Furniture Management System Requirements Specification

Version 2.0

Team 14

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# Project Overview

Given the various challenges that joineries of furniture face in managing multiple tasks daily, the need for an efficient management system has become essential. The Furniture Management System (FMS) is designed to manage operations both within and outside the furniture store, ensuring smooth handling of different tasks. This system aims to provide a versatile and user-friendly platform that enables employees to efficiently manage their work at any time.

The platform will be developed to integrate all essential requirements, bringing them together into a practical and reliable system for tracking stopovers, purchases, payment history, and order plans in an organized and efficient manner.

To ensure the system's continuous improvement, it is crucial to establish a strong communication link between administrators, user needs, and system design.

The FMS software will significantly simplify work processes, addressing key areas such as production, finance, human resources, and sales, while also resolving operational challenges effectively.

# Product Description

X Furniture Joinery is a diverse manufacturing company that operates through multiple departments and follows a range of business processes to ensure success. To enhance efficiency and improve its overall performance, we propose the development of a specialized software solution.

The Furniture Management System (FMS) will serve as a platform for collecting, processing, and analyzing all operational activities. This system will be highly beneficial to the company, as it will aid in managing assets, optimizing investments in personnel, materials, suppliers, and overseeing essential business operations.

The software will provide users with decision-making support, improving workflow efficiency and minimizing time-consuming tasks. It will store and manage critical data related to suppliers, employees, products, sales, invoices, salaries, customers, reports, and the production process.

User levels

**1. Administrator**

* Has the ability to create and manage new user accounts.
* Controls user login credentials and authentication.
* Assigns appropriate access levels to users.
* Has unrestricted access to all system functionalities.

**2. Chief Financial Officer (CFO)**

* Responsible for registering new products in the system.
* Can add and categorize brands under specific product types.
* Manages supplier registrations and their details.
* Generates financial reports on a monthly basis.

**3. Human Resources Specialist**

* Handles the onboarding of new employees.
* Manages employee records and updates staff details.
* Oversees payroll processing and salary management.
* Conducts job performance evaluations.

**4. Sales Agent**

* Registers new customers into the system.
* Maintains a database of customer details.
* Records and tracks sales transactions.
* Generates reports related to sales performance.

**5. Operations Manager**

* Adds and monitors raw materials in the system.
* Tracks labor costs associated with production.
* Manages overhead expenses in the manufacturing process.
* Registers and maintains records of machinery.
* Documents work instructions for production processes.
* Oversees and tracks progress in the manufacturing workflow.

1. **Requirements**
   1. ***Functional Requirements***

Priority Definitions

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

The requirement numbering follows the scheme - FR\_ ##

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Nr ## | Requirement | Further\_comment | Priority | Date |
| FR\_01 | The system should provide a web-based application that enables efficient management and operational functionality. | The system will be utilized by five key roles: Administrator, CFO, HR, Sales Manager, and Operations Manager.  Each of these users will have specific access rights and responsibilities within the system. | 1 | 8/03/2025 |
| FR\_02 | The administrator will have the ability to manage user access and permissions within the system. | He/She will provide them with login information. | 1 | 8/03/2025 |
| FR\_03 | The administrator will update and manage user details within the system. | Whenever an employee leaves, changes roles, or requires updated information, the administrator will be responsible for modifying their records accordingly. | 1 | 8/03/2025 |
| FR\_04 | The administrator will have the ability to generate detailed reports that provide insights into the company’s operations | Reports will include financial summaries, employee performance, sales statistics, and operational efficiency. | 1 | 8/03/2025 |
| FR\_05 | The administrator will be able to generate analytical graphs based on company data. | This feature helps management quickly interpret data and make informed decisions. | 2 | 8/03/2025 |
| FR\_06 | CFO will generate in PDF format and print weekly/monthly reports. | These reports will include revenue analysis, expense tracking, profit and loss statements, and financial forecasting.  They will help the management team assess financial health and make strategic decisions. | 1 | 8/03/2025 |
| FR\_07 | CFO will register every expense in the company | Each transaction related to raw materials, utilities, salaries, and operational costs will be logged into the system.  This ensures transparency in financial records and assists in budgeting. | 1 | 8/03/2025 |
| FR\_08 | The CFO will log every sale transaction made within the company. | Each time a product is sold, the system will record details such as product name, quantity, customer information, and payment method. | 1 | 8/03/2025 |
| FR\_09 | The CFO will be responsible for registering products before they are available for sale. | Each product must be registered with its associated details such as price, brand, category, and supplier information | 1 | 8/03/2025 |
| FR\_10 | The CFO will have the ability to add and categorize brands for the registered products. | To organize inventory effectively, every product will be assigned to a specific brand. | 2 | 8/03/2025 |
| FR\_11 | CFO will calculate salaries and pass to HR. | CFO will calculate and then will pass to HR. | 1 | 8/03/2025 |
| FR\_12 | CFO will add suppliers. | Supply chain is very important for this company so there will be lots of information including prices during the times. | 2 | 8/03/2025 |
| FR\_13 | CFO will view raw materials. | The system will provide the CFO with access to real-time data on raw material stock levels.  This includes quantities available, supplier details, purchase history, and cost tracking. | 2 | 8/03/2025 |
| FR\_14 | HR will have the ability to add, update, and remove employees from the system. | HR personnel will maintain accurate records of all employees, including their roles, departments, and salary details. | 1 | 8/03/2025 |
| FR\_15 | HR will be responsible for managing payroll and processing salaries for employees. | Payroll management will include salary calculations, deductions, and bonus allocations. | 1 | 8/03/2025 |
| FR\_16 | HR will track employee attendance, working hours, and overtime. | This data will be used for payroll processing and performance evaluation. | 2 | 8/03/2025 |
| FR\_17 | Employee award | Each month, the system will evaluate employee performance and automatically identify the top-performing employee for recognition. | 3 | 8/03/2025 |
| FR\_18 | HR will process employee leave requests and approve them accordingly. | Employees can request leave through the system, and HR will be responsible for approvals and tracking. | 1 | 8/03/2025 |
| FR\_19 | Sales agent will add and print orders. | Every sale made by the sales agent will be recorded in the system.  The system will allow sales agents to generate and print order receipts for customers. | 1 | 8/03/2025 |
| FR\_20 | Sales agent will see reports. | This feature helps the sales team analyze performance and adjust sales strategies. | 2 | 8/03/2025 |
| FR\_21 | Sales person will register customers. | Every new customer must be added to the system along with their personal information.  This ensures that customer records are maintained and can be used for future interactions | 1 | 8/03/2025 |
| FR\_22 | Sales person will edit and view customers. | Sales agents will have the ability to modify customer details if necessary.  This includes updating contact information, address, and purchase preferences. | 1 | 8/03/2025 |
| FR\_23 | Sales agents will be able to filter and search customer data efficiently. | The system will include a search and filter functionality for customer profiles.  Sales agents can quickly locate customers based on name, phone number, or purchase history. | 3 | 8/03/2025 |
| FR\_24 | Operations manager will add raw materials. | All materials used in the manufacturing process, such as wood, textiles, and metal, will be registered in the system. | 1 | 8/03/2025 |
| FR\_25 | Operations manager will calculate labor cost. | Labor expenses will be calculated and integrated into financial reports. | 1 | 8/03/2025 |
| FR\_26 | Operations manager will register machineries. | This includes registration in the system and purchase details, maintenance schedules, and usage history. | 2 | 8/03/2025 |
| FR\_27 | Operations manager will put all work instructions. | Employees will follow structured work processes to maintain consistency in production. | 1 | 9/03/2025 |
| FR\_28 | Achievement of production. | All work done by employees will be posted in the system by operation manager. | 1 | 9/03/2025 |
| FR\_29 | System will support role-based dashboards. | Each user role (Admin, CFO, HR, Sales Agent, Operations Manager) will have a personalized dashboard displaying relevant information. | 2 | 9/03/2025 |
| FR\_30 | The system will include an automated backup feature to prevent data loss. | Data backups will be generated periodically to ensure security and business continuity. | 2 | 9/03/2025 |

