



B3Albania_OSMS

Requirements Specification

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Executive Summary

1.1 Project Overview

This project is about creating and building a software, specifically a web-based application that manages the activity within a company. The software is called OSMS (Online Shop Management System). OSMS can be used both by the clients/customers and staff. It covers different procedures from online ordering on the client site to inventory, products, price, and orders management on staff site (admin or storekeeper).

The client can make the orders directly from a web browser and also can check the status of its own order. This is a very efficient way of buying, as it saves time and money (going to the shop, finding a parking place which may cost). Basically, the app has a special user interface for each user.

Another task being managed by the app is sales management. The lists of products are updated every time a new product is added in a specific category. This lists are accessible by the customers, who can see the prices, product description and photo. The staff users can see the orders, the status of the order, the sale's progress. Also they could ask the system for daily, monthly, yearly reports (ex. How many orders, feedback for a specific product etc.) .

1.2 Purpose and Scope of this Specification

The purpose of this software is to provide a set of solutions to the company that depend on sales management and user management. In the current state, a full lifecycle of B3Albania when it comes to sales is very unorganized and unprofessional. The administrator has no way of get ready automatic reports, and the employees have a very frustrated way of managing the orders. Additionally the clients could not buy without going in the shop or at least by calling the company to make an order and this is so uncomfortable because imagine one hundred people that want to buy products by a call at the same time. Orders are often overlooked and this leads to major problems in the future, which may result in bankruptcy. This software will provide a very organized, hybrid and comprehensive solution for these issues, which will increase the cooperation between administrators, employees and customers. It will make the life inside the company easier and save needed time and energy for both parts that go through the process (staff and customers).

2. Product/Service Description

B3Albania is a new company in the market, founded in December 2017. It started by trading perfumes for kids and after that continued with the skin care (mostly concentrated in sun protection) and recently going on with nails care. The company is mainly focused in children stuff. As it is a sale based company the main goal is to have higher sale rates in a shorter time and simpler way.

OSMS (Online Shop Management System) is a software which aims to redesign the lifecycle of the company and provide new technological solutions to every step of the process. This software will be used by the administrator, storekeeper and the customer. Our mission is to create a dynamic software, which will prove useful to every user of the company (staff and clients).

The software aims to help every step of the company job, starting from simple order receiving to order status tracking, report generation, dynamic form filling and much more. If we divide the company in two major subsections we are able to give a more detailed description of what this software provides for both parties.

Company Staff (Administrator, Storekeeper, Economists)

- Real time Statistics, Sales Performance, Charts and Graphs
- Live Feeds
- Order Receiving and Tracking, Dynamic Forms, Reports and much more.

Company Costumers

- Order Making
- Order Status Checking
- Offers Providing
- Chat Support

2.1 Product Context

The context of this software is related to the B3Albania, even though our scope is to provide a solution for every branch of the company. This solution will be used by every office employee of the company and also by the costumers in order to enhance their cooperation between staff and clients, make their jobs/purchases easier and make sure they make a full use of their time and energy.

2.2 User Characteristics

There are three user types that will take advantage and use the software:

- Administrator
- Manager
- Costumer

a) Administrator

- This user will be responsible for fulfilling the product quantity, adding new products, categories. This user will be provided an administrator level account that will be able to CRUD product,

categories, orders, users etc. These user is the backbone of the system, making sure that data is generated in the system by continuously observing the reports.

b) Manager

- This user will be responsible for order receiving from all costumers, making them ready, send them to the costumer, checking the order status, and the product availability. This user will be provided a manager level account that will be able to Read Update Send orders. These users are the engine of the system, making sure that orders are successfully processed in all their lifecycle.

c) Costumer

- This user will be responsible for **only** its orders, chart, and purchases. This user will be provided a classic level account that will be able to CRUD only its own orders. This user is the king of the system (company) by purchasing the products.

2.3 Assumptions

- It is assumed that the B3Albania has the right to go through all the data generated from every other branch of company according to law.
- It is assumed that the data generated from the system will be fully confidential and only available to the inspectorate and/or higher state institutions which govern the inspectorate.
- It is assumed that every manager is equipped with a smart device from where they will perform every operation they are required to. If not, the company is assumed responsible for equipping every manager with the required device. These smart devices have to be capable of receiving information from web browsers. The smart devices are assumed to have an IOS, Android, Windows, LINUX, Ubuntu etc. Operating System.
- It is assumed further that the managers are able to use smart devices and especially the OSMS web application effectively and efficiently.
- It is assumed that every costumer should be limited to watching only his orders and not interfere with other costumers.
- It is assumed that office employees (administrator, manager) have a web browser and an active internet connection.
- It is assumed that every completed order needs to be stored in the system for documentation and report purposes.
- It is assumed that the manager is responsible for the progress of the orders.
- It is assumed that the administrator is responsible for updating stock in real time.

2.4 Constraints

This system will be potentially constrained by:

- The fact that employees have to be equipped at all times with smart devices
- The need of a fast internet connection and real time database update.

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- Having every employees understand the way the system works and training them to use the web application correctly and efficiently.
- The need of a browser in every device to run the application.

2.5 Dependencies

List dependencies that affect the requirements.

- Users need to have a strong internet connection in order to run effectively.
- Customer should be logged-in in case of making an order.
- The order needs to satisfy product stock availability.
- The costumer need to have at least 1 product in cart in case to make an order.
- The system is also dependent on the browser performance.
- Products are on stock but are expired and cannot be ordered.

3. Requirements

Priority Definitions

The following definitions are intended as a guideline to prioritize requirements.

- Priority 1 – The requirement is a “must have” as outlined by policy/law
- Priority 2 – The requirement is needed for improved processing, and the fulfillment of the requirement will create immediate benefits
- Priority 3 – The requirement is a “nice to have” which may include new functionality

It may be helpful to phrase the requirement in terms of its priority, e.g., "The value of the employee status sent to DIS **must be** either A or I" or "It **would be nice** if the application warned the user that the expiration date was 3 business days away". Another approach would be to group requirements by priority category.

3.1 Functional Requirements

- a. I want you to build for me a website for B3 from where people can make online purchases. (Original version: Dua te me ndertosh per B3 nje website nga ku njerezit mund te bejne blerje online.)
 - i. The software must be a web-based application.
 - ii. The service that the system will offer will be based on online sales and purchases.
 - iii. The application must have a specific UI (user interface) for client.
 - iv. Client should register in order to gain access to online transactions.
- b. Also I want to have the opportunity to check these orders together with the manager for making them ready to deliver to respective clients. (Original version: Gjithashtu une te kem mundesi ti kontrolloj keto porosi se bashku me magazinieren qe ti bejme gati per ti bere dergesat neper adresat perkatese.)
 - i. The application must have two other user interfaces administrator and manager.
 - ii. The manager should provide the access of reading orders and updating their status.
 - iii. The administrator must also provide access on orders.
- c. I also want to have the opportunity to easily add new products or new lines that we can add later in company. (Original version: Po ashtu te kem mundesi dhe une te shtoj produkte te reja lehtesisht ose linja te reja qe mund te fusim me vone.)
 - i. The administrator must have the highest level of user access.
 - ii. The administrator must have access to CRUD categories, products, orders, users.
- d. And if you can make it that at the end of each month to have the opportunity to print the monthly sales performance to see how the online store is going on. (Original version: Dhe nese ke mundesi ne fund te muajit te kem mundesi te printoj ecurin mujore te shitjeve per te pare sesi po ecen dyqani online.)
 - i. The system must generate automatically every last day of the month the sales report.

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- ii. The reports must be accessed only by the administrator.
 - iii. The statistical data will be displayed by charts or graphs in order to review and compare easily to each other.
 - iv. The admin must have the ability to filter the reports depended on his needs.
 - v. The system must convert the reports in PDF format in order to be printed in a correct format.
 - vi. The system should provide a print service.
 - vii. The user orders and data will be saved by the system for statistical issues.
- e. I am open for any suggestions that may come out during the way, on what we can add or remove. (Original version: Per cdo sygjerrim qe mund te dali rruges se cfare mund te shtojme ose te heqim i mirepres.)
- i. The Software Development Life Cycle will be in an iterative process flow.
- f. Attached I am sending you the lists of the products with the relevant descriptions. (Original version: Bashkengjitur po te coj dhe listen e produkteve me pershkrimet perkatese.)
- i. In user interface a specific description will be displayed for every product.
 - ii. In user interface the price will be displayed for every product.

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Req#	Requirement	Comments	Priori ty	Date Rvwd	Written/ Reviewed & Approved
BR_01	The software must be a web-based application.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_02	The service that the system will offer will be based on online sales and purchases.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_03	The application must have a specific UI (user interface) for client.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_04	Client should register in order to gain access to online transactions.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_05	The application must have two other user interfaces administrator and manager.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_06	The manager should provide the access of reading orders and updating their status.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_07	The administrator must also provide access on orders.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_08	The administrator must have the highest level of user access.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_09	The administrator must have access to CRUD categories, products, orders, users.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_10	The system must generate automatically every last day of the month the sales report.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_11	The reports must be accessed only by the administrator.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_12	The statistical data will be displayed by charts or graphs in order to review and compare easily to each other.		3	29/03/2019	Greta Daci, Tajda Kumbulla

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Req#	Requirement	Comments	Priori ty	Date Rvwd	Written/ Reviewed & Approved
BR_13	The admin must have the ability to filter the reports depended on his needs.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_14	The system must convert the reports in PDF format in order to be printed in a correct format.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_15	The system should provide a print service.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_16	The user orders and data will be saved by the system for statistical issues.		1	29/03/2019	Greta Daci, Tajda Kumbulla
BR_17	The Software Development Life Cycle will be in an iterative process flow.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_18	In user interface a specific description will be displayed for every product.		2	29/03/2019	Greta Daci, Tajda Kumbulla
BR_19	In user interface the price will be displayed for every product.		2	29/03/2019	Greta Daci, Tajda Kumbulla

3.2 Non-Functional Requirements

3.2.1 Product Requirements

The main application shall be a web application, which can be used either with Mozilla, Internet Explorer, Chrome or Safari.

The main page of web application for the customer side will display the menu, the categories, and products with images, descriptions and prices. The customer can filter the products, add them to wish list, add them to card or order them to buy. Customers must create accounts in order to purchase. In their accounts they could see customer info, addresses (only their), orders made by them, their wish list and shopping card.

The main page of web application for staff side shall display a simple login interface, where it will ask the user for its Username and Password. Based on the given credentials, the necessary system constraints will apply. The user will gain access to the system, in case of proven authenticity otherwise, an error message of invalid credentials will be displayed.

As part of the system structure different system modules are included in staff interfaces, such modules are, dashboard module, user module, orders module, report module and the settings module. Once the user is logged in the web application, he/she shall have access to specific modules of the system. The will redirect the user to the dashboard module. Thus the page displayed by the system after the login interface, shall provide additional information, regarding the sales overall performance.

The last module provided by the system, is the reports model. This model, just like in the dashboard model will provide statistical and useful information, regarding the sales, order and products.

The format of such reports shall be mainly in pdf in case of printing them and excel format in case of downloading them.

3.2.2 Usability Requirements

Include any specific usability requirements, for example,

- Learnability
 - The application is simple to use and understand.
 - The web application will come together with a PDF manual, providing a step by step information on how to effectively use the system.
 - Specific error messages will be displayed, by also identifying the specific action, that caused the error.
 - The application is specified for certain users, thus the system will know, when a certain action is not allowed.
- Accessibility
 - The software shall be easy to access remotely and at all times, since both customers and staff will use the application on their devices (laptop, computer, smartphone etc.).
- Responsiveness

- The software shall be responsive both in design and data transactions.
- Flexibility
 - The software shall be easy to update in order to accommodate new requirements.
 - The software shall be designed in such a way that the isolation and management of errors is possible
- Effectiveness
 - The software shall provide both staff and clients with practical tools of managing their data and with a convenient way of communicating their needs across the platform.

3.2.3 Efficiency Requirements

3.2.3.1 Performance Requirements

The application, being a web application, will be stored in a web server.

The application's time of execution will depend on:

- The algorithm's efficiency for fetching data from the database.
- The users Internet connection strength.
- The server hardware capabilities.
- The operating system installed on a server.
- Third party library dependencies that need to be installed.
- The number of active user accessing the website.

3.2.3.2 Capacity and space requirements

- Database writes are limited to 3000 per second, which will be more than enough for our use case.
- Maximum concurrent connections web clients are limited to 150000 per database.
- Maximum number of documents that can be passed to a Commit operation in a transaction is 500
- Maximum number of composite indexes for a database is 200

3.2.3.3 Availability

Include specific and measurable requirements for:

- The web application will be available for use 24/7.
- The web application will work in an optimal manner during the working hours of the day.
- The application can be accessed and used in any geographical area, as long as the user has an active Internet connection.
- By creating separate user sessions, their overall work efficiency and productivity will not decrease by much, while using the application.
- Specific error messages will be provided, in case an action would cause systems fatal error.

3.2.3.4 Latency

The latency of the web application will mainly depend on:

- The Internet connection strength.
- The efficiency of the specific algorithm for fetching the data from the database.
- The size of the database.

Specific modules are expected to load within such time line:

- The login module should load within the first 100 ms
- The dashboard module should load within the first 300ms
- The reports module should load within the 1500 ms
- The setting module should load with the first 300 ms

3.2.4 Dependability Requirements

3.2.4.1 Monitoring

The application user interface, will be easy and it will not provide cases that would crash the system. Necessary actions for any of error will be taken. The login interface needs a Username ⁽¹⁾ and Password ⁽²⁾ as input. These two input data must be valid input data. The user will log in the system, in case the user has entered valid credentials, otherwise an error message of “Invalid Credentials” will be displayed.

The user module will order the registered users (separated clients from staff). Within the module, a search bar is included, in order to fetch a user having some specific credential. Users can be searched by: name ⁽¹⁾, email ⁽²⁾ and username ⁽³⁾. Placing other type of data information will result in an empty table. Also within the user module, a failure message is included, for modifying the user data. A failure condition is included whenever the administrator tries to change the password. If the administrator tries to place information which is not compatible with the data in the database, then a message alert will be shown. If the changed password does not match with the confirmed password then no changes are made and an alert message will be shown.

The settings module will hold the user personal information. Within this module the users can change their credentials. If the new data is not the same as the data type specified by the database, then an error message alert will be displayed. If the changed password does not match with the confirmed password then no changes are made and an alert message will be shown.

3.2.4.2 Maintenance

The software will be developed working on Laravel framework. Laravel uses MVC pattern for software developing. The Model–view–controller shortly known as MVC is a software architectural design for implementing user interfaces on computers. Also the database will be built using MySQL.

Advantages of using MVC & MySQL:

- Faster development process
- Ability to provide multiple views
- Support for asynchronous technique
- Modification does not affect the entire model

- MVC model returns the data without formatting
- SEO friendly Development platform
- Data Security
- On-Demand Scalability
- High Performance
- Round-the-Clock Uptime
- Comprehensive Transactional Support
- Complete Workflow Control

3.2.4.3 Operations

Operations required by the user:

- Weekly back up.
- No data sharing is allowed.
- Data security.
- Users will have the authority to change his/her own credential data.
- CRUD functionality for users.
- Admin will have the authority to add or remove new users (from staff).
- Admin will have the authority of checking and evaluating performance.

3.2.5 System Interface/Integration

3.2.5.1 Network and Hardware Interfaces

TCP (transfer control protocol) and IP (internet protocol) define as how computers should connect with each other through the internet and how they share information. Common TCP/IP protocols are HTTPS, HTTP and FTP. We use these protocols to access the website without even realizing it. FTP (file transfer protocol) used to download files from a browser.

HTTPS (where the “S” stands for security) responsible for the secure communication between a server and a browser like an account information or personal information.

SSL (secure sockets layer) and TLS (transport layer security) are the protocols associated with trust and security.

We are also using SMTP (google SMTP) for email verification.

Ports allow one device to connect with the other through a different and unique IP address. A device can have more than one port.

Port 25 (SMTP) is usually reserved for email. It is used to transmit data from remote email servers. If that port is blocked no emails can be sent. Some other port numbers are 80(HTTP), 443 (HTTPS), 21 (FTP). Firewalls can often block a port to tighten the security.

3.2.5.2 Systems Interfaces

System to system interface

Email using google SMTP service:

SMTP server (i.e., outgoing mail): smtp.gmail.com

SMTP username: be3albania@gmail.com

SMTP password: email password

SMTP port: 465

SMTP TLS/SSL required: yes

In order to store a copy of outgoing emails in your Gmail or Google Apps Sent folder, log into your Gmail or Google Apps email Settings and:

Click on the Forwarding/IMAP tab and scroll down to the IMAP Access section: IMAP must be enabled in order for emails to be properly copied to your sent folder.

3.2.6 Security Requirements

3.2.6.1 Protection

Specify the factors that will protect the system from malicious or accidental access, modification, disclosure, destruction, or misuse. For example:

- The encryption of customer data (personal information, credit card information) as well as inventories, company financial information, etc.
- Communication between modules is done via the exchange of named objects with the event and object manager. Modules therefore do not depend on specific other modules being available in memory or having been run before, but only on whether the necessary data objects have been stored in the event or the object manager. This allows us to completely specify a module by defining which objects or containers it expects as input from the event and object manager and which objects are produced as output in event and object manager. Any two objects using and producing the same objects should be completely interchangeable in running macros. The names of input and output objects for each module should be set to a default value in the modules constructor. They can be overwritten at any time, allowing the same module to be run on the same event with different tuning parameters producing different output containers. Using special tags in the comment fields of the module data member declaration allows the programmer to identify the names of input and output containers. This will be used to automatically check the availability of the containers needed by the module, check whether a particular chain of modules is likely to be consistent and provide automated module documentation. As a rule of thumb, modules should exit gracefully and with a meaningful error message if one of necessary input objects is not found in the event or object manager.
- Data integrity we are going to use in the database system by a series of integrity constraints. The integrity used will be:
 - Entity integrity concerns the concept of a primary key. Entity integrity is an integrity rule which states that every table must have a primary key and that the column or columns chosen to be the primary key should be unique and not null.
 - Referential integrity concerns the concept of a foreign key. The referential integrity rule states that any foreign-key value can only be in one of two states. The usual state of affairs is that the foreign-key value refers to a primary key value of some table in the database. Occasionally, and this will

depend on the rules of the data owner, a foreign-key value can be null. In this case, we are explicitly saying that either there is no relationship between the objects represented in the database or that this relationship is unknown.

- Domain integrity specifies that all columns in a relational database must be declared upon a defined domain.
- User-defined integrity refers to a set of rules specified by a user, which do not belong to the entity, domain and referential integrity categories.

3.2.6.2 Authorization and Authentication

Authentication:

- Used by a server when the server needs to know exactly who is accessing their information or site.
- Used by a client when the client needs to know that the server is system it claims to be.
- The user or computer has to prove its identity to the server or client.
- By a server entails the use of a user name and password.
- By a client usually involves the server giving a certificate to the client in which a trusted third party states that the server belongs to the entity (such as a bank) that the client expects it to.
- Identifies and verifies who the person or system is.

Authorization:

- A process by which a server determines if the client has permission to use a resource or access a file.
- Coupled with authentication so that the server has some concept of who the client is that is requesting access.
- The type of authentication required for authorization may vary; passwords may be required in some cases but not in others.

3.2.7 Data Management

The database that the application will be using, will contain this kind of possible information:

- Users (id, email, password, full_name, phone, birth_date, user_level, image, address, city, region, postal_code, verification_token, verified, created_at, updated_at)
- Orders (id, user_id, status_code, note, created_at, updated_at)
- Products (id, code, price, title, description, in_stock, created_at, updated_at)
- Reviews (user_id, product_id, description, image, rating, created_at, updated_at)
- Categories (id, title, description)
- Carts (user_id, product_id, quantity)
- Favorites (user_id, product_id)

3.2.8 Standards Compliance

Specify the requirements derived from existing standards, policies, regulations, or laws (e.g., report format, data naming, accounting procedures, audit tracing). For example, this could specify the requirement for software to trace processing activity. Such traces are needed for some applications to meet minimum regulatory or financial

standards. An audit trace requirement may, for example, state that all changes to a payroll database must be recorded in a trace file with before and after values.

3.2.9 Portability

Portability it is not an issue. The application will be accessed as long as you have internet connection by using either a computer or mobile phone.

3.2.10 Organizational Requirements

3.2.10.1 Environmental Requirements

In our software system the framework used is Laravel.
To run Laravel, it is needed to have the PhpStorm and the most preferred one is PhpStorm.
You should do some installations for the framework to work correctly.

Commands used:

- Composer install
- Php artisan config:cache
- Php artisan key:gen
- Php artisan config:clear
- Php artisan migrate
- Php artisan db:seed
- Php artisan serve

3.2.10.2 Operational Requirements

The operational requirement includes the following activities:

- (a) Identification of stakeholders who will or should have an interest in the system throughout its entire life cycle(second level user(customer)).
- (b) Elicit requirements for what the system must accomplish and how well.
- (c) Definition of constraints imposed by agreements or interfaces.
- (d) Establishment of critical and desired user performance.
- (e) Establishment of measures of effectiveness and suitability: measures that reflect overall customer (e.g., performance, safety, reliability, availability, maintainability, and workload requirements).

3.2.10.3 Development Requirements

This process area addresses all customer requirements rather than only product level requirements because the customer can also provide specific design requirements. Customer requirements are further refined into product and product component requirements. In addition to customer requirements, product and product component requirements are derived from the selected design solutions.

- Development of the lifecycle requirements of the product

- Establishment of the customer functional and quality attribute requirements
- Establishment of initial product and product component requirements consistent with customer requirements

3.2.11 External Requirements

- The firm must establish policies and procedures designed to provide it with reasonable assurance that the firm and its personnel comply with relevant ethical requirements.

Relevant ethical requirements establish fundamental principles of professional ethics, which include:

- (a) Integrity;
- (b) Objectivity;
- (c) Professional competence and due care;
- (d) Confidentiality; and
- (e) Professional behavior.

3.2.11.1 Regulatory Requirements

3.2.11.1.1 Pre-contractual Information

- (a) The website must tell the visitor how **contractual procedures** regarding products and/or services will be implemented
- (b) Users must know about the **technical means** available to them in case they wish to exercise their rights to modify, correct, or eliminate information
- (c) The website must be clear about its **terms of use** – as well as indicating **how electronic documents** containing information on the provider, client, products and/or services will be stored

3.2.11.1.2 Post-contractual information

The e-commerce site must **confirm all website purchases** by notifying the client within **24 hours**. These notifications can be delivered electronically or by any other means indicated during the contractual procedures. The only requirement is that the method chosen must allow the client to save the notification.

3.2.12 Ethical Requirements

Ethical requirements are principles that when followed, promote values such as trust, good behavior, fairness and/or kindness. Each company has the right to develop the standards that are meaningful for their organization. Ethical standards are not always easily enforceable, as they are frequently vaguely defined and somewhat open to interpretation or they might be more specific.

3.2.13 Legislative Requirements

3.2.13.1 Data Protection Legislation

Personal data shall be:

- (a) Processed lawfully, fairly and in a transparent manner in relation to individuals ('lawfulness, fairness and transparency')
- (b) Collected for specified, explicit and legitimate purposes and not further processed in a manner that is incompatible with those purposes
- (c) Adequate, relevant and limited to what is necessary in relation to the purposes for which they are processed
- (d) Processed in a manner that ensures appropriate security of the personal data, including protection against unauthorised or unlawful processing and against accidental loss.

3.2.13.2 Accounting Requirements

The user shall comply with relevant rules of professional conduct / code of ethics, issued by various professional requirements, or requirements imposed by law or regulation, that are at least as demanding. Relevant ethical requirements for user establish the following fundamental principles with which the user is required to comply:

- Compliance with professional standards
- Confidentiality of information
- Handling of property of others
- Objectivity

3.2.13.3 Safety/Security Requirements

Software faults that lead to failures are embedded into the code either through coding errors or because of errors/omissions/ambiguities in software requirements.

In order to perform a requirements review that can focus on safety-aspects of the code, the following design products must be taken into consideration:

- (a) System architecture
- (b) Complete system requirements documents
- (c) System hazard analysis and/or Fault Tree Analysis

3.3 Domain Requirements

- OSMS can be used both by the clients/customers and staff.

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- It covers different procedures from online ordering on the client site to inventory, products, price and orders management on staff site (admin or storekeeper).
- This business application does not communicate with any third party entity.
- Different system users have different privileges that should be respected and take full responsibility by the account holder.

