

SYSTEM DESIGN DOCUMENT TEMPLATE

**PROJECT : (HANNAH PR) SALE
MANAGEMENT SYSTEM**

About the System Design Document

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1. Introduction

1.1 Purpose of the system

The purpose of this system is to provide an all-in-one-system that will handle sale management for this store. This system will handle the calculation sale of records in a run-time for the company. Users should be able to review the information given the correct authorization. Additional features include adding,delete,sorting, and updating. Users will have a role such as the owner of the company and the current employee in the store. Depending upon the role and authorization, this user will have access to certain features.

1.2 Design Goals

Performance :

In terms of response time, our Sale Management System (SMS) should be able to handle all requests from users such as inserting new data of receipt of customers, update the sale records and logging in. The throughput of the system will be high with the help of load balancing. This system should be able to calculate the sale records in a run-time and according to the user specification.

Dependability :

Sale Management System (SMS) will be able to survive invalid user input by displaying notification or warning messages to users when the result of the sale records having any loss. The Sales Management System (SMS) will also be reliable as it will only deliver related results as requested by the users. The availability of this system to run in a run-time, easier for users to get a real-live update of the sale records.

Cost :

The development cost and other costs for this system such as development, upgrade,maintenance and administration cost will be covered by ourselves. However, this system will use an existing system such as JavaScript,MySQL and others. Therefore, the cost expense of this system is almost none.

Maintenance :

Sales Management System (SMS) will be easy to modify as long as the developers have the knowledge of JavaScript,MySQL and some other programming languages. This system should be able to run on any platform such as computer and mobile devices with the presence of the internet. Besides, the Sale Management System (SMS) should implement all functional requirements listed in a requirements analysis document to facilitate traceability of requirements.

End User Criteria :

This Sale Management System (SMS) proposed contains functions that are requested by the stakeholders. To increase the user's utility and usability to our system, the Sales Management System (SMS) will display a user interface that is friendly,reactive and scalable.

1.3 Definitions,acronyms,abbreviations

- SMS : Sale Management System
- CS: Computer Science
- MVC: Model - View - Controller
- SDD: System Design Document
- RAD: Requirement Analysis Document
- DBMS: Database Management System
- API: Application Programming Interface

1.4 References

References	References' Location	Date
Sales Management System Report	https://www.researchgate.net/publication/360928926_Sales_Management_System_Project_Report	31/10/2020

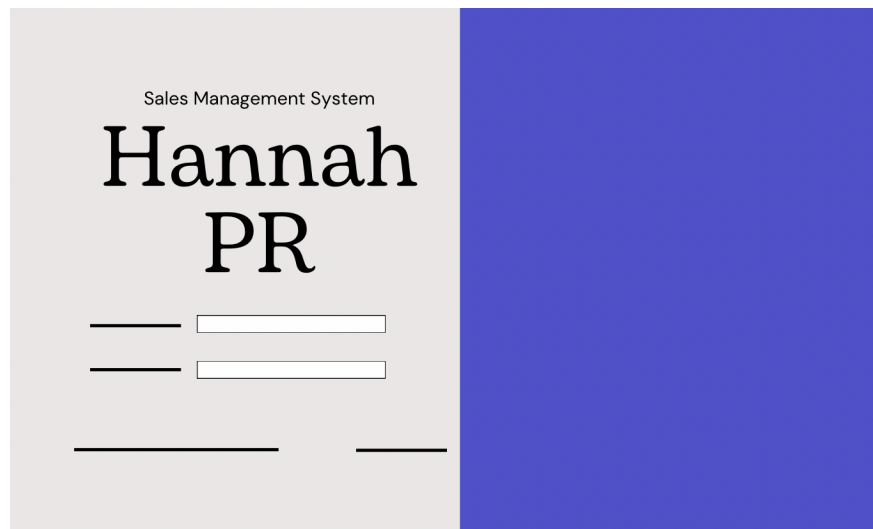
1.5 Overview

This document was constructed to facilitate comprehension of the Sale Management System (SMS) and it's inner workings. These documents will aid development of the system and provide a well structured blueprint of the system.

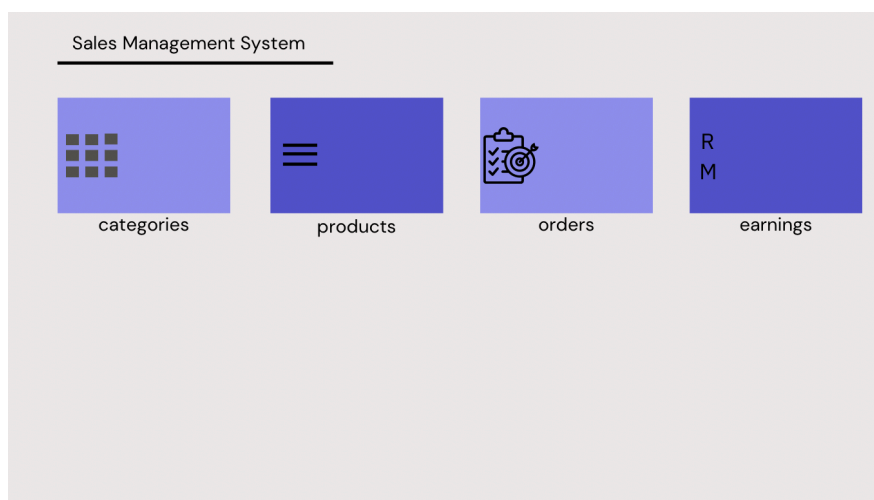
This document we will break down the many aspects of the Sale Management System (SMS) . First we will explore the current software architecture, and then to the proposed software architecture. However, this document will break down the subsystems, hardware and software mapping used in the system, data management, access control and security, and global software control. Finally this document will discuss the subsystem services provided by the Sale Management System (SMS) .

