# Functional Requirement

1. Functional Requirements   
  
1.1 Email Creation Function   
 Function ID: FR-01   
 Description: A user or administrator can create a new email by filling in the subject, body, and recipient information. The email must be validated and stored in the email archive.   
 Input: Email subject, body, sender ID, recipient ID, timestamp, and formatting rules (optional).   
 Output: A new email stored in the email archive with a unique EmailID and status updated to "Draft" or "Pending Approval."  
  
1.2 Email Sending Function   
 Function ID: FR-02   
 Description: A user or administrator can send an existing email to the intended recipient after validation and approval (if required).   
 Input: Email to be sent, recipient validation result, and administrative approval status (if required).   
 Output: Email status updated to "Sent" in the email archive, and a confirmation message to the user.  
  
1.3 Email Receiving Function   
 Function ID: FR-03   
 Description: The system receives an email from an external source or another user, validates it, and stores it in the email archive under the recipient's information.   
 Input: Incoming email data including sender, recipient, subject, body, and timestamp.   
 Output: Email stored in the email archive with status "Received" and a notification sent to the recipient user.  
  
1.4 Email Reading Function   
 Function ID: FR-04   
 Description: A user or administrator can read the content of an existing email in the email archive. The system updates the email status to "Read" and logs the action if required.   
 Input: EmailID of the selected email.   
 Output: Displayed email content (subject, sender, body, attachments) and updated email status to "Read."  
  
1.5 Email Deletion Function   
 Function ID: FR-05   
 Description: A user or administrator can delete an email from the system. The system must confirm the deletion and log it if an administrator is involved.   
 Input: EmailID of the email to be deleted.   
 Output: Email removed from the email archive and a confirmation message sent to the user or administrator.  
  
1.6 Email Archiving Function   
 Function ID: FR-06   
 Description: A user or administrator can archive an email, moving it from the active inbox or sent items to the email archive.   
 Input: EmailID of the email to be archived.   
 Output: Email moved to the archive with updated status and a confirmation message to the user or administrator.  
  
1.7 Email Recovery Function   
 Function ID: FR-07   
 Description: A user or administrator can recover an archived email, moving it back to the active inbox or sent items.   
 Input: EmailID of the archived email.   
 Output: Email moved back to the active section with updated status and a confirmation message to the user or administrator.  
  
1.8 Contact Creation Function   
 Function ID: FR-08   
 Description: A user or administrator can create a new contact with name, email address, and phone number. The contact must be validated and stored in the user account database.   
 Input: Name, email address, phone number, and UserID.   
 Output: A new contact stored in the user account database with a unique ContactID and status updated to "Pending Approval" or "Active."  
  
1.9 Contact Update Function   
 Function ID: FR-09   
 Description: A user or administrator can update the information of an existing contact. The system must validate the new data and update the contact in the user account database.   
 Input: ContactID and updated contact information (name, email, phone number).   
 Output: Updated contact information stored in the user account database and a confirmation message to the user or administrator.  
  
1.10 Contact Deletion Function   
 Function ID: FR-10   
 Description: A user or administrator can delete a contact from the user account database. The system must confirm the deletion and log it if an administrator is involved.   
 Input: ContactID of the contact to be deleted.   
 Output: Contact removed from the database and a confirmation message sent to the user or administrator.  
  
1.11 Contact Viewing Function   
 Function ID: FR-11   
 Description: A user or administrator can view the details of an existing contact. The system must retrieve and display the contact information without modifying it.   
 Input: ContactID of the contact to be viewed.   
 Output: Displayed contact details (name, email, phone number, notes) and a log entry if an administrator is viewing it.  
  
1.12 User Account Creation Function   
 Function ID: FR-12   
 Description: An administrator can create a new user account by entering the username, email, password, and role. The system must validate the input and store the account in the user account database.   
 Input: Username, email address, password, and role.   
 Output: A new user account stored in the user account database with a unique AccountID and a confirmation message to the administrator.  
  