4. User Scenarios/Use Cases

1. Story name: Customer Successful Login
 - a. The user is asked to enter his email
 - b. The user is asked to enter his password
 - c. The user presses “Sign In” button
 - d. If his credentials are matched in the database, he is authorized to be redirected
 - e. The user gets redirected to the website (front page)
2. Story name: Customer Failed Login
 - a. The user is asked to enter his username
 - b. The user is asked to enter his password
 - c. The user presses “Sign In” button
 - d. The credentials that were entered are not found in the database
 - e. The user is displayed an error message, “You credentials were not correct, please try again”
 - f. The user tries to enter the credentials again’
3. Story name: First time customer register successfully
 - a. The costumer press “Register” button
 - b. The registration form is shown to customer
 - c. The customer fill the registration form
 - d. The data entered are valid
 - e. The costumer is displayed a message, “You have been registered successfully”
 - f. The customer receive a mail validation message in the email he/she puted
 - g. The customer verifies the email
 - h. The costumer become a user
4. Story name: First time client register failed
 - a. The costumer press “Register” button
 - b. The registration form is shown to customer
 - c. The customer fill the registration form
 - d. The data entered are ambiguous(not valid)/ not existent email / one of the required fields left empty
 - e. The costumer is displayed an error message, “Your data are not valid or you have left any required field empty ”
 - f. The costumer retries to fill the form
5. Story name: Customer view his profile
 - a. Customer is logged-in
 - b. Press the menu button
 - c. Press My Profile
 - d. Profile is shown to the customer
6. Story name: Customer updates profile

- a. Customer is logged-in
 - b. Press the menu button
 - c. Press My Profile
 - d. Profile is shown to the customer
 - e. Customer edit data
 - f. Customer press the “Update” button
 - g. Profile is updated
7. Story name: Customer views products
- a. Customer is logged-in
 - b. Press the menu button
 - c. Customer press Browse
 - d. Product and Categories are shown to customer
8. Story name: Customer filters products
- a. Customer is logged-in
 - b. Press the menu button
 - c. Customer press Browse
 - d. Product and Categories are shown to customer
 - e. Customer filters the product by categories and subcategories
9. Story name: Customer search products
- a. Customer is logged-in
 - b. Press the menu button
 - c. Customer press Browse
 - d. Product are shown to customer
 - e. Customer write the name in the search bar
 - f. The searched product is shown to the costumer
10. Story name: Customer add a product to wishlist
- a. Customer is logged-in
 - b. Press the menu button
 - c. Customer press Browse
 - d. Product are shown to customer
 - e. Customer pres the star icon in the product cart
 - f. The product is added in wishtlist (favorites)
11. Story name: Customer add a product to card
- a. Customer is logged-in
 - b. Press the menu button
 - c. Customer press Browse
 - d. Product are shown to customer

- e. Customer press the product name in the product cart
- f. The product details are shown to customer
- g. Customer press the “Add to Cart” button in actions section
- h. The product is added in customer cart.

12. Story name : Costumer successful order a product

- a. Customer is logged-in
- b. Press the menu button
- c. Customer press Browse
- d. Product are shown to customer
- e. Customer press the product name in the product cart
- f. The product details are shown to customer
- g. Customer define the quantity.
- h. Customer press the “Order” button in actions section
- i. The order is sent

13. Story name : Costumer feedback of a product (when he is logged in)

- a. Press the menu button
- b. Customer press Browse
- c. Product are shown to customer
- d. Customer press the product name in the product cart
- e. The product details are shown to customer
- f. Customer write the review description and give the rating.
- g. Customer press the “Send” button in make review section
- h. The review is made.

14. Story name: Costumer check his orders status (when is logged in)

- a. Press the menu button
- b. Customer press My Orders
- c. Orders are shown to customer

15. Story name: Costumer delete his order (only when the status is received)

- a. Press the menu button
- b. Customer press My Orders
- c. Orders are shown to customer
- d. Customer press the view tool to the order he want to delete.
- e. The order details are shown to customer
- f. Customer press the “Remove” button
- g. The order is removed

16. Story name: Admin Login

- f. The admin is asked to enter his email

- g. The admin is asked to enter his password
- h. The admin presses “Sign In” button
- i. If his credentials are matched in the database, he is authorized to be redirected
- j. The admin gets redirected to the dashboard

17. Story name: Admin opens user management

- a. Admin is logged in
- b. Press the management scroll down menu
- c. Admin press User Management
- d. All users are displayed to admin

18. Story name: Admin create a user

- a. Admin is logged in
- b. Press the management scroll down menu
- c. Admin press User Management
- d. All users are displayed to admin
- e. Admin press the “Create” button
- f. Admin fill the fields needed to create a user
- g. Admin press the “Submit” button
- h. The user is successfully created

19. Story name: Admin edit a user

- a. Admin is logged in
- b. Press the management scroll down menu
- c. Admin press User Management
- d. All users are displayed to admin
- e. Admin press the edit tool
- f. The user data are shown to admin
- g. Admin change the data
- h. Admin press the “Update” button
- i. The user is successfully updated

20. Story name: Admin delete a user

- a. Admin is logged in
- b. Press the management scroll down menu
- c. Admin press User Management
- d. All users are displayed to admin
- e. Admin press the edit tool
- f. The user data are shown to admin
- g. Admin press the “Delete” button
- h. The user is successfully deleted

21. Story name: Admin opens category management
 - a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Category Management
 - d. All “Categories” and “Category Types” are displayed to admin
22. Story name: Admin create a “Catgory type”
 - a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Category Management
 - d. All “Categories” and “Category Types” are displayed to admin
 - e. Admin press the “Create” button under the category type
 - f. Admin write the category type name
 - g. Admin press the “Add” button
 - h. The category type is successfully added
23. Story name: Admin create a “Catgory” for a “Category type”
 - a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Category Management
 - d. All “Categories” and “Category Types” are displayed to admin
 - e. Admin press the “Create” button under the category
 - f. Admin write the category title, description and which category type it is related
 - g. Admin press the “Add” button
 - h. The category is successfully added
24. Story name: Admin edit a “Category Type” or “Category”
 - a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Category Management
 - d. All “Categories” and “Category Types” are displayed to admin
 - e. Admin press the “Edit” tool for a category type or category
 - f. Admin changes the field values
 - g. Admin press “Update” button
 - h. “Category Type” or “Category” is successfully updated
25. Story name: Admin delete a “Category Type” or “Category”
 - a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Category Management
 - d. All “Categories” and “Category Types” are displayed to admin
 - e. Admin press the “Edit” tool for a category type or category

- f. Admin press “Delete” button
 - g. “Category Type” or “Category” is successfully deleted
26. Story name: Admin check reports (when is logged in)
- a. Admin goes to reports module
 - b. Admin press “Reports”
 - c. Admin choose the type of the reports
 - d. Admin put the dates he/she want te report
 - e. Admin press th button “Make”
 - f. The report is generated based on the admin filters and is automatically downloaded in pdf format
27. Story name: Admin opens product management
- a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Product Management
 - d. All products are displayed to admin
28. Story name: Admin view a product
- a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Product Management
 - d. All products are displayed to admin
 - e. Admin press the view tool
 - f. All the product details are displayed to admin
29. Story name: Admin edit a product
- a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Product Management
 - d. All products are displayed to admin
 - e. Admin press the edit tool
 - f. Admin changes the product details
 - g. Admin press the “Submit” button
 - h. The product is successfully updated
30. Story name: Admin add a new product
- a. Admin is logged in
 - b. Press the management scroll down menu
 - c. Admin press Product Management
 - d. All products are displayed to admin
 - e. Admin press the “Create” button

- f. Admin fills the product details
 - g. Admin press the “Submit” button
 - h. The product is successfully added
31. Story name: Admin view orders
- a. Admin is logged in
 - b. Press the order menu in the navigation bar
 - c. All orders are displayed to admin
32. Story name: Admin change order status
- a. Admin is logged in
 - b. Press the order menu in the navigation bar
 - c. All orders are displayed to admin
 - d. Admin press the edit tool
 - e. The order details are displayed to admin
 - f. Admin change the order status
 - g. Status is successfully updated
33. Story name: Admin print order
- a. Admin is logged in
 - b. Press the order menu in the navigation bar
 - c. All orders are displayed to admin
 - d. Admin press the print tool
 - e. A PDF format is automatically downloaded with all order details
34. Story name: Manager Successful Login
- a. The manager is asked to enter his email
 - b. The manager is asked to enter his password
 - c. The manager presses “Sign In” button
 - d. If his credentials are matched in the database, he is authorized to be redirected
 - e. The manager gets redirected to the website (front page)
35. Story name: Manager view orders
- a. Manager is logged in
 - b. Press the order menu in the navigation bar
 - c. All orders are displayed to manager
36. Story name: Manager change order status
- a. Manager is logged in
 - b. Press the order menu in the navigation bar
 - c. All orders are displayed to manager
 - d. Manager press the edit tool

- e. The order details are displayed to manager
- f. Manager change the order status
- g. Status is successfully updated

37. Story name: Manager print order

- a. Manager is logged in
- b. Press the order menu in the navigation bar
- c. All orders are displayed to manager
- d. Manager press the print tool
- e. A PDF format is automatically downloaded with all order details

38. Story name: Manager view a product

- a. Manager is logged in
- b. Press the product menu in the navigation bar
- c. All products are displayed to manager
- d. Manager press the view tool
- e. All the product details are displayed to manager

39. Story name: Manager edit a product

- a. Manager is logged in
- b. Press the product menu in the navigation bar
- c. All products are displayed to manager
- d. Manager press the edit tool
- e. Manager changes the product details
- f. Manager press the “Submit” button
- g. The product is successfully updated

Use Case Tables

Name	User Login
Summary	The user enters its credentials in order to login into the web application
Actor	Manager, Customer, Admin
Description	In order to use the web application, all users must enter their credentials (email/password) so they can access their respective user interface.
Precondition	<ul style="list-style-type: none"> • The Second level User (Customer) and First level user (Manager) must be registered in order to login into application. • First level user is registered by admin.
Alternative	There is no other way of logging in into application and gain access to its functionalities.
Post Condition	To gain access to the modules provided by the software system.

Name	User Register
Summary	Second level users (Customer) must fill the registration form in order to create a new account.
Actor	Second level users (Customer)
Description	For new users it is required to firstly register into application by filling the registration form with their personal data and the system will automatically confirm their email address and redirect them to the customer user interface.
Precondition	Without filling the registration form the user is unable to create its new account.
Alternative	There is no alternative condition.
Post Condition	Second level user may update its profile by uploading a new photo.

Name	Filter Product
Summary	Every user can filter product and regarding to user level, they can take different actions to specific products.
Actor	Customer, Manager, Admin
	<ul style="list-style-type: none"> • Second level user (Customer) filters product in order to purchase it or to

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Description	leave a comment, feedback. <ul style="list-style-type: none"> ● First level user (Manager) filters product in order to change product stock. ● Admin filters product in order to add a new product, modify an existing product or delete an existing product.
Precondition	<ul style="list-style-type: none"> ● For second level user they must login in order to purchase, give a feedback or to leave a comment on a specific product. ● For first level user they must login in order to change product stock. ● Admin user must login in order to take action on a specific product.
Alternative	There is no alternative condition.
Post Condition	<ul style="list-style-type: none"> ● A second level user can't give a second feedback or leave a second comment on a single product. ● A first level user has no post condition. ● Admin user must populate the new category created with new or existing products. ● A new product added must be modified and redirected to its respective category.

Name	Profile/View Update
Summary	Second level user (Customer) can visit its profile and update its current data.
Actor	Second level users (Customer)
Description	Customer visits its profile in order to update its personal data such as email, password, address and profile photo.
Precondition	In order to update its personal data, customer must be firstly logged in into application.
Alternative	There is no alternative condition.
Post Condition	<ul style="list-style-type: none"> ● The new updated data must be different from the old one. ● User may update its profile by uploading a new photo.

Name	Check Review
Summary	<ul style="list-style-type: none"> ● Second level user (Customer) checks its reviews on different products. ● Admin user checks reviews and takes action on reviews
Actor	Customer, Admin
Description	<ul style="list-style-type: none"> ● Second level user (Customer) is able to check the comment and feedback he left to different products. ● Admin user can take action regarding comments and feedbacks left by customers and delete them if necessary.

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Precondition	<ul style="list-style-type: none">● In order to check for reviews, a second level user must login into application first.● In order to take action on reviews, admin must login into application.
Alternative	There is no alternative condition.
Post Condition	There is no post condition.

Name	Make Review
Summary	Second level user (Customer) leaves a comment or gives a feedback.
Actor	Customer
Description	Second level user (Customer) can leave a comment or give a feedback to a specific product he bought.
Precondition	<ul style="list-style-type: none">● Customer must firstly login into application in order to leave a comment or to give a feedback.● Customer can't leave a review or give a feedback to a product he/she hasn't bought.
Alternative	The costumer can only leave a comment or give a feedback, or both.
Post Condition	For the same product, a customer can't leave a second comment or give a second feedback.

Name	View product
Summary	Admin and manager user check the product status.
Actor	Admin, Manager
Description	Admin and manager user can view products and change its status.
Precondition	Both users must be logged in, in order to take action on product status.
Alternative	There is no alternative condition
Post Condition	Manager must update the product stock for the new arriving products.

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Name	View dashboard
Summary	Admin views dashboard of sales.
Actor	Admin
Description	<ul style="list-style-type: none">● Admin is able to view a dashboard which displays sales during a specific period of time and generate reports regarding these sales.● Admin is also able to download these reports.
Precondition	Admin must firstly be logged in, in order to take actions on reports.
Alternative	Admin might only see dashboard without downloading reports.
Post Condition	There is no post condition.

Name	View user
Summary	Admin takes action on user.
Actor	Admin
Description	<ul style="list-style-type: none">● Admin is able to modify a user by changing its user level (admin can create first level user (Manager)).● Can also delete users (including both first level user (Manager) and second level user (Customer)).
Precondition	Admin must be logged in in order to take actions on user.
Alternative	There is no alternative condition.
Post Condition	There is no post condition.

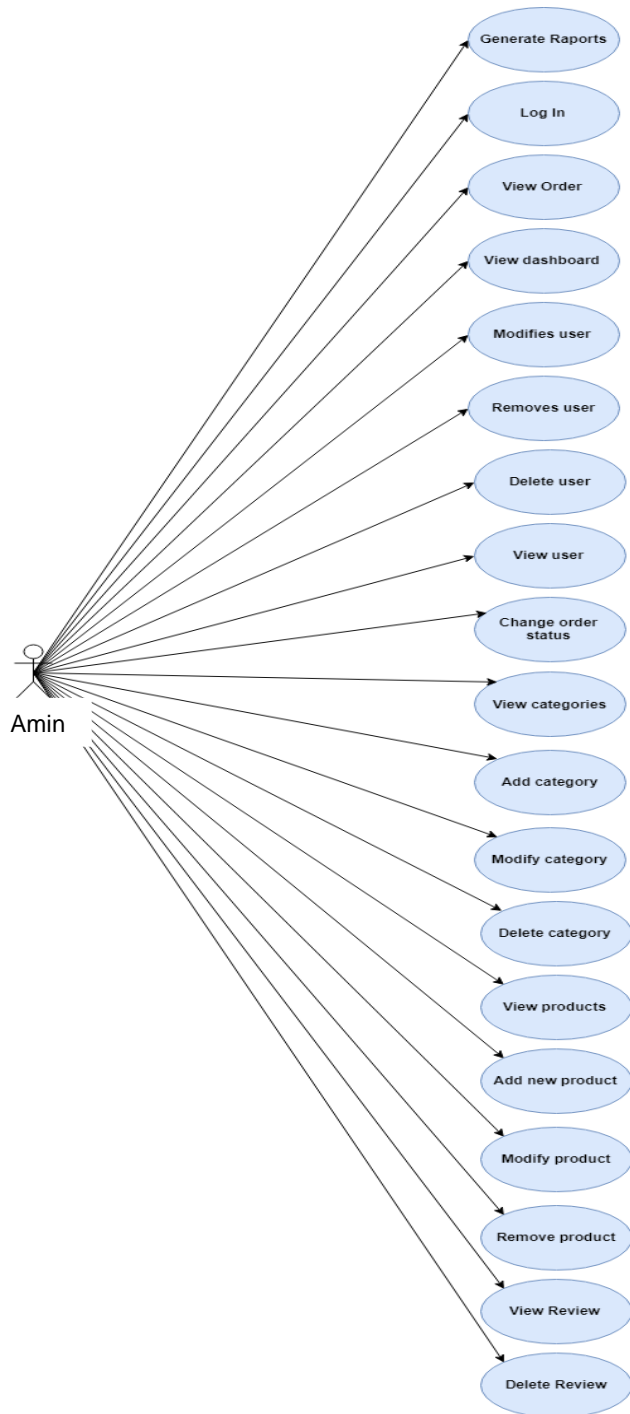
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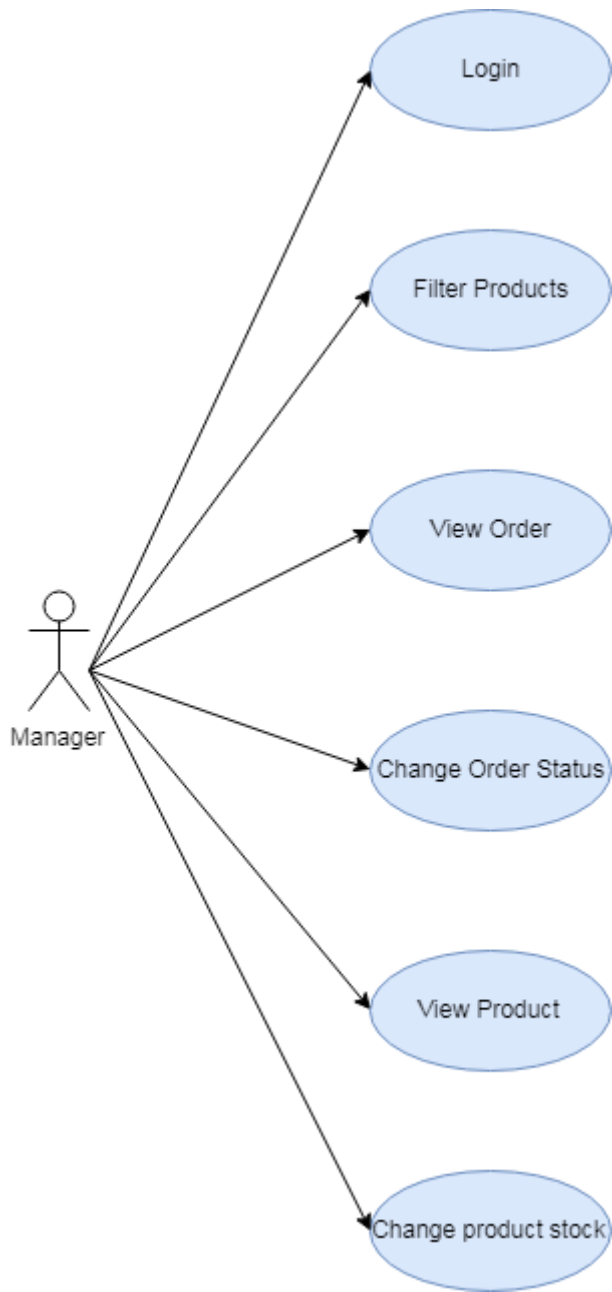
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Name	Action on Category
Summary	Admin takes action on product category.
Actor	Admin
Description	Admin is able to create a new category, to update an existing category or to delete a category
Precondition	Products can't be deleted if the category they belonged to is erased.
Alternative	There is no alternative condition.
Post Condition	A category that is newly created must be populated with products.

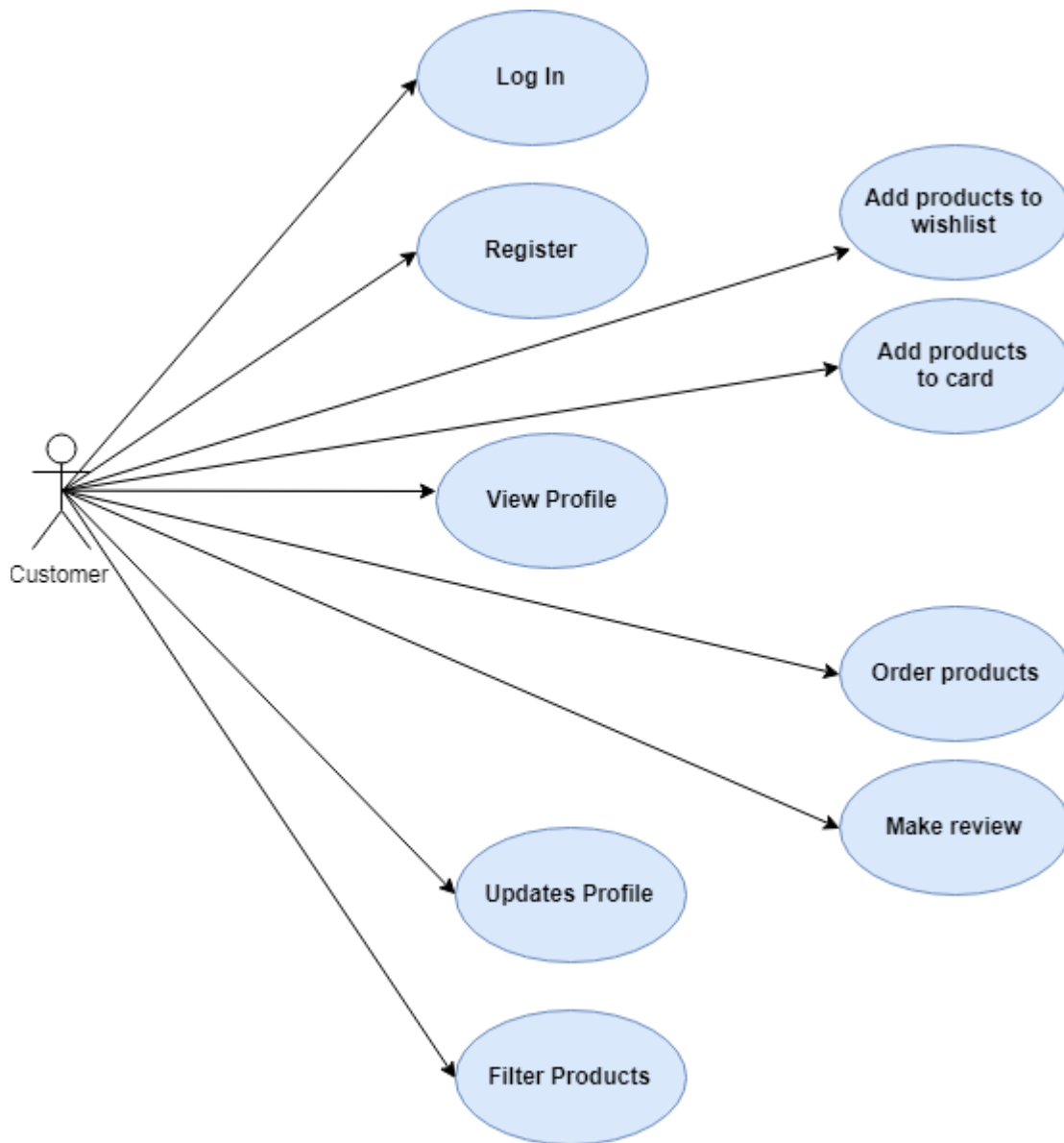
Name	Action on product
Summary	Admin takes action on product.
Actor	Admin
Description	Admin is able to create a new product, modify an existing product or to delete a product.
Precondition	There is no precondition
Alternative	Newly created products can be assigned to specific categories/category
Post Condition	There is no post condition

