# The Development of Web-based Sales and Inventory System for a Stationary Store

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*Abstract—The study-case method was applied in this research at a stationery store. The problems derive from an observation of a stationary store called Andesta, a micro, small, and medium-sized enterprise (MSMEs) run by individuals who engage in stationery and document procurement. The problem is that transactions are not properly recorded, preventing the store from knowing the profits and losses incurred during a certain period. As a result, the availability of stocks coming in and out is unclear. This issue will be resolved by developing an integrated sales and inventory system. The prototype method is implemented in the system development lifecycle. The system will be constructed as soon as the design is completed and accepted by the business owner. The CodeIgniter framework and MySQL databases were used to build the system. The construction of the sales and inventory system is supposed to support stores in running their business processes more efficiently.*

*Index Terms—integrated system; prototyping method; sales and inventory system; stationary store.*

## I. INTRODUCTION

Many companies already implement Information Technology (IT) to support business processes. IT is a technological device that facilitates the arrangement of tasks related to data processing, information and communication to increase effectiveness and efficiency in a job [1]. Business processes are a series of activities that are linked together to solve a specific problem [2]. IT may assist the business process in an organization, which is known as Enterprise Resource Planning (ERP) on a big scale organization. ERP offer an integrated system to the company, so that the recording can be done effectively and efficiently [3]. Successful implementation requires effective implementation, environmental analysis and strategies so as to produce high performance according to the needs of the company [4]. The business process addressed in this research is part of the ERP system, specifically the sales and inventory modules, and the case study used is a MSME (Macro, Small, Medium Enterprise). MSMEs are relatively small businesses. The characteristics of MSMEs are the actual conditions contained in the company's activities, as well as the behavior of

entrepreneurs who are interested in running their business [5].

The case study of this research is taken from a problem that occurred in an MSME's store called Andesta that was owned by individuals. Andesta sells a variety of stationery, computer supplies, musical instruments, and sports equipment. Andesta handles an average of 30-40 transactions per day. The process of recording and storing data of products and transactions in this store is still paper-based utilizing books and notes thus errors in writing the quantity of products or the nominal price are common. Furthermore, the sales transaction activity is also less optimal because it cannot automatically calculate the amount of sales.

Based on the existing problem, the goal of this research is to develop an integrated sales and inventory system capable of recording and storing products and transactions data, making the generation of sales reports and inventories much easier. As a result of previous research by Arnold et al. [6] and Hasanudin M. [7] that the proposed system is capable of storing all the transaction data but lacks a function to notify users of stock availability. During this research, the proposed system would include a function that notifies users of stock availability.

## II. THEORETICAL BASIS

### A. Literature Review

Recording is the process of recording an inventory to find out existing inventory data so that the business becomes more efficient [8]. Inventory is an asset or stock owned by a company or other business to generate the highest profit in supporting its business processes [9]. Sufficient supplies with the availability of time, quality, and the right location, have benefits, namely:

1. Minimize the risk of delay or goods exhausted from the distributor.

2. Minimize defects of new goods from distributors.

3. Minimize the risk of lost goods.

Sales is the process by which the seller meets all the needs of the buyer and hopes to provide sustainable and profitable income for both sellers and buyers [10]. Generally, purchase is interpreted as an attempt to obtain goods or services for personal purposes, in the process of manufacture or for resale [11].

Prototyping is a technique for building functions quickly but incomplete information system models using application developer tools. The construction of a system is focused on the customization carried out by the application developer tools. The prototype technology used in the study aims to give researchers an idea of the applications created during the application prototype development stage and initially evaluated by users [12].

UML (Unified Modelling Language) is part of the business process model for available organizations. UML is the design of a system of a diagram that is seen from how the system works, how the system interacts with the user, and there are features available on the system [13]. Use Case Diagram is modeling intended for the information system to be created. Use Case works to describe the type of interaction between the user in the system and his own system, by the system. Activity diagrams are used to model characters in business processes without relying on objects. Activity diagrams are used to model behavior in business processes that are independent of objects. In many ways, activity diagrams can be seen as sophisticated data flow diagrams used in conjunction with structured analysis. A class diagram is a static model that shows multiple classes and relationships between each class that have not changed in the system. Class diagrams represent classes consisting of behavior and circumstances, along with relationships between classes.

### B. Previous Research

This research is based on previous studies regarding the development of a sales and inventory system. Table 1 lists three previous research that were used as references.

