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DESIGN OF POINT OF SALES AND MEMBERSHIP INTEGRATION MODEL IN A CAMPUS BUSINESS UNIT AT POLITEKNIK NEGERI MANADO

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Abstract

Campus business units have great potential to become innovative business laboratories. By adopting advanced information technology, campus business units can develop unique business models that are relevant to market needs. Therefore, there is a need for innovation and business strategies that enable to compete with similar business. One strategy that can be implemented is to integrate the product database with the creation of a membership program for customers.
This research employs a prototyping approach for system development. This method divides the system into several stages that are directly implemented as models. The prototype is designed through use case diagram and activity diagram of each actor that involved in the process.
As a result, a proposed design is able to control 6 control components, namely: Business Unit Admin, UPT Admin, Cashier, Shopkeeper, and Customer. On the other hand, the integration between the Point of Sales System and Membership can be seen in the key activities of customers and cashiers, where both parties will collaborate in controlling the transaction status, showing availability of special offers for members in the form of points or discounts, and calculating the appropriate offers for the completed transactions.

Keywords *Campus Business Unit, Point of Sales, Membership*

INTRODUCTION

In today's digital era, data management has become increasingly crucial for the sustainability of any business, including campus business units. Campus business units often have a large amount of data, ranging from product data, customer data, to transaction data. However, this data is often scattered across various unintegrated systems. This makes it difficult to access, analyze, and utilize data effectively.

Campus business units have great potential to become innovative business laboratories. By adopting advanced information technology, campus business units can develop unique business models that are relevant to market needs. Therefore, there is a need for innovation and business strategies that enable to compete with similar business competitors in the area around the campus.

One strategy that can be implemented is to integrate the product database with the creation of a membership program for customers. This is one example of the application of information technology that can be done by campus business units. Through data integration, campus business units can optimize product management, improve customer satisfaction, and develop effective loyalty programs. The integration of product and membership databases becomes a relevant solution to address this problem. By integrating these two databases, campus business units can obtain a more comprehensive picture of their business activities, so that they can make better decisions and improve operational efficiency.

The integration itself is utilizing a Point of Sales (POS) system and a customer database. A Point of Sales (POS) system is a system used to record individual sales transactions. A POS system typically consists of a cash register, which is not a standalone device but rather includes hardware such as a computer, receipt printer, payment terminal, barcode scanner, mini printer, and software components such as inventory management, reporting, purchasing, sales, and transaction security standards (Wahyudi et al, 2018). These components work together to facilitate the sales transaction process. Meanwhile, a customer database is a comprehensive collection of organized information about individual customers or potential customers that is currently accessible and can be used as a basis for marketing activities such as lead generation, lead qualification, selling products or services, or customer relationship management (Micheaux & Bosio, 2019). The customer database in this study refers to customers who have registered as members of the campus business unit and will subsequently enjoy various benefits from their member status when making transactions.

Politeknik Negeri Manado or Polimdo is one of the leading vocational campuses that is actively forming several teaching factories which can also function as business units, including: Caffe Polimdo, Galeri Investasi, Polimart, Tax Centre, Barbershop and Beauty Salon. The existence of these Teaching Factories is managed by each department and is directly monitored by Polimdo's Entrepreneurship Centre or *UPT Kewirausahaan*. However, in its implementation, the administrative performance of these business units is still less than optimal, including the lack of

a well-managed product database system, marketing activities that are still not directed and only focus on specific target markets, and a lack of coordination between the management and UPT often makes operational activities only run on their own without any good control mechanisms. By creating this integration design, it will not only help managers monitor the progress of each business unit but also facilitate operational activities and improve the sales performance of each business unit.

This research aims to design a product database and membership integration model that is specific to campus business units at Politeknik Negeri Manado. This model is expected to be a reference for other campus business units that want to improve their business performance through the utilization of information technology.

LITERATURE REVIEW

Product Database

A database is a software application used to store and manage data that will be processed on a webpage. Databases are often referred to as Database Management Systems or DBMS, which are applications that serve as an interface between users and the data within a database system. By using a DBMS, users can quickly process and manipulate data (Rudyanto. A, 2011).

A product database is an organized and structured collection of data containing comprehensive information about products sold by a company. This information can encompass various aspects, ranging from product name, description, price, category, to technical specifications and product images (Elmasri and Navathe, 2016)

Point of Sales

A Point of Sale (POS) system is a computerized system used to record sales transactions at the point of purchase. It consists of a cash register, barcode scanner, and other hardware components, and is used to calculate the amount of a sale, to issue receipts, and to collect payments (Herdiansyah, et. al, 2021). In other words, A point-of-sale (POS) system is a tool used to complete sales transactions, it enables businesses like stores, hotels, restaurants, supermarkets, and retail outlets to process customer purchases (Mulyana and Rusmawan, 2023).

