Zendaya Online Fashion Store

Technical Report

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Group Number: WE_36

Batch: Third Year (First Semester - Weekend)

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1.0 Introduction

The aim of Zendaya fashion store is to provide an easy to use and efficient outlet for customers to buy the fashion offerings of our client. Our system has three different levels of stakeholders: Admins, Store Managers and customers. The admin will be able to manage the system as a whole and also be in charge of adding Store Managers. The Store Managers will be able to add and manage products and keep the product details up to date. Each Product will be able to have their details, a discount and a maximum of four images, furthermore the products will have user feedback and they can be sorted into categories. The customers will be able to browse the products without logging in and need only create an account if they wish to purchase something.

1.1 Product Scope

we will provide a system which can control all the operations of the Zendaya Online Fashion Store.Admin can handle the system to keep track of each function in the store. This system ultimately leads to high performance with less resources to manage the day to day operations.

Scope of each Individual Function of the System	
Management System	**Scope**
User Management	Handling users. Such as admin, store managers and customers.
Product and Product Category Management	Handling products and its categories. Can also perform CRUD operations in product categories and products.
Order Management	Handling orders of registered customers and status of the order. Status of an order can be in transit or delivered which can be edited or deleted. Each order maintains payment history.
Shopping Cart	Handles the products of an order and total payment summary of each order.
Wish List	It stores a list of products. Each user can add their favorite products to the Wishlist to buy later

2.0 Methodology

2.1 Requirement Analysis

Requirement analysis is the process of explaining the expectations of the Zendaya Online Store and give the idea about uses for the system to be built. It involves all the tasks that are conducted to identify the needs of different stakeholders. Therefore, the requirement analysis means to analyze, validate, document and manage system requirements of the system. Requirements are measurable, testable. It helps to identify and facilitate the system design.

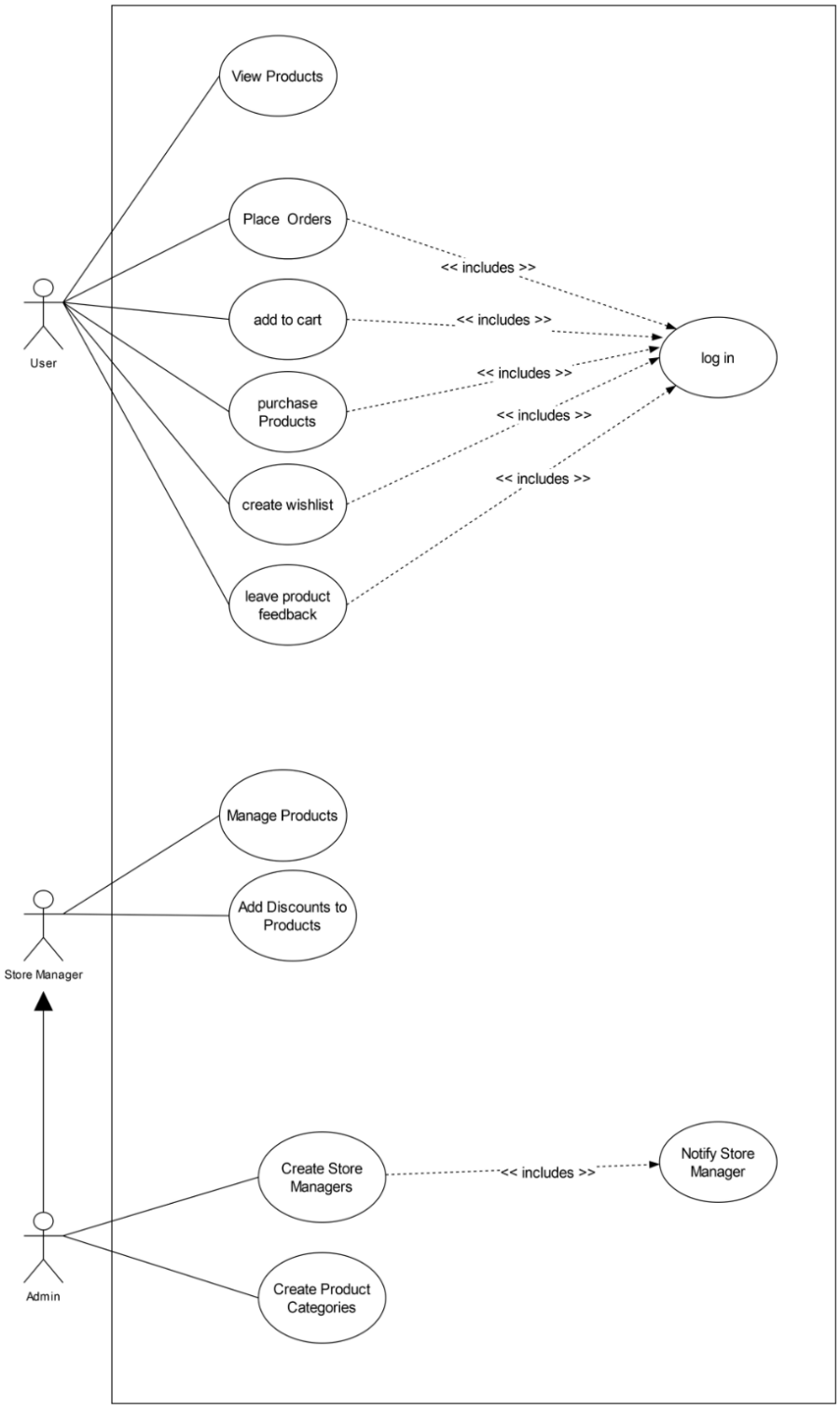

Figure 1 - Use Case Diagram of Zendaya Online Fashion Store

2.2 Functional Requirement of the System

➲ Requirement Analysis of User Management System -

It handles basic functions of three types of users. Admin, store managers and customers are users of this system.