# 3.2 Non-Functional Requirements

**3.2.1 Product Requirements**

**3.2.1.1 User Interface Requirements**

Our application will be a web-based system, accessible through any web browser on computers with an internet connection.

The first page will be a login interface, requiring users to enter their username and password. If incorrect login credentials are provided, the system will immediately notify the user. Upon successful authentication, the appropriate interface will be displayed. The system will support four user roles: Administrator, Chief Finance Officer (CFO), Human Resource (HR) Specialist, and Sales Agent.

The application will include multiple modules to efficiently manage the company’s operations. These modules include:

1. Employee Management
2. Sales and Order Processing
3. Customer Management
4. Supplier Management
5. Report Generation

The Administrator will be responsible for managing user accounts, including adding new users (CFO, HR Specialist, Sales Agent, or Operations Manager), modifying existing accounts, and reviewing user details. Once a new user is registered, the Administrator will provide their login credentials.

The CFO will oversee company activities, manage financial data, register products, add brands and categories, and generate monthly reports for management. Additionally, the CFO will be responsible for supplier registration and maintaining supplier-related information.

The HR Specialist will handle employee-related tasks, including hiring, modifying employee records, and managing departmental structures. Other key responsibilities include job evaluations and payroll management.

The Sales Agent will track customer data and sales transactions. At the end of each month, they will review reports detailing the most sold products. Additionally, they will be responsible for registering new customers and maintaining records of existing ones.

The Operations Manager will manage raw materials, labor costs, and production expenses. They will also register machinery, monitor work instructions, and track production achievements.

**3.2.1.2 Usability**

* The system will be user-friendly and easy to navigate.
* It will be context-sensitive, ensuring that users clearly understand each function.
* The interface will be designed to be intuitive and efficient, avoiding unnecessary complexity.

**3.2.1.3 Efficiency**

Performance

* Users will be able to complete tasks efficiently within the management system.
* The software will facilitate seamless operations for administrators and financial personnel by providing intuitive management tools.
* First-time users will be able to interact with the system without requiring assistance.
* The system will minimize user errors and ensure all tasks are completed with minimal effort.
* System performance will be optimized to maximize productivity.

Space Requirements

* Since the system is a web application, it will be hosted on a web server.
* The application itself will require approximately 150MB, while the database will be relatively smaller.
* The number of active users will be limited to the registered users in the system.
* The system is expected to consume a maximum of 3GB of bandwidth per month.

**3.2.1.4 Dependability**

Availability

* The application will be accessible anytime and anywhere.
* Users can log in as long as they have an internet connection.
* The system is geographically unrestricted but will only be available in English.
* Downtime will be minimal, ensuring that business operations are not significantly disrupted.

Portability

* The system will function consistently regardless of the user's OS.
* The system will support cross-platform usage without modifications.

Reliability

* The system will be designed to provide fast and accurate task execution with minimal errors.
* Error-prone scenarios will be eliminated, ensuring high reliability.
* The system will minimize the chances of operational failures.
* *Performance benchmarks:* 
  + Login module: Load time ≤ 100ms.
  + Employee module: Load time ≤ 300ms.
  + Sales, Order, and Customer modules: Load time ≤ 300ms.
  + Supplier and Report modules: Load time ≤ 400ms.

Maintainability

Monitoring

* The system will be designed to prevent crashes.
* The login page will enforce strict input validation to prevent errors due to incorrect credentials.
* The employee module will include:
  + Employee registration
  + Modification of records
  + Deletion of employees
* Input validation will prevent errors such as entering numbers in name fields or leaving mandatory fields blank.

Maintenance

* If a system crash occurs, the web application will automatically restart and resume from the last known state.
* The system will include a speed test feature, particularly useful for generating financial reports.
* A backup system will be implemented to preserve progress before any modifications, preventing data loss.