Use Cases Diagrams

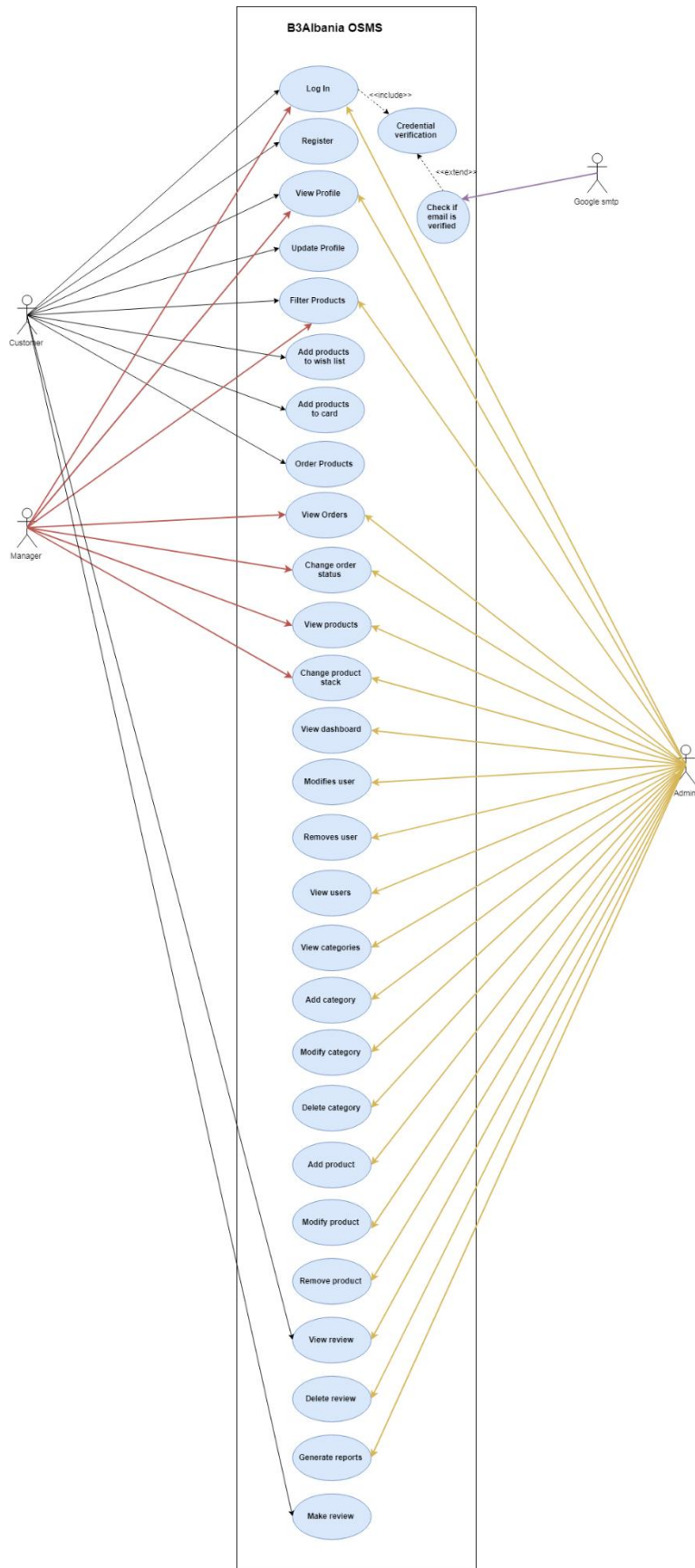




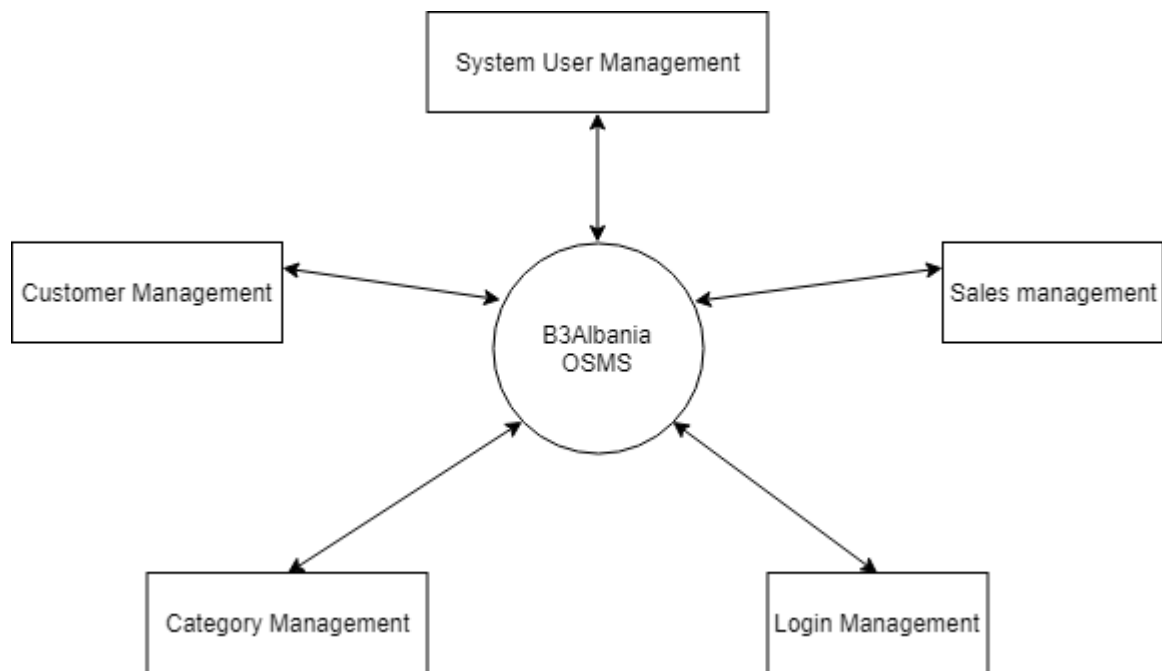
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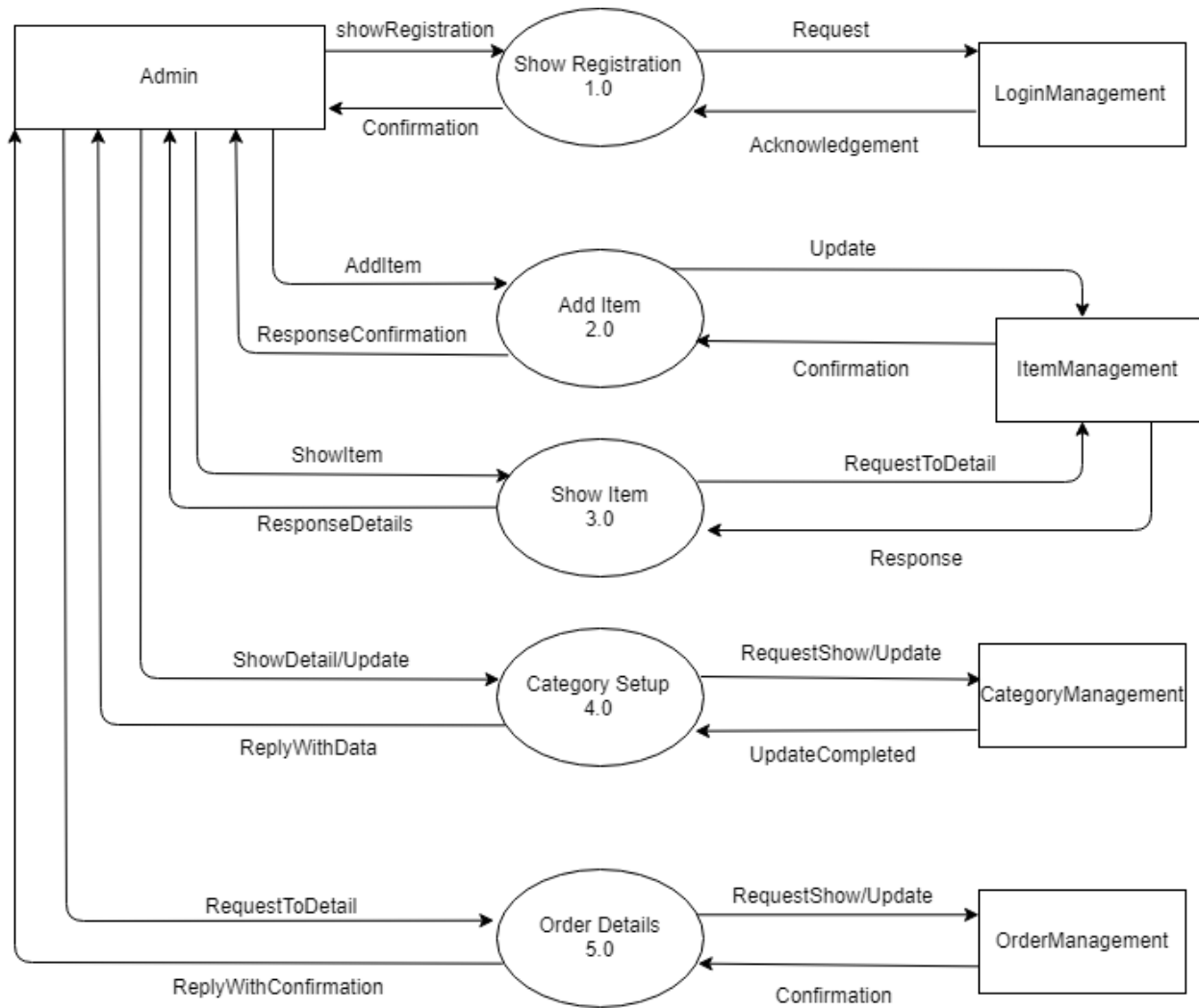
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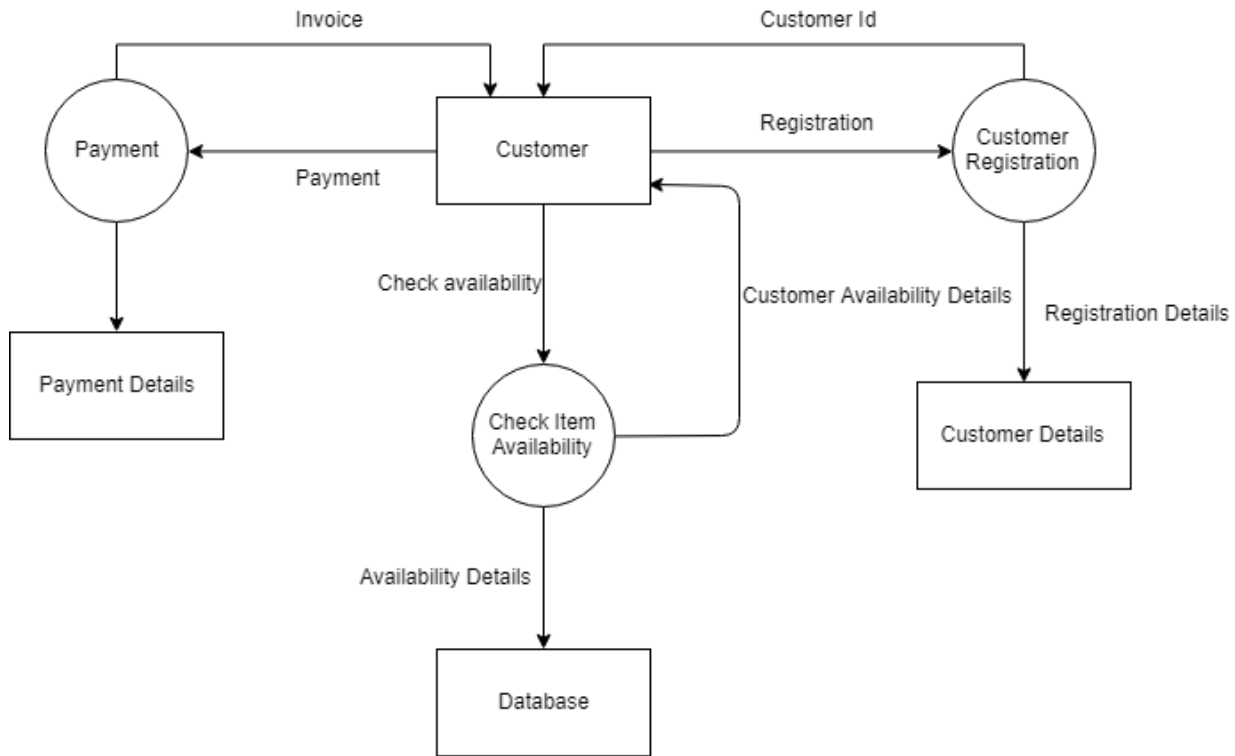
5. Data flow diagrams



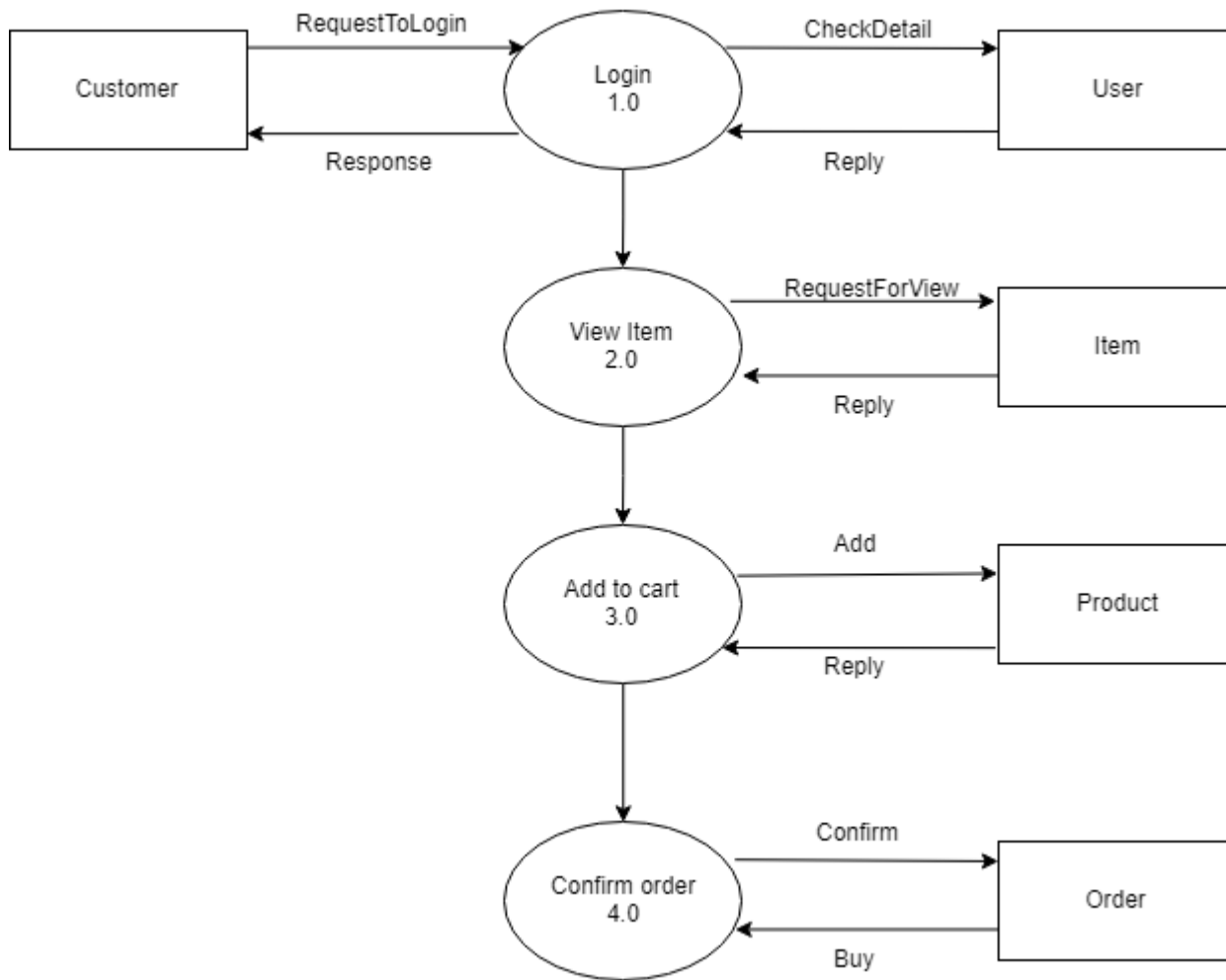
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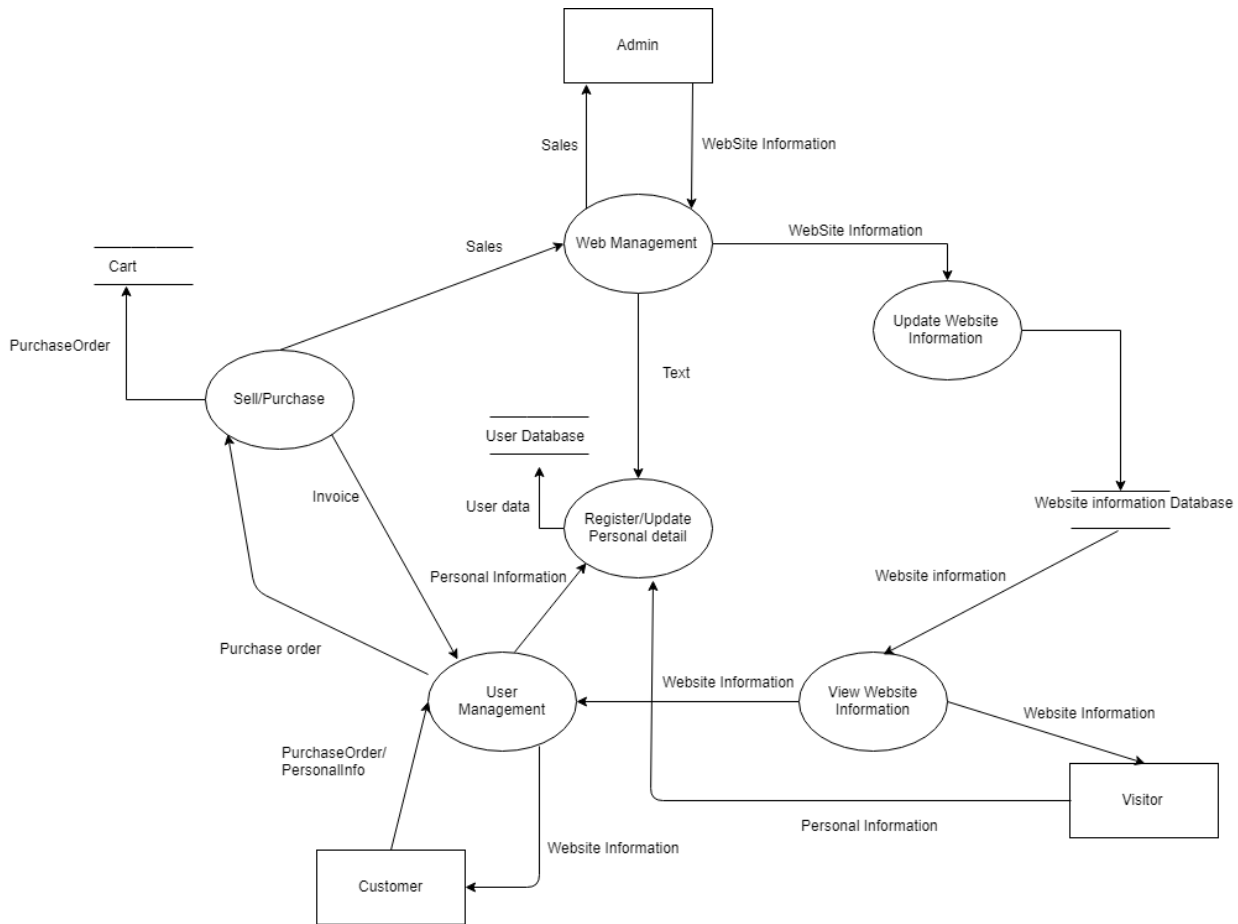
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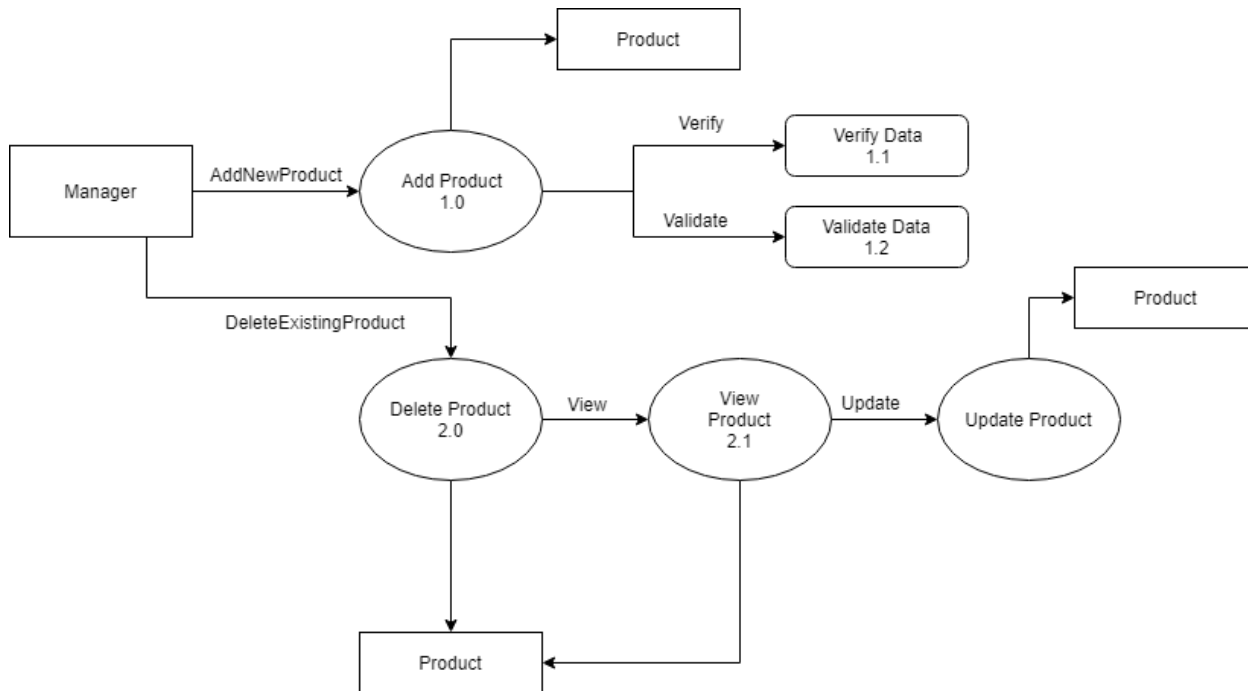
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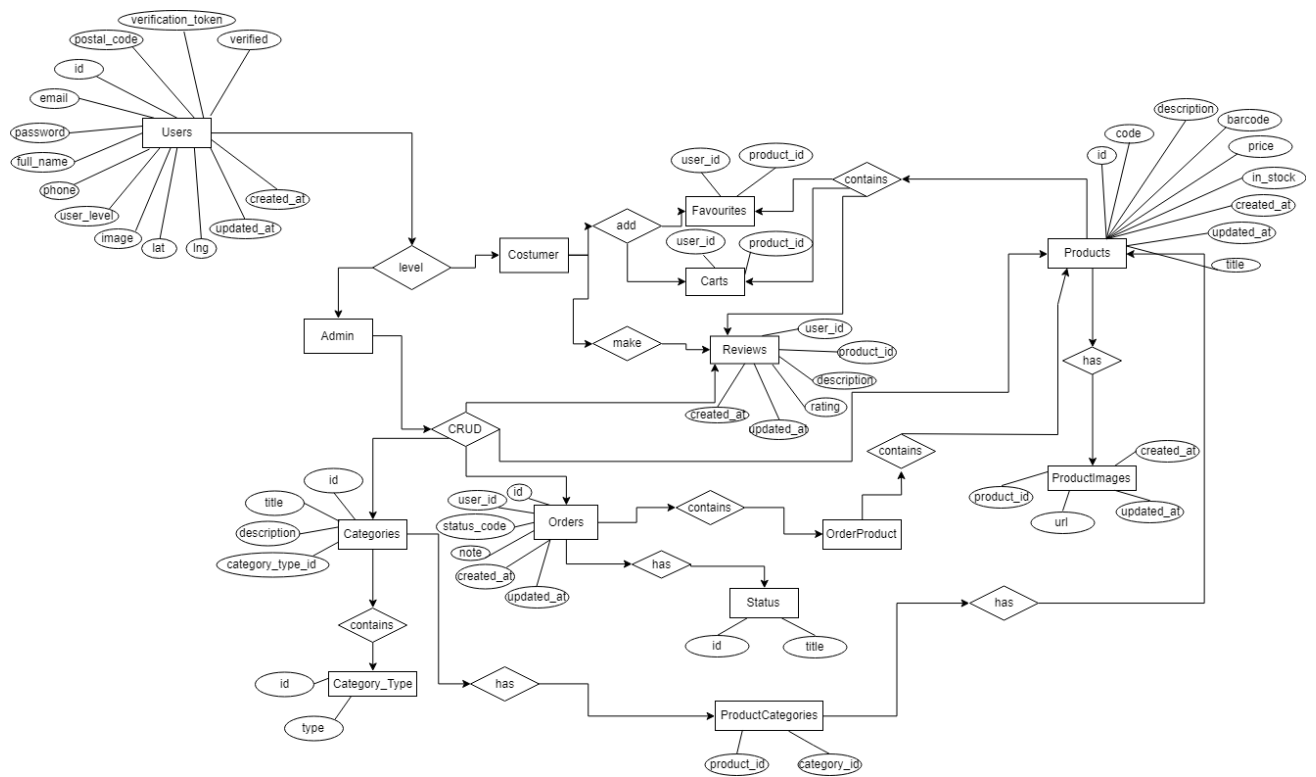
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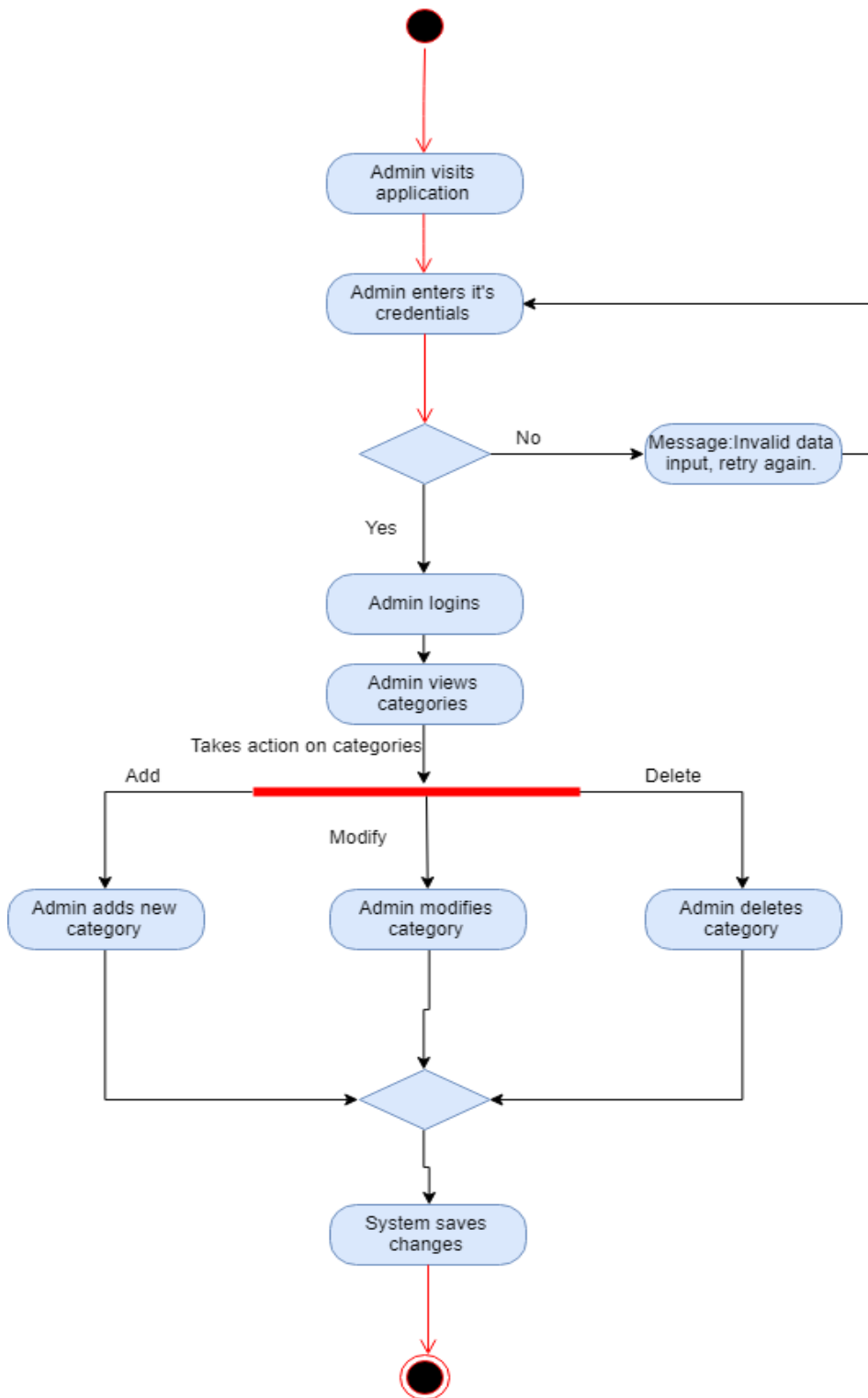
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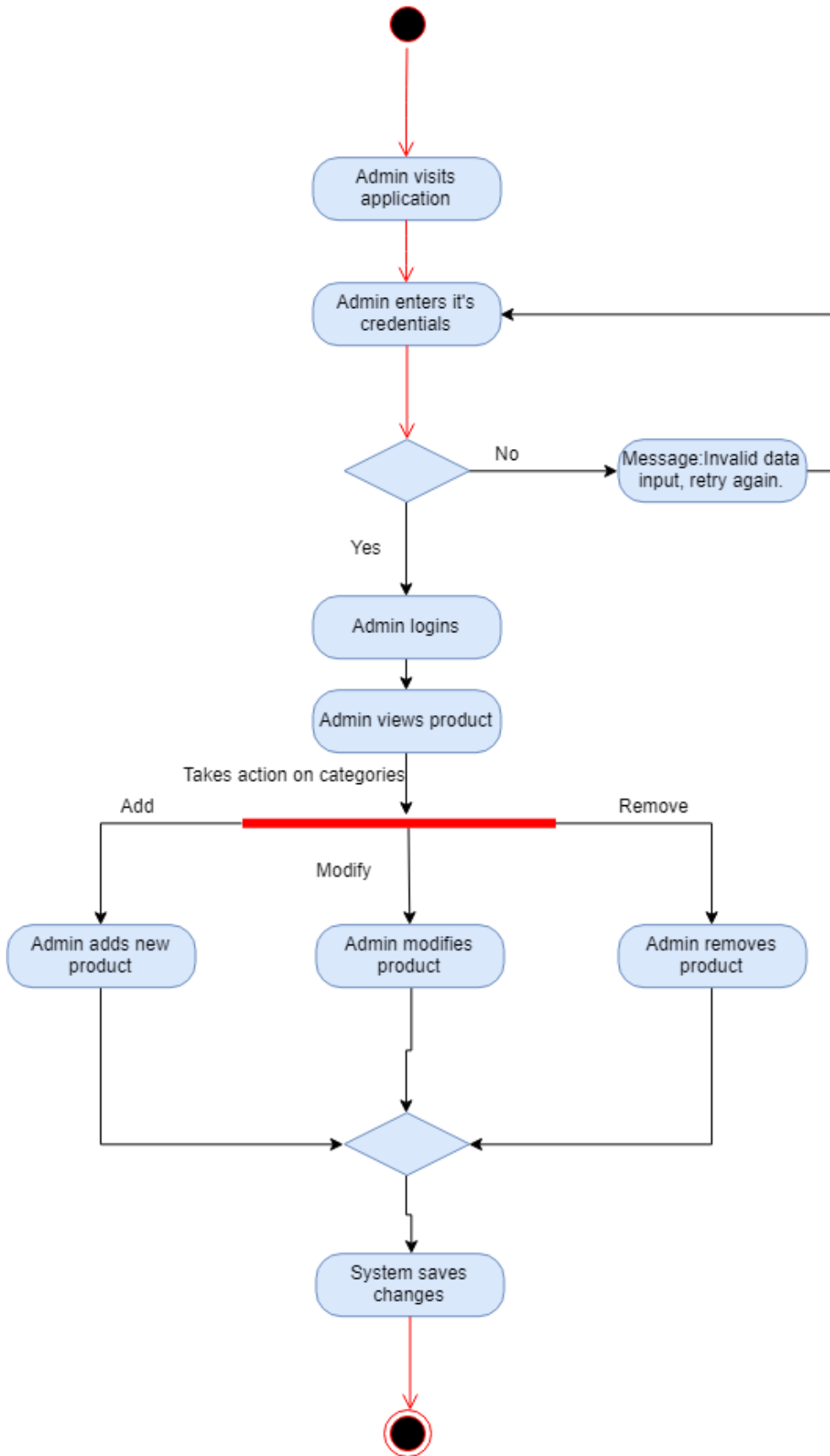