2.0 Storyboard

A good user interface's ultimate purpose is to make the user's interaction as simple, straightforward, and efficient as feasible. In this Sale Management System, user-friendly interfaces are a critical component of the user experience, and they can have a significant impact on a website's performance and, as a result, sales.



2.1 Log in page (manager, seller)



2.0.2 Seller dashboard

Category

2.0.3 Manage category of products

Product

2.0.4 Manage product

[illegible]

2.0.5 Manage order

Order

2.0.5 Manage customer information of order

3. Proposed Software Architecture

Hannah PR Sale Management System (SMS) is a web-based system that was developed to help the owner of Hannah PR, the employees and the accountant to store, update, delete, add and view the recorded data for Hannah PR. The main purpose of the Sale Management System is to store the physical recorded data such as the items record and the receipt into a safest way. The Sale Management System (SMS) could guarantee a better storing method for Hannah PR in the future.

The Sale Management System (SMS) was divided into some functions, such as the categories functions, product function and orders functions and staff management. Besides, the user can view the total earnings at the home page of the website. The categories and product functions have the same functions, the user can view, delete, update and add new categories and products in the system. The orders function has a function for the receipt record, the employee will insert a new record or ordering to the system. The recorded earning list will be reviewed by the accountant that works under HannahPR owner, Miss Lee Chai Chin to calculate any shortage in the sales. This earning list will be shown by day, which is easier for the accountant to track any shortage based on the days. Therefore, the Sale Management System (SMS) is a suitable approach for storing data for Hannah PR.

3.0 Client/Server Architecture

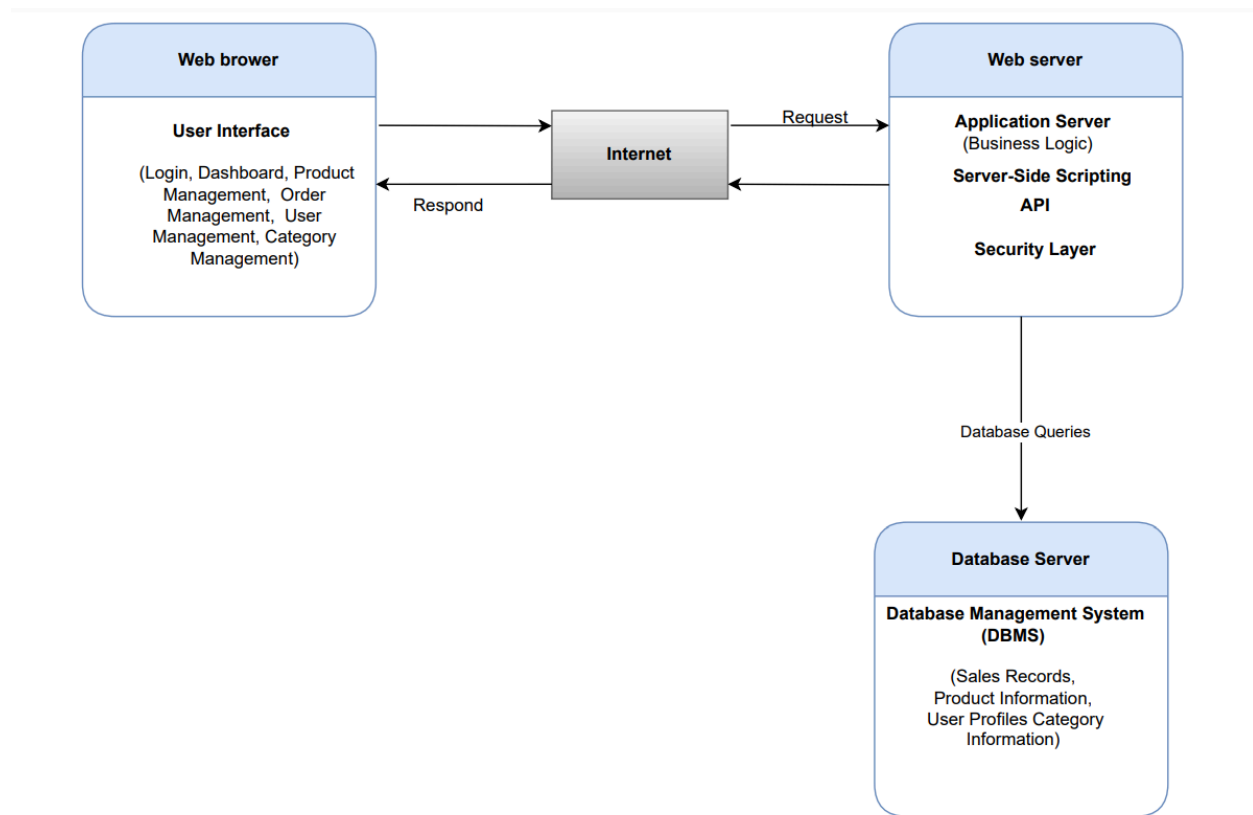


Figure 3.0 Client/Server Architecture

From Figure 3.0, the client-server architecture showed a client and server side of architecture as the representation of the Web Server (User Interface) to Database Management System (DBMS) through an internet and Web Server (Business Logic). The figure shown on the client server, that is represented by Web Browser, Sales Management System (SMS) that will be interacted with by the user to request an action from the website to the Web Server (Business Logic). The Web Server (User Interface) consists of functions, product, categories, order, earning and staff. Each of these functions have a specified action that the user can interact with such as add, delete, update and view.