**3.2.1.5 Security**

Data Protection

* To safeguard system data from unauthorized access, modification, or misuse, the system will enforce:
* Strict validation before storing data in the database.
* Regular expressions for validating:
  + Passwords
  + Email addresses
  + Usernames
  + Names
* User activity logs will track system actions.
* Sensitive data (e.g., passwords) will be encrypted using hashing methods.
* Employees will only have access to relevant information, while administrators will have control over all user data.

System Security Measures

* Encryption
* Activity logging
* Data integrity checks

Authorization & Authentication

* Users will only have access to relevant information based on their role.
* Only internet-connected users can access the system.
* *Authentication* will be enforced through:
  + Session management
  + Cookies for persistent login

Data Management

* User data will be restricted based on assigned roles.
* Validation will be enforced for critical fields.
* The system will manage:
  + User profiles
  + Products and suppliers
  + Financial records
  + Sales and production details
* The database will include: Users, Products, Suppliers, Orders, Departments, Customers, Production Details, etc.

**3.2.2 Organizational Requirements**

**3.2.2.1 Operational Process**

The application will assist users in:

* Managing user accounts (CFO, HR Specialist, Sales Agent, etc.)
* Modifying user credentials
* Registering, modifying, and deleting suppliers, products, and employees
* Managing payroll, job evaluations, and financial reports
* Handling sales and order tracking
* Keeping records of raw materials and production costs
* Registering machinery and work instructions

**3.2.2.2 Development Process**

* The system will utilize HTTP & HTTPS protocols.
* It will employ SQL technologies for database management.
* Networking protocols: UDP & TCP/IP.
* Users cannot modify the database structure.
* The system will function over Wi-Fi, mobile data, or any internet connection.
* Authentication will require valid credentials.
* Different user interfaces and functionalities will be assigned based on roles.
* The system will support multiple time zones.

**3.2.2.3 Network & Hardware Interfaces**

* The web application will be hosted on a web server.
* The user’s browser will establish a TCP connection with the server.

**3.2.3 External Requirements**

**3.2.3.1 Regulatory Compliance**

* The system will comply with Law No. 25/2024 on Accounting and Financial Statements.
* It will support financial report generation following national tax authority regulations.

**3.2.3.2 Ethical Considerations**

* User privacy will be strictly maintained.
* All users will be treated *equally* by the system.

**3.2.3.3 Legislative Compliance**

* The system will comply with Law No. 9887 regarding personal data protection.
* A domain registration request will be submitted to AKSHI.
* The system will adhere to copyright and intellectual property laws.

**3.2.4 Domain Requirements**

The system will digitize business operations in furniture retail management. It will provide:

* Detailed reports for decision-making.
* HR management tools for handling employee data.
* Financial tools for managing accounting and suppliers.
* Sales tracking features to oversee customer interactions.

These ensure efficient business operations and better financial oversight.

**4.User Scenarios/Use Cases**

* 1. ***User Scenarios***

|  |  |  |
| --- | --- | --- |
| Nr | User Scenario | Description |
|  | Register users | Admin registers users. |
|  | Login as user | The users: admin, economist, HR, OM successfully login into the software. |
|  | Fail to Login | User fails to login using his username and password. |
|  | Add a new customer | The sales agent registers the customer into the system. |
|  | Customers’ list | View all the customers of the company. |
|  | Update customer details | Sales agent updates customer details. |
|  | Add a new supplier | CFO adds new supplier in the database. |
|  | Suppliers’ list | View all suppliers. |
|  | Update supplier | CFO updates new details of supplier. |
|  | Add a new purchase | CFO adds details of purchases done by the company. |
|  | Purchases’ list | View all the purchases details that are stored in the database. |
|  | Update purchase | CFO can modify the purchases details. |
|  | View inventory | CFO can access details of inventory. |
|  | Add new employee | HR adds new employee in the database. |
|  | Employees’ list | View all employees of the company. |
|  | Update employee | HR updates employee’s information. |
|  | Add new product | CFO adds new product in the system. |
|  | Products’ list | View all products. |
|  | Update product | CFO updates new details of product. |
|  | Generate financial statement | CFO manages the financial statements of the company. |
|  | Add new order | Sales agent adds new order in the system. |
| * 1. 0 | Orders’ list | View all orders of a month. |
|  | Update order | Sales agent updates an order in case of errors. |
|  | Add new invoice | The sales agent creates a new invoice. |
|  | Invoices’ list | View all the invoices. |
|  | Update invoice | The sales agent may update the invoice. |
|  | Calculate salary of employee | The CFO makes use of HR department information to calculate the salary of an employee. |
|  | Update salary | The CFO updates the salary in case it changes. |
|  | Reports | The CFO, HR, sales agent and Operation Manager generate reports, which are accessible to the Administrator of the company. |
|  | Manufactured products | The Operations Manager adds information about the manufactured products. |
|  | Manage work instructions | The operation manager mayadd, edit or delete work instructions of different processes in the system. |
|  | Update achievement of production | In the end of the day, the operation manager shall update the achievement of production for each category of furniture. |
|  | Update users’ details | Admin can update users’ details after he registers them. |
|  | Add new department | HR adds new departments of the company on the system |
|  | Update departments | HR updates details of departments. |

* + 1. **User scenarios extended**

1. Register users.
2. Admin logs in the system using his/her credentials.
3. When successfully logged in, s/he is redirected to his home page.
4. Admin selects the “*Register user”* button.
5. Admin is directed to a form page that gathers information about each user registration.
6. The “*Submit*” button is selected.
7. The data inserted follows a validation process.
8. If data are:
9. Correctly inserted, the alert message “User is successfully registered” is shown and data are automatically registered in the database.
   1. Admin is directed to his/her home page.
10. incorrect, alert messages for the specific errors in the fields of the form are displayed.
    1. Admin corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_02** and **US\_03**-Login as user and Fail to Login.