TABLE I. PREVIOUS RESEARCH

| No. | Journal Article | Results |
|---|---|---|
| 1 | Sistem Informasi Penunjang Proses Pemesanan dan Desain Kue pada Toko Kue Artisan Online Berbasis Web<br>Author:<br>Wibowo, A.A., Widjaja, A.E, Wibowo, Tania Jovita, Suryasari<br><br>Ultima Infosys, vol. x, no. 1, 2019 | The building of a web-based system to support the ordering and design process in an online craft cake store. The use of this system helps to create order processes effectively and efficiently. The advantage of this system is that it can help the buyer to express his picture of the cake that wants to be customized using a sketch tool that is 3 dimensions that are present on the system to look more real [6]. |
| 2 | Rancang Bangun Sistem Informasi Inventory Barang Berbasis Web (Studi Kasus: PT. Nusantara Sejahtera Raya)<br><br>Author:<br>Hasanudin, M.<br><br>Jurnal IKRA-ITH Informatika Vol. 2, No. 3, 2018 | A system builds to facilitate the recording of products [7]. |
| 3 | Designing Mobile Application Interaction for School Internal Communication Using User-centered Design<br><br>Author:<br>Parahita, A.D., Lestari, D.P., Niwanputri, G.S.<br><br>IJNMT, Vol. VII, No. 1, 2020 | For future work and development, prototypes can be implemented as software and teacher-side applications for school internal communication should be designed and implemented too. A user-centred approach proved good to make a good application and should be used for future developments [14]. |

Based on the three previous research used as references in the development of the proposed system, the first and the third journal article [6][14] were used as references for the design of the system utilizing the prototype approach. The second journal article [7] was used as a reference to assist the data record process.

### III. RESEARCH METHODOLOGY

#### A. Research Object

The objects in this study were shown for MSMEs Andesta store. Andesta store is a small business conducted by individuals but not a branch of a company owned by medium-sized businesses or large businesses. This store sells a variety of office stationery, computers, musical instruments to sports equipment. Not only that, Andesta store also sells services such as document printing, document doubling, and file volumes.

#### B. Data Collection

Data collection techniques are done by conducting interviews. The use of this interview technique was chosen to collect data directly from business owners. Interviews are useful to discuss in detail about the problems in the store. The creation of this system

certainly adjusts the circumstances, needs and criteria of the business owner.

*C. System Methodology*

The method used for developing the system is prototyping. One advantage of the prototyping process is that it allows the end user to quickly gain an understanding of the system [15].

1. Analysis Stage

   Based on the results of interviews with the owner of the Andesta store, a web-based sales information system will be created to assist in the recording and storage process.

2. Design Stage

   Based on the results of the interview conducted, a prototype of the system will be designed. A design that makes it easier for store owners to have an idea of the system to be created. Once the prototyping design is complete, the store owner will provide feedback in the form of input and suggestions and system design revisions.

3. Implementation Stage

   If the prototyping designed has been approved then the next step is to implement the coding in accordance with existing needs. Tools that will be used in the creation of the system, namely CodeIgniter as a framework in the creation of the system, MySQL as a database used.

4. Testing Stage

   Once the system is complete, the system will be tested by the users. The purpose of testing this system is to find out whether the parts are not appropriate or there are still errors in the system.

5. Evaluation Stage

   If there is an error or discrepancy in the system, a repair will be made immediately.

6. System Usage Stage

   The last stage, the system is ready to be used because it is in accordance with the needs of the business owner.

## IV. ANALYSIS AND RESEARCH RESULT

Regarding the problems that have been obtained from the results of the interview, it was agreed that a system should be created in accordance with the existing needs. Table 2 details the requirements and the actor involved.

TABLE II. TABLE REQUIREMENT

| No | Requirement | Actor | Use Case |
|---|---|---|---|
| 1 | Users can enter the categories of items available in the store. | Superadmin, and admin | Category of Product |
| 2 | Users can add new entered items to store inventory and can check stock availability. | Superadmin, and admin | Product Data |
| 3 | Users record in the sale of products | Superadmin, admin and cashier | Sales Transaction |
| 4 | Assist users in obtaining detailed and accurate information about the results of availability of products, sales of products at the end of the month and year, and sales profits every month. | Superadmin, and admin | Recap List |
| 5 | Admins can create access for new users. | Superadmin | Manage User |
| 6 | Admins can monitor store developments regarding stock and sale of products based on their period. | Superadmin, and admin | Graphs |
| 7 | As a reminder to users when the inventory of goods has reached a minimum value. | Superadmin, and admin | Item Notifications |