The Web Server hosts the Application Server, which contains the business logic of the system including the server-side scripting, API and security layer. This Web Server will act as a generator between Web Server (User Interface) and Database Server (My SQL). The Database

Server (MySQL) acted as a storage for storing all data added, deleted and updated from the Sales Management System (SMS). The Internet serves as the communication medium between the client-side and server-side components, enabling HTTP requests and responses to be exchanged between the Web Browser (User Interface) and the Web Server (Business Logic). When a user requests an action from the Web Server (Business Logic), the Application Server will request from a Database Server (MySQL) to perform database queries and retrieve or update data stored in the Database Management System (DBMS).

3.1 Overview

Our proposed system makes use of frameworks and APIs such as Angular. ASP Net Core, Entity Framework, RESTful/API, and ASP . NET Web API. API which stands for application programming interface which allows communication between different software and components to transfer their data (*What Is an API? #Api #Postman*, n.d.). A Model View Controller(MVC) architecture will be used as the model layer for our web-based application. This model layer is responsible for handling the data and allows the user to retrieve, insert and update information in the database through the controller. The view layer is the user interface that will be interacted with by the users and the data from the model layer will be displayed through this layer. Moreover, the controller layer acts as a medium for the model layer and view layer to process the HTTP request and generate the web application.

3.2 Subsystem Decomposition

The Sales Management System consists of some functions, such as categories, product, orders earning and staff. Each of these functions have a specified task that can be interacted with by the user. Firstly, the Category functions are responsible for storing the category of items in the store such as toys, shoes, bags and others. The data in the Category can be modified by the user by updating, deleting and adding new categories to the system. The Category data are stored with category_id and category_name. This data can be added, deleted and updated by the user.

Next, Product functions that also have the same responsibilities like Category functions. The Product functions will store all items and products from the HANNAH PR. Besides, these Product functions will be stored according to their category such as a dragon plushie will be in the toy category, sandals will be in the shoes category and others. This storing is easier for the

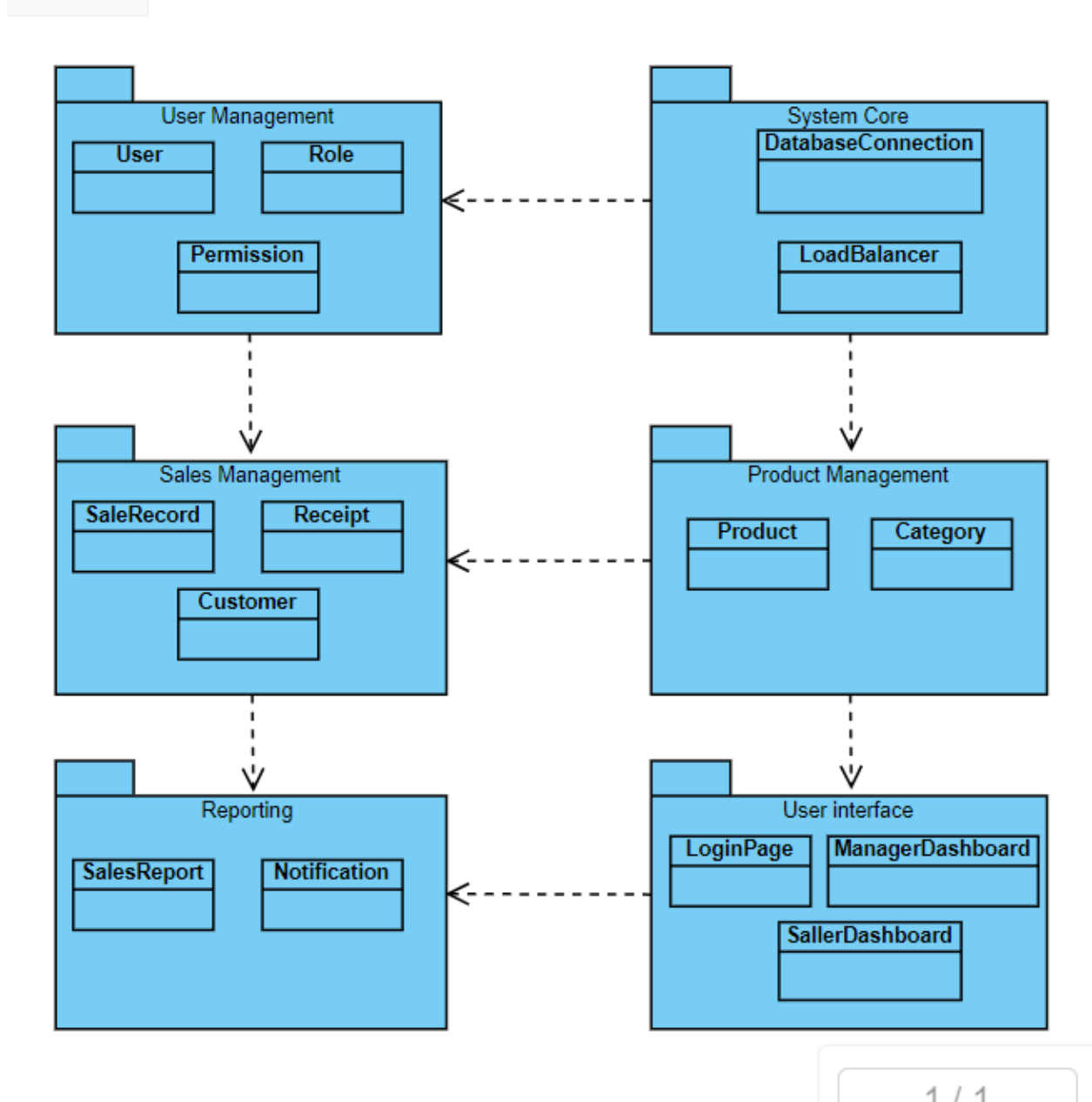
user to search and update the data in the Product. The Product was stored with product_id, product_name, cateory_id, price and category. This data can be modified by the user and will be updated to the Database Management System (DBMS).

