

**Capstone Project Report**

**Report 7 – Software Design Document**

– Ho Chi Minh, January 2021 –

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**Acknowledge**

First of all, we would like to express our sincere and deepest gratitude to our supervisors, Mr. Pham Cong Thanh and Mr. Doan Nguyen Thanh Hoa, for giving us the precious opportunity to participate in this project. During the process of making the project, the enthusiasm, understanding and valuable knowledge you bring to us are what makes us very grateful. No matter day or night, as long as we have problems, you are always ready to support without complaining, once again we would like to sincerely thank you Mr. Thanh and Mr. Hoa.

We owe deep thanks to lecturers for taking valuable time to help us review this project. Furthermore, all of you also gave very sincere and accurate suggestions to help us realize where the problem is and what we should do to make this project more complete.

We would like to thanks to each individual in our group for our enthusiasm, hard-working, and non-stop effort. Sometimes our group fell into a state of deadlock, stress, and fatigue, but luckily, we all tried to overcome them to reach today. Special thanks to Than Nhat Truong for being a great leader, always be the one who gives the best effort and direction for group members. Thank you Do Ngoc Huu for always tolerating the mistakes of us and the diligent no matter day or night. Much appreciations to Nguyen Thanh Hieu for his silent contributions and always actively taking care of other members. Thank you Nguyen Minh Luan for not giving up and always trying to care about the smallest things.

Last but not least, we would like to extend our gratitude to our families and friends who have provided emotional and practical support for this project. Thanks for everything all of you give us, we will forever be engraved in our heart.

# Defintion and Acronyms

|  |  |
| --- | --- |
| **Acronym** | **Definition** |
| BR | Business Rule |
| BA | Business Analysis |
| ERD | Entity Relationship Diagram |
| GUI | Graphical User Interface |
| UC | Use Case |
| API | Application Programming Interface |
| FE | Feature |
| LI | Limitation |
| EX | Exclusion |
| WBS | Work Breakdown Structure |
| JSON | JavaScript Object Notation |
| CUDA | Compute Unified Device Architecture |
| IIS | Internet Information Services |
| CFFE | Customer Feedback Through Facial Expression Analysis |
| Hot Spot | Count number of customer in specific area |
| Admin |  |
| Manager |  |

**I. Project Introduction**

**1. Overview**

**1.1 Project Information**

* Project name: Customer feedback through facial expression analysis
* Project code: CFFE
* Group name: CFFE Team
* Software type: Web App, Mobile App

**1.2 Project Team**

**a. Supervisors**

**Table 2. Supervisors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Email** | **Phone Number** | **Title** |
| Pham Cong Thanh | thanhpc@fe.edu.vn | 0908316748 | Lecturer |
| Doan Nguyen Thanh Hoa | hoadnt@fe.edu.vn |  | Lecturer |

**b. Team Members**

**Table 3. Team members**

|  |  |  |  |
| --- | --- | --- | --- |
| **Full Name** | **Email** | **Mobile** | **Role** |
| Than Nhat Truong | truongtnse130426@fpt.edu.vn | 0971601584 | Leader |
| Do Ngoc Huu | huudnse130557@fpt.edu.vn | 0397189696 | Member |
| Nguyen Thanh Hieu | hieuntse130434@fpt.edu.vn | 0392997510 | Member |
| Nguyen Minh Luan | luannmse62431@fpt.edu.vn | 0336808288 | Member |

**2. Product Background**

Capturing customer psychology and product experience emotions, identifying areas where customers often have a habit of going back and forth is always a matter of concern for product suppliers. They can make better product judgments and strategies based on customer experience reports from distribution affiliates.

Specifically, based on the report, the product supplier can determine which products are of interest, which areas of the store have a lot of people passing through. So that they can easily make decisions such as promoting advertising, discounting items of little interest, and placing new products in high-traffic areas.

**3. Existing Systems**

In the process of market research, we found that companies and organizations in Vietnam mostly choose the traditional solution: hiring staff to collect data manually, follow up with eyes. This traditional approach is inefficient due to human error, and high operating costs.

**4. Business Opportunity**

With the development of computers, we are interested in applying AI solutions to shorten the current manual process, thereby improving efficiency in capturing the emotions of product experience in products designated areas, and count the number of customers passing through the store. This system is developed in accordance with the actual conditions and infrastructure in Vietnam today.

**5. Software Product Vision**

CFFE is a system that will automate some manual steps in the entire process. This can save employees' time, reduce costs for companies, organizations, and reduce processes that depend on people.

In more detail, CFFE is a system that uses IP cameras installed in specific areas of the system to count people in certain areas, and analyze customers' emotions automatically. After that, the system will store the analyzed video so that the user can check the authenticity of the data.

**6. Project Scope & Limitations**

**6.1 Major Features**

1. **Admin**

**FE-01:** Create, view, update, delete, reset password, create account for manager.

**FE-02**: Create, view, update, delete store.

**FE-03**: Create, update, delete product.

**FE-04**: Create, update, delete camera.

**FE-05**: Create, update, delete category.

1. **Manager**

**FE-06:** Create, view, update, delete shelf.

**FE-07:** Create, view, update, delete stack.

**FE-08:** Upload video.

1. **System AI**

**FE-09:** Analyze facial emotion.

**FE-10:** Count the customer.

1. **Unauthenticated User**

**FE-11:** Login by account.

1. **Authenticated User**

**FE-12:** View category.

**FE-13:** View video.

**FE-14:** View camera.

**FE-15:** View product.

**FE-16:** View, update own profile.

**FE-17:** View, download the report.

**FE-18:** View, download the report.

**FE-19:** Logout.

**6.2 Limitations & Exclusions**

**LI-01:** The CFFE only assists humans in detecting, it does not completely replace humans, and still need human participation to upload the video.

**LI-02:** The CFFE is currently only used for the system which has one or many stores, and has not been applied for many systems.

**LI-03:** The detection result depends on the quality of camera’s video.

**LI-04:** The CFFE has no the update detection model feature.

**LI-06:** In case to many customers in store at a time, the customer counting results may not be highly accurate.

# III. System Requirement Specification

## 1. Overall Description

### 1.1 Product Overview

#### Unauthenticated User Requirements

Unauthenticated user who has not been identified by CFFA system. Unauthenticated user has limited access to the system with the following feature:

* Login

#### Authenticated User Requirements

Authenticated User who has been logged into the CFFA system. Authenticated user can use the following functions:

* Logout
* Change account's password
* Watch the video
* Save the video
* Delete the video
* View the reports
* View report detail
* Export the report file

#### Manager Requirements

Manager is a person who accesses to the system as manager role. Manager can use the following functions:

* View the shelves
* View shelf detail
* Search the shelf
* Create new shelf
* Update the shelf
* Delete the shelf
* View the stacks
* View stack detail
* Search the stacks
* Create new stack
* Update the stack
* Delete the stack
* View the products
* View product detail
* Search the products
* Create new product
* Update the product
* Delete the product
* View the cameras
* View camera detail
* Search the cameras
* Create new camera
* Update the camera
* Delete the camera
* View the categories
* Create new category
* Update the category
* Delete the category

#### Admin Requirements

Admin is a person who accesses to the system as admin role. Admin can use the following functions:

* View the managers
* View manager detail
* Search the manager
* Create new manager
* Update the manager
* Delete the manager
* View the accounts
* View account detail
* Search the account
* Create new account
* Update the account
* Delete the account
* View the stores
* View store detail
* Search the store
* Create new store
* Update the store
* Delete the account
* Send the mail to the manager

#### Camera Requirements

Camera is an actor which can do:

* Send the videos to the server

#### System AI Requirements

System AI is an actor which can do:

* Analyse facial expression
* Detect the "hotspot"

### 1.2 Business Rules

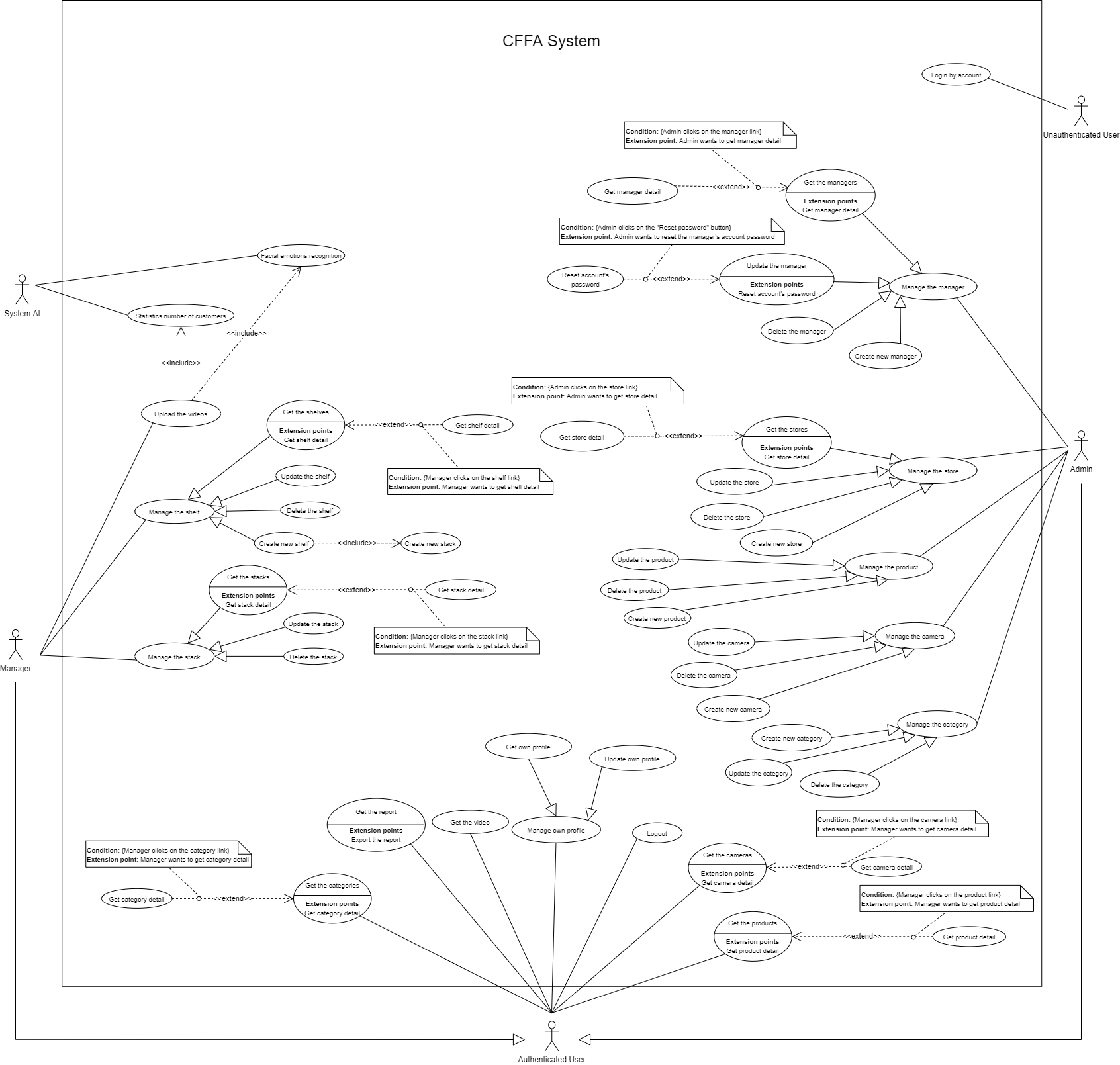
|  |  |
| --- | --- |
| ID | Rule Definition |
| BR-001 | User logs in using username and password are registered. If the username and password are correct, CFFA system redirects users to corresponding home page:   * User logs in as “manager” role, CFFA system will display the manager's home page. * User logs in as “admin” role, CFFA system will display the admin's home page. |
| BR-002 | After logging in as "manager" role, if the manager has not yet mapped to any store, CFFA system will display the "You don't have a store to manage" message and log out CFFA system. |
| BR-003 | The newly created manager's status is active. |
| BR-004 | After logging out successfully, user becomes the “Unauthenticated User” and CFFA system will direct to login page. |
| BR-005 | JSON web token will be removed on the client-side. |
| BR-006 | Cookies will be destroyed on the client-side. |
| BR-007 | The password must be SHA256 encrypted before sending it to the server. |
| BR-008 | Exporting a file is PDF format for the user with the file name is current time that has hh:mm-DD/MM/YY format and store name separated by '\_'. |
| BR-009 | CFFA system only allows users to download the report which has data. |
| BR-010 | CFFA system only allows users to play video that has been analysed and stored. |
| BR-011 | CFFA system only allows to play the "hotspots" on a specific shelf or the emotions on a specific shelf/stack/product/camera video. |
| BR-012 | Password must be at least 8 characters and must contain the following:   * At least one uppercase letter * At least one lowercase letter * At least one digits |
| BR-013 | Time must be hh:mm dd/mm/yyyy format. |
| BR-014 | Shelf combobox can select multiple values that include:   * All shelves * Specific shelves ( including active, pending, and inactive shelves that sort by shelf's name)   Default value is all shelves. |
| BR-015 | Stack combobox can select multiple values that include:   * All stacks * Specific stacks ( including active, pending, and inactive stacks that sort by shelf's name and No   Default value is all stacks |
| BR-016 | Product combobox can select multiple values that include:   * All products * Specific products ( including active, and inactive products that sort by product's name)   Default value is all products |
| BR-017 | Camera combobox can select multiple values that include:   * All cameras * Specific cameras ( including active, pending, and inactive cameras that sort by camera's name   Default value is all cameras |
| BR-018 | Analysed options checkbox can select multiple values that include:   * Emotions * Hotspots   Default value is emotions and hotspots. |
| BR-019 | Time filter only selects single value that includes:   * Hour * Day * Week * Month * Quarter * Year   Default value is hour. |
| BR-020 | Selecting all values cannot select specific values and vice versa. |
| BR-021 | Start time is always less than End time.  Default period of the start and end time is one week. |
| BR-022 | Video options check box only selects single value that includes:   * Emotions * Hotspots   Default value is emotions. |
| BR-023 | Set time combobox only selects single value that includes from 0 to 23 hours. |
| BR-024 | Using pagination to display 15 lines / page. |
| BR-025 | When changing the manager status from active to inactive, there must be a reason and sure that this manager are removed from store. |
| BR-026 | Manager can search the shelves with following conditions:   * Shelf name * Status ( Shelf's status includes all status, active, and inactive)   Status's default value is all status. |
| BR-027 | Displays a list of shelves with the following information:   * No (List of shelves order by shelf name) * Shelf name * Number of stacks * Last Updated * Status |
| BR-028 | Displays the shelf detail with the following information:   * Id * Shelf name * Description * Maximum of stacks * Created * Last Updated * Reason inactive * Status * Camera detail * Number of stack * List of stacks |
| BR-029 | Shelf's status has three options:   * Active (Shelf is active and has the camera set up) * Pending (Shelf is active and hasn't the camera set up) * Inactive (Shelf is inactive) |
| BR-030 | When changing the shelf's status from inactive, there must be a reason and sure that all the stacks and cameras on the shelf are removed. |
| BR-031 | A shelf information required fields:   * Name: between 1 - 100 characters, unique * Description: between 1 - 250 characters * Maximum of stacks: between 1 - 30 stacks * Status: active/inactive |
| BR-032 | After updating or deleting, CFFA system updates the last update time. |
| BR-033 | Deletion is a change to inactive status |
| BR-034 | The newly created shelf's status is active. |
| BR-035 | After creation, CFFA system stores the create time. |
| BR-036 | Manager can search the stacks with following conditions:   * Status ( Shelf's status includes all status, active, pending, and inactive)   Status's default value is all status. |
| BR-037 | Displays a list of stacks with the following information:   * Position (List of stacks order by position) * Shelf name * Product * Camera * Status |
| BR-038 | Displays the stack detail with the following information:   * Id * Position * Product detail * Camera detail * Created time * Reason inactive * Status |
| BR-039 | Manager only can select a pending camera, product to set up on the shelf, stack. |
| BR-040 | Stack’s status has three options:   * Active * Pending * Inactive |
| BR-041 | When changing the stack status from pending to inactive, there must be a reason and sure that the product and camera on the stack are removed. |
| BR-042 | If the product and camera already on stack, the stack's status will change to active automatically.  If the product or camera on the stack is missed, the stack's status will change to pending automatically. |
| BR-043 | The newly created stack's status is pending. |
| BR-044 | Manager can search the products with following conditions:   * Product name * Product category * Status (Product's status includes all status, active, pending, and inactive)   Product category's default value is all categories.  Status's default value is all status. |
| BR-045 | Displays a list of products with the following information:   * No (List of stacks order by product name) * Product name * Product image * Product category * Last update * Status |
| BR-046 | Displays the product detail with the following information:   * Id * Product name * Product image * Category * Description * List of stack * Created * Last Updated * Reason inactive * Status |
| BR-047 | A product information required fields:   * Name: between 1 - 100 characters, unique * Image: must be png, jpg, jpeg format * Category: at least one category * Description: between 1 - 250 characters * Status: active/inactive |
| BR-048 | Product’s status has two options:   * Active * Inactive |
| BR-049 | When changing the product status from active to inactive, there must be a reason and sure that this product on all stacks are removed. |
| BR-050 | Stack's No is the position on the shelf that is automatically generated by the CFFA system in the order of creation. |
| BR-051 | The newly created product's status is active. |
| BR-052 | Manager can search the cameras with following conditions:   * Camera name * Status ( Camera's status includes all status, active, pending, and inactive)   Status's default value is all status. |
| BR-053 | Displays a list of cameras with the following information:   * No (List of stacks order by camera name) * Camera name * Camera image * IP address * Last update * Status |
| BR-054 | Displays the camera detail with the following information:   * Id * Camera name * Camera image * Ip address * RTSP string Shelf * Stack Created * Last Updated * Reason inactive * Status |
| BR-055 | A camera information required fields:   * Name: between 1 - 100 characters, unique * Image: must be png, jpg, jpeg format * IP address: x.x.x.x ( x is number between 0 to 255), unique * RTSP string: at least 1 characters, unique * Status: active/pending/inactive |
| BR-056 | Camera status has two options:   * Active * Pending * Inactive |
| BR-057 | When changing the camera status from pending to inactive, there must be a reason and sure that this camera are removed from stack. |
| BR-058 | When changing the camera status from active to inactive, there must be a reason and sure that this camera are removed from the stack. |
| BR-059 | The newly created camera's status is pending. |
| BR-060 | When the camera does not setup on any stack, the camera's status is changed to pending |
| BR-061 | Displays a list of cameras with the following information:   * No (List of stacks order by category name) * Category name |
| BR-062 | Displays the category detail with the following information:   * ID * Category name * Products belongs to the category |
| BR-063 | A category information required fields:   * Name: between 1 - 100 characters, unique |
| BR-064 | Admin can search the stores with following conditions:   * Store name * City * District * Status (Store's status includes all status, active and inactive) Status's default value is all status. |
| BR-065 | Displays a list of stores with the following information:   * No (List of stacks order by store name) * Store name * Image * Manager * Address * Last update * Status |
| BR-066 | Displays the store detail with the following information:   * Id * Store name * Image * Manager * Address * City * District * Created * Last Updated * Reason inactive * Status |
| BR-067 | A store information required fields:   * Name: between 1 - 100 characters, unique * Image: must be png, jpg, jpeg format * Address: between 1 - 250 character * City * District * Analysed time * Status: active/inactive |
| BR-068 | Store status has three options:   * Active * Pending * Inactive |
| BR-069 | When changing the store status from active to inactive, there must be a reason and sure that this manager are removed from store. |
| BR-070 | The newly created camera's status is pending. |
| BR-071 | Admin can search the manager with following conditions:   * Employee code * Manager name * Username * Status (Manager's status includes all status, active and inactive)   Status's default value is all status. |
| BR-072 | Displays a list of manager with the following information:   * No (List of stacks order by Employee code) * Employee code * Manager name * Username * Store * Image * Identify card * Last update * Status |
| BR-073 | Displays the store detail with the following information:   * Id * Employee code * Manager name * Username * Image * Gender * BirthDate * Identify Card * Phone * Email * Store * Address * City * District * Created * Last Updated * Reason inactive * Status |
| BR-074 | A manager information required fields:   * Employee code: unique * Email: match regex ^\(?([0-9]{3})\)?[-. ]?([0-9]{3})[-. ]?([0-9]{4})$ * Status: active/inactive |
| BR-075 | Manager status has two options:   * Active * Inactive |
| BR-076 | If the camera already on shelf, the shelf's status will change to active automatically.  If the camera on the shelf is missed, the shelf's status will change to pending automatically. |
| BR-077 | The newly created product contain as least one category. |
| BR-078 | If the pending camera is used by any shelf or stack, the camera's status will change to active automatically. If the active camera is removed from any shelf or stack, the camera's status will change to pending automatically. |
| BR-079 | Manager can not see the the camera are using by another manager. |

*Table 1 - Business rules*

## 2. User Requirements

### 2.1 Overview

#### Use Case Diagram



*Figure 1 - <Use Case Overview> Overview*

#### System Actors

|  |  |  |
| --- | --- | --- |
| **#** | **Actor** | **Description** |
| 1 | Unauthenticated User | Unauthenticated User is person who has no account. |
| 2 | Authenticated User | Authenticated User is a person who has an account in the system (There are two roles that are admin and manager). |
| 3 | Manager | Manager manages the store's products, shelves, stacks, and cameras. |
| 4 | Admin | Admin manages the managers, accounts, and stores in the system. |
| 5 | System AI | System AI analyses customers' emotions and statistics number of customers in the stores. |

*Table 2 - System actors*

#### Use Case List

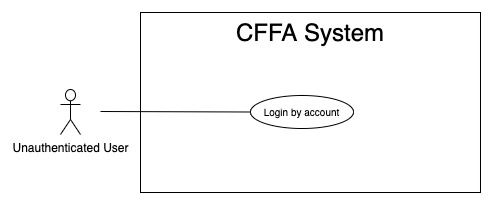
|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Use Case** | **Primary Actors** | **Secondary Actors** |
| UC-01 | **Login by account** | Unauthenticated user | N/A |
| UC-02 | **Logout** | Authenticated user | N/A |
| UC-03 | **Change account's password** | Authenticated user | N/A |
| UC-04 | **Get the report** | Authenticated user | N/A |
| UC-05 | **Export the report** | Authenticated user | N/A |
| UC-06 | **Get the video** | Authenticated user | N/A |
| ~~UC-07~~ | **~~Set time to analyze the videos~~** | ~~Admin~~ | ~~N/A~~ |
| UC-08 | **Get the shelves** | Manager | N/A |
| UC-09 | **Get shelf detail** | Manager | N/A |
| UC-10 | **Update the shelf** | Manager | N/A |
| UC-11 | **Delete the shelf** | Manager | N/A |
| UC-12 | **Create new shelf** | Manager | N/A |
| UC-13 | **Get the stacks** | Manager | N/A |
| UC-14 | **Get stack detail** | Manager | N/A |
| UC-15 | **Update the stack** | Manager | N/A |
| UC-16 | **Delete the stack** | Manager | N/A |
| UC-17 | **Create new stack** | Manager | N/A |
| UC-18 | **Get the products** | Authenticated user | N/A |
| UC-19 | **Get product detail** | Authenticated user | N/A |
| UC-20 | **Update the product** | Admin | N/A |
| UC-21 | **Delete the product** | Admin | N/A |
| UC-22 | **Create new product** | Admin | N/A |
| UC-23 | **Get the cameras** | Authenticated user | N/A |
| UC-24 | **Get camera detail** | Authenticated user | N/A |
| UC-25 | **Update the camera** | Admin | N/A |
| UC-26 | **Delete the camera** | Admin | N/A |
| UC-27 | **Create new camera** | Admin | N/A |
| UC-28 | **Get the categories** | Authenticated user | N/A |
| UC-29 | **Get category detail** | Authenticated user | N/A |
| UC-30 | **Update the category** | Admin | N/A |
| UC-31 | **Create new category** | Admin | N/A |
| UC-32 | **Get the stores** | Admin | N/A |
| UC-33 | **Get store detail** | Admin | N/A |
| UC-34 | **Update the store** | Admin | N/A |
| UC-35 | **Delete the store** | Admin | N/A |
| UC-36 | **Create new store** | Admin | N/A |
| UC-37 | **Get the managers** | Admin | N/A |
| UC-38 | **Get manager detail** | Admin | N/A |
| UC-39 | **Update the manager** | Admin | N/A |
| UC-40 | **Delete the manager** | Admin | N/A |
| UC-41 | **Create new manager** | Admin | N/A |
| UC-42 | **Reset account's password** | Admin | N/A |
| UC-43 | **Create new account** | Admin | N/A |
| UC-44 | **Send the mail to the manager** | Admin | N/A |
| ~~UC-45~~ | **~~Analyze facial expression~~** | ~~System AI~~ | ~~N/A~~ |
| UC-46 | **Upload the videos** | Manager | N/A |
| UC-47 | **Get own profile** | Authenticated user | N/A |
| UC-48 | **Update own profile** | Authenticated user | N/A |
| UC-49 | **Facial emotions recognition** | System AI | N/A |
| UC-50 | **Statistics number of customers** | System AI | N/A |

UC-4*Table 3 - Use case list*

### User case specification

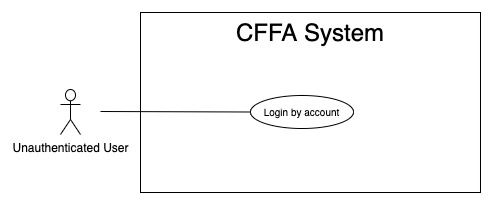


#### 2.2.1 <Unauthenticated User> Overview Use Case



*Figure 2 - <Overview Use Case> Unauthenticated User*

##### 2.2.1.1 <Unauthenticated User> Login by account

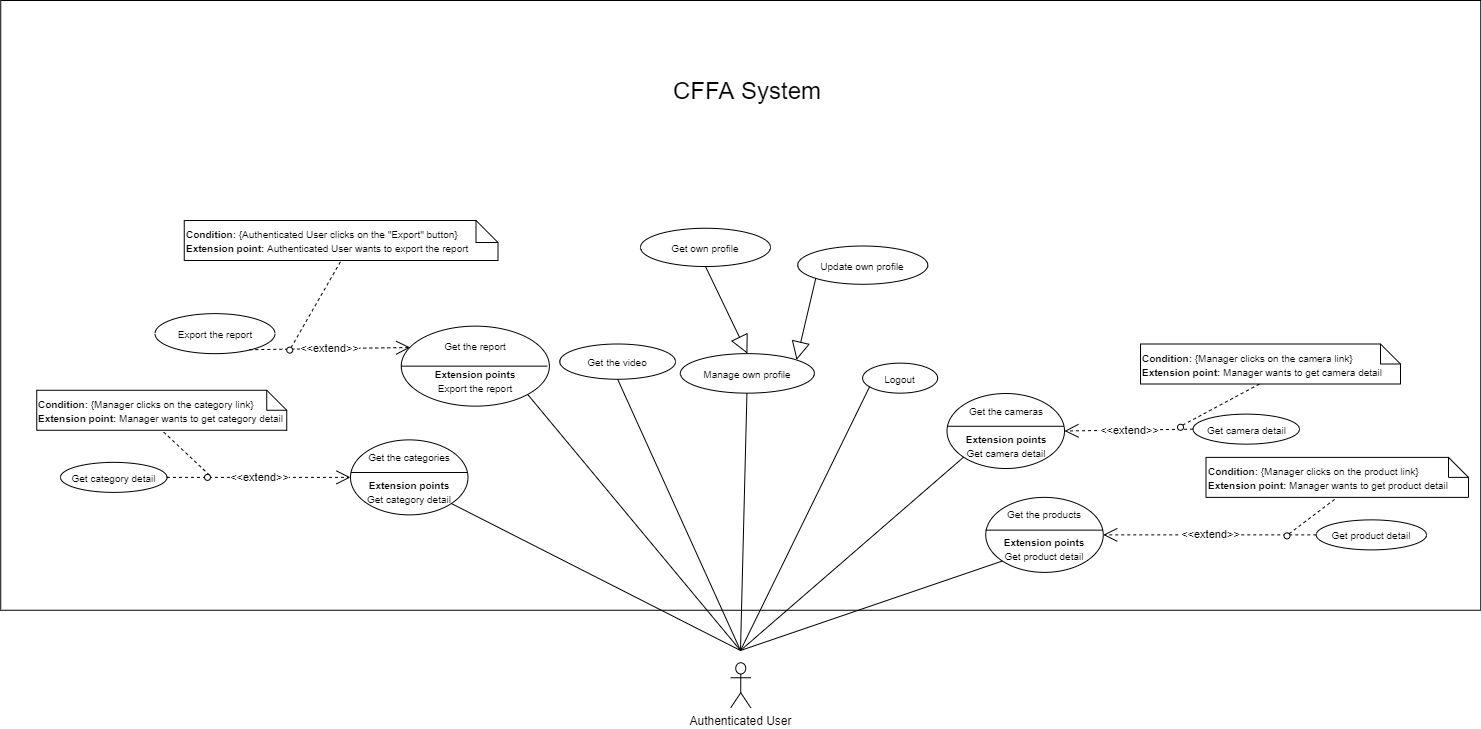


*Figure 3 - <Use Case> Login by account*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-01 Login by account** | | |
| Created By: | TruongTN | Date Created: | 25/01/2021 |
| Primary Actor: | Unauthenticated User | Secondary Actors: | N/A |
| Description: | This feature allows the unauthenticated user to login to CFFA system to verify the role and gives them access to more features. | | |
| Trigger: | Unauthenticated User sends a request to login to CFFA system. | | |
| Pre-conditions: | PRE-01. User's account has been created.  PRE-02. User's account has been authorized as Admin or Manager role.  PRE-03. User has not logged in to CFFA system. | | |
| Post-conditions: | POST-01. User has successfully logged into CFFA system. | | |
| Normal Flow: | **1.0 Login by account**   1. Unauthenticated User send a request to login to the CFFA system. 2. CFFA system requires information from Unauthenticated User:  * “Username”: text input, blank * “Password”: text input, blank  1. Unauthenticated User inputs a login form: username, password. 2. Unauthenticated User clicks to “Login” button. 3. CFFA system validates the username and password. (see 1.0.E1, 1.0.E2) 4. CFFA system determines the user’s identity, role, and permission then redirects to the home page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **1.0.E1 Unauthenticated User does not enter the required fields**   1. CFFA system returns to Unauthenticated User to fill the required fields again (MSG-001, MSG-002). 2. If Unauthenticated User inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Unauthenticated User cancels the login process, then CFFA system terminates this use case.   **1.0.E2 Unauthenticated User enters wrong username or password.**   1. CFFA system returns to Unauthenticated User to fill the required fields again (MSG-003). 2. If Unauthenticated User inputs username and password again, CFFA system returns to step 3 of normal flow. 3. Else if Unauthenticated User cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Always | | |
| Business Rules: | BR-001, BR-002, BR-008, BR-012 | | |
| Other Information: | In case of internet connection failure, Unauthenticated User cannot finish this use case. | | |
| Assumptions: | N/A | | |

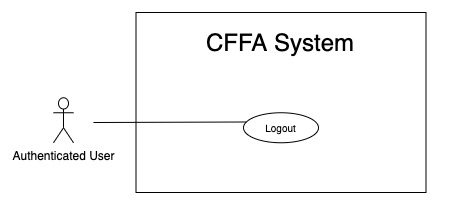
*Table 4 - <Use Case> Login by account*

#### 2.2.2 <Authenticated User> Overview Use Case



*Figure 4 - <Overview Use Case> Authenticated User*

##### 2.2.2.1 <Authenticated User> Logout

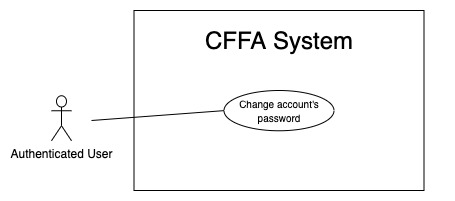


*Figure 5 - <Use Case> Logout*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-02 Logout** | | |
| Created By: | TruongTN | Date Created: | 25/01/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows Authenticated User to log out from CFFA system. | | |
| Trigger: | Authenticated user sends a request to log out from CFFA system. | | |
| Pre-conditions: | PRE-01. User has logged into CFFA system. | | |
| Post-conditions: | POST-01. User has successfully logged out CFFA system. | | |
| Normal Flow: | **2.0 Logout**   1. Authenticated user clicks on “Logout” button. 2. CFFA system deletes their cookies. 3. CFFA system redirects to "Login" page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | N/A | | |
| Priority: | Medium | | |
| Frequency of Use: | Sometimes | | |
| Business Rules: | BR-004, BR-005, BR-006 | | |
| Other Information: | In case of internet connection failure, Authenticated User cannot finish this use case. | | |
| Assumptions: | N/A | | |

*Table 5 - <Use Case> Logout*

##### 2.2.2.2 <Authenticated User> Change account's password

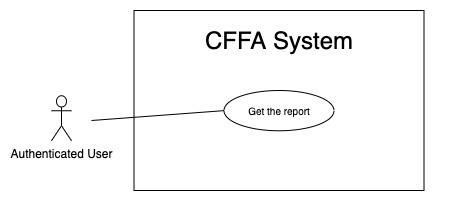


*Figure 6 - <Use Case> Change account's password*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-03 Change account's password** | | |
| Created By: | HuuDN | Date Created: | 10/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows Authenticated User to change the account's password. | | |
| Trigger: | Authenticated User sends a request to change the account's password. | | |
| Pre-conditions: | PRE-01. User has logged into CFFA system. | | |
| Post-conditions: | POST-01. Authenticated User has successfully changed the account's password. | | |
| Normal Flow: | **3.0 Change account's password**   1. Authenticated User sends a request to change the account's password. 2. CFFA system requires information from Authenticated User:  * “Old password”: text input, blank * “New Password”: text input, blank * “Re-enter New Password”: text input, blank  1. Authenticated User inputs a changing password form: old password, new password, and re-enter new password. 2. Authenticated User clicks to "Save" button. 3. CFFA system validates the old password, new password, and re-enter new password. (see 3.0.E1, 3.0.E2) 4. CFFA system will stores changing information. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **3.0.E1 Authenticated User does not enter the required fields**   1. CFFA system returns to Authenticated User to fill the required fields again (MSG-004, MSG-005, MSG-006, MSG-007). 2. If Authenticated User inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Unauthenticated User cancels the login process, then CFFA system terminates this use case.   **3.0.E2 Authenticated User enters the required fields that are not valid**   1. CFFA system returns to Authenticated User to fill the required fields again (MSG-003). 2. If Authenticated User inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Unauthenticated User cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Sometimes | | |
| Business Rules: | BR-002, BR-007, BR-008, BR-012 | | |
| Other Information: | In case of internet connection failure, Authenticated User cannot finish this use case. | | |
| Assumptions: | N/A | | |

*Table 6 - <Use Case> Change account's password*

##### 2.2.2.3 <Authenticated User> Get the report

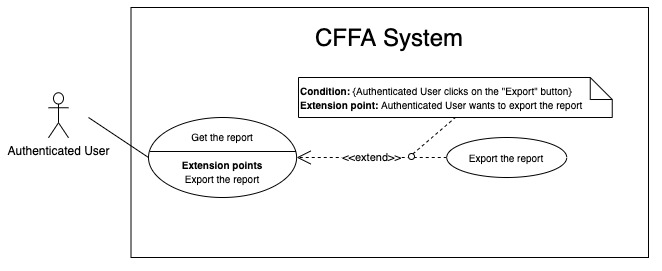


*Figure 7 - <Use Case> Get the report*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-04 Get the report** | | |
| Created By: | HuuDN | Date Created: | 11/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows the Authenticated User to get the report. | | |
| Trigger: | Authenticated User sends a request to get the report. | | |
| Preconditions: | PRE-01. User has logged into CFFA system as admin or manager role. | | |
| Post-conditions: | POST-01. Authenticated User has successfully got the report. | | |
| Normal Flow: | **4.0 Get the report**   1. Authenticated User sends a request to get the report. 2. CFFA system requires the report's information from Authenticated User:  * “Start Time”: text input, blank * “End Time”: text input, blank * “Shelf”: combobox * “Stack”: combobox * “Product”: combobox * “Camera”: combobox * “Analysed Options”: checkbox * “Time Filter”: checkbox  1. Authenticated User inputs/selects a form: start time, end time, shelf, stack, product, camera, Analysed options, and time filter. 2. CFFA system returns the reports (see 4.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **4.0.E1 The report has no data.**   1. CFFA system returns the message (MSG-010). | | |
| Priority: | High | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-013, BR-014, BR-015, BR-016, BR-017, BR-018, BR-019, BR-020, BR-021. | | |
| Other Information: | In case of internet connection failure, Authenticated User cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 7 - <Use Case> Get the report*