1. User chooses from the main page the department where he/she operates such as: Human Resources, Finance, Customer Relations, Operations Management and Manager.
2. According to the selected department, user is redirected to the login page where he/she inserts his credentials.
3. If username and password are:
   1. correctly inserted, user successfully logs in.
      1. user is directed to his/her home page.
   2. not right, user fails to log in.
      1. user is directed to the login page and all the above-mentioned steps are repeated until user is successfully logged in.

**US\_04**- Add a new customer.

1. Sales manager logs in following the steps of **US\_01.**
2. The “Customers” section is selected.
3. After a table with previous customers is displayed, sales agent may select the “Add new Customer” button.
4. Sales manager fills in the form displayed to gather customer data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the message “Customer is successfully registered” is displayed and data are automatically registered in the database.
      1. Sales manager is directed to the table of customers.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_05**- View customers’ list.

1. Sales manager logs in following the steps of **US\_01.**
2. The “Customers” section is selected.
3. A table with all customers’ details is displayed.

**US\_06**- Update customer details.

1. Sales manager logs in following the steps of **US\_01.**
2. The “Customers” section is selected.
3. After table with the customers’ details is displayed, the sales manager may choose the “Update” button in the end of each row.
4. Sales manager is directed to the form page, where he/she can edit the fields that has to be changed to that specific customer.
5. The “Submit” button is selected
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Customer’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. Sales manager is directed to the table of customers.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_07** - Add a new supplier.

1. CFO logs in following the steps of **US\_01.**
2. The “Supplier” section is selected.
3. After a table with previous suppliers is displayed, CFOmay select the “Add new supplier” button.
4. CFO fills in the form displayed to gather supplier data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the message “Supplier is successfully registered” is displayed and data are automatically registered in the database.
      1. CFO is directed to the table of suppliers.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_08**- View suppliers’ list.

1. CFO logs in following the steps of **US\_01.**
2. The “Suppliers” section is selected.
3. A table with all suppliers’ details is displayed.

**US\_09**- Update supplier’s details.

1. CFO logs in following the steps of **US\_01.**
2. The “Supplier” section is selected.
3. After table with the suppliers’ details is displayed, the CFO may choose the “Update” button in the end of each row.
4. CFO is directed to the form page, where he/she can edit the fields that has to be changed to that specific supplier.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Supplier’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. CFO is directed to the table of suppliers.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_10** - Add a new purchase.

1. CFO logs in following the steps of **US\_01.**
2. The “Purchases” section is selected.
3. After a table with previous purchases is displayed, CFO may select the “Add new purchase” button.
4. CFO fills in the form displayed to gather purchase data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the alert message “Purchase is successfully registered” is displayed and data are automatically registered in the database.
      1. CFO is directed to the table of purchases.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_11** - View purchases’ list.

1. CFO logs in following the steps of **US\_01.**
2. The “Purchases” section is selected.
3. A table with all purchases’ details is displayed.

**US\_12** - Update purchase.

1. CFO logs in following the steps of **US\_01.**
2. The “Purchases” section is selected.
3. After table with the purchases’ details is displayed, the CFO may choose the “Update” button in the end of each row.
4. CFO is directed to the form page, where he/she can edit the fields that has to be changed to that specific purchase.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Purchase’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. CFO is directed to the table of purchases.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_13** - View inventory.

1. CFO logs in following the steps of **US\_01.**
2. The “Inventory” section is selected.
3. CFO can select the month for the purchased products or produced products, which represent the inventory of the company.
4. A table with all inventory details is displayed.

**US\_14** - Add a new employee.

1. HR manager logs in following the steps of **US\_01.**
2. The “Employees” section is selected.
3. After a table with previous employees is displayed, HR manager may select the “Add new employee” button.
4. HR manager fills in the form displayed to gather employee data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the alert message “Employee is successfully registered” is displayed and data are automatically registered in the database.
      1. HR manager is directed to the table of employees.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. HR manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_15**- View employees’ list.

1. HR manager logs in following the steps of **US\_01.**
2. The “Employees” section is selected.
3. A table with all employees’ details is displayed.

**US\_16**- Update employee’s details.

1. HR manager logs in following the steps of **US\_01.**
2. The “Employees” section is selected.
3. After table with the employees’ details is displayed, the HR manager may choose the “Update” button in the end of each row.
4. HR manager is directed to the form page, where he/she can edit the fields that has to be changed to that specific employee.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Employee’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. HR manager is directed to the table of employees.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. HR manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_17** - Add a new product.

1. CFO logs in following the steps of **US\_01.**
2. The “Products” section is selected.
3. After a table with registered products is displayed, CFO may select the “Add new product” button.
4. CFO fills in the form displayed to gather product data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the alert message “Product is successfully registered” is displayed and data are automatically registered in the database.
      1. CFO is directed to the table of products.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_18**- View products’ list.

1. CFO logs in following the steps of **US\_01.**
2. The “Products” section is selected.
3. A table with all products’ details is displayed.

**US\_19**- Update product’s details.

1. CFO logs in following the steps of **US\_01.**
2. The “Products” section is selected.
3. After table with the products’ details is displayed, the CFO may choose the “Update” button in the end of each row.
4. CFO is directed to the form page, where he/she can edit the fields that has to be changed to that specific product.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Product’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. CFO is directed to the table of products.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_20** – Generate income statement.

1. CFO logs in following steps of **US\_01**.
2. The “Income statement” section is selected.
3. The monthly revenue and expenses are shown by selecting a month.
4. CFO fills in with the appropriate numbers the fields of the income statement that is generated bellow.
5. Data follows a validation process
6. If data are:
   1. correctly inserted, the alert message “Income statement successfully created” is displayed and data are automatically registered in the database too.
      1. CFO is directed to the “Income statement” section.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. CFO corrects the fields then resubmits the data. Steps 5 and 6 are repeated until 6/a is fulfilled.
7. After filling in the appropriate numbers, the “Save” or “Print” button can be selected.