1.13 User Account Update Function   
 Function ID: FR-13   
 Description: A user or administrator can update the information of an existing user account. The system must validate the new data and update the account in the user account database.   
 Input: AccountID and updated user account information (username, password, email, role).   
 Output: Updated user account information stored in the user account database and a confirmation message to the user or administrator.  
  
1.14 User Account Deletion Function   
 Function ID: FR-14   
 Description: A user or administrator can delete a user account. The system must confirm the deletion, remove the account, and delete or archive associated data.   
 Input: AccountID of the account to be deleted.   
 Output: User account removed from the database, associated data deleted or archived, and a confirmation message to the user or administrator.  
  
1.15 User Account Viewing Function   
 Function ID: FR-15   
 Description: A user or administrator can view the details of an existing user account. The system must retrieve and display the account information without modifying it.   
 Input: AccountID of the user account to be viewed.   
 Output: Displayed user account details (username, email, role, creation date, last login) and a log entry if an administrator is viewing it.  
  
1.16 Email Folder Management Function   
 Function ID: FR-16   
 Description: A user or administrator can manage email folders by creating, renaming, deleting, or moving emails between folders.   
 Input: FolderID and folder management action (create, rename, delete, move).   
 Output: Updated email folder structure in the database and a confirmation message to the user or administrator.  
  
1.17 Email Format Management Function   
 Function ID: FR-17   
 Description: A user or administrator can manage email formatting rules by creating, editing, or deleting formatting templates.   
 Input: FormatID and formatting action (create, edit, delete).   
 Output: Updated email format configuration in the database and a confirmation message to the user or administrator.  
  
1.18 Email Format Application Function   
 Function ID: FR-18   
 Description: A user or administrator can apply formatting rules to an email, ensuring it is styled according to the system or user-defined template.   
 Input: EmailID and FormatID to be applied.   
 Output: Email updated with the specified formatting rules in the email archive.  
  
1.19 Email Archive Management Function   
 Function ID: FR-19   
 Description: An administrator can manage the email archive by setting retention policies, reorganizing folders, or modifying archive contents.   
 Input: ArchiveID and archive management action (set retention, reorganize, modify).   
 Output: Updated email archive structure and configuration and a confirmation message to the administrator.  
  
1.20 Email Archive Viewing Function   
 Function ID: FR-20   
 Description: A user or administrator can view the contents of the email archive, including filtering and searching for specific emails.   
 Input: ArchiveID or search/filter criteria.   
 Output: Displayed list of archived emails with details (subject, sender, timestamp, status) and a log entry if an administrator is viewing it.  
  
1.21 Administrator Assignment Function   
 Function ID: FR-21   
 Description: An administrator can assign administrative privileges to another user. The system must update the user account and log the action.   
 Input: Target UserID and administrative role assignment.   
 Output: Updated user account with administrative role and a log entry in the archive log.  
  
1.22 Administrator Permission Management Function   
 Function ID: FR-22   
 Description: An administrator can modify the permissions of another administrator, granting or revoking access to specific system functions.   
 Input: Target AdminID and permission update action (grant, revoke).   
 Output: Updated permissions in the user account database and a log entry in the archive log.  
  
1.23 Administrator Deletion Function   
 Function ID: FR-23   
 Description: An administrator can delete another administrator account. The system must confirm the deletion, remove the account, and log the action.   
 Input: AdminID of the administrator to be deleted.   
 Output: Administrator account removed from the database, permissions revoked, and a confirmation message to the administrator.  
  
1.24 Archive Log Management Function   
 Function ID: FR-24   
 Description: An administrator can view, filter, export, or delete entries in the archive log for auditing purposes.   
 Input: Log management action (view, filter, export, delete) and optional search criteria.   
 Output: Updated or retrieved archive log entries and a confirmation message to the administrator.

