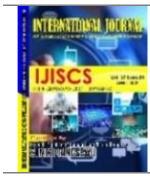

IJISCS (International Journal of Information System and Computer Science)
IJISCS, Volume 9, Number 2, August 2025
E ISSN: 2598-246X; P ISSN: 2598-0793, pp. 114-121
Accredited SINTA 4 Number 79/E/KPT/2023
https://jurnal.ftikomibn.ac.id/index.php/ijiscs

INTEGRATED INFORMATION SYSTEM DESIGN FOR STOCK MANAGEMENT AND PAYMENT AT TB BANGUN JAYA

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Article history:
Received July 28, 2025;
Revised August 19, 2025;
Accepted August 28, 2025

Keywords:
Management Information System;
Waterfall;
Payment;
Stock Goods.

Abstract
TB Bangun Jaya is a building materials store that still manages manual stock recording and sales transactions, so there are often recording errors, delays in reporting, and difficulties in tracking goods data. This problem shows the need for an information system that is able to integrate stock management and payments efficiently and accurately. This research aims to design an integrated information system that can support the operational process of TB Bangun Jaya. The system development method with the waterfall model, and the data collection techniques used include observation, interviews, and literature studies, with a structured system development approach. The result of this study is a system design that includes context diagrams, DFD Level 0, DFD Level 1, ERD, which represent the process of managing data of goods, transactions, and reporting. This design is expected to be the initial solution in the digitization of store business processes. Further research is recommended to proceed to the stage of system implementation, functionality testing, and development of cloud-based features so that the system can be accessed online and in real-time.

1.0. INTRODUCTION

The development of information technology has encouraged various business sectors, including building shops, to adapt to digital systems in their operational activities. TB Bangun Jaya as one of the small and medium enterprises (SMEs) in the field of providing building materials still uses a manual system in recording stocks and payment transactions. This conventional system causes various problems such as inconsistencies in stock data, delays in sales reports, and difficulties in compiling financial reports. Based on observations over three months, it was found that the delay in recording stock caused empty goods 4 times per month, which had an impact on lost sales opportunities. In addition, the absence of an integrated system leads to duplication of work and reliance on certain personnel in data management.

Based on research that has been conducted, it proves the effectiveness of information systems in supporting inventory management and business transactions. Haryanto and Lestari [1] showed that web-based systems can reduce recording errors by up to 70% in the management of goods in retail stores. Research by Putri and Ramadhan [2] developed an integrated payment system that speeds up the transaction process and improves customer satisfaction. Siregar and Wahyuni [3] proved that integrated desktop applications are able to help business actors in reporting and evaluating daily sales. Meanwhile, Maulana and Safitri [4] highlighted the importance of integration between the financial system and inventory in reducing the operational costs of small businesses. Khairunnisa and Yuniarti [5] even developed a mobile-based system to increase the flexibility of stock management in family-based MSMEs.

Some previous studies that still separate stock recording and payment systems, this research will design a solution in the form of an integrated information system designed according to the needs of TB Bangun Jaya. This innovation emphasizes the merging of stock management and payments in one interconnected digital platform. In addition, the system will be equipped with automatic reporting features and minimum stock reminder notifications, which have not been widely developed in similar studies.

The problems to be solved in this study include low recording accuracy, delay in stock information, and the absence of an integrated system between inventory and transactions. As a solution, the information system designed will be web-based with an interface that is easy to use by store owners and employees. The use of this system is expected to speed up workflows, reduce human error, and provide real-time data for decision-making. The purpose of this research is to build an integrated information system that can improve efficiency and accuracy in stock management and payments at TB Bangun Jaya. The benefits include improving operational performance, ease of monitoring goods, and compiling more systematic and informative sales reports.

2.0. LITERATURE

2.1. Information Systems

Information system is a unit of components that function in managing inventory and cash data in a building shop business in an integrated manner. With this system, the operational management process becomes more systematic and easy to control. [6] Information systems function as a tool for digitizing work processes and data storage, which has a direct impact on improving work efficiency, especially in the management of goods inventory[7]. Information systems act as a link between data and users that help the information processing process automatically,[8] making it very relevant in the context of sales and stock recording. Information systems in the process of recording and reporting financial transactions in micro businesses, which were previously done manually and often caused recording errors.