Customer Database

A customer database is a comprehensive, organized collection of information about current and potential customers. This data can be accessed and used to support marketing activities such as lead generation, lead qualification, sales, and customer relationship management. Database marketing involves building, maintaining, and utilizing customer databases, as well as other databases (such as product, supplier, and reseller databases), to conduct transactions and build customer relationships (Chalmeta in Mandal, 2022).

Administration in Business Activities in the Digital Era

The field of administration, as a decision-making process in an organization, involves the activities related to how an organization processes and analyzes information. Initially, the advancement of information technology focused on data, including data collection, storage, transmission, and presentation. However, today's technology advancement places more emphasis on the information contained within the data. Furthermore, the use of administration with the aid of technology can integrate all the processes within an organization to produce faster and more organized output.

METHODS

Research's Thinking Flow

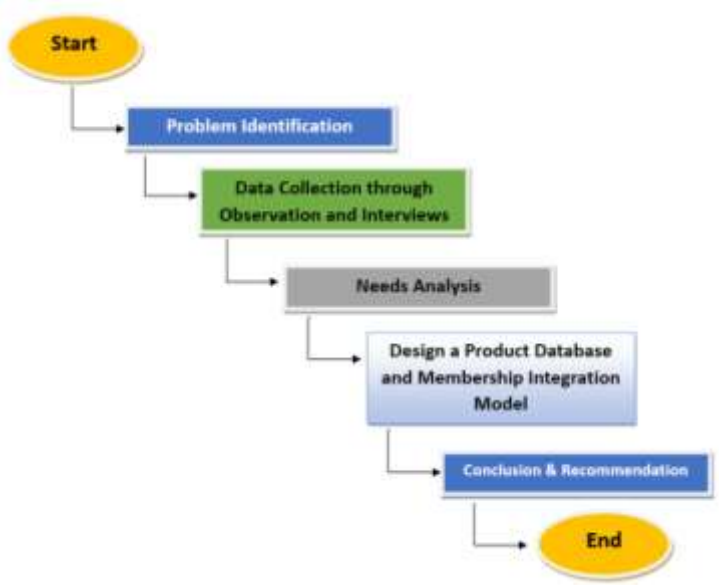

Figure 1. Research Thinking Flow

Compliation Sources by Researcher, (2024)

This article presents an analysis and design of a Point of Sale (POS) system integrated with a customer database of registered members. This research employs a prototyping approach for system development. This method divides the system into several stages that are directly implemented as models, eliminating the need to wait for the entire system to be completed. The prototype is designed to accommodate changes to refine the existing model, thus providing users with a better understanding of the system's functionality (Bere et al, 2023). In prototype development, various data collection and analysis methods are employed to ensure that the design or system model adequately meets the requirements, refer to Figure 1.

The explanation for each research flow in Figure 1 is as follows:

1. Problem identification.

Researchers identified problems occurring in several business units at Politeknik Negeri Manado, specifically in the retail and service area. To determine the research topic, the researchers found the following problems: still using manual systems such as notes, notebooks, and Microsoft Excel, making it difficult to record sales transactions, errors in nominal values when creating invoices, incomplete customer data, inventory that does not match the real condition, theft, double work, difficulty in knowing income and expenses. In addition, the increasing number of customers is not balanced by a well-documented customer database, and there is a need to conduct customer retention.

2. Data Collection
   Data collection was conducted through interviews with the business unit managers and and the head of Polimdo's Entrepreneurship Centre or UPT Kewirausahaan. Also, collecting product data to be organized into a structured database. Additionally, a literature review was conducted to explore the research problem.
3. Needs Analysis
   A thorough analysis of the existing manual system was conducted, followed by a detailed analysis of the system requirements. The findings from interviews were used to identify specific problems at business units at Politeknik Negeri Manado to propose suitable solutions.
4. System Design
   The system was designed using visual modeling techniques, including Use Case Diagrams and Activity Diagrams.
5. Conclusions and Suggestions
   After all the design process is complete, the last process is to make conclusions and suggestions that can be taken from this research.

RESULT AND DISCUSSION

Designing System

In the design of the system, several stages are carried out including modeling of the system created such as (flowchart), data flow diagrams and other forms of modeling, such as database tables and creating database relationships. Below is a draft use case diagram of the actors involved in the model.