Thirdly is Order, responsible for listing the sale of records by the day into the system. This Order will store the list of items bought by customers daily. This function should be updated frequently to ensure no mistype and missing data of order daily. The data that needed to be added into the Order is product_id, order_date and total_price. This data can be modified by the user and be viewed after the data is completely added into the Order.

Fourthly, Earning is a generated list order entered by the user from Order. Earning will display a total earning from all the sales in HANNAH PR and the recorded sale from Order. The users can view the earning list by day from the Earning. The data from Earning, earning_id, date and total can help the accountant of HANNAH PR to review the generated list earning and calculate the profit and any shortage from the sale daily record

Lastly, Staff, the manager of HANNAH PR are responsible to allow an accessible and authorized user to access the Sales Management System (SMS). The manager needs to enter the staff_id, username, email, role, hire_date and dismissial_date into the Staff to be recorded as the authorized user into the system. The manager can edit, add and delete the data form Staff and control the security of the system from unauthorized users.

3.2.1 Package Diagram



3.2.1 Figure of Package Diagram for Sales Management System

DESCRIPTION

The system encompasses various components to handle different functionalities effectively. The User Management module is responsible for all user-related operations such as authentication, authorization, and profile management. It involves key classes like User for managing user details and authentication, Role for defining user roles and permissions, and Permission for managing specific permissions assigned to roles.

The Sales Management module deals with sales-related activities, including recording sales transactions, generating receipts, and maintaining customer information. Essential classes in this module include SaleRecord for recording transaction details, Receipt for generating and managing receipts, and Customer for handling customer information.

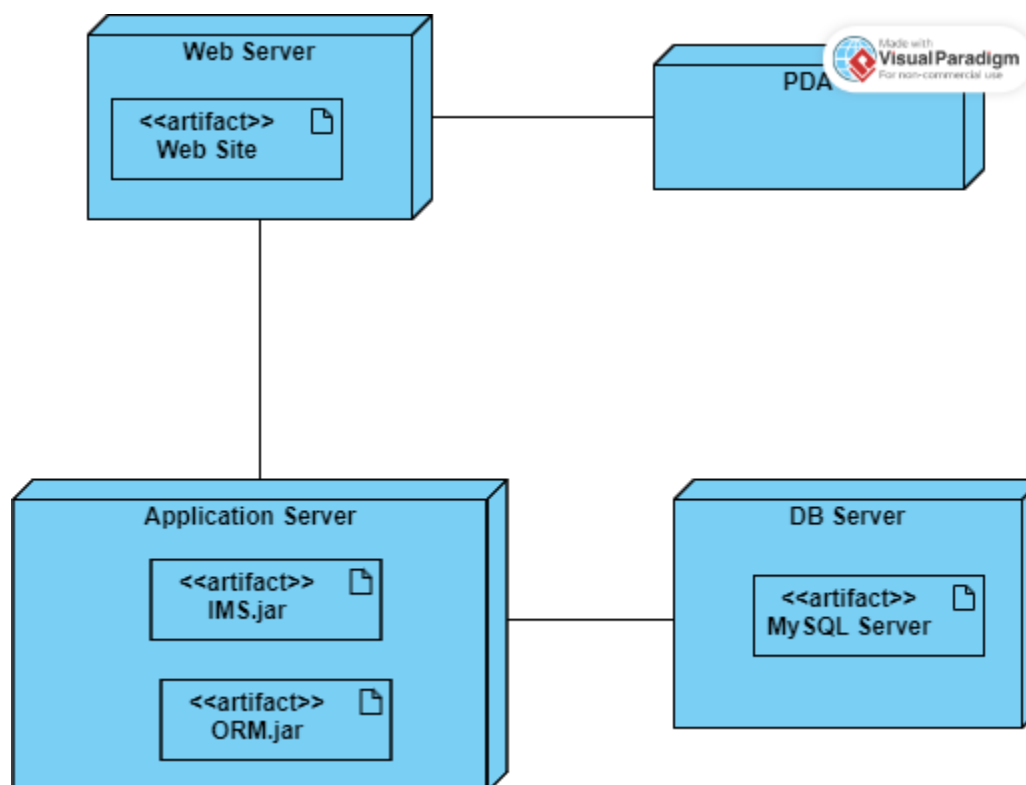
The Product Management module focuses on managing products and categories, including adding, deleting, and updating products. Key classes in this module are Product for managing individual product details and Category for handling product categories.

The Reporting module generates reports based on sales data and manages user notifications. It utilizes classes such as SalesReport for generating reports and Notification for managing alerts and notifications.

The System Core module provides essential functionalities such as database connections and load balancing to ensure the system's efficient operation. This module includes classes like DatabaseConnection for managing database connectivity and LoadBalancer for distributing load across servers.

Lastly, the User Interface module manages the user interface components, including login pages and dashboards for different user roles. Crucial classes in this module are LoginPage for managing the user login interface, SellerDashboard for providing a dashboard for sellers to manage sales and products, and ManagerDashboard for providing a dashboard for managers to oversee sales and user management.

3.2.2 Deployment Diagram



Components:

The components in the deployment diagram are client devices which are web browser and PDA, web server and SQL Server. The web browser represents users accessing the web application via a standard web browser on a desktop or laptop. The PDA (Personal Digital Assistant) represents users accessing the web application via a handheld device, typically with a smaller screen and limited processing power compared to a desktop.