Technology-based information systems, especially Android, are able to provide flexibility for MSME actors in managing stock data and transaction history anytime and anywhere. [9] This shows that information systems are not only limited to desktop use, but have also penetrated mobile platforms to suit the needs of modern users. From these various views, it can be concluded that information systems are an important foundation in data management in organizations or businesses, including building shops. The system supports work automation, reduction of human error, and acceleration of the reporting process, which ultimately improves the quality of management and service to customers.

2.2. Management Information Systems

Management Information System (SIM) is a form of information technology application designed to support the management process in an organization or business. SIM functions as a tool that provides accurate, relevant, and timely information to support decision-making, planning, control, and evaluation activities of organizational performance. In the context of small and medium enterprises (SMEs), the existence of a driver's license can increase operational efficiency and help manage data more systematically.

SIM is a computer-based system developed to support operational and financial processes for MSMEs, as well as provide accurate information to support managerial decision-making. This definition shows the importance of SIM in digitizing routine business activities to be more efficient and measurable.[10] Web-based SIM allows for the integration of business processes, especially in inventory management, to improve transparency and workflow efficiency[11]. SIM provides real-time data that is critical in supporting fast and informed decision-making in a competitive retail business environment.[12] SIM is a technological solution that facilitates the management of daily operations such as stock and transaction management, and helps minimize manual errors common in conventional systems[13].

SIM integrates transaction data and stock of goods in a digital system, so that business reporting and monitoring can be carried out more quickly, accurately, and centrally. This is very important in business management such as building stores or basic necessities that have many transactions every day[14]. Based on the description of these experts, it can be concluded that a Management Information System is a system that integrates information technology with managerial processes to provide information needed in planning, decision-making, and controlling operational activities. In this study, SIM is used as a basis for building an integrated information system for stock management and payments at TB Bangun Jaya, with the hope of being able to improve efficiency, speed, and accuracy in recording data and business reports.

2.3 Transaction Management

Transaction and stock management are two very important aspects in business operations, especially in the trade, retail, and small and medium enterprises (SMEs) sectors. Transactions are related to the recording of buying and selling activities, both sales and purchases, which directly affect the company's financial statements and cash flow. Meanwhile, stock management includes all processes related to the availability of goods, from recording, monitoring, to inventory control. Good transaction management must be able to record all sales and purchase activities systematically and integrated, in order to produce accurate and accessible financial reports in real-time. This is critical to supporting fast, data-driven decision-making.[15] Effective stock management must be based on an information system that is able to present information on the availability of goods in real time, so as to prevent stockout *and overstock*. [16]

An integrated transaction and stock information system is able to reduce recording errors and improve operational efficiency. In this system, each sales transaction will automatically reduce the amount of stock of goods, and conversely, each purchase transaction will increase the amount of available stock. The integration also supports data transparency and minimizes manual interventions that risk errors[17]. By integrating transaction and stock management in one centralized information system, businesses like TB Bangun Jaya can reduce manual workloads, improve recording efficiency, and speed up the reporting process. Such a system can also be the basis for building a broader management information system in the future, as it creates valid and ready-to-analyze data for strategic decision-making.

3.0. RESEARCH METHODS

3.1 Data Collection Methods

The research was conducted using three data collection techniques, namely observation, interviews, and literature studies. These three techniques are used to obtain accurate information about the needs of the system and business processes running at TB Bangun Jaya.

1. Observation

   The observation technique is carried out directly at TB Bangun Jaya's business location to observe the ongoing stock management process and payment transactions. This observation includes activities of recording incoming and outgoing goods, a sales transaction system, and the use of tools such as notebooks or simple applications. The purpose of this observation is to understand the workflow and real problems that occur in the field as the basis for designing the right information system.