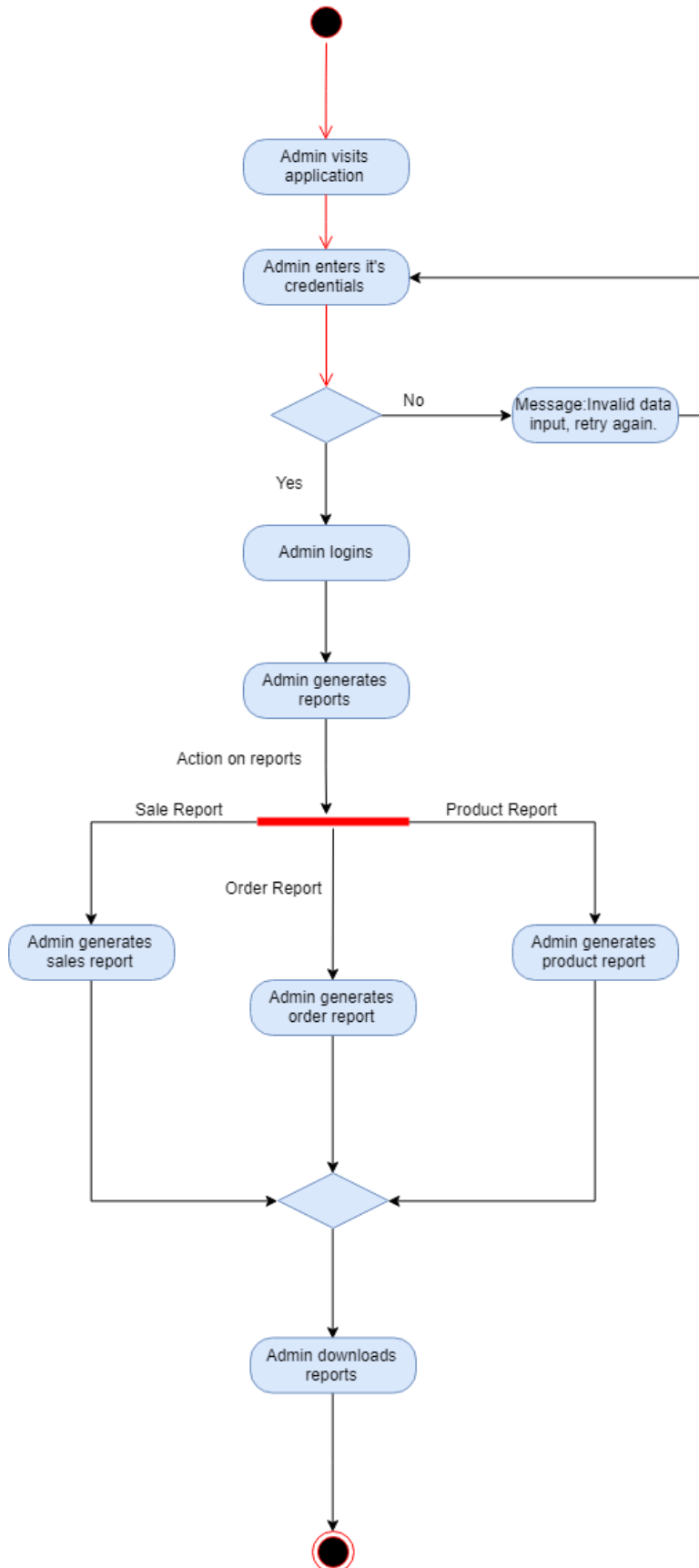
6. Entity Relationship Diagram



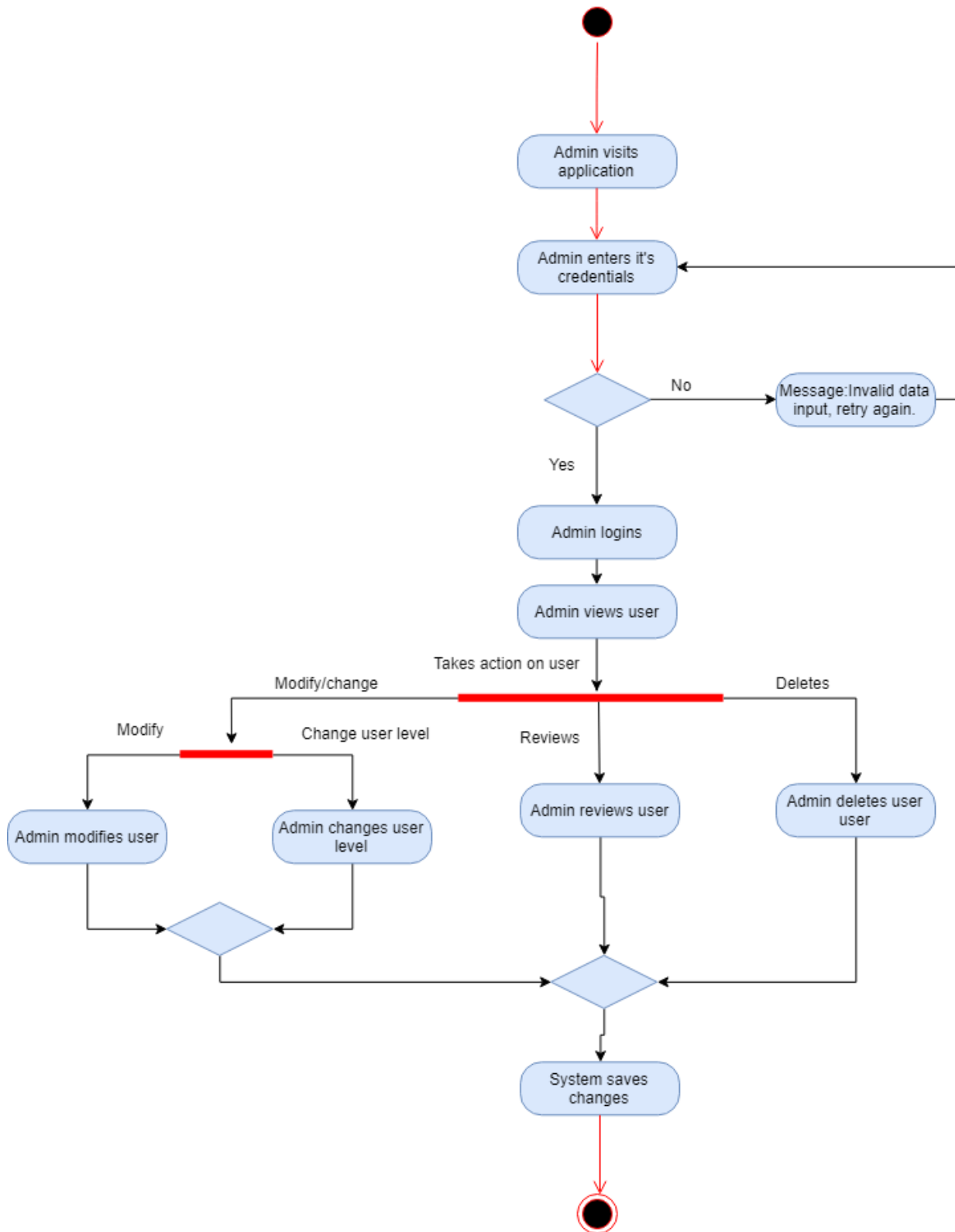
7. Activity/Swimlane Diagrams

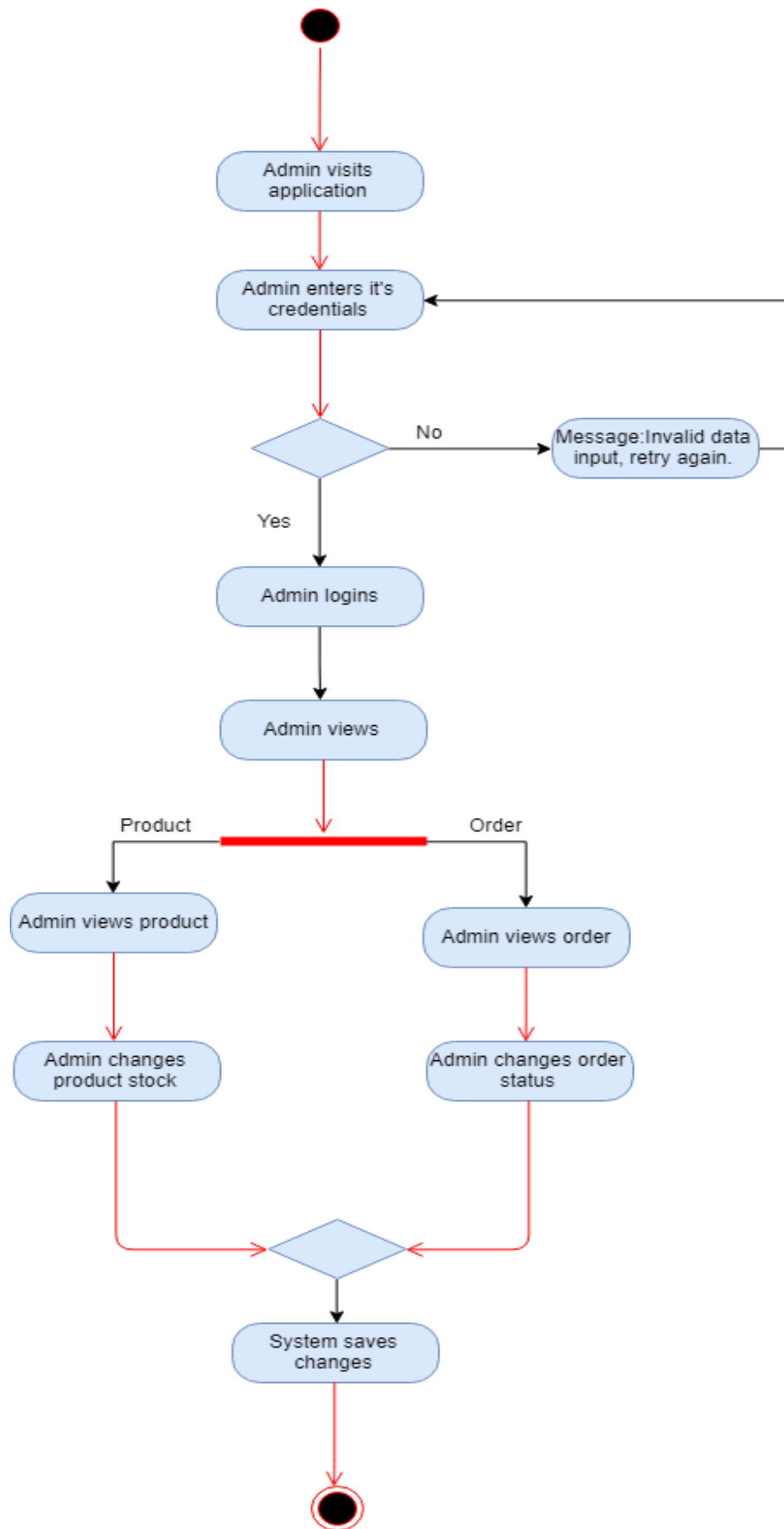


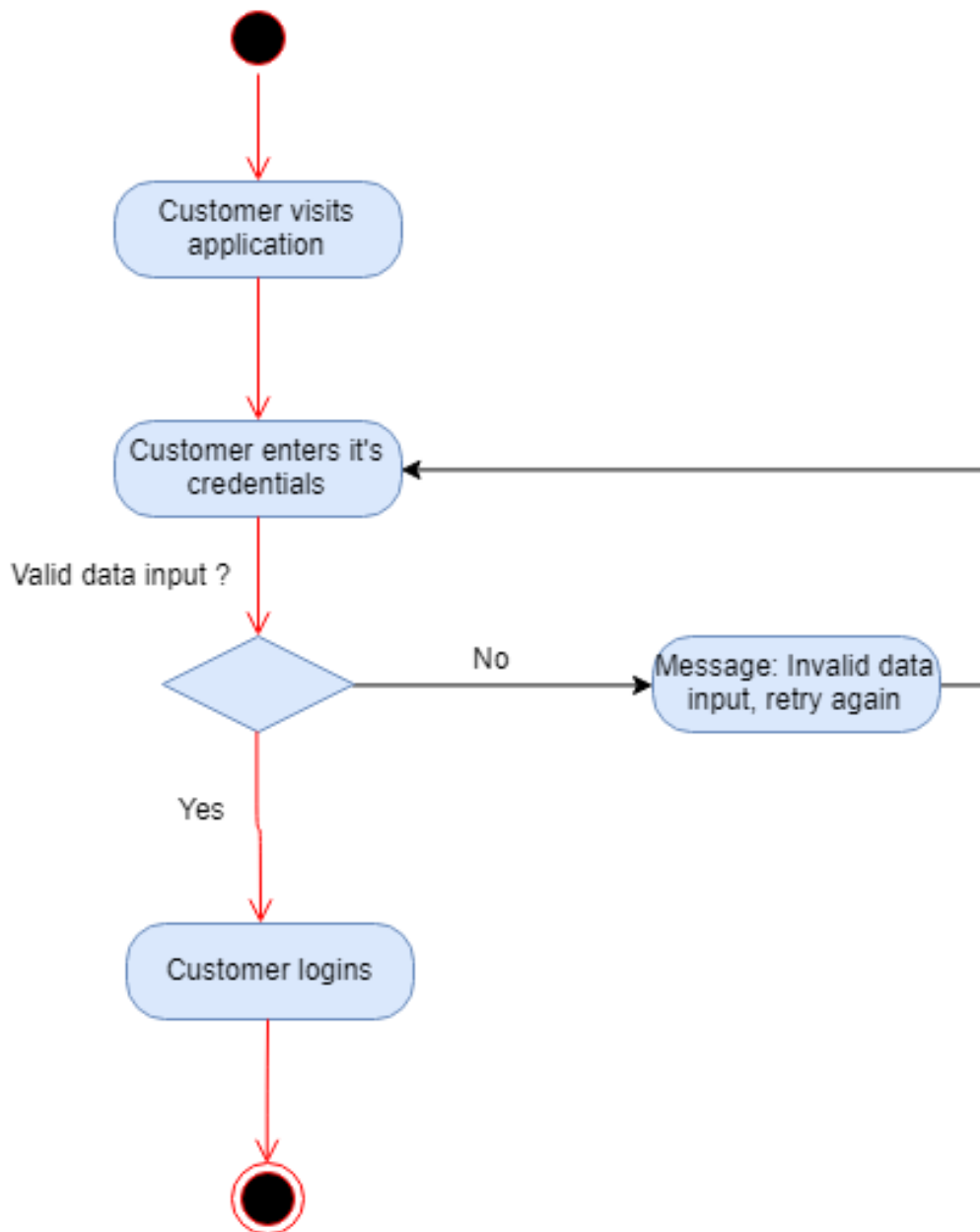


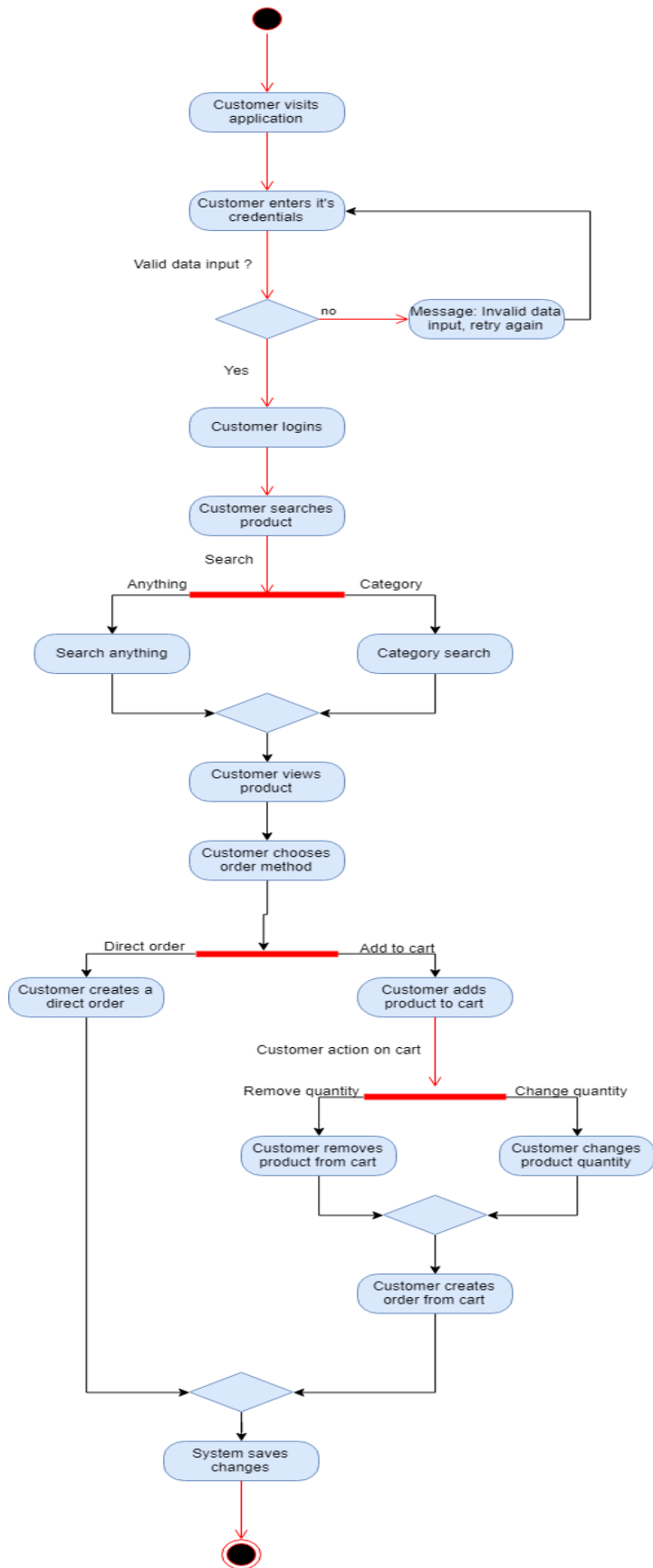


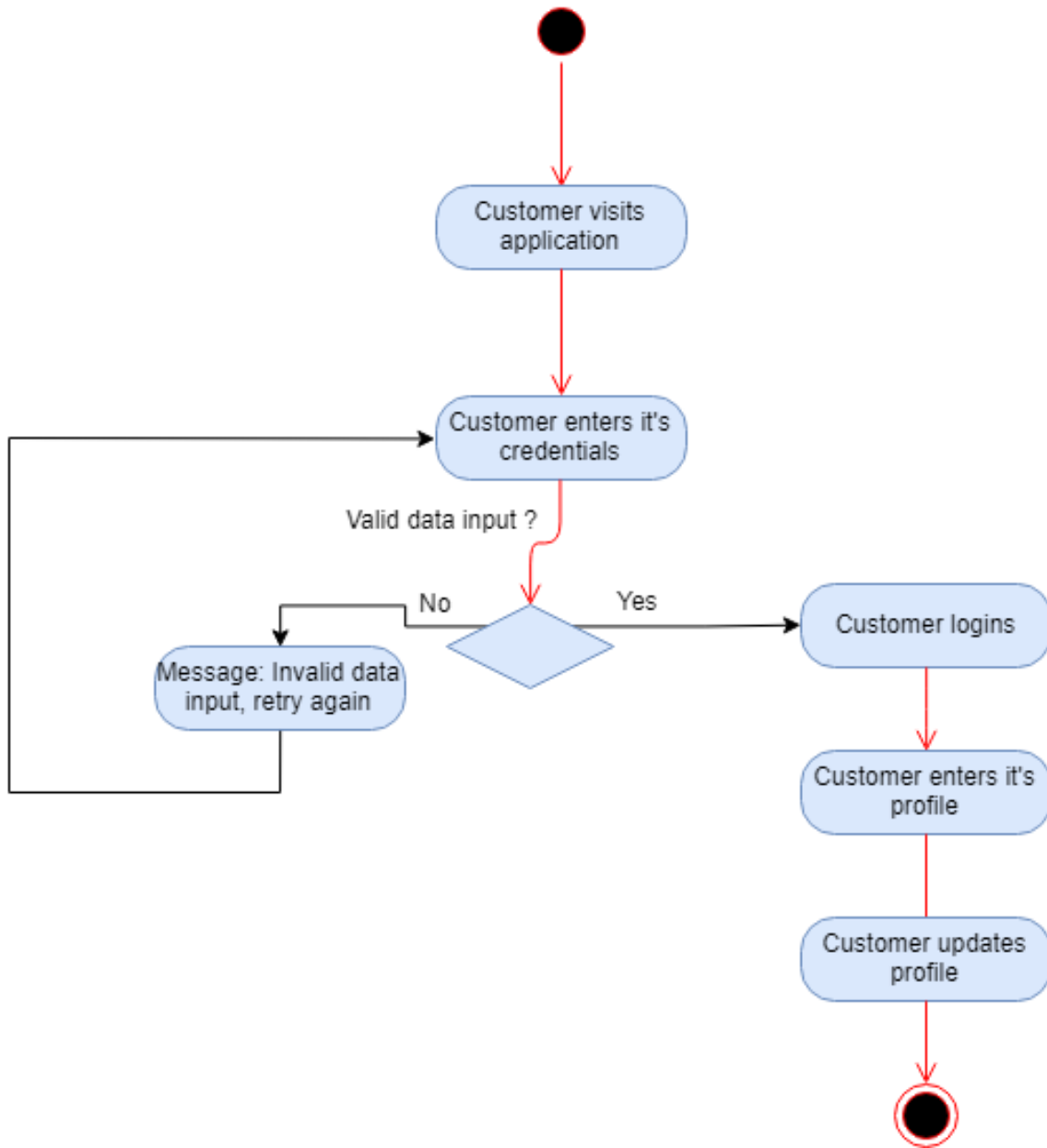
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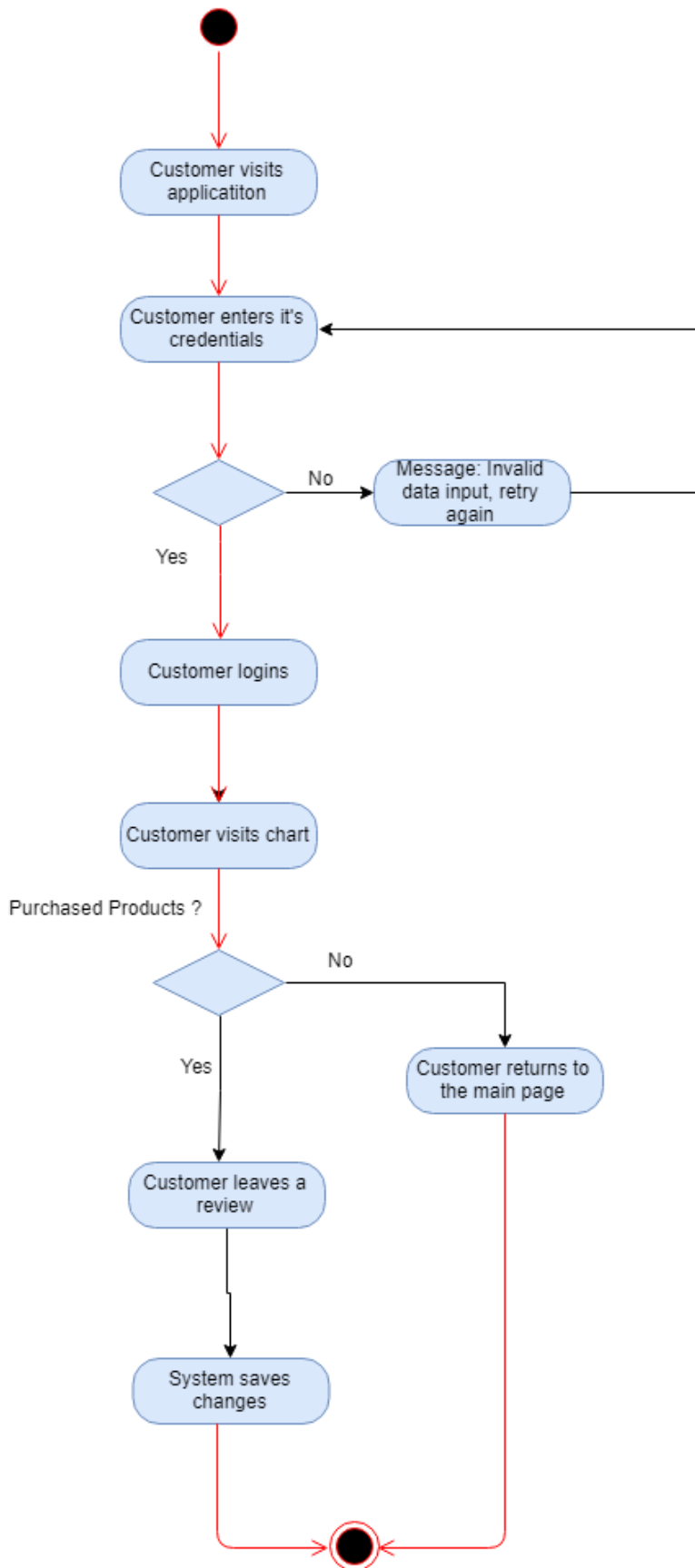


