THE STATE UNIVERSITY OF ZANZIBAR

DEPARTMENT OF COMPUTER SCIENCE AND INFORMATION TECHNOLOGY

FINAL YEAR PROJECT DESIGNING DOCUMENT

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1. INTRODUCTION

Island online shopping is a mobile application where users will be able to buy goods from their electronic devices such as a mobile, tablet, etc.

This application will show variety of products, where a user can search for specific product, add to cart, add to wish list and get it's list, share product link, see a product detail with easy to choose color and size, etc.

This system will be developed in two parts; website part for the administrator and the mobile application for the users / customers will be developed using Android Studio.

My intentions in developing this application are:

- Helping peoples who don't have time to visit physical shops and make their transactions when they are at their places in anytime.
- Will be the best way to let a customer see many related products of what he wanted along with the colors available as sometimes one doesn't have a satisfaction choice in physical shops.
- A customer will be able to see detailed information (description) of their products along with the images. It will help in customer getting a clear image of the product and its usability.

2. RATIONALE

In March 2020, much of the world went into lockdown, forcing many businesses to temporarily shut down. As of this writing, cities are gradually relaxing restrictions, but the future is still uncertain. Even businesses that are reopening have restrictions enforcing social distancing, the wearing of masks, and limits on how many customers can enter a space at one time.

When traditional shopping becomes difficult, or may even be scary, people are increasingly inclined to shop online. The fact that consumers were already embracing Amazon and other online retailers with open arms made this transition considerably easier.

Online revenue growth as of April 2020 was up 68%. There's a good chance that this trend will continue in the post-quarantine world. The advantages of online shopping aren't going to disappear even when retail businesses reopen fully. All of this points explains why this is the ideal time to either start or double down on your e-commerce efforts.

Factors that will continue to drive e-commerce growth:

- The rapid growth of mobile devices is making it easier than ever to browse and shop online. Customers can place orders one-handed from the device that is likely in their hand or pocket at all times.
- Even as some items became scarce in physical stores there were options for ordering online.
- It becomes more convenient for consumers to shop anywhere, any time, on and across multiple devices.

3. OBJECTIVES

Ecommerce business drives profitable growth with reduction is cost-to-customer, developing customer reach, and providing a unique customer experience. It has become more than essential for B2B as well as other businesses to make the right use of ecommerce.

Now, ecommerce is evolving or better say evolved into digital commerce that implies to the entire business journey from buying to delivery with an online experience.

3.1. GENERAL OBJECTIVES

- Reduce management costs

  Business aim at reducing the costs incurred for the betterment of their revenue. Island online shopping can help in reducing the management cost significantly. Moreover, the right use of digital marketing can help in reducing the cost spent on driving customers to such an extent that businesses can bring customers for free of cost.

- Developing business relations

  With ecommerce as the primary use, business development can be easily achieved. The direct communication between a supplier and the customers, the business relationship can be boosted. Eventually the Island online shopping market shall be expanded.

- Increasing the number of loyal customers

  Customers are the core of all business strategies. Therefore, ensuring the great customer experience is of prime importance for the growth of the business. You need to meet your customers where they spend their time. More than 60% of consumers look for purchasing goods online. If you meet your customers where they are already active, the chances of them, interacting with your business increases two folds. You can increase the number of loyal customers by giving the best experience to your already existing customers as well as bring in newer customers.

- Increasing sales

  The other objective of this software which will always remain continuous and constant for an e-commerce business is to increase sales as many peoples can interact with the system at a time different from traditional shops as it has a limit place. Having this system will boost the sales constantly.

3.2. CHALLENGES OF THE EXISTING SYSTEM

Fumba superstore is the online shopping that is available in Zanzibar currently and has various products with it. The following are the challenges of this system.

- This system's products are expensive compared to the retail shops, this stop the market of this business to expand.
- Many peoples don't have the knowledge of this system existence
- Many peoples don't have the knowledge on how to use this system

3.3. SOLUTION TO THE CURRENT BUSINESS OPERATION

The solution of the above challenges will be Island online shopping system where it will contain the things that were lack in the existing system.