##### 2.2.2.4 <Authenticated User> Export the report

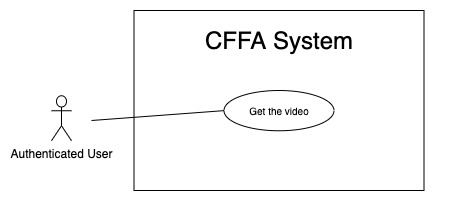


*Figure 8 - <Use Case> Export the report*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-05 Export the report** | | |
| Created By: | HuuDN | Date Created: | 18/01/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows Authenticated User to export the report. | | |
| Trigger: | Authenticated User sends a request to export the report. | | |
| Preconditions: | PRE-01. User has logged into CFFA system as admin or manager role.  PRE-02. Authenticated User has got the report. | | |
| Post-conditions: | POST-01. Authenticated User has successfully exported the report. | | |
| Normal Flow: | **5.0 Export the report**   1. Authenticated User clicks on "Export" button. 2. CFFA system returns the report file for Authenticated User (see 5.0.E1) | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **5.0.E1 The report has no data**   1. CFFA system returns the message (MSG-010). | | |
| Priority: | High | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-008, BR-009. | | |
| Other Information: | In case of internet connection failure, Authenticated User cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 8 - <Use Case> Export the report*

##### 2.2.2.5 <Authenticated User> Get the video

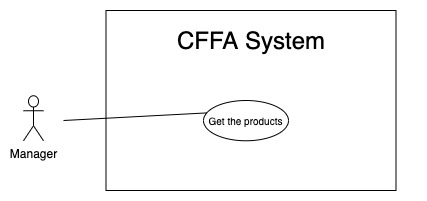


*Figure 9 - <Use Case> Get the video*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-06 Get the video** | | |
| Created By: | HuuDN | Date Created: | 11/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows Authenticated User to get the video. | | |
| Trigger: | Authenticated User sends a request to get the video. | | |
| Preconditions: | PRE-01. User has logged into CFFA system as admin or manager role. | | |
| Post-conditions: | POST-01. Authenticated User has successfully played the video. | | |
| Normal Flow: | **6.0 Get the video**   1. Authenticated User sends a request to get the report. 2. CFFA system requires the report's information from Authenticated User:  * “Start Time”: text input, blank * “End Time”: text input, blank * “Shelf”: combobox * “Stack”: combobox * “Product”: combobox * “Camera”: combobox * “Video Options”: checkbox  1. Authenticated User inputs/selects a form: start time, end time, shelf, stack, product, camera, video options. 2. Authenticated User clicks on "Play" button. 3. CFFA system plays the video (see 6.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **6.0.E1 The video has no data to play.**   1. CFFA system returns the message (MSG-011). | | |
| Priority: | High | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-010, BR-011, BR-013, BR-021, BR-022. | | |
| Other Information: | In case of internet connection failure, Authenticated User cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 9 - <Use Case> Get the video*

##### 2.2.3.6 < Authenticated User > Get the products

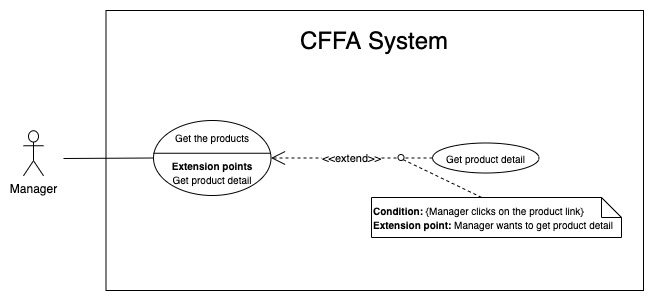


*Figure 22 - <Use Case> Get the products*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-18 Get the products** | | |
| Created By: | HieuNT | Date Created: | 08/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows authenticated user to get the products. | | |
| Trigger: | authenticated user sends a request to get the products. | | |
| Pre-conditions: | PRE-01. User has logged into the system as admin or manager role. | | |
| Post-conditions: | POST-01. CFFA system returns the list of products. | | |
| Normal Flow: | **18.0 Get the products**   1. Authenticated user sends a request to get the products. 2. CFFA system requires the product information:  * “Product name”: input text, blank * “Category”: combobox * “Status”: combobox  1. Authenticated user inputs/selects the fields: product name, category, status. 2. Authenticated user clicks on "Search" button. 3. CFFA system returns the list of products based on below conditions and display them (see 18.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **18.0.E1 The list of product has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-044, BR-045 | | |
| Other Information: | In case of internet connection failure, authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 21 - <Use Case> Get the products*

##### 2.2.3.7 < Authenticated User > Get product detail

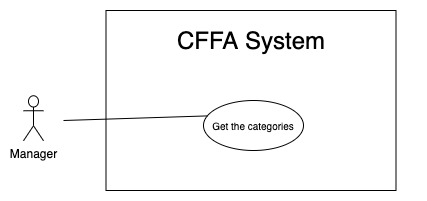


*Figure 23 - <Use Case> Get product detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-19 Get product detail** | | |
| Created By: | HieuNT | Date Created: | 10/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows the authenticated user to getproductdetail. | | |
| Trigger: | Authenticated user sends a request to get product detail. | | |
| Preconditions: | PRE-01. User has logged in the system as admin or manager role.  PRE-02. There is at least one the product link. | | |
| Post-conditions: | POST-01. CFFA system returns product information and redirect to product detail page. | | |
| Normal Flow: | **19.0 Get product detail**   1. Authenticated user clicks on the product link. 2. CFFA system validates the product exists (see 19.0.E1) 3. CFFA system returns the product information and redirects to product detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **19.0.E1 The stack does not exist.**  1. CFFA system returns the message (MSG-0023) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-046 | | |
| Other Information: | In case of internet connection failure, Authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table22 - <Use Case> Get product detail*

##### 2.2.3.8 < Authenticated User > Get the categories

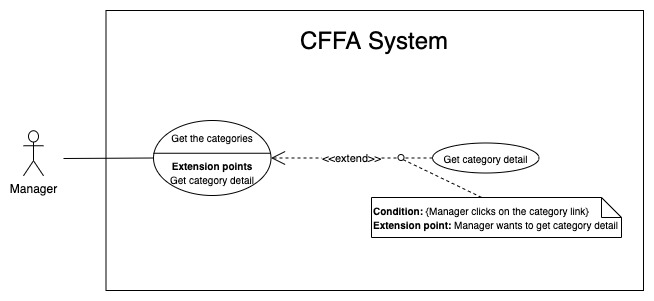


*Figure 32 - <Use Case> Get the categories*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-28 Get the categories** | | |
| Created By: | TruongTN | Date Created: | 08/05/2021 |
| Primary Actor: | Authenticated user | Secondary Actors: | N/A |
| Description: | This feature allows manager to get the categories. | | |
| Trigger: | Authenticated user sends a request to get the categories. | | |
| Pre-conditions: | PRE-01. User has logged into the system as admin or manager role. | | |
| Post-conditions: | POST-01. CFFA system returns the list of categories. | | |
| Normal Flow: | **28.0 Get the categories**   1. Authenticated user sends a request to get the categories. 2. CFFA system requires the camera information:  * “Category name”: input text, blank  1. Authenticated user inputs/selects the fields: category name 2. Authenticated user clicks on "Search" button. 3. CFFA system returns the list of products based on below conditions and display them (see 28.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **28.0.E1 The list of categories has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-061 | | |
| Other Information: | In case of internet connection failure, authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 31 - <Use Case> Get the categories*

##### 2.2.3.9 < Authenticated User > Get category detail

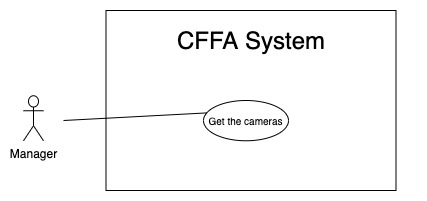


*Figure 33 - <Use Case> Get category detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-29 Get category detail** | | |
| Created By: | HuuDN | Date Created: | 10/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows the authenticated user to getcategorydetail. | | |
| Trigger: | Authenticated user sends a request to get categorydetail. | | |
| Preconditions: | PRE-01. User has logged in the system as admin or manager role.  PRE-02. There is at least one the categorylink. | | |
| Post-conditions: | POST-01. CFFA system returns categoryinformation and redirect to categorydetail page. | | |
| Normal Flow: | **29.0 Get product detail**   1. Authenticated user clicks on the categorylink. 2. CFFA system validates the categoryexists (see 24.0.E1) 3. CFFA system returns the categoryinformation and redirects to categorydetail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **29.0.E1 The category does not exist.**  1. CFFA system returns the message (MSG-0033) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-062 | | |
| Other Information: | In case of internet connection failure, authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 32 - <Use Case> Get camera detail*

##### 2.2.3.10 < Authenticated User > Get the cameras

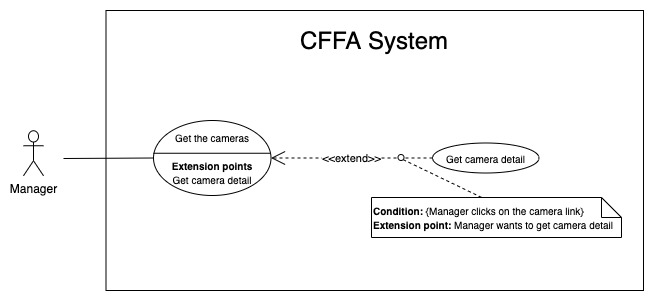


*Figure 27 - <Use Case> Get the cameras*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-23 Get the cameras** | | |
| Created By: | HuuDN | Date Created: | 08/05/2021 |
| Primary Actor: | Authenticated user | Secondary Actors: | N/A |
| Description: | This feature allows authenticated user to get the cameras. | | |
| Trigger: | Authenticated user sends a request to get the cameras. | | |
| Pre-conditions: | PRE-01. User has logged into the system as admin or manager role. | | |
| Post-conditions: | POST-01. CFFA system returns the list of cameras. | | |
| Normal Flow: | **23.0 Get the cameras**   1. Authenticated user sends a request to get the cameras. 2. CFFA system requires the camera information:  * “Camera name”: input text, blank * “Status”: combobox  1. Authenticated user inputs/selects the fields: product name, status. 2. Authenticated user clicks on "Search" button. 3. CFFA system returns the list of products based on below conditions and display them (see 23.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **23.0.E1 The list of cameras has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-052, BR-053, BR-079 | | |
| Other Information: | In case of internet connection failure, authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 26 - <Use Case> Get the products*

##### 2.2.3.11 < Authenticated User > Get camera detail

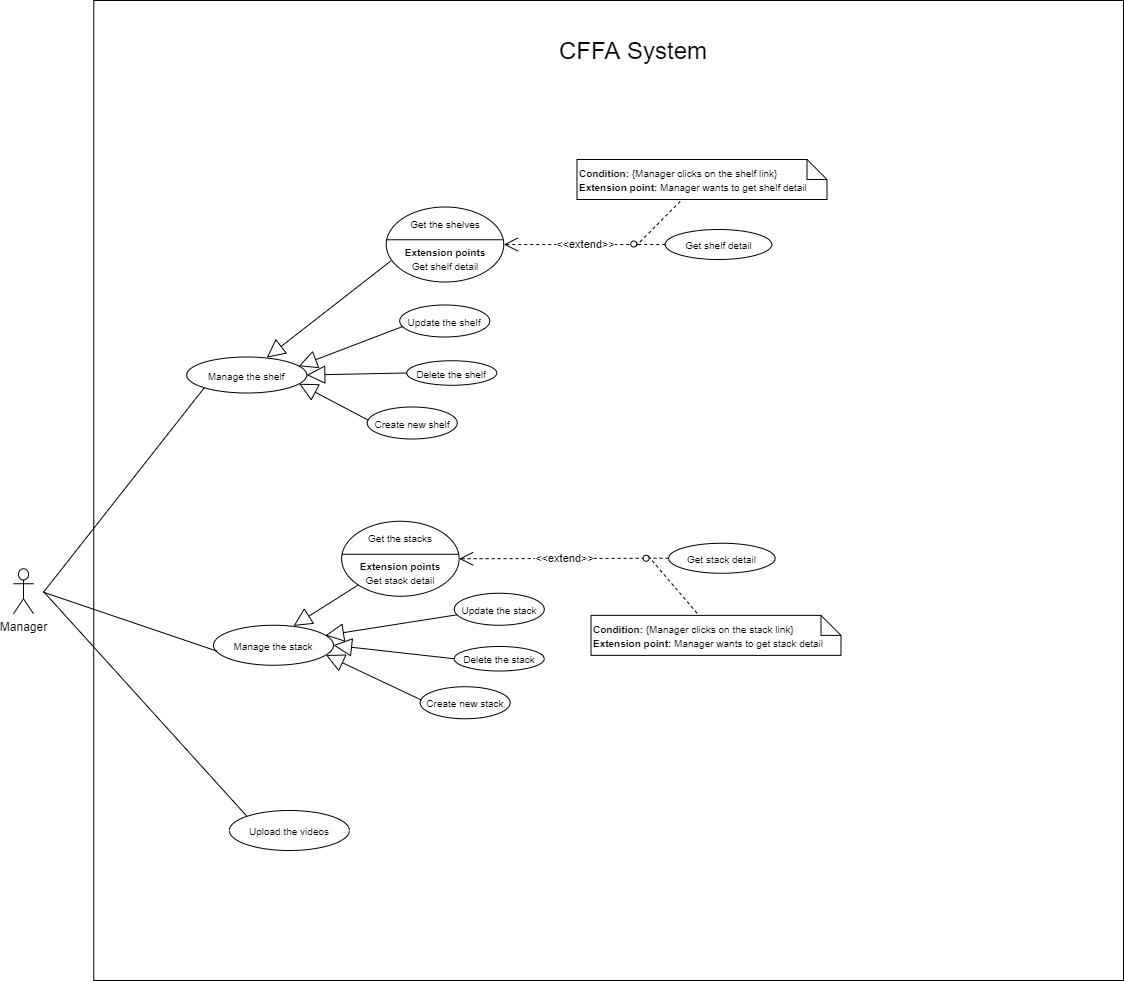


*Figure 28 - <Use Case> Get camera detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-24 Get camera detail** | | |
| Created By: | HuuDN | Date Created: | 10/05/2021 |
| Primary Actor: | Authenticated User | Secondary Actors: | N/A |
| Description: | This feature allows the authenticated user to getcameradetail. | | |
| Trigger: | Authenticated user sends a request to get camera detail. | | |
| Preconditions: | PRE-01. User has logged in the system as admin or manager role.  PRE-02. There is at least one the camera link. | | |
| Post-conditions: | POST-01. CFFA system returns camera information and redirect to camera detail page. | | |
| Normal Flow: | **24.0 Get product detail**   1. Authenticated user clicks on the camera link. 2. CFFA system validates the camera exists (see 24.0.E1) 3. CFFA system returns the camera information and redirects to camera detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **24.0.E1 The camera does not exist.**  1. CFFA system returns the message (MSG-0024) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-054, BR-079 | | |
| Other Information: | In case of internet connection failure, authenticated user cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

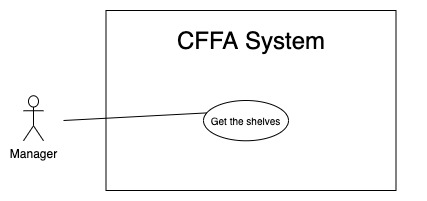
*Table 27 - <Use Case> Get camera detail*

#### 2.2.3 <Manager> Overview Use Case



*Figure 11 - <Overview Use Case> Manager*

##### 2.2.3.1 <Manager> Get the shelves

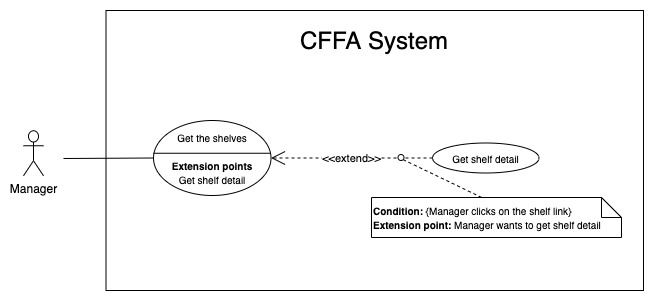


*Figure 12 - <Use Case> Get the shelves*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-08 Get the shelves** | | |
| Created By: | TruongTN | Date Created: | 08/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows manager to get the shelves. | | |
| Trigger: | Manager sends a request to get the shelves. | | |
| Pre-conditions: | PRE-01. User has logged into the system as manager role.  PRE-02. Manager is managing a store. | | |
| Post-conditions: | POST-01. CFFA system returns the list of shelves. | | |
| Normal Flow: | **8.0 Get the shelves**   1. Manager sends a request to get the shelves. 2. CFFA system requires the shelf information from Manager:  * “Name”: text input, blank * “Status”: combobox  1. Manager inputs/selects a form: name and status. 2. Manager clicks on "Search" button. 3. CFFA system returns the shelves based on below conditions and display them (see 8.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **8.0.E1 The list of shelves has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-026, BR-027 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 11 - <Use Case> Get the shelves*

##### 2.2.3.2 <Manager> Get shelf detail

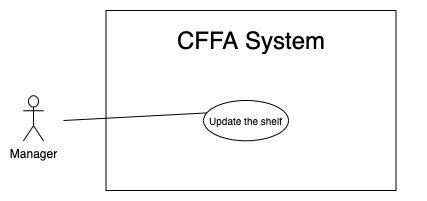


*Figure 13 - <Use Case> Get shelf detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-09 Get shelf detail** | | |
| Created By: | TruongTN | Date Created: | 10/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows the Manager to get shelf detail. | | |
| Trigger: | Manager sends a request to get shelf detail. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. There is at least one the shelf link. | | |
| Post-conditions: | POST-01. CFFA system returns shelf information and redirect to shelf detail page. | | |
| Normal Flow: | **9.0 Get shelf detail**   1. Manager clicks on the shelf link. 2. CFFA system validates the shelf exists (see 9.0.E1) 3. CFFA system returns the shelf information and redirects to shelf detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **9.0.E1 The shelf does not exist.**  1. CFFA system returns the message (MSG-0012) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-028 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 12 - <Use Case> Get shelf detail*

##### 2.2.3.3 <Manager> Update the shelf

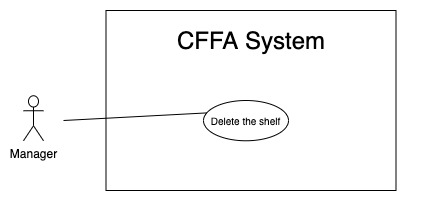


*Figure 14 - <Use Case> Update the shelf*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-10 Update the shelf** | | |
| Created By: | TruongTN | Date Created: | 18/01/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to update shelf information in CFFA system. | | |
| Trigger: | Manager sends a request to update the shelf. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Shelf detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates shelf information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **10.0 Update the shelf**   1. Manager sends a request to update the shelf. 2. CFFA system requires shelf information that includes:  * “Shelf name”: input text, blank. * “Description”: input text, blank. * “Maximum of stacks:” input text, blank. * “Status”: combobox. * “Camera”: popup.  1. Manager inputs/selects the required fields. 2. Manager clicks on “Save” button. 3. CFFA system validates the required fields (see 10.0.E1, 10.0.E2) 4. CFFA system updates shelf information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **10.0.E1 Manager does not enter the required fields**   1. CFFA system returns to Manager to fill the required fields again (MSG-014, MSG-016, MSG-018). 2. If Manager inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Manager cancels the login process, then CFFA system terminates this use case.   **10.0.E2 Manager enters the required fields that are not valid**   1. CFFA system returns to Authenticated User to fill the required fields again (MSG-015, MSG-017, MSG-018, MSG-020, MSG-034). 2. If Manager inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Manager cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-029, BR-030, BR-031, BR-032, BR-039, BR-076 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 13 - <Use Case> Update the shelf*

##### 2.2.3.4 <Manager> Delete the shelf

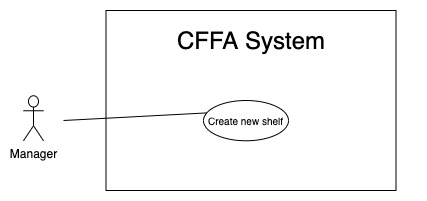


*Figure 15 - <Use Case> Delete the shelf*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-11 Delete the shelf** | | |
| Created By: | TruongTN | Date Created: | 18/01/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to delete the shelf. | | |
| Trigger: | Manager sends a request to delete the shelf. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Shelf detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates shelf information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **11.0 Delete the shelf**   1. Manager sends a request to delete the shelf. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Manager can select:  * "Yes" button * "No" button   1. Manager clicks on "Yes" button, CFFA system updates shelf information and returns the message (MSG-021) (see 11.0.E1).   2. Manager clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **11.0.E1 The shelf does not exist**   1. CFFA system returns a message (MSG-012). 2. CFFA system redirects to manage shelf page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-030, BR-032, BR-033 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 14 - <Use Case> Delete the shelf*

##### 2.2.3.5 <Manager> Create new shelf

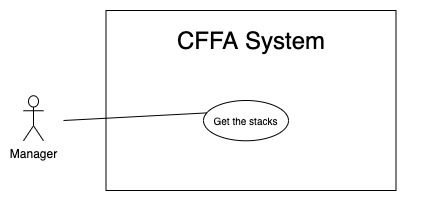


*Figure 16 - <Use Case> Create new shelf*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-12 Create new shelf** | | |
| Created By: | TruongTN | Date Created: | 10/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to create new shelf. | | |
| Trigger: | Manager sends a request to create new shelf. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Manage Shelf” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly shelf information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **12.0 Create new shelf**   1. Manager sends a request to create new shelf. 2. CFFA system requires shelf information that includes:  * “Shelf name”: input text, blank. * “Description”: input text, blank. * “Number of stacks:” input text, blank.  1. Manager inputs/selects the required fields. 2. Manager clicks on “Create” button. 3. CFFA system validates the required fields (see 12.0.E1, 12.0.E2). 4. CFFA system stores newly shelf information and returns the message (MSG-013). 5. CFFA system create new stack | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **12.0.E1 Manager does not enter the required fields**   1. CFFA system returns to Manager to fill the required fields again (MSG-014, MSG-016, MSG-018). 2. If Manager inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Manager cancels the login process, then CFFA system terminates this use case.   **12.0.E2 Manager enters the required fields that are not valid**   1. CFFA system returns to Authenticated User to fill the required fields again (MSG-015, MSG-017, MSG-018, MSG-020, MSG-034). 2. If Manager inputs the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Manager cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-031, BR-034, BR-035 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 15 - <Use Case> Create new shelf*

##### 2.2.3.6 <Manager> Get the stacks

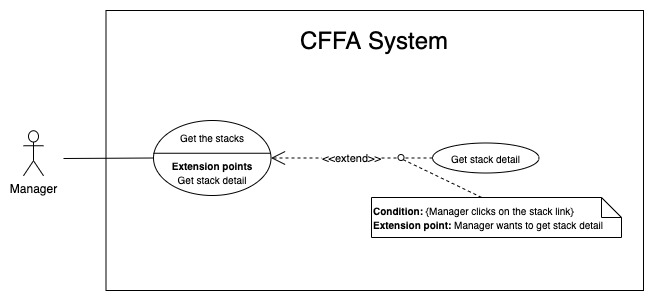


*Figure 17 - <Use Case> Get the stacks*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-13 Get the stacks** | | |
| Created By: | LuanNM | Date Created: | 08/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows manager to get the stacks. | | |
| Trigger: | Manager sends a request to get the stacks. | | |
| Pre-conditions: | PRE-01. User has logged into the system as manager role.  PRE-02. Manager is managing a store. | | |
| Post-conditions: | POST-01. CFFA system returns the list of stacks. | | |
| Normal Flow: | **13.0 Get the stacks**   1. Manager sends a request to get the stacks. 2. CFFA system requires the stack information from Manager:  * “Status”: combobox  1. Manager selects a status. 2. Manager clicks on "Search" button. 3. CFFA system returns the stacks based on below conditions and display them (see 13.0.E1). | | |
| Alternative Flows: | **13.1 Get the stacks on a shelf**   1. Manager clicks on the shelf link to redirect to shelf detail page. 2. CFFA system returns the stacks on the shelf based on below conditions and display them (see 13.0.E1). | | |
| Exceptions: | **13.0.E1 The list of stacks has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-036, BR-037 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 16 - <Use Case> Get the stacks*

##### 2.2.3.7 <Manager> Get stack detail

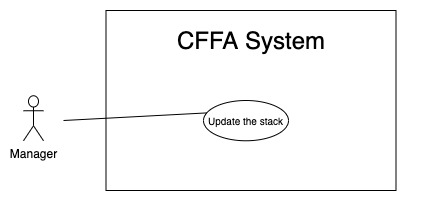


*Figure 18 - <Use Case> Get stack detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-14 Get stack detail** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows the Manager to getstackdetail. | | |
| Trigger: | Manager sends a request to get stack detail. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. There is at least one the stack link. | | |
| Post-conditions: | POST-01. CFFA system returns stack information and redirect to stack detail page. | | |
| Normal Flow: | **14.0 Get stack detail**   1. Manager clicks on the stack link. 2. CFFA system validates the stack exists (see 14.0.E1) 3. CFFA system returns the stack information and redirects to stack detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **14.0.E1 The stack does not exist.**  1. CFFA system returns the message (MSG-022) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-038 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 17 - <Use Case> Get stack detail*

##### 2.2.3.8 <Manager> Update the stack

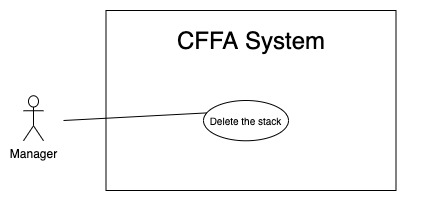


*Figure 19 - <Use Case> Update the stack*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-15 Update the stack** | | |
| Created By: | LuanNM | Date Created: | 18/01/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to update stack information in CFFA system. | | |
| Trigger: | Manager sends a request to update the stack. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Stack detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates stack information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **15.0 Update the stack**   1. Manager sends a request to update the stack. 2. CFFA system requires stack information that includes:  * “Product”: popup. * “Camera”: popup. * “Status”: combobox.  1. Manager selects the fields. 2. Manager clicks on “Save” button. 3. CFFA system validates the fields (see 15.0.E1) 4. CFFA system updates stack information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **15.0.E1 Manager inputs/selects the fields that are not valid**   1. CFFA system returns to Manager to input/select the fields again (MSG-023, MSG-024). 2. If Manager selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Manager cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-039, BR-040, BR-041, BR-042, BR-078 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 18 - <Use Case> Update the stack*

##### 2.2.3.9 <Manager> Delete the stack

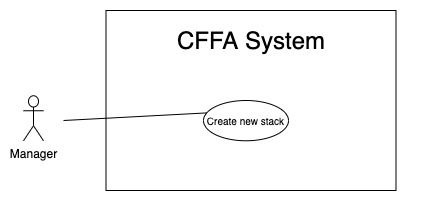


*Figure 20 - <Use Case> Delete the shelf*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-16 Delete the stack** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to delete the stack. | | |
| Trigger: | Manager sends a request to delete the stack. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Stack detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates stack information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **16.0 Delete the stack**   1. Manager sends a request to delete the stack. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Manager can select:  * "Yes" button * "No" button   1. Manager clicks on "Yes" button, CFFA system updates stack information and returns the message (MSG-021) (see 11.0.E1).   2. Manager clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **16.0.E1 The stack does not exist**   1. CFFA system returns a message (MSG-022). 2. CFFA system redirects to manage stack page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-033, BR-041 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 19 - <Use Case> Delete the stack*

##### 2.2.3.10 <Manager> Create new stack

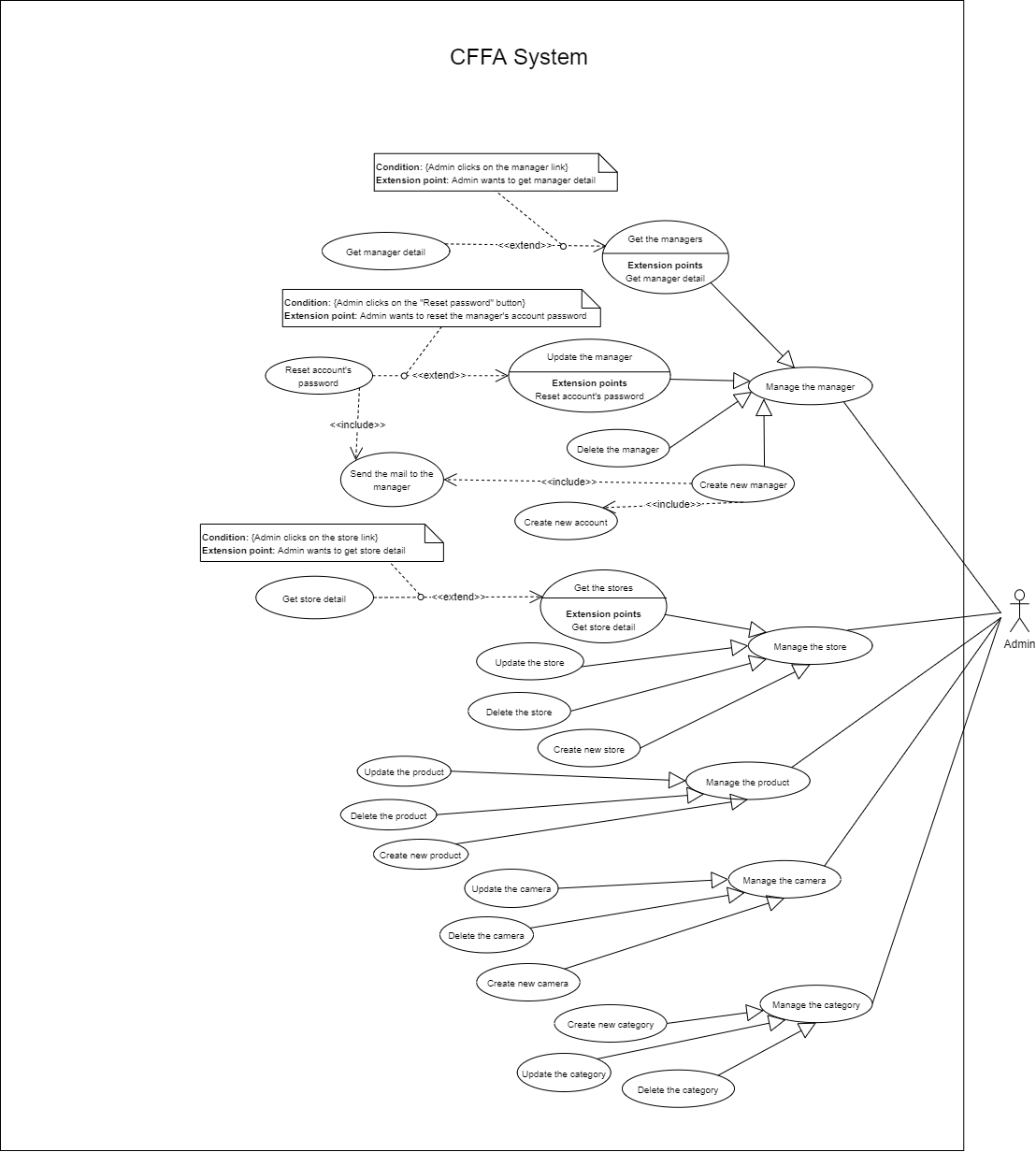


*Figure 21 - <Use Case> Create new stack*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-17 Create new stack** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Manager | Secondary Actors: | N/A |
| Description: | This feature allows Manager to create new stack. | | |
| Trigger: | Manager sends a request to create new stack. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Manager is on “Shelf detail” page.  PRE-03. This shelf has total of stacks less than maximum of stacks. | | |
| Post-conditions: | POST-01. CFFA system stores newly created stack information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **17.0 Create new stack**   1. Manager sends a request to create new stack. 2. CFFA system stores newly created stack information and returns the message (MSG-013) (see 17.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **17.0.E1 The shelf is full**   1. CFFA system returns a message (MSG-025) and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-035, BR-043, BR-50, BR-077 | | |
| Other Information: | In case of internet connection failure, Manager cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

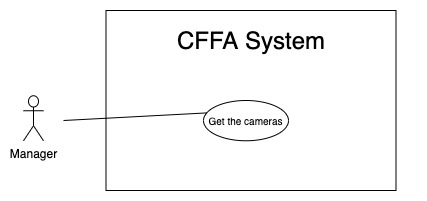
*Table 20 - <Use Case> Create new stack*

#### 2.2.4 <Admin> Overview Use Case



*Figure 36 - <Use Case> Get the cameras*

##### 2.2.4.1 <Admin> Get the stores



*Figure 37 - <Use Case> Get the stores*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-32 Get the stores** | | |
| Created By: | LuanNM | Date Created: | 08/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows admin to get the stores. | | |
| Trigger: | Admin sends a request to get the stores. | | |
| Pre-conditions: | PRE-01. User has logged into the system as admin role. | | |
| Post-conditions: | POST-01. CFFA system returns the list of stores. | | |
| Normal Flow: | **32.0 Get the stores**   1. Admin sends a request to get the stores. 2. CFFA system requires the store information from Admin:  * “Store name”: input text, blank * “City”: combobox * “District”: combobox * “Status”: combobox  1. Admin inputs/selects the fields: Store name, city, district, and status. 2. Admin clicks on "Search" button. 3. CFFA system returns the list of stores based on below conditions and display them (see 32.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **32.0.E1 The list of stores has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-064, BR-065 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 35 - <Use Case> Get the stores*

##### 2.2.4.2 <Admin> Get store detail

*Figure 38 - <Use Case> Get store detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-33 Get store detail** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows the admin to getstoredetail. | | |
| Trigger: | Admin sends a request to get store detail. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. There is at least one the store link. | | |
| Post-conditions: | POST-01. CFFA system returns stores information and redirect to store detail page. | | |
| Normal Flow: | **33.0 Get store detail**   1. Admin clicks on the admin link. 2. CFFA system validates the store exists (see 33.0.E1) 3. CFFA system returns the stores information and redirects to store detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **33.0.E1 The stores does not exist.**  1. CFFA system returns the message (MSG-035) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-066 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 36 - <Use Case> Get camera detail*

##### 2.2.4.3 <Admin> Update the store

*Figure 39 - <Use Case> Update the store*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-34 Update the store** | | |
| Created By: | LuanNM | Date Created: | 18/01/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to update store information in CFFA system. | | |
| Trigger: | Admin sends a request to update the store. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Store detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates store information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **34.0 Update the store**   1. Admin sends a request to update the store. 2. CFFA system requires store information that includes:  * “Store Name”: input text * “Image”: button * “Address”: input text * “City”: combobox * “District”: combobox * “Manager”: combobox * “Status”: combobox.  1. Admin inputs/selects the required fields. 2. Admin clicks on “Save” button. 3. CFFA system validates the fields (see 34.0.E1, 34.0.E2) 4. CFFA system updates store information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **34.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-026, MSG-036, MSG-038, MSG-039). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **34.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Manager to input/select the fields again (MSG-015, MSG-027, MSG-037, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-067, BR-68, BR-69 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 37 - <Use Case> Update the store*

##### 2.2.4.4 <Admin> Delete the store

*Figure 40 - <Use Case> Delete the store*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-35 Delete the store** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to delete the store. | | |
| Trigger: | Admin sends a request to delete the store. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Store detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates store information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **35.0 Delete the store**   1. Admin sends a request to delete the camera. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Admin can select:  * "Yes" button * "No" button   1. Admin clicks on "Yes" button, CFFA system updates store information and returns the message (MSG-021) (see 35.0.E1).   2. Admin clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **35.E1 The store does not exist**   1. CFFA system returns a message (MSG-035). 2. CFFA system redirects to manage store page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-033, BR-069 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 38 - <Use Case> Delete the store*

##### 2.2.4.5 <Admin> Create new store

*Figure 41 - <Use Case> Create new store*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-36 Create new store** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to create new store. | | |
| Trigger: | Admin sends a request to create new store. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Manage store” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly created store information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **36.0 Create new store**   1. Admin sends a request to create new store. 2. CFFA system requires the store information:    * "Store name": input text, blank    * "Image": button    * "Address": input text    * "City": combobox    * "District": combobox 3. Admin inputs/selects the required fields. 4. Admin clicks on the "Create" button to create new store. 5. CFFA system validates the required fields (see 36.0.E1, 36.0.E2). 6. CFFA system stores newly created camera information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **36.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-026, MSG-036, MSG-038, MSG-39). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **36.0.E1 Admin** **inputs/selects the fields that are not valid**   1. CFFA system returns to Admin to input/select the fields again (MSG-015, MSG-027, MSG-034, MSG-037). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-035, BR-067, BR-070 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 39 - <Use Case> Create new store*

##### 2.2.4.6 <Admin> Get the managers

*Figure 37 - <Use Case> Get the stores*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-37 Get the managers** | | |
| Created By: | HieuNT | Date Created: | 08/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows admin to get the managers. | | |
| Trigger: | Admin sends a request to get the managers. | | |
| Pre-conditions: | PRE-01. User has logged into the system as admin role. | | |
| Post-conditions: | POST-01. CFFA system returns the list of stores. | | |
| Normal Flow: | **37.0 Get the managers**   1. Admin sends a request to get the managers. 2. CFFA system requires the manager information from Admin:  * “Employee code”: input text, blank * “Manager name”: input text, blank * “Username”: input text, blank * “Status”: combobox  1. Admin inputs/selects the fields: Manager name, and status. 2. Admin clicks on "Search" button. 3. CFFA system returns the list of stores based on below conditions and display them (see 37.0.E1). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **37.0.E1 The list of managers has no data.**   1. CFFA system returns the message (MSG-009). | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-024, BR-071, BR-072 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 40 - <Use Case> Get the managers*

