项目文档

# Functional Requirement

# 1. Functional Requirements  
  
## 1.1 Email Creation Function   
Function ID: FR-01   
Description: Administrators can create new email accounts with associated distribution groups.   
Input: Email address, password, contact information, selected distribution group   
Output: Created email account with status set to active, added to the specified distribution group  
  
## 1.2 Email Sending Function   
Function ID: FR-02   
Description: Users can compose and send emails to individual contacts or distribution groups.   
Input: Selected email account, subject, body content, attachment files, recipient contact/distribution group selection   
Output: Sent email with timestamp, status set to sent, copy stored in archive if configured  
  
## 1.3 Email Receiving Function   
Function ID: FR-03   
Description: System automatically receives and processes incoming emails for associated accounts.   
Input: Email server connection, active email account, system notification settings   
Output: Received email with sender