The following are the solution of the challenges faced by the existing system:

- Island online shopping will sell its products by the price that is normally used by the retailers and some products will have even less price compared to the retailer's price
- Island online shopping system will have a document that will explain how the system works
- Provide stickers, banners, along with the advertisements to reach different peoples at Zanzibar
- Provide knowledge of the existence of the system in different places which have a high collection and interaction of peoples like colleges, offices, schools, etc.

4. DEVELOPMENT METHODOLOGIES

Software Development Methodology means splitting software and building work into different stages with certain activities for the purpose of more effective planning and management. The stages are requirements, designing, implementation, testing, etc.

The methodology that will be used in developing this system (Island online shopping) will be Iterative software development model as software should be developed in increments, where each increment adds some functional capability to the system until the full system is implemented.

Iterative model is a particular implementation of a software development life cycle (SDLC) that focuses on an initial, simplified implementation, which then progressively gains more complexity and a broader feature set until the final system is complete.

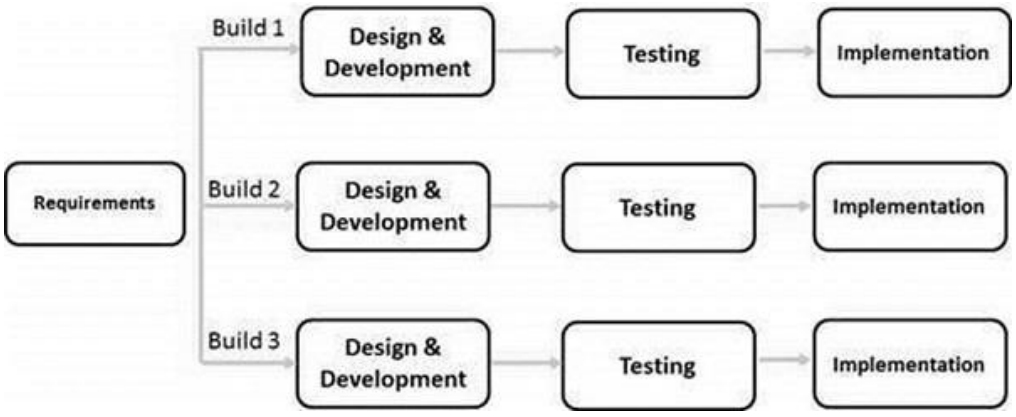

Figure 1: Iterative Model

I decided to use Iterative model for this system because of the following:

- Is best thought of as a cyclical process. After an initial planning phase, a small handful of stages are repeated over and over, with each completion of the cycle incrementally improving and iterating on the software.
- Enhancements can quickly be recognized and implemented throughout each iteration and allowing the next iteration to be at least marginally better than the last.
- Tries to combine the benefits of both prototyping and the waterfall model
- Testing each increment is likely to be easier than testing entire system like in the waterfall model.

- Furthermore, as in prototyping, the increments provide feedback to the client which is useful for determining the final requirements of the system

Application of Iterative Model:

- Requirements of the complete system are clearly defined and understood.
- There is a time to the market constraint.
- A new technology is being used and is being learnt by the development team while working on the project.
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Advantages of Iterative Model:

- Some working functionality can be developed quickly and early in the life cycle.
- Parallel development can be planned.
- Progress can be measured.
- Less costly to change the scope/requirements.
- Testing and debugging during smaller iteration is easy.
- Risks are identified and resolved during iteration, and iteration is an easily managed milestone.

Disadvantages of Iterative Model:

- More resources may be required.
- Although cost of change is lesser, but it is not very suitable for changing requirements.
- Defining increments may require definition of the complete system.
- Not suitable for smaller projects.
- Management complexity is more.

5. ARCHITECTURE OF THE SYSTEM

System architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system.

A type of software architecture which will be used in this system is 3-tier architecture which is composed of three tiers or three layers of logic computing as this is often used in applications as a specific type of a client-server system.

3-tier architectures provide many benefits for production and development environments by modularizing the user interface, business logic, and data storage layers. Doing so gives greater flexibility to development teams by allowing them to update a specific part of an application independently of the other parts. This added flexibility can improve overall time-to-market and decrease development cycle times by giving development teams the ability to replace or upgrade independent tiers without affecting the other parts of the system.