- ❖ Add username, password and role. Attributes are common for all three types of user.
- ❖ Admin can perform CRUD operations on users.

➲ Requirement Analysis of Product & Product Category Management System

Store manager can handle operations of products, discounts and categories.

- ❖ Add products
- ❖ Add products under different categories
- ❖ Add discounts for products if need
- ❖ Handle CRUD operations of the products and its categories.

➲ Requirement Analysis of Order Management System

Customers should be able to place orders once they logged in. Then orders can be managed by admin.

- ❖ Add products to order
- ❖ Adding products should add product price to the order by the system.
- ❖ Discount should be calculated if there is a discount for a product while adding products to orders.
- ❖ Payment of the order will be calculated while adding orders.

➲ Requirement Analysis of Shopping Cart Management System

It should add products history and total summary of a particular order.

- ❖ Add selected products to the shopping cart.
- ❖ While adding calculate the amount.
- ❖ Give the summary of products and total amount for the particular order.

➲ Requirement Analysis of Wishlist Management System

This is where customers can save their favorite products and keep for them to view later.

- ❖ Add products to the Wishlist
- ❖ View Wishlist
- ❖ Delete products in the Wishlist

2.3 Non-Functional Requirement of the System

The non-functional requirements explain the quality of the Zendaya Online Fashion Store with set of standards used to explain the operations of the system. It is essential also to this system to ensure that the system provides effectiveness and usability as a whole. Non-functional requirements of this system ensure performance, reliability and availability of the system and it gives good user experience for all the levels of users. It also formulating security policy of the system.

Reliability

The system must provide accurate details to all types of users. It should resist unauthorized, unintended or accidental access and provide access only to legitimate users. Provide the admin or store managers to update details in the functions and existing details in the database.

Usability

The system must be easy to use by users that they do not need to read extensive amount of manual data in the store. It must be quickly accessible by both admin and managers as well as be simple in the way it displays all relevant data and relationships. The products of the store must be easily accessible by the customers.Buttons that are easy to understand and navigate.

Performance

All the functions of the system must be available to the user every time the system is turned on. The calculations performed by the system must comply according to the norms set by the admin. Provider systems must meet the agreed response time performance.

Supportability

The software is designed such that it works even on systems having the minimum configuration. The system should be adaptable. The system should be designed to optimize the ability of the maintenance to enhance it. System need to be cost effective to maintain

Availability

24 * 7 available. [1]

3.0 Design

Design is the process of transforming user requirements that helps the developer in software implementation and coding. It is the crucial step in software development, which moves the concentration from problems to solutions. This tries to specify fulfill all the user requirements. One of the software design phases is the High-Level design which works under "Single-Entity-Multiple-Component" concept of architectural design into less abstracted view of sub modules and systems of the Zendaya Fashion Store. [2]

3.1 Flow Architecture Diagram

Flow architecture diagram is to understand, clarify and communicate the whole idea about the system's user requirements and the structure. It is a framework which can be used at the system planning phase to understand the architecture and communicate with the each and every intention clearly.

It is the process of converting the characteristics of the Zendaya Online Fashion Store into structured solution that meets the business and technical expectations. Such as reusability, flexibility, scalability and security. It also represents common abstraction of a system that most stakeholder can use it as a basis for mutual understanding, negotiation, communication and consensus. [3]

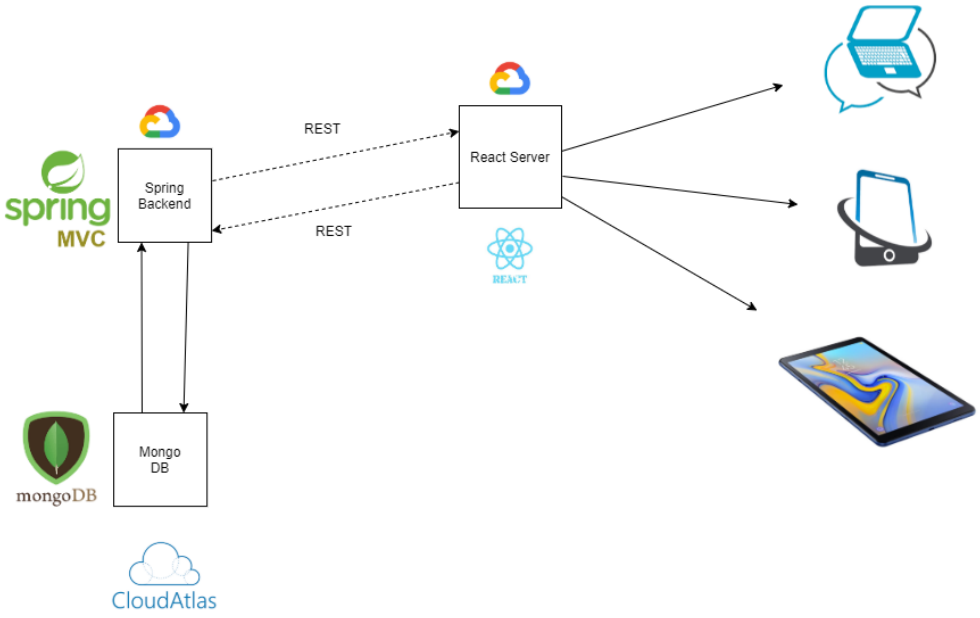

Figure 2- Architecture Diagram of the Zendaya Fashion Store

3.2 UML Diagram

UML stands for Unified Modeling Language which is represented in object-oriented software development. There are various UML diagrams which are typically used in the development of Zendaya Online Fashion Store. It is a rich language that can be used to model application structures and it breaks the complex system in to part by part that can be figure out easily. It is a platform specific most-used and flexible which is highly recognized and understood platform for software design along with behavior and business process. Some UML diagrams including structured and behavioral were used for the Zendaya Online Store are given here.