##### 2.2.4.7 <Admin> Get manager detail

*Figure 43 - <Use Case> Get store detail*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-38 Get manager detail** | | |
| Created By: | HieuNT | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows the admin to getmanagerdetail. | | |
| Trigger: | Admin sends a request to get manager detail. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. There is at least one the manager link. | | |
| Post-conditions: | POST-01. CFFA system returns manager information and redirect to manager detail page. | | |
| Normal Flow: | **38.0 Get manager detail**   1. Admin clicks on the manager link. 2. CFFA system validates the manager exists (see 38.0.E1) 3. CFFA system returns the manager information and redirects to manager detail page. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **38.0.E1 The manager does not exist.**  1. CFFA system returns the message (MSG-041) and terminates this use case. | | |
| Priority: | High | | |
| Frequency of Use: | Usually | | |
| Business Rules: | BR-073 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 42 - <Use Case> Get manager detail*

##### 2.2.4.8 <Admin> Update the manager

*Figure 44 - <Use Case> Update the manager*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-39 Update the manager** | | |
| Created By: | HieuNT | Date Created: | 18/01/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to update manager information in CFFA system. | | |
| Trigger: | Admin sends a request to update the manager. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Manager detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates manager information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **39.0 Update the manager**   1. Admin sends a request to update the store. 2. CFFA system requires store information that includes:  * “Employee code”: input text * “Manager name”: input text * “Store”: combobox * “Identify card”: input text * “Phone”: input text * “Gender”: checkbox * “BirthDate”: combobox * “Email”: input text * “Image”: button * “Address”: input text * “City”: combobox * “District”: combobox * “Status”: combobox.  1. Admin inputs/selects the required fields. 2. Admin clicks on “Save” button. 3. CFFA system validates the fields (see 39.0.E1, 39.0.E2) 4. CFFA system updates manager information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **39.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-042, MSG-044). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **39.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Manager to input/select the fields again (MSG-015, MSG-043, MSG-045). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-074, BR-075, BR-025 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 37 - <Use Case> Update the store*

##### 2.2.4.9 <Admin> Delete the manager

*Figure 45 - <Use Case> Delete the manager*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-40 Delete the manager** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to delete the manager. | | |
| Trigger: | Admin sends a request to delete the manager. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Manager detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates manager information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **40.0 Delete the manager**   1. Admin sends a request to delete the manager. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Admin can select:  * "Yes" button * "No" button   1. Admin clicks on "Yes" button, CFFA system updates manager information and returns the message (MSG-021) (see 40.0.E1).   2. Admin clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **40.E1 The manager does not exist**   1. CFFA system returns a message (MSG-041). 2. CFFA system redirects to manage store page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-033, BR-025 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 38 - <Use Case> Delete the store*

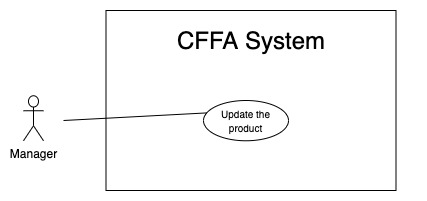
##### 2.2.4.10 <Admin> Create new manager

*Figure 46 - <Use Case> Create new manager*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-41 Create new manager** | | |
| Created By: | LuanNM | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to create new manager. | | |
| Trigger: | Admin sends a request to create new manager. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Manage manager” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly created store information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **41.0 Create new manager**   1. Admin sends a request to create new store. 2. CFFA system requires the manager information:    * "Manager name": input text, blank    * "Employee code": input text, blank    * "Identify card": input text, blank    * "Email": input text, blank    * "Phone": input text, blank    * "BirthDate": datepicker    * "Gender": checkbox    * "Image": button    * "Address": input text    * "City": combobox    * "District": combobox 3. Admin inputs/selects the required fields. 4. Admin clicks on the "Create" button to create new store. 5. CFFA system validates the required fields (see 41.0.E1, 41.0.E2). 6. CFFA system stores newly created camera information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **41.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-042, MSG-044). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **41.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Manager to input/select the fields again (MSG-015, MSG-043, MSG-045). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-035, BR-074, BR-070, BR-003 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 47 - <Use Case> Create new manager*

##### 2.2.3.11 <Admin> Update the product

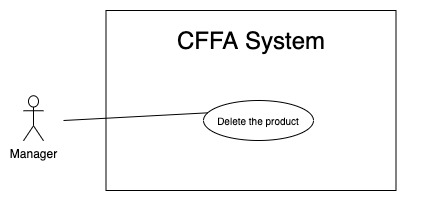


*Figure 24 - <Use Case> Update the product*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-20 Update the product** | | |
| Created By: | HieuNT | Date Created: | 18/01/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows admin to update product information in CFFA system. | | |
| Trigger: | Admin sends a request to update the product. | | |
| Preconditions: | PRE-01. User has logged in the system as admin role.  PRE-02. Admin is on “Product detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates product information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **20.0 Update the product**   1. Admin sends a request to update the product. 2. CFFA system requires product information that includes:  * “Product Name”: input text * “Image”: button * “Category”: combobox * “Description”: input text * “Status”: combobox.  1. Admin inputs/selects the required fields. 2. Admin clicks on “Save” button. 3. CFFA system validates the fields (see 20.0.E1, 20.0.E2) 4. CFFA system updates product information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **20.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Manager to input/select the required fields again (MSG-014, MSG-016, MSG-026, MSG-028). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **20.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Admin to input/select the fields again (MSG-015, MSG-017, MSG-027, MSG-029, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-047, BR-048, BR-049 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 13 - <Use Case> Update the product*

##### 2.2.3.12 <Admin> Delete the product

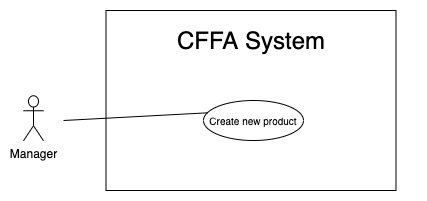


*Figure 24 - <Use Case> Delete the product*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-21 Delete the product** | | |
| Created By: | HieuNT | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to delete the product. | | |
| Trigger: | Admin sends a request to delete the product. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Admin is on “Product detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates product information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **21.0 Delete the product**   1. Admin sends a request to delete the product. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Manager can select:  * "Yes" button * "No" button   1. Admin clicks on "Yes" button, CFFA system updates product information and returns the message (MSG-021) (see 21.0.E1).   2. Admin clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **21.E1 The product does not exist**   1. CFFA system returns a message (MSG-023). 2. CFFA system redirects to manage product page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-033, BR-049 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 24 - <Use Case> Delete the product*

##### 2.2.3.13 <Admin> Create new product

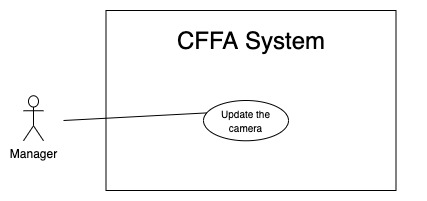


*Figure 26 - <Use Case> Create new product*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-22 Create new product** | | |
| Created By: | HieuNT | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to create new product. | | |
| Trigger: | Admin sends a request to create new product. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Admin is on “Manage product” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly created product information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **22.0 Create new product**   1. Admin sends a request to create new product. 2. CFFA system requires the product information:    * "Product name": input text, blank    * "Description": input text, blank    * "Category": combobox    * "Image": button 3. Admin inputs/selects the required fields. 4. Admin clicks on the "Create" button to create new product. 5. CFFA system validates the required fields (see 22.0.E1, 22.0.E2) 6. CFFA system stores newly created product information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **22.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-016, MSG-026, MSG-028). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **22.0.E1 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Manager to input/select the fields again (MSG-015, MSG-017, MSG-027, MSG-029, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-035, BR-051 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 25 - <Use Case> Create new product*

##### 2.2.3.14 <Admin> Update the camera

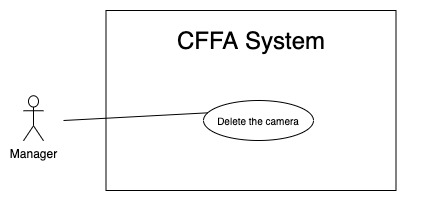


*Figure 29 - <Use Case> Update the camera*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-25 Update the camera** | | |
| Created By: | HuuDN | Date Created: | 18/01/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to update camera information in CFFA system. | | |
| Trigger: | Admin sends a request to update the camera. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Manager is on “Camera detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates camera information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **25.0 Update the camera**   1. Admin sends a request to update the camera. 2. CFFA system requires camera information that includes:  * “Camera Name”: input text * “Image”: button * “IP address”: input text * “RTSP string”: input text * “Status”: combobox.  1. Admin inputs/selects the required fields. 2. Admin clicks on “Save” button. 3. CFFA system validates the fields (see 25.0.E1, 25.0.E2) 4. CFFA system updates camera information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **25.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-026, MSG-028, MSG-031). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **25.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Admin to input/select the fields again (MSG-015, MSG-027, MSG-029, MSG-032, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-055, BR-056, BR-57, BR-60, BR-078 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 28 - <Use Case> Update the product*

##### 2.2.3.15 <Admin> Delete the camera

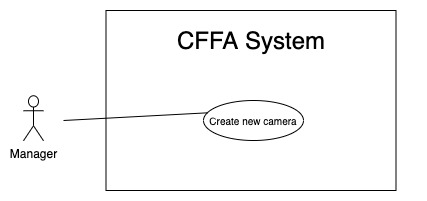


*Figure 29 - <Use Case> Delete the camera*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-26 Delete the camera** | | |
| Created By: | HuuDN | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to delete the camera. | | |
| Trigger: | Admin sends a request to delete the camera. | | |
| Preconditions: | PRE-01. User has logged in the system as manager role.  PRE-02. Admin is on “Camera detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates camera information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **26.0 Delete the camera**   1. Admin sends a request to delete the camera. 2. CFFA system shows delete popup with message: "Are you sure?" and two buttons for Admin can select:  * "Yes" button * "No" button   1. Admin clicks on "Yes" button, CFFA system updates camera information and returns the message (MSG-021) (see 26.0.E1).   2. Admin clicks on "No" button, close popup and nothing change. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **26.E1 The camera does not exist**   1. CFFA system returns a message (MSG-024). 2. CFFA system redirects to manage camera page and terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-032, BR-033, BR-058 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 24 - <Use Case> Delete the product*

##### 2.2.3.16 <Admin> Create new camera

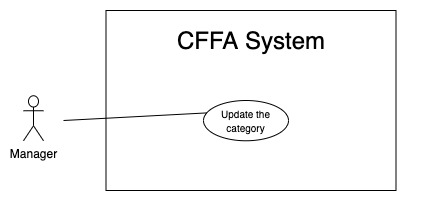


*Figure 30 - <Use Case> Create new camera*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-27 Create new product** | | |
| Created By: | HuuDN | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to create new camera. | | |
| Trigger: | Admin sends a request to create new camera. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Admin is on “Manage camera” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly created camera information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **27.0 Create new camera**   1. Admin sends a request to create new camera. 2. CFFA system requires the camera information:    * "Camera name": input text, blank    * "Image": button    * "Ip address": input text, blank    * "RPST string": input text, blank 3. Admin inputs/selects the required fields. 4. Admin clicks on the "Create" button to create new camera. 5. CFFA system validates the required fields (see 27.0.E1, 27.0.E2). 6. CFFA system stores newly created camera information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **27.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014, MSG-026, MSG-028, MSG-031). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **27.0.E1 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Admin to input/select the fields again (MSG-015, MSG-027, MSG-029, MSG-032, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-035, BR-055, BR-059, BR-060 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 30 - <Use Case> Create new camera*

##### 2.2.3.17 <Admin> Update the category

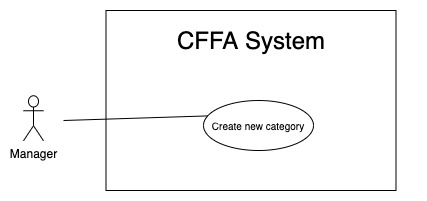


*Figure 33 - <Use Case> Update the category*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-30 Update the category** | | |
| Created By: | HuuDN | Date Created: | 18/01/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to update category information in CFFA system. | | |
| Trigger: | Admin sends a request to update the category. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Admin is on “Category detail” page. | | |
| Post-conditions: | POST-01. CFFA system updates category information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **30.0 Update the category**   1. Admin sends a request to update the camera. 2. CFFA system requires category information that includes:  * “Category Name”: input text  1. Admin inputs/selects the required fields. 2. Admin clicks on “Save” button. 3. CFFA system validates the fields (see 30.0.E1, 30.0.E2) 4. CFFA system updates camera information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **30.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input/select the required fields again (MSG-014). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **30.0.E2 Admin inputs/selects the fields that are not valid**   1. CFFA system returns to Admin to input/select the fields again (MSG-015, MSG-034). 2. If Admin inputs/selects the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-063 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

*Table 33 - <Use Case> Update the product*

##### 2.2.3.18 <Admin> Create new category

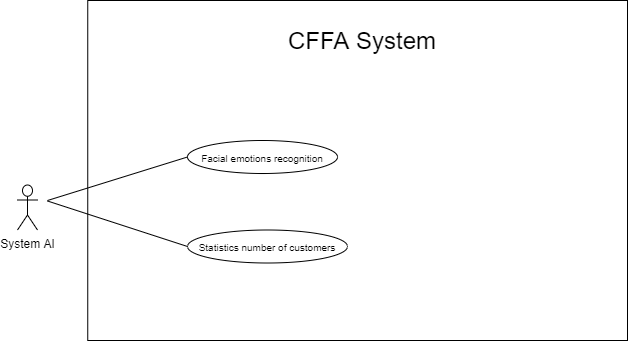


*Figure 35 - <Use Case> Create new category*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-31 Create new category** | | |
| Created By: | TruongTN | Date Created: | 10/05/2021 |
| Primary Actor: | Admin | Secondary Actors: | N/A |
| Description: | This feature allows Admin to create new category. | | |
| Trigger: | Admin sends a request to create new category. | | |
| Preconditions: | PRE-01. User has logged in the system as Admin role.  PRE-02. Admin is on “Manage category” page. | | |
| Post-conditions: | POST-01. CFFA system stores newly created category information.  POST-02. CFFA system returns the message. | | |
| Normal Flow: | **31.0 Create new camera**   1. Admin sends a request to create new category. 2. CFFA system requires the category information:    * "Category name": input text, blank 3. Admin inputs the required fields. 4. Admin clicks on the "Create" button to create new category. 5. CFFA system validates the required fields (see 31.0.E1, 31.0.E2). 6. CFFA system stores newly created category information and returns the message (MSG-013). | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **31.0.E1 Admin does not input/select the required fields**   1. CFFA system returns to Admin to input the required fields again (MSG-014). 2. If Admin inputs/selects the required fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case.   **31.0.E1 Admin inputs the fields that are not valid**   1. CFFA system returns to Admin to input the fields again (MSG-015, MSG-034). 2. If Admin inputs the fields again, CFFA system returns to step 3 of normal flow. 3. Else if Admin cancels the login process, then CFFA system terminates this use case. | | |
| Priority: | Medium | | |
| Frequency of Use: | Often | | |
| Business Rules: | BR-063 | | |
| Other Information: | In case of internet connection failure, Admin cannot finish this use case properly. | | |
| Assumptions: | N/A | | |

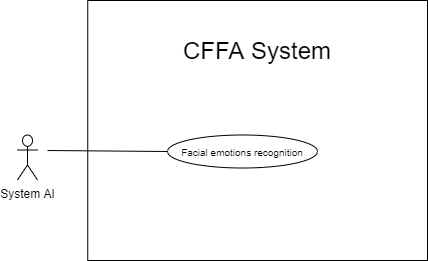
*Table 31 - <Use Case> Create new category*

#### 2.2.5 <System AI> Overview Use Case



*Figure 2 - <Overview Use Case> System AI*

##### 2.2.5.1 <System AI> Facial emotions recognition

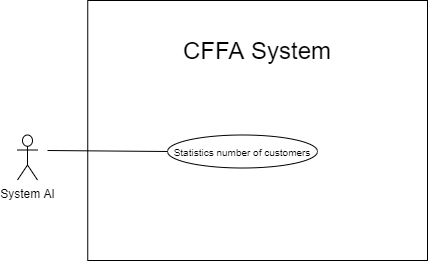


*Figure 3 - <Use Case> Facial emotions recognition*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-01 Facial emotions recognition** | | |
| Created By: | HieuHD | Date Created: | 25/01/2021 |
| Primary Actor: | System AI | Secondary Actors: | N/A |
| Description: | This feature allows the System AI to facial emotions recognition. | | |
| Trigger: | When system is received an request analyse video. | | |
| Pre-conditions: | N/A | | |
| Post-conditions: | POST-01. System will store result of facial emotions recognition to database.  POST-02. System will save the detected video to storage. | | |
| Normal Flow: | **1.0 Facial emotions recognition**   1. System AI analyse the video. 2. System AI store result to database. 3. System AI save the detected video to storage. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **1.0.E1 File not found exception:**   1. System AI returns to error message | | |
| Priority: | High | | |
| Frequency of Use: | Always | | |
| Business Rules: | N/A | | |
| Other Information: | In case of internet connection failure, System AI cannot finish this use case. | | |
| Assumptions: | N/A | | |

*Table 4 - <Use Case> Facial emotions recognition*

##### 2.2.5.2 <System AI> Statistics number of customers



*Figure 3 - <Use Case> Statistics number of customers*

|  |  |  |  |
| --- | --- | --- | --- |
| ID and Name: | **UC-01 Statistics number of customers** | | |
| Created By: | HieuHD | Date Created: | 25/01/2021 |
| Primary Actor: | System AI | Secondary Actors: | N/A |
| Description: | This feature allows the System AI to statistics number of customers. | | |
| Trigger: | When system is received an request analyse video. | | |
| Pre-conditions: | N/A | | |
| Post-conditions: | POST-01. System will store result statistics number of customers to database.  POST-02. System will save the detected video to storage. | | |
| Normal Flow: | **1.0 Statistics number of customers**   1. System AI analyse the video. 2. System AI store result to database. 3. System AI save the detected video to storage. | | |
| Alternative Flows: | N/A | | |
| Exceptions: | **1.0.E1 File not found exception:**   1. System AI returns to error message | | |
| Priority: | High | | |
| Frequency of Use: | Always | | |
| Business Rules: | N/A | | |
| Other Information: | In case of internet connection failure, System AI cannot finish this use case. | | |
| Assumptions: | N/A | | |

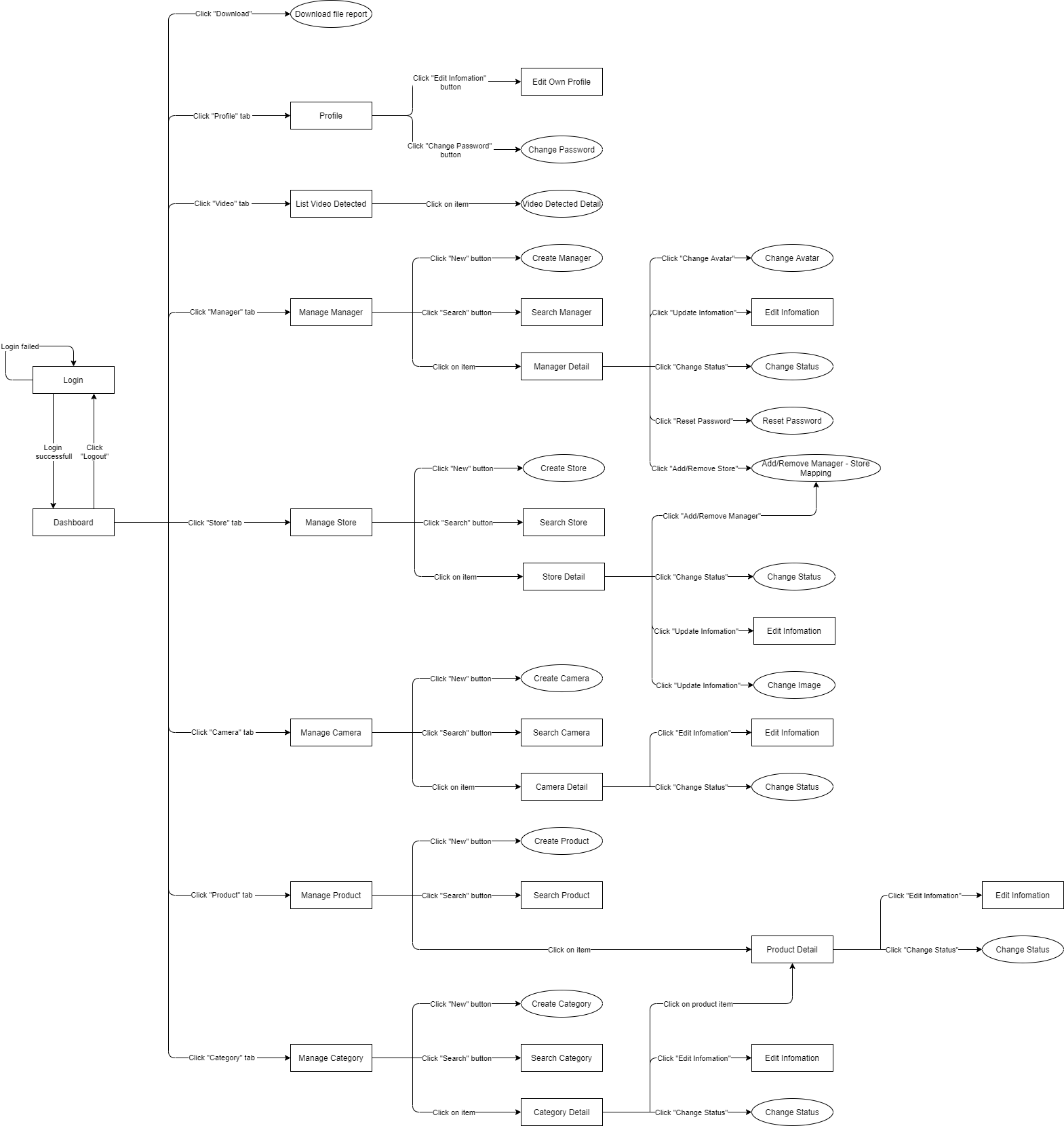
*Table 4 - <Use Case> Statistics number of customers*

## 3. Functional Requirements

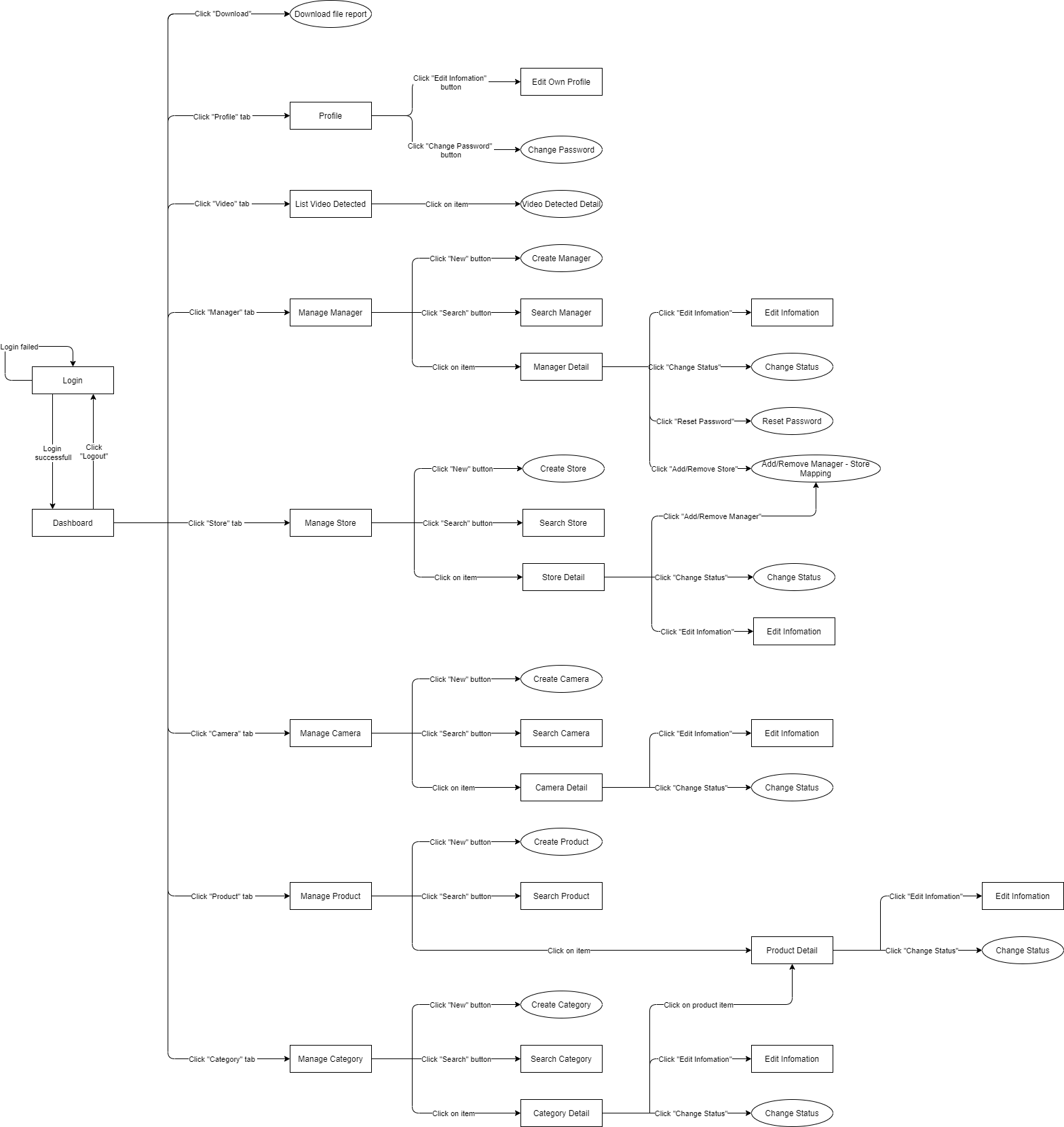
### 3.1 System Functional Overview

#### a. Screen Flow

* **Admin**

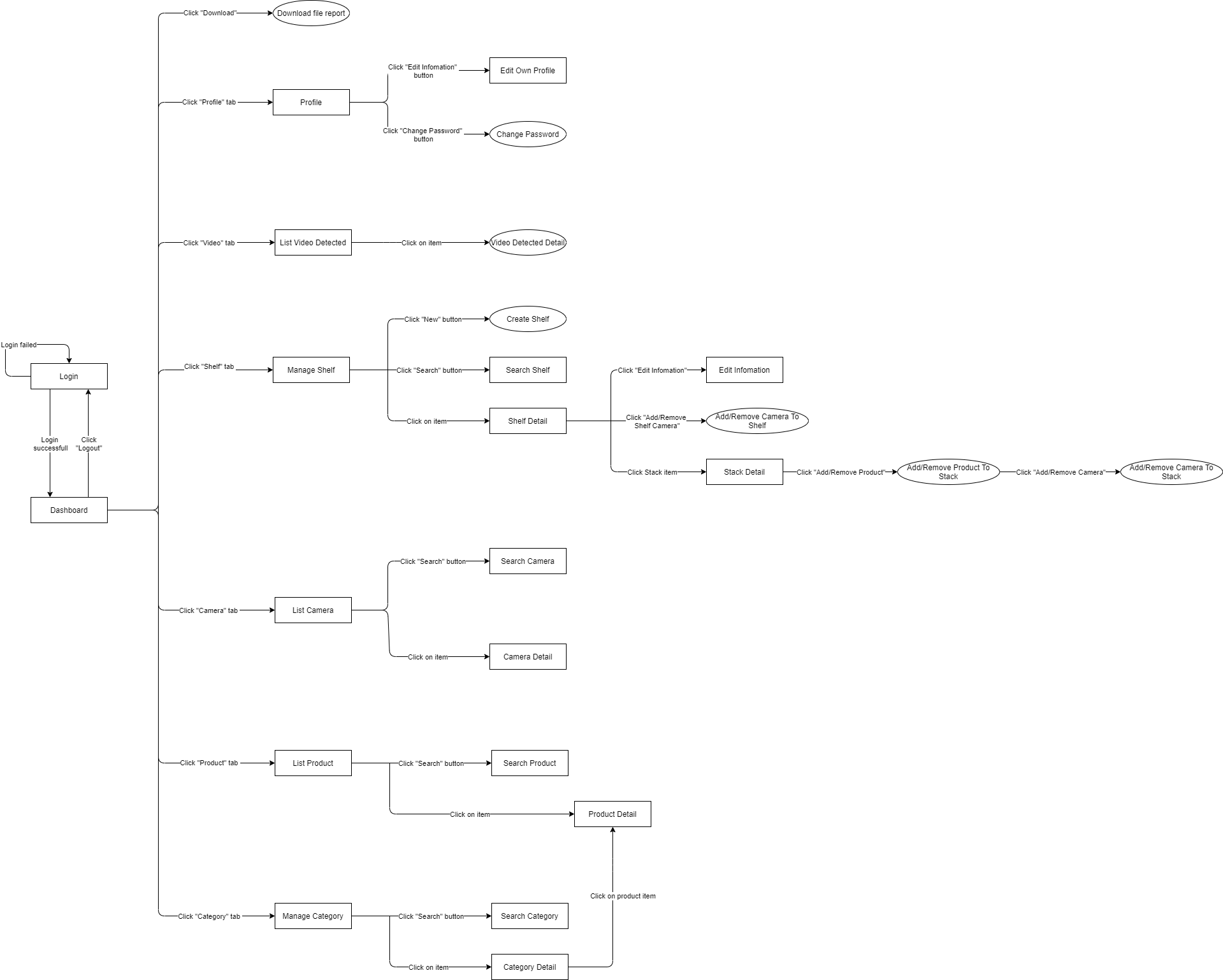


[Figure 53. Admin Mobile App screen flow](https://drive.google.com/file/d/1lhJlD_IVppbJX3ACV0seNcU3DDNysGU6/view?usp=sharing)

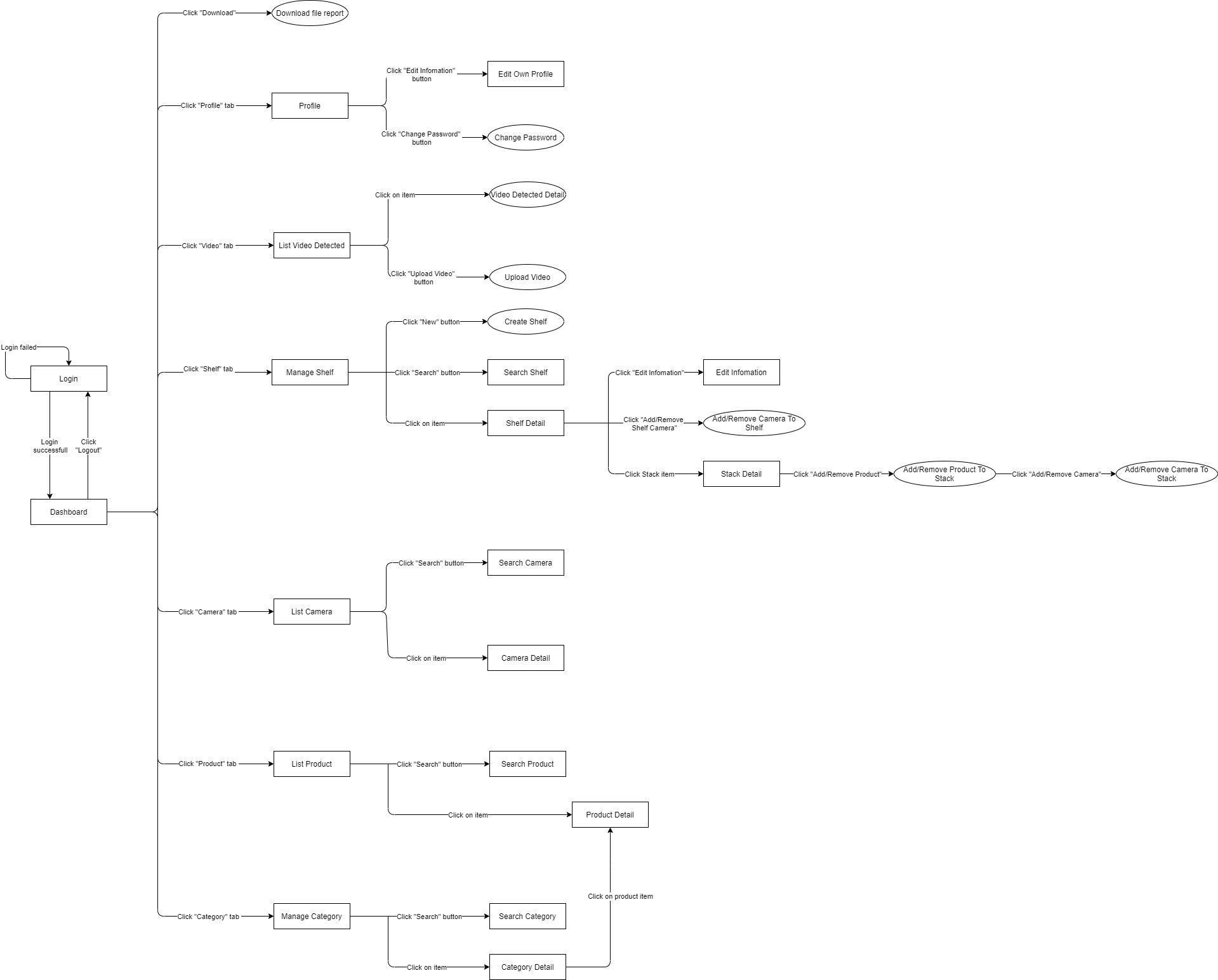


[Figure 53. Admin Web App screen flow](https://drive.google.com/file/d/1lhJlD_IVppbJX3ACV0seNcU3DDNysGU6/view?usp=sharing)

* **Manager**



[Figure 53. Manager Mobile App screen flow](https://drive.google.com/file/d/1lhJlD_IVppbJX3ACV0seNcU3DDNysGU6/view?usp=sharing)



[Figure 53. Manager Web App screen flow](https://drive.google.com/file/d/1lhJlD_IVppbJX3ACV0seNcU3DDNysGU6/view?usp=sharing)

#### b. Screen Detail

* **Admin – mobile**

Table 64. Staff Web App screen detail

|  |  |  |  |
| --- | --- | --- | --- |
| **Id** | **Feature** | **Screen** | **Description** |
| 01 | Login | Login | Allow user to login with a role |
| 02 | Display general information report | Dashboard | Allow user to view general information report |
| 03 | Download file report | Download file report | Allow user download file report PDF format |
| 04 | Get user’s profile | Profile | Show user’s profile information |
| 05 | Edit user’s profile | Edit Profile | Allow user edit profile |
| 06 | Change password | Change Password | Allow user change password |
| 07 | Get list video detected | List Video Detected | Show list of video detected |
| 08 | Get video information | Video Detail | Show video information |
| 09 | Manage mangers | Manage Managers | Show list of manager in system |
| 10 | Create new manager | Create Manager | Allow user create a new manager |
| 11 | Search a manager | Search Manager | Allow user search a manager |
| 12 | Get manager information | Manager Detail | Show manager information |
| 13 | Change manager’s picture | Change Profile Picture | Allow user change manager’s picture |
| 14 | Edit manager information | Edit Manager Information | Allow user update manager information |
| 15 | Change manager status | Change Manager Status | Allow user change manager status |
| 16 | Reset manager’s password | Reset Password | Allow user reset manager’s password |
| 17 | Add manager to a store, or remove manager from a store | Add/Remove Manager – Store Mapping | Allow user add manager to a store, or remove manager from a store |
| 18 | Manage stores | Manage Stores | Show list of stores |
| 19 | Create new store | Create Store | Allow user create new store |
| 20 | Search a store | Search Store | Allow user search a store |
| 21 | Get store information | Store Detail | Show store information |
| 22 | Change store status | Change Store Status | Allow user change store status |
| 23 | Edit store information | Edit Store Information | Allow user edit store information |
| 24 | Change store image | Change Store Image | Allow user change store image |
| 25 | Manage cameras | Manage Cameras | Show list of cameras |
| 26 | Create new camera | Create Camera | Allow user create new camera |
| 27 | Search a camera | Search Camera | Allow user search a camera |
| 28 | Get camera information | Camera Detail | Show camera information |
| 29 | Edit camera information | Edit Camera Information | Allow user edit camera information |
| 30 | Change camera’s status | Change Camera Status | Allow user change camera status |
| 31 | Manage products | Manage Products | Show list of products in system |
| 32 | Create new product | Create Product | Allow user create new product |
| 33 | Search a product | Search Product | Allow user search a product |
| 34 | Get product information | Product Detail | Show product information |
| 35 | Edit product information | Edit Product Information | Allow user edit product information |
| 36 | Change product’s status | Change Product Status | Allow user change product’s status |
| 37 | Manage categories | Manage Categories | Show list of categories |
| 38 | Create new category | Create Category | Allow user create new category |
| 39 | Search a category | Search Category | Allow user search a category |
| 40 | Get category information | Category Detail | Show category information |
| 41 | Edit category information | Edit Category Information | Allow user edit category information |
| 42 | Change category’s status | Change Category Status | Allow user change category status |
| 43 | Logout | Logout | Logout of the system. |