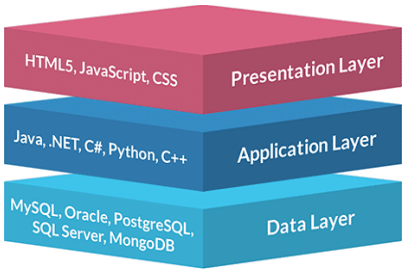

Figure 2: System Architecture

The following are the three layers:

- Presentation Tier: is the front end layer in the 3-tier system and consists of the user interface. This user interface is often a graphical one accessible through a web-based application and which displays content and information useful to an end user. This layer will be developed using web and mobile technologies such as HTML5, CSS5, JSP and Dart or through other popular web development frameworks, and communicates with others layers through API calls.
- Application layer: contains the functional business logic which drives an application's core capabilities. It will be written in Java, etc.

- Data layer: The data tier comprises of the database/data storage system and data access layer. The system that will be used for database is MySQL. Data is accessed by the application layer via API calls.

6. CONCEPTUAL DESIGN OF THE SYSTEM

Conceptual design is an early phase of the design process, in which the broad outlines of function and form of something are articulated. It includes the design of interactions, experiences, processes, and strategies.

Conceptual model of the Island online shopping is divided into 4 groups which are a customer side, administrator side, delivery agent side and the credit card company. The following diagram shows the main function of all groups:

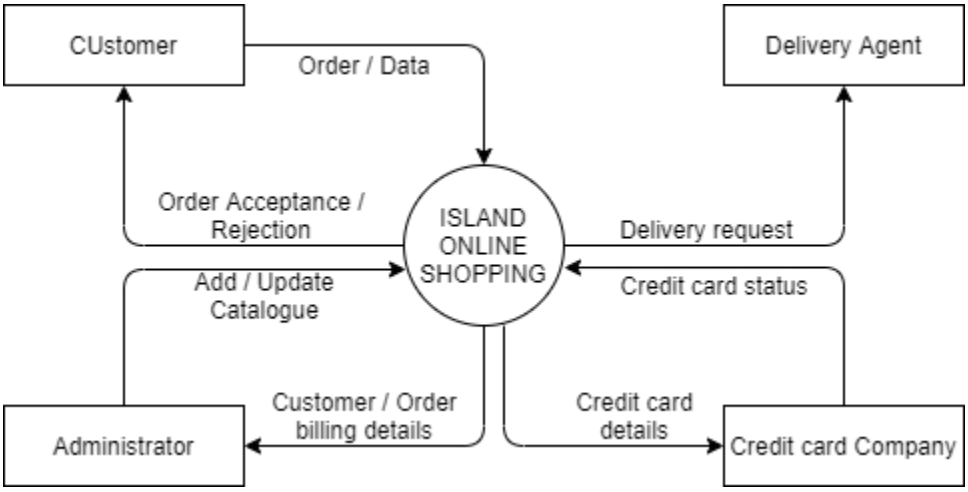

Figure 3: Conceptual Model

7. DATABASE DESIGN

Database Design is defined as a collection of steps that help with designing, creating, implementing, and maintaining a business's data management systems. The main purpose of designing a database is to produce physical and logical models of designs for the proposed database system.

Island online shopping will contain seven tables known as: Admin, Customer, orders, payment_method, payment, products and categories.

The following is the database design along with their attributes, constraints and relationships between tables of the Island online shopping:

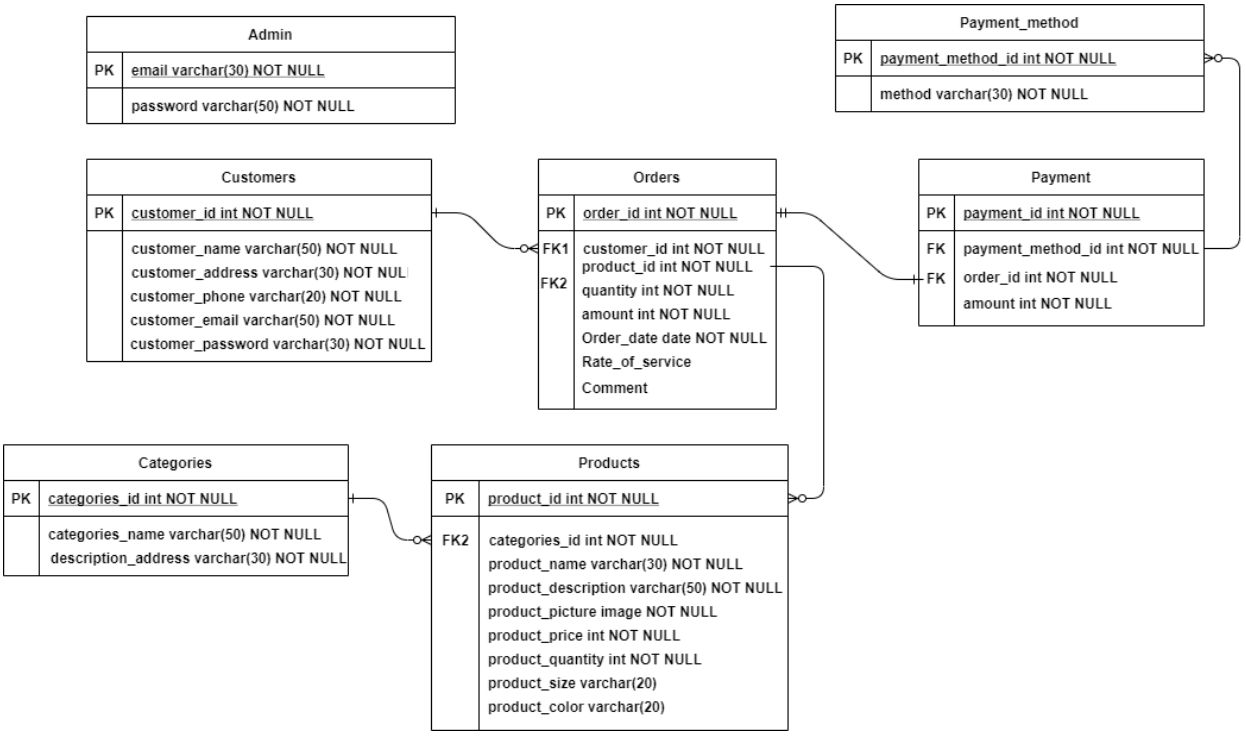

Figure 4: Database Design

8. ACTIVITY FLOW OF THE SYSTEM

Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. Typically, an event needs to be achieved by some operations, particularly where the operation is intended to achieve a number of different things that require coordination, or how the events in a single use case relate to one another, in particular, use cases where activities may overlap and require coordination. It is also suitable for modeling how a collection of use cases coordinate to represent business workflows

The following are the activity flow diagrams for both admin side and user side (customer) and specify all the activities that will be conducted by them but both need the authenticated login so they can access the functions of the system.

Admin have the ability to add and modify category and products, manage users and orders where a user can search for products and place his order, edit hi profile and view report of his orders or payment information.