The web server is the central component that responsible for handling user requests, processing data, and serving web pages. The web server hosts several critical components like user login, dashboard, order management, user management, category management and product management. Lastly, the sql server which is the DBMS that represents the database management

system where all data related to users, orders, products, etc., is stored. The web server interacts with the SQL server to query and update data as required.

3.3 Hardware/Software Mapping

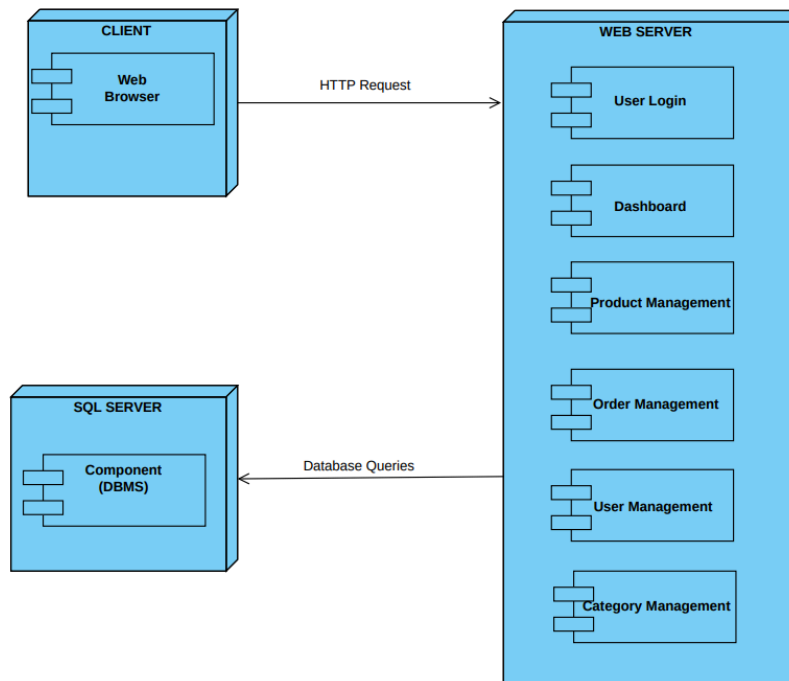


Figure 3.3 Hardware/Software Mapping

The Hardware and Software Mapping is about identifying all interaction and dependency that make up the application including the interaction and relationship between each other (Application Mapping: Benefits, Challenges, and Technologies, n.d.) . Figure 3.3 shows the Hardware and Software Mapping for the Sales Management System that consists of the client, Web Server and the SQL Server. The client server is a web browser of Sales Management System (SMS) that will interact directly with the user. When the user requests a https to open to the browser, an interface of the Sales Management System will be displayed.

The interface will display various functions that users can interact with such as User Login, Dashboard, Product Management, Order Management, Category Management and User

Management. The User Login is responsible to identify the authorized user to login and enter the system. The user authentication will be extracted from the data queries, SQL Server to check the authority of the username and password entered by the users. When the user successfully enters the system, a Dashboard will be displayed with Product Management, Order Management, Category Management and User Management. The user can freely interact with the web browser and any request made by the users will be updated to the Database Management System (DBMS) in the SQL Server.

3.4 Persistent Data Management

For persistent data management, a relational database created by MySQL will be used as the database management system (DBMS) of the Sales Management System (SMS). This database is used to store all data related to the SMS, including user information, product management, sales management, and orders management. SMS shall implement some authentication mechanism for access to the database. The following figure shows the relational database schema of the SMS.