**US\_21** - Add a new order.

1. Sales agent logs in following the steps of **US\_01.**
2. The “Orders” section is selected.
3. After a table with previous orders is displayed, sales agent may select the “Add new order” button.
4. Sales agent fills in the form displayed to register details about the order.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the alert message “Order is successfully registered” is displayed and data are automatically registered in the database.
      1. Sales agent is directed to the table of orders.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales agent corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_22**- View orders’ list.

1. Sales agent logs in following the steps of **US\_01.**
2. The “Orders” section is selected.
3. A table with all orders’ details is displayed (divided monthly).

**US\_23**- Update order’s details.

1. Sales agent logs in following the steps of **US\_01.**
2. The “View orders” button is selected.
3. After table with the orders’ details is displayed, the sales agent may choose the “Update” button in the end of each row.
4. Sales agent is directed to the form page, where he/she can edit the fields that has to be changed to that specific order.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the alert message “Order’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. Sales agent is directed to the table of orders.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales agent corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_24** - Add a new invoice.

1. Sales agent logs in following the steps of **US\_01.**
2. Under the “Orders” section, the “Add invoice” sub-section is selected
3. Sales agent fills in the form displayed to register details about the invoice.
4. The “Submit” button is selected.
5. The data inserted follows a validation process.
6. If data are:
   1. correctly inserted, the alert message “Invoice is successfully registered” is displayed and data are automatically registered in the database.
      1. Sales agent can print the invoice by selecting the “Print” button

OR

* + 1. Sales agent cane be directed to his/her home page by selecting the “Back” button.
  1. incorrect, alert messages for the specific errors in the fields of the form are displayed.
     1. Sales agent corrects the fields then resubmits the data. Steps 5 and 6 are repeated until 6/a is fulfilled.

**US\_25**- View invoices’ list.

1. Sales agent logs in following the steps of **US\_01.**
2. The “Invoices” subsection is selected.
3. A table with all invoices’ details is displayed (divided monthly).

**US\_26**- Update invoice’s details.

1. Sales agent logs in following the steps of **US\_01.**
2. The “Invoices” subsection is selected.
3. After table with the invoices’ details is displayed, the sales agent may choose the “Update” button in the end of each row.
4. Sales agent is directed to the form page, where he/she can edit the fields that has to be changed to that specific invoice.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the alert message “Invoice’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. Sales agent is directed to the table of invoices.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales agent corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_27** – Calculate salary of employee.

1. CFO logs in following the steps of **US\_01.**
2. The “Salaries” section is selected.
3. A table is displayed containing employee details (provided by the HR department) about their performance during a month.
4. CFO may use a given formula to calculate salary of employee, or edit the given formula.
5. Changes in the table of salaries (payrolls) are saved.

**US\_28** – Update salary.

1. CFO logs in following the steps of **US\_01.**
2. The “Salaries” section is selected.
3. A table is displayed containing employee details (provided by the HR department) including their salary.
4. CFO selects “Update” button located in the end of each row.
5. CFO makes the required updates to the salaries.
6. Changes in the table of salaries(payrolls) are saved.

**US\_29** – Reports.

1. Each user log in following the steps of **US\_01.**
2. The “Reports” section is selected.
3. Each user may generate reports based on the data that they can access.

**US\_30**–Manufactured products.

1. Operations’ manager logs in following the steps described in **US\_01**.
2. The “Manufactured products” section is selected.
3. At the end of each working day, operations’ manager reports about the details of the produced furniture.
4. The “Save” button is selected.

**US\_31**– Manage work instructions.

1. Operations’ manager logs in following the steps of **US\_01.**
2. “Work instructions” section is selected.
3. A web page is displayed that shows work instruction for different processes.
4. Operations’ manager may edit or delete information displayed.

**US\_32**– Update achievement of production.

1. Operations’ manager logs in following the steps of **US\_01.**
2. “Achievements of production” section is selected.
3. Based on the advancement of work during the day, the operations’ manager reports in percentage the progress for each category of products.

**US\_33** - Update users’ details.

1. Admin logs in following the steps of **US\_01.**
2. The “Dashboard” section is selected.
3. After table with the users’ details is displayed, the administrator may choose the “Edit” button in the end of each row.
4. Admin is directed to the form page, where he/she can edit the fields that has to be changed to that specific user.
5. The “Submit” button is selected
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “User’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. Sales manager is directed to the table of users.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. Sales manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_34** - Add a new department.

1. HR manager logs in following the steps of **US\_01.**
2. The “Departments” section is selected.
3. After a table with previous departments is displayed, HR manager may select the “Add” button.
4. HR manager fills in the form displayed to gather department data.
5. The “Submit” button is selected.
6. The data inserted follows a validation process.
7. If data are:
   1. correctly inserted, the alert message “Department is successfully registered” is displayed and data are automatically registered in the database.
      1. HR manager is directed to the table of departments.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. HR manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.

**US\_35** - Update employee’s details.

1. HR manager logs in following the steps of **US\_01.**
2. The “Departments” section is selected.
3. After table with the Departments’ details is displayed, the HR manager may choose the “Update” button in the end of each row.
4. HR manager is directed to the form page, where he/she can edit the fields that has to be changed to that specific department.
5. The “Submit” button is selected.
6. Data follows a validation process
7. If data are:
   1. correctly inserted, the message “Department’s details are successfully updated” is displayed and data are automatically updated in the database too.
      1. HR manager is directed to the table of departments.
   2. incorrect, alert messages for the specific errors in the fields of the form are displayed.
      1. HR manager corrects the fields then resubmits the data. Steps 6 and 7 are repeated until 7/a is fulfilled.
   3. ***Use cases***

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| --- | --- |
| **Name** | **US\_01** Register Users |
| **Summary** | Admin logs in the system and register other Users of FMS |
| **Actor** | Admin |
| **Description** | Admin needs to login first in order to access the module. Admin must enter valid name/ username. Must Register a User by filling valid data about them |
| **Precondition** | Admin who loges in, must have first an existing account, with a specific username and password. |
| **Alternative** | There are no alternative options. This is done in order to protect confidential information. |
| **Post Condition** | To gain access to the modules provided by the software system. |