Activity flow diagram for Admin side

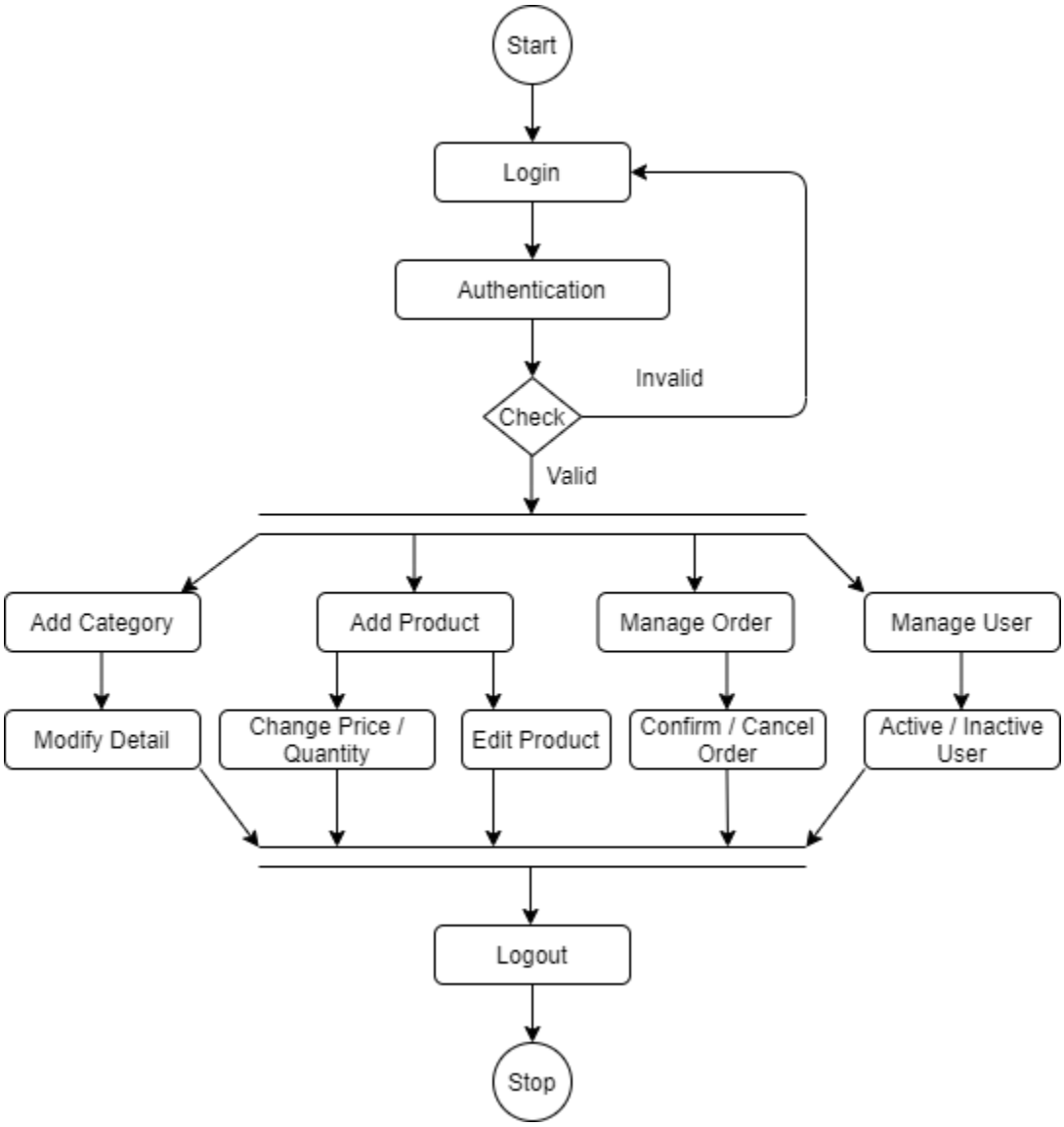

Figure 5: Admin Activity Flow

Activity flow diagram for user side

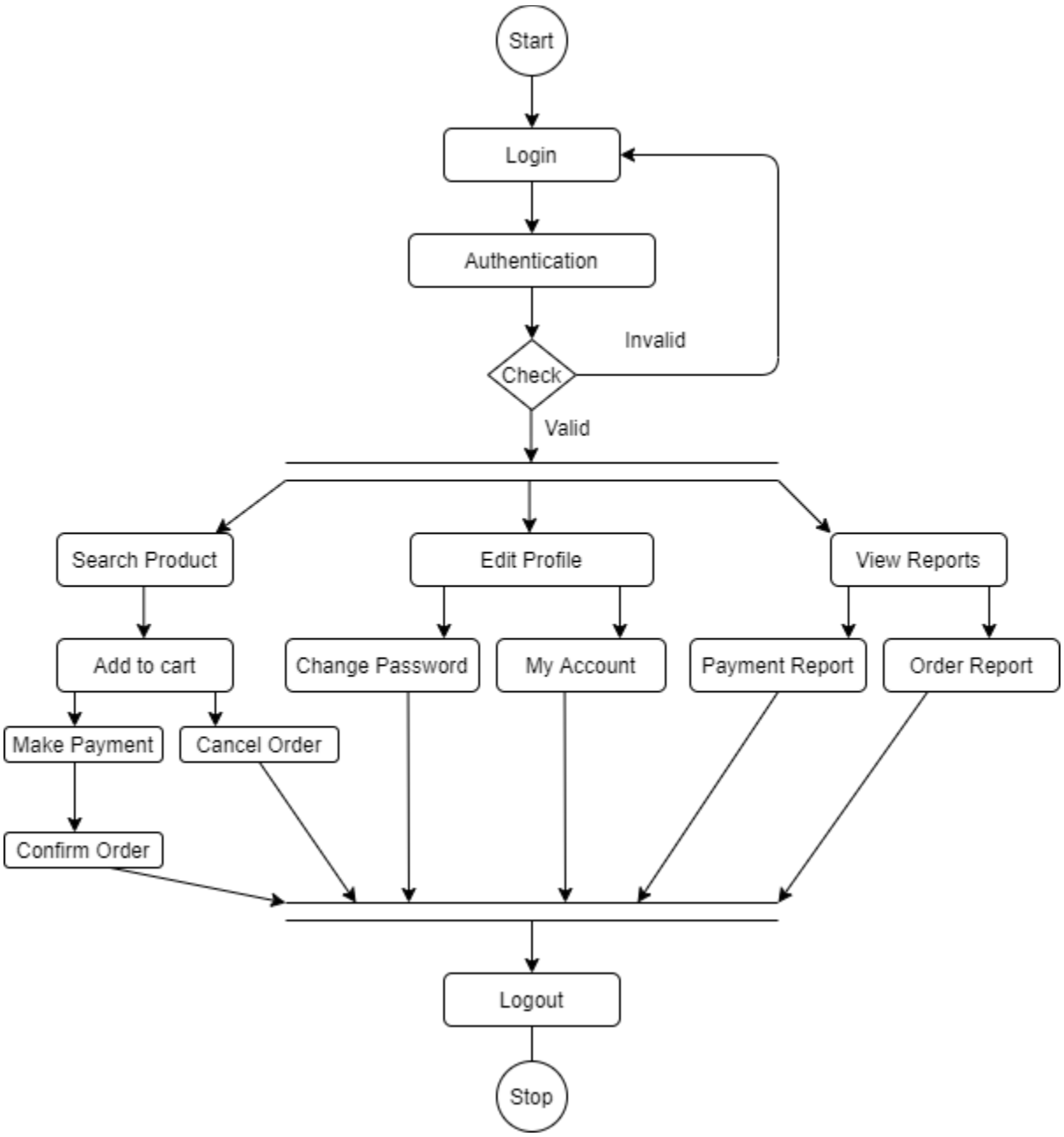

Figure 6: User Activity Flow

9. USE CASE

A use case diagram for Island online shopping represents a user's interaction with the system which shows the relationships between the user and the different use cases in which the user is involved. This captures the system's functionality and requirements for the system and how a user will handle the system.

