# Functional Requirement

1.1 Email Creation Function   
Function ID: FR-01   
Description: Administrators can create new emails by selecting a recipient Contact, entering subject and content, and associating the email with a valid Account.   
Input: Recipient Contact details, email subject, email content, and associated Account ID.   
Output: A new Email entity with the status "Draft" or "Sent", stored in the Email Archive.   
  
1.2 Email Sending Function   
Function ID: FR-02   
Description: Administrators can send a selected email to the associated Contact. The system updates the email status and logs the sending action.   
Input: Selected Email ID, recipient Contact details, and associated Account ID.   
Output: The Email status is updated to "Sent", and a record is added to the Email Log.   
  
1.3 Email Receiving Function   
Function ID: FR-03   
Description: The system automatically detects and stores incoming emails in the Email Archive, associating them with the appropriate Contact and Account.   
Input: Incoming email data (sender, content, timestamp, etc.).   
Output: A new Email entity with the status "Received", stored in the Email Archive and associated with a Contact and Account.   
  
1.4 Email Reading Function   
Function ID: FR-04   
Description: Administrators can view the content of a selected email along with its associated Contact and Account details. The system logs the read action and updates the email's read status.   
Input: Selected Email ID.   
Output: Email content and metadata displayed to the Administrator; the Email status is updated to "Read", and a read log entry is added.   
  
1.5 Email Deletion Function   
Function ID: FR-05   
Description: Administrators can delete an email from the system. The system verifies the selection and logs the deletion action.   
Input: Selected Email ID.   
Output: The Email is removed from the system; a deletion log entry is added to the Email Log.   
  
1.6 Email Archiving Function   
Function ID: FR-06   
Description: Administrators can archive an email to ensure long-term storage and compliance. The system updates the email status and logs the archiving action.   
Input: Selected Email ID and archiving reason (optional).   
Output: The Email status is updated to "Archived", and a corresponding Archive Record is created in the Email Archive.   
  
1.7 Email Recovery Function   
Function ID: FR-07   
Description: Administrators can recover an archived email and return it to the inbox or sent items. The system updates the email status and logs the recovery action.   
Input: Selected Email ID from the Email Archive.   
Output: The Email is moved back to its original location with status "Recovered", and a recovery log entry is added.   
  
1.8 Email Formatting Function   
Function ID: FR-08   
Description: Administrators can apply formatting rules (font style, size, color, layout) to an email using a Format Template.   
Input: Selected Email ID and formatting rules from a Format Template.   
Output: The Email is updated with the applied formatting, and the formatting changes are stored in the Email Archive.   
  
1.9 Contact Creation Function   
Function ID: FR-09   
Description: Administrators can create new Contacts and associate them with a valid Account.   
Input: Contact name, email address, phone number, address, and associated Account ID.   
Output: A new Contact entity stored in the system and linked to a valid Account.   
  
1.10 Contact Update Function   
Function ID: FR-10   
Description: Administrators can modify the details of an existing Contact, and the changes are logged.   
Input: Selected Contact ID and updated Contact details.   
Output: The Contact entity is updated in the system, and an update log entry is added.   
  
1.11 Contact Deletion Function   
Function ID: FR-11   
Description: Administrators can delete a Contact from the system. The system updates related Email records and logs the deletion action.   
Input: Selected Contact ID.   
Output: The Contact is removed from the system; related Email records are updated, and a deletion log entry is added.   
  
1.12 Contact Viewing Function   
Function ID: FR-12   
Description: Administrators can view the details of an existing Contact, including their associated Account.   
Input: Selected Contact ID.   
Output: Contact details displayed to the Administrator, and a view log entry is added.   
  
1.13 Account Management Function   
Function ID: FR-13   
Description: Administrators can create, update, or delete an Account. The system ensures all associated Emails and Contacts are updated accordingly.   
Input: Account details for creation, update, or deletion.   
Output: Account entity is created, updated, or deleted in the system; related entities are adjusted, and the action is logged.   
  
1.14 Account Update Function   
Function ID: FR-14   
Description: Administrators can update an existing Account's information, and the system logs the update and reflects changes in related entities.   
Input: Selected Account ID and updated Account details.   
Output: Account entity is updated in the system; related Emails and Contacts are updated as necessary, and an update log entry is added.   
  