3.2.1 Class Diagram

Figure 3- Class Diagram of Zendaya Online Fashion Store

3.2.2 Component Diagram

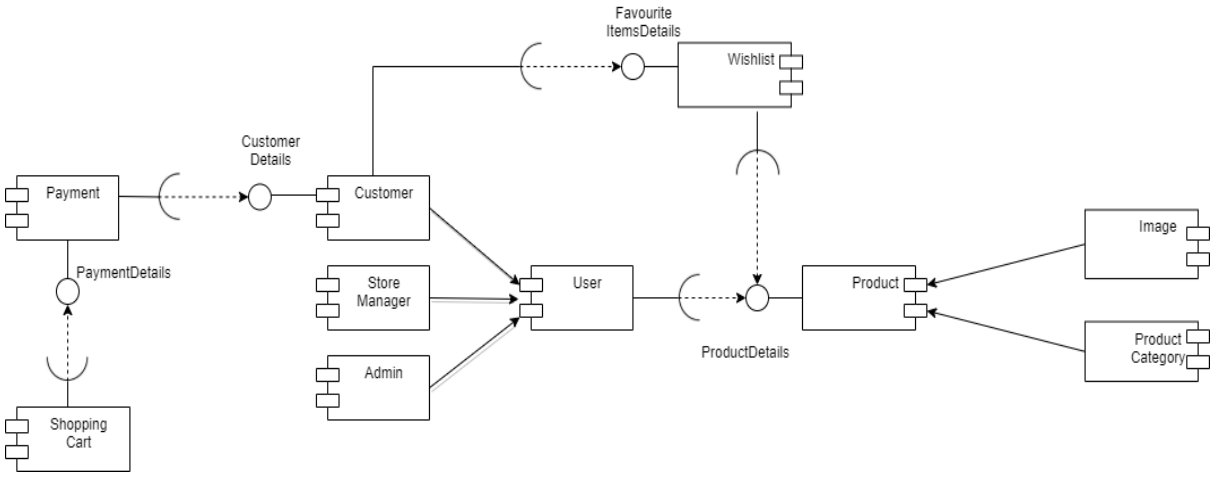

Figure 4 - Component Diagram of Zendaya Online Fashion Store

3.2.3 Database Structure Diagram

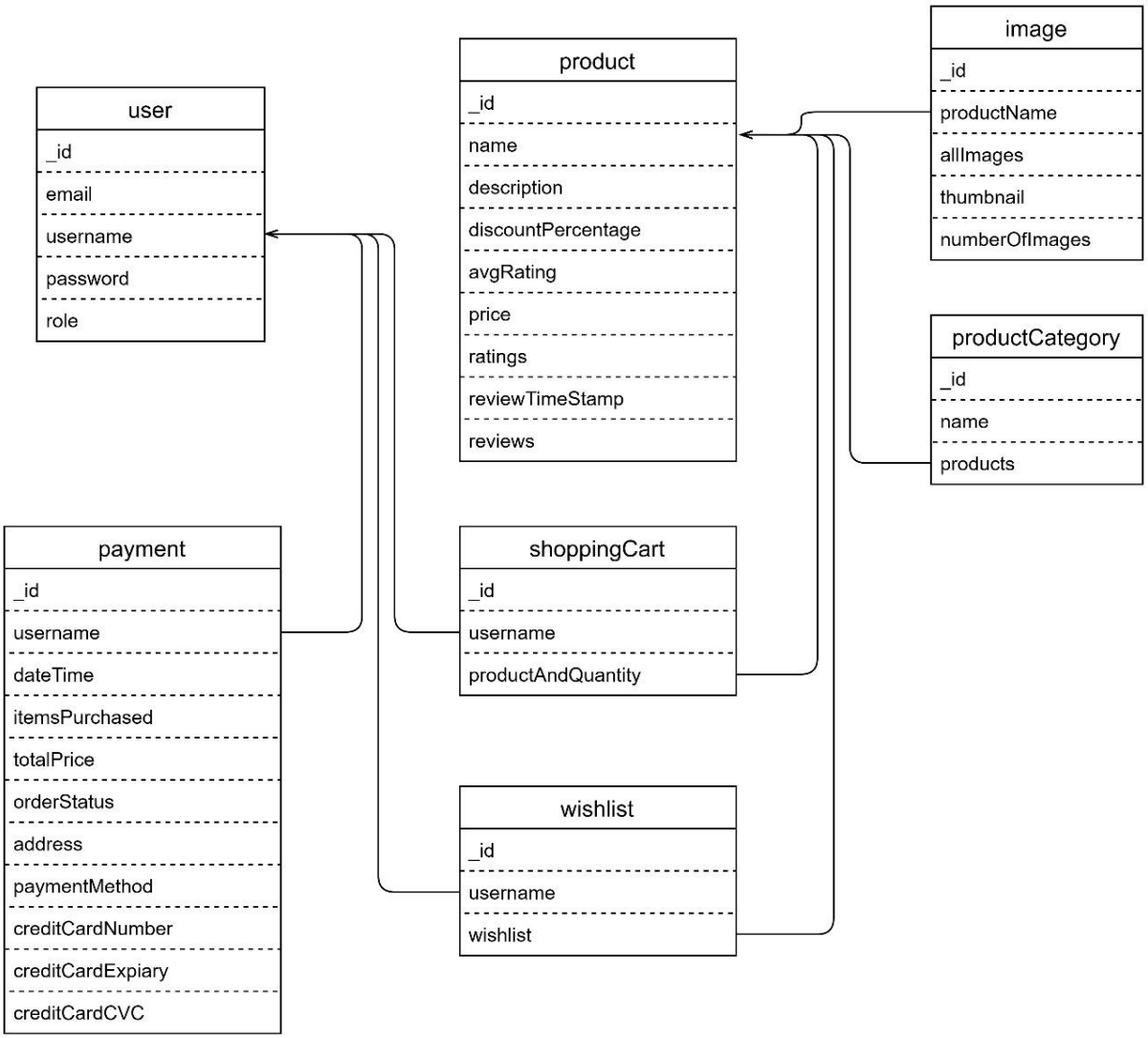

Figure 5 – Database Structure Diagram of Zendaya Online Fashion Store

3.2.4 Sequence Diagrams

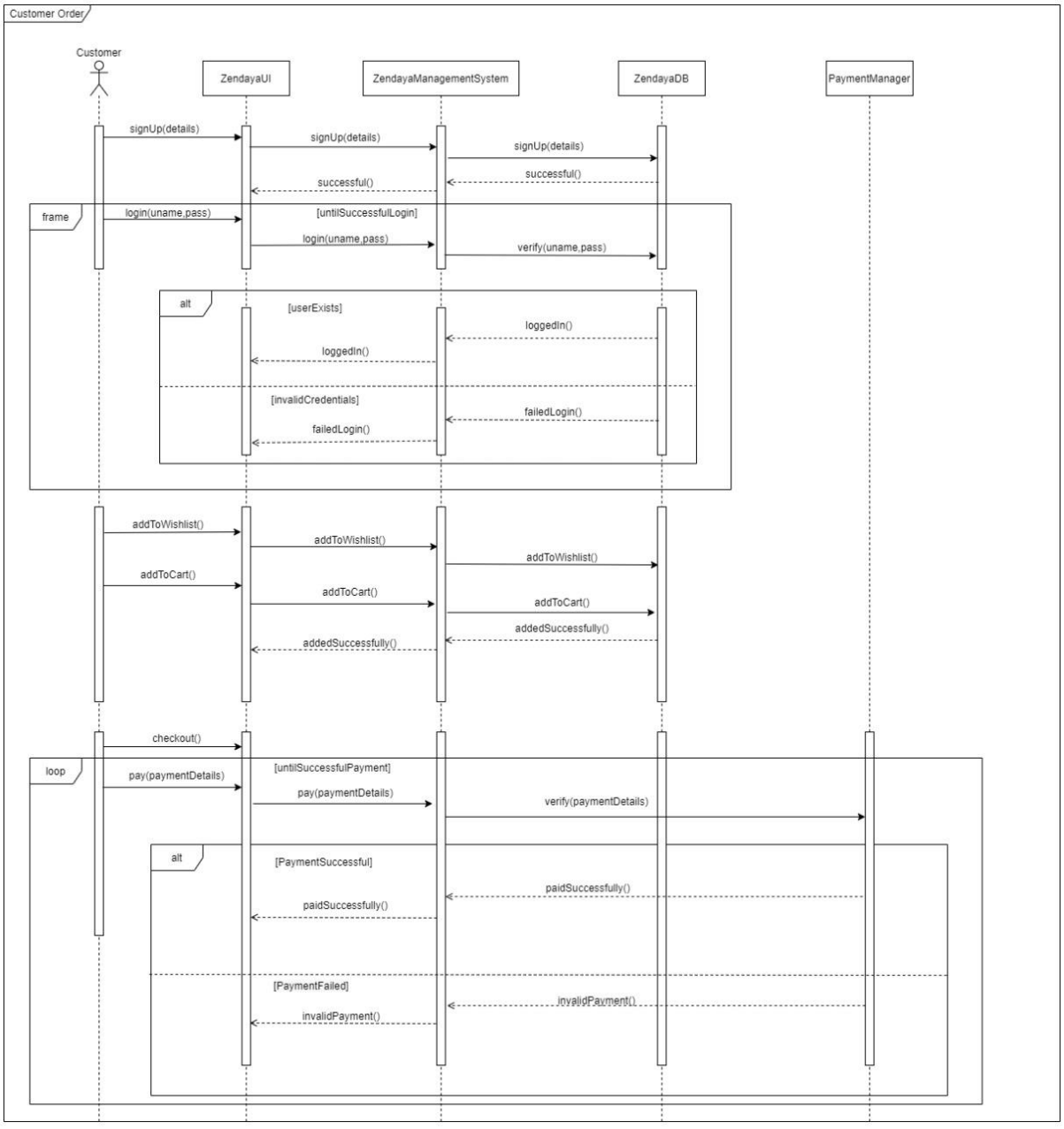

Figure 6 – Sequence Diagram for Customer Order

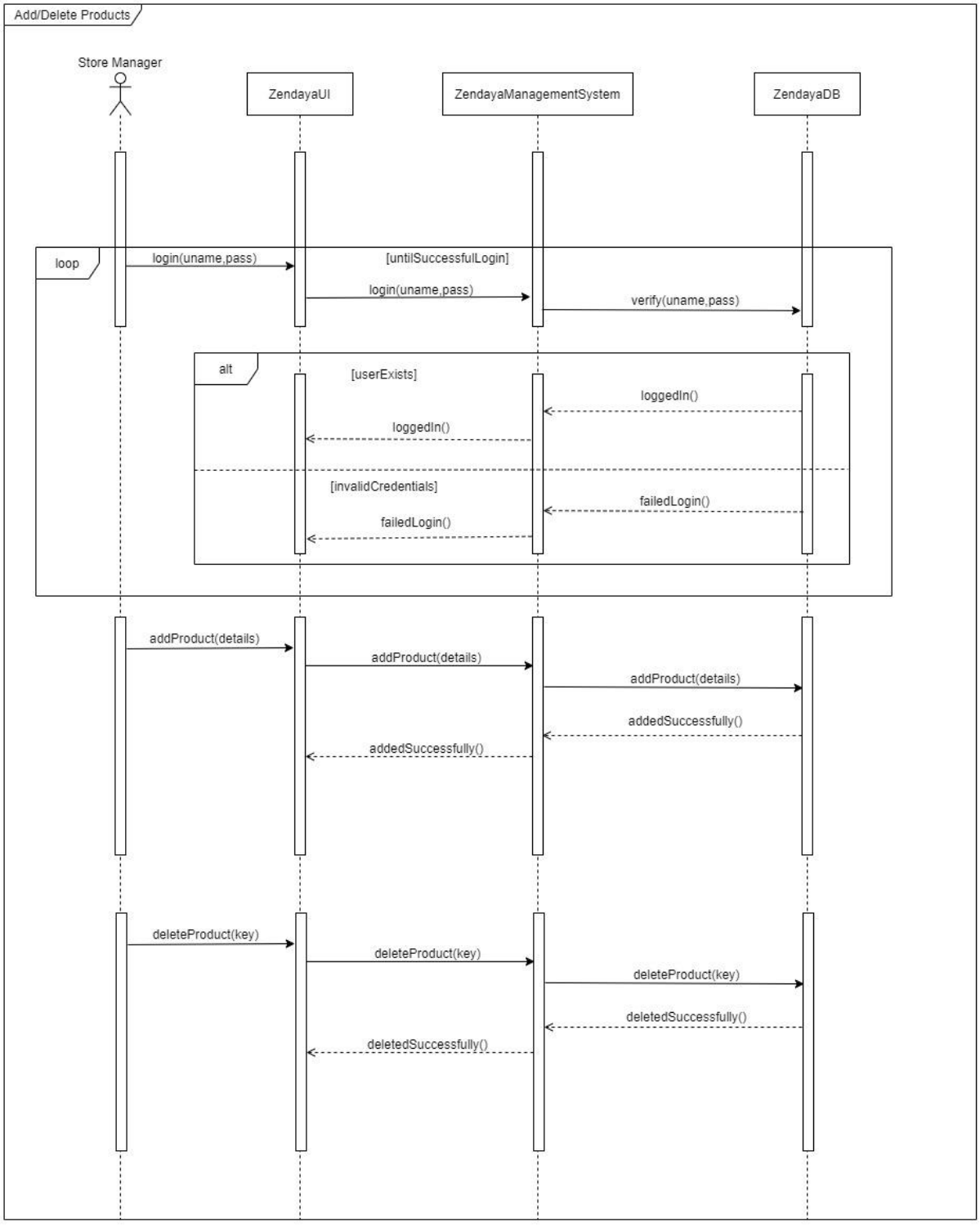

Figure 7 - Sequence Diagram for Handling Products in the System

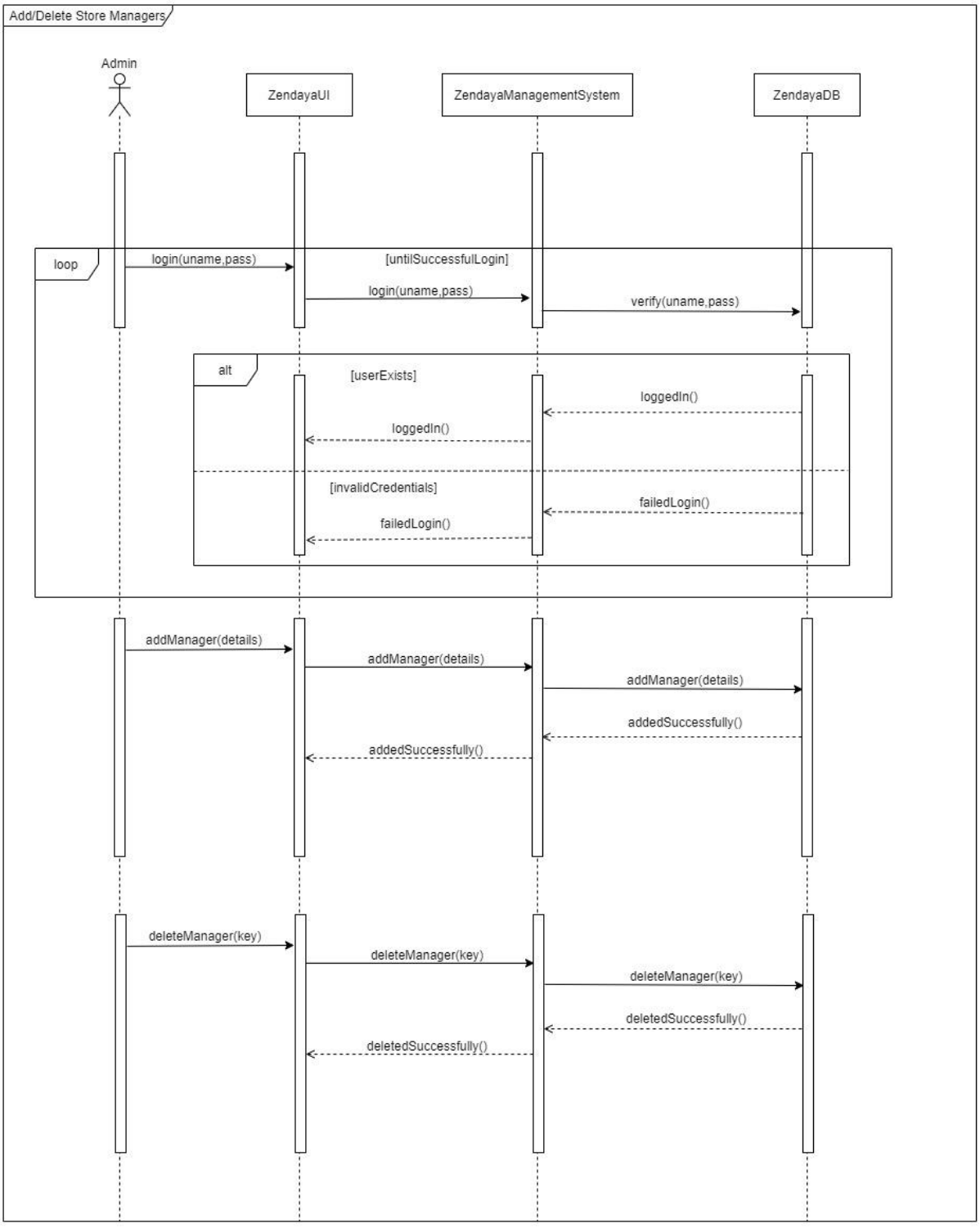

Figure 8 – Sequence Diagram for Handling Admin Functions

3.3 User Interface Design

The user interface design is about interaction between the multiple user and the application. It was focused on anticipating what the user needs to do and ensuring it has elements that are easy to facilitate, understand and access in the Zendaya Online Fashion Store. After choosing the user interface elements of the solution, users will become familiar with interfaces and elements in various ways. This project interfaces give completion, efficiency and satisfaction to the users. It consists of various interface elements. The following sections represents interface elements which is used for system.

- Informational Components

Modal windows, message boxes, notifications, progress bar, icons and tooltips.

- Navigational Components

Icons, tags, slider, search field, sliders and breadcrumb.