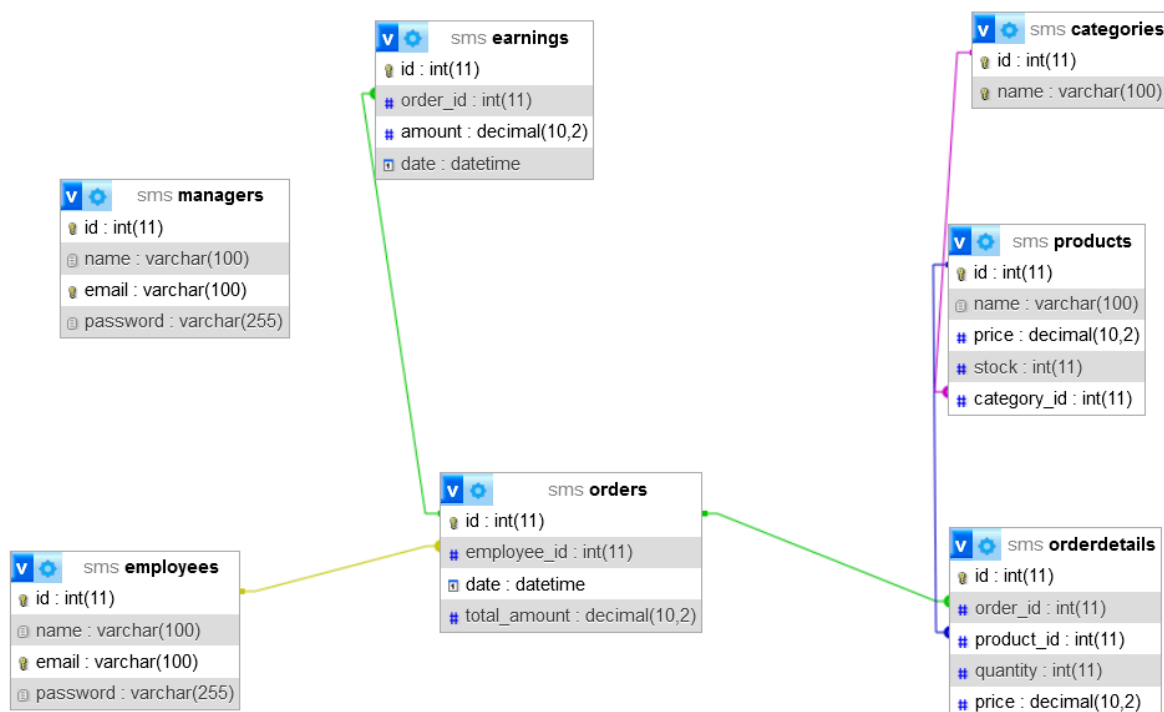


Figure 3.4: Class diagram

3.5 Access Control and Security

Actors	Privileges
Manager	<ul style="list-style-type: none">• Register users• Delete users• Assign roles• View earning• Edit profile
Employee	<ul style="list-style-type: none">• Manage product information• Manage categories• Manage orders• Edit profile
Accountant	<ul style="list-style-type: none">• View earning

Required Login

In order for an user to gain access and utilize the system they must first login to the system using valid credentials.

Data Encryption

Delicate data will be encrypted using SHA512 hashing.

4. Subsystem Architecture

The subsystem architecture is a flow of work process from the system (*IBM I 7.2*, n.d.). A subsystem architecture will show a dependency of each process in the system. Each subsystem can run a unique operation. The Sale Management System (SMS) consists of 5 subsystems: login, manage product, manage staff, manage order and manage total earnings. All of these have their own unique operation that can be interacted with by the users.

4.1 Subsystem Services

User Interface

The User Interface will be the bridge between users and the services of the subsystems

Login

In order for a user to utilize the system, first they must prove that they have access to the system through the Login subsystem. Only an authorized user can access through the system. When the user enters an incorrect username or password, the system will display an error message to the user indicating a wrong username or password. The data of username and password will be validated from the database to ensure only authorized users access the system.

Manage Product

The users can modify the data inside the product management by adding, deleting and updating the list of products in the system. Each modification of adding, deleting and updating will be updated to the database and the system will display a message indicating a successful modification to the user.

Manage Staff

The managers are responsible for the authorization of the user through the system. The manager which is the admin of the system can update, delete and add a new staff or user that can access through the system. The modification of managed staff will be updated to the database server and the system will display a message indicating successful modification on the staff management/. From the modification, the system will only allow an authorized user to successfully access through the system from the login subsystem.

Manage Order

The users can update the order in the system by adding a new order in the order from. A new order list will be displayed as the users click on the save order button from the interface.. A message will be displayed indicating a successful update and addition of order into the system and the data will be updated to the database server. The users can also modify by deleting and editing an existing list order in the system.

Manage Total Earning

The meaning total has a dependency from the order list updated the user, each total order will indicate an increment and decrement of the total earning in the system. The total earning will be listed out by day to ensure an easier review by the accountant to calculate the profit and any shortage from the sale of the day.