* **Admin – web**
* Table 64. Admin Web App screen detail

|  |  |  |  |
| --- | --- | --- | --- |
| **Id** | **Feature** | **Screen** | **Description** |
| 01 | Login | Login | Allow user to login with a role |
| 02 | Display general information report | Dashboard | Allow user to view general information report |
| 03 | Download file report | Download file report | Allow user download file report PDF format |
| 04 | Get user’s profile | Profile | Show user’s profile information |
| 05 | Edit user’s profile | Edit Profile | Allow user edit profile |
| 06 | Change password | Change Password | Allow user change password |
| 07 | Get list video detected | List Video Detected | Show list of video detected |
| 08 | Get video information | Video Detail | Show video information |
| 09 | Manage mangers | Manage Managers | Show list of manager in system |
| 10 | Create new manager | Create Manager | Allow user create a new manager |
| 11 | Search a manager | Search Manager | Allow user search a manager |
| 12 | Get manager information | Manager Detail | Show manager information |
| 13 | Change manager’s picture | Change Profile Picture | Allow user change manager’s picture |
| 14 | Edit manager information | Edit Manager Information | Allow user update manager information |
| 15 | Change manager status | Change Manager Status | Allow user change manager status |
| 16 | Reset manager’s password | Reset Password | Allow user reset manager’s password |
| 17 | Add manager to a store, or remove manager from a store | Add/Remove Manager – Store Mapping | Allow user add manager to a store, or remove manager from a store |
| 18 | Manage stores | Manage Stores | Show list of stores |
| 19 | Create new store | Create Store | Allow user create new store |
| 20 | Search a store | Search Store | Allow user search a store |
| 21 | Get store information | Store Detail | Show store information |
| 22 | Change store status | Change Store Status | Allow user change store status |
| 23 | Edit store information | Edit Store Information | Allow user edit store information |
| 24 | Change store image | Change Store Image | Allow user change store image |
| 25 | Manage cameras | Manage Cameras | Show list of cameras |
| 26 | Create new camera | Create Camera | Allow user create new camera |
| 27 | Search a camera | Search Camera | Allow user search a camera |
| 28 | Get camera information | Camera Detail | Show camera information |
| 29 | Edit camera information | Edit Camera Information | Allow user edit camera information |
| 30 | Change camera’s status | Change Camera Status | Allow user change camera status |
| 31 | Manage products | Manage Products | Show list of products in system |
| 32 | Create new product | Create Product | Allow user create new product |
| 33 | Search a product | Search Product | Allow user search a product |
| 34 | Get product information | Product Detail | Show product information |
| 35 | Edit product information | Edit Product Information | Allow user edit product information |
| 36 | Change product’s status | Change Product Status | Allow user change product’s status |
| 37 | Manage categories | Manage Categories | Show list of categories |
| 38 | Create new category | Create Category | Allow user create new category |
| 39 | Search a category | Search Category | Allow user search a category |
| 40 | Get category information | Category Detail | Show category information |
| 41 | Edit category information | Edit Category Information | Allow user edit category information |
| 42 | Change category’s status | Change Category Status | Allow user change category status |
| 43 | Logout | Logout | Logout of the system. |

* **Manager – mobile**

Table 64. Manager Mobile App screen detail

|  |  |  |  |
| --- | --- | --- | --- |
| **Id** | **Feature** | **Screen** | **Description** |
| 01 | Login | Login | Allow user to login with a role |
| 02 | Display general information report | Dashboard | Allow user to view general information report |
| 03 | Download file report | Download file report | Allow user download file report PDF format |
| 04 | Get user’s profile | Profile | Show user’s profile information |
| 05 | Edit user’s profile | Edit Profile | Allow user edit profile |
| 06 | Change password | Change Password | Allow user change password |
| 07 | Get list video detected | List Video Detected | Show list of video detected |
| 08 | Get video information | Video Detail | Show video information |
| 25 | Manage cameras | Manage Cameras | Show list of cameras |
| 27 | Search a camera | Search Camera | Allow user search a camera |
| 28 | Get camera information | Camera Detail | Show camera information |
| 31 | Manage products | Manage Products | Show list of products in system |
| 33 | Search a product | Search Product | Allow user search a product |
| 34 | Get product information | Product Detail | Show product information |
| 37 | Manage categories | Manage Categories | Show list of categories |
| 39 | Search a category | Search Category | Allow user search a category |
| 40 | Get category information | Category Detail | Show category information |
| 43 | Logout | Logout | Logout of the system. |
| 44 | Manage Shelves | Manage Shelves | Show list of shelf |
| 45 | Create new shelf | Create Shelf | Allow user create a new shelf |
| 46 | Search a shelf | Search Shelf | Allow user search a shelf |
| 47 | Get shelf information | Shelf Detail | Show shelf information |
| 48 | Edit shelf information | Edit Shelf Information | Allow user edit shelf information |
| 49 | Add camera to shelf, or remove camera from shelf | Add/Remove Shelf’s Camera | Allow user add camera to shelf, or remove camera form shelf |
| 50 | Get stack detail | Stack Detail | Show stack information |
| 51 | Add product to stack, or remove product from stack | Add/Remove Product To Stack | Allow user add product to stack, or remove product from stack |
| 52 | Add camera to stack, or remove camera from stack | Add/Remove Stack’s Camera | Allow user add camera to stack, or remove camera from stack |

* **Manager – web**

Table 64. Manager Web App screen detail

|  |  |  |  |
| --- | --- | --- | --- |
| **Id** | **Feature** | **Screen** | **Description** |
| 01 | Login | Login | Allow user to login with a role |
| 02 | Display general information report | Dashboard | Allow user to view general information report |
| 03 | Download file report | Download file report | Allow user download file report PDF format |
| 04 | Get user’s profile | Profile | Show user’s profile information |
| 05 | Edit user’s profile | Edit Profile | Allow user edit profile |
| 06 | Change password | Change Password | Allow user change password |
| 07 | Get list video detected | List Video Detected | Show list of video detected |
| 08 | Get video information | Video Detail | Show video information |
| 25 | Manage cameras | Manage Cameras | Show list of cameras |
| 27 | Search a camera | Search Camera | Allow user search a camera |
| 28 | Get camera information | Camera Detail | Show camera information |
| 31 | Manage products | Manage Products | Show list of products in system |
| 33 | Search a product | Search Product | Allow user search a product |
| 34 | Get product information | Product Detail | Show product information |
| 37 | Manage categories | Manage Categories | Show list of categories |
| 39 | Search a category | Search Category | Allow user search a category |
| 40 | Get category information | Category Detail | Show category information |
| 43 | Logout | Logout | Logout of the system. |
| 44 | Manage Shelves | Manage Shelves | Show list of shelf |
| 45 | Create new shelf | Create Shelf | Allow user create a new shelf |
| 46 | Search a shelf | Search Shelf | Allow user search a shelf |
| 47 | Get shelf infomation | Shelf Detail | Show shelf information |
| 48 | Edit shelf information | Edit Shelf Information | Allow user edit shelf information |
| 49 | Add camera to shelf, or remove camera from shelf | Add/Remove Shelf’s Camera | Allow user add camera to shelf, or remove camera form shelf |
| 50 | Get stack detail | Stack Detail | Show stack information |
| 51 | Add product to stack, or remove product from stack | Add/Remove Product To Stack | Allow user add product to stack, or remove product from stack |
| 52 | Add camera to stack, or remove camera from stack | Add/Remove Stack’s Camera | Allow user add camera to stack, or remove camera from stack |
| 53 | Upload video | Upload Video | Allow user upload video to detect |

#### c. Screen Authorization

##### c1. Web Application Screen Authorization

Table 66. Web Application Screen Authorization

|  |  |  |  |
| --- | --- | --- | --- |
| **Screen/Popup** | **Unauthenticated User** | **Administrator** | **Manager** |
| Login | X |  |  |
| Logout |  | X | X |
| Dashboard |  | X | X |
| Download file report |  | X | X |
| Profile |  | X | X |
| Edit profile |  | X | X |
| Change password |  | X | X |
| List video detected |  | X | X |
| Video detected detail |  | X | X |
| Manage manager |  | X |  |
| Create manager |  | X |  |
| Search manager |  | X |  |
| Manager detail |  | X |  |
| Edit manager information |  | X |  |
| Change manager status |  | X |  |
| Reset manager password |  | X |  |
| Add/Remove manager store mapping |  | X |  |
| Manage store |  | X |  |
| Create store |  | X |  |
| Search store |  | X |  |
| Store detail |  | X | X |
| Change store status |  | X |  |
| Edit store information |  | X |  |
| Manage camera |  | X |  |
| Create camera |  | X |  |
| Search camera |  | X | X |
| Camera detail |  | X | X |
| Edit camera information |  | X |  |
| Change camera status |  | X |  |
| Manage product |  | X |  |
| Create product |  | X |  |
| Search product |  | X | X |
| Product detail |  | X | X |
| Edit product information |  | X |  |
| Change product status |  | X |  |
| Manage categories |  | X |  |
| Create category |  | X |  |
| Search category |  | X | X |
| Category detail |  | X | X |
| Edit category information |  | X |  |
| Change category status |  | X |  |
| Upload video |  |  | X |
| Manage shelves |  |  | X |
| Create shelf |  |  | X |
| Search shelf |  |  | X |
| Shelf detail |  |  | X |
| Edit shelf information |  |  | X |
| Add/Remove camera to shelf |  |  | X |
| Stack detail |  |  | X |
| Add/Remove product to stack |  |  | X |
| Add/Remove camera to stack |  |  | X |

***Annotation:***

* Unauthenticated User: a user who has not logged in to CFFE.
* Administrator: a user who has logged in to CFFE with role admin.
* Manager: a user who has logged in to CFFE with role manager.

##### c2. Web Application Screen Authorization

Table 66. Mobile Application Screen Authorization

|  |  |  |  |
| --- | --- | --- | --- |
| **Screen/Popup** | **Unauthenticated User** | **Administrator** | **Manager** |
| Login | X |  |  |
| Logout |  | X | X |
| Dashboard |  | X | X |
| Download file report |  | X | X |
| Profile |  | X | X |
| Edit profile |  | X | X |
| Change password |  | X | X |
| List video detected |  | X | X |
| Video detected detail |  | X | X |
| Manage manager |  | X |  |
| Create manager |  | X |  |
| Search manager |  | X |  |
| Manager detail |  | X |  |
| Edit manager information |  | X |  |
| Change manager status |  | X |  |
| Reset manager password |  | X |  |
| Add/Remove manager store mapping |  | X |  |
| Manage store |  | X |  |
| Create store |  | X |  |
| Search store |  | X |  |
| Store detail |  | X | X |
| Change store status |  | X |  |
| Edit store information |  | X |  |
| Manage camera |  | X |  |
| Create camera |  | X |  |
| Search camera |  | X | X |
| Camera detail |  | X | X |
| Edit camera information |  | X |  |
| Change camera status |  | X |  |
| Manage product |  | X |  |
| Create product |  | X |  |
| Search product |  | X | X |
| Product detail |  | X | X |
| Edit product information |  | X |  |
| Change product status |  | X |  |
| Manage categories |  | X |  |
| Create category |  | X |  |
| Search category |  | X | X |
| Category detail |  | X | X |
| Edit category information |  | X |  |
| Change category status |  | X |  |
| Manage shelves |  |  | X |
| Create shelf |  |  | X |
| Search shelf |  |  | X |
| Shelf detail |  |  | X |
| Edit shelf information |  |  | X |
| Add/Remove camera to shelf |  |  | X |
| Stack detail |  |  | X |
| Add/Remove product to stack |  |  | X |
| Add/Remove camera to stack |  |  | X |

***Annotation:***

* Unauthenticated User: a user who has not logged in to CFFE.
* Administrator: a user who has logged in to CFFE with role admin.
* Manager: a user who has logged in to CFFE with role manager.

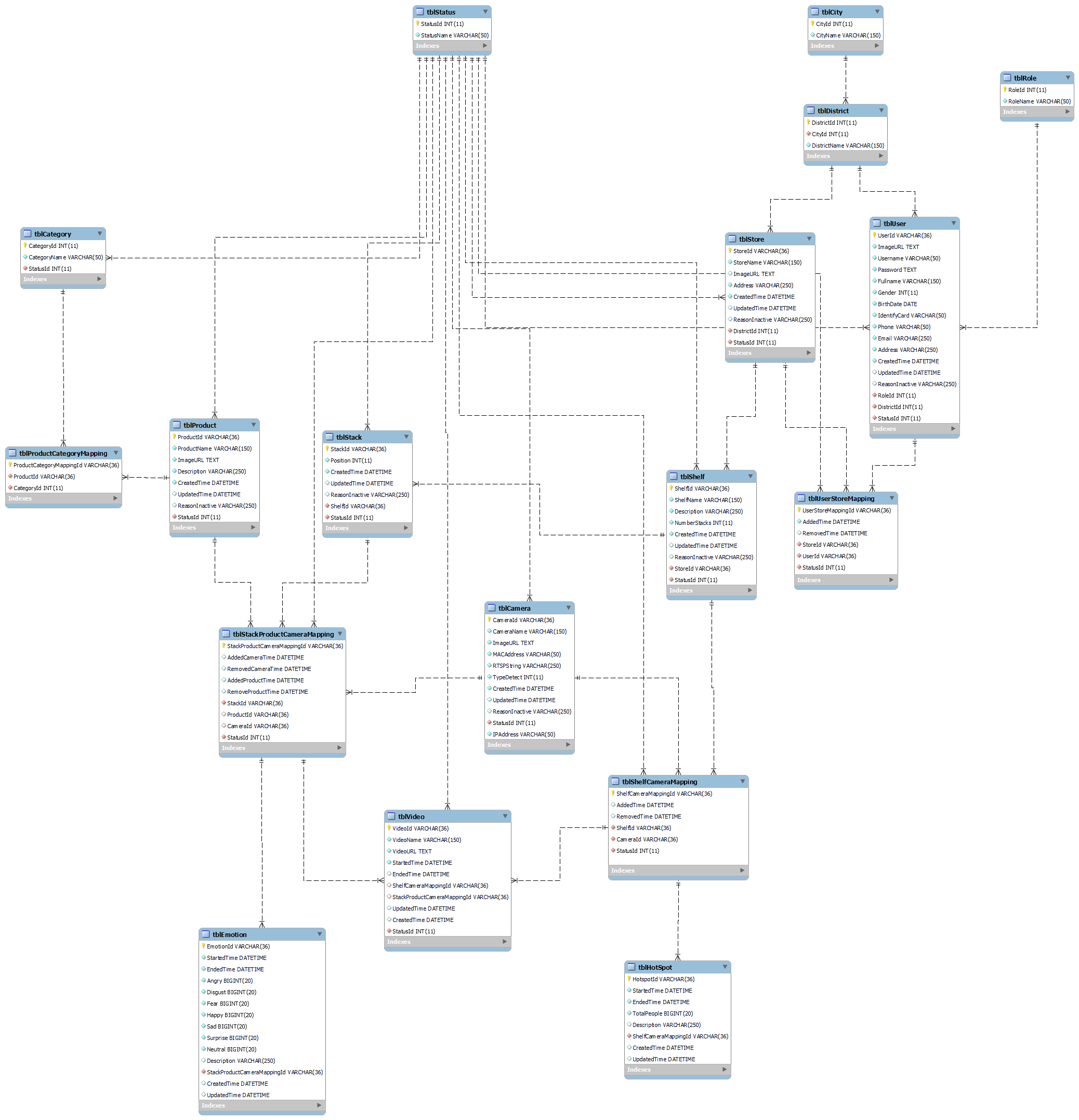
#### d. Non-Screen Functions

Table 70. Non-Screen functions

|  |  |  |
| --- | --- | --- |
| **#** | **System Function** | **Description** |
| 1 | Count the customer | System AI will statistic number of customers |
| 2 | Detect emotion | System AI will recognise facial emotions |

#### e. Entity Relationship Diagram

***Note:*** *using Crow's foot notation*



[Figure 55 . Entity relationship diagram](file:///E:\B\SE1312\Capstone\SE_ThanhPC_HoaDNT_GSPSE06\Diagram\Entity%20Relationship%20Diagram.jpg)

Table 71. Entity description

|  |  |  |
| --- | --- | --- |
| **#** | **Entity** | **Description** |
| 1 | tblCity | tblCity represents the cities in the system. |
| 2 | tblDistrict | tblCity represents the districts in the system. |
| 3 | tblCategory | tblCategory represents the category of products in the system. |
| 4 | tblStatus | tblStatus represents the status in the system. |
| 5 | tblRole | tblRole represents the role in the system. |
| 6 | tblUser | tblUser store information of user in the system includes username and password. |
| 7 | tblStore | tblStore represents the information of stores in the system. |
| 8 | tblUserStoreMapping | Mapping user with store, it means a manager manage stores. |
| 9 | tblShelf | tblShelf represents the information of shelf in a store. |
| 10 | tblStack | tblStack represents the information of stack on the shelf. |
| 11 | tblShelfCameraMapping | Mapping camera with shelf, it means mount the camera on the shelf. |
| 12 | tblStackProductCameraMapping | Mapping product and camera with stack, it means mount the camera and product on stack. |
| 13 | tblCamera | tblCamera represent the cameras that are running and operating in the system. Cameras are used for record video of shelf or stack. That includes the camera’s information. |
| 14 | tblProduct | tblProduct represent the products that are running in the system. Product are used for show on the stack in store. That includes the product’s information. |
| 15 | tblProductCategoryMapping | Mapping product with categories. |
| 16 | tblVideo | tblVideo represent the products that are detected in the system. That includes the video’s informantion. |
| 17 | tblEmotion | Store result of video detect emotion. |
| 18 | tblHotSpot | Store result of video detect “hot spot”. |

## 4. Non-Functional Requirements

### 4.1 External Interfaces

#### a. User Interfaces

UI-1: UI must be in English.

UI-2: GUI must be friendly, clear and easy to use.

UI-3: Information content pages should be concise, clear and users can focus easily.

UI-4: Content will fit the screen of almost android phone, allows users to view the main content without zooming or scrolling horizontally.

UI-5: Elements are designed for touching gesture to help users interact with app easily and more comfortable.

UI-6: Background and font colors have great contrast to help users easy to read text.

#### b. Software Interfaces

SI-1:Web application: browser Safari (version 14.1.2 or higher), Google Chrome (version 70 or higher), Firefox (version 60 or higher), Internet Explorer (version 10 or higher).

SI-2:Mobile application: phone operating system requires Android version 10.0 or higher.

#### c. Hardware Interfaces

HI-1: Desktop or laptop.

HI-2: Camera IP.

#### d. Communications Interfaces

CI-1: System handler will send emails to manager based on specific functions.

### 4.2 Quality Attributes

#### a. Usability

* Users will probably take at least 2 days to learn how to use the system.
* The UI of website fits for each browser on each device.
* The system should be intuitive and easy so that even non-IT staff can use.

#### b. Reliability

* The accuracy of detect emotion must be over 60%.
* The accuracy of counting customer must be over 60%.

#### c. Performance

* Normal response time is less than 500ms.

#### d. Dependability

##### d1. Security

* Each role in system can only access its own functions.
* Before saving data to database, all input is validated.

##### d2. Safety

* Integration of CFFE system is low-impact on the workflow of manager.

#### e. Supportability

* Should apply RESTFUL Web API Standard.
* Should follow the coding convention.
* All development tools should be listed with attached documents.

#### f. Design Constraints

* Using OpenCV, Tensorflow and open source frameworks.
* Coding language:
  + Python: video processing and detection.
  + Java: back-end server.
  + Dart: UI of mobile programming.
  + JavaScript, CSS, HTML: UI of web programming.

#### g. Support Documents

* Manual documents should be step-by-step, simple and clear.
* Installation instructions should be easy and straightforward.
* Include full of configuration parameters.

#### h. Purchased Components

* Google Cloud Service

## 5. Other Requirements

### 5.1 Messages List

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **#** | **Message code** | **Message Type** | **Context** | **Content** |
| 1 | MSG-001 | In line, under input form, red text | The username is empty. | Username is required. |
| 2 | MSG-002 | In line, under input form, red text | The password is empty. | Password is required. |
| 3 | MSG-003 | In line, under input form, red text | Invalid username or password. | Invalid username or password. |
| 4 | MSG-004 | In line, under input form, red text | The old password cannot be empty | Old password is required |
| 5 | MSG-005 | In line, under input form, red text | The new password cannot be empty | New password is required |
| 6 | MSG-006 | in line, text field, red text | The retype password cannot be empty | Retype password is required |
| 7 | MSG-007 | in line, text field, red text | The new password and retype password must be matched | New password and retype password must be matched |
| 8 | MSG-008 | In line, under input form, red text | The password must be must contain :  - At least one digit [0-9]. - At least one lowercase Latin character [a-z]. - At least one uppercase Latin character [A-Z]. - At least one special character like ! @ # & ( ). - At least 8 characters and a maximum of 20 characters. | The password must be must contain :  - At least one digit [0-9]. - At least one lowercase Latin character [a-z]. - At least one uppercase Latin character [A-Z]. - At least one special character like ! @ # & ( ). - At least 8 characters and a maximum of 20 characters. |
| 9 | MSG-009 | In line, under input form, red text | The list has no data | No data |
| 10 | MSG-010 | In line, under input form, red text | The report has no data | Can not find the report |
| 11 | MSG-011 | in line, text field, red text | The video doesn't exist | The video doesn't exist |
| 12 | MSG-012 | in line, text field, red text | The shelf doesn't exist | This shelf doesn't exist |
| 13 | MSG-013 | in line, text field, red text | The updating process is successful | Updating process is successful |
| 14 | MSG-014 | in line, text field, red text | The name is empty | The name is required |
| 15 | MSG-015 | in line, text field, red text | The fullname is between 1 to 100 characters | The fullname is between 1 to 100 characters |
| 16 | MSG-016 | in line, text field, red text | The description is empty | The description is required |
| 17 | MSG-017 | in line, text field, red text | The description is between 1 to 250 characters | The description is between 1 to 250 characters |
| 18 | MSG-018 | in line, text field, red text | The shelf's maximum of stack is empty | The shelf's maximum of stack is required |
| 19 | MSG-019 | in line, text field, red text | The shelf's maximum of stack is between 1 to 30 stacks | The shelf's maximum of stack is between 1 to 30 stacks |
| 20 | MSG-020 | in line, text field, red text | The camera id can not empty. | The camera id is required. |
| 21 | MSG-021 | in line, text field, red text | The deleting process is successful | Deleting process is successful |
| 22 | MSG-022 | in line, text field, red text | The stack doesn't exist | This stack doesn't exist |
| 23 | MSG-023 | in line, text field, red text | The product doesn't exist | This product doesn't exist |
| 24 | MSG-024 | in line, text field, red text | The camera doesn't exist | This camera doesn't exist |
| 25 | MSG-025 | in line, text field, red text | The shelf has total of stacks equal then maximum of stacks | This shelf is full |
| 26 | MSG-026 | in line, text field, red text | The image is empty | Image is required |
| 27 | MSG-027 | in line, text field, red text | The image is not png, jpg, jpeg format | The image must be png, jpg, jpeg format |
| 28 | MSG-028 | in line, text field, red text | The category is empty | Category is required |
| 29 | MSG-029 | in line, text field, red text | The category does not exist | Category does not exist |
| 30 | MSG-030 | in line, text field, red text | The ip address is empty | The RTSP string is required |
| 31 | MSG-031 | in line, text field, red text |  |  |
| 32 | MSG-032 | in line, text field, red text | The ip address must be x.x.x.x format (x is number between 0 to 255) | The ip address must be x.x.x.x format (x is number between 0 to 255) |
| 33 | MSG-033 | in line, text field, red text | The category doesn't exist | The category doesn't exist |
| 34 | MSG-034 | in line, text field, red text | The name already exist | The name already exist |
| 35 | MSG-035 | in line, text field, red text | The store doesn't exist | The store doesn't exist |
| 36 | MSG-036 | in line, text field, red text | The address is empty | Address is required |
| 37 | MSG-037 | in line, text field, red text | The address is between 1 to 250 characters | Address is between 1 to 250 characters |
| 38 | MSG-038 | in line, text field, red text | City has not been selected | City is required |
| 39 | MSG-039 | in line, text field, red text | District has not been selected | District is required |
| 40 | MSG-040 | in line, text field, red text |  |  |
| 41 | MSG-041 | in line, text field, red text | The user doesn't exist | The user doesn't exist |
| 42 | MSG-042 | in line, text field, red text | Employee code is empty | Employee code is required |
| 43 | MSG-043 | in line, text field, red text | Manager already exists | Manager already exists |
| 44 | MSG-044 | in line, text field, red text | Email is empty | Email is required |
| 45 | MSG-045 | in line, text field, red text | Email does not match /^(([^<>()[\]\\.,;:\s@"]+(\.[^<>()[\]\\.,;:\s@"]+)\*)|(".+"))@((\[[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}\.[0-9]{1,3}\])|(([a-zA-Z\-0-9]+\.)+[a-zA-Z]{2,}))$/ regex | Email is wrong format |
| 46 | MSG-046 | in line, text field, red text | Status doesn't exist | Status doesn't exist |
| 47 | MSG-047 | in line, text field, red text | Birthdate is empty | Birthdate is required |
| 48 | MSG-048 | in line, text field, red text | Current year minus birth year is less than 15 | Birthdate is invalid |
| 49 | MSG-049 | in line, text field, red text | Phone is empty | Phone is empty |
| 50 | MSG-050 | in line, text field, red text | Phone is between 10 to 13 digits | Phone is between 10 to 13 digits |
| 51 | MSG-051 | in line, text field, red text | Identity card is empty | Identity card is required |
| 52 | MSG-052 | in line, text field, red text | Identity card includes from 9 to 12 digits | Identity card includes from 9 to 12 digits |
| 53 | MSG-053 | in line, text field, red text | Password is wrong | Password is wrong |
| 54 | MSG-054 | in line, text field, red text | Gender is empty | Gender is required. |
| 55 | MSG-055 | in line, text field, red text | Email is exist. | Email is exist. |
| 56 | MSG-056 | in line, text field, red text | Identify card is exist | Identify card is exist |
| 57 | MSG-057 | in line, text field, red text | IPAddress is exist | IPAddress is exist |
| 58 | MSG-058 | in line, text field, red text | RTSPString is exist | RTSPString is exist |
| 59 | MSG-059 | in line, text field, red text | CategoryName is exist | CategoryName is exist |
| 60 | MSG-060 | in line, text field, red text | ProductName is exist | ProductName is exist |
| 61 | MSG-061 | in line, text field, red text | ShelfName is exist | ShelfName is exist |
| 62 | MSG-062 | in line, text field, red text | StoreName is exist | StoreName is exitst |
| 63 | MSG-063 | in line, text field, red text | The manager does not found. | The manager does not found. |
| 64 | MSG-064 | in line, text field, red text | Create manager successfully. | Create manager successfully. |
| 65 | MSG-065 | in line, text field, red text | This status is not exist. | This status is not exist. |
| 66 | MSG-066 | in line, text field, red text | Changing status must be followed by business rules: - Pending status can be changed to be inactive status if it has an inactive reason and mappings are inactive. - Inactive status only changing to be pending status. | Changing status must be followed by business rules: - Pending status can be changed to be inactive status if it has an inactive reason and mappings are inactive. - Inactive status only changing to be pending status. |
| 67 | MSG-067 | in line, text field, red text | Inactive reason must be from 1 to 250 characters. | Inactive reason must be from 1 to 250 characters. |
| 68 | MSG-068 | in line, text field, red text | The old password is not correct. | The old password is not correct. |
| 69 | MSG-069 | in line, text field, red text | StoreID can not empty. | StoreID can not empty. |
| 70 | MSG-070 | in line, text field, red text | Analysed time can not empty. | Analysed time can not empty. |
| 71 | MSG-071 | in line, text field, red text | ShelfId can not empty when get shelf detail | ShelfId can not be empty. |
| 72 | MSG-072 | in line, text field, red text | Wrong time format (hh:mm:ss) | Time must be format (hh:mm:ss) |
| 73 | MSG-073 | in line, text field, red text | BirthDate must be follow by format yyyy-MM-dd HH:mm:ss | BirthDate must be follow by format yyyy-MM-dd HH:mm:ss |
| 74 | MSG-074 | in line, text field, red text | Manager is not found Manager status is not pending | Manager is not available. |
| 75 | MSG-075 | in line, text field, red text | Store is not found Store status is not pending | Store is not available. |
| 76 | MSG-076 | in line, text field, red text | System can not finish this action | System can not finish this action |
| 77 | MSG-077 | in line, text field, red text | Store and Manager is not mapping | Store and manager is not mapping. |
| 78 | MSG-078 | in line, text field, red text | Stack ID is not empty | Stack ID is required. |
| 79 | MSG-079 | in line, text field, red text | Shelf name is empty | Shelf name is required |
| 80 | MSG-080 | in line, text field, red text | Shelf name must be from 1 to 100 characters. | Shelf name must be from 1 to 100 characters. |
| 81 | MSG-081 | in line, text field, red text | Store contain shelfs active or pending. | Store contain shelfs active or pending. |
| 82 | MSG-082 | in line, text field, red text | Camera name can not be empty | Camera name is required. |
| 83 | MSG-083 | in line, text field, red text | Camera name must be from 1 to 100 characters. | Camera name must be from 1 to 100 characters. |
| 84 | MSG-084 | in line, text field, red text | TypeDetect must be 1 or 2. | TypeDetect is not exist. |
| 85 | MSG-085 | in line, text field, red text | Shelf must be exist and not active. | Shelf must be exist and not active. |
| 86 | MSG-086 | in line, text field, red text | Camera must be exist and not active. | Camera must be exist and not active. |
| 87 | MSG-087 | in line, text field, red text | Camera or Shelf is not available. | Camera or Shelf is not available. |
| 88 | MSG-088 | in line, text field, red text | Shelf and Camera is not mapping | Shelf and Camera is not mapping |
| 89 | MSG-089 | in line, text field, red text | Product is not active. | Product is not active. |
| 90 | MSG-090 | in line, text field, red text | Stack is already active or inactive. | Stack is already active or inactive. |
| 91 | MSG-091 | in line, text field, red text | Stack is already have a product. | Stack is already have a product. |
| 92 | MSG-092 | in line, text field, red text | Product and stack is not mapping. | Product and stack is not mapping. |
| 93 | MSG-093 | in line, text field, red text | Camera is already active or inactive. | Camera is already active or inactive. |
| 94 | MSG-094 | in line, text field, red text | Camera and stack is not mapping. | Camera and stack is not mapping. |
| 95 | MSG-095 | in line, text field, red text | Stack contain product. | Stack contain product. |
| 96 | MSG-096 | in line, text field, red text | Product ID is required. | Product ID is required. |
| 97 | MSG-097 | in line, text field, red text | Have stack contain this product. | Have stack contain this product. |
| 98 | MSG-098 | in line, text field, red text | Changing status product must be followed by business rules:\n- Active status can be changed to be inactive status if it has an inactive reason, and no any stack contain it.\n | Changing status product must be followed by business rules:\n- Active status can be changed to be inactive status if it has an inactive reason, and no any stack contain it.\n |
| 99 | MSG-099 | in line, text field, red text | Product name is required. | Product name is required. |
| 100 | MSG-100 | in line, text field, red text | Stack much contain product. | Stack much contain product. |
| 101 | MSG-101 | in line, text field, red text | Stack already active. | Stack already active. |
| 102 | MSG-102 | in line, text field, red text | Catelogy is required. | Catelogy is required. |
| 103 | MSG-103 | in line, text field, red text | Catelogy list at least 1 item, and maximum is 3. | Catelogy list at least 1 item, and maximum is 3. |
| 104 | MSG-104 | in line, text field, red text | Catelogy list contain invalid id. | Catelogy list contain invalid id. |
| 105 | MSG-105 | in line, text field, red text | Catelogy name is required. | Catelogy name is required. |
| 106 | MSG-106 | in line, text field, red text | Store name is required. | Store name is required. |
| 107 | MSG-107 | in line, text field, red text | Store address is required. | Store address is required. |
| 108 | MSG-108 | in line, text field, red text | Store analysed time is required. | Store analysed time is required. |
| 109 | MSG-109 | in line, text field, red text | This category is being used. | This category is being used. |
| 110 | MSG-100 | in line, text field, red text | Changing status category must be followed by business rules:\n- Active status can be changed to be inactive status if it has no product using it.\n | Changing status category must be followed by business rules:\n- Active status can be changed to be inactive status if it has no product using it.\n |

# IV. Software Design Description

## 1. Overall Description

### 1.1 Assumptions

This system is designed basing on these following assumptions:

* Software/OS:
  + Windows 10
  + Safari browser 14.1.2
  + MySQL 8.0
  + Java 8.0
  + NodeJS 14.16.1
  + Flutter 2.0.6
* Hardware:
  + Computer that have internet connection
  + Camera IP

### 1.2 Design Constraints

* End-user environment: OS with have Safari, android phone, camera.
* Network communication: this system works based on the network connection.