2. Interview
Interviews are conducted with store owners and administrative staff who are responsible for managing goods and transactions. The interview is semi-structured, with pre-arranged questions but still allowing room for further exploration. This technique is used to explore the needs of the system, the obstacles that are often faced, and the expectations of users for the information system to be developed.
3. Literature Study
Literature studies are carried out by browsing various literature sources such as scientific journals, textbooks, and previous research reports that are relevant to management information systems, transaction management, and stock of goods. This study aims to strengthen the theoretical foundation and compare solutions from previous research as reference material in designing an information system that is in accordance with the needs of TB Bangun Jaya.

Through this data collection technique, complete data can be obtained to compile system needs and design in accordance with real conditions in the field.

3.2 Waterfall *Development Model*

The system development model used in this study is a structured system development approach, which is arranged in stages to build an information system according to the needs of users. This model consists of several main stages which can be seen in figure 1. Below.

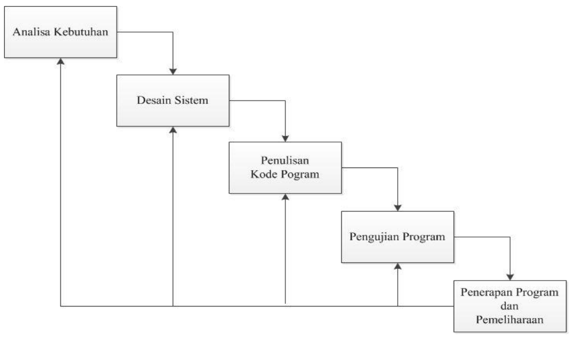

Figure 1. Model *Waterfall*

This system development model was chosen because it provides a systematic and structured approach, suitable for the development of small to medium-scale information systems such as those applied at TB Bangun Jaya. With clear stages, it is hoped that the system can be built efficiently and according to user needs.

1. Needs Analysis
This initial stage is carried out to identify user needs and business processes running at TB Bangun Jaya. Information was collected through observation, interviews, and literature studies. The result of this stage is the specification of system requirements that includes data, processes, and information flows needed in the management of transactions and stock of goods.
2. System Design
At this stage, system design is carried out using a structured approach. The design is carried out through several models such as context diagrams, Data Flow Diagram level 0, and *Entity relationship diagrams* (ERD), Context Diagram: Describes the system as a whole, showing the relationship between the system and outside entities (Admin, customer, and Cashier). Data Flow Diagram (DFD) Level 0: Details the key processes in the system and the flow of data between processes and external entities. DFD Level 1: Provides more in-depth details of each process at DFD Level 0, describing subprocesses, data flows, and data stores. Entity Relationship Diagram (ERD): Describes the database structure, relationships between entities, and key attributes in the system, which will be used in the design of the relational database.

3. Program Code Writing
   Once the system design is compiled, the next process is to implement the design into the form of program code. The system is developed using programming languages and web technologies (PHP, MySQL, HTML/CSS) that suit the needs and capabilities of the user. Code writing follows coding standards to maintain readability and future system maintenance.
4. Program Testing
   Testing is carried out to ensure that the system runs according to the functionality that has been designed. The testing technique used is black-box testing, which is by testing the input and output of each feature without looking at the content of the program code. Testing is carried out on the transaction module, stock of goods, login, reports, and data management.
5. System Implementation (Implementation)
   After the system has been successfully tested and runs according to specifications, the next stage is the implementation of the system in the TB Bangun Jaya work environment. This stage includes system installation, database configuration, user training, and initial data adjustments to ensure the system can be used right away.
6. System Maintenance
   Maintenance is carried out to ensure that the system continues to run optimally in the long term. Maintenance activities include bug fixes, feature improvements, data updates, and system adjustments to new needs in the future. The developed system is expected to be flexible and easy to develop further.