# External Description

2. External Interfaces   
  
This chapter describes the system’s external interfaces, including user interfaces, hardware interfaces, software interfaces, and communication interfaces. These interfaces define how the system interacts with users, external hardware, software components, and communication protocols.   
  
2.1 User Interface   
  
The system provides a graphical user interface (GUI) for users and administrators to interact with its functionalities. The interface includes screens for creating, sending, receiving, reading, deleting, archiving, and recovering emails, as well as managing contacts, email folders, formatting rules, and archive logs.   
  
- \*\*Email Management Interface\*\*:   
 - Input: Email subject, body, sender ID, recipient ID, timestamp, formatting rules, and actions (create, send, delete, archive, recover).   
 - Output: Confirmation messages, email status updates (e.g., "Draft," "Sent," "Read"), and displayed email content.   
  
- \*\*Contact Management Interface\*\*:   
 - Input: Name, email address, phone number, UserID, and actions (create, update, delete, view).   
 - Output: Confirmation messages, updated contact status (e.g., "Active," "Pending Approval"), and displayed contact details.   
  
- \*\*User Account Management Interface\*\*:   
 - Input: Username, email, password, role, AccountID, and actions (create, update, delete, view).   
 - Output: Confirmation messages, updated account status, and displayed account details (e.g., username, email, role, creation date, last login).   
  
- \*\*Email Folder Management Interface\*\*:   
 - Input: FolderID and folder management actions (create, rename, delete, move).   
 - Output: Confirmation messages and updated folder structure.   
  
- \*\*Email Format Management Interface\*\*:   
 - Input: FormatID and formatting actions (create, edit, delete).   
 - Output: Confirmation messages and updated formatting rules.   
  
- \*\*Email Format Application Interface\*\*:   
 - Input: EmailID and FormatID.   
 - Output: Confirmation message and updated email with applied formatting.   
  
- \*\*Email Archive Management Interface\*\*:   
 - Input: ArchiveID and archive management actions (set retention, reorganize, modify).   
 - Output: Confirmation messages and updated archive structure.   
  
- \*\*Email Archive Viewing Interface\*\*:   
 - Input: ArchiveID or search/filter criteria.   
 - Output: Displayed list of archived emails with details (subject, sender, timestamp, status) and a log entry if an administrator is viewing it.   
  
- \*\*Administrator Privilege Management Interface\*\*:   
 - Input: UserID, AdminID, and administrative actions (assign, modify, delete).   
 - Output: Confirmation messages, updated user/administrator roles, and log entries for auditing.   
  
- \*\*Archive Log Management Interface\*\*:   
 - Input: Log management actions (view, filter, export, delete) and optional search criteria.   
 - Output: Retrieved or modified archive log entries and confirmation messages.   
  
The user interface is designed to be intuitive, accessible via a web browser or desktop application, and supports user authentication and authorization to ensure secure access to administrative functions.   
  
2.2 Hardware Interface   
  
The system does not directly interact with specific hardware devices. However, it relies on the following hardware components for operation:   
  
- \*\*Storage Devices\*\*: The system stores emails, contacts, user accounts, formatting rules, and archive logs on server-based or cloud-based storage.   
- \*\*Computing Devices\*\*: Users and administrators access the system through computing devices such as desktops, laptops, tablets, or smartphones.   
  
No specialized hardware is required for the system to function. It is compatible with standard computing hardware and storage solutions.   
  
2.3 Software Interface   
  
The system interacts with the following software components and databases to manage its core functionalities:   
  
- \*\*Email Archive Database\*\*:   
 - Description: A database storing all email records, including subject, body, sender ID, recipient ID, timestamp, status, and formatting information.   
 - Interaction Method: The system performs CRUD (Create, Read, Update, Delete) operations on this database to manage emails.   
 - Input/Output:   
 - Input: Email subject, body, sender ID, recipient ID, timestamp, formatting rules, EmailID, and actions (create, send, read, delete, archive, recover).   
 - Output: Email records stored in the archive with status updates and confirmation messages.   
  
