).

a. Understanding Databases

A database is defined as a collection of data that is integrated and organized in such a way that it can be manipulated, accessed, and searched appropriately.

Databases contain not only data but also metadata. Metadata is data that explains the structure of the data itself. The following types of metadata are contained in a database:

1. Table

Data in a database will be classified based on its type and stored in a separate place, called a table.

2. Constraint

A rule or limitation that defines the values or data that can be stored in a database, either through insert, update, or delete operations. In ANSI standard SQL, constraints are divided into four, namely:

a. Primary Key

A primary key is a rule that is useful for ensuring that each row of data in a table is unique (different from one row to another)

b. Foreign Key

A foreign key is useful for defining columns in a table whose values refer to another table.

c. Unique

The function of unique is basically the same as a primary key, namely to ensure that each row of data in a table is unique (not the same).

d. Check

This type of constraint functions to limit the values that can be entered into a column in a table.

b. Understanding Database Management System (DBMS)

DBMS is a collection of programs for defining, managing and processing databases. (Budi Raharjo, 2011:10)

Currently, there are many DBMS programs such as: MySQL, Oracle, Interbase/Firebird, IBM DB2 and others. Some DBMS can only run on mainframe computers, some only on minicomputers and some can only run on personal computers (PCs).

c. Understanding MYSQL

MySQL is an RDBMS software that can manage databases very quickly, handle large amounts of data that can be accessed by many users and can run a process simultaneously (multi-threaded).

MySQL is actually a derivation of one of the main concepts of previously existing databases, namely SQL (Structured Query Language). SQL is a database operation concept, especially for selecting or selecting and entering data, which makes it easy to perform data operations in an automated manner.

The reliability of a database system (DBMS) can be determined by how the optimizer works when executing SQL commands created by the user and the application programs that use it. The advantages of MySQL include:

A. Flexible

MySQL allows desktop applications and web applications to be developed using different technologies

B. High performance

MySQL has a query engine with high performance, so transaction processes can be performed very quickly.

C. Cross-platform

MySQL can be used on different platforms or environments (in this case operating systems) such as Microsoft Windows, Linux or UNIX.

D. Free

MySQL is free to use. However, there are also commercial MySQL software.

e. Reliable data protection

MySQL provides a powerful mechanism to deal with data security issues, especially by providing user management features, data encryption, etc.

F. Scalability and limitations.

MySQL is capable of managing large databases containing more than 50 million records, 60,000 tables and 5 billion rows. Moreover, the index limit that can be connected is 32 indexes for each table.

In this last task, the author uses XAMPP as a MYSQL DBMS medium to create a database that will be connected using Microsoft Visual Basic 2010.

d. A glance at XAMPP

XAMPP is an apache web server software that already has a mysql database server and supports php programming. XAMPP is easy-to-use, free software that supports installation on Linux and Windows. XAMPP combines several different software packages into one package. XAMPP can be obtained at http://apachefriend.org. Its function is as a stand-alone server (localhost), which consists of the Apache HTTP Server program, MySQL database, and language translator written in the PHP and Perl programming languages. The name XAMPP stands for X (four operating systems), Apache, MySQL, PHP and Perl. This program is available in GNU (General Public License) and is free, is an easy-to-use web server that can serve dynamic web page displays.

Procedure Description

The following will explain more clearly about the procedures of the information system that will be analyzed in the warehouse of PT. XYZ.

Incoming Goods Data Procedure

Recording of goods entering the warehouse of PT. XYZ has the following procedures:

1. First, the delivery employee of PT. XYZ will provide a delivery note to the warehouse staff in 2 copies. The procedure for ordering goods from the branch office of PT. XYZ Group must go through PT. XYZ as the head office, then the delivery employee of PT. XYZ will deliver the goods order to each branch office or if the goods ordered by the branch office are only a few/small, they will be sent via JNE services.

2. After the warehouse staff receives the delivery note along with the ordered goods, the warehouse staff will match it based on the goods order letter that has been stored by the warehouse staff, if it is appropriate, the delivery note is approved and stored by the warehouse staff as an archive.

3. If the delivery note does not match the order or order, the warehouse staff will return it to the goods delivery service officer

4. After that, the warehouse staff will record the incoming goods into the stock card

Outgoing Goods Data Procedure

The release of goods from the warehouse of PT. XYZ has the following procedures:

1. First, the salesman will provide a letter of order for goods from the customer (PO) to the warehouse staff,

2. The warehouse staff checks the goods requested by the salesman. If the stock of goods is not available, the warehouse staff will immediately return the letter of request for order for goods (PO) and inform the salesman that the stock of goods is not available.