1.15 Account Deletion Function   
Function ID: FR-15   
Description: Administrators can delete an Account. The system verifies for active dependencies and updates or disassociates related Contacts and Emails.   
Input: Selected Account ID.   
Output: The Account is deleted from the system; related Contacts and Emails are updated or disassociated, and a deletion log entry is added.   
  
1.16 Account Viewing Function   
Function ID: FR-16   
Description: Administrators can view the details of an Account and its associated Contacts.   
Input: Selected Account ID.   
Output: Account details and associated Contacts are displayed to the Administrator, and a view log entry is added.   
  
1.17 Archive Record Management Function   
Function ID: FR-17   
Description: Administrators can create, update, or delete Archive Records for archived Emails. The system logs all actions and updates the Email Archive accordingly.   
Input: Archive Record details for creation, update, or deletion.   
Output: Archive Record is created, updated, or deleted in the system; the Email Archive is updated if necessary, and the action is logged.   
  
1.18 Compliance Audit Function   
Function ID: FR-18   
Description: Administrators can perform a compliance audit to check emails against data privacy and content policies. The system flags non-compliant emails and generates a compliance report.   
Input: Audit criteria (time range, filters, etc.).   
Output: Compliance audit results displayed to the Administrator, including flagged emails; a Compliance Log is updated with audit details.   
  
1.19 Archive Log Viewing Function   
Function ID: FR-19   
Description: Administrators can view logs of archiving and recovery actions. The system supports filtering by time range and other audit criteria.   
Input: Time range or filter criteria for archive logs.   
Output: Archive logs displayed to the Administrator, including email details, action timestamps, and associated entities; the view is logged.   
  
1.20 Administrator Log Viewing Function   
Function ID: FR-20   
Description: Administrators can view logs of their own actions and other administrators' actions for auditing and troubleshooting.   
Input: Time range or filter criteria for administrator logs.   
Output: Administrator logs displayed to the user, including action details and timestamps; the viewing action is logged.   
  
1.21 Format Template Management Function   
Function ID: FR-21   
Description: Administrators can create, update, or delete Format Templates that define formatting rules for Emails.   
Input: Format Template details for creation, update, or deletion.   
Output: Format Template is created, updated, or deleted in the system; the formatting rules are applied to associated Emails, and the action is logged.   
  
1.22 Administrator Creation Function   
Function ID: FR-22   
Description: Administrators can create new Administrator accounts and assign them to valid Accounts.   
Input: New Administrator details (name, username, password) and associated Account ID.   
Output: A new Administrator is created in the system and linked to an Account; the action is logged.   
  
1.23 Administrator Permission Assignment Function   
Function ID: FR-23   
Description: Administrators can assign administrative permissions to other users within the system.   
Input: Target user ID and the Account for which permissions are being assigned.   
Output: The user is granted administrative rights for the selected Account; the action is logged.   
  
1.24 Administrator Removal Function   
Function ID: FR-24   
Description: Administrators can remove other administrators from the system. The system verifies if there are other administrators for the Account and updates permissions accordingly.   
Input: Target Administrator ID.   
Output: The Administrator is removed from the system; the associated Account is updated, and the action is logged.   
  
1.25 Compliance Log Management Function   
Function ID: FR-25   
Description: Administrators can view, update, or delete Compliance Log entries that track audit results for Emails.   
Input: Compliance Log action (view, update, or delete) and relevant Compliance Log ID.   
Output: Compliance Log is updated or removed as per the action; the action is logged for traceability.

# External Description

# \*\*Chapter 2: External Interfaces\*\*   
  
This chapter defines the external interfaces of the system, including user interfaces, hardware interfaces, software interfaces, and communication interfaces. These interfaces are essential for the system to interact with external entities such as users, hardware components, external software systems, and communication protocols. The description of each interface includes its role, definition, and interaction method with the system.   
  
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## \*\*2.1 User Interface Output\*\*   
  
The system provides a set of user interfaces for administrators to manage emails, contacts, accounts, format templates, and compliance logs. These interfaces are designed for ease of use and efficient interaction with the system.   
  