4.0. RESULTS

4.1 Results

The results of this study are in the form of an integrated information system design for stock management and payments at TB Bangun Jaya. The design is compiled based on the results of the needs analysis and produces several main components, namely a context diagram that describes the system's relationship with external entities, a Level 0 and Level 1 Data Flow Diagram (DFD) that describes the main data flows and processes in the system, and an Entity Relationship Diagram (ERD) that designs a database structure for the management of goods, transactions, and users. This design is the basis for the implementation stage of the system in the next phase.

4.2 Discussion

The integrated information system design prepared in this study is an effort to answer the operational problems faced by TB Bangun Jaya, especially in stock recording and transactions that are still carried out manually. Based on the results of observations and interviews, it was found that the manual recording system often causes calculation errors, delays in reporting, and difficulty in tracking goods and transaction data. With a structured system development approach, this system design is able to map user needs through context diagram models, DFD Level 0 and Level 1, as well as integrated ERD.

1. Diagram context
   A context diagram is a description of a system, which shows the relationship between the information system and the external entities that interact directly with it. This diagram contains only one main process (system) and the data flows in and out of external entities.

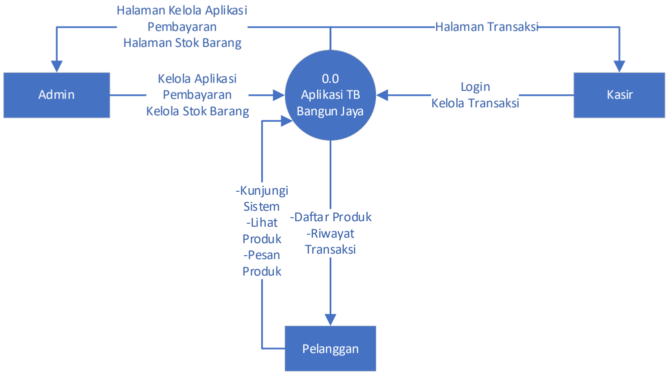

Figure 2. Context Diagram of Goods Stock Management and Tb Bangun Jaya Payment

In figure 2 above, it can be seen that there are three entities involved in the system, namely the admin as the system controller, the cashier who manages the payment system and customers who can carry out the ordering process, see the stock of goods and payments at TB Bangun Jaya.

Data Flow Diagram (DFD) Level 0

DFD Level 0 is an extension of a context diagram that shows the main processes in the system and the flow of data between processes, data stores, and external entities. At this level, the system is broken down into several main processes.

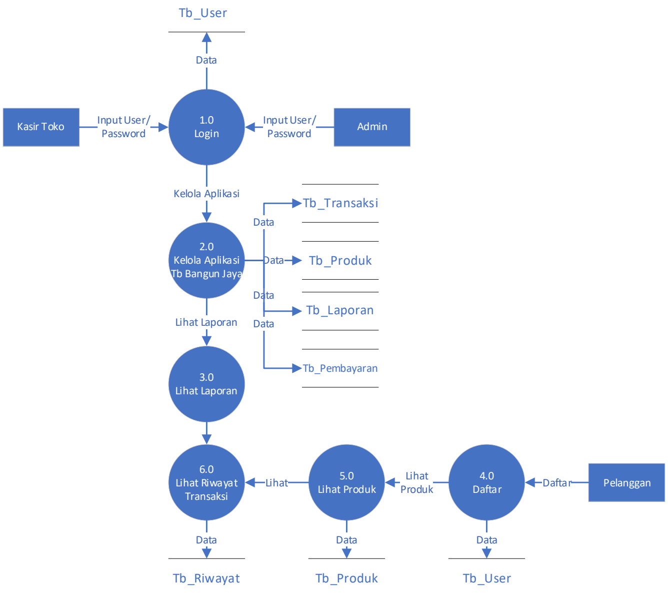

Figure 3. DFD Level 0

DFD Level 1

DFD Level 1 details the internal data flow from one of the main processes in DFD Level 0, the Sales Transaction process, to more specific subprocesses.