*A. Use Case Diagram of the Proposed System*

The system modeling is done by creating the use case diagram and the activity diagram. Fig 1 below shows the use case diagram of the proposed system.
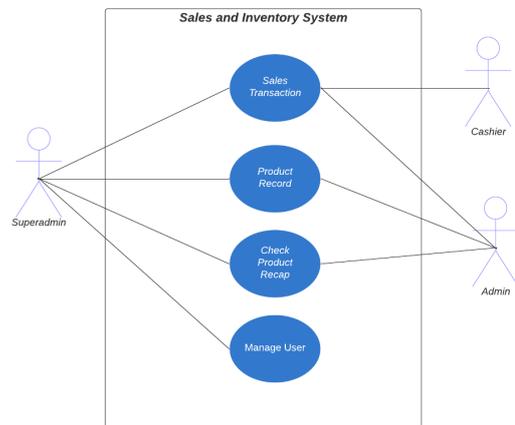


Fig. 1. Use Case Diagram of Sales and Inventory System

There are 3 actors, namely Superadmin, Admin and Cashier. There are 4 use cases in the diagram namely sales transactions, product record, check product recap, and manage user.

## B. *Activity Diagram of the System*

There are several activity diagrams created on the modeling systems. Fig 2 describes the activity diagram of the sales transaction business processes. Sales transactions will be recorded and stored in the system. The stock of products will be automatically reduced in the system and every item out will be recorded in the report. If the stock reaches its minimum value, the system will give a notification.

The process business of sales transactions begins with the user choosing the transaction menu, then the user may input the product code. Once the entire product to be purchased is entered into the transaction process then the system will print the invoice.

Fig 3 shows an activity diagram of the recap product. All transaction activities that have been carried out for several periods and stock inventory of goods, there will be recap results.



Fig. 3.   Activity Diagram of Check Product Recap

Fig 4 is an activity diagram of product record. Users can do the record of products by inputting new data or editing and adding stock of products.



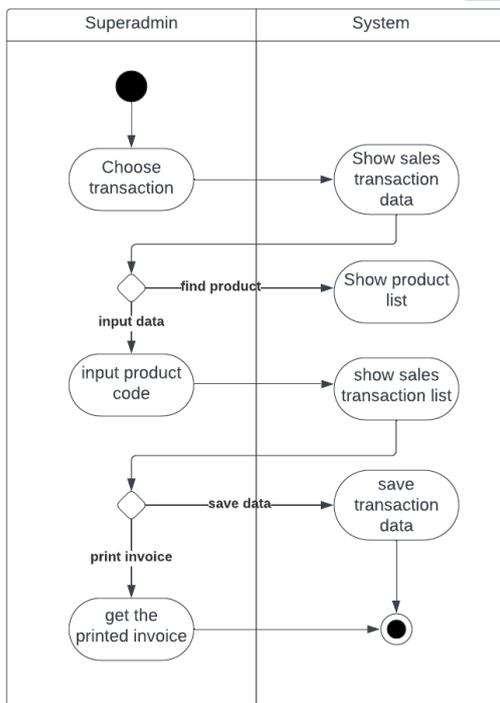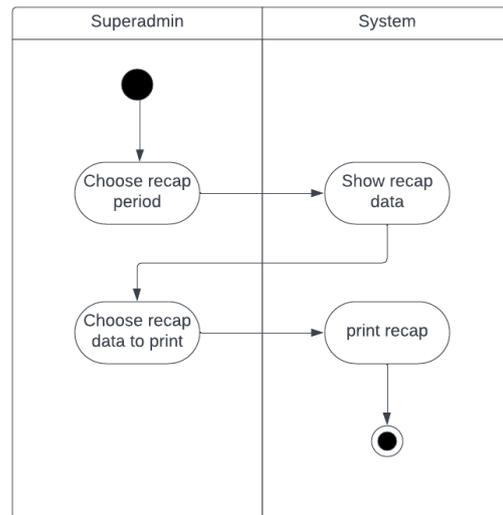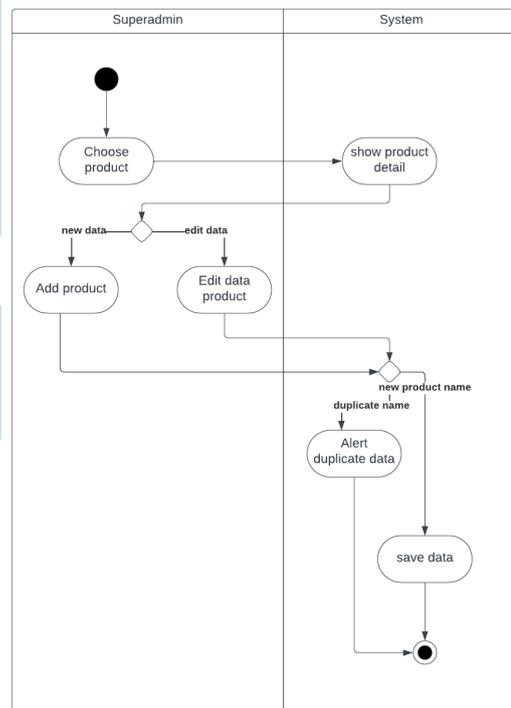Fig. 4.   Activity Diagram of Product Record



Fig. 2.   Activity Diagram of Sales Transaction

The business process of checking products recap starts with the user choosing recap period by date, by month or by year.