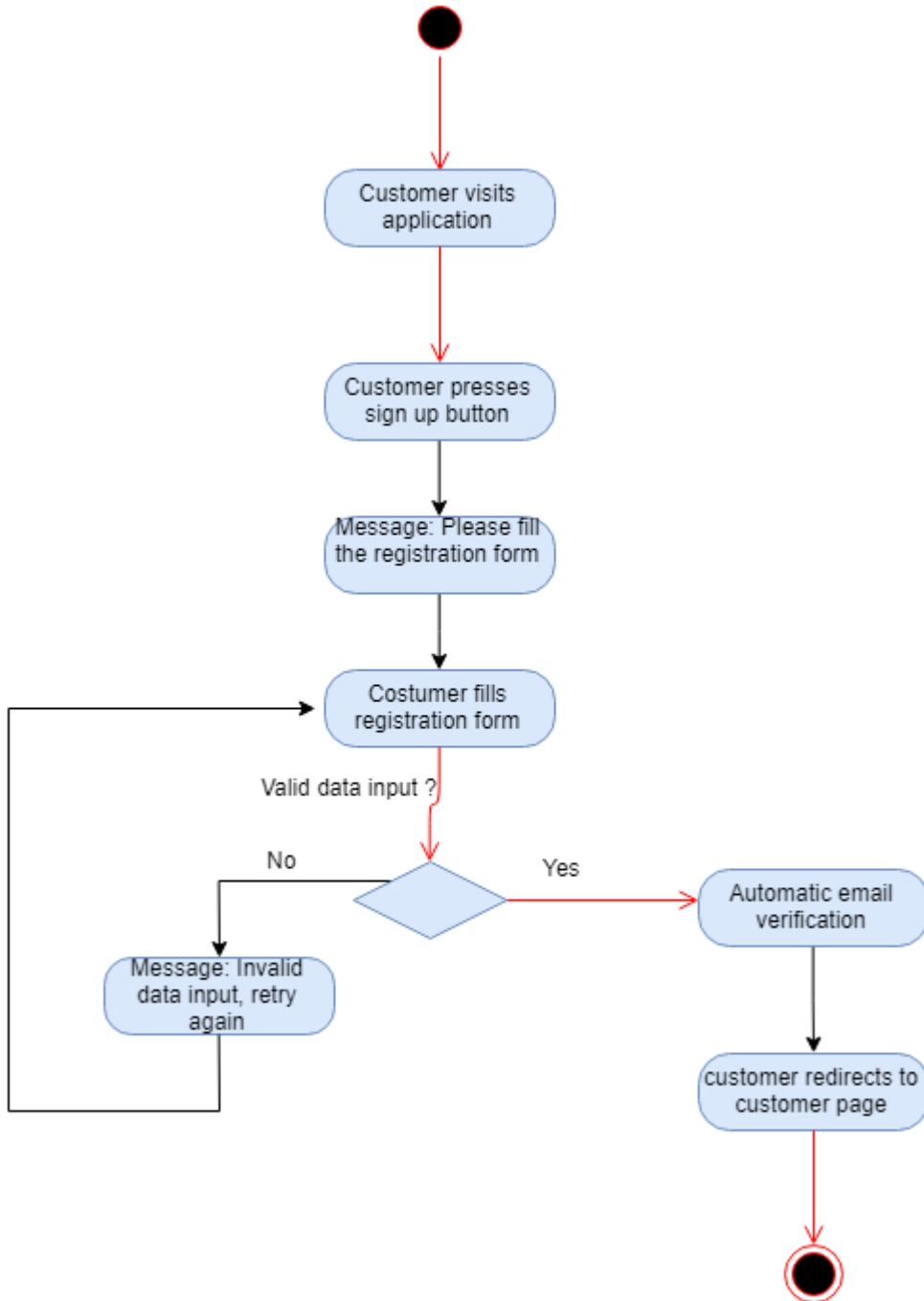


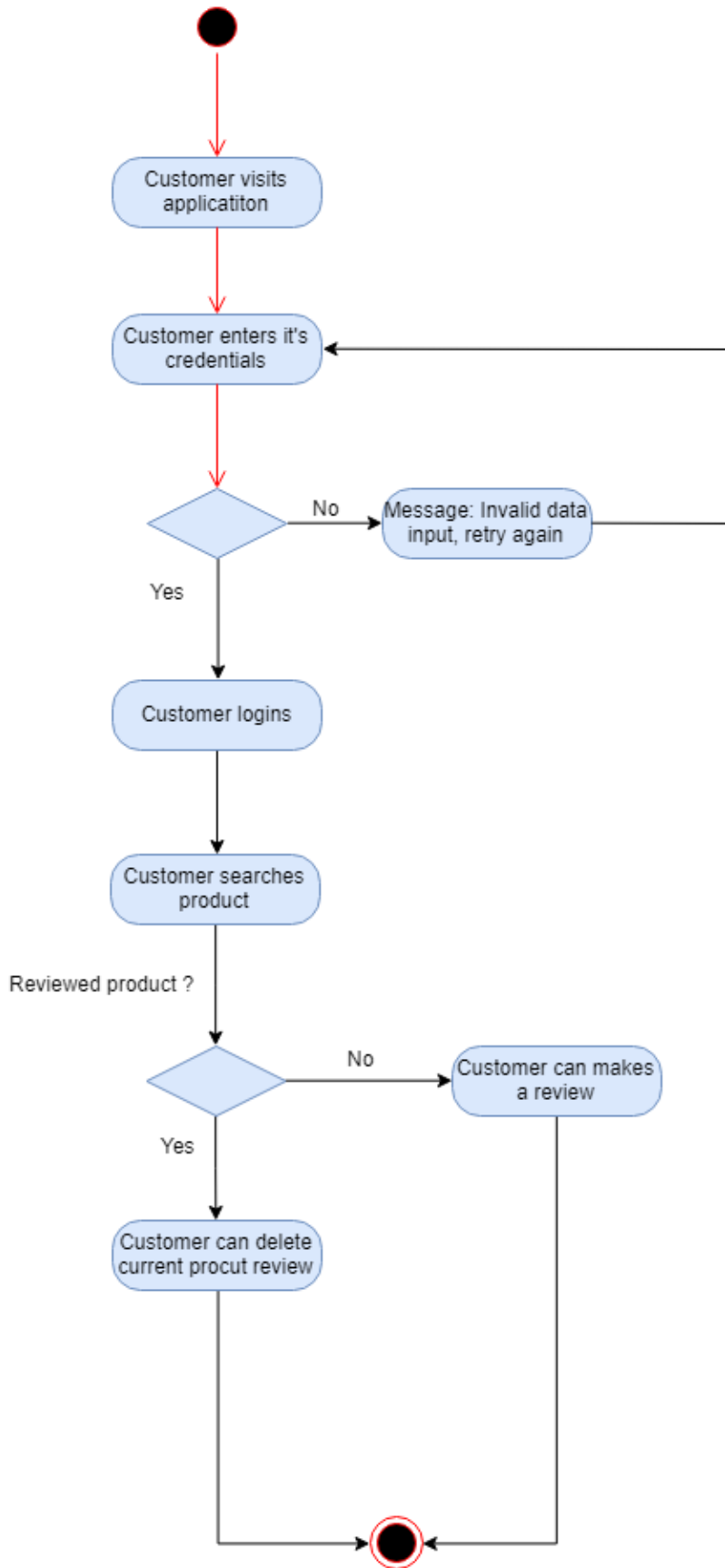


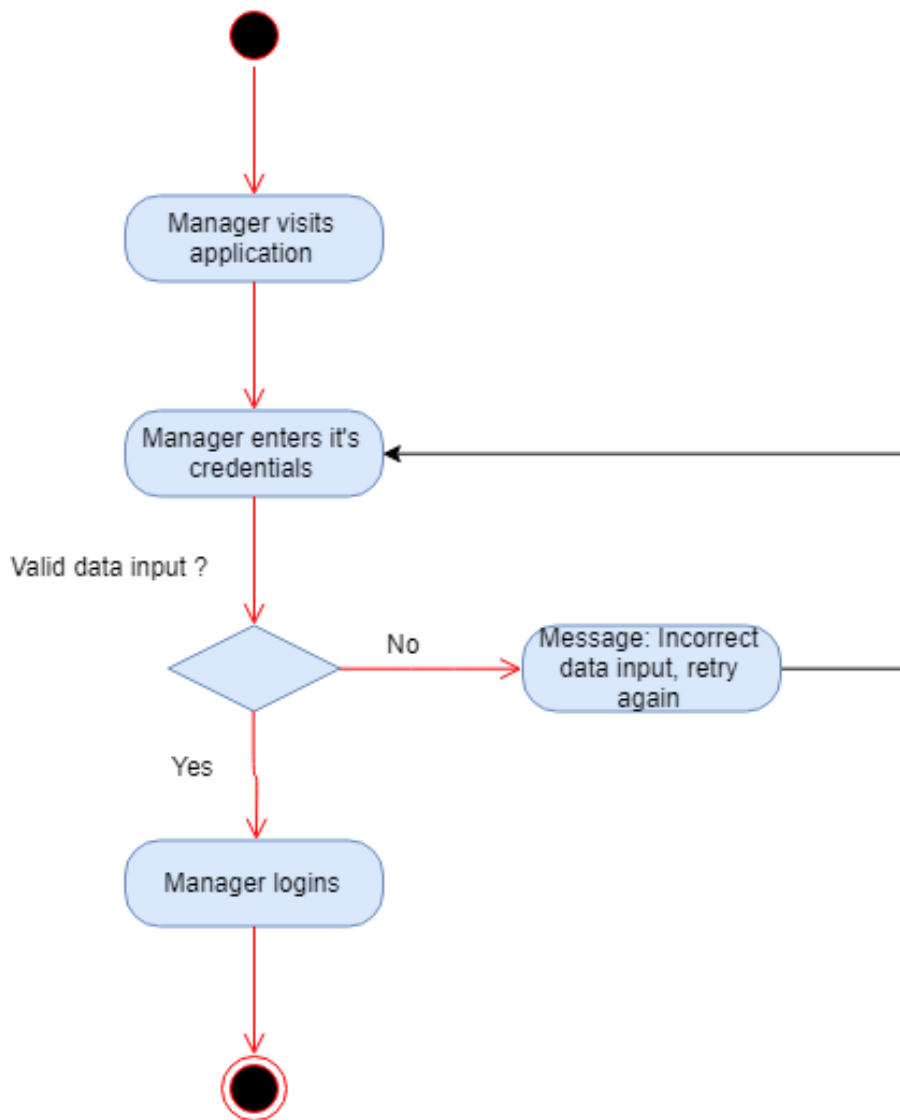


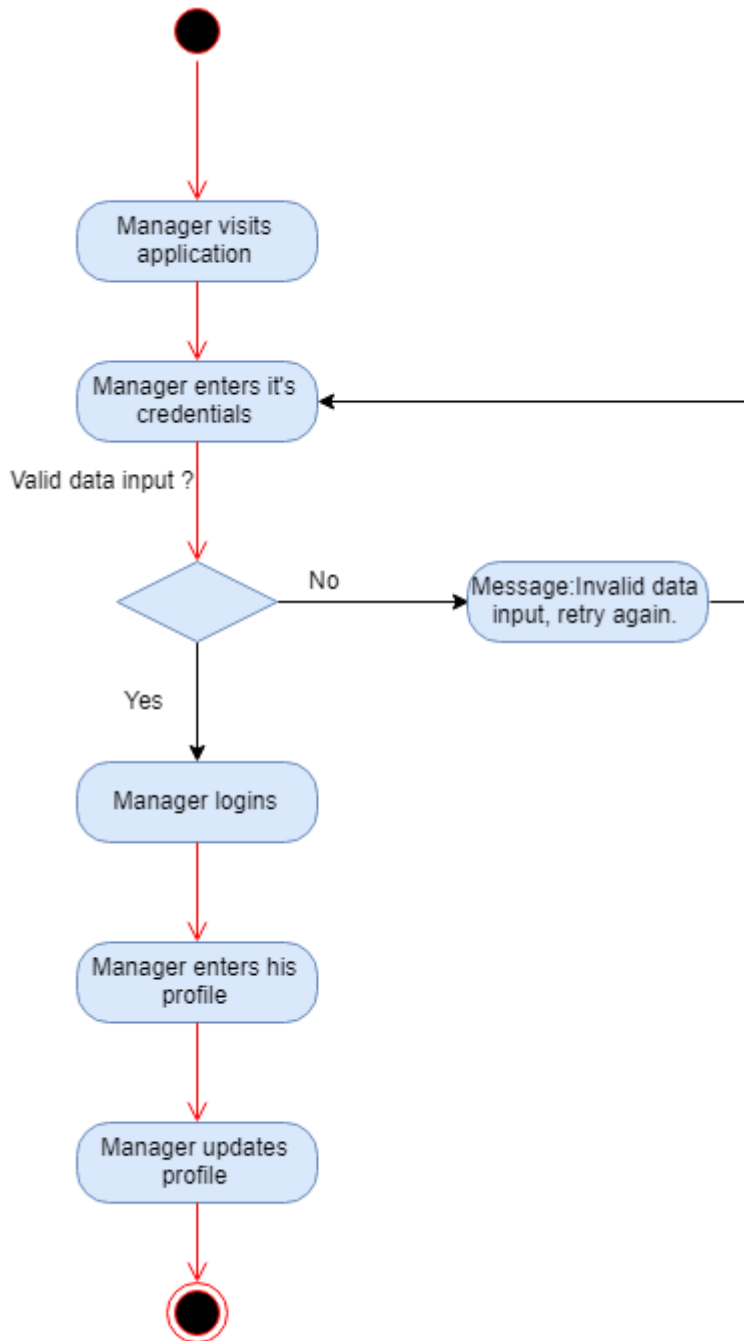


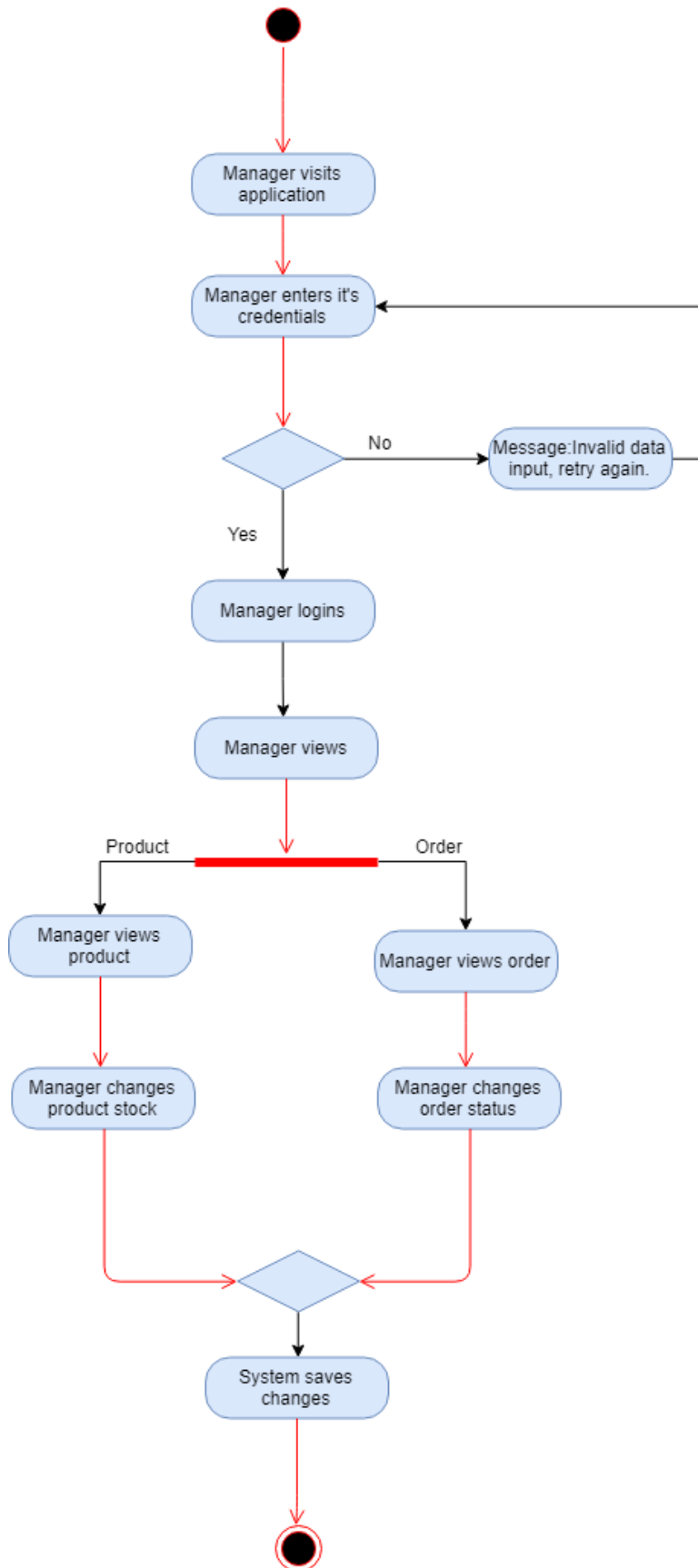




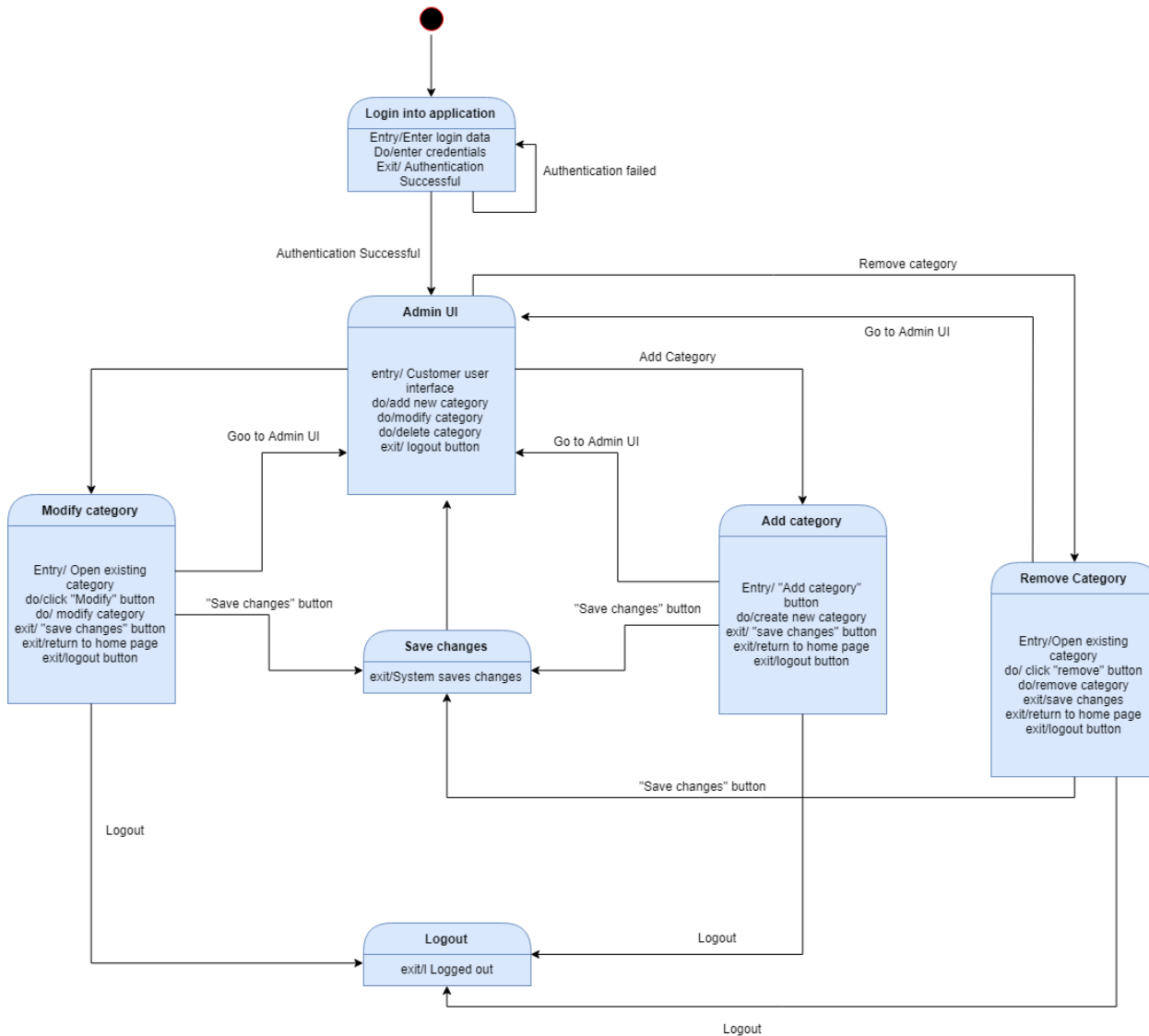




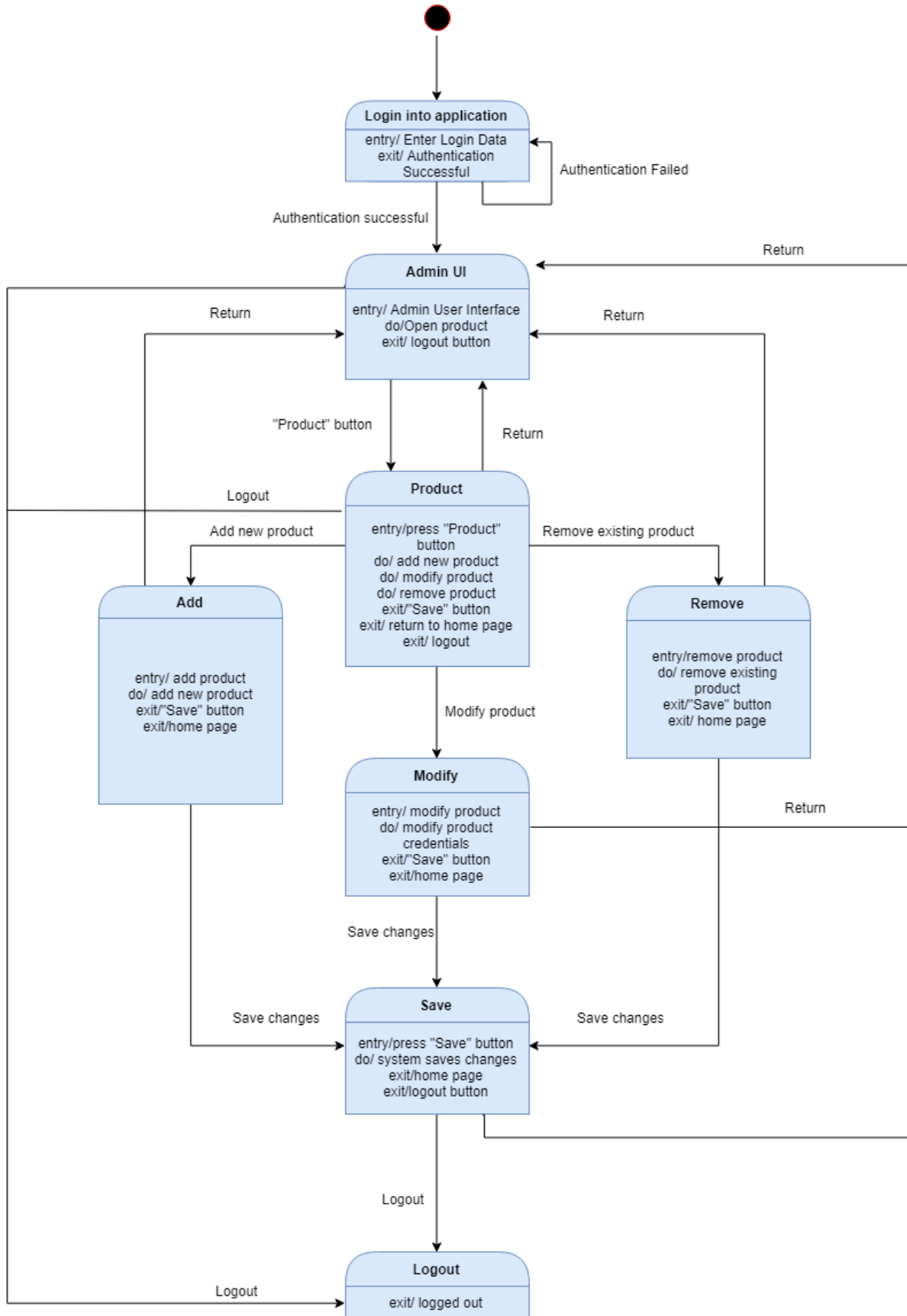