### \*\*2.1.1 Email Management Interface\*\*   
\*\*Definition:\*\* A graphical interface for creating, sending, reading, deleting, archiving, and recovering emails.   
\*\*Role:\*\* Allows administrators to compose and manage emails, view their status and content, and perform related actions.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Recipient Contact details   
 - Email subject and content   
 - Email ID for sending, reading, deleting, archiving, or recovering   
 - Formatting rules from a selected Format Template   
- \*\*Outputs:\*\*   
 - Display of email content and metadata   
 - Status updates (e.g., "Draft", "Sent", "Read", "Archived", "Recovered")   
 - Confirmation messages for sending, deleting, or archiving actions   
 - Logging of user actions (e.g., sending, reading, deleting)   
  
### \*\*2.1.2 Contact Management Interface\*\*   
\*\*Definition:\*\* A graphical interface for creating, updating, deleting, and viewing contacts.   
\*\*Role:\*\* Enables administrators to manage contact records associated with accounts.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Contact name, email address, phone number, and address   
 - Contact ID for updating or deleting   
- \*\*Outputs:\*\*   
 - Display of contact details and associated account   
 - Confirmation of contact creation, update, or deletion   
 - Logging of user actions   
  
### \*\*2.1.3 Account Management Interface\*\*   
\*\*Definition:\*\* A graphical interface for creating, updating, deleting, and viewing account records.   
\*\*Role:\*\* Provides a central point for administrators to manage account-related data and associated contacts and emails.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Account details for creation or update   
 - Account ID for deletion or viewing   
- \*\*Outputs:\*\*   
 - Display of account information and associated contacts   
 - Confirmation of account creation, update, or deletion   
 - Logging of user actions   
  
### \*\*2.1.4 Format Template Management Interface\*\*   
\*\*Definition:\*\* A graphical interface for managing formatting rules applied to emails.   
\*\*Role:\*\* Allows administrators to define, update, or delete format templates for consistent email formatting.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Format template details (font style, size, color, layout)   
 - Template ID for updating or deleting   
- \*\*Outputs:\*\*   
 - Display of format template details   
 - Confirmation of template creation, update, or deletion   
 - Logging of user actions   
  
### \*\*2.1.5 Compliance Audit Interface\*\*   
\*\*Definition:\*\* A graphical interface for performing compliance audits on emails.   
\*\*Role:\*\* Enables administrators to review emails for compliance with data privacy and content policies.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Audit criteria (e.g., time range, filters)   
- \*\*Outputs:\*\*   
 - Display of audit results, including flagged emails   
 - Generation of compliance audit reports   
 - Logging of audit actions   
  
### \*\*2.1.6 Administrator Management Interface\*\*   
\*\*Definition:\*\* A graphical interface for managing administrator accounts and permissions.   
\*\*Role:\*\* Provides tools for creating new administrators, assigning or removing permissions, and viewing logs of administrative actions.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Administrator details (name, username, password)   
 - Target user or administrator ID for permission assignment or removal   
- \*\*Outputs:\*\*   
 - Display of administrator account details and permissions   
 - Confirmation of administrator creation, permission assignment, or removal   
 - Logging of administrative actions   
  
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## \*\*2.2 Hardware Interface Output\*\*   
  
There are no direct hardware interfaces required for this system, as it operates primarily through software and network-based communication. The system is expected to run on standard server hardware and desktop/laptop devices, but no specialized hardware is required for its core functionality.   
  
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## \*\*2.3 Software Interface Output\*\*   
  
The system interacts with external software components, particularly databases and logging systems, to store and retrieve data efficiently.   
  
### \*\*2.3.1 Email Archive Database\*\*   
\*\*Definition:\*\* A persistent storage system for email entities, including their content, metadata, status, and associated contacts and accounts.   
\*\*Role:\*\* Stores all created, sent, received, read, archived, and recovered emails.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Email entities with statuses such as "Draft", "Sent", "Read", "Archived", or "Recovered"   
 - Archive records for long-term compliance storage   
- \*\*Outputs:\*\*   
 - Retrieval of email entities for viewing, updating, or deleting   
 - Storage of email entities with updated status or formatting   
 - Creation of archive records for compliance   
  
### \*\*2.3.2 Email Log Database\*\*   
\*\*Definition:\*\* A database that records all email-related actions, including sending, reading, deleting, and archiving.   
\*\*Role:\*\* Maintains a traceable history of all email operations for auditing and compliance.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Email action details (e.g., "Sent", "Read", "Deleted", "Archived", "Recovered")   
 - Timestamps and associated entity IDs (Email ID, Contact ID, Account ID)   
- \*\*Outputs:\*\*   
 - Storage of log entries   
 - Retrieval of log data for viewing or audit purposes   
  