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| --- | --- |
| **Name** | **US\_02** User Login |
| **Summary** | The user enters the system by entering valid credentials |
| **Actor** | Sales Agent, Human Resource, Finance, Operation Manager, Administrator |
| **Description** | User needs to login first in order to access the module. The user must enter valid name/ username. |
| **Precondition** | The user who loges in, must have first an existing account, with a specific username and password. |
| **Alternative** | There are no alternative options. This is done in order to protect confidential information. |
| **Post Condition** | To gain access to the modules provided by the software system. |

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| **Name** | **US\_04** Customer Registration |
| **Summary** | Sales Agent register a customer with needed information |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent is able to create a new customer. This is done by completing a form with customer information, completed by sales agent. |
| **Precondition** | Sales agent must be logged in into the system |
| **Alternative** | There are no alternative options. |
| **Post Condition** | Be aware of the customer activities, by keeping track their activity. |

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| **Name** | **US\_05** View and Search Customer |
| **Summary** | Sales Agent can search and view all the customer list that are registered |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent can search for a customer and its details in order to easily access the necessary information. |
| **Precondition** | Sales agent must be logged in into the system and must have registered customer |
| **Alternative** | The new data added to the customer is not valid. |
| **Post Condition** | Be aware of missing of necessary information of customers. |

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| **Name** | **US\_06** Customer Updated |
| **Summary** | Sales Agent updates customer information |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent is able to update existing customer. This is done by updating the form of customer information which are based on the purchase of customers. |
| **Precondition** | Sales agent must be logged in into the system and must be registered a customer |
| **Alternative** | There are no alternative options. |
| **Post Condition** | To update necessary information |

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| **Name** | **US\_07** Add Supplier |
| **Summary** | CFO make the registration of a supplier when a new raw material is purchased |
| **Actor** | The primary actor is CFO (Finance) |
| **Description** | CFO log in into the system and fill the registration form for a new supplier. Enter all necessary details |
| **Precondition** | CFO must be logged in into the system and must be purchased a raw material from supplier |
| **Alternative** | There is an existing supplier |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| **Name** | **US\_08 & US\_09** View/ Update Suppliers |
| **Summary** | CFO search and view all the necessary information for a supplier |
| **Actor** | The primary actor is CFO (Finance) |
| **Description** | CFO log in into the system and see all the list of suppliers. CFO clicks the name of the supplier that want to make changes and edit them. CFO makes the changes also in database |
| **Precondition** | User must be logged in. |
| **Alternative** | The new data entered to the supplier is not valid. System gives the opportunity to enter the new data. |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_10** Add Purchase |
| **Summary** | CFO manages purchases for the company. He/she register all products that enters in the company |
| **Actor** | The primary actor is CFO |
| **Description** | CFO manager log in into the system and select the option to add a new Purchase. Fills in the form to gather purchase data and select submit. |
| **Precondition** | CFO manager must be logged in into the system |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task CFO manager may access other functionalities |

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| --- | --- |
| **Name** | **US\_11 & US\_12** View/ Update Purchase |
| **Summary** | CFO manages purchases for the company. He/she register all products that enters in the company |
| **Actor** | The primary actor is CFO |
| **Description** | CFO manager logs in into the system and is directed to the form page, where he/she can edit the fields that has to be changed to  that specific purchase. |
| **Precondition** | CFO manager must be logged in into the system |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task CFO manager may access other functionalities |

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| --- | --- |
| **Name** | **US\_13** View inventory |
| **Summary** | CFO can access information in the Inventory section |
| **Actor** | The primary actor is CFO |
| **Description** | CFO manager logs in into the system and selects the Inventory section, where he/she can see monthly availability of purchased products or manufactured products. |
| **Precondition** | CFO manager must be logged in into the system |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task CFO manager may access other functionalities |

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| **Name** | **US\_14** Register employee |
| **Summary** | HR manager fills in the form displayed to gather employee data such as name, surname, ID, photo, CV… |
| **Actor** | The primary actor is HR manager |
| **Description** | HR manager log in into the system and select the option to add a new employee. Fills in the form the personal data of the employee, upload to the employee data the CV in pdf format, upload photo and finishes the process of entering employee data |
| **Precondition** | HR manager must be logged in into the system |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task HR manager may access other functionalities |

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| --- | --- |
| **Name** | **US\_15 & US\_16** View/Update employee data |
| **Summary** | HR manager has the right to view and update the employee data. They can edit and show all the necessary data |
| **Actor** | The primary actor is HR manager |
| **Description** | HR manager log in into the system and require to view all the list of employees. He fills in the form the personal data, CV and photo. HR makes changes also in the database |
| **Precondition** | HR manager must be logged in into the system. |
| **Alternative** | There is not an alternate form |
| **Post Condition** | After finishing this task HR manager may access other functionalities |

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| **Name** | **US\_17** Add Product |
| **Summary** | CFO make the registration of a product when a new raw material is purchased |
| **Actor** | The primary actor is CFO (Finance) |
| **Description** | CFO log in into the system and require to register a new product. Fill the registration form for a new product. Enter all necessary details in a valid form |
| **Precondition** | CFO must be logged in into the system and must be purchased a product |
| **Alternative** | There is not an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_18 & US\_19** View/ Update product |
| **Summary** | CFO has the right to view and update all the products. |
| **Actor** | The primary actor is CFO (Finance) |
| **Description** | CFO log in into the system and require to view all the list of products. CFO can click the name of the product that want and update the necessary of data in the valid form. CFO makes changes also in database. |
| **Precondition** | CFO must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| **Name** | **US\_20** Generate Income Statement |
| **Summary** | CFO logs in the system and the “Income statement” section is selected which show the current finance state. |
| **Actor** | The primary actor is CFO (Finance) |
| **Description** | The monthly revenue and expenses are shown by selecting a month. CFO fills in with the appropriate numbers the fields of the income statement that is  generated bellow. Data follows a validation process |
| **Precondition** | CFO must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_21** Add new Order |
| **Summary** | Sales Agent has the right to make a new order according to customer request. |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent log in into the system and the “Orders” section is selected. After a table with previous orders is displayed, sales agent may select the “Add new order”  button. Sales agent fills in the form displayed to register details about the order. The “Submit” button is selected. The data inserted follows a validation process. |
| **Precondition** | CFO must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_22** View order list |
| **Summary** | Sales agent has the right to view order list |
| **Actor** | The primary actor is sales agent |
| **Description** | Sales Agent log in into the system and require to view orders in order to see if they are accomplished since it is a manufacture company and it needs time to be done. |
| **Precondition** | Sales Agent must be logged in into the system. |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task sales agent may access other functionalities |