## 2. System Architecture Design

### 2.1 Overall Architecture

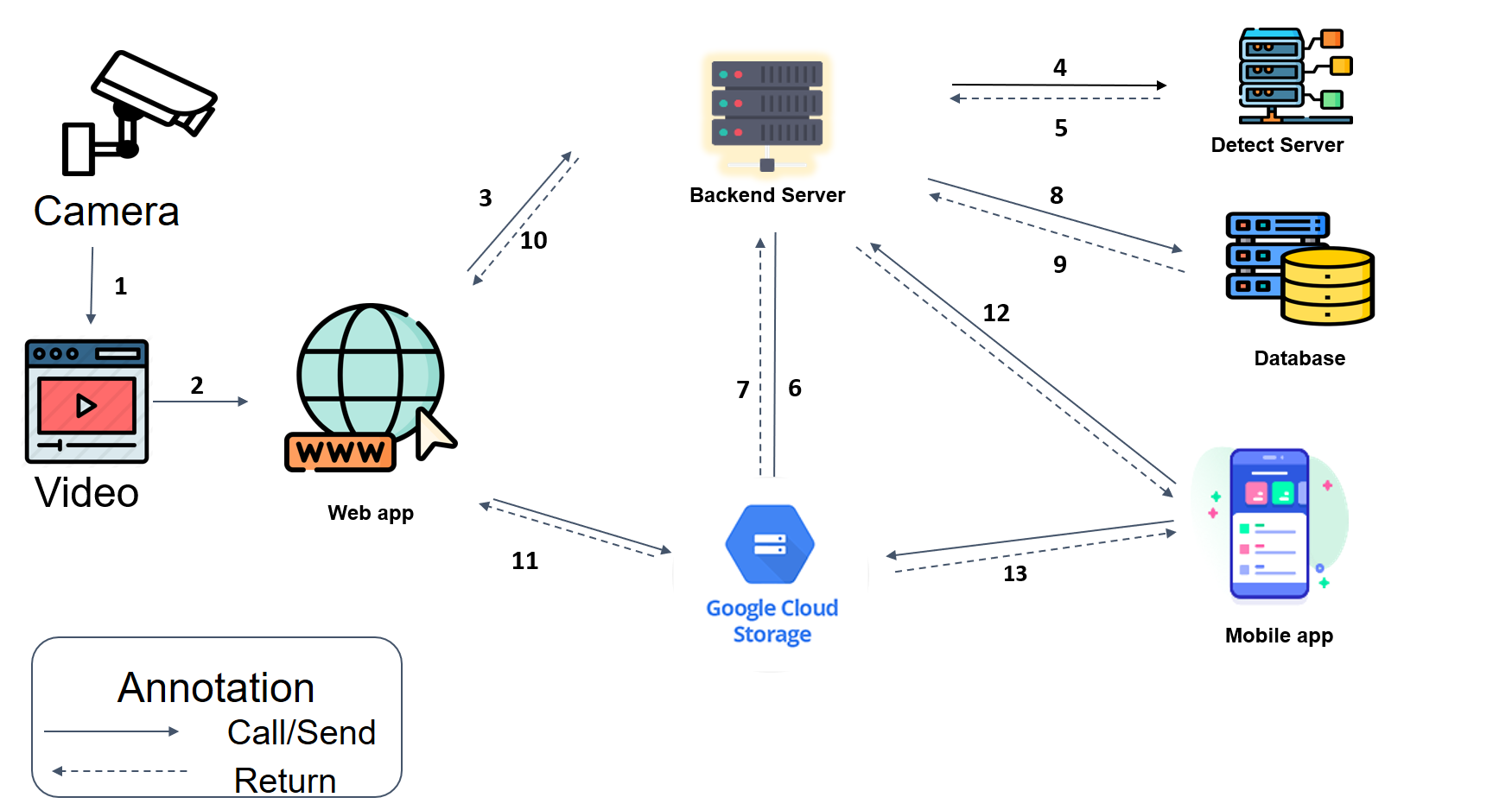


Figure 155. Overall architecture

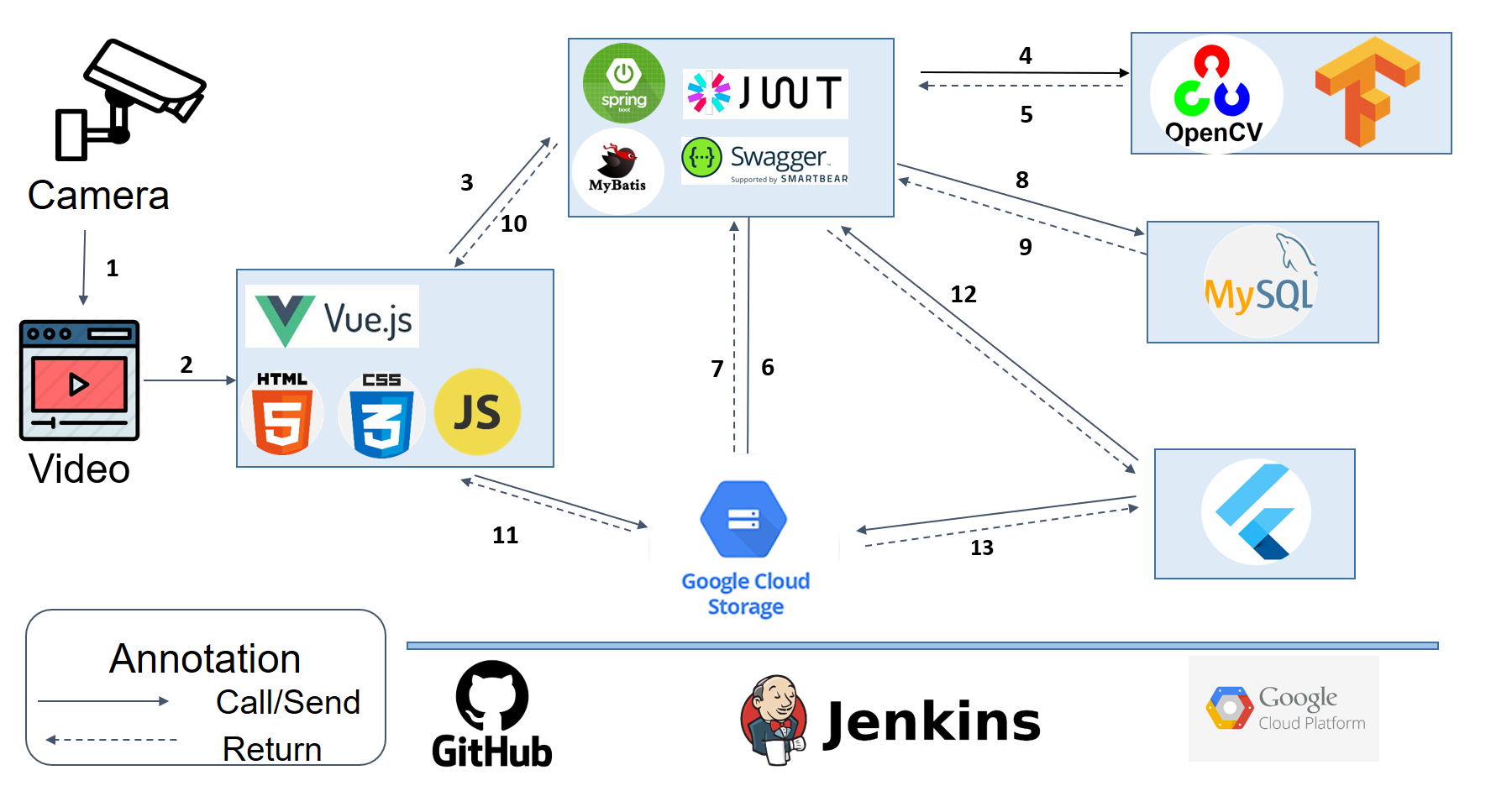


Figure 155. Overall architecture technology applied

### 2.3 Package Diagram

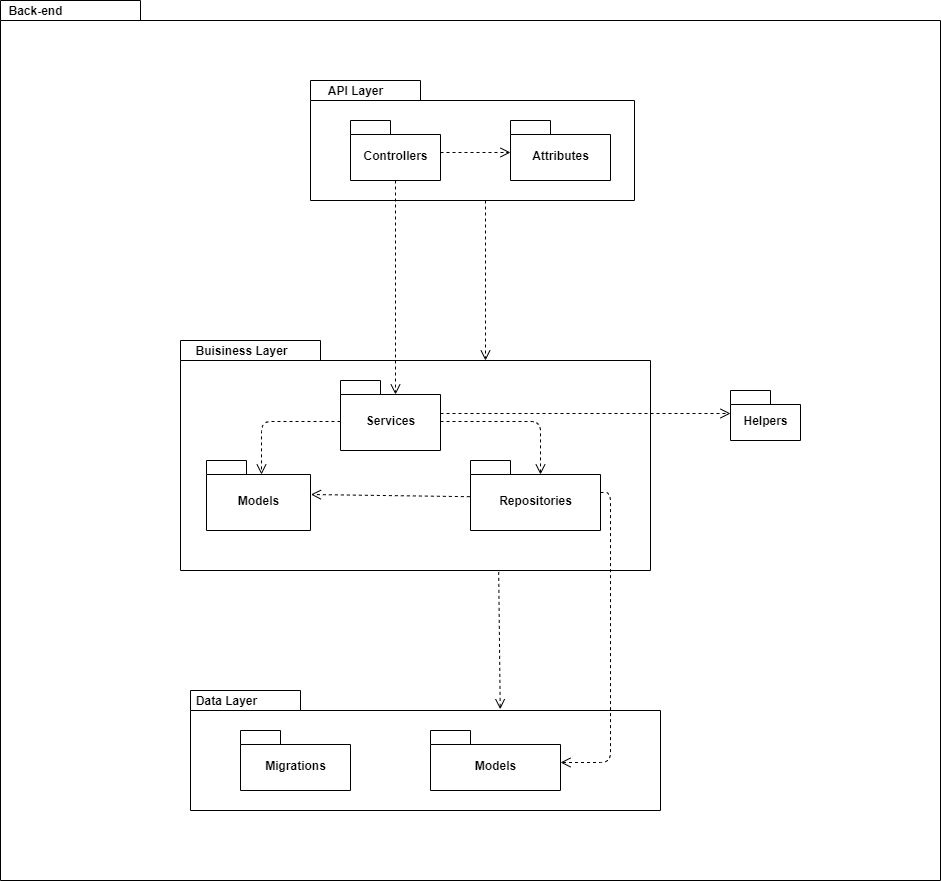


Figure 156. <Package Diagram> Back-end

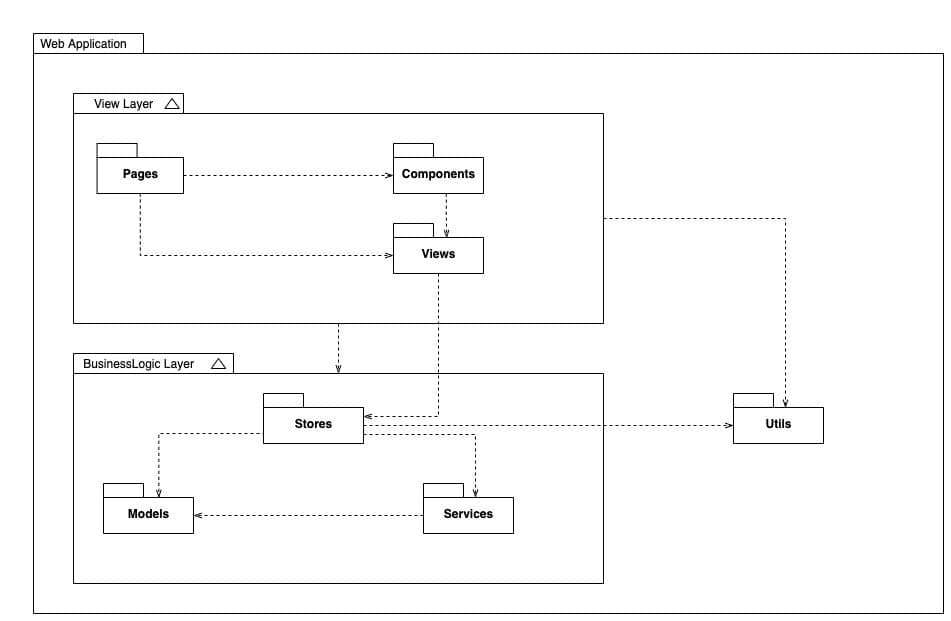


Figure 157. <Package Diagram> Web App

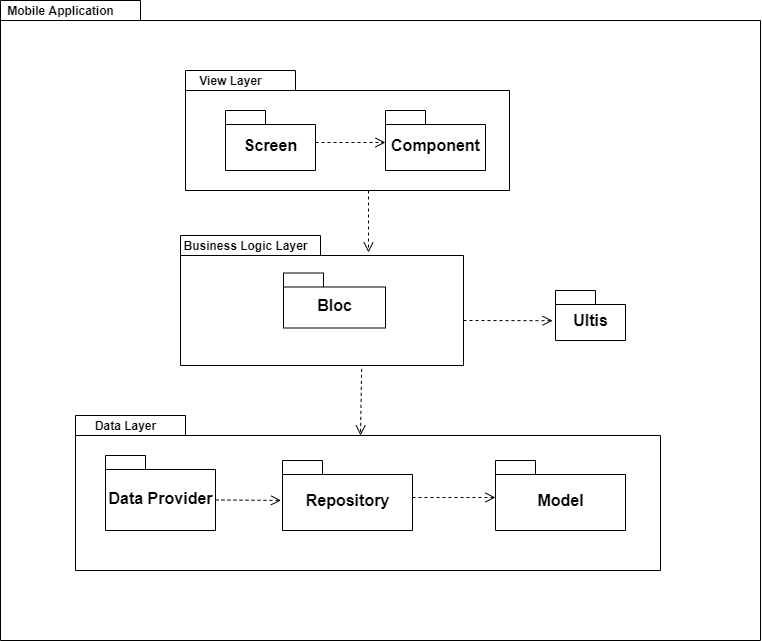


Figure 158. <Package Diagram> Mobile App

## 3. System Detailed Design

### 3.1 Class Diagram

<img class diagram>

### 3.2 Class Specification

#### 3.2.1 Camera

Table 72. <Class Specification> Camera

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| CameraId | string | Unique identifier of camera |
| CameraName | string | Name of camera |
| ImageURL | string | Image of camera |
| MACAddress | string | MAC address of camera |
| RTSPString | string | RTSP of camera |
| TypeDetect | int | Type of camera |
| CreatedTime | string | Created date of camera |
| UpdatedTime | string | Last modified date of camera |
| ReasonInactive | string | Reason inactive of camera |
| StatusId | int | Unique identifier of status |
| IPAddress | String | IP address of camera |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.2 Category

Table 72. <Class Specification> Category

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| CategoryId | int | Unique identifier of category |
| CategoryName | string | Name of category |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.3 City

Table 72. <Class Specification> City

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| CityId | int | Unique identifier of city |
| CityName | string | Name of city |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.4 District

Table 72. <Class Specification> District

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| DistrictId | int | Unique identifier of district |
| CityId | Int | Unique identifier of city |
| DistrictName | string | Name of district |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.5 Emotion

Table 72. <Class Specification> Emotion

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| EmotionId | string | Unique identifier of emotion |
| StartedTime | string | Time started of video |
| EndedTime | string | Time ended of video |
| Angry | int | Number of angry |
| Disgust | int | Number of disgust |
| Fear | int | Number of fear |
| Happy | int | Number of happy |
| Sad | int | Number of sad |
| Surprise | int | Number of surprise |
| Neutral | int | Number of neutral |
| Description | string | Description of emotion |
| StackProductCameraMappingId | string | Unique identifier of stack product camera mapping |
| CreatedTime | string | Created date of emotion |
| UpdatedTime | string | Last modified date of emotion |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.6 HotSpot

Table 72. <Class Specification> HotSpot

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| HotspotId | string | Unique identifier of hot spot |
| StartedTime | string | Time started of video |
| EndedTime | string | Time ended of video |
| TotalPeople | int | Number of customer |
| Description | string | Description of hot spot |
| ShelfCameraMappingId | string | Unique identifier of shelf camera mapping |
| CreatedTime | string | Created date of hot spot |
| UpdatedTime | string | Last modified date of hot spot |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.7 Product

Table 72. <Class Specification> Product

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| ProductId | string | Unique identifier of product |
| ProductName | string | Name of product |
| ImageURL | string | Image URL of product |
| Description | string | Description of product |
| CreatedTime | string | Created date of product |
| UpdatedTime | string | Last modified date of product |
| ReasonInactive | string | Reason inactive of product |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.8 ProductCategoryMapping

Table 72. <Class Specification> ProductCategoryMapping

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| ProductCategoryMappingId | string | Unique identifier of product category mapping |
| ProductId | string | Unique identifier of product |
| CategoryId | int | Unique identifier of category |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.9 Role

Table 72. <Class Specification> Role

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| RoleId | int | Unique identifier of role |
| RoleName | string | Name of role |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.10 Shelf

Table 72. <Class Specification> Shelf

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| ShelfId | string | Unique identifier of shelf |
| ShelfName | string | Name of shelf |
| Description | string | Description of shelf |
| NumberStacks | int | Number stack of shelf |
| CreatedTime | string | Created date of shelf |
| UpdatedTime | string | Last modified date of shelf |
| ReasonInactive | string | Reason inactive of shelf |
| StoreId | string | Unique identifier of store |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.11 ShelfCameraMapping

Table 72. <Class Specification> ShelfCameraMapping

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| ShelfCameraMappingId | string | Unique identifier of shelf camera mapping |
| AddedTime | string | Added time of camera |
| RemovedTime | string | Removed time ò camera |
| ShelfId | string | Unique identifier of shelf |
| CameraId | string | Unique identifier of camera |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.12 Stack

Table 72. <Class Specification> Stack

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| StackId | string | Unique identifier of stack |
| Position | int | Position of stack |
| CreatedTime | string | Created date of stack |
| UpdatedTime | string | Last modified date of stack |
| ReasonInactive | string | Reason inactive of stack |
| ShelfId | string | Unique identifier of shelf |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.13 StackProductCameraMapping

Table 72. <Class Specification> StackProductCameraMapping

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| StackProductCameraMappingId | string | Unique identifier of stack product camera mapping |
| AddedCameraTime | string | Added time of camera |
| RemovedCameraTime | string | Removed time of camera |
| AddedProductTime | string | Added time of product |
| RemoveProductTime | string | Removed time of product |
| StackId | string | Unique identifier of stack |
| ProductId | string | Unique identifier of product |
| CameraId | string | Unique identifier of camera |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.14 Status

Table 72. <Class Specification> Status

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| StatusId | int | Unique identifier of status |
| StatusName | string | Name of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.15 Store

Table 72. <Class Specification> Store

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| StoreId | string | Unique identifier of store |
| StoreName | string | Name of store |
| ImageURL | string | Image URL of store |
| Address | string | Address of store |
| CreatedTime | string | Created date of store |
| UpdatedTime | string | Last modified date of store |
| ReasonInactive | string | Reason Inactive of store |
| DistrictId | int | Unique identifier of district |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.16 User

Table 72. <Class Specification> User

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| UserId | string | Unique identifier of user |
| ImageURL | string | Image URL of user |
| Username | string | Username of user |
| Password | string | Password of user |
| Fullname | string | Name of user |
| Gender | int | Gender of user |
| BirthDate | string | Day of birth of user |
| IdentifyCard | string | Identify card of user |
| Phone | string | Phone number of user |
| Email | string | Email of user |
| Address | string | Address of user |
| CreatedTime | string | Created date of user |
| UpdatedTime | string | Last modified date of user |
| ReasonInactive | string | Reason inactive of user |
| RoleId | int | Unique identifier of role |
| DistrictId | int | Unique identifier of district |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.17 UserStoreMapping

Table 72. <Class Specification> UserStoreMapping

|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| UserStoreMappingId | string | Unique identifier of user store mapping |
| AddedTime | string | Added time of user |
| RemovedTime | string | Removed time of user |
| StoreId | string | Unique identifier of store |
| UserId | string | Unique identifier of user |
| StatusId | int | Unique identifier of status |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

#### 3.2.18 Video

Table 72. <Class Specification> Video

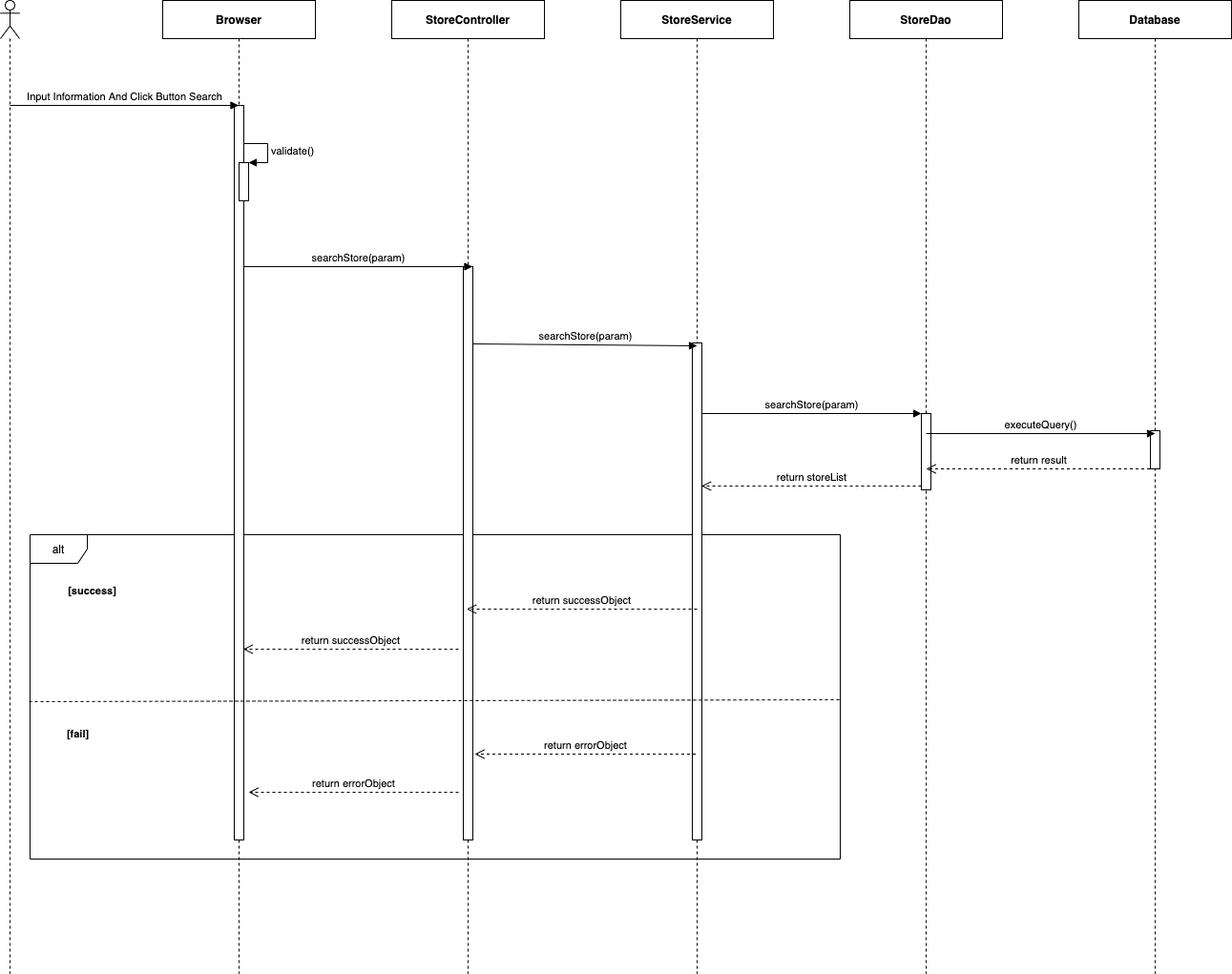
|  |  |  |
| --- | --- | --- |
| **Property** | **Type** | **Description** |
| VideoId | string | Unique identifier of video |
| VideoName | string | Name of video |
| VideoURL | string | URL of video |
| StartedTime | string | Started time of video |
| EndedTime | string | Ended time of video |
| ShelfCameraMappingId | string | Unique identifier of shelf camera mapping |
| StackProductCameraMappingId | string | Unique identifier of stack product camera mapping |
| UpdatedTime | string | Created date of video |
| CreatedTime | string | Last modified date of video |
| getter() | data type | Get attribute of class |
| setter() | void | Set value of class’s attribute |

### 3.3 Sequence Diagram(s)

Unauthenticated user who has not been identified by CFFA system. Unauthenticated user has limited access to the system with the following feature:

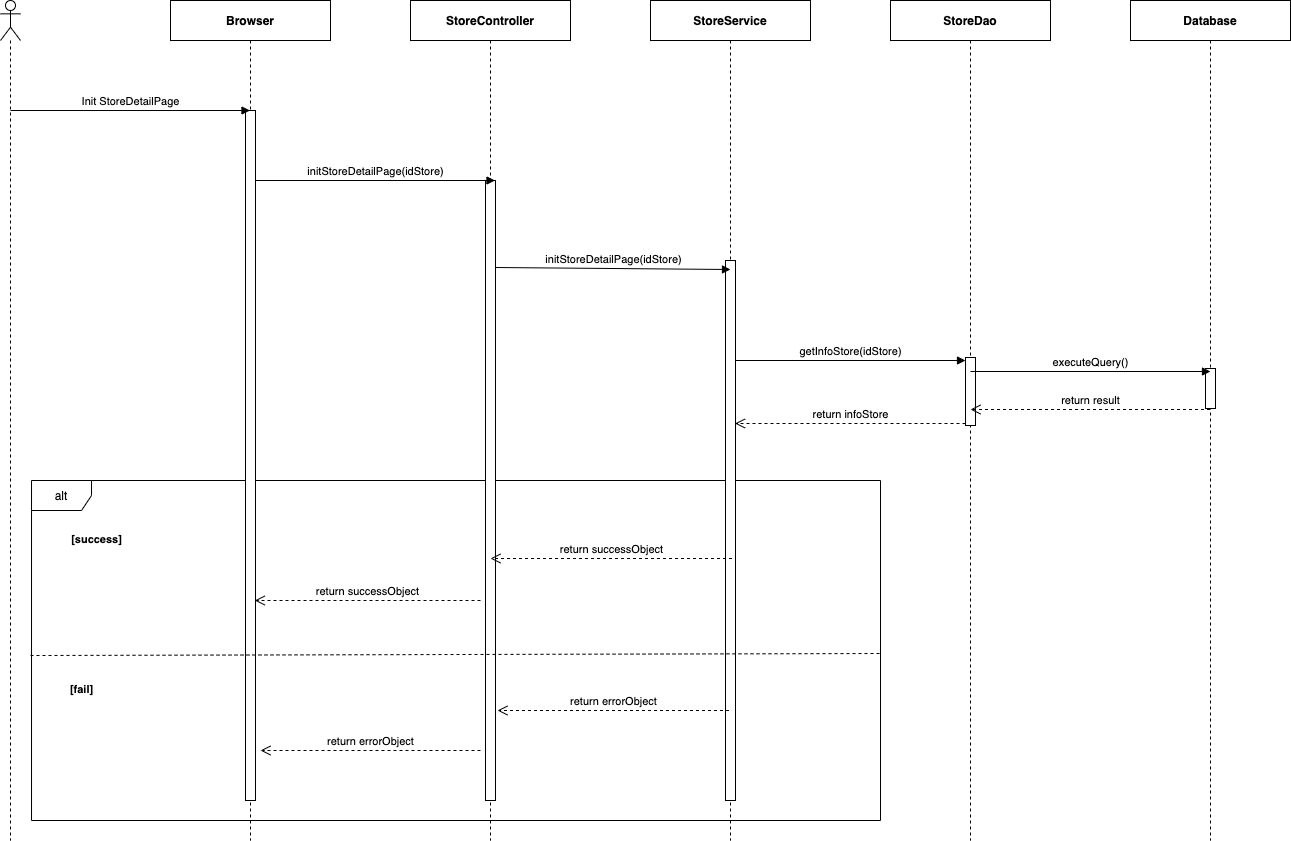
##### c1 <Admin> Sequence Diagram(s)

###### c1.1 <Admin> Get the stores



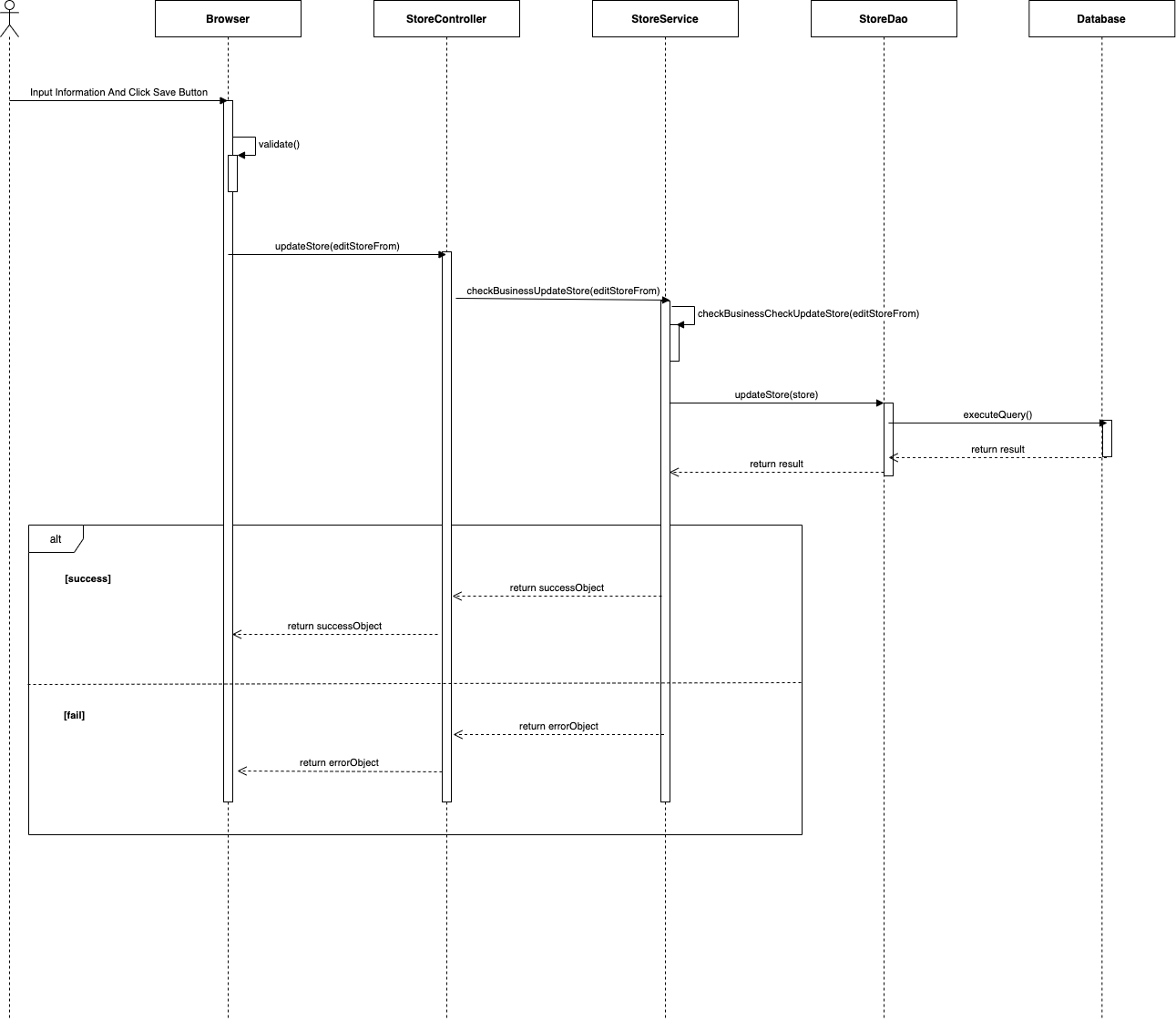
*Figure 1 - <Sequence Diagram> Get the stores*

###### c1.2 <Admin> Get store detail



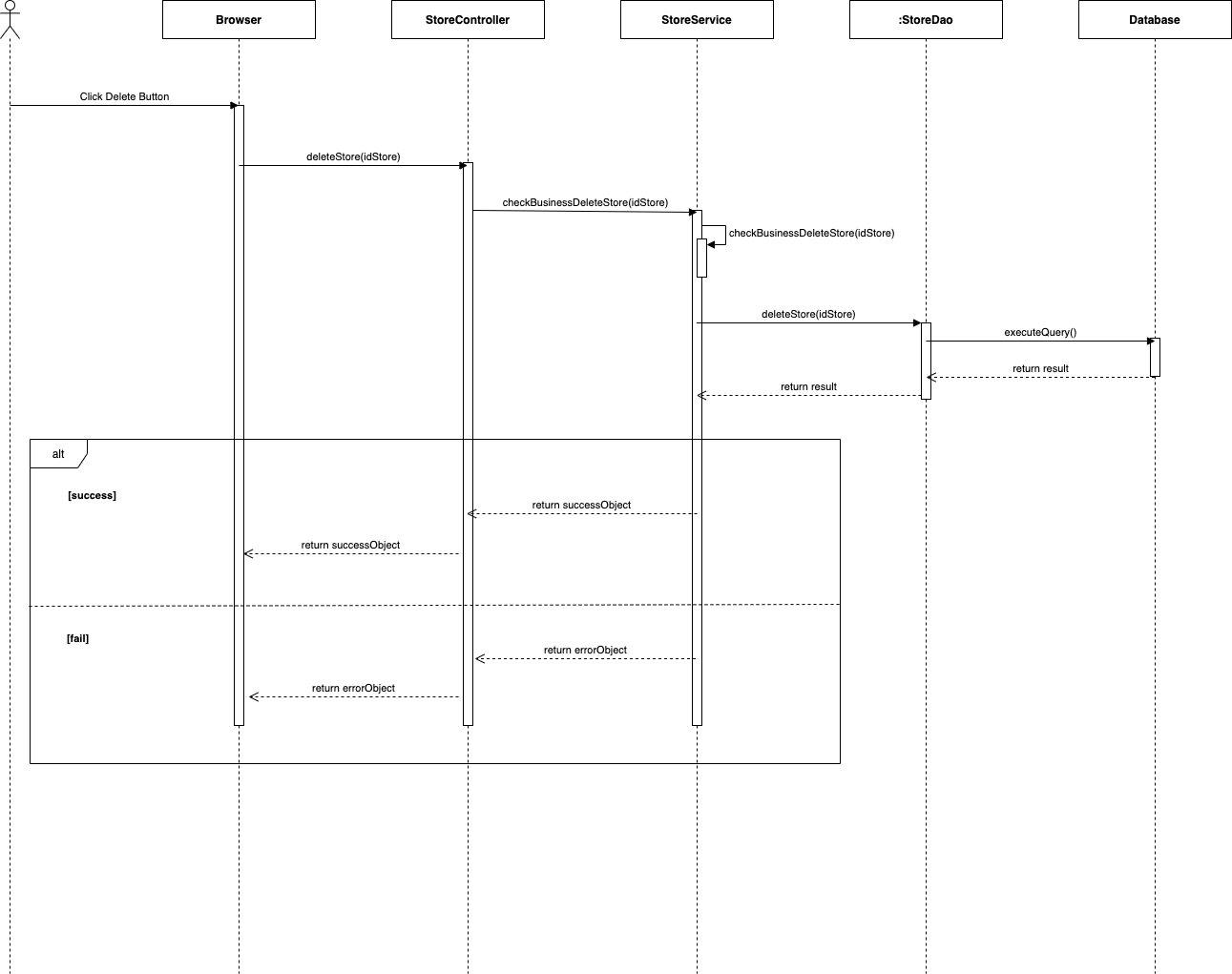
*Figure 1 - <Sequence Diagram> Get store detail*

###### c1.3 <Admin> Update the store



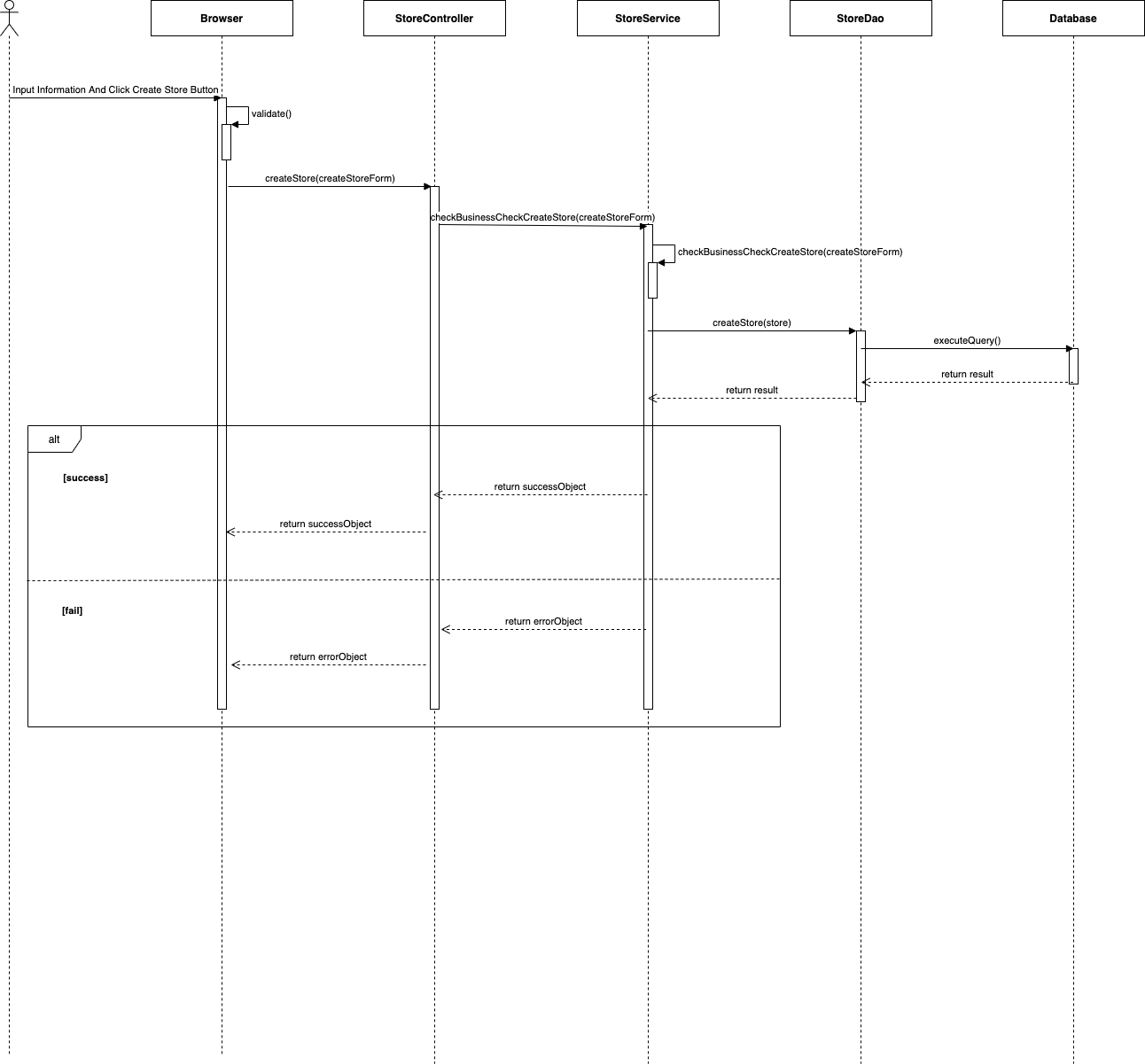
*Figure 1 - <Sequence Diagram> Update the store*