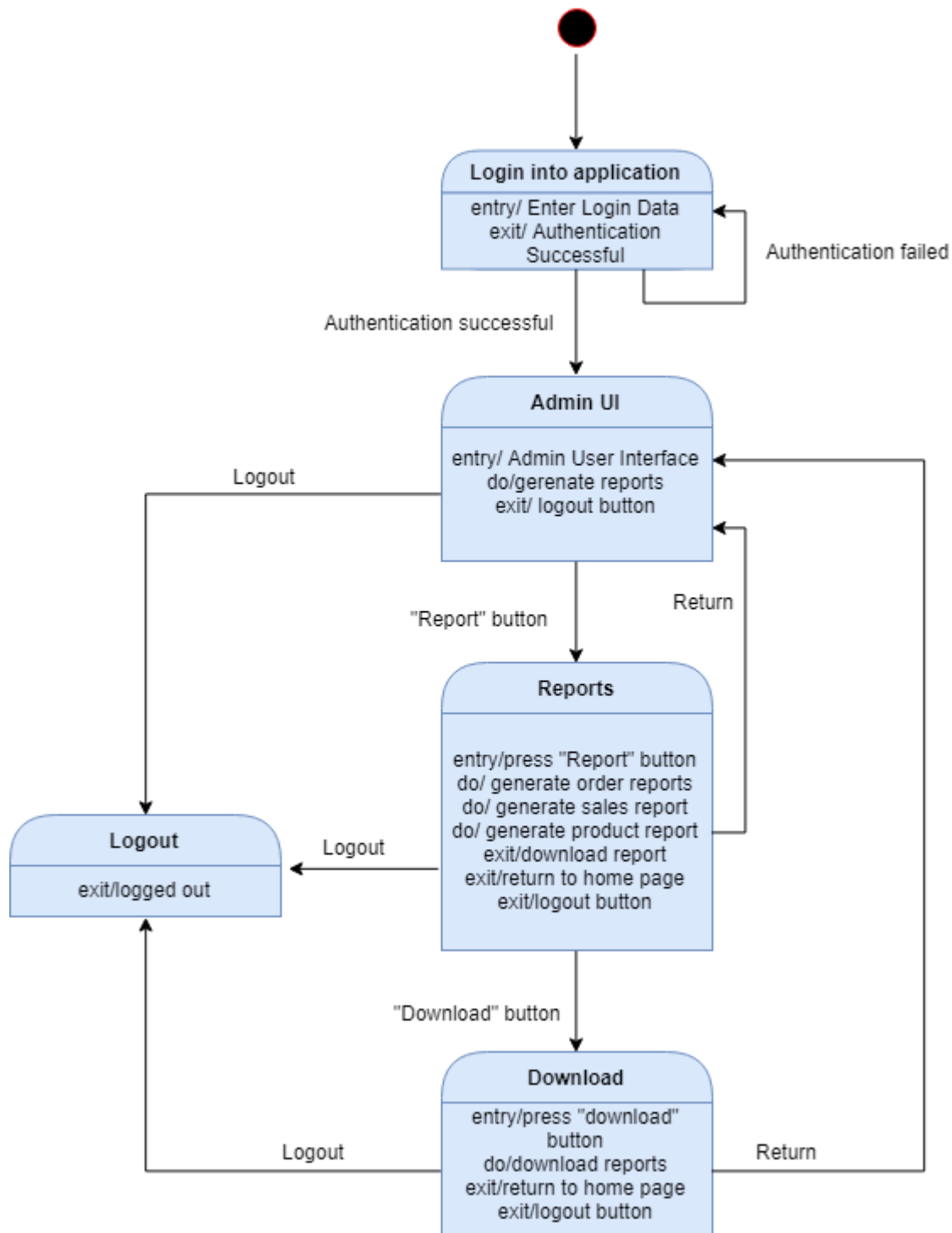


8. State Diagrams

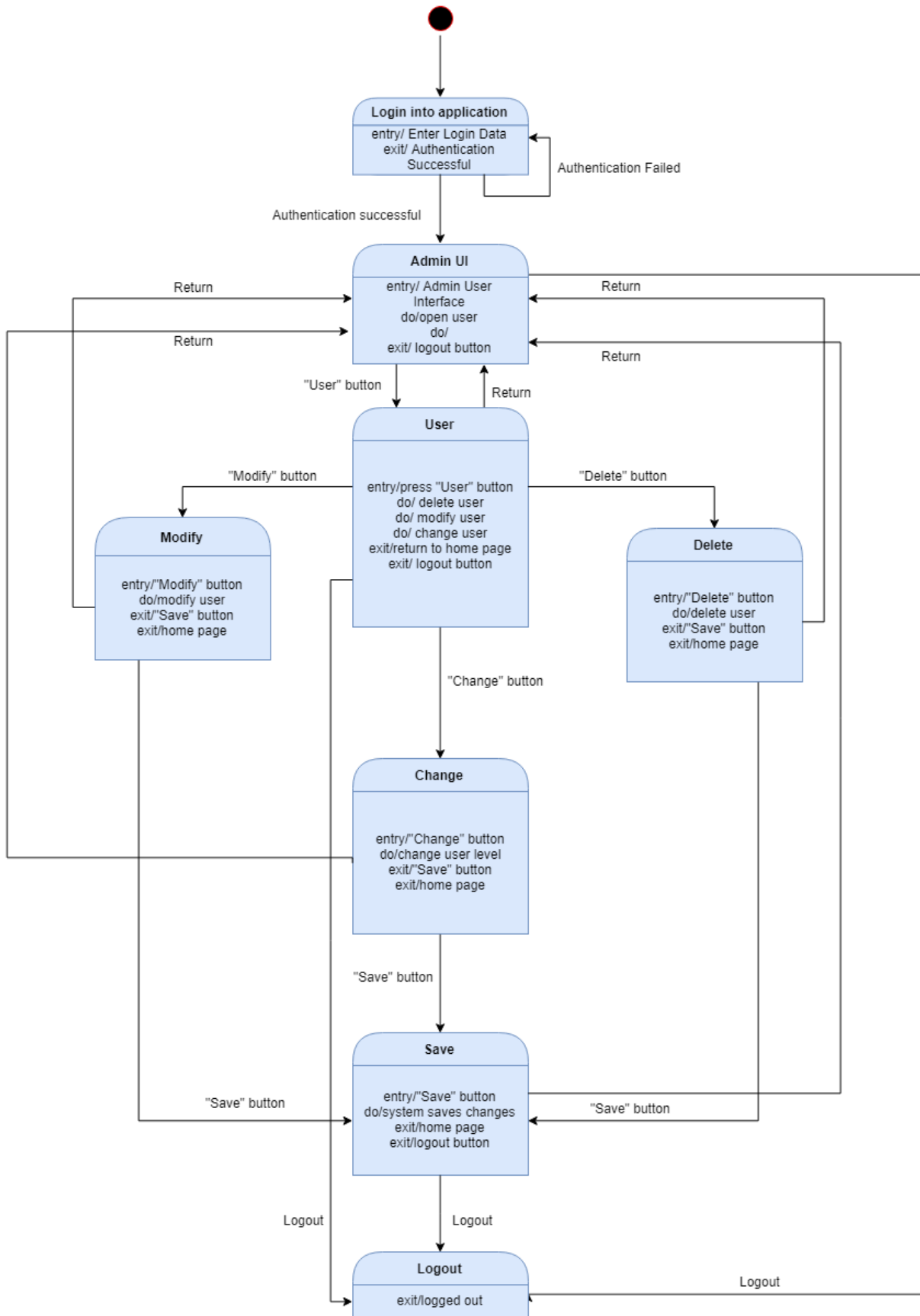


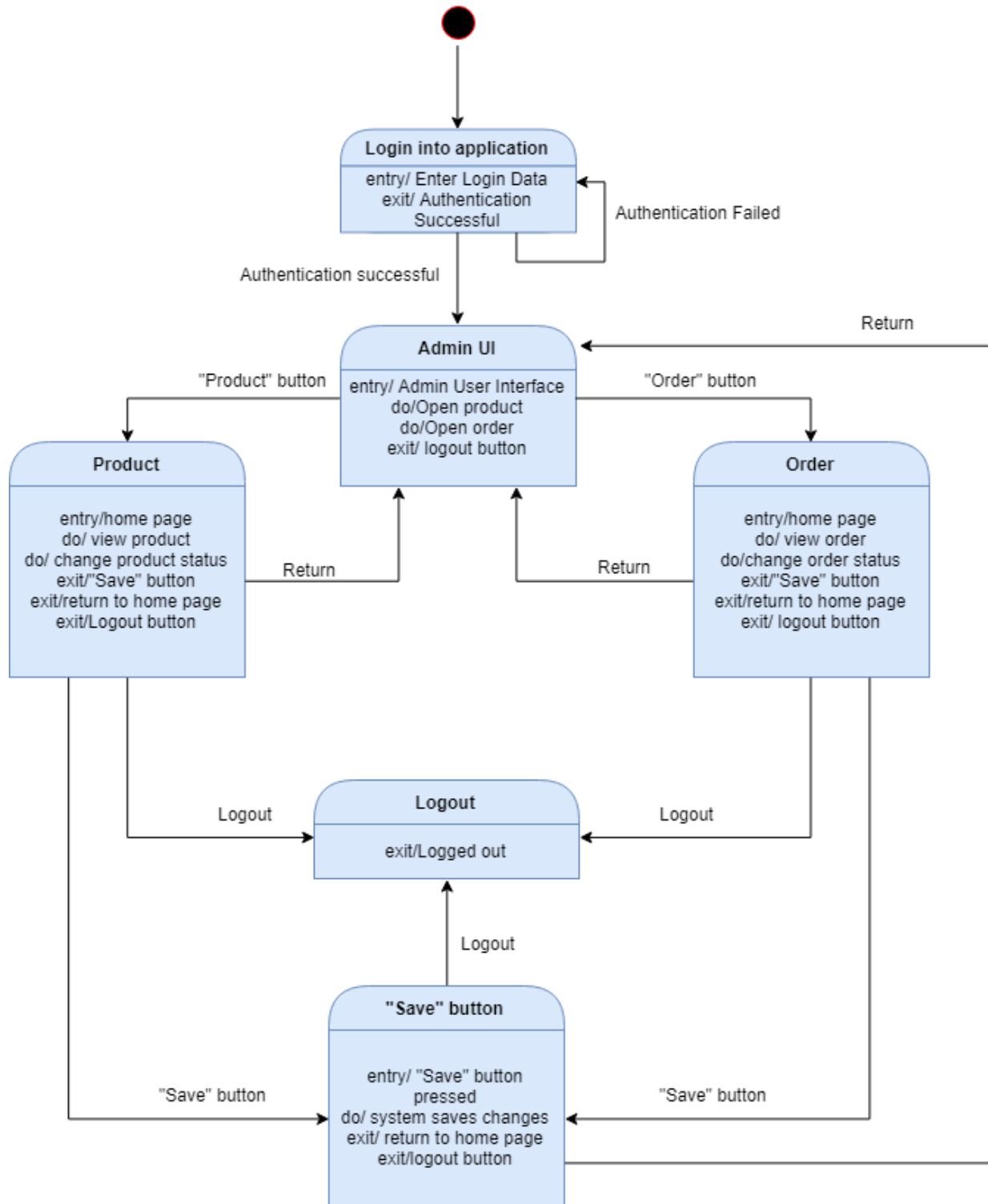
B3Albania_OSMS Requirements Specification

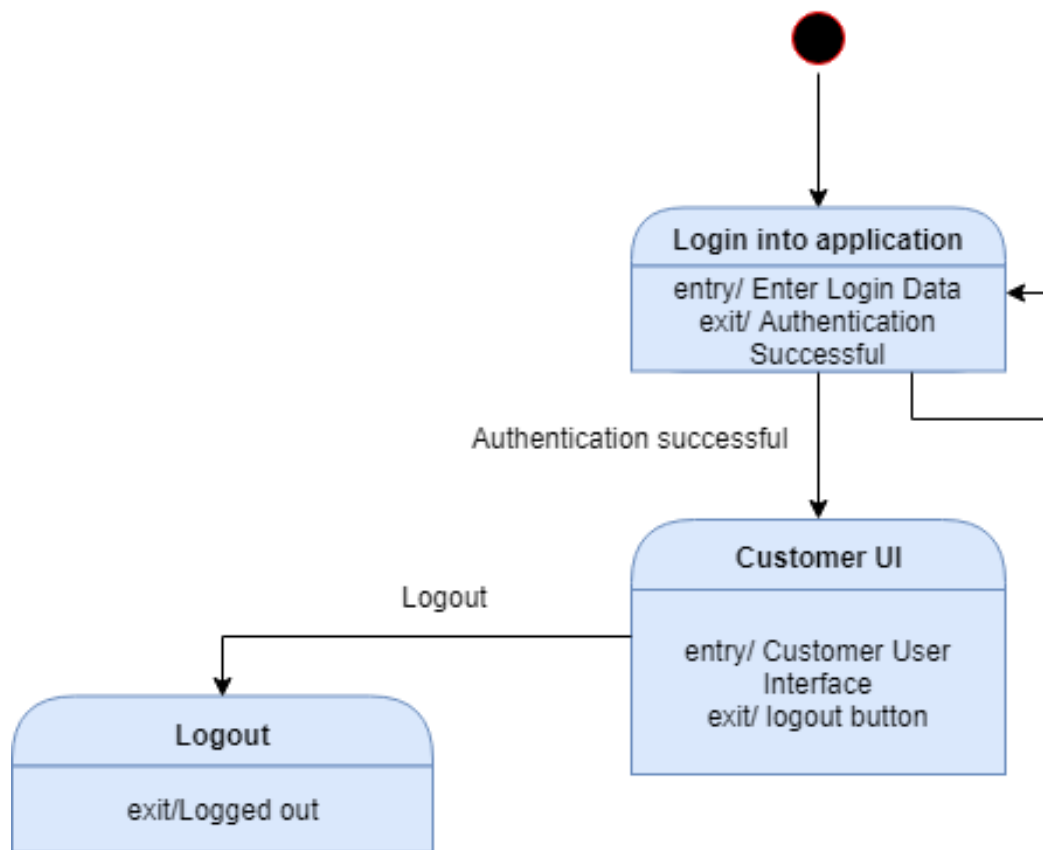




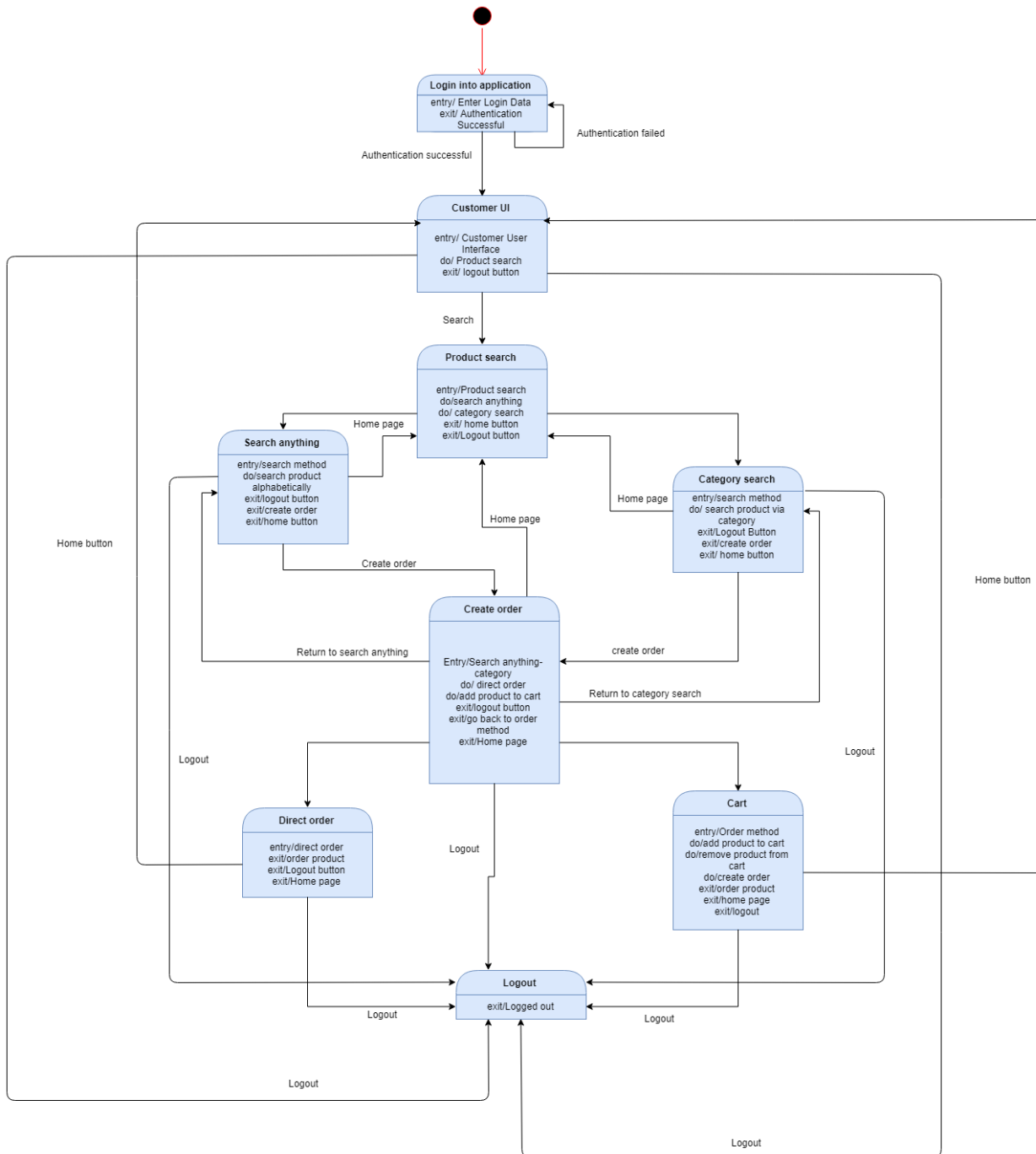
B3Albania_OSMS Requirements Specification