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| --- | --- |
| **Name** | **US\_23** Update Order |
| **Summary** | Sales agent has the right to update the order |
| **Actor** | The primary actor is sales agent |
| **Description** | Sales Agent log in into the system and the “View orders” button is selected. After table with the orders’ details is displayed, the sales agent may choose the “Update”  button in the end of each row. Sales agent is directed to the form page, where he/she can edit the fields that has to be  changed to that specific order. |
| **Precondition** | Sales Agent must be logged in into the system. Also, CFO should have registered in system name of products, brands and categories. |
| **Alternative** | Sales agent may cancel the order |
| **Post Condition** | After finishing this task sales agent save as pdf format or may access other functionalities |

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| --- | --- |
| **Name** | **US\_24** Add invoice |
| **Summary** | Sales Agent has the right to generate an invoice |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent log in into the system and Under the “Orders” section, the “Add invoice” sub-section is selected. Sales agent fills in the form displayed to register details about the invoice. The “Submit” button is selected. |
| **Precondition** | Sales Agent must be logged in into the system. |
| **Alternative** | CFO may show the financial statement to admin. |
| **Post Condition** | After finishing this task CFO may download it and may access other functionalities |

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| --- | --- |
| **Name** | **US\_25** View Invoice |
| **Summary** | Sales Agent has the right to view all the invoices. |
| **Actor** | The primary actor is Sales Agent |
| **Description** | Sales Agent log in into the system and require to view all the invoices. A table with the invoices details is displayed. |
| **Precondition** | Sales Agent must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_26** Update Invoice |
| **Summary** | Sales agent has the right to update invoices. |
| **Actor** | The primary actor is sales agent |
| **Description** | Sales agent log in into the system and require to update an invoice. Sales agent can click the name of the invoice that want and update the necessary of data in the valid form. Sales Agent makes changes also in database. |
| **Precondition** | Sales Agent must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task Sales Agent may access other functionalities |

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| --- | --- |
| **Name** | **US\_27** Calculate salary of employee |
| **Summary** | CFO has the right to calculate the salary of employee. |
| **Actor** | The primary actor is CFO |
| **Description** | CFO log in into the system and require to calculate the salary of employee. A table is displayed containing employee details (provided by the HR department) about  their performance during a month. CFO may use a given formula to calculate salary of employee, or edit the given formula. |
| **Precondition** | CFO must be logged in into the system and HR manager must have registered employees |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_28** Update Salary |
| **Summary** | CFO has the right to update the employee’s salary |
| **Actor** | The primary actor is CFO |
| **Description** | CFO log in into the system and require to update the salary of employee. A table is displayed containing employee details (provided by the HR department) about  their performance during a month. CFO selects “Update” button located in the end of each row. |
| **Precondition** | CFO must be logged in into the system and HR manager must have registered employees |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task CFO may access other functionalities |

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| --- | --- |
| **Name** | **US\_29** Reports |
| **Summary** | Each user may generate reports based on the data that they can access. |
| **Actor** | The primary actor is Admin, CFO, HR, Sales agent, Operation Manager |
| **Description** | Each user logs in into the system and require report according to the module that they are responsible. Each user may generate reports based on the data that they can access. |
| **Precondition** | Each user must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task each user may access other functionalities |

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| --- | --- |
| **Name** | **US\_30** Add Manufactured Product |
| **Summary** | Operation manager enter details about the manufactured products. |
| **Actor** | The primary actor is Operation Manager |
| **Description** | Operation Manager log in into the system and choose the option to enter Manufactured Product details. OM fill in the form displayed all the information |
| **Precondition** | OM must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task OM may access other functionalities |

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| --- | --- |
| **Name** | **US\_31** Add Work Instructions |
| **Summary** | Operation manager enter details about the work instructions |
| **Actor** | The primary actor is Operation Manager |
| **Description** | Operation Manager log in into the system and choose the option to enter details about the work instructions. Enter details about machine hour used. |
| **Precondition** | OM must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task OM may access other functionalities |

|  |  |
| --- | --- |
| **Name** | **US\_32** Update achievement of production |
| **Summary** | Operation manager enter details about the achievement of production |
| **Actor** | The primary actor is Operation Manager |
| **Description** | Operation Manager log in into the system and choose the option to enter details about the achievement of production. Based on the advancement of work during the day, the operations’ manager reports for  each product of different categories how much they are completed. |
| **Precondition** | OM must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task OM may access other functionalities |

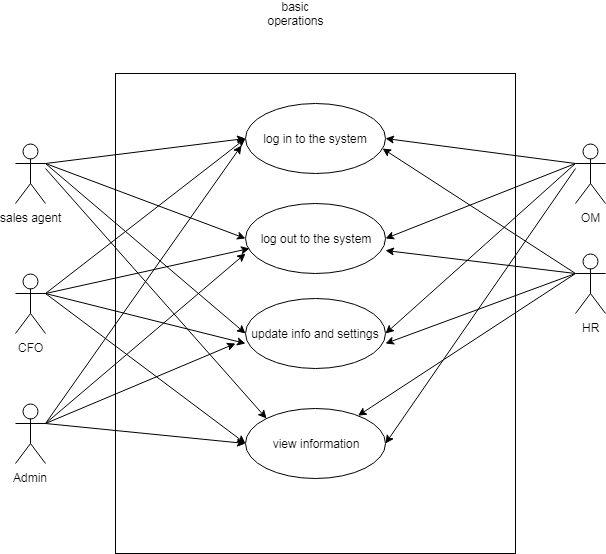
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| --- | --- |
| **Name** | **US\_33** Update users’ details |
| **Summary** | Admin has the right to view and update all the users. |
| **Actor** | The primary actor is Admin |
| **Description** | Admin logs in into the system and require to view all the list of users. Admin can click the name of the user that want and update the necessary of data in the valid form. |
| **Precondition** | Admin must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task Admin may access other functionalities |