###### c1.4 <Admin> Delete the store



*Figure 1 - <Sequence Diagram> Delete the store*

###### c1.5 <Admin> Create the store



*Figure 1 - <Sequence Diagram> Create the store*

###### c1.6 <Admin> Get the managers

###### c1.7 <Admin> Get manager detail

###### c1.8 <Admin> Update the manager

###### c1.9 <Admin> Delete the manager

###### c1.10 <Admin> Create new manager

###### c1.11 <Admin> Update the product

###### c1.12 <Admin> Delete the product

###### c1.13 <Admin> Create new product

###### c1.14 <Admin> Update the camera

###### c1.15 <Admin> Delete the camera

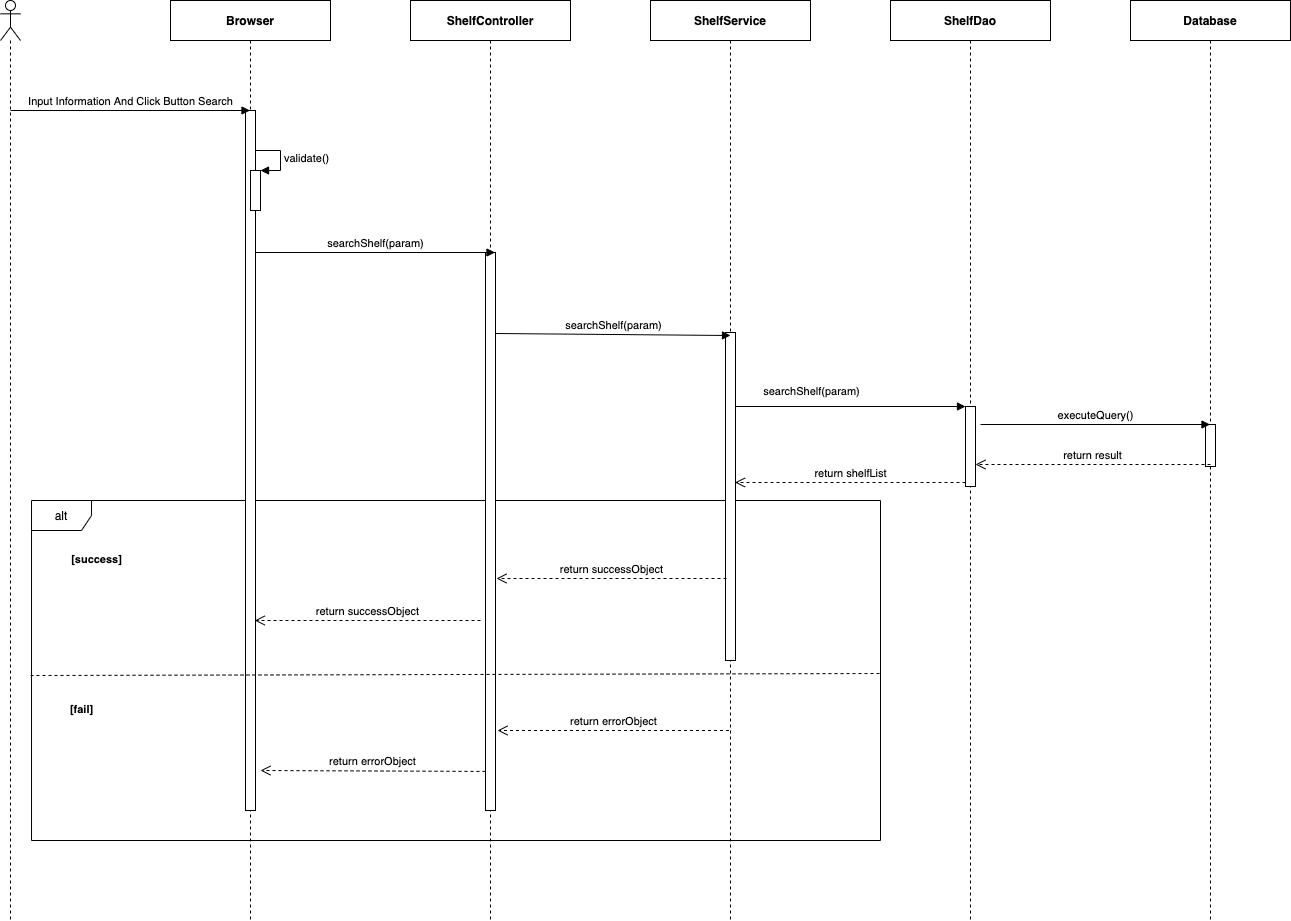
###### c1.16 <Admin> Create the camera

###### c1.17 <Admin> Update the category

###### c1.18 <Admin> Create new category

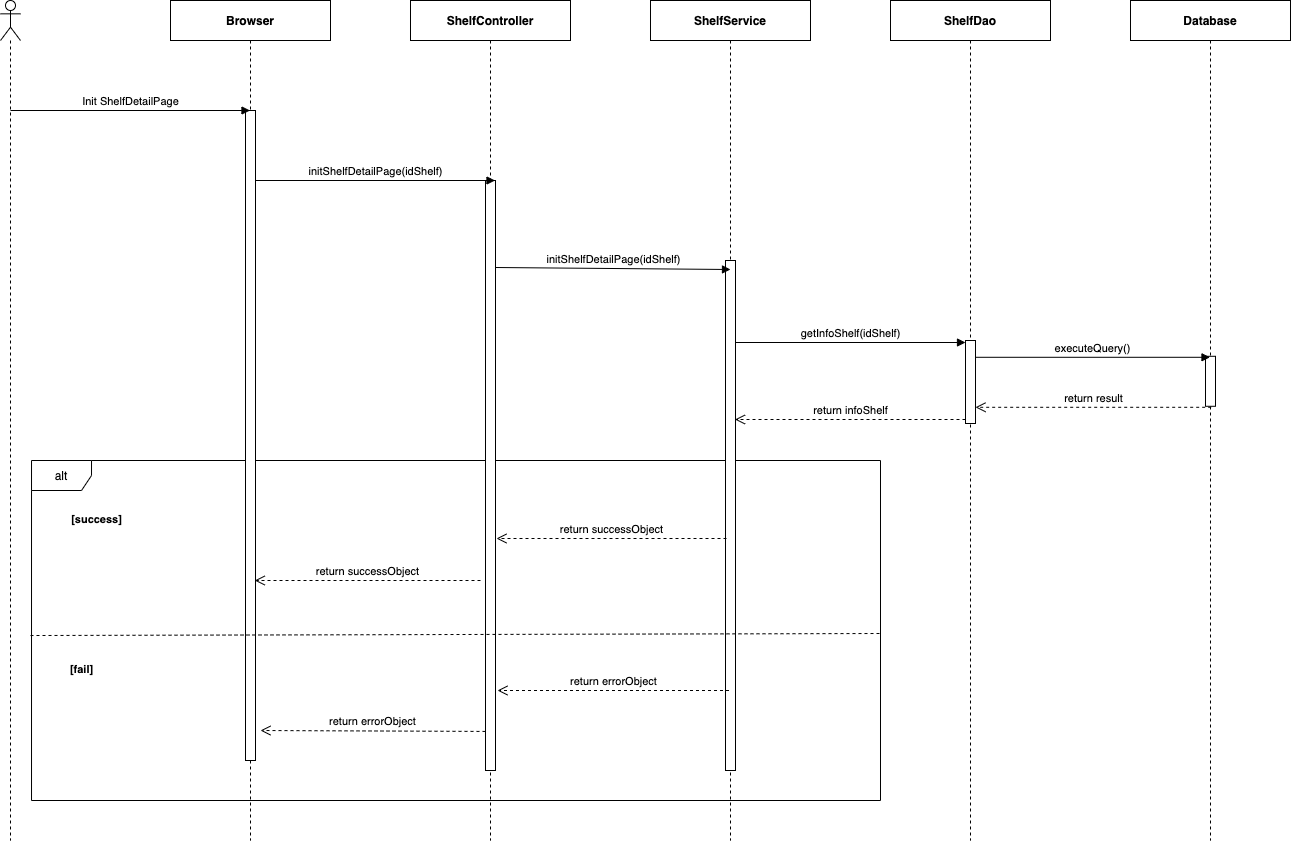
##### c2 <Manager> Sequence Diagram(s)

###### c2.1 <Manager> Get the shelves



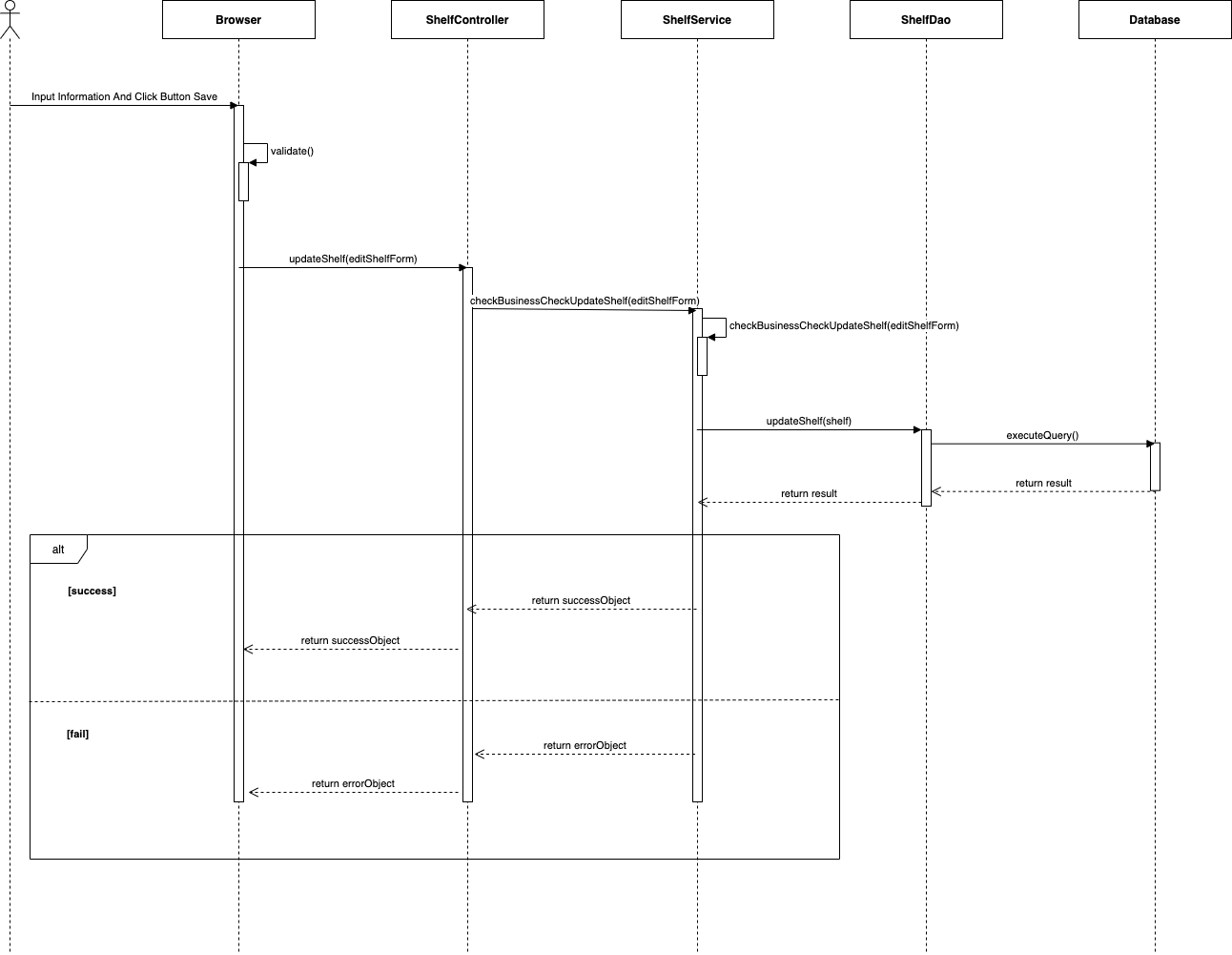
*Figure 1 - <Sequence Diagram> Get the shelves*

###### c2.2 <Manager > Get shelf detail



*Figure 1 - <Sequence Diagram> Get shelf detail*

###### c2.3 <Manager> Update the shelf



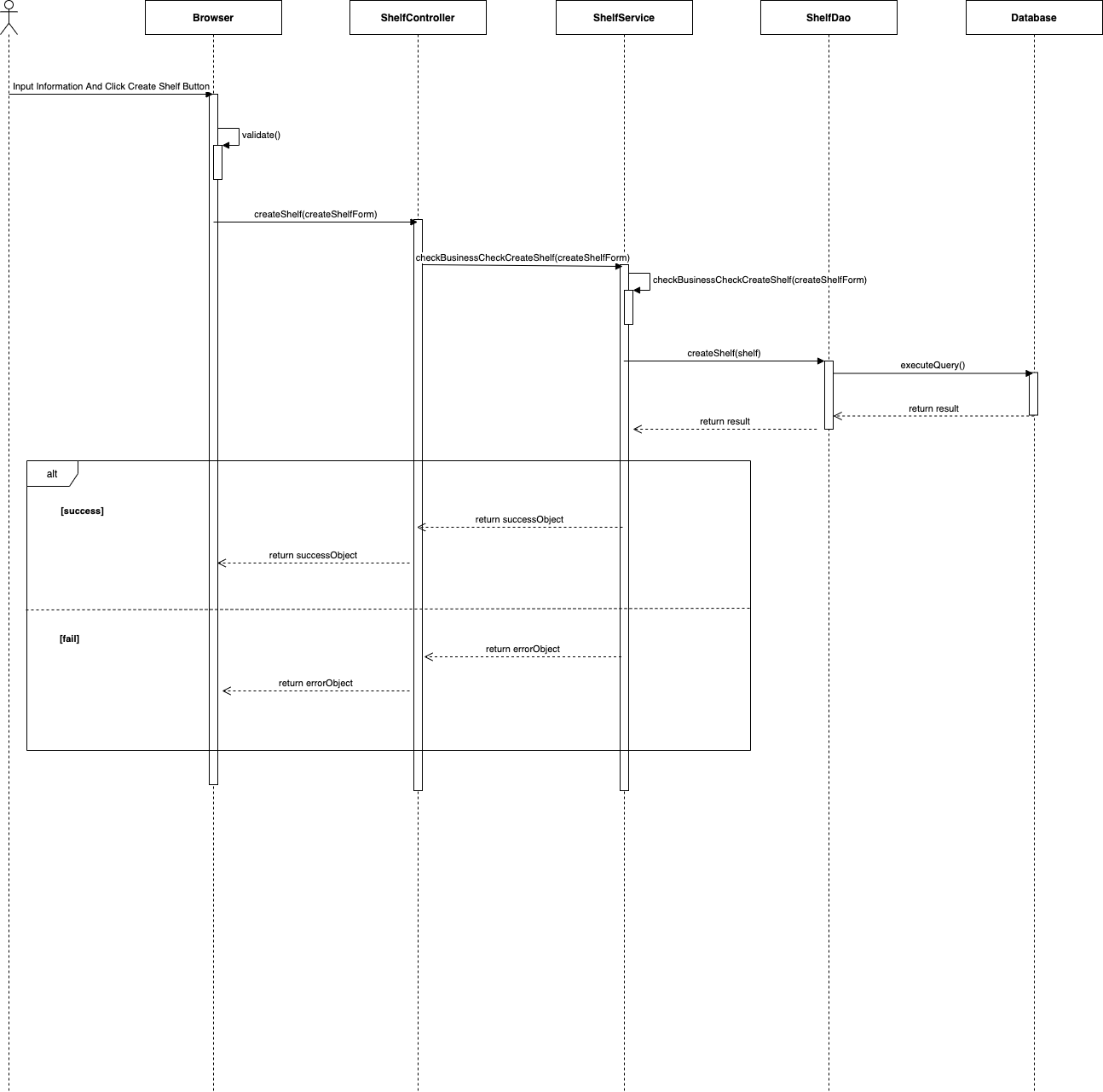
*Figure 1 - <Sequence Diagram> Update the shelf*

###### c2.4 <Manager> Delete the shelf



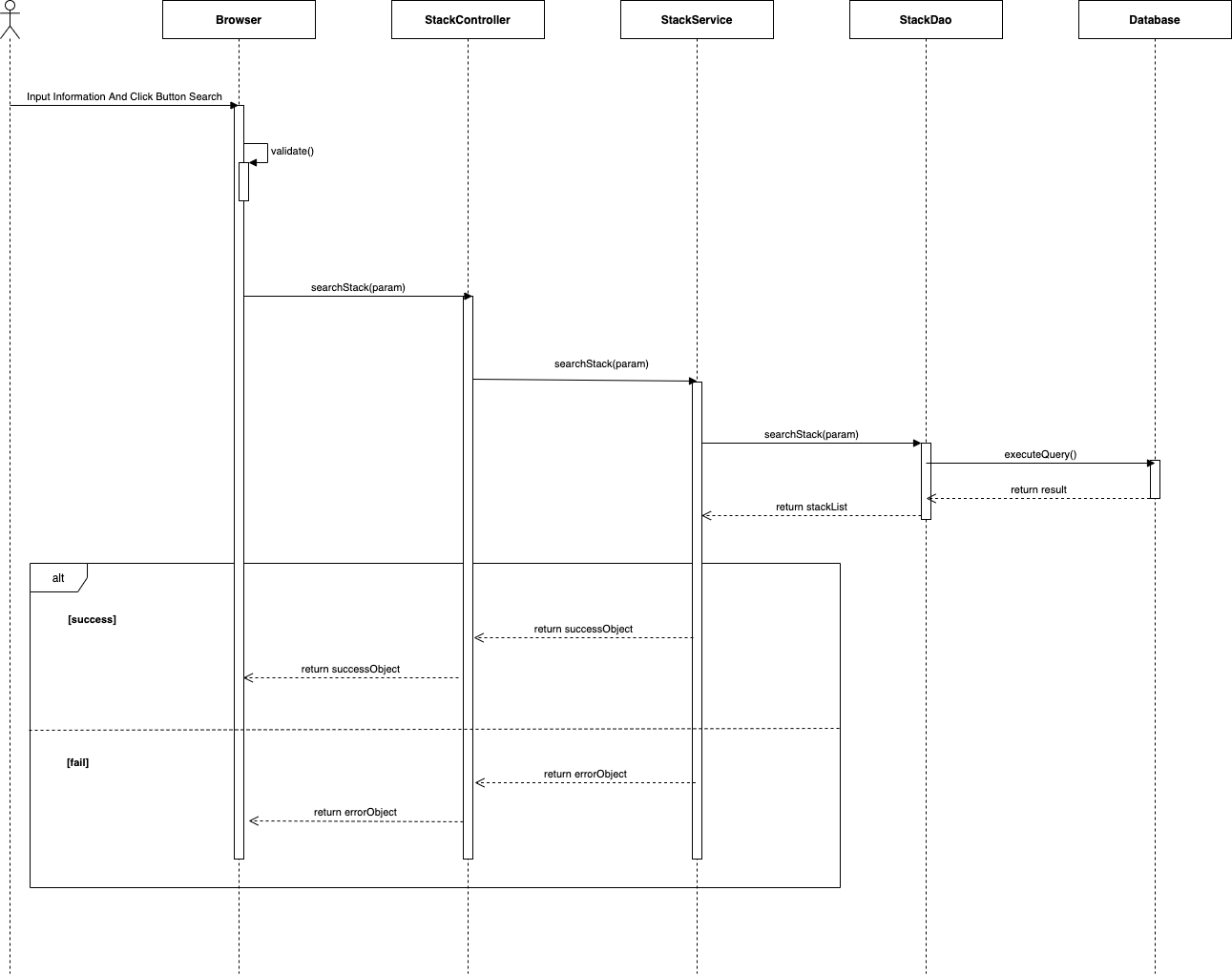
*Figure 1 - <Sequence Diagram> Delete the shelf*

###### c2.5 <Manager> Create new shelf



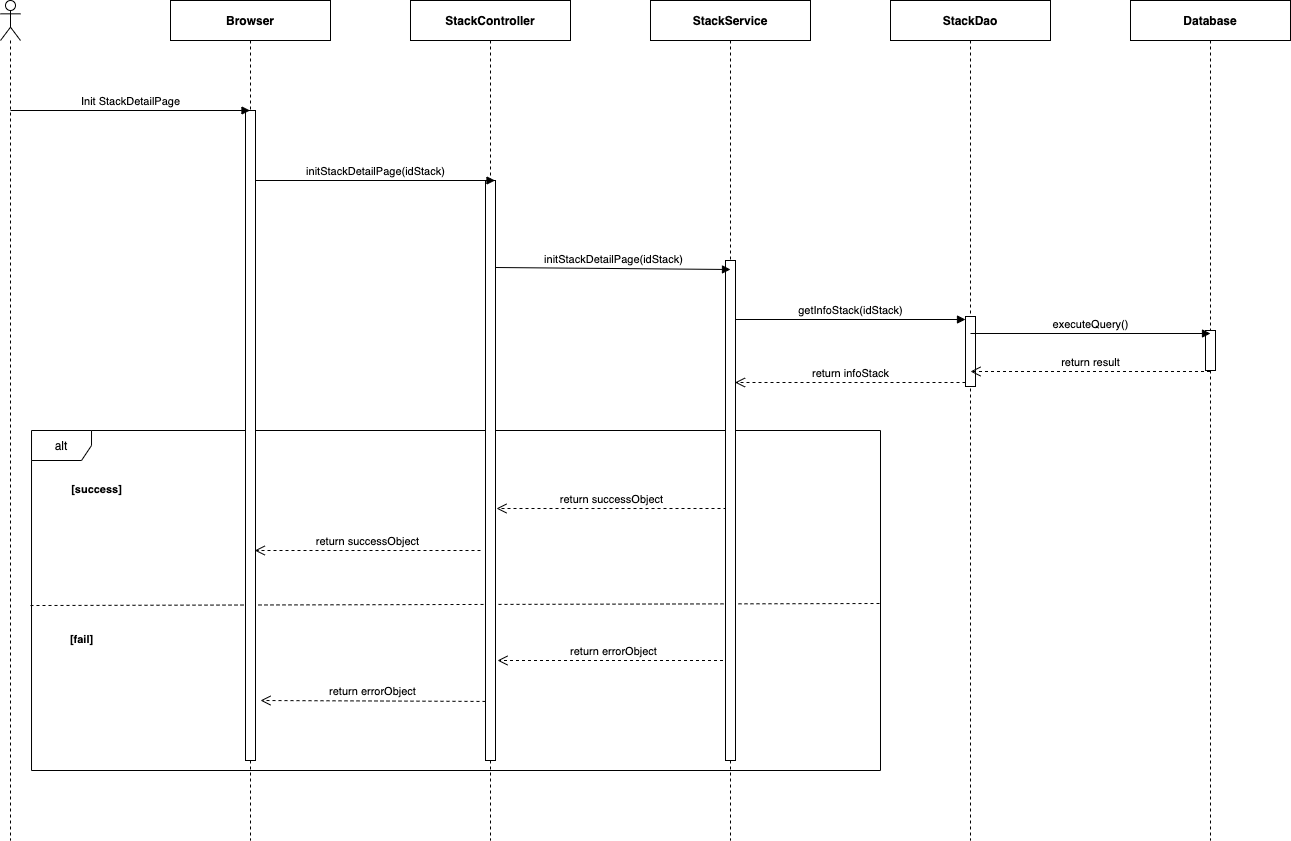
*Figure 1 - <Sequence Diagram> Create new shelf*

###### c2.6 <Manager> Get the stacks



*Figure 1 - <Sequence Diagram> Get the stacks*

###### c2.7 <Manager > Get stack detail



*Figure 1 - <Sequence Diagram> Get stack detail*

###### c2.8 <Manager> Update the stack



*Figure 1 - <Sequence Diagram> Update the stack*

###### c2.9 <Manager> Delete the stack

###### c2.10 <Manager> Create new stack

*Figure 1 - <Sequence Diagram> Create new stack*

##### c3 <Authenticated User> Sequence Diagram(s)

###### c3.1 <Authenticated User> Logout

###### c3.2 <Authenticated User> Change account's password

###### c3.3 <Authenticated User> Get the report

###### c3.4 <Authenticated User> Export the report

###### c3.5 <Authenticated User> Get the video

###### c3.6 <Authenticated User> Get the products

###### c3.7 <Authenticated User> Get product detail

###### c3.8 <Authenticated User> Get the categories

###### c3.9 <Authenticated User> Get category detail

###### c3.10 <Authenticated User> Get camera detail

###### c3.11 <Authenticated User> Get the cameras

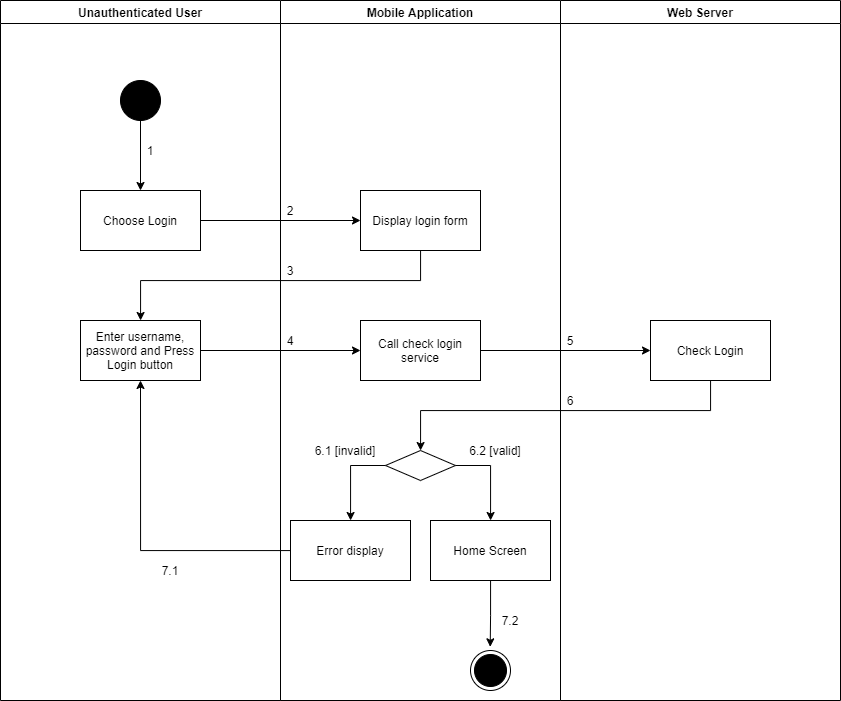
##### c4 <Unauthenticated User> Sequence Diagram(s)

###### c4.1 <Unauthenticated User> Login by account

### 3.4 Activity Diagram(s)

##### d1 <Unauthenticated User> Activity Diagram(s)

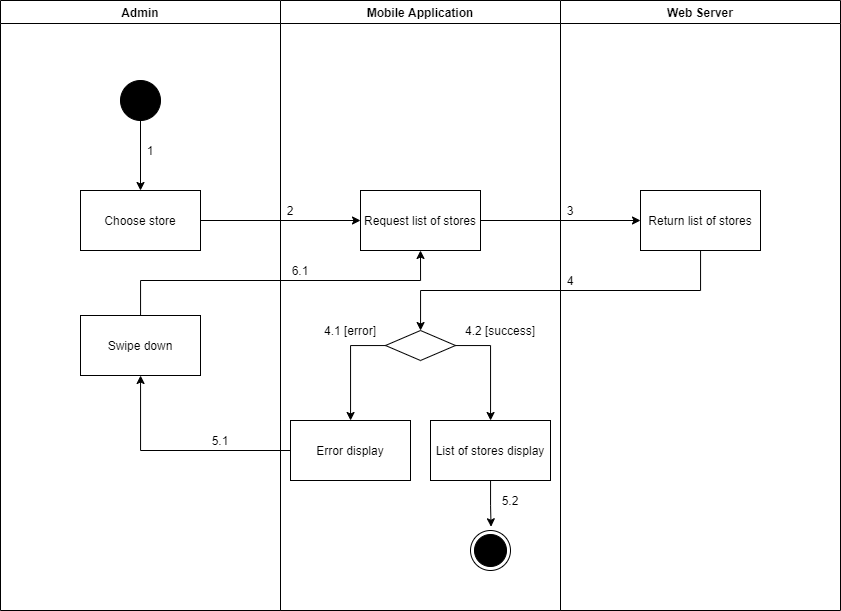
###### d1.1 <Unauthenticated User> Login by account



*Figure 1 - <Activity Diagram> Login by account*

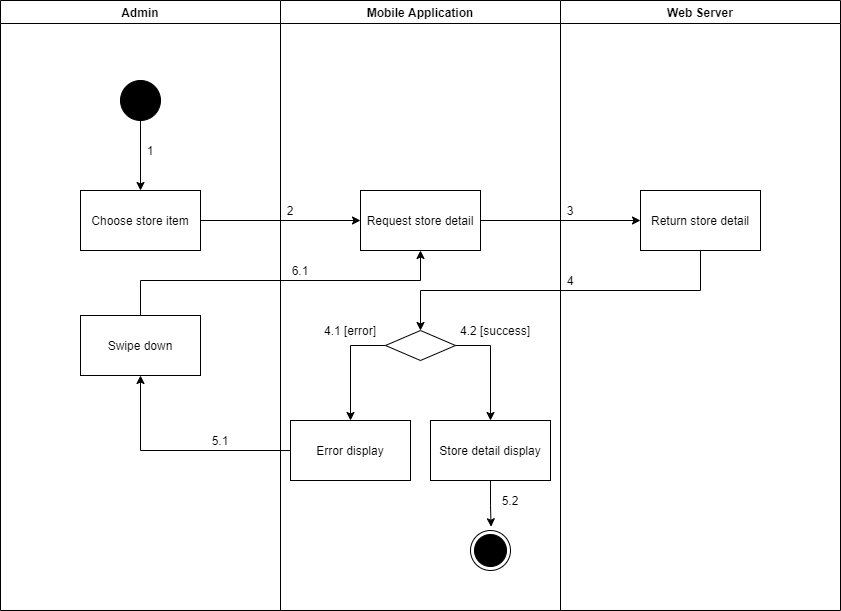
##### d2 <Admin> Activity Diagram(s)

###### d2.1 <Admin> Get the stores



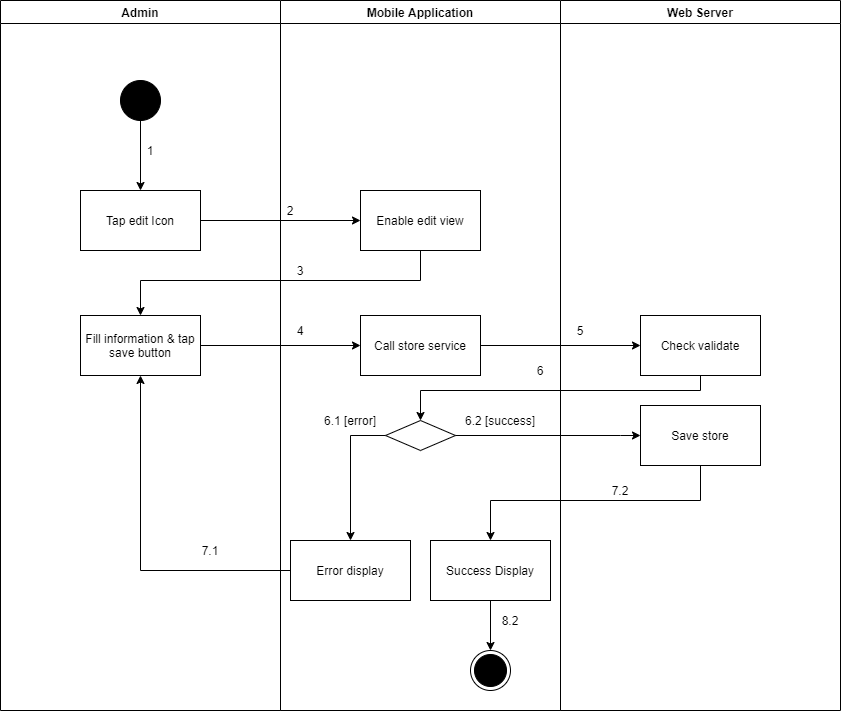
*Figure 1 - <Activity Diagram> Get the stores*

###### d2.2 <Admin> Get store detail



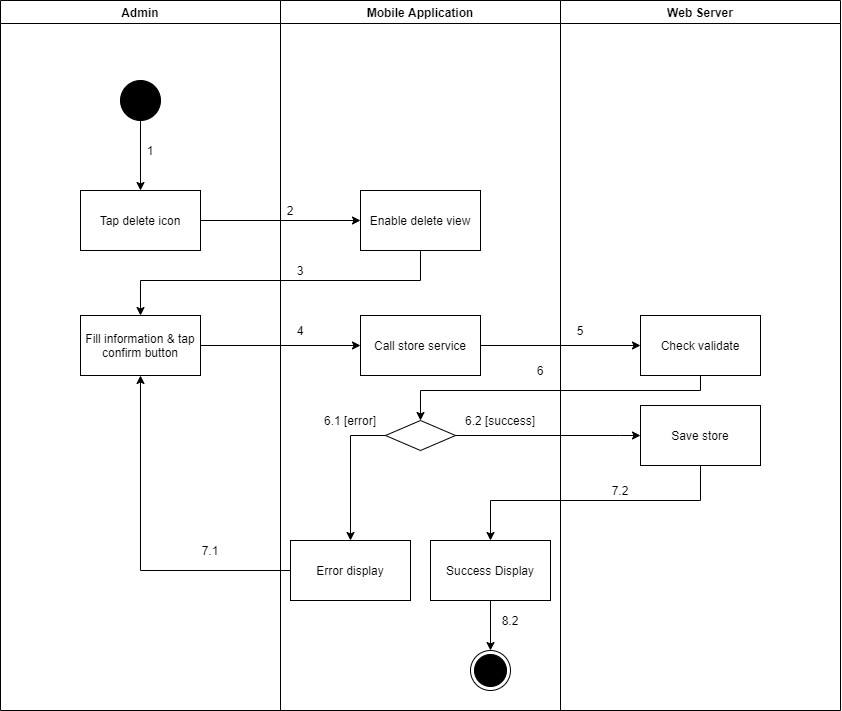
*Figure 1 - <Activity Diagram> Get store detail*

###### d2.3 <Admin> Update the store



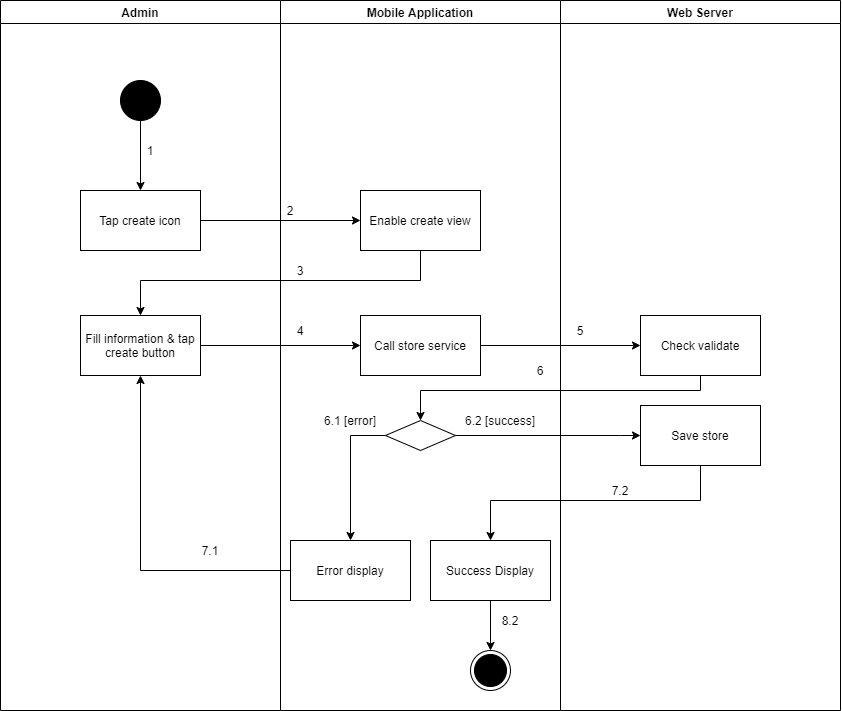
*Figure 1 - <Activity Diagram> Update the store*

###### d2.4 <Admin> Delete the stores



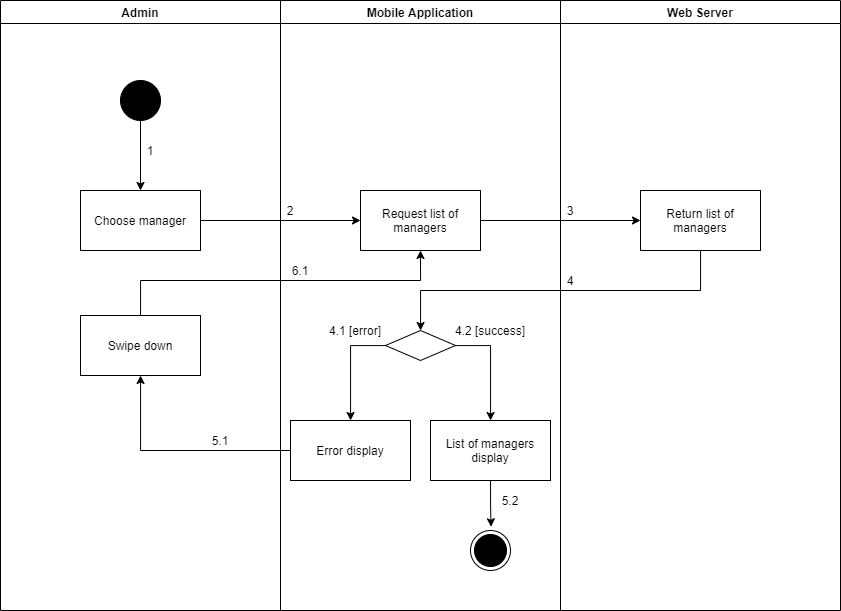
*Figure 1 - <Activity Diagram> Delete the stores*

###### d2.5 <Admin> Create new stores



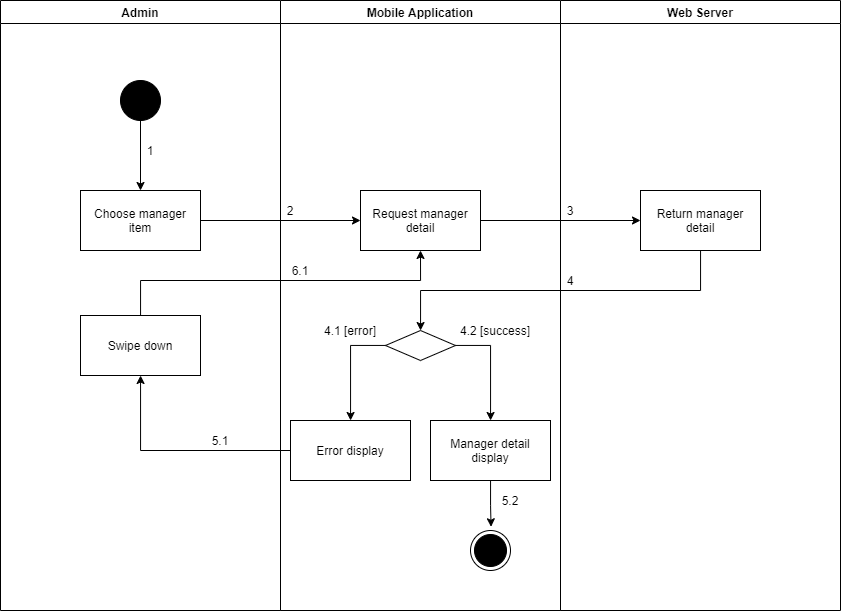
*Figure 1 - <Activity Diagram> Create new stores*