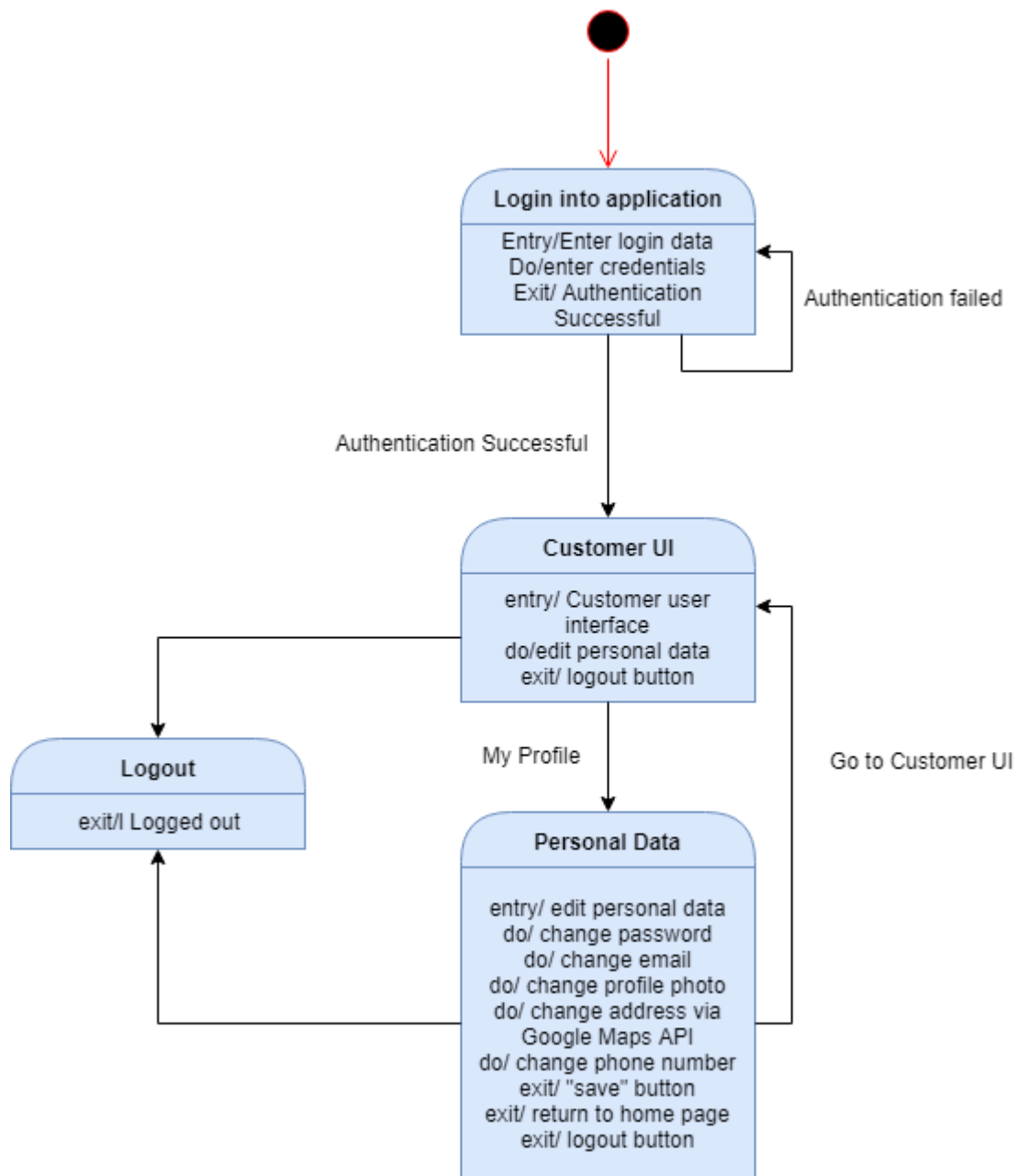


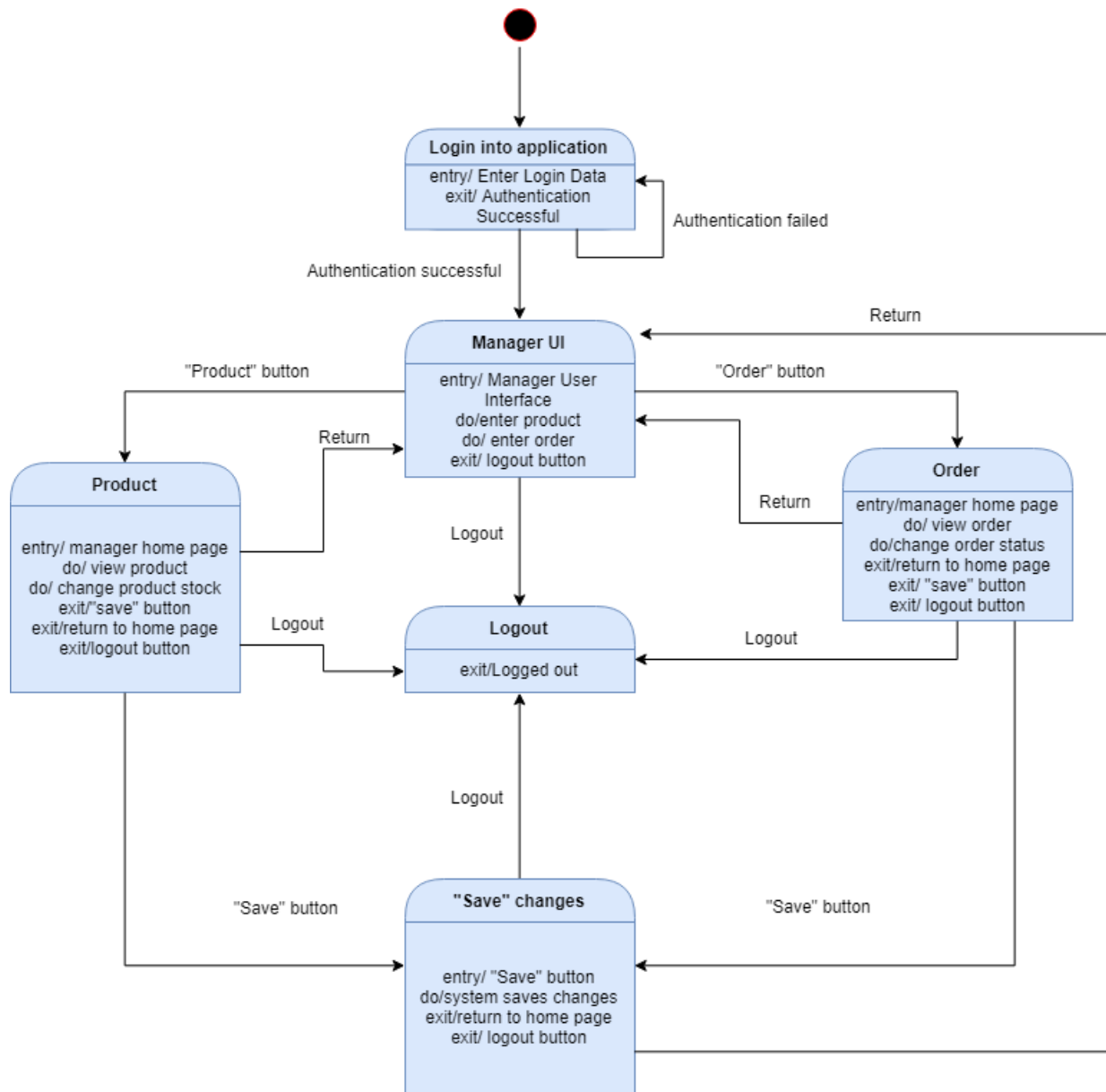




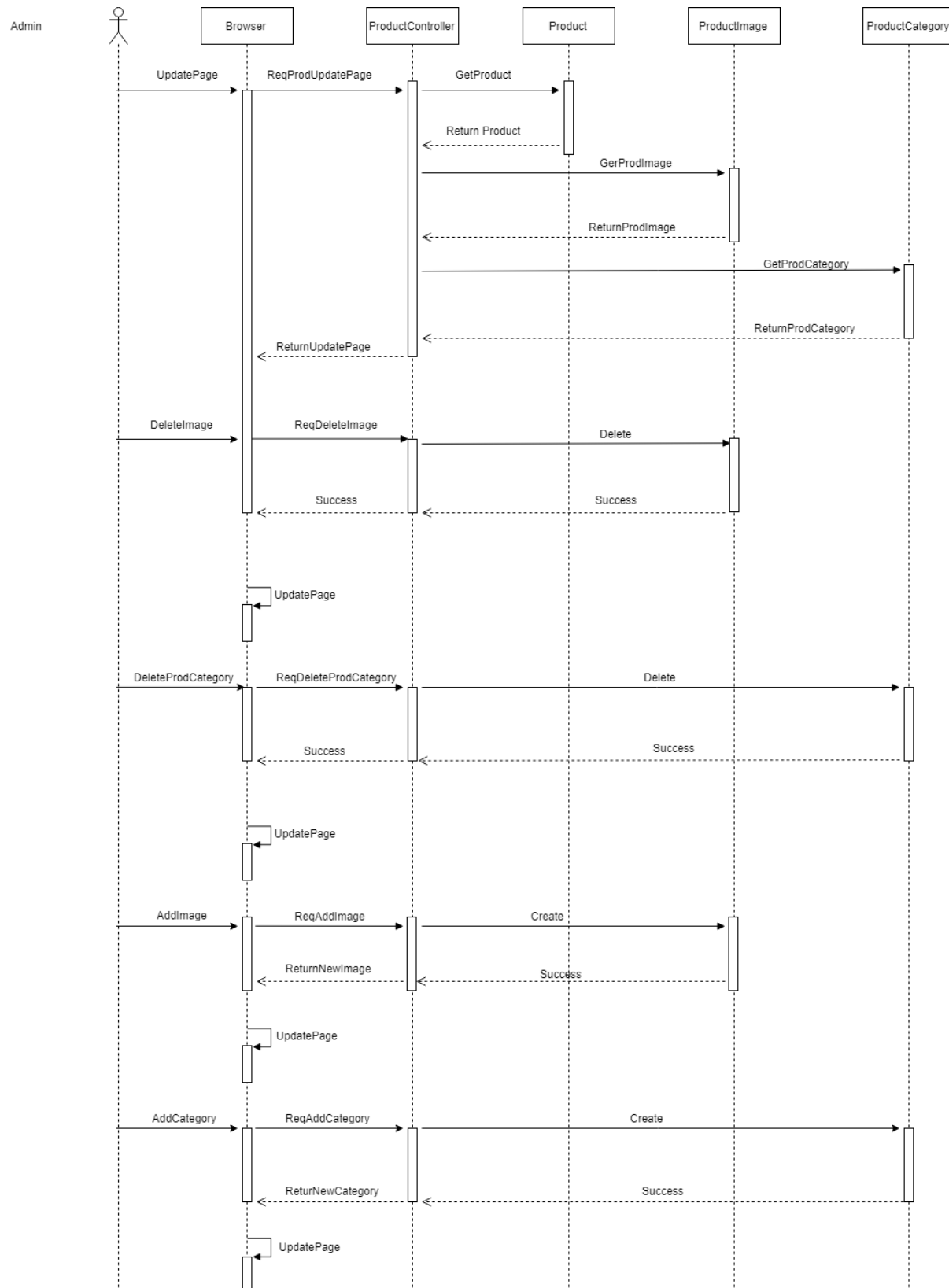
B3Albania_OSMS Requirements Specification



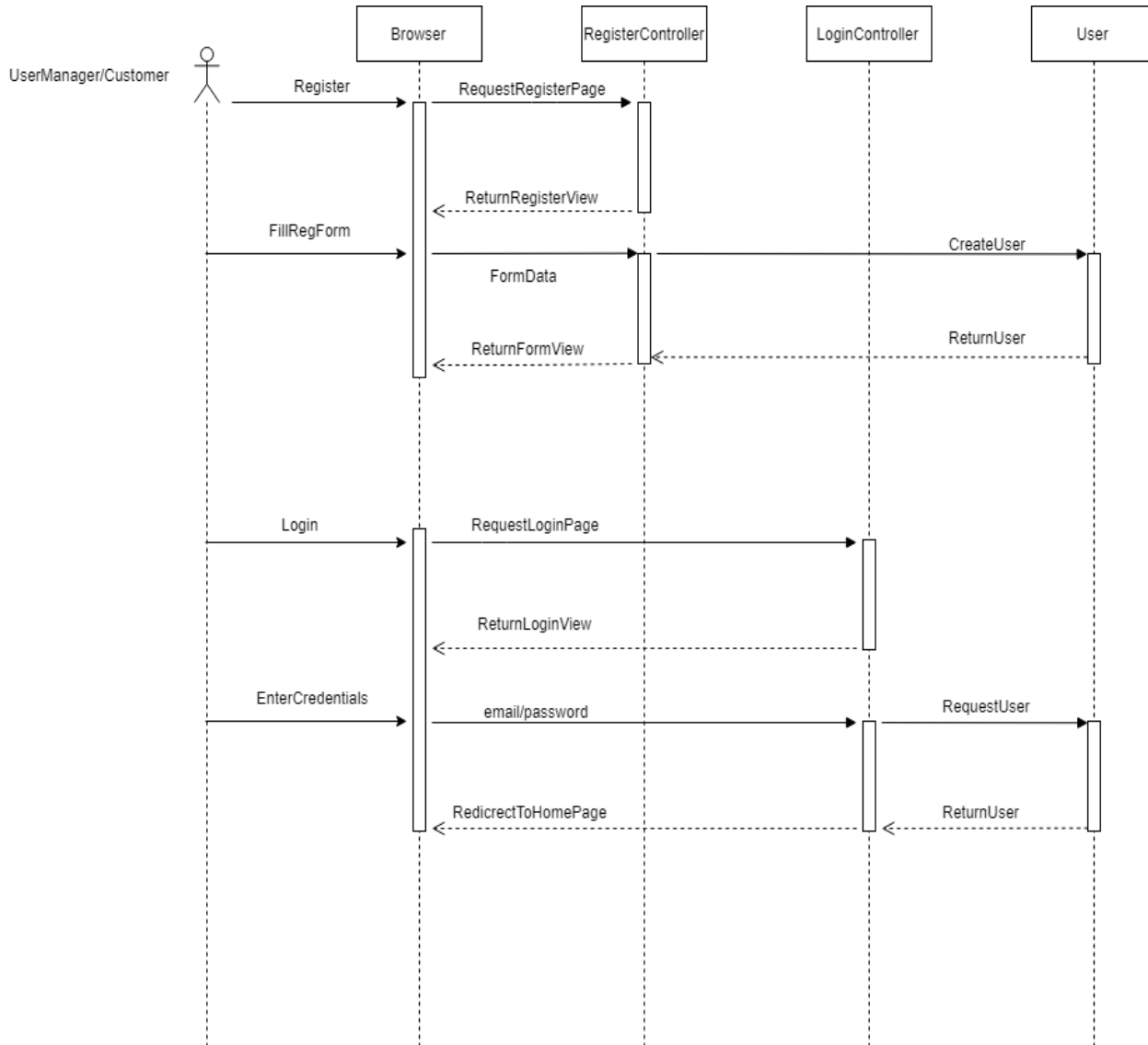


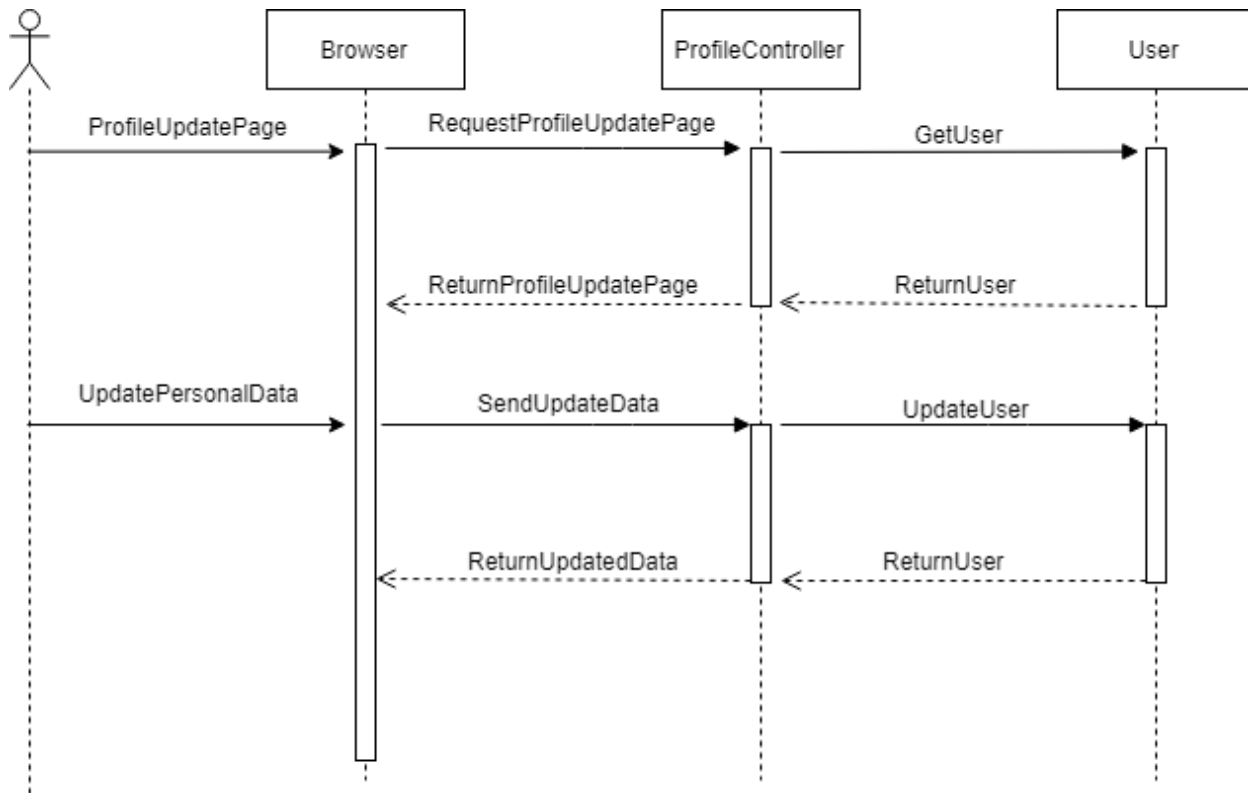


9. Sequence Diagrams

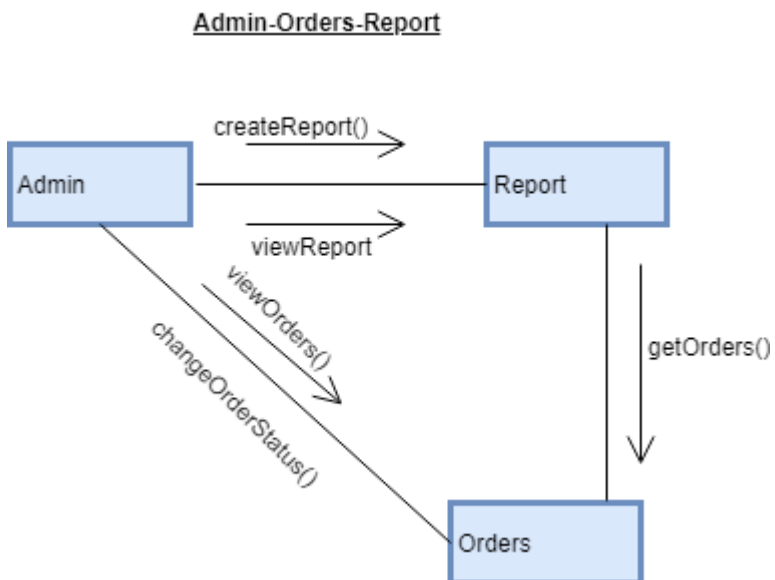
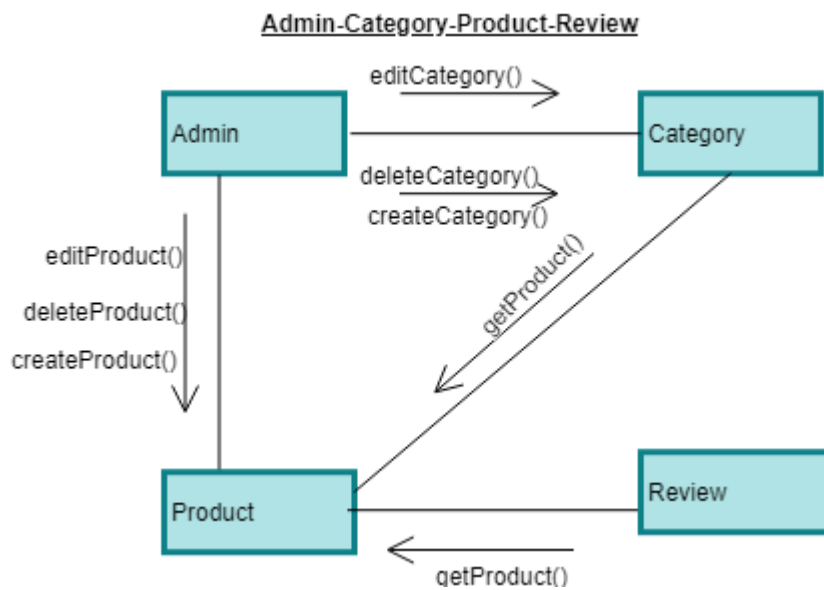


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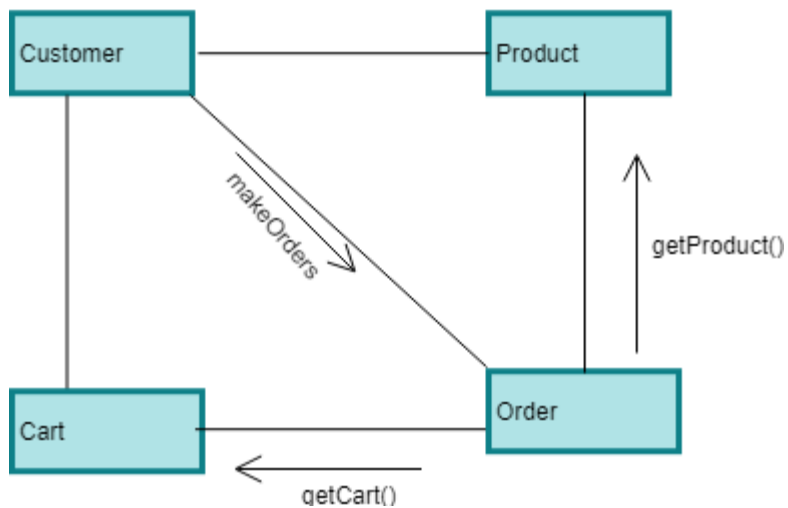
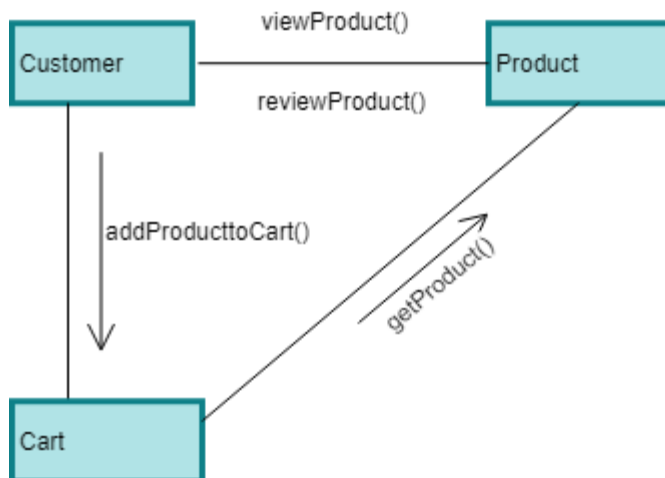