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| --- | --- |
| **Name** | **US\_34** Add new department |
| **Summary** | HR manager fills in the form displayed to gather department data such as name of department, status, id… |
| **Actor** | The primary actor is HR manager |
| **Description** | HR manager log in into the system and select the option to add a new department. Fills in the form the specific data of the department and then submits them |
| **Precondition** | HR manager must be logged in into the system |
| **Alternative** | There is no alternate form |
| **Post Condition** | After finishing this task HR manager may access other functionalities |

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| --- | --- |
| **Name** | **US\_35** Update department |
| **Summary** | HR manager has the right to view and update all the departments. |
| **Actor** | The primary actor is HR manager |
| **Description** | HR manager logs in into the system and require to view all the list of departments. HR manager can click the name of the department that want and update the necessary of data in the valid form. The changes will also be saved automatically in the database. |
| **Precondition** | HR manager must be logged in into the system |
| **Alternative** | There isn’t an alternate form |
| **Post Condition** | After finishing this task HR manager may access other functionalities |

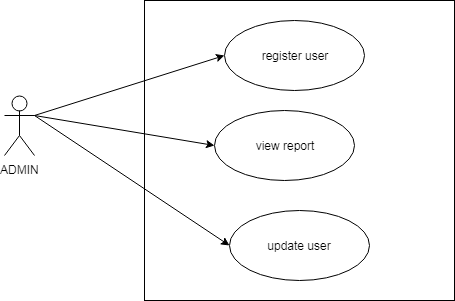
# System Design/Diagrams

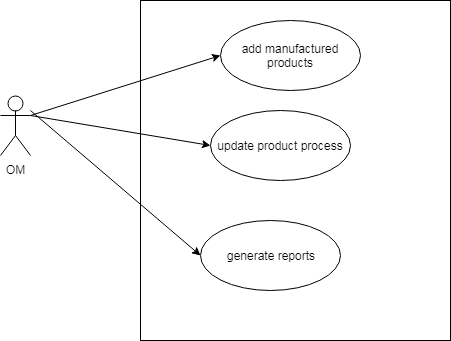
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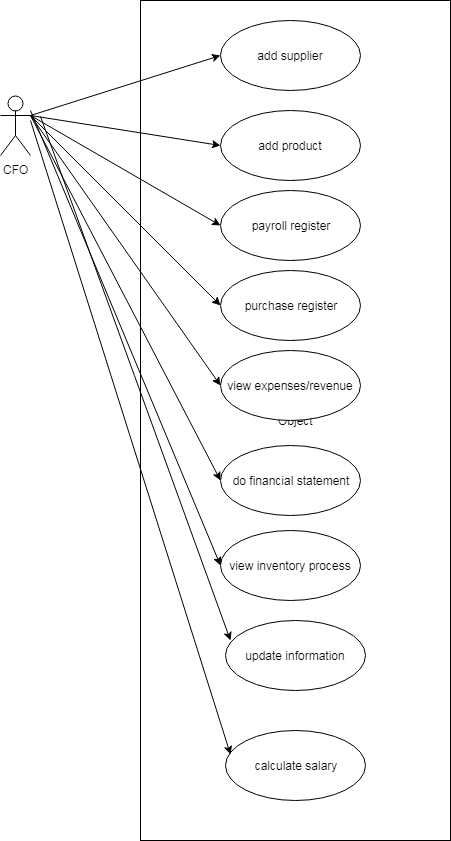
***5.1Use case diagrams***

BASIC OPERATIONS-US\_01,US\_02,US\_06,US\_09,US\_12,US\_13,US\_16,US\_19,US\_23,US\_26,US\_28,US\_32

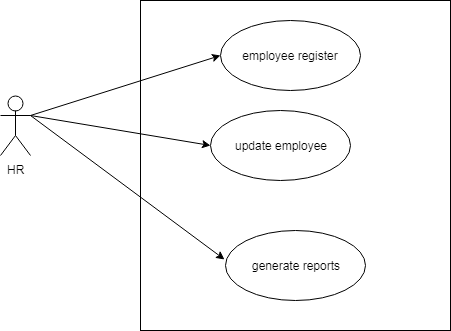
 US\_01,US\_32



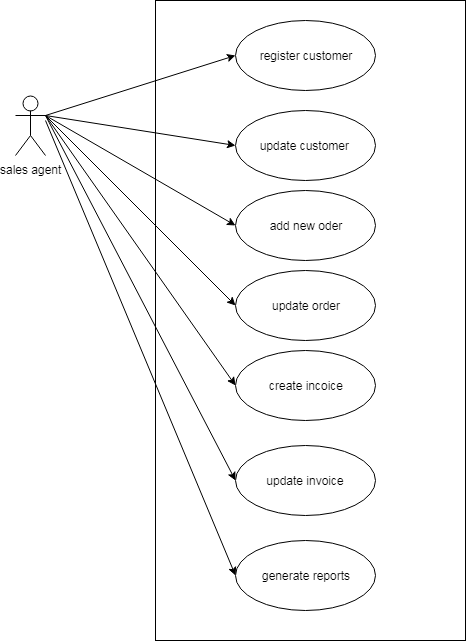




CFO-US\_02,US\_07,US\_09,US\_10,US\_12,US\_13,US\_17,US\_19,US\_20,US\_27



HR-US\_01,



Sales agent-US\_04, US\_06, US\_21, US\_23, US\_24, US\_26, US\_29