###### d2.6 <Admin> Get the managers



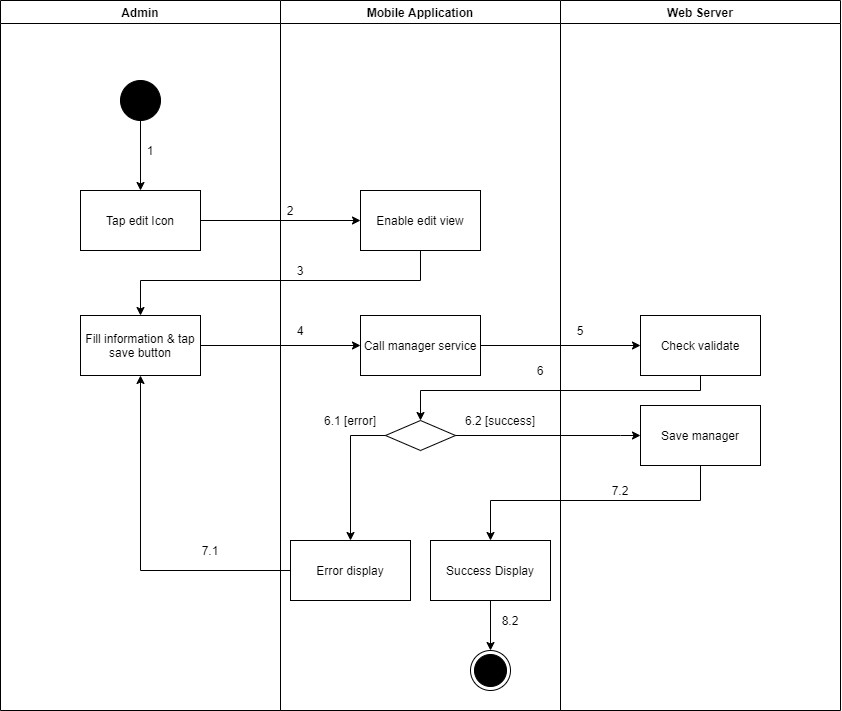
*Figure 1 - <Activity Diagram> Get the managers*

###### d2.7 <Admin> Get manager detail



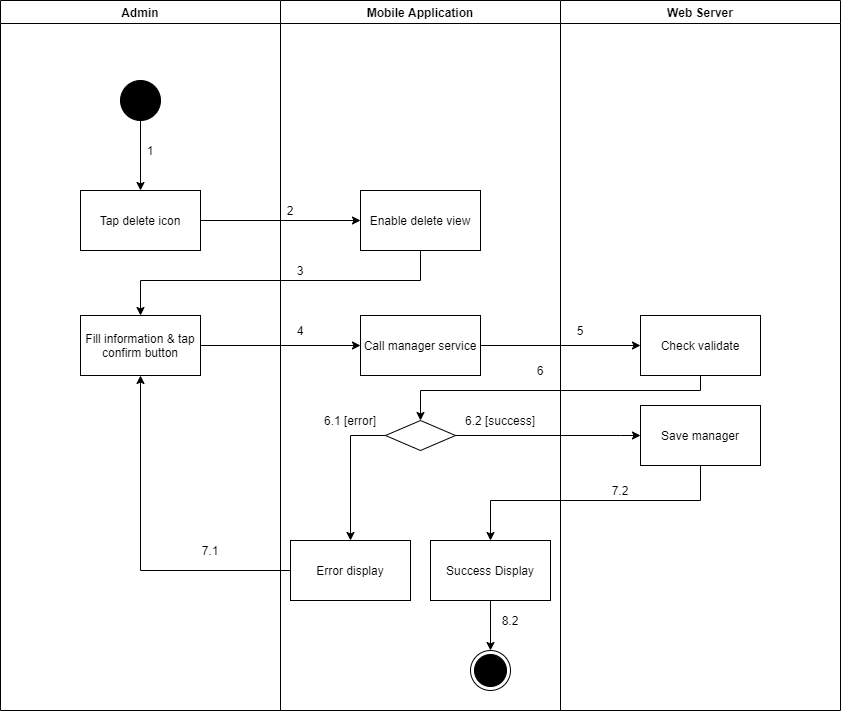
*Figure 1 - <Activity Diagram> Get manager detail*

###### d2.8 <Admin> Update the stores



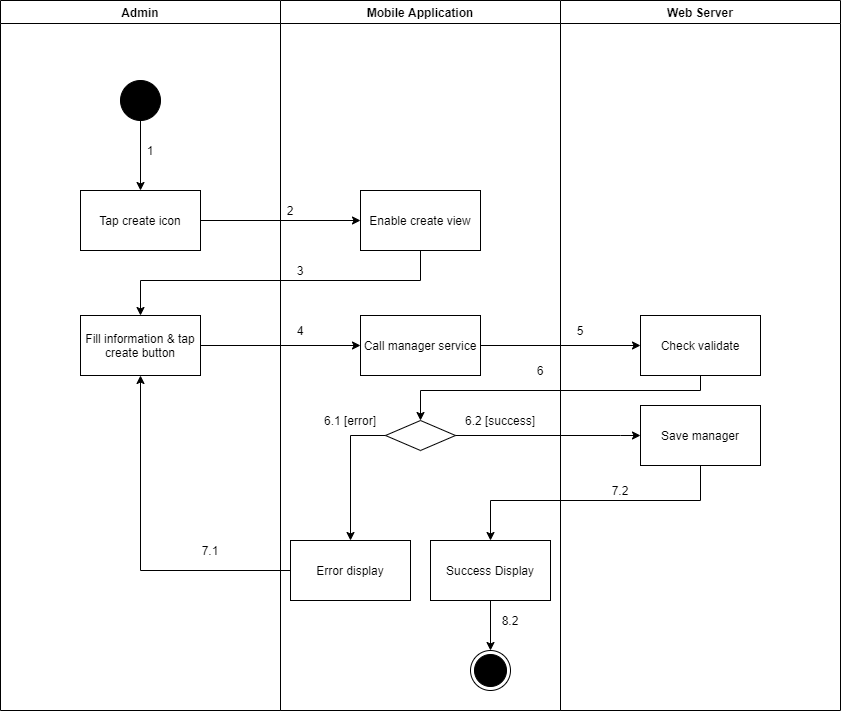
*Figure 1 - <Activity Diagram> Update the stores*

###### d2.9 <Admin> Delete the stores



*Figure 1 - <Activity Diagram> Delete the stores*

###### d2.10 <Admin> Create new stores



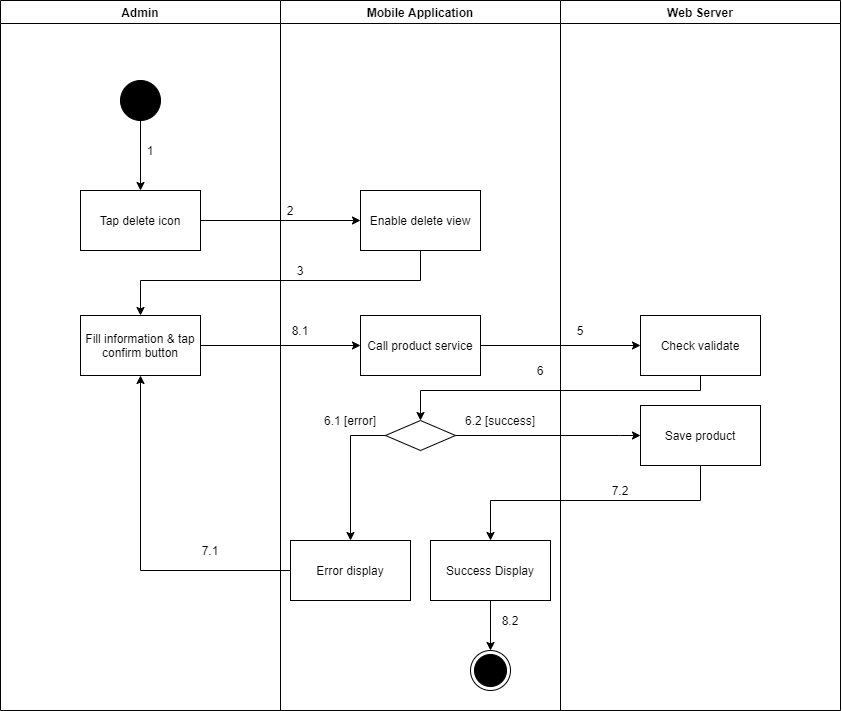
*Figure 1 - <Activity Diagram> Create new stores*

###### d2.11 <Admin> Update the product



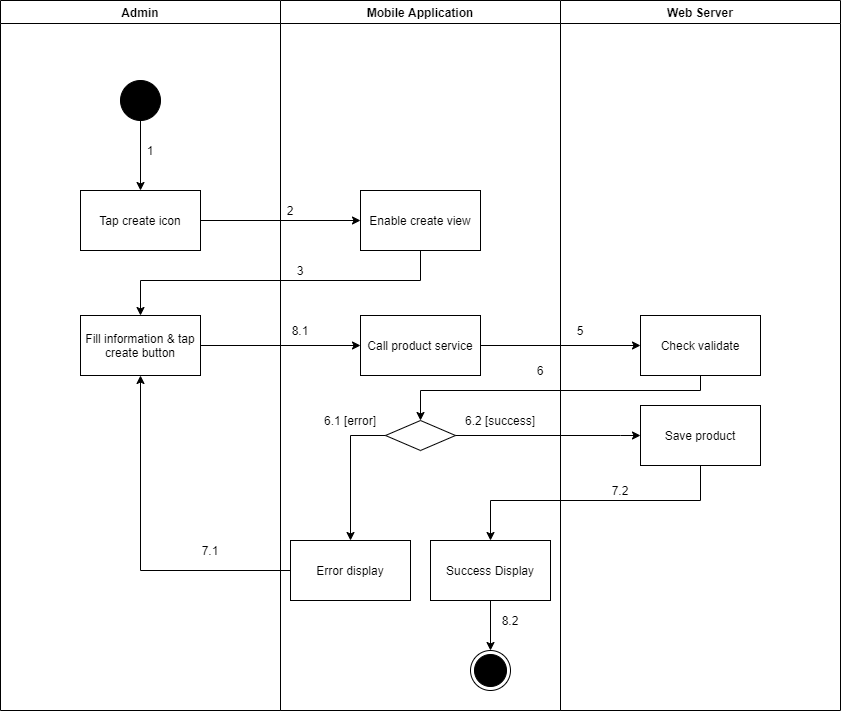
*Figure 1 - <Activity Diagram> Update the product*

###### d2.12 <Admin> Delete the product



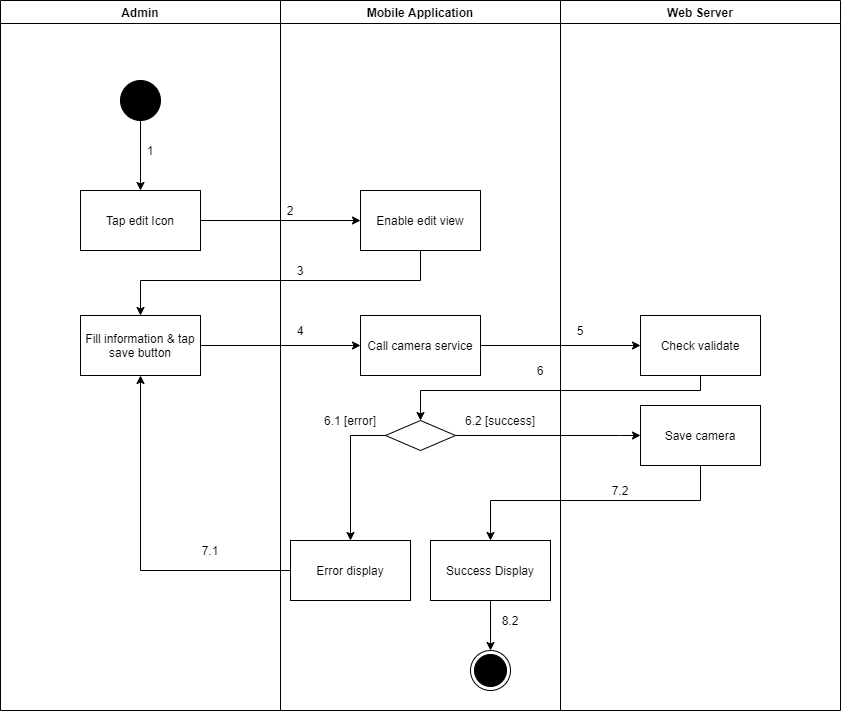
*Figure 1 - <Activity Diagram> Delete the product*

###### d2.13 <Admin> Create new product



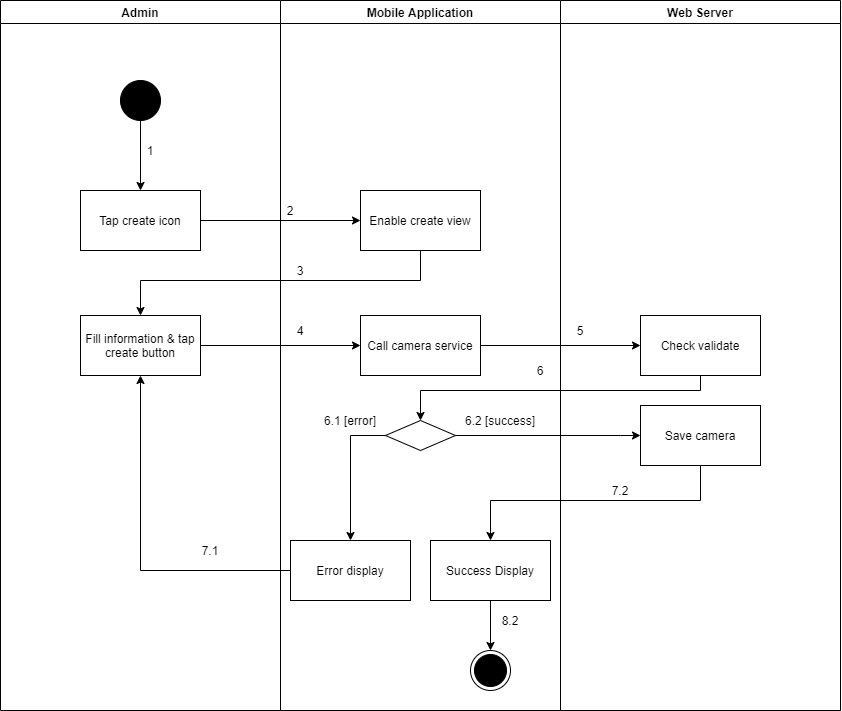
*Figure 1 - <Activity Diagram> Create new product*

###### d2.14 <Admin> Update the camera



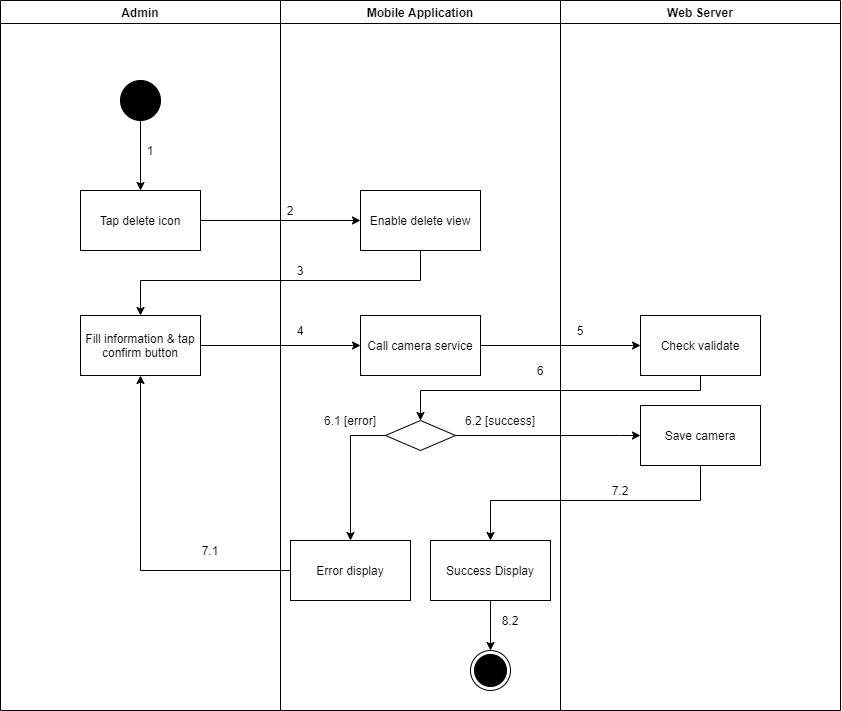
*Figure 1 - <Activity Diagram> Update the camera*

###### d2.15 <Admin> Create new camera



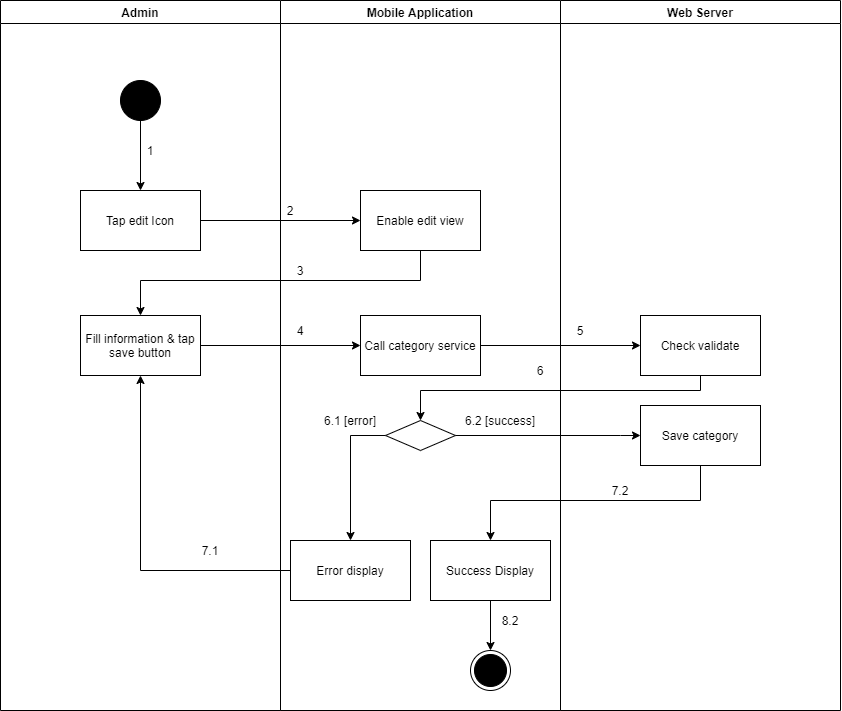
*Figure 1 - <Activity Diagram> Create new camera*

###### d2.16 <Admin> Delete the camera



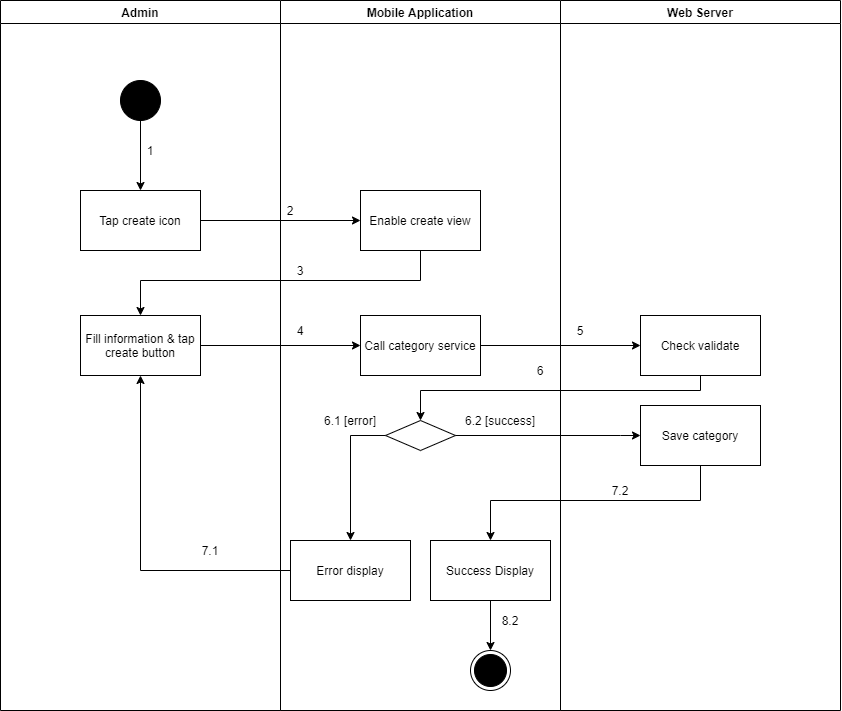
*Figure 1 - <Activity Diagram> Delete the camera*

###### d2.17 <Admin> Update the category



*Figure 1 - <Activity Diagram> Update the category*

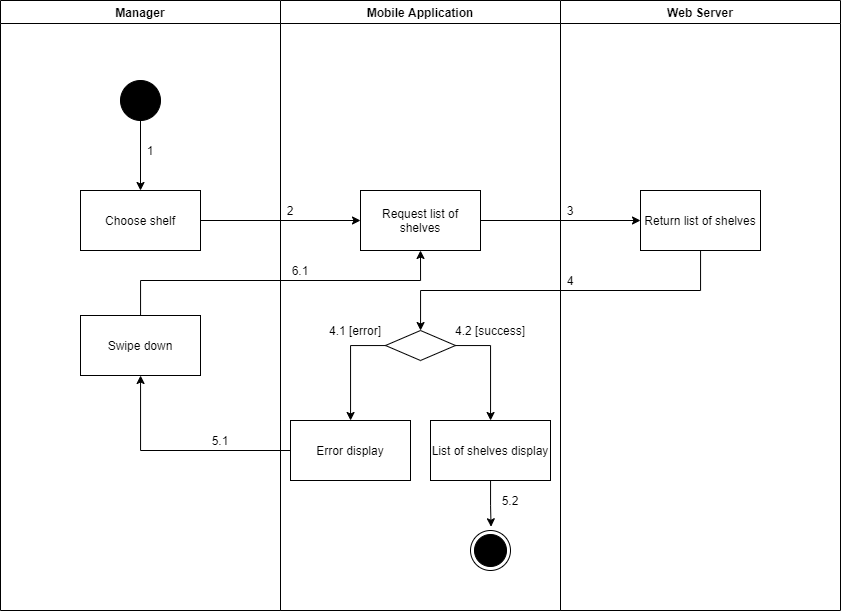
###### d2.18 <Admin> Create new category



*Figure 1 - <Activity Diagram> Create new category*

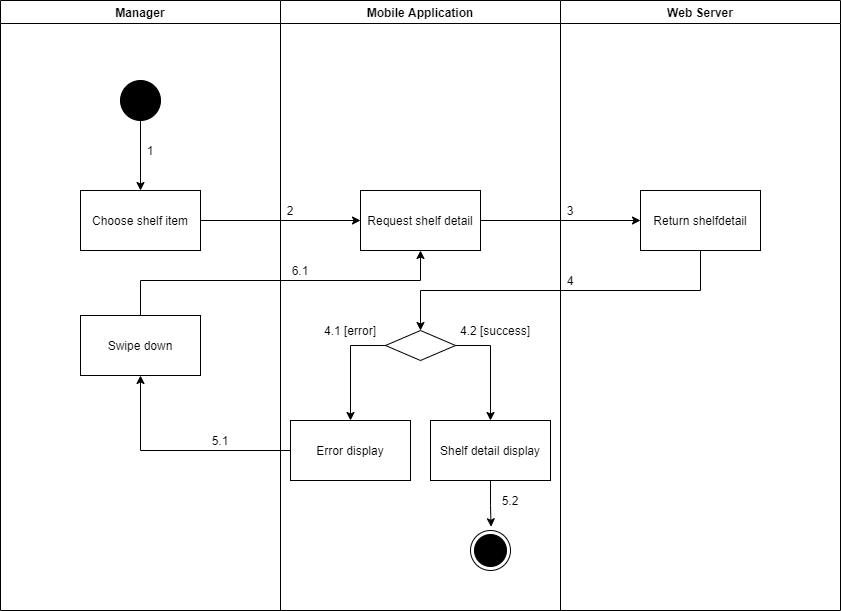
##### d3 <Manager> Activity Diagram(s)

###### d3.1 <Manager> Get the shelve



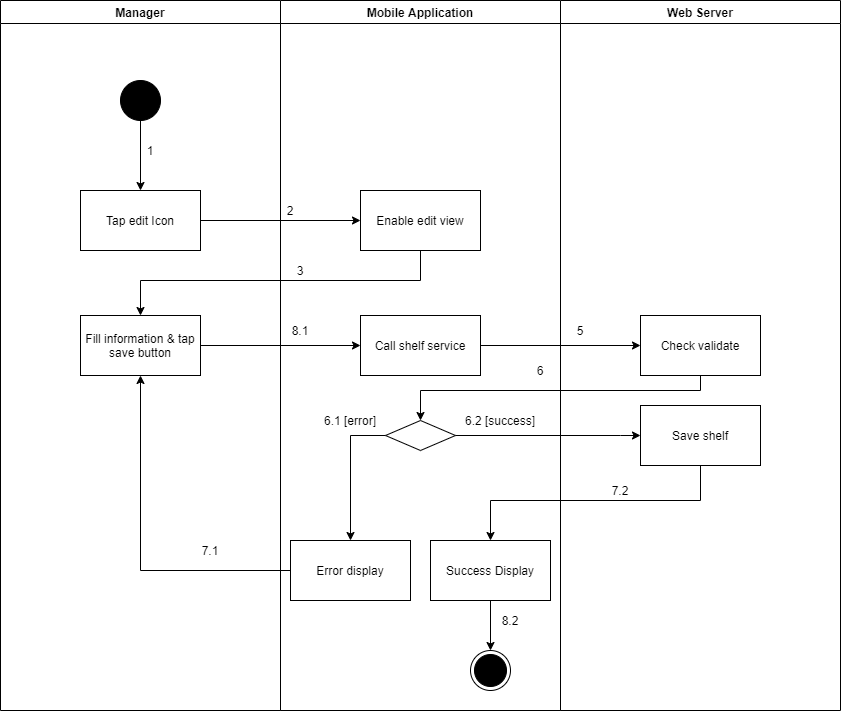
*Figure 1 - <Activity Diagram> Get the shelve*

###### d3.2 <Manager> Get shelf detail



*Figure 1 - <Activity Diagram> Get shelf detail*

###### d3.3 <Manager> Update the shelf



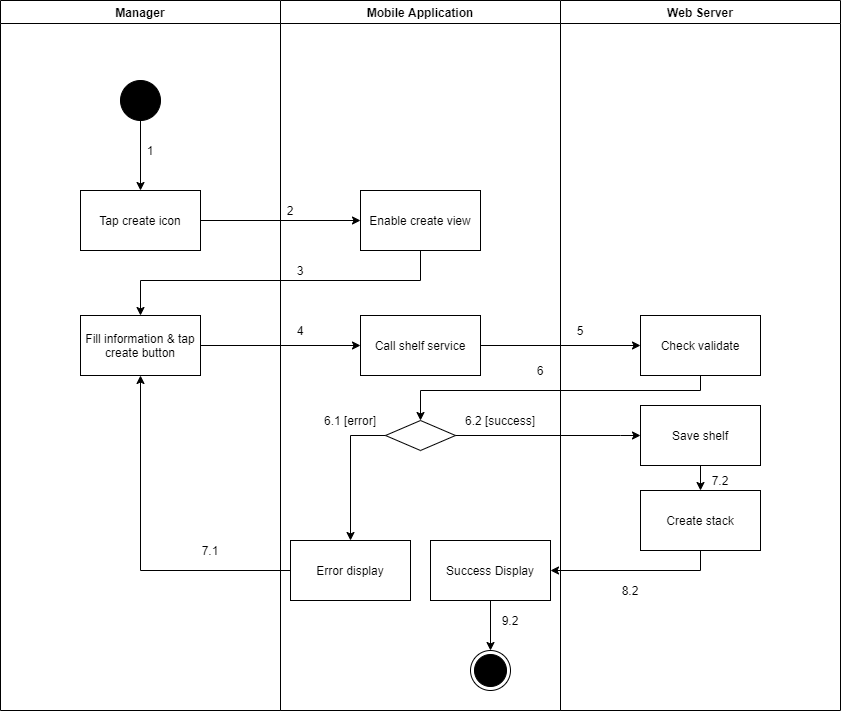
*Figure 1 - <Activity Diagram> Update the shelf*

###### d3.4 <Manager> Delete the shelf



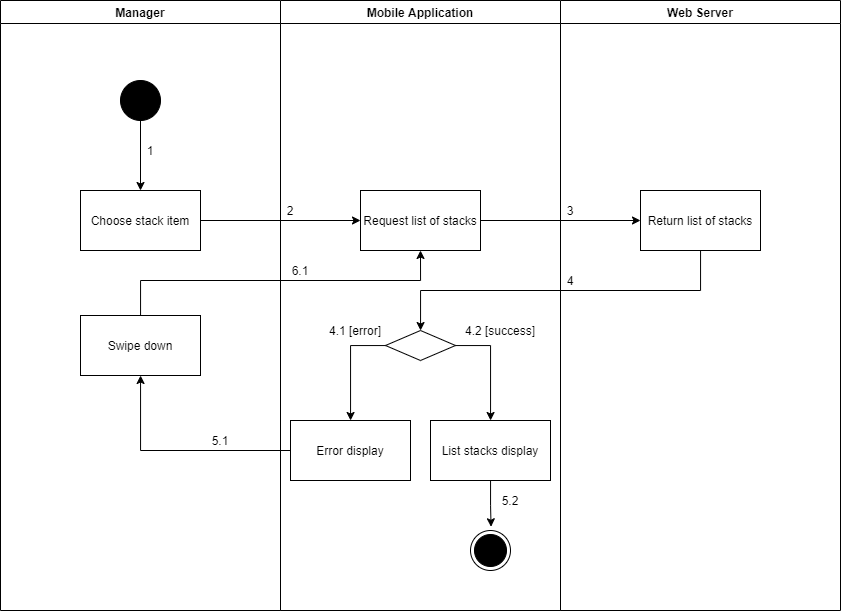
*Figure 1 - <Activity Diagram> Delete the shelf*

###### d3.5 <Manager> Create new shelf



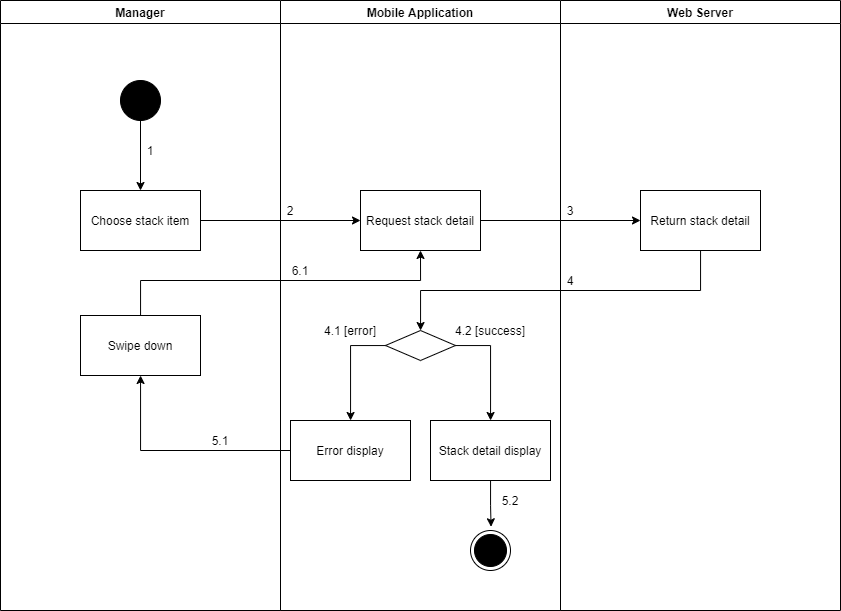
*Figure 1 - <Activity Diagram> Create new shelf*

###### d3.6 <Manager> Get the stacks



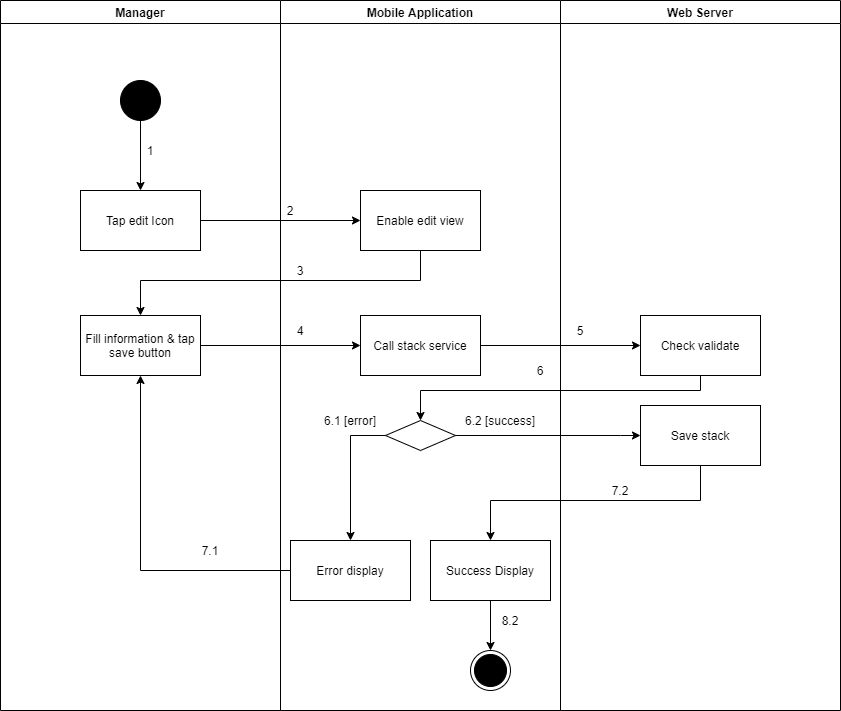
*Figure 1 - <Activity Diagram> Get the stacks*

###### d3.7 <Manager> Get stack detail



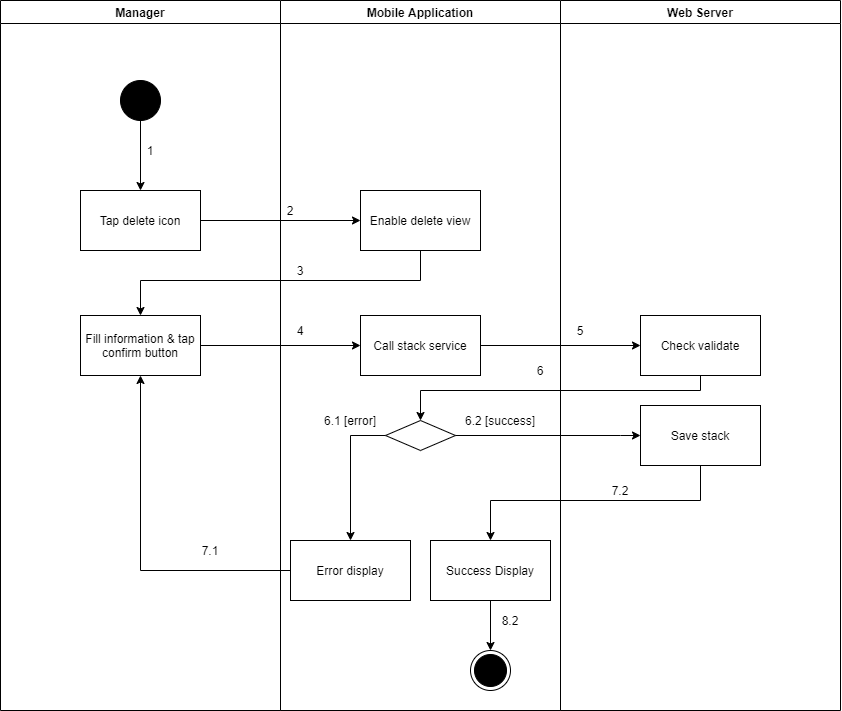
*Figure 1 - <Activity Diagram> Get stack detail*