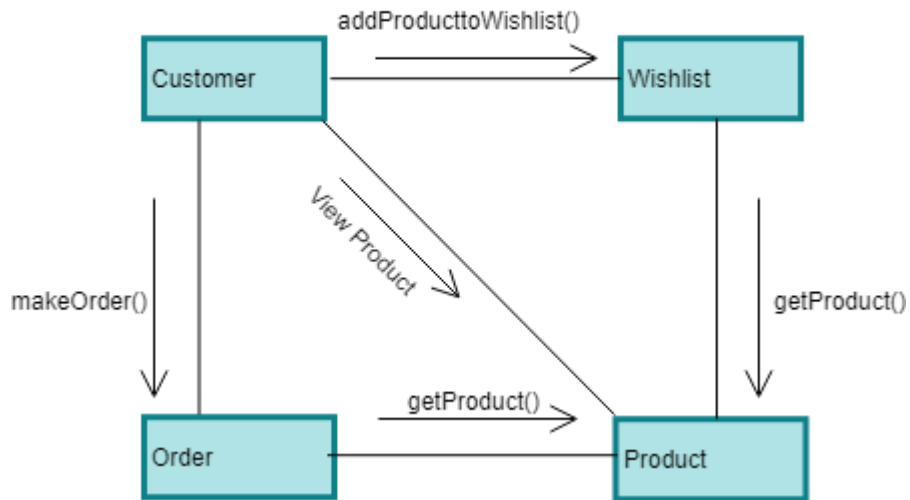
10. Collaboration Diagrams



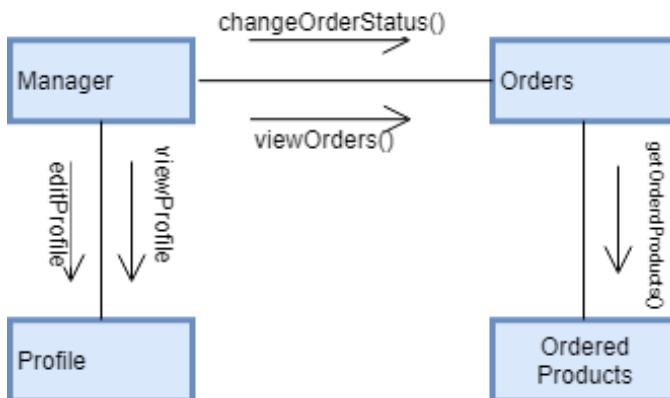
Customer-Cart-Product-Order



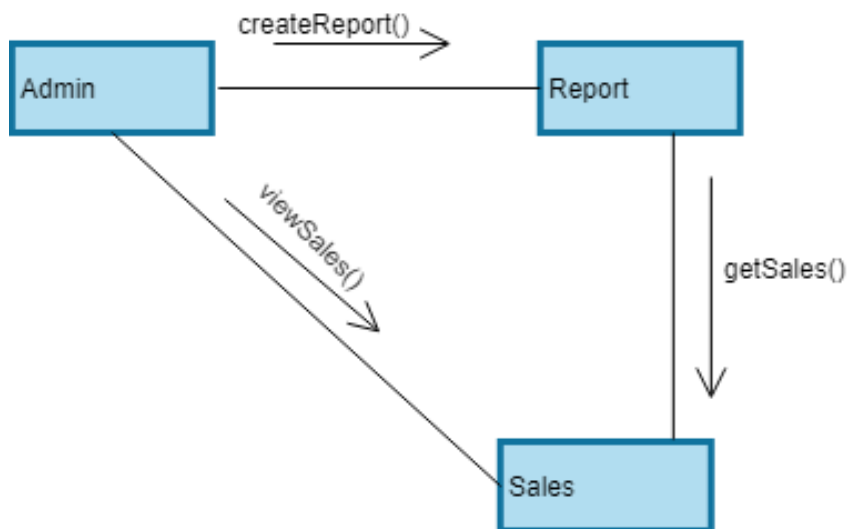
Customer-Wishlist-Product-Order



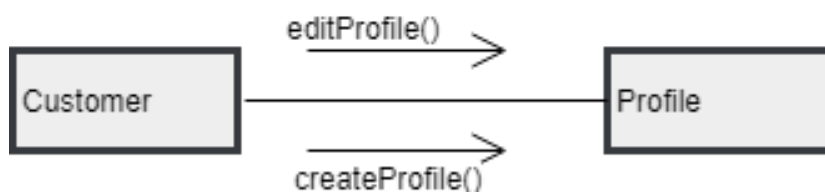
Manager-Order-Profile



Admin-Sales-Reports

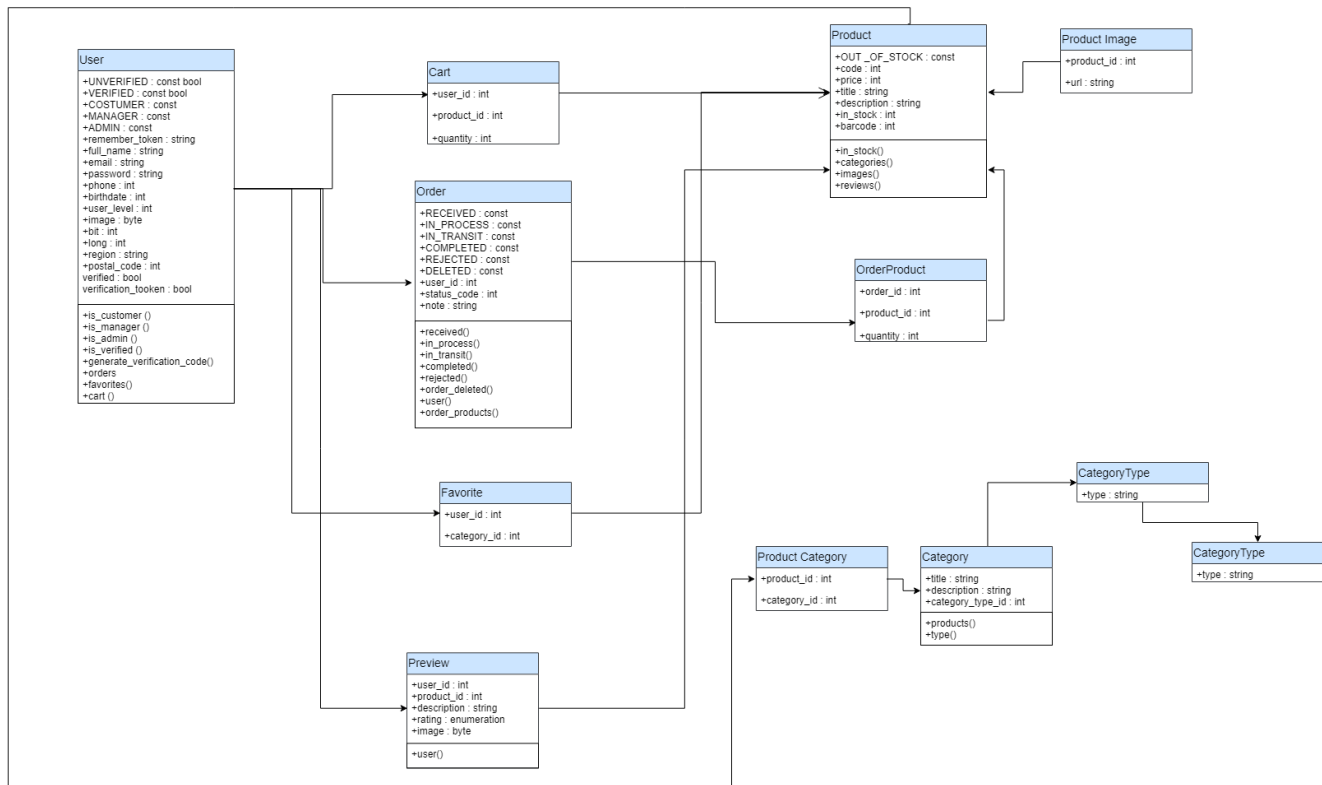


Customer-Profile

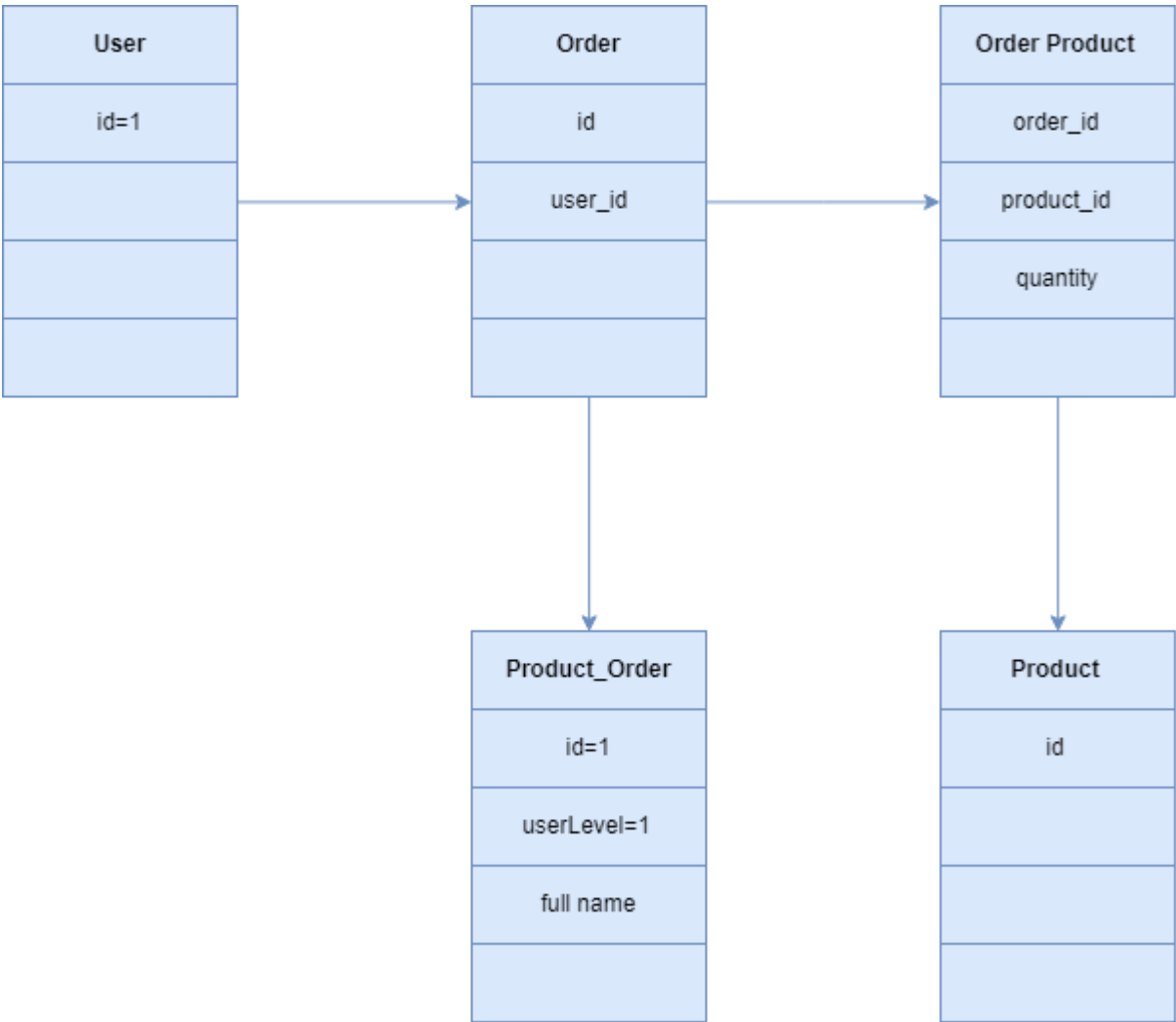


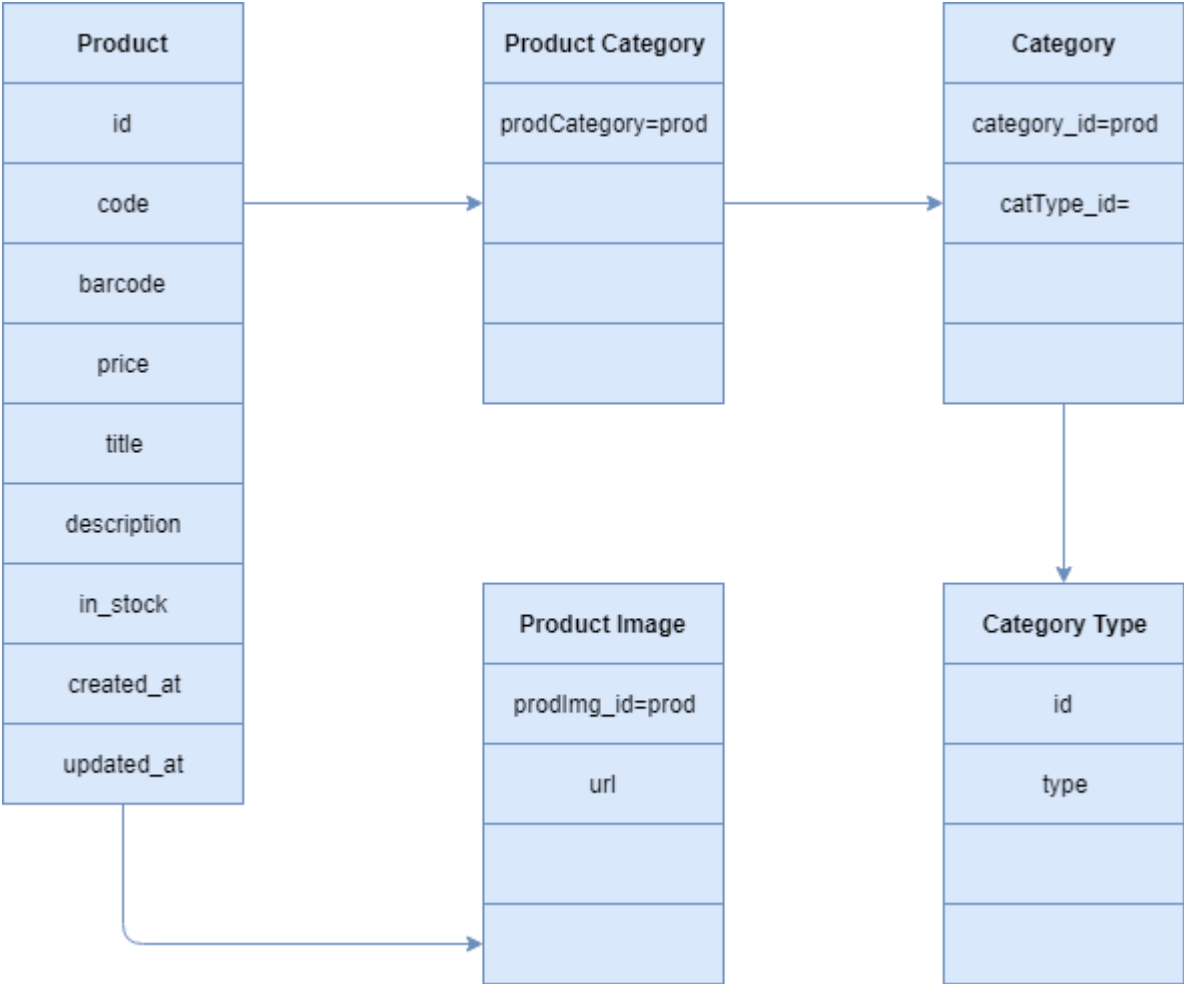
11. Class Diagram

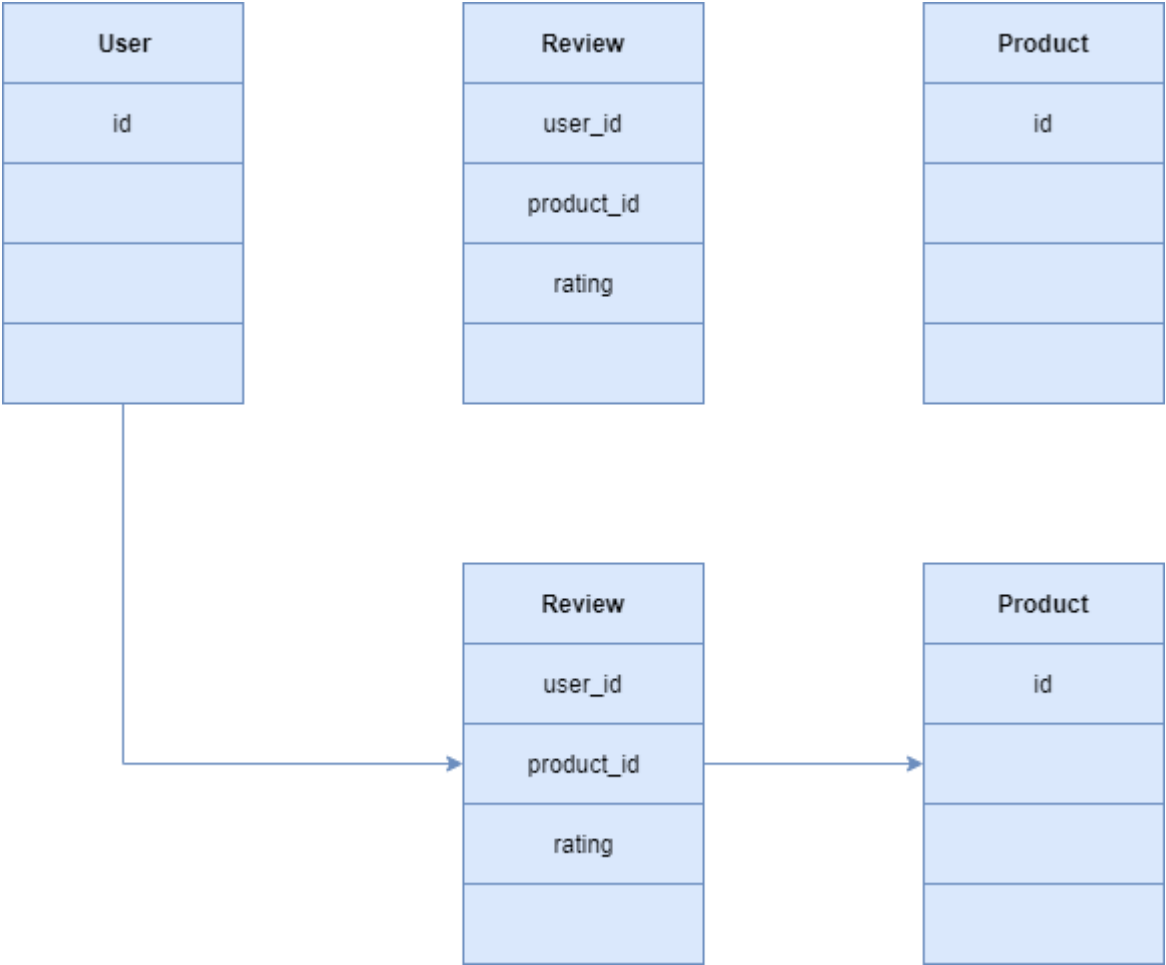
CLASS DIAGRAM



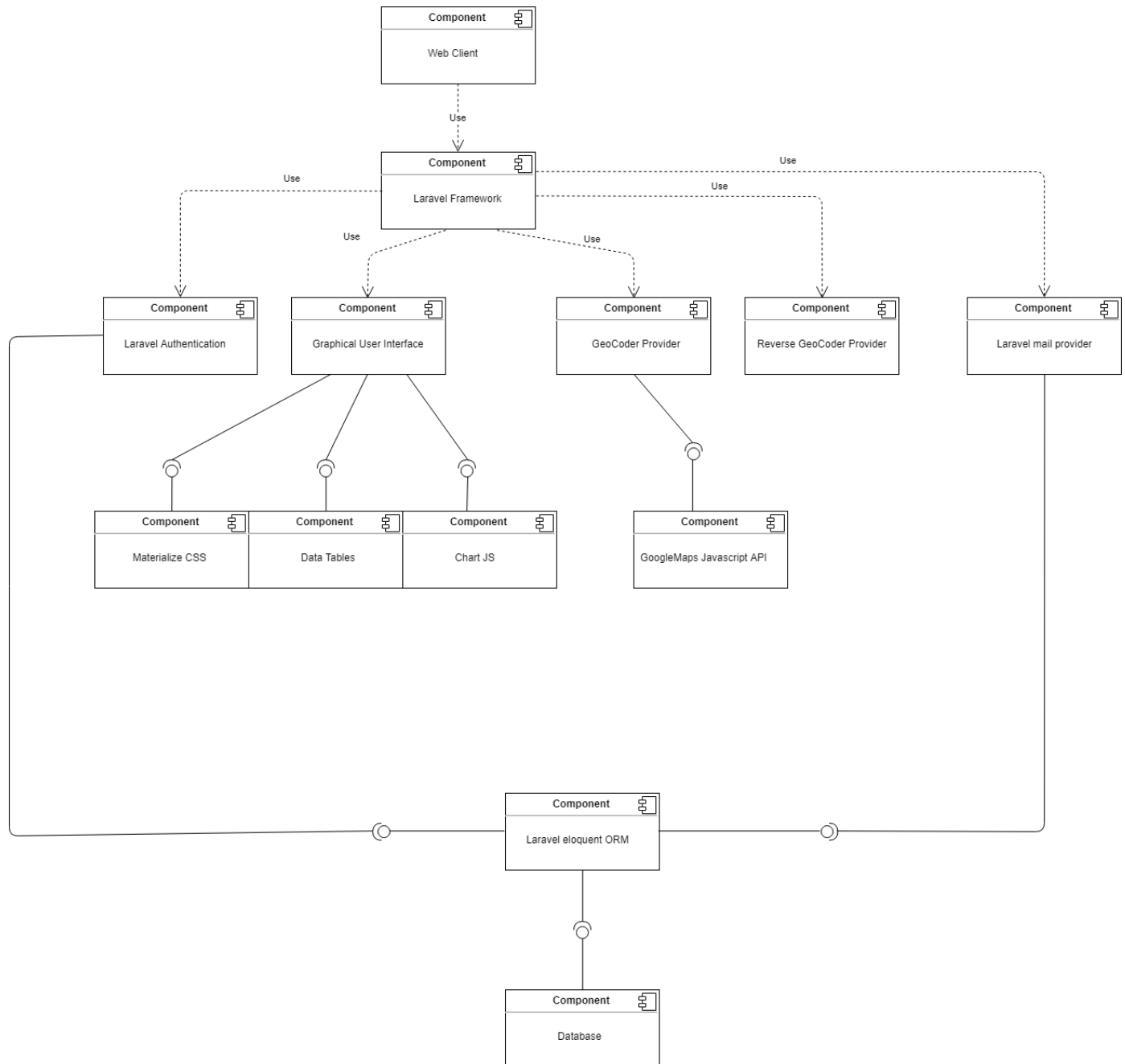
12. Object Diagrams







13. Component Diagram



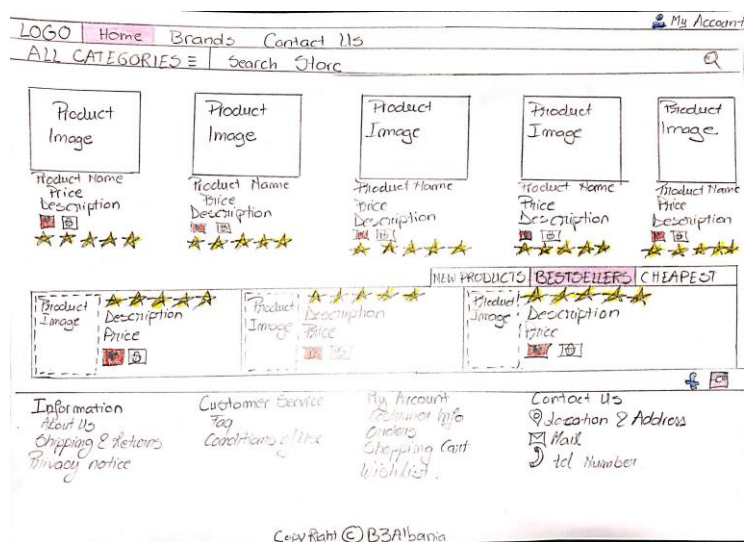
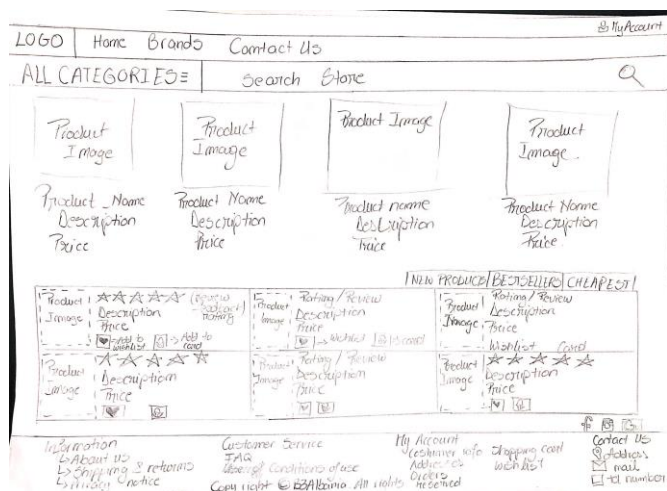
APPENDIX

The appendixes are not always considered part of the actual Requirements Specification and are not always necessary. They may include

- Sample input/output formats, descriptions of cost analysis studies, or results of user surveys;
- Supporting or background information that can help the readers of the Requirements Specification;
- A description of the problems to be solved by the system;
- Special packaging instructions for the code and the media to meet security, export, initial loading, or other requirements.

When appendixes are included, the Requirements Specification should explicitly state whether or not the appendixes are to be considered part of the requirements.

Appendix A. Schetches



REGISTER

Full name:

Email:

Phone:

Birthdate:

Image (optional): @ Attach a file

Address:

City:

Religion:

Postal Code:

Create a password:

Retype password:

Submit

Reset



My Account

User
Picture

Logout

MY ORDERS

SHOPPING CART

WISHLIST


Welcome User_Name!

Personal Infos


Edit

Manager View


[Orders](#)
[Products](#)



[Logout](#)



[Orders](#)
[Products](#)



[Logout](#)

Order Management

Show entries

Id	User Name	Note	Status	Time	Edit	Print
3	tyda	kot	Received	2019-06-06 20:47:25		
2	tyda		Received	2019-06-06 19:43:11		
1	tyda		Deleted	2019-06-06 19:17:01		

Showing 1 to 3 of 3 entries

[Previous](#)

1

[Next](#)

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- Restrictions
- Content
- Jurisdiction

Privacy Policy

- Introduction
- Log
- Children
- Consent

Contact Us

Phone: xxx-xxx-xxxx


Sheshi Skënderbeg, Tiranë 1000, Albania


Email: be3albania@gmail.com

On Social Media

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
[Orders](#) [Products](#)



[Logout](#) 

Product Management

Show entries Search:

Id	Title	Code	Barcode	Price	Stock	Edit
1	Kaloo Miniature Set	13010	 152457896541	28	103	
2	Kaloo Miniature Set	13040	 123954687962	28	100	
3	Kaloo Scented Water	10100	 983746291823	21	100	


Showing 1 to 3 of 3 entries Previous 1 Next

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[Privacy Policy](#)
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[Log](#)

[Contact Us](#)
Phone: xxx-xxx-xxxx
Sheshi Skënderbeg, Tiranë 1000, Albania

Log In



[login](#) [register](#)

Login

E-Mail Address




Password

☐ Remember Me


[LOGIN](#) [FORGOT YOUR PASSWORD?](#)

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Email: be3albania@gmail.com
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Admin View

Management
Orders
Reports

Logout









Categories


Show
10

CREATE +

Search:

entries

Id	Title	Description	Type	Edit
1	Babies	Products for babies	Age	
2	Teens	Products for teens	Age	
3	Adults	Products for adults	Age	
4	Male	For boys and men	Gender	
5	Female	For girls and women	Gender	
7	Skin Care	Different skin products	Other	
8	Fragrance	Collection of fragrances and perfumes	Other	
9	Boy Cat	Cat with fragrances, teddies, toys, rings, necks and night lights	Other	






Management
Orders
Reports

Logout

User Management

Show entries

CREATE +

Search:

Id	Full Name	Email	Phone	User Level	Registered	Edit
1	admin	admin@admin.com	+35569696969	3	2019-05-26 18:27:50	
2	manager	manager@manager.com	+35569696969	2	2019-05-26 18:27:50	
3	tyda	tyda@user.com	3272431168	1	2019-05-26 18:27:50	
4	Tajda Kumbulla	tajdakumbulla@gmail.com	696365008	1	2019-06-04 18:12:45	
5	prova prov	tkumbulla16@epoka.edu.al	69636963609	1	2019-06-06 20:56:58	

Showing 1 to 5 of 5 entries

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B3Albania_OSMS Requirements Specification

Management

Orders

Reports

B

Logout

Orders

From Date

2019-06-01

To Date

2019-06-07

Status

Received

MAKE

Sales

From Date

To Date

MAKE

Products

Min Quantity

0

Max Quantity

0

Client View

prova prov

tkumbulla16@epoka.edu.al

Browse

Other


My Cart

My Profile

My Orders

B

Logout



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B3Albania_OSMS Requirements Specification

RULE


Full Name

prova prova

Email

ikumbulla16@epoka.edu.al

Map Satellite



Phone

+355 6963693609

UPDATE

Terms and Conditions

Contact Us
Phone: 303-333-3000

Logout

Categories

Age

- Toddlers
- Babies

Gender

- Unisex
- Female
- Male

Brand

- Snuggly
- Crayola
- Kokochi
- Bebevolution
- Kaloo

Other

- Fragrance
- Skin Care
- Box Set

Kaloo Miniature Set

Kaloo 4 Miniatures Set Brnl Blue, Lililblue, Dragee & Lilirose

28€ ★

Kaloo Scented Water

Kaloo Scented Water 100ml Blue

21€ ★

Kaloo Miniature Set

Kaloo 4 Miniatures Set Brnl Popo

28€ ★

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Appendix B. Organizing the Requirements

This section is for information only as an aid in preparing the requirements document.

Detailed requirements tend to be extensive. Give careful consideration to your organization scheme. Some examples of organization schemes are described below:

By System Mode

Some systems behave quite differently depending on the mode of operation. For example, a control system may have different sets of functions depending on its mode: training, normal, or emergency.

By User Class

Some systems provide different sets of functions to different classes of users. For example, an elevator control system presents different capabilities to passengers, maintenance workers, and fire fighters.

By Objects

Objects are real-world entities that have a counterpart within the system. For example, in a patient monitoring system, objects include patients, sensors, nurses, rooms, physicians, medicines, etc. Associated with each object is a set of attributes (of that object) and functions (performed by that object). These functions are also called services, methods, or processes. Note that sets of objects may share attributes and services. These are grouped together as classes.

By Feature

A feature is an externally desired service by the system that may require a sequence of inputs to affect the desired result. For example, in a telephone system, features include local call, call forwarding, and conference call. Each feature is generally described in a sequence of stimulus-response pairs, and may include validity checks on inputs, exact sequencing of operations, responses to abnormal situations, including error handling and recovery, effects of parameters, relationships of inputs to outputs, including input/output sequences and formulas for input to output.

By Stimulus

Some systems can be best organized by describing their functions in terms of stimuli. For example, the functions of an automatic aircraft landing system may be organized into sections for loss of power, wind shear, sudden change in roll, vertical velocity excessive, etc.

By Response

Some systems can be best organized by describing all the functions in support of the generation of a response. For example, the functions of a personnel system may be organized into sections corresponding to all functions associated with generating paychecks, all functions associated with generating a current list of employees, etc.

By Functional Hierarchy

When none of the above organizational schemes prove helpful, the overall functionality can be organized into a hierarchy of functions organized by common inputs, common outputs, or common internal data access. Data flow diagrams and data dictionaries can be used to show the relationships between and among the functions and data.

Additional Comments

Whenever a new Requirements Specification is contemplated, more than one of the organizational techniques given above may be appropriate. In such cases, organize the specific requirements for multiple hierarchies tailored to the specific needs of the system under specification.

There are many notations, methods, and automated support tools available to aid in the documentation of requirements. For the most part, their usefulness is a function of organization. For example, when organizing by mode, finite state machines or state charts may prove helpful; when organizing by object,

B3Albania_OSMS Requirements Specification

object-oriented analysis may prove helpful; when organizing by feature, stimulus-response sequences may prove helpful; and when organizing by functional hierarchy, data flow diagrams and data dictionaries may prove helpful.