- Input Controls

Date field, toggles, list boxes, dropdown lists, radio buttons, checkboxes, text fields and buttons.

Designing an interface stems from users of this system including their tendencies, preferences, skills as well as goals. After requirement gathering techniques, following areas were considered when designing the interfaces of the software.

Think About the Defaults

Precisely thought about anticipating the goals of the Zendaya's online Store. The defaults that reduce the burden on the user.

Use Typography to Create Clarity and Hierarchy

This stage concerned about to use the typeface such as fonts, sizes and arrangements of the text to help readability, legibility as well as scalability.

Use Color and Texture

Attention on using color, contrast, light and texture to advantage.

Be Purposeful in Page Layout

Cogitated the spatial relationships between objects on the structure and the page based on importance which can aid scanning and readability.

Use Common UI Tools and Create Consistency

Users able to get things done quickly and feel more comfortable by using common elements. It was also important that to create patterns in design, layout and language.

Keep the Interface Simple

Avoid unnecessary elements. Clear language use in the labels and buttons.

While designing the interfaces and various things were considered which are already mentioned above but additionally, Considered on efficient, attractive, consistent, response, familiar, concise as well as clear too. System is useless if users cannot to use the system properly. User interfaces are designed for interaction with the processing back end and show a simple interface. [4]

4.0 Implementation

4.1 IDE Used for the Project

The implementation phase was started upon designing the necessary diagrams for the proposed system as illustrated above. In order to implement the system, it was necessary to consider certain factors prior to start developing the application. Upon analyzing the requirements, it was decided that the application should be developed using Spring Boot and MongoDB as the database of the system. Hence, ReactJS as the front-end. There were many reasons as to why the above-mentioned technologies were decided to be used in the implementation of the proposed application.

4.1.1 Eclipse Integrated Development Environment (IDE)

An Integrated Development Environment (IDE) is required in order to implement the proposed system using the above-mentioned technologies. The IDE used for this project was the Eclipse. The main reason for the use of this application is due to the numerous benefits it offers. Eclipse consists of several key benefits that are of great use during the development process of the application. Features such as real-time error detection, availability of breakpoints, code suggestions, etc. are very helpful in the process of coding the application. Development of the above proposed application using Spring Boot provides the following key

- Provides validation for spring config files
- Gives support for Spring-specific refactoring
- Provides Spring-specific content-assistant
- Gives graphical visualization of beans and their dependencies
- Provides editors for Spring Integration, Spring Web flow and Spring Batch

- Guide to 'Getting Started' guides for Spring - http://spring.io/guides
- Integration with Mylyn tooling and AJDT

4.1.2 Visual Studio Code

Visual studio code is used for front end development for the system since it combines the simplicity of a source code editor with powerful tools. Such as debugging and IntelliSense code completion. It helps less time to build, edit or debug process cycle with the code environment. It also has enriched built-in support for Node.js development with JavaScript that includes awesome tooling for HTML, CSS, React/JSX and JSON.

4.2 Technologies used for the Project

4.2.1 ReactJS

ReactJS is used for development of the front end of Zendaya Online Fashion Store. React is a well-drafted, leading and widely applicable JavaScript technology. It is dynamic, interactive and stateful ways of creating user-interfaces. It also called simply to ReactJS is the most famous front-end library for web applications. It is an open-source JavaScript library that is used for building user interfaces for single-page applications. It is used for handling the view layer for mobile apps and web.