###### d3.8 <Manager> Update the stack



*Figure 1 - <Activity Diagram> Update the stack*

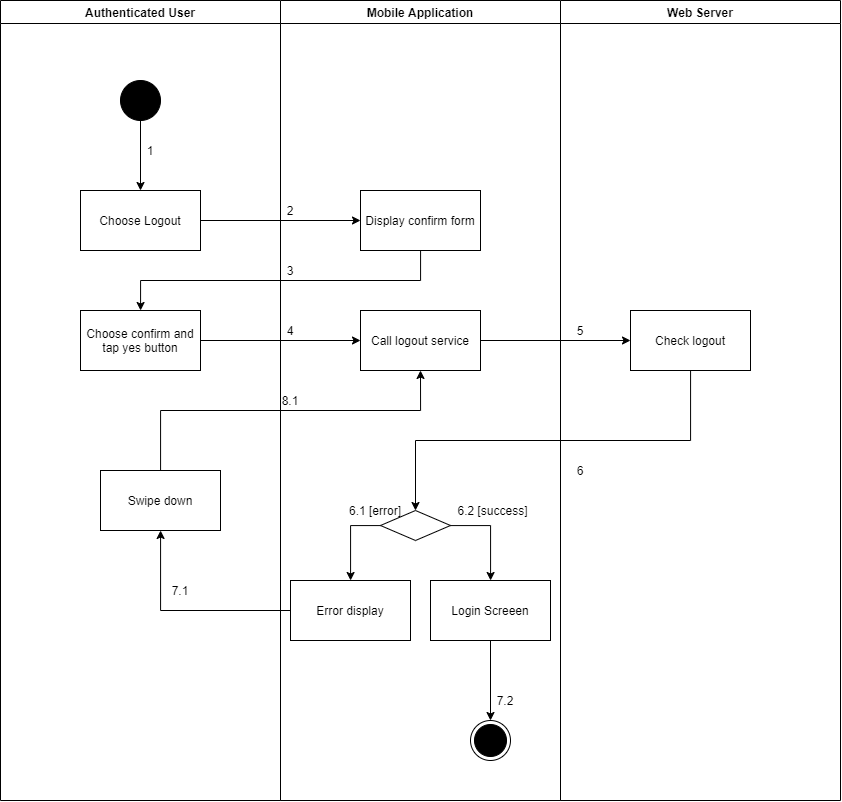
###### d3.9 <Manager> Delete the stack



*Figure 1 - <Activity Diagram> Delete the stack*

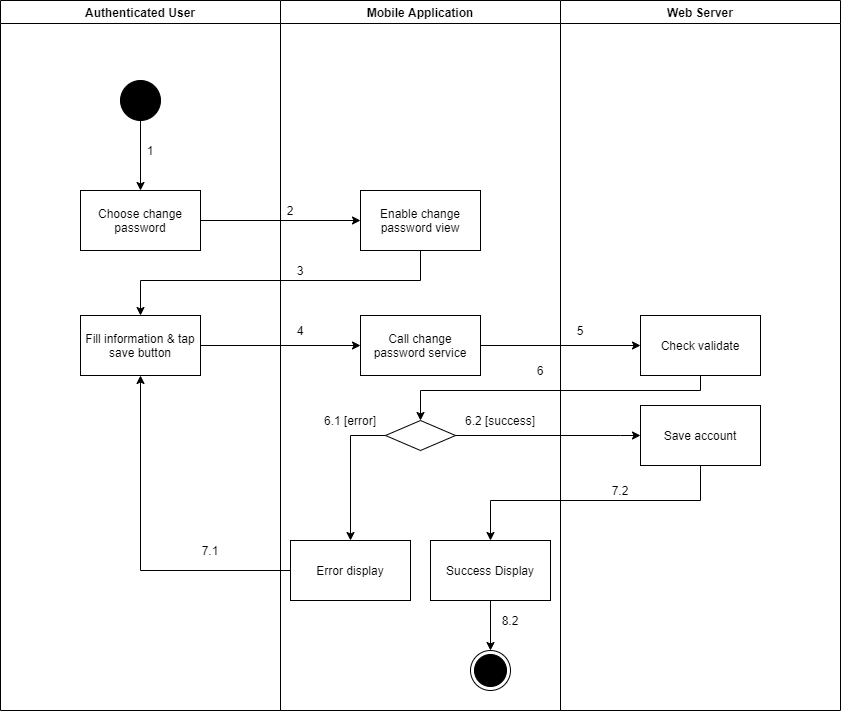
##### d4 <Authenticated User> Activity Diagram(s)

###### d4.1 <Authenticated User> Logout



*Figure 1 - <Activity Diagram> Logout*

###### d4.2 <Authenticated User> Change account's password



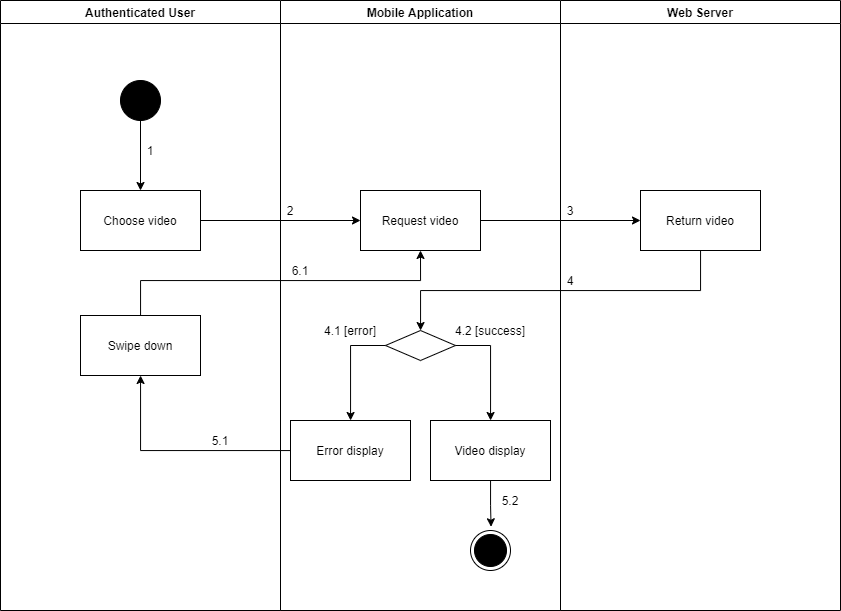
*Figure 1 - <Activity Diagram> Change account's password*

###### d4.3 <Authenticated User> Get the report



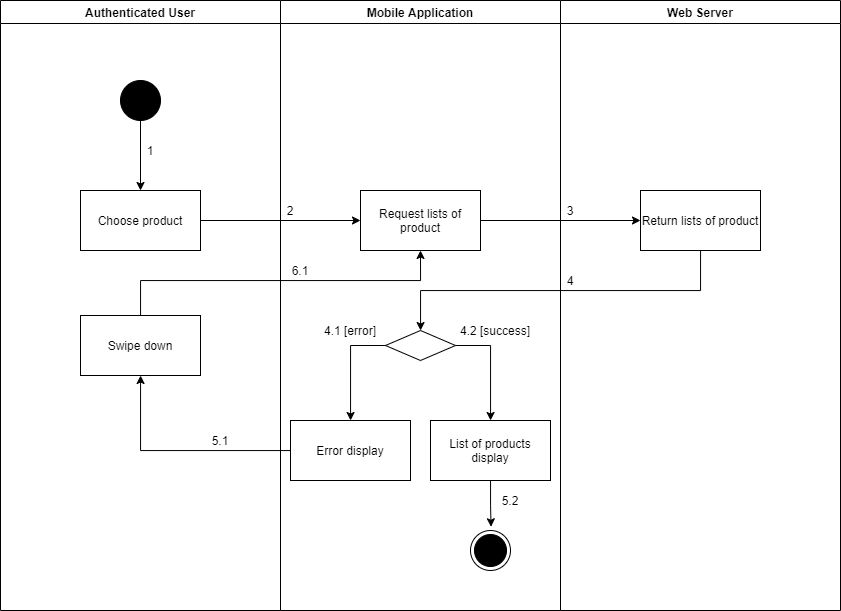
*Figure 1 - <Activity Diagram> Get the report*

###### d4.5 <Authenticated User> Get the video



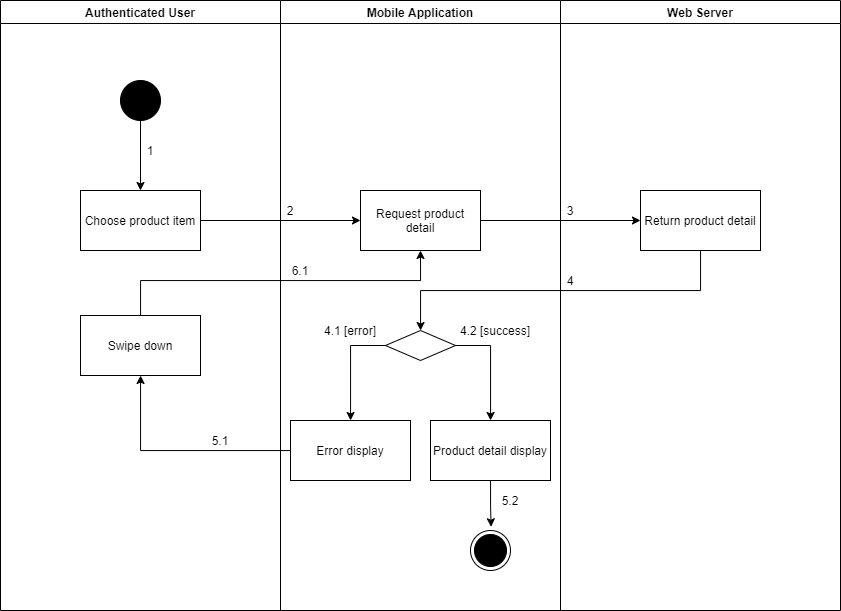
*Figure 1 - <Activity Diagram> Get the video*

###### d4.6 <Authenticated User> Get the products



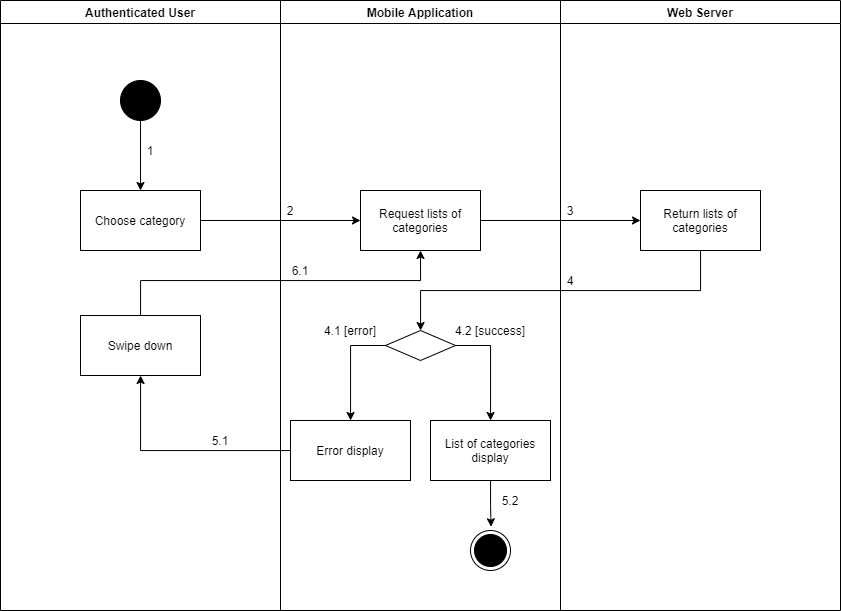
*Figure 1 - <Activity Diagram> Get the products*

###### d4.7 <Authenticated User> Get product detail



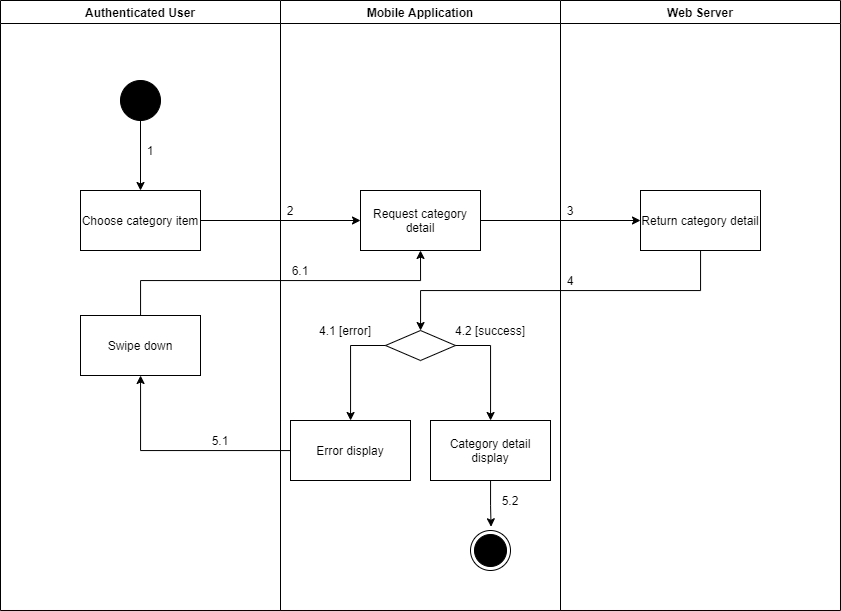
*Figure 1 - <Activity Diagram> Get product detail*

###### d4.8 <Authenticated User> Get the categories



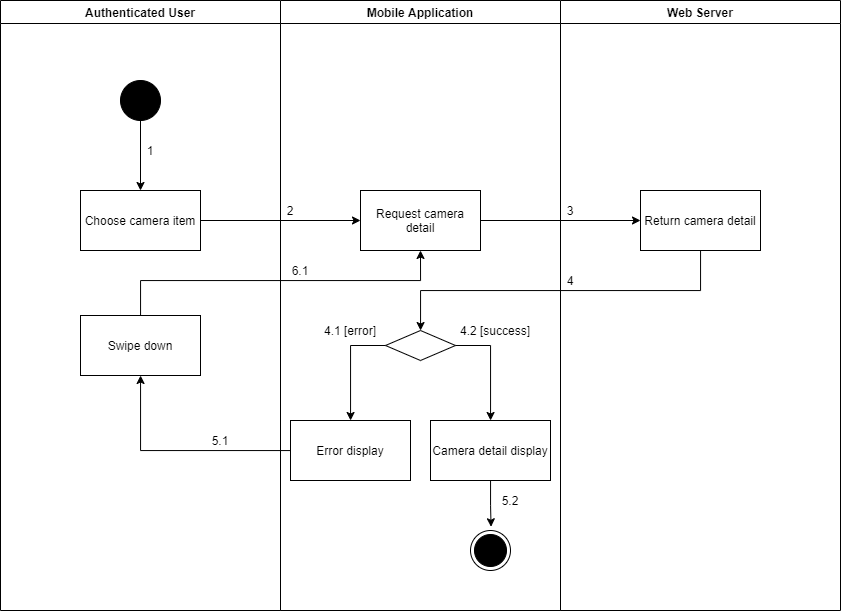
*Figure 1 - <Activity Diagram> Get the categories*

###### d4.9 <Authenticated User> Get category detail



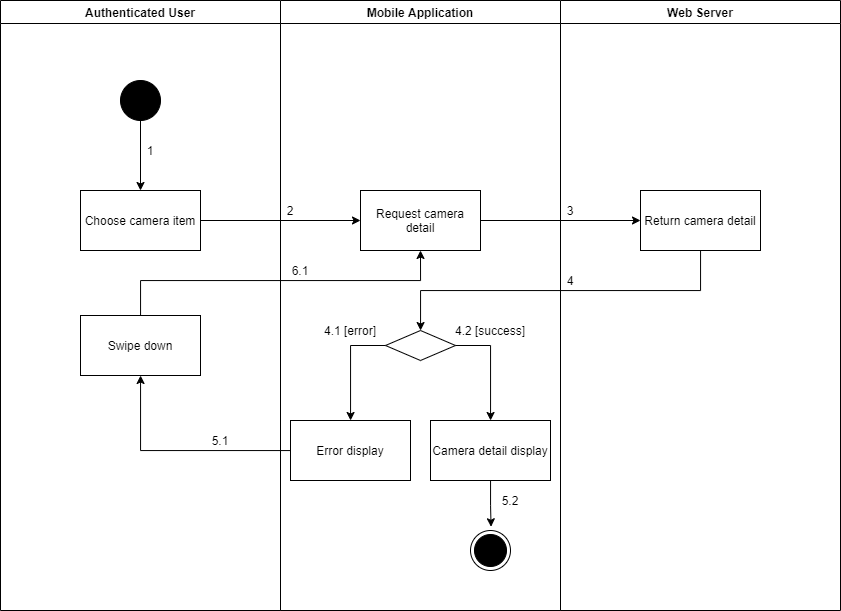
*Figure 1 - <Activity Diagram> Get category detail*

###### d4.10 <Authenticated User> Get camera detail



*Figure 1 - <Activity Diagram> Get camera detail*

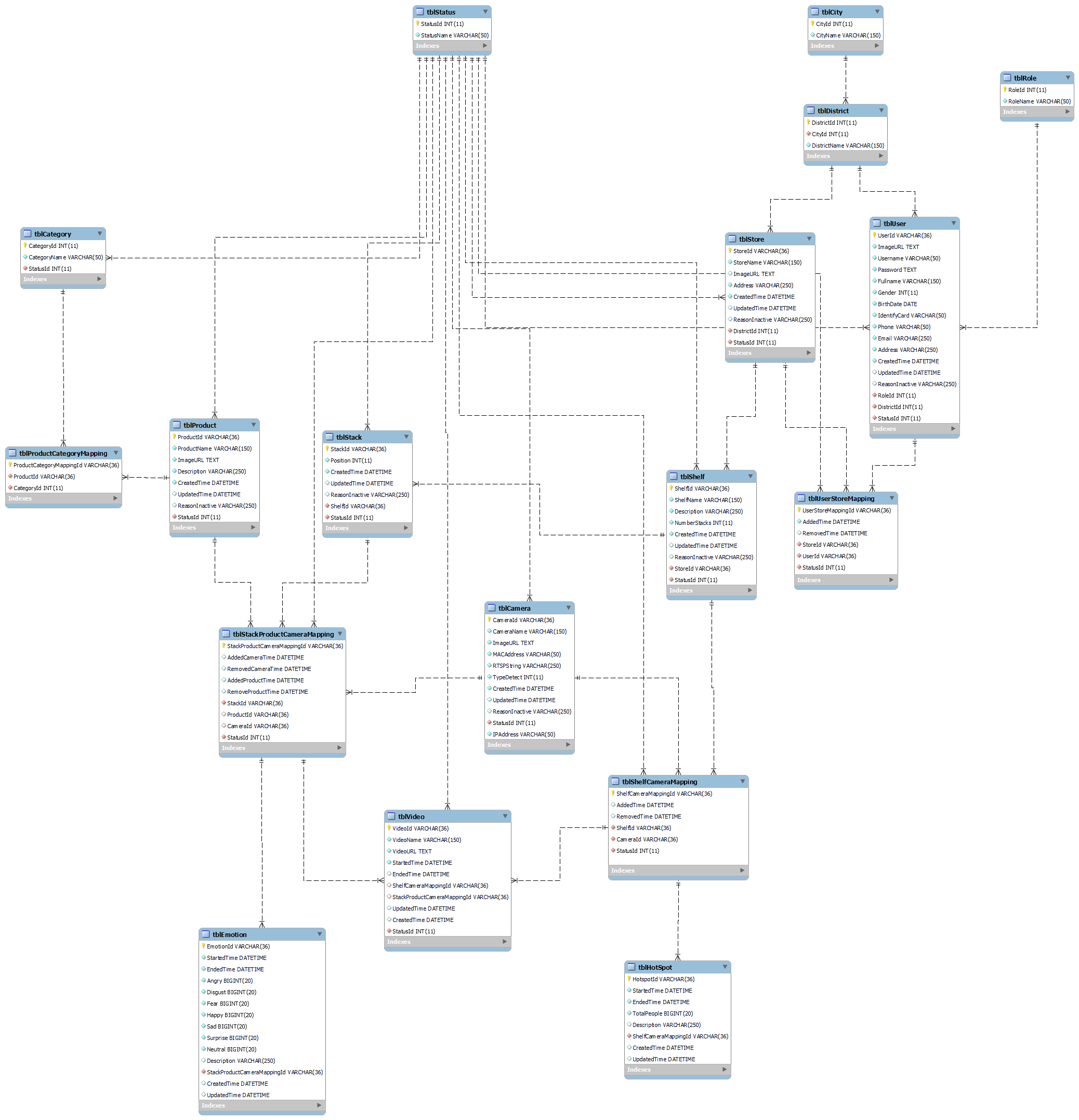
###### d4.11 <Authenticated User> Get the cameras



*Figure 1 - <Activity Diagram> Get the cameras*

## 4. Data & Database Design

### 4.1 Database Design



*Figure 1 – Database Design*

#### 3.1.1 tblCity

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| CityId | int | 11 | Yes | Yes | PK | Unique identifier of city |
| CityName | varchar | 150 | Yes | Yes |  | Name of city |

#### 3.1.2 tblDistrict

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| DistrictId | int | 11 | Yes | Yes | PK | Unique identifier of district |
| CityId | int | 11 | Yes | Yes | FK | Unique identifier of city |
| DistrictName | varchar | 150 | No | Yes |  | Name of district |

#### 3.1.3 tblRole

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| RoleId | int | 11 | Yes | Yes | PK | Unique identifier of role |
| RoleName | varchar | 50 | Yes | Yes |  | Name of role |

#### 3.1.4 tblStatus

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| StatusId | int | 11 | Yes | Yes | PK | Unique identifier of status |
| StatusName | varchar | 50 | Yes | Yes |  | Name of status |

#### 3.1.5 tblUser

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| UserId | varchar | 36 | Yes | Yes | PK | Unique identifier of user |
| ImageURL | text |  | No | No |  | Image URL of user |
| UserName | varchar | 50 | Yes | Yes |  | Username of user |
| Password | text |  | No | Yes |  | Password of user |
| Fullname | varchar | 150 | No | Yes |  | Name of user |
| Gender | int | 11 | No | Yes |  | Gender of user |
| BirthDate | date |  | No | Yes |  | Day of birth of user |
| IdentifyCard | varchar | 50 | Yes | Yes |  | Identify card of user |
| Phone | varchar | 50 | Yes | Yes |  | Phone number of user |
| Email | varchar | 250 | Yes | Yes |  | Email of user |
| Address | varchar | 250 | No | Yes |  | Address of user |
| CreatedTime | datetime |  | No | Yes |  | Created date of user |
| UpdatedTime | datetime |  | No | No |  | Last modified date of user |
| ReasonInactive | varchar | 250 | No | No |  | Reason inactive of user |
| RoleId | int | 11 | No | Yes | FK | Unique identifier of role |
| DistrictId | int | 11 | No | Yes | FK | Unique identifier of district |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.6 tblStore

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| StoreId | varchar | 36 | Yes | Yes | PK | Unique identifier of store |
| StoreName | varchar | 150 | Yes | Yes |  | Name of store |
| ImageURL | text |  | No | No |  | Image URL of store |
| Address | varchar | 250 | No | Yes |  | Address of store |
| CreatedTime | datetime |  | No | Yes |  | Created date of store |
| UpdatedTime | datetime |  | Yes | No |  | Last modified date of store |
| ReasonInactive | varchar | 250 | No | Yes |  | Reason Inactive of store |
| DistrictId | int | 11 | No | Yes | FK | Unique identifier of district |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.7 tblCamera

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| CameraId | varchar | 36 | Yes | Yes | PK | Unique identifier of camera |
| CameraName | varchar | 150 | Yes | Yes |  | Name of camera |
| ImageURL | text |  | No | No |  | Image of camera |
| MACAddress | varchar | 150 | Yes | Yes |  | MAC address of camera |
| RTSPString | varchar | 150 | Yes | Yes |  | RTSP of camera |
| TypeDetect | int | 11 | No | Yes |  | Type of camera |
| CreatedTime | datetime |  | No | Yes |  | Created date of camera |
| UpdatedTime | datetime |  | No | No |  | Last modified date of camera |
| ReasonInactive | varchar | 250 | No | No |  | Reason inactive of camera |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |
| IPAddress | varchar | 150 | Yes | Yes |  | IP address of camera |

#### 3.1.8 tblCategory

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| CategoryId | int | 11 | Yes | Yes | PK | Unique identifier of category |
| CategoryName | varchar | 50 | Yes | Yes |  | Name of category |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.9 tblEmotion

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| EmotionId | varchar | 36 | Yes | Yes | PK | Unique identifier of emotion |
| StartedTime | datetime |  | No | Yes |  | Time started of video |
| EndedTime | datetime |  | No | Yes |  | Time ended of video |
| Angry | bigint | 20 | No | Yes |  | Number of angry |
| Disgust | bigint | 20 | No | Yes |  | Number of disgust |
| Fear | bigint | 20 | No | Yes |  | Number of fear |
| Happy | bigint | 20 | No | Yes |  | Number of happy |
| Sad | bigint | 20 | No | Yes |  | Number of sad |
| Surprise | bigint | 20 | No | Yes |  | Number of surprise |
| Neutral | bigint | 20 | No | Yes |  | Number of neutral |
| Description | varchar | 250 | No | No |  | Description of emotion |
| StackProductCameraMappingId | varchar | 36 | No | Yes | FK | Unique identifier of stack product camera mapping |
| CreatedTime | datetime |  | No | Yes |  | Created date of emotion |
| UpdatedTime | datetime |  | No | No |  | Last modified date of emotion |

#### 3.1.10 tblHotSpot

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| HotspotId | varchar | 36 | Yes | Yes | PK | Unique identifier of hot spot |
| StartedTime | datetime |  | No | Yes |  | Time started of video |
| EndedTime | datetime |  | No | Yes |  | Time ended of video |
| TotalPeople | bigint | 20 | No | Yes |  | Number of customer |
| Description | varchar | 250 | No | No |  | Description of hot spot |
| ShelfCameraMappingId | varchar | 36 | No | Yes | FK | Unique identifier of shelf camera mapping |
| CreatedTime | datetime |  | No | Yes |  | Created date of hot spot |
| UpdatedTime | datetime |  | No | No |  | Last modified date of hot spot |

#### 3.1.11 tblProduct

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| ProductId | varchar | 36 | Yes | Yes | PK | Unique identifier of product |
| ProductName | varchar | 150 | Yes | Yes |  | Name of product |
| ImageURL | text |  | No | No |  | Image URL of product |
| Description | varchar | 250 | No | No |  | Description of product |
| CreatedTime | datetime |  | No | Yes |  | Created date of product |
| UpdatedTime | datetime |  | No | No |  | Last modified date of product |
| ReasonInactive | varchar | 250 | No | No |  | Reason inactive of product |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.12 tblProductCategoryMapping

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| ProductCategoryMappingId | varchar | 36 | Yes | Yes | PK | Unique identifier of product category mapping |
| ProductId | varchar | 36 | No | Yes | FK | Unique identifier of product |
| CategoryId | int | 11 | No | Yes | FK | Unique identifier of category |

#### 3.1.13 tblShelf

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| ShelfId | varchar | 36 | Yes | Yes | PK | Unique identifier of shelf |
| ShelfName | varchar | 150 | No | Yes |  | Name of shelf |
| Description | varchar | 250 | No | Yes |  | Description of shelf |
| NumberStacks | int | 11 | No | Yes |  | Number stack of shelf |
| CreatedTime | datetime |  | No | Yes |  | Created date of shelf |
| UpdatedTime | datetime |  | No | No |  | Last modified date of shelf |
| ReasonInactive | varchar | 250 | Yes | No |  | Reason inactive of shelf |
| StoreId | varchar | 36 | No | Yes | FK | Unique identifier of store |
| StatusId | Int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.14 tblShelfCameraMapping

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| ShelfCameraMappingId | varchar | 36 | Yes | Yes | PK | Unique identifier of shelf camera mapping |
| AddedTime | datetime |  | No | Yes |  | Added time of camera |
| RemovedTime | datetime |  | No | No |  | Removed time ò camera |
| ShelfId | varchar | 36 | No | Yes | FK | Unique identifier of shelf |
| CameraId | varchar | 36 | No | Yes | FK | Unique identifier of camera |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.15 tblStack

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| StackId | varchar | 36 | Yes | Yes | PK | Unique identifier of stack |
| Position | int | 11 | No | Yes |  | Position of stack |
| CreatedTime | datetime |  | No | Yes |  | Created date of stack |
| UpdatedTime | datetime |  | No | No |  | Last modified date of stack |
| ReasonInactive | varchar | 250 | No | No |  | Reason inactive of stack |
| ShelfId | varchar | 36 | No | Yes | FK | Unique identifier of shelf |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.16 tblStackProductCameraMapping

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| StackProductCameraMappingId | varchar | 36 | Yes | Yes | PK | Unique identifier of stack product camera mapping |
| AddedCameraTime | datetime |  | No | No |  | Added time of camera |
| RemovedCameraTime | datetime |  | No | No |  | Removed time of camera |
| AddedProductTime | datetime |  | No | No |  | Added time of product |
| RemovedProductTime | datetime |  | No | No |  | Removed time of product |
| StackId | varchar | 36 | No | Yes | FK | Unique identifier of stack |
| ProductId | varchar | 36 | No | No | FK | Unique identifier of product |
| CameraId | varchar | 36 | No | No | FK | Unique identifier of camera |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.17 tblUserStoreMapping

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| UserStoreMappingId | varchar | 36 | Yes | Yes | PK | Unique identifier of user store mapping |
| AddedTime | datetime |  | No | Yes |  | Added time of user |
| RemovedTime | datetime |  | No | No |  | Removed time of user |
| StoreId | varchar | 36 | No | Yes | FK | Unique identifier of store |
| UserId | varchar | 36 | No | Yes | FK | Unique identifier of user |
| StatusId | int | 11 | No | Yes | FK | Unique identifier of status |

#### 3.1.18 tblVideo

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Field name** | **Type** | **Size** | **Unique** | **Not Null** | **PK/FK** | **Notes** |
| VideoId | varchar | 36 | Yes | Yes | PK | Unique identifier of video |
| VideoName | varchar | 150 | No | Yes |  | Name of video |
| VideoURL | text |  | No | Yes |  | URL of video |
| StartedTime | datetime |  | No | Yes |  | Started time of video |
| EndedTime | datetime |  | No | No |  | Ended time of video |
| ShelfCameraMappingId | varchar | 36 | No | No | FK | Unique identifier of shelf camera mapping |
| StackProductCameraMappingId | varchar | 36 | No | No | FK | Unique identifier of stack product camera mapping |
| UpdatedTime | datetime |  | No | No |  | Last modified date of video |
| CreatedTime | datetime |  | No | Yes |  | Created date of video |

# V. Software Testing Documentation

## 1. Overall Description

### 1.1 Test Model

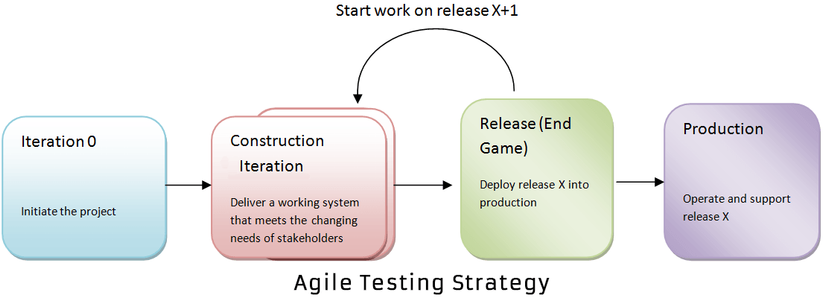


Figure 209. Agile model

***Source:***[*What is Agile Testing? Methodology, Process & Life Cycle (guru99.com)*](https://www.guru99.com/agile-testing-a-beginner-s-guide.html)

We apply Agile Testing because of the following reasons:

* It makes the interaction between developers and customers more fast and simple.
* It can quickly adapt to the rate of change required.
* It helps developers pay more attention to quality, performance and usability.

### 1.2 Testing Levels

* Unit testing
* Integration testing
* System testing

### 1.3 Testing Types

* Function testing
* UI testing

## 2. Test Plan

### 2.1 Test Stages

Table 89. Test stages

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Type of Tests** | **Stage of Test** | | | |
| **Unit** | **Integration** | **System** | **Acceptance** |
| Function Test | X | X | X | X |
| User Interface Test | X |  | X |  |

### 2.2 Resources

#### a. Human Resources

Table 90. Human resources

|  |  |  |
| --- | --- | --- |
| **Worker/Doer** | **Role** | **Specific Responsibilities/Comments** |
| Nguyen Minh Luan | Test Leader | Write test plans, test cases, do test, and report |
| Than Nhat Truong | Tester | Do test and report |
| Do Ngoc Huu | Tester | Do test and report |
| Nguyen Thanh Hieu | Tester | Do test and report |

### 2.3 Test Milestones

Table 91. Test milestones

|  |  |  |  |
| --- | --- | --- | --- |
| **Milestone Task** | **Effort (md)** | **Start Date** | **End Date** |
| Create Test Plan | 3 | 27/07/2021 | 27/07/2021 |
| Create unit tests for module Web App | 2 | 28/07/2021 | 30/07/2021 |
| Create integration test cases for Web App | 2 | 01/08/2021 | 03/08/2021 |
| Create system test cases for Web App | 2 | 05/08/2021 | 07/08/2021 |
| Create unit tests for module Mobile App | 2 | 09/08/2021 | 11/08/2021 |
| Create integration test cases for Mobile App | 2 | 12/08/2021 | 14/08/2021 |
| Create system test cases for Mobile App | 2 | 14/08/2021 | 16/08/2021 |
| Create reports for testing | 2 | 16/08/2021 | 17/08/2021 |

### 2.4 Deliverables

Table 92. Deliverables

|  |  |  |
| --- | --- | --- |
| **No** | **Deliverables** | **Due Date** |
| 1 | Test Plan | 27/07/2021 |
| 2 | Test Case Suite for Web App | 07/07/2021 |
| 3 | Test Case Suite for Mobile App | 16/08/2021 |
| 4 | Report on Testing | 17/08/2021 |

## 3. Test Cases

* Unit Test Cases: [Report5\_Unit Test Case.xls](https://docs.google.com/spreadsheets/d/1IGBltpeFEN0eOmOq_bEBWAD_EmH6iSoN/edit?usp=sharing&ouid=100254008834501773562&rtpof=true&sd=true)
* Other Test Cases:

## 4. Test Reports

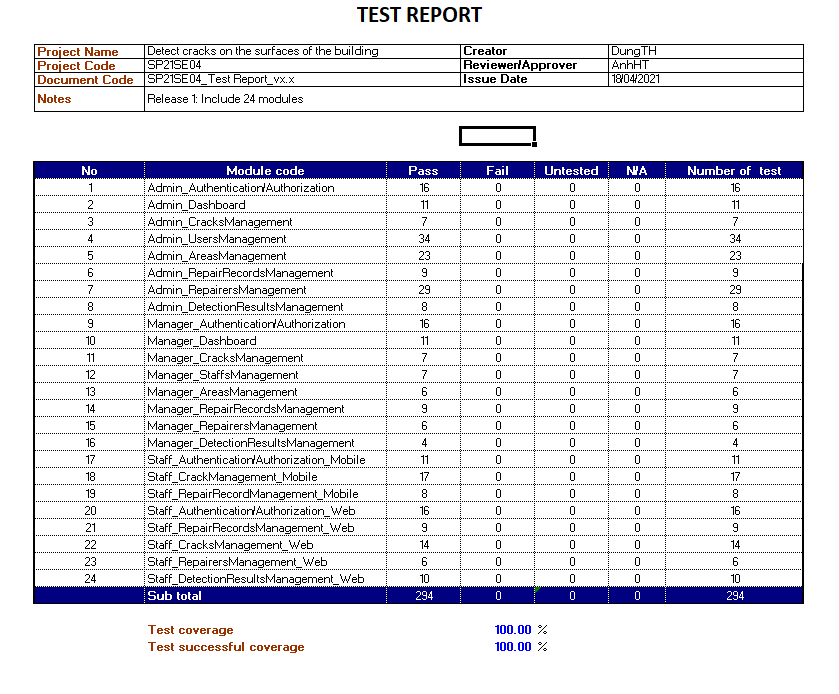


Figure 210. Test case report

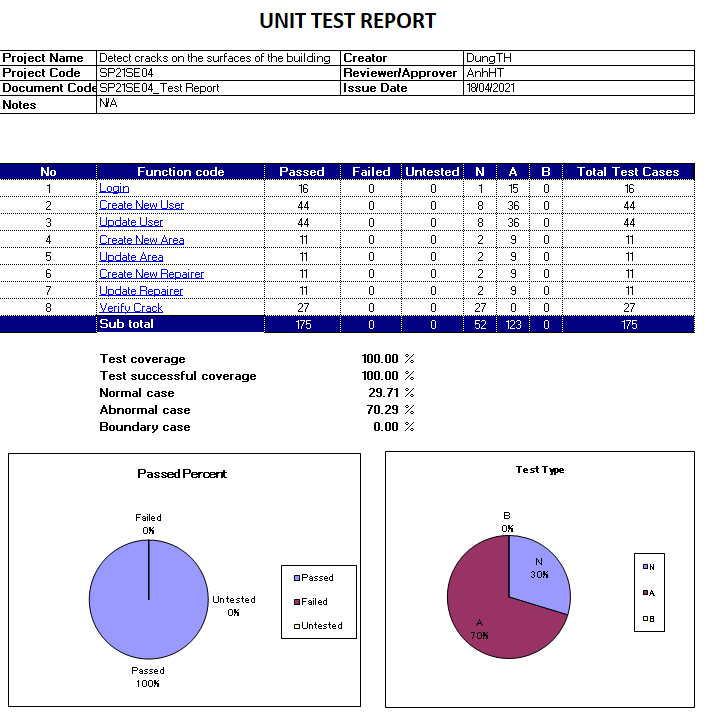


Figure 211. Unit test case report