- \*\*User Account Database\*\*:   
 - Description: A database storing user account information, including username, email, password, role, AccountID, and login history.   
 - Interaction Method: The system performs CRUD operations on this database to manage user accounts and permissions.   
 - Input/Output:   
 - Input: Username, email, password, role, AccountID, and actions (create, update, delete, view).   
 - Output: Updated user account records, confirmation messages, and log entries for administrative actions.   
  
- \*\*Contact Database\*\*:   
 - Description: A database storing contact information, including name, email address, phone number, UserID, and ContactID.   
 - Interaction Method: The system performs CRUD operations to manage contacts.   
 - Input/Output:   
 - Input: Name, email, phone number, UserID, and actions (create, update, delete, view).   
 - Output: Updated contact records, confirmation messages, and log entries for administrative views.   
  
- \*\*Email Folder Database\*\*:   
 - Description: A database storing folder structures for organizing emails.   
 - Interaction Method: The system performs CRUD operations to manage folders and their contents.   
 - Input/Output:   
 - Input: FolderID and actions (create, rename, delete, move).   
 - Output: Updated folder structure and confirmation messages.   
  
- \*\*Email Format Configuration Database\*\*:   
 - Description: A database storing formatting templates and rules for emails.   
 - Interaction Method: The system performs CRUD operations to manage formatting configurations.   
 - Input/Output:   
 - Input: FormatID and actions (create, edit, delete).   
 - Output: Updated formatting rules and confirmation messages.   
  
- \*\*Archive Log Database\*\*:   
 - Description: A database storing logs of administrative actions, such as user account changes, email status updates, and archive modifications.   
 - Interaction Method: The system performs read, filter, export, and delete operations on this database.   
 - Input/Output:   
 - Input: Log management actions (view, filter, export, delete) and optional search criteria.   
 - Output: Retrieved or modified archive log entries and confirmation messages.   
  
The system may also integrate with third-party tools or libraries for email validation, formatting, and logging, as required for implementation.   
  
2.4 Communication Interface   
  
The system communicates with external sources using standard communication protocols and methods, primarily via email and web-based interactions.   
  
- \*\*Email Communication\*\*:   
 - Description: The system sends and receives emails using standard email protocols (e.g., SMTP for sending, POP/IMAP for receiving).   
 - Interaction Method:   
 - For sending emails: The system validates the recipient and sends the email using SMTP.   
 - For receiving emails: The system connects to an external mail server using POP or IMAP to retrieve emails and store them in the email archive.   
 - Input/Output:   
 - Input: Incoming email data (sender, recipient, subject, body, timestamp) and outgoing email data (subject, body, sender ID, recipient ID, timestamp, formatting rules).   
 - Output: Emails sent to external recipients and emails stored in the archive after receiving.   
  
- \*\*Web-based Communication\*\*:   
 - Description: The system is accessible via web browsers and may support RESTful APIs for external applications to interact with it.   
 - Interaction Method: HTTP/HTTPS protocols are used for communication between the client (browser or application) and the server.   
 - Input/Output:   
 - Input: API requests for email and account management (e.g., POST for creating an email, GET for viewing an email archive).   
 - Output: JSON/XML responses containing email/contact/account data, status updates, and confirmation messages.   
  
- \*\*Notification Services\*\*:   
 - Description: The system sends notifications to users when emails are received or actions are completed.   
 - Interaction Method: Notifications may be delivered via in-app messages, email, or SMS, depending on user preferences and system capabilities.   
 - Input/Output:   
 - Input: Recipient information and notification content.   
 - Output: Delivered notification to the user, with a log entry for administrative visibility.   
  
The communication interfaces ensure seamless interaction with external email servers, user devices, and administrative tools, enabling efficient and secure email and user account management.