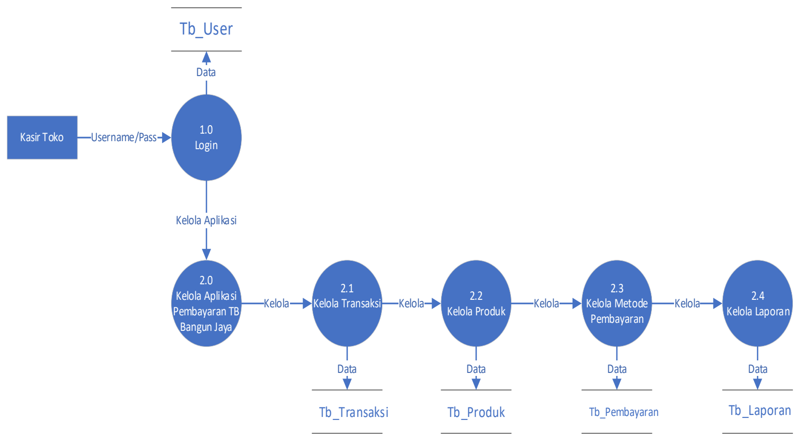

Figure 4. DFD Level 1

2. *Entity Relationship Diagram* (ERD)

ERD serves to describe the relationship between one entity and another. This information system has several entities that are interrelated with each other. The relationship between entities contained in this information system can be seen in Figure 5.

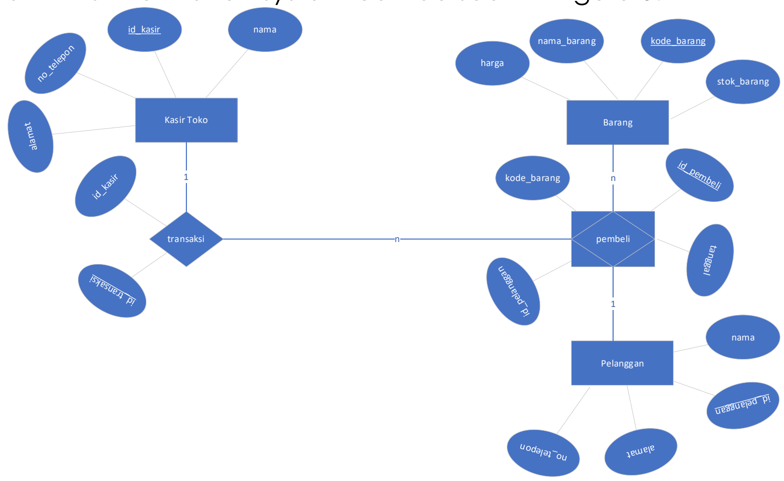

Figure 5. ER Diagram

4.3 Results of the analysis

Based on the results of analysis of data obtained through observations, interviews, and literature studies, it was found that the transaction and stock recording system at TB Bangun Jaya is still manual and less efficient, so it has the potential to cause recording errors, data loss, and delays in reporting. Through the needs analysis stage, an information system is designed that can overcome these problems by simplifying workflows, integrating transaction processes and stock management, and providing reports automatically. The system design was prepared using a structured approach with Context Diagram, DFD Level 0, DFD Level 1, and ERD models, which have clearly described functional needs and data flows. In addition, the design of the system flow also reflects the needs of the user with simple navigation and complete functionality. The results of the analysis show that this system has high potential to improve operational efficiency, reduce the risk of recording errors, and facilitate decision-making through real-time and structured data.

5.0. CONCLUSION

Based on the results of the analysis and design that has been carried out, it can be concluded that an integrated information system for stock management and payment at TB Bangun Jaya is needed to overcome operational problems that have been carried out manually. The designed system is able to describe functional needs with a structured approach through context diagrams, DFD Level 0 and Level 1, and Entity Relationship Diagrams (ERDs), which clearly reflect business process flows and data structures. This design also results in a design that is simple and according to user needs, such as goods data management features, transaction logging, stock reports, and sales reports. The overall design results show that this system has the potential to improve efficiency, accuracy of recording, and speed up the reporting process. This conclusion becomes a solid basis for proceeding to the implementation and testing stage of the system in the next phase of research.

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