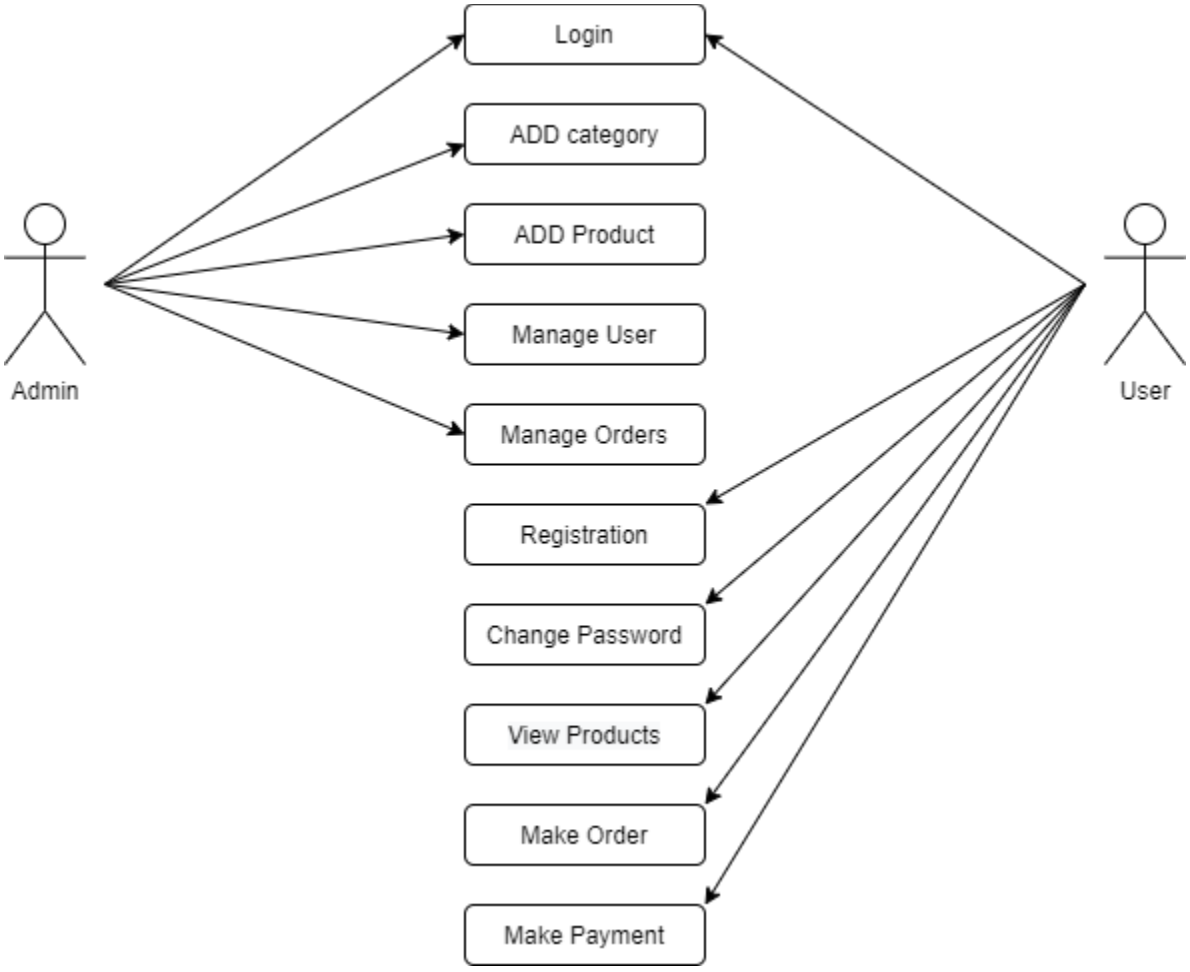

Figure 7: Use Case

10. DEVELOPMENT TECHNOLOGIES

Island online shopping will be developed with various software technologies on both mobile application and web system such as:

- Java: is a set of computer software and specifications developed by James Gosling at Sun Microsystems, which was later acquired by the Oracle Corporation that provides a system for developing application software and deploying it in a cross-platform computing environment.
- Flutter: is the new trending cross-platform mobile application development technology in town. It uses “Dart” as a programming language instead of JavaScript which facilitates rapid and effective analysis, fabricates UIs, includes highlights and fixes bugs in milliseconds. The open source cross-platform SDK by Google extends a wide range of plugins backed by Google and allows mobile apps to be built for both Android and Apple iOS platforms.
- MySQL: is an open-source relational database management system where "SQL", the abbreviation for Structured Query Language.
- Git: is a free and open source distributed version control system designed to handle everything from small to very large projects with speed and efficiency. It’s easy to learn and has a tiny footprint with lightning fast performance. And Github offers the distributed version control and source code management functionality of Git, plus its own features
- HTML: is a markup language used for structuring and presenting content on the World Wide Web. It is the fifth and last major HTML version that is a World Wide Web Consortium recommendation. The current specification is known as the HTML Living Standard.
- CSS: Cascading Style Sheets is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.