Fig 5 is an activity diagram of manage user. This diagram is to add new users such as admins and cashiers, it can only be done by Superadmin. Superadmin can also edit and set user account status
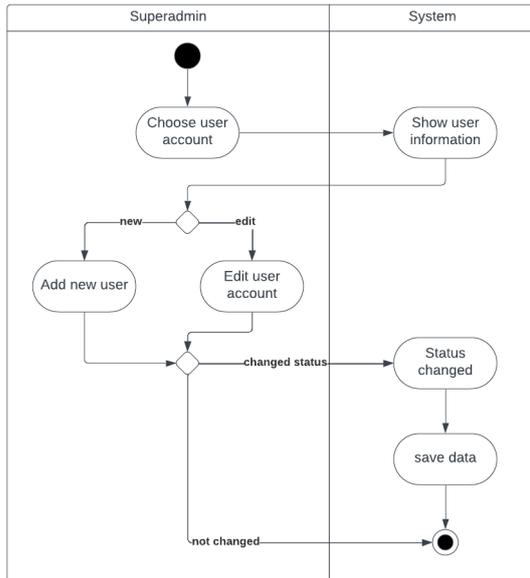
Fig. 5 Activity Diagram of Manage User

## C. User Interface of the System

There are 3 views as the result prototyping that has been designed for sales and inventory system of Andesta store. The proposed system used Bahasa Indonesia. Fig 6 is the user interfaces of transaction.
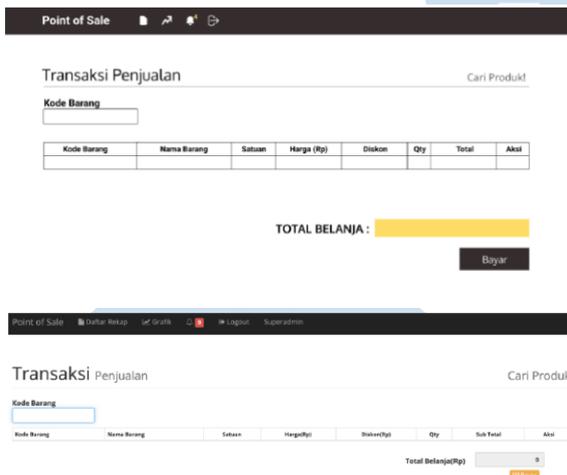


Fig. 6 User Interface of Transaction

Fig 7 below is the user interface of product. After the interface design is completed, the system prototype is tested to determine if there are still errors or bugs.
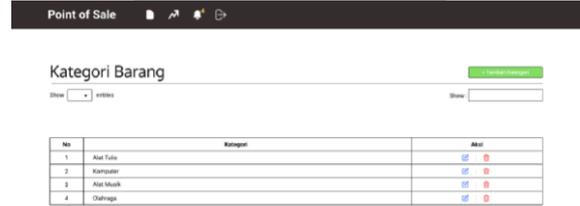




Fig. 7 User Interface of Product

## D. User Acceptance Test (UAT)

Based on the system that has been created, there will be testing of the system. System testing based on User Acceptance Test (UAT) with black-box method. The system test involved 3 user access as superadmin, admin, and cashier.

The scenario for testing included feature of transaction, product category, product, product recap, user account, and sales report graphics. Table 3 shows the summary of UAT Scenario Testing.

TABLE III.        UAT SCENARIO TESTING

| No | Scenario Testing | Functions | Results |
|---|---|---|---|
| 1 | Transaction | Search, Input product, payment, save transaction | OK |
| 2 | Product Category | Add, Edit, Delete | OK |
| 3 | Product | Add, Edit | OK |
| 4 | Product Recap | Recap, Sales recap per date, Sales recap per month, Sales recap per year, recap of profit | OK |
| 5 | User Account | Add, Edit, change status, Delete user | OK |
| 6 | Sales Report Graphics | Sales graphics, sales per date, sales per month, sales per year, | OK |

From the testing results can be concluded that all the functions already runs well and ready to be implemented.

## V. CONCLUSION

This research is accomplished by developing several solutions in accordance with the determined objective of the research. According to user requirements, a web-based system for recording sales and inventories has been successfully developed. There are notifications on the inventory feature that might provide information about the minimal stock availability. The system can also generate sales reports and inventories based on the desired period.

There are various potential developments for the proposed system. Adding a function for recording

supplier information and shipping transactions is one option.

## ACKNOWLEDGMENT

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