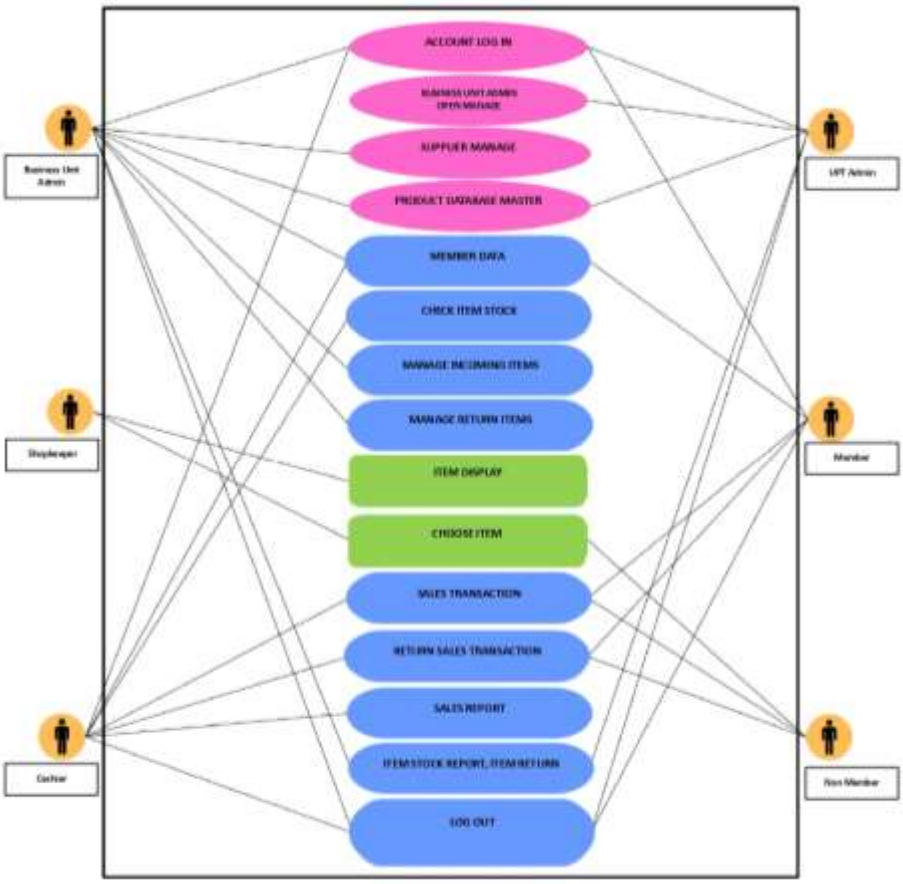

Figure 2. Use Case Diagram
Compliation Sources by Researcher, (2024)

Use case diagram shows the relationship between various actors and functions in a system. This use case diagram has 6 actors, including Business Unit Admin, UPT Admin, Shopkeeper, Cashier, Member, and Non-Member, where each actor has a relationship with system functions such as login, manage business unit admin, manage suppliers, master product data, member data, view stock, manage incoming goods, manage product returns, display products, sales transactions, sales return transactions, sales reports, stock and product return reports, and logout. The main interactions between actors and system functions are as follows:

1. UPT Admin interacts with login, manage business unit admin accounts, view master product data, receive all reports, and logout.
2. Business Unit Admin interacts with login, manage suppliers, view member data, manage incoming goods, manage product returns, stock and product return reports, and logout.
3. Cashier interacts with login, sales transactions, sales returns, add members, view stock, daily sales reports, and logout.
4. Shopkeeper interacts with displaying products and selecting or searching for products.
5. Member interacts with login, view their member data, then logout, make purchase transactions, and select products.
6. Non-member interacts with selecting products and making purchase transactions.

Activity Diagram

After identifying the parties involved in the model, an activity diagram is drawn up to determine the activities carried out. Below is the overall activity design for the integration of the point of sales system with members in the business unit at Politeknik Negeri Manado.