React also helped to create reusable user interface (UI) components specifically for the system. The main purpose of using it to be simple, scalable and fast as well.

4.2.2 Spring Framework

Spring Boot is used for backend of Zendaya Fashion Store. It is Java based framework used to create a micro service-based. Also, a combination of Embedded Servers and Spring Framework that is built on the top of the spring framework. It is also very famous technology because of the rapid product read environment that enables the developers to focus on the logic other than configuring and set up. Spring MVC is a widely used part that is used to create web applications. It also accommodates to set up, configure and run web and simple applications very fast.

4.2.3 MongoDB

MongoDB is used as a database for Zendaya Online Store since it is a non-relational database technology and open source DBMS that uses document-oriented database that provides automatic scaling, high availability and performance. It upholds different forms of data that makes easier to split up the data across multiple servers. It is a document-oriented NoSQL

database which is used for higher amount of data storage. Rather than using traditional database with rows and tables. MongoDB naturally care of load across a cluster and balancing data, routing user to the correct machines a redistributing document automatically.

4.2.4 JWT Authentication

JWT is used in the project since it is an open standard that interpret a self-contained and compact approach for robustly transmitting data between parties as a JSON object. It is a prominent mechanism to verify the owner of some JSON data. It is an encoded string with URL safe which can consist of indefinite amount of data. It is cryptography signed. This data can be authenticated and reliable because it is digitally signed.

4.2.5 Explanation of Backend in the System

- User details were stored together and users were separated by using a "role" attribute. This helps us identify if the person logging in is a normal user, admin or store manager.
- For security all passwords are hash-coded before storing/using, this is to avoid storing plain-text passwords.
- Products have a name, description, price, discount percentage, user feedback details and up to 4 images, one of which is used as the thumbnail.
- Product images are also stored in MongoDB, When the front end sends an image it is stored as Binary under that product. If the front end requests the image then the image is reconstructed in the server before being sent to the front-end.
- Products could be sorted into categories which would have the category name and a list of products in the category. A particular product could fall into multiple categories.
- A history of each user purchase is stored and made visible to the user. This offers the ability to view past purchases and also see the delivery status of the product.
- When paying for products the user has the option of either paying using a card or pay by cash-on-delivery.
- Security of the system is provided by requiring JWT tokens with all requests for authentication.

4.3 Requirements

There are several requirements that are required in order to carry on with the implementation process of the application. These requirements could be divided into two main categories as Software and Hardware.

4.3.1 Software Requirements

Listed below are the software requirements that were required in order to develop the system.

- Eclipse
- Microsoft office
- Adobe Photoshop 2017
- Google Chrome Browser
- Mozilla Firefox Browser

4.3.2 Hardware Requirements

- Processor: Intel Core i7 7th Generation or better
- RAM: 6GB or better
- Storage: Minimum 50GB
- Monitor: Any RGB Monitor
- Standard Keyboard.

4.4 Architecture of the System

Similar to deciding the technologies used for the development of the application, it was also vital that the architecture of the system is designed accordingly in order to maintain the standard and the quality of the application. In this instance, the application is designed according to the four-layer architecture. Spring helps to follow layered architecture which each layer communicates with each layer. Four different layers of Spring Boot are given below.

- Presentation Layer – It handles HTTP requests, render HTTP JSON parameter to object, and verifies request and transfer it to business layer.
- Business Layer – It includes uses services provided by data access layers and service classes. It also helps to achieve authorization and validation.
- Persistence Layer – It includes all the storage logic and converts business objects to database rows.
- Database Layer – CRUD operations are performed here. Such as create, update, delete and retrieve.

