# Functional Requirement

1.1 Asset Registration Function   
 Function ID: FR-01   
 Description: Administrators can register new assets into the system by entering essential details.   
 Input: Asset details including Name, Description, Category, Status, PurchaseDate, and Location.   
 Output: A new Asset entity is stored in the database with a generated AssetID.  
  
1.2 Asset Information Update Function   
 Function ID: FR-02   
 Description: Administrators can update the details of an existing asset.   
 Input: AssetID and updated fields such as Name, Description, Category, Status, PurchaseDate, and Location.   
 Output: The updated Asset entity is stored in the database.  
  
1.3 Asset Deletion Function   
 Function ID: FR-03   
 Description: Administrators can delete an asset from the system after confirming it is not in use.   
 Input: AssetID and a confirmation to proceed with deletion.   
 Output: The Asset entity is removed from the database, and the deletion is logged.  
  
1.4 Asset Usage Assignment Function   
 Function ID: FR-04   
 Description: Administrators can assign a specific usage to an asset, including details and usage type.   
 Input: AssetID, UsageDate, UsageType, and UsageDetails.   
 Output: A new AssetUsage entity is created and stored in the database, linked to the corresponding Asset.  
  
1.5 Asset Usage Modification Function   
 Function ID: FR-05   
 Description: Administrators can modify the usage details of an existing asset usage record.   
 Input: UsageID and updated fields such as UsageDate, UsageType, and UsageDetails.   
 Output: The modified AssetUsage entity is stored in the database.  
  
1.6 Asset Usage Deletion Function   
 Function ID: FR-06   
 Description: Administrators can delete a specific asset usage record.   
 Input: UsageID and a confirmation to proceed with deletion.   
 Output: The AssetUsage entity is removed from the database, and the deletion is logged.  
  
1.7 Asset Usage History Viewing Function   
 Function ID: FR-07   
 Description: Administrators can view the usage history of an asset, including timestamps and usage types.   
 Input: AssetID or a search query to identify the asset.   
 Output: A list of UsageHistory records is retrieved and displayed, linked to the selected AssetUsage.  
  
1.8 Email Notification Sending Function   
 Function ID: FR-08   
 Description: Administrators can send email notifications to users regarding asset usage.   
 Input: UsageID, ToAddress, FromAddress, Subject, and Content of the notification.   
 Output: An Email entity is created and sent through the integrated email system.  
  
1.9 Notification Record Management Function   
 Function ID: FR-09   
 Description: The system automatically tracks and records the status and details of each email notification sent.   
 Input: UsageID and EmailID from the system's internal records.   
 Output: A NotificationRecord entity is created and stored in the database with SendStatus and SendDate.  
  
1.10 Administrator Account Management Function   
 Function ID: FR-10   
 Description: System Administrators can create, update, or delete other administrator accounts.   
 Input: AdminID (for update/delete), or new administrator details (Name, Role, EmailID, Department).   
 Output: A new or modified Administrator entity is stored in the database, or the account is deleted and logged.  
  
1.11 Administrator Account Deletion Function   
 Function ID: FR-11   
 Description: System Administrators can delete another administrator account from the system.   
 Input: AdminID and a confirmation to proceed with deletion.   
 Output: The Administrator entity is removed from the database, and the deletion is logged.  
  
1.12 Administrator Information Viewing Function   
 Function ID: FR-12   
 Description: System Administrators can view the details of other administrator accounts.   
 Input: AdminID or a search query to identify the administrator.   
 Output: The selected Administrator entity's details are retrieved and displayed.

# External Description

# 2. External Interfaces  
  
This chapter describes the external interfaces of the system, including user interfaces, hardware interfaces, software interfaces, and communication interfaces. Each interface is defined and described to ensure clear understanding and implementation by developers.  
  
## 2.1 User Interface Output  
  
The user interface is the primary means of interaction between the system and administrators. It provides a graphical and intuitive way for administrators to manage assets, asset usage, and administrator accounts.  
  