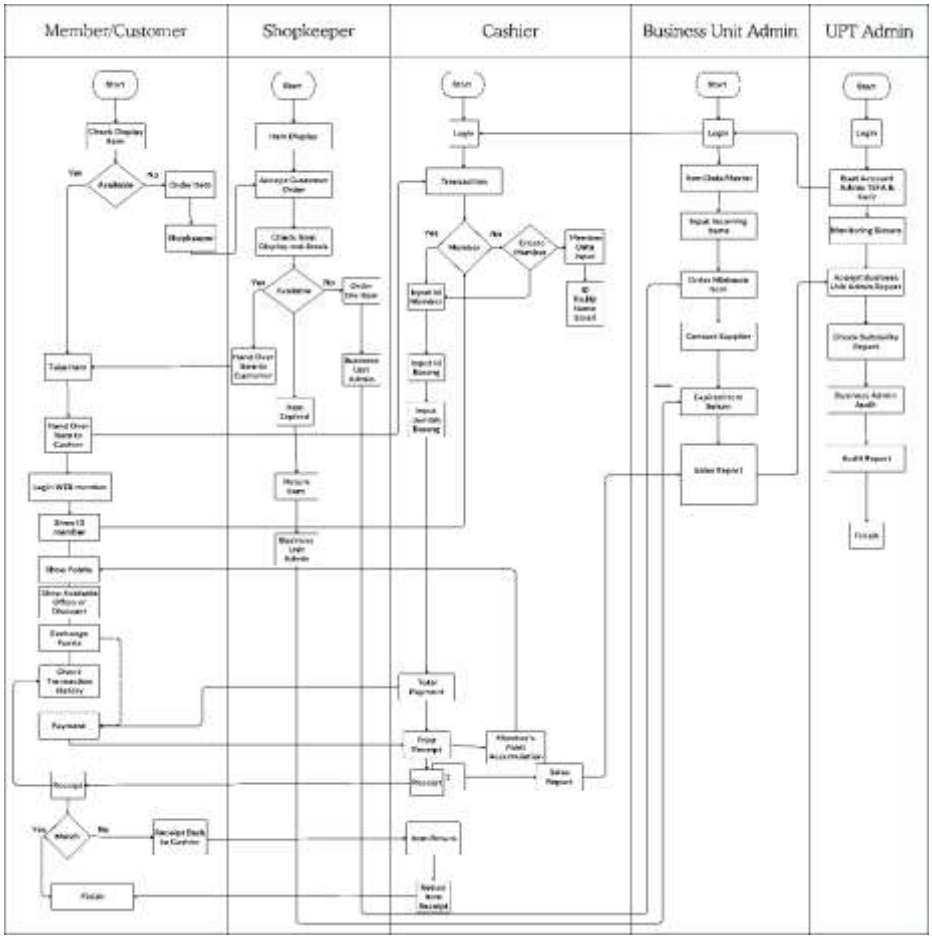

Figure 3. Overall Activity Diagram

Compliation Sources by Researcher, (2024)

This activity diagram graphically illustrates the workflow or activities within a system. It depicts how a process or system operates from start to finish, showcasing the interactions between various actors or roles involved in the process. Here's an explanation of the activity diagram based on the diagram above:

1. All business processes originate from the customer. Customers begin by browsing the displayed items. If they find a desired item that is available, they will take it and bring it to the cashier for payment. However, if the item they are looking for is unavailable, they will seek assistance from a salesperson to find it. For members, there is an additional activity: point checking. After the salesperson handles their order and ensures product availability, the customer returns to the previous step, taking the item and proceeding to the cashier for payment. This process ensures that customers get the desired items, even if they may need to wait while the salesperson searches for stock.
2. The shopkeeper serves as a crucial intermediary between the buyer and the products sold. They ensure that all items are displayed correctly and neatly. When customers seek assistance or order items, the salesperson checks the availability of the stock on display or in the warehouse. If the item is available, the salesperson directly gives it to the customer. The salesperson places orders for unavailable items and must handle returns of expired or unsalable items by contacting the Business Unit Admin for further processing.
3. The cashier has the primary responsibility for transaction processes. After logging into the system, the cashier is ready to serve sales transactions. If the customer is a member, the cashier enters the member's ID; otherwise, the cashier creates a new member account for the customer by inputting personal data such as ID, phone number, name, and email. Then, the cashier enters the item ID and quantity purchased into the system to calculate the total payment. The cashier processes the payment, prints a receipt, and hands it to the customer. The cashier must ensure that the payment and receipt are correct. If there is any discrepancy, the cashier performs a sales return to complete the transaction.
4. The Business Unit Admin is responsible for stock management and ordering. After logging in, the Business Unit Admin manages the master product data, inputs new incoming items into the system, and monitors low stock items for reordering from suppliers. The admin also handles returns of expired or unsalable items. Each month, the Business Unit Admin creates a monthly report that includes information on sales profit, returns, stock, member data, and supplier data.
5. The UPT Admin has an oversight and auditing role. After logging in, the UPT Admin creates accounts for the Business Unit Admin and cashier, ensuring they have the necessary access to perform their duties. The UPT Admin also collects the overall system, receives reports from the Business Unit Admin, and verifies the accuracy of those reports. Process audits are conducted to ensure that all procedures are followed correctly and there are no deviations. After the audit, the UPT Admin compiles a report and sends it to relevant parties. The UPT Admin is responsible for ensuring that all operations run according to established standards and regulations, and making improvements if any issues are found."