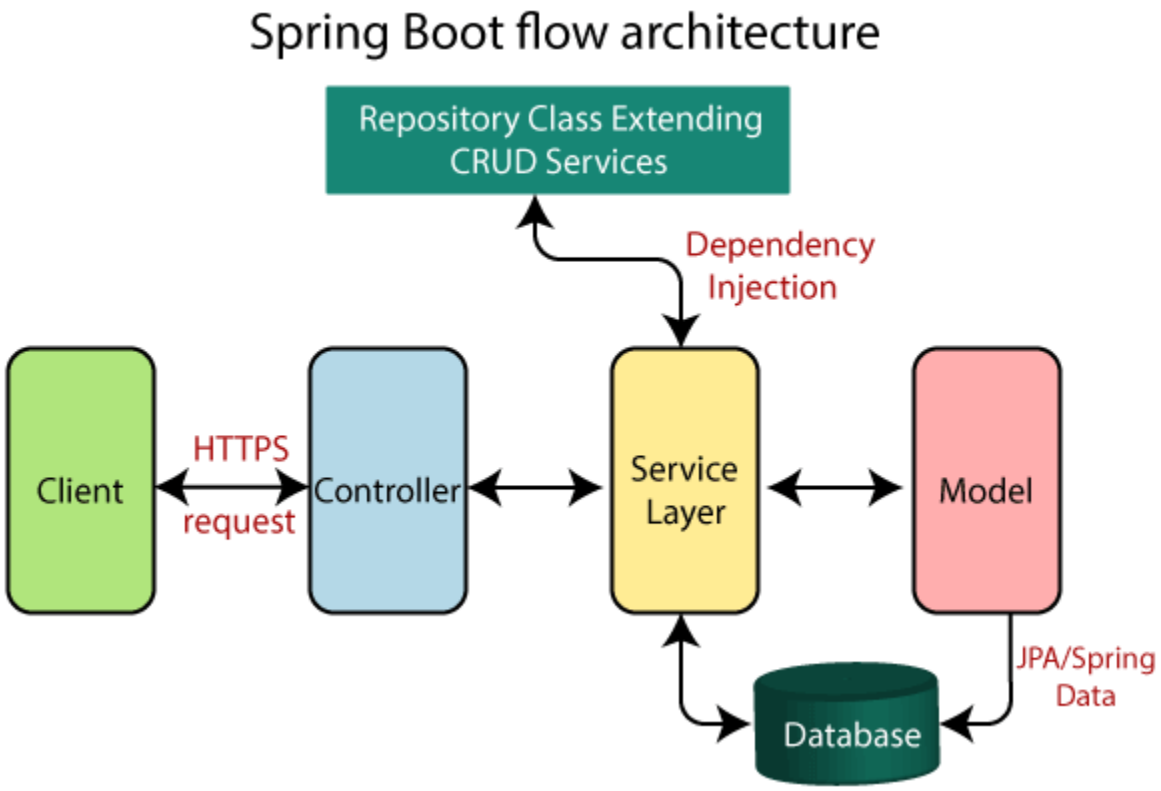

Figure 9 – Spring Boot Architecture Diagram of the Zendaya Fashion Store Backend

5.0 Testing

Tests for Spring were written using the TestNG Framework.

- First the test will start up the spring boot application
- Next it will create a temporary Test user by calling "/createAdmin" and use it to obtain the JWT token needed to make requests.
- Then it will test product functionality by calling "/addProduct", "/addReview", "/updateProduct" respectively with appropriate JSON body.
- If above test passes, it will test Product category functionality by calling "/createCategory","/addToCategory","/removeFromCategory","/getAllCategories", "/deleteCategory" respectively with appropriate JSON body.
- If above test passes, it will test Wish List functionality by calling "/addToWishList", "/moveToShoppingCart","/removeFromWishList" respectively with appropriate JSON body.
- If above test passes it will test Shopping Cart functionality by calling "/addToShoppingCart","/getTotalPriceAndNumberOfItems",

"/getProductsAndDetails","/removeFromShoppingCart","/purchaseItemsInCart" respectively with appropriate JSON body.

- If above test passes it will test Payment functionality by calling "/getPaymentHistory","/getPaymentDetails","/setOrderStatus","/getOrderStatus" respectively with appropriate JSON body.
- Finally it runs a clean-up function where it will delete the product it created specifically for the test.

6.0 Deployment

- The Backend was deployed to a Virtual Machine on Google cloud, running Ubuntu.
- The Database was deployed on mongoDB Atlas.

7.0 Evaluation

7.1 Assessment of the Project Results

The software was exclusively developed for all the stakeholders of the Zendaya Fashion Store in order to carry out their daily processes and transactions easier and service delivery as a management group as a best support business tool for their managerial decision for present and future too.

The software was developed using great web technologies. The existing local database system could be totally replaced by this system with various features and functionalities with security. Final output of this project is user friendly, highly reliable, for this organization and their customers. The system was developed according to all the requirements and achieved almost all the scopes, objectives and goals of the project. The requirements were analyzed, transformed in to diagrams and architecture and developed in to an executable code. Finally, all the levels of tastings were successfully completed. System quality was concerned and maintained along with functional and non-functional requirements. Moreover, the system is now working properly with expected output and error free.

7.2 Lessons Learnt

Working and developing with this project was a tremendous experience and the knowledge which gained through problem solving, time management, project planning were some major areas in which significant knowledge and improvements experienced. Moreover, the software language proficiency was also another main thing in which the level of knowledge was increased. ReactJS, MongoDB, Spring framework were some of those. Additionally, it was able to experience a significant improvement in software proficiency level compared since the project started until now.

Additionally, some more benefits gained as developers of this project including, distinct knowledge in various domain areas which will be assistive for development and designing in the carrier, industrial practical knowledge also was an important area handled by this. Every lesson was very important for successful completion of this project.

7.3 Future Enhancements

The system analyzed and developed in open source environment in order to maintain scalability and independency of the system. Any improvements can be easily made and incorporated to this system. Further enhancement of the system can be possible to add any kind of process and also organization expecting to integrate many modules in this same software product. Some enhancements are planned for the future development.

- Develop flex dashboards with more features along with data mining approaches.
- Integrating stock management support system.
- System can be further developed to support user definable access control.
- System should include a dashboard where mangers and customers can access information quickly.
- Can be developed as a mobile application.
- Use augmented reality to advance the system.
- Connect the system to a SMS and E-Mail to send payment gateway notifications in order to give customers an easier opportunity to make their payments.

8.0 Conclusion

The purpose of this project is to address the problems raised in the organization with the expansion of the business; where it led to issues in handling functions regarding customers and the functions within the store. The system is an online store application developed to automate the day to day activities of the business and it supports to upgrade the quality of the services rendered by the Zendaya organization.

The user experience for a system is unlike the user experience for traditional desktop software. The location of data storage, limitations with the user interface, and limited access to operating system features are just some of the distinctions. It is a requirement to have an effective Internet connection but it is accessible from any Internet-enabled computer where the users are free to use with different operating systems and browser applications. The application makes easier to roll out program updates since only software on the server needs to be updated not on every desktop in the organization.

We are willing to maintain the system because it is an effective method to showcase the products and services rendered, where developing a site helps to create a social proof as well as it helps to brand the business by allowing of attracting more customer support and helps to achieve the objectives and goals of the Zendaya organization. Succeeding of developing a web site makes the developing team success in their objectives of the project by giving the clients a final outcome beyond their expectations.

9.0 References

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