4.2 UML Diagram

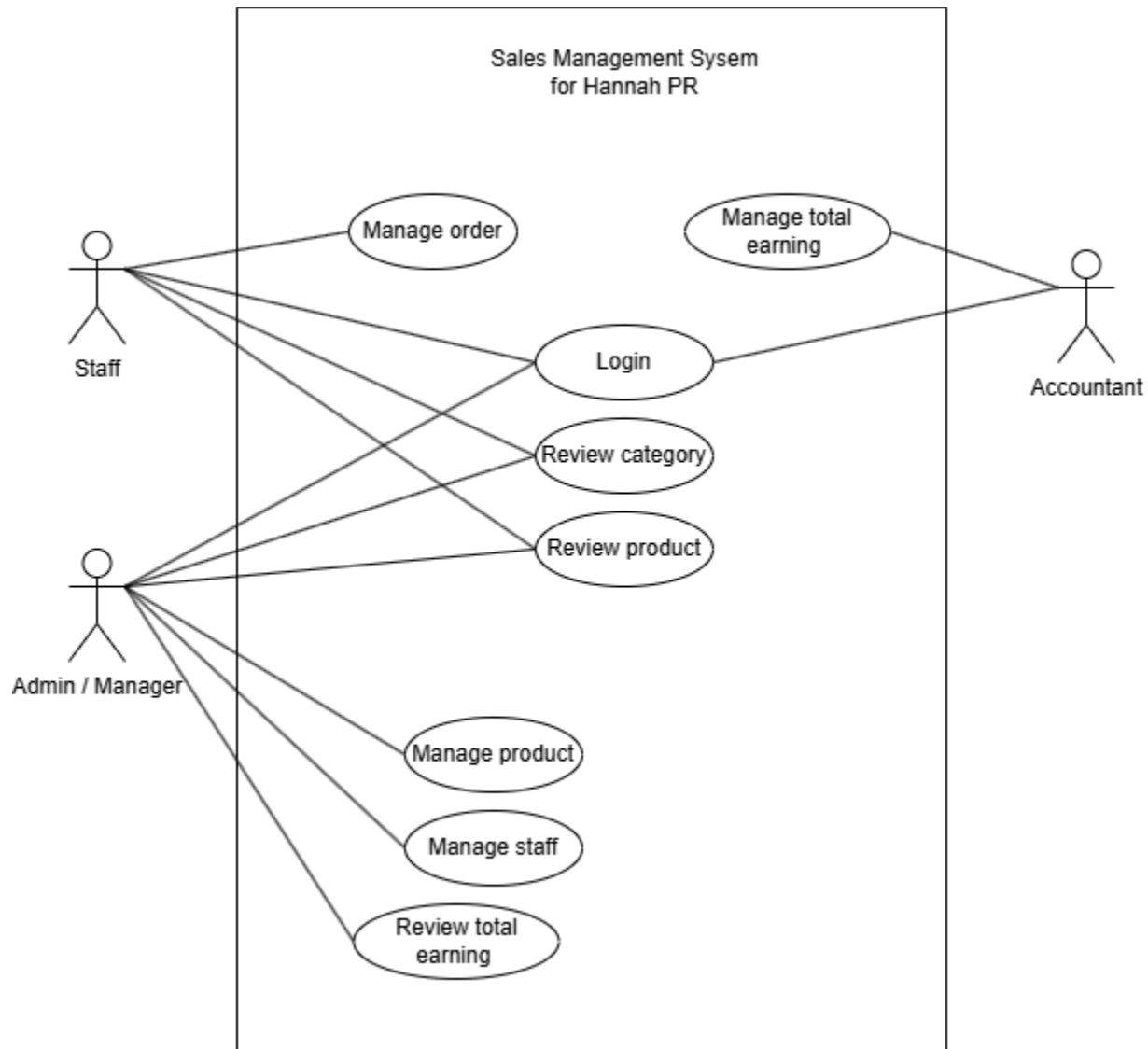


Figure 4.2 UML Diagram for Sales Management System (SMS)

Figure 4.2 shows the use case model for the Sales Management System (SMS) that consists of three actors, employee or staff, manager, the owner of HannahPR and the accountant for HannahPR. Because an actor represents a role played by a user, there can be multiple employees and currently only one accountant and manager that are responsible for the actor in HannahPR. The employees are responsible for managing the orders and reviewing the category and product in the Sales Management System. The employee will be managing the CAUD (Create, Add, Update/Edit, Delete) process in the system for the functions and module order.

As the employee updates the order list, the earning amount in the system will be updated, which will be displayed at the home interface of the system. This earning amount will be listed out as the accountant interacts with the earning modules to calculate any shortage from the sales. Besides, the system will update the earning list by day which is easier for the accountant to locate any shortage from the sales of the day.

The manager will be responsible for managing the record of employees and accountants that are allowed to access the system. This function gives a validation to the employee and the accountant user to access the system only when their records are in the staff record. This situation can be initiated by the user, the employee, manager and accountant. When they login into the system, the password and username need to be validated to ensure the security and the accessibility into the system are allowed only for users that have a record in the system.

4.3 Dynamic Modelling

4.3.1 Login

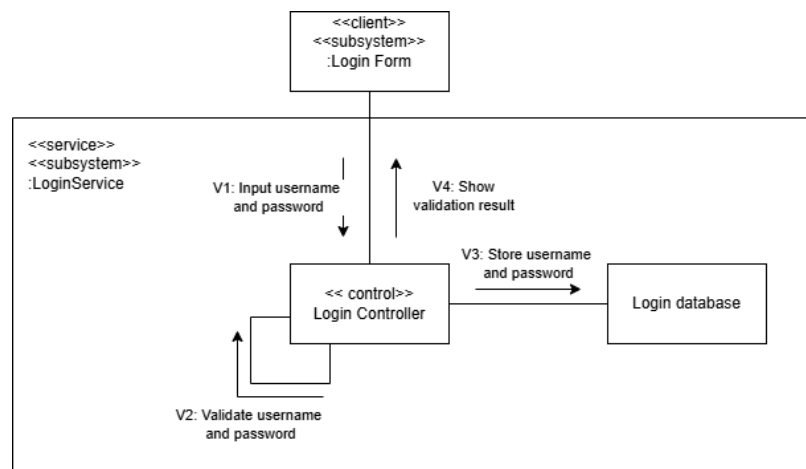


Figure 4.3.1 Dynamic modeling for login.

4.3.2 Manage Product

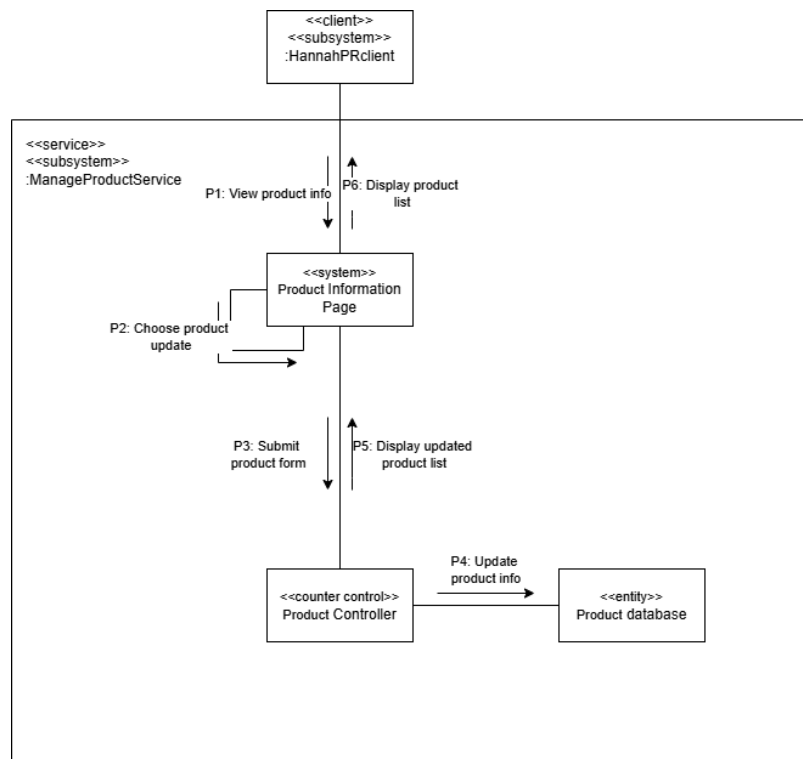


Figure 4.3.2 Dynamic modeling for managing Product.