- \*\*Function FR-01 to FR-12\*\*: These functions are all accessed and executed through the system's user interface. The interface allows administrators to enter, update, delete, and view asset and administrator information.  
- \*\*Inputs via UI\*\*:  
 - Asset registration form (Name, Description, Category, Status, PurchaseDate, Location)  
 - Asset update form (AssetID, updated fields such as Name, Description, Category, Status, PurchaseDate, Location)  
 - Asset deletion confirmation dialog (AssetID, confirmation)  
 - Asset usage assignment form (AssetID, UsageDate, UsageType, UsageDetails)  
 - Asset usage modification form (UsageID, updated fields such as UsageDate, UsageType, UsageDetails)  
 - Asset usage deletion confirmation dialog (UsageID, confirmation)  
 - Asset usage history search and display (AssetID or search query)  
 - Email notification sending form (UsageID, ToAddress, FromAddress, Subject, Content)  
 - Administrator account management form (AdminID or new administrator details such as Name, Role, EmailID, Department)  
 - Administrator deletion confirmation dialog (AdminID, confirmation)  
 - Administrator information search and display (AdminID or search query)  
- \*\*Outputs via UI\*\*:  
 - Confirmation messages after asset, asset usage, or administrator account operations  
 - Display of asset usage history records  
 - Display of administrator account details  
 - Status of email notifications (e.g., sent, failed)  
  
The user interface must be responsive, accessible, and provide clear feedback to the user for each action taken.  
  
## 2.2 Hardware Interface Output  
  
The system does not require direct interaction with any external hardware devices. Therefore, there are no hardware interfaces defined in this section.  
  
## 2.3 Software Interface Output  
  
The system interacts with several software components, including a database for storing and retrieving data, and an email system for sending notifications.  
  
### 2.3.1 Database Interface  
  
- \*\*Description\*\*: The system uses a database to store and manage Asset, AssetUsage, Email, and Administrator entities. All data persistence and retrieval operations are conducted through this interface.  
- \*\*Entities\*\*:  
 - \*\*Asset\*\*: Represents an asset in the system with fields such as Name, Description, Category, Status, PurchaseDate, Location, and AssetID.  
 - \*\*AssetUsage\*\*: Represents a usage record of an asset, including UsageDate, UsageType, UsageDetails, and a foreign key linking to the Asset entity.  
 - \*\*Email\*\*: Represents an email notification with fields such as ToAddress, FromAddress, Subject, Content, and EmailID.  
 - \*\*Administrator\*\*: Represents an administrator account with fields such as Name, Role, EmailID, Department, and AdminID.  
 - \*\*NotificationRecord\*\*: Represents the status and details of an email notification, including SendStatus, SendDate, UsageID, and EmailID.  
- \*\*Interaction Method\*\*:  
 - \*\*Insert\*\*: Create new records in the database (e.g., inserting a new Asset or Email entity).  
 - \*\*Update\*\*: Modify existing records (e.g., updating an Asset or AssetUsage entity).  
 - \*\*Delete\*\*: Remove records from the database (e.g., deleting an Asset or Administrator entity).  
 - \*\*Select\*\*: Retrieve records based on criteria such as AssetID, UsageID, or AdminID.  
  
The database interface must support ACID (Atomicity, Consistency, Isolation, Durability) properties to ensure data integrity and reliability.  
  
### 2.3.2 Email System Interface  
  
- \*\*Description\*\*: The system integrates with an external email system to send notifications to users regarding asset usage. This interface is responsible for creating and sending Email entities.  
- \*\*Inputs\*\*:  
 - UsageID: Identifies the asset usage record associated with the notification.  
 - ToAddress: Recipient email address.  
 - FromAddress: Sender email address.  
 - Subject: Title of the email notification.  
 - Content: Body of the email notification.  
- \*\*Outputs\*\*:  
 - Email entity created and sent.  
 - NotificationRecord entity stored in the database to track the status of the sent email.  
  
The email system interface must support secure email transmission and provide feedback on the success or failure of the email delivery.  
  
## 2.4 Communication Interface Output  
  
The communication interface is primarily used for sending email notifications and managing their status.  
  
### 2.4.1 Email Notification Interface  
  
- \*\*Description\*\*: This interface is used to send email notifications to users when asset usage is assigned or modified. It also tracks the status of each email notification.  
- \*\*Inputs\*\*:  
 - UsageID: Identifies the asset usage record associated with the notification.  
 - ToAddress: Email address of the recipient.  
 - FromAddress: Email address of the sender.  
 - Subject: Title of the email.  
 - Content: Body of the email.  
- \*\*Outputs\*\*:  
 - The email is sent to the recipient.  
 - A NotificationRecord is created in the database with the SendStatus and SendDate.  
  
The communication interface must ensure timely and reliable delivery of email notifications, with proper error handling and logging for failed deliveries.