3. If the stock of goods requested is available, the warehouse staff will record the type of goods that come out and keep a copy of the PO letter for the archives that must be owned by the warehouse staff

4. The warehouse staff will record the evidence of the release of goods from the warehouse on the stock card.

Report Making Procedure

This procedure contains the creation of reports on incoming and outgoing goods at the warehouse of PT. XYZ. The procedures are as follows:

1. Warehouse staff will take data from stock cards and outgoing goods archives to create outgoing goods reports.

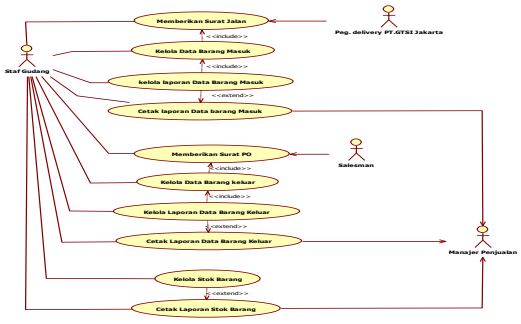
2. After that, warehouse staff will take data from delivery notes and stock of goods to create incoming goods reports

3. The creation of both reports is done in Microsoft Excel as a data processing tool

4. Both reports consisting of incoming and outgoing goods reports will be submitted to the sales manager.

Process Analysis

In the analysis conducted at the Warehouse of PT. XYZ, the author uses an object-oriented analysis method. Where the data is presented in the form of a UML (Unified Modeling Language) diagram which in this analysis will be described through the Usecase Diagram and Activity Diagram.



Usecase Diagram of Data Warehouse Information System

Problems Faced

Problems Faced in Warehouse Data Information System Analysis at PT. XYZ

The problems faced in the analysis of warehouse data information systems at PT. XYZ are as follows:

1. Recording of all incoming and outgoing goods from the warehouse is still manual, namely using stock cards.

2. There is no special classification in recording data on goods in the warehouse so that searching for data becomes more difficult.

Creating reports on incoming goods, outgoing goods and stock of goods still uses Microsoft Excel and warehouse staff must review the records of goods on the stock card so that making reports takes quite a long time.

Problem Solving Efforts in Warehouse Data Information System Analysis PT. XYZ

1. Create a computerized information system that can store data on goods coming in and out of the warehouse.

2. Stock cards should be stored based on brand or type of goods so that data searches are easier and do not take a long time.

3. Create a computerized information system that can process and create a report on incoming, outgoing and stock data based on data entered at the beginning.

Conclusion of Analysis Results

The input of data on incoming and outgoing goods is still done through warehouse cards and not computerized. Microsoft Excel is still used to generate reports on goods receipts, goods issues and inventory items and the warehouse staff have to look at the goods records on the warehouse cards again to be able to generate reports, which takes quite a long time.

Analysis of the inputs required by the system at PT. XYZ is a Purchase Order (PO) and a Travel Document while the output required by the system is a goods receipt report, goods issue report and goods inventory or warehouse report.

Computer hardware specifications can be found in the Warehouse Processing section at PT. GTSI Bandung is Processor: Intel Core 2 Duo 2.2GHz, RAM: 2GB DDR2, Hard Disk: ATA 80GB, VGA Card: 512MB.

Considering all the analysis results including input, output and available computer specifications, the information system design proposed by the author is to use Microsoft Visual Basic 2010 and MySql because both software programs can be run on computers available in the PT warehouse data processing area. XYZ can also solve all the problems in the PT Warehouse Data Processing area. Germanantara Tooling Service Indonesia Bandung.

Conclusion

Based on the results of observations and interviews with employees in the warehouse area of PT. Germanantara Tooling Service Indonesia Bandung, the following conclusions are drawn:

1. Warehouse data processing at PT. XYZ still uses warehouse cards manually to record goods receipts and goods issues from the warehouse and only uses MS. Excel as a data processor by displaying warehouse cards to summarize item data as a report source.

2. The problem in warehouse data processing is that due to the carelessness of employees in data entry, there are often differences in the number of items in the MS. Excel and data in the warehouse, preparing reports on goods receipts, goods issues and inventory takes quite a long time because employees have to glance at the warehouse card to summarize the goods data. When searching for goods data, employees often encounter difficulties because there is no special classification of the goods data.

3. The information system design proposed by the author uses object-oriented methodology and uses Microsoft Visual Basic 2010 and MySQL software because with the above methods and software, all the problems in warehouse data processing process at PT. Germanantara Tooling Service Indonesia Bandung can be solved.

Suggestion

After making observations and seeing the results of the warehouse data information system analysis, several things were suggested that could serve as useful input that could be implemented in overcoming warehouse data processing problems at PT. Germanantara Tooling Service Indonesia Bandung, namely:

1. An information system was created that can support and simplify the performance of employees in the warehouse area while dealing with all the problems related to warehouse data processing at PT. Germanantara Tooling Service Indonesia Bandung.

2. Employees in the warehouse need to be more careful when entering item data in order to minimize data errors in Ms. Excel and data on goods in the warehouse, special classification needs to be made when entering data on the warehouse card, such as classification by commodity brand and commodity name, so that the search for commodity data becomes easier and does not take a long time.

3. It is hoped that the results of the analysis and design of the information system can be used as considerations for improving and upgrading the existing system at PT. Germanantara Tooling Service Indonesia Bandung, especially in the warehouse area.

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