### \*\*2.3.3 Compliance Log Database\*\*   
\*\*Definition:\*\* A database that stores compliance audit results and actions taken on emails.   
\*\*Role:\*\* Ensures traceability and compliance tracking for all email content.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Compliance audit details (e.g., flagged emails, audit timestamps, criteria)   
 - Log entries for viewing, updating, or deleting   
- \*\*Outputs:\*\*   
 - Storage of compliance audit results   
 - Retrieval of log data for viewing or updating   
  
### \*\*2.3.4 Format Template Database\*\*   
\*\*Definition:\*\* A database storing formatting rules and templates used to apply consistent styles to emails.   
\*\*Role:\*\* Stores and retrieves formatting configurations for email creation and modification.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Format template details (font style, size, color, layout)   
 - Template ID for retrieval or deletion   
- \*\*Outputs:\*\*   
 - Retrieval of formatting rules for applying to emails   
 - Storage of new or updated format templates   
  
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## \*\*2.4 Communication Interface Output\*\*   
  
The system communicates with external entities through email protocols and network-based interactions.   
  
### \*\*2.4.1 Email Communication Interface\*\*   
\*\*Definition:\*\* A communication interface for sending and receiving emails via standard email protocols (e.g., SMTP, POP3, IMAP).   
\*\*Role:\*\* Enables the system to send outgoing emails to recipients and receive incoming emails from external sources.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - Email content and recipient details for sending   
 - Incoming email data (sender, content, timestamp) for receiving   
- \*\*Outputs:\*\*   
 - Sent emails to the recipient’s email server   
 - Stored incoming emails in the Email Archive with appropriate associations   
 - Logging of sending and receiving actions   
  
### \*\*2.4.2 Web Communication Interface\*\*   
\*\*Definition:\*\* A communication interface for administrators to access the system via a web browser.   
\*\*Role:\*\* Provides a secure and accessible way to interact with the system using HTTP/HTTPS protocols.   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - User login credentials   
 - Input data from web-based forms and interfaces (e.g., email content, contact details)   
- \*\*Outputs:\*\*   
 - Rendered web pages and interface elements   
 - Real-time updates and responses to user actions   
 - Logging of all web-based interactions   
  
### \*\*2.4.3 API Communication Interface (Optional)\*\*   
\*\*Definition:\*\* A potential software interface for external systems to interact with the email management system using defined API endpoints.   
\*\*Role:\*\* Allows for integration with third-party systems (e.g., CRM tools, enterprise email servers).   
\*\*Interaction Method:\*\*   
- \*\*Inputs:\*\*   
 - JSON/XML payloads containing email, contact, or account data   
 - API requests for creating, updating, or retrieving data   
- \*\*Outputs:\*\*   
 - Structured responses in JSON/XML format   
 - Status codes indicating success or failure of API requests   
 - Logging of API-based actions   
  
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## \*\*Summary of External Interfaces\*\*   
  
| Interface Type | Interface Name | Description |  
|-----------------------------|----------------------------------|-----------------------------------------------------------------------------|  
| User Interface | Email Management Interface | Manages creation, sending, reading, deleting, archiving, and recovery of emails |  
| User Interface | Contact Management Interface | Manages contact records and their associations to accounts |  
| User Interface | Account Management Interface | Manages account creation, updates, deletions, and associated entities |  
| User Interface | Format Template Management Interface | Manages formatting templates for emails |  
| User Interface | Compliance Audit Interface | Performs and displays compliance audits on emails |  
| User Interface | Administrator Management Interface | Manages administrator accounts and permissions |  
| Software Interface | Email Archive Database | Stores and retrieves email entities and their metadata |  
| Software Interface | Email Log Database | Logs all email-related actions for auditability |  
| Software Interface | Compliance Log Database | Logs compliance audit results for traceability |  
| Software Interface | Format Template Database | Stores formatting rules for email templates |  
| Communication Interface | Email Communication Interface | Handles sending and receiving of emails via external email servers |  
| Communication Interface | Web Communication Interface | Provides access to the system through web browsers |  
| Communication Interface | API Communication Interface | Allows external systems to interact with the system through API endpoints |  
  
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This section ensures that all external data sources referenced in the functional requirements are clearly defined and categorized. Developers can refer to these interfaces to understand how the system interacts with the outside world and how to implement these interactions consistently and accurately.