Activity Diagram Integration of Point of Sales and Membership

The proposed integration of the point of sales and membership system that will be developed in optimizing the business unit can be seen in the figure below:

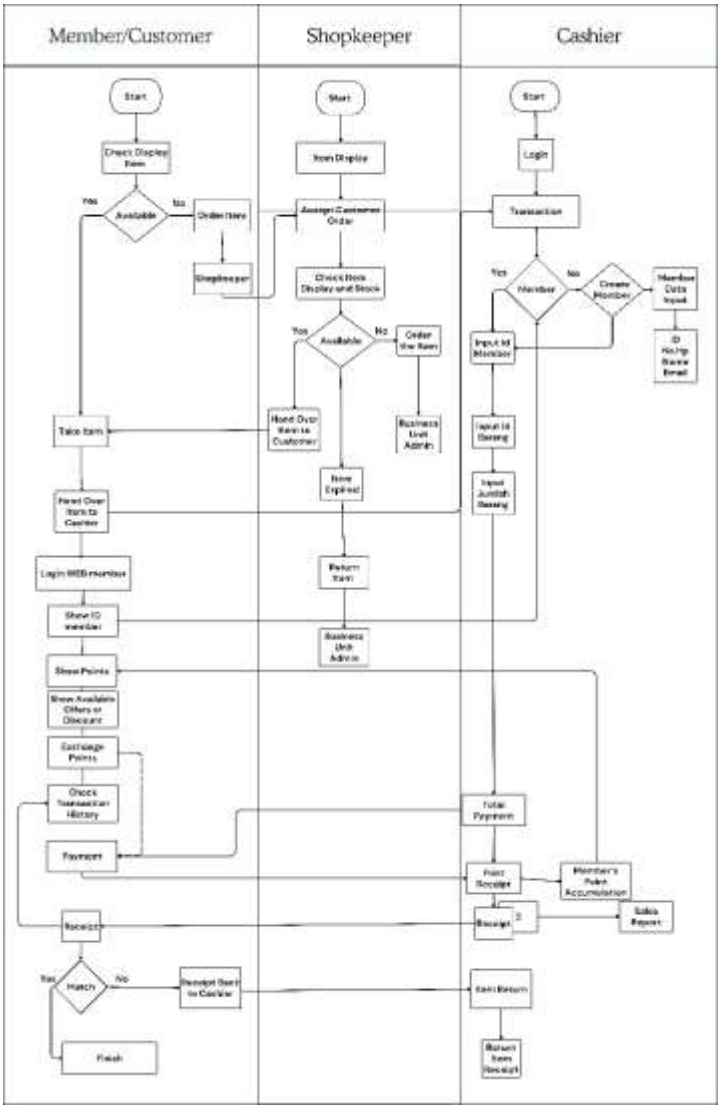

Figure 4. Optimizing Point of Sales and Membership Activity Diagram
Compliation Sources by Researcher, (2024)

As shown in the figure above, the integration of point of sales and membership systems can be seen in the key activities of customers and cashiers, which are described as follows:

1. Customer Members, can earn points and or discounts or other offers from every transaction made.
2. Cashier will input member data, input item id, input the number of items and will display payment calculations according to offers that can be applied to each transaction.

CONCLUSION

Based on the discussion conducted by the author, the following conclusions can be drawn:

1. Overall, this design offers a comprehensive and efficient system for managing sales operations, ranging from inventory management, sales transactions, supervision, and audits to integrating the point-of-sales system with customer retention strategies through special offers for members.
2. The system control is able to control 6 control components, namely: Business Unit Admin, UPT Admin, Cashier, Shopkeeper, and Customer. The clear division of roles and structured workflow ensure that each process runs smoothly and all actors can collaborate well to achieve business objectives.
3. The integration between the Point of Sales System and Membership can be seen in the key activities of customers and cashiers, where both parties will collaborate in controlling the transaction status, starting from the availability of special offers for members in the form of points or discounts, and the cashier can calculate the appropriate offers for the completed transactions.

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