4.3.3 Manage Staff

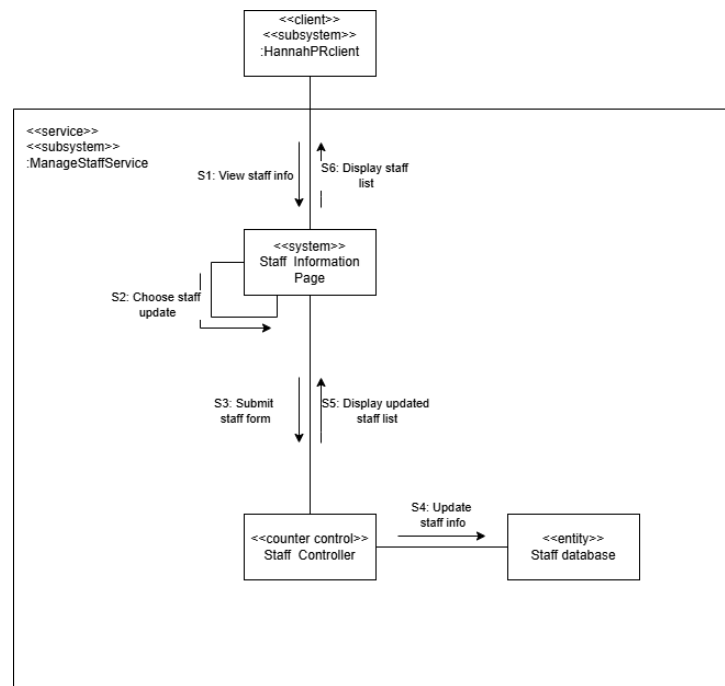


Figure 4.3.3 Dynamic modeling for managing staff.

4.3.4 Manage Order

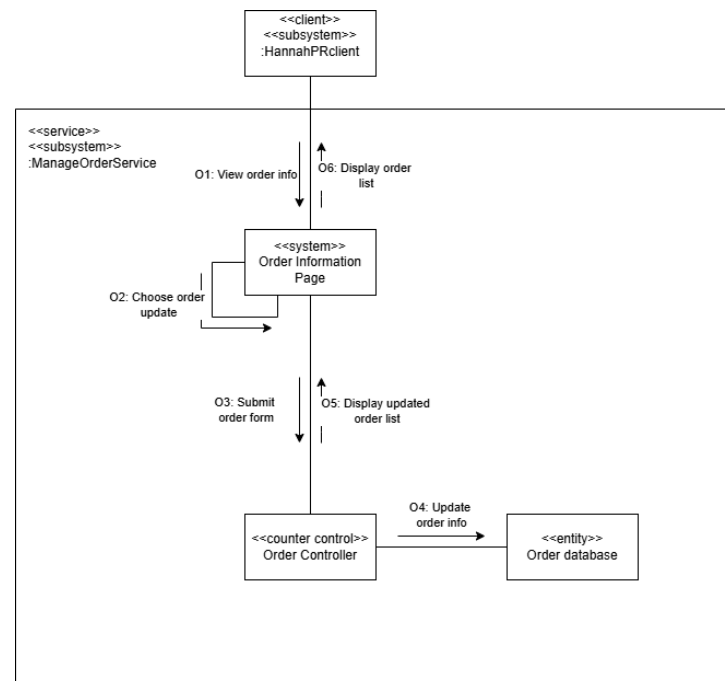


Figure 4.3.4 Dynamic modeling for managing order.

4.3.5 Manage total earning

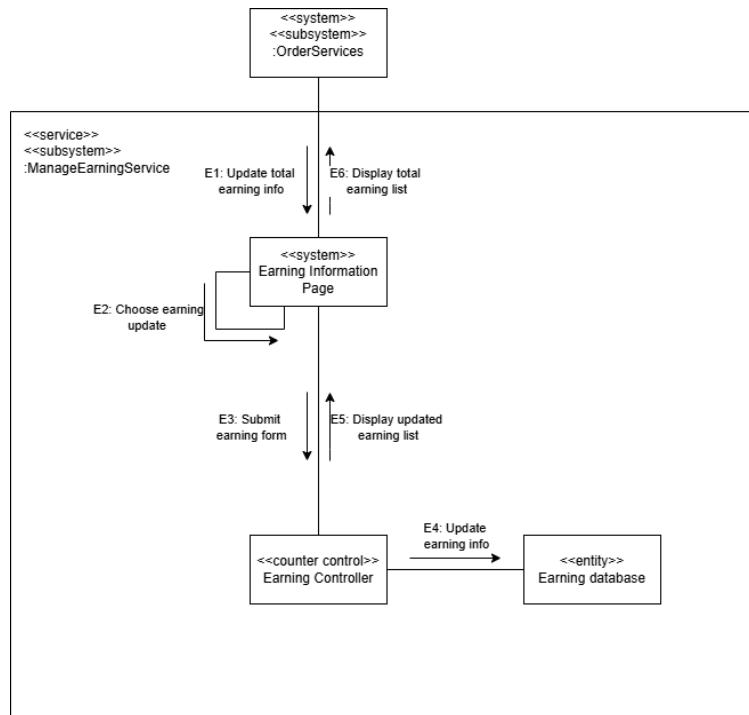


Figure 4.3.5 Dynamic modeling for managing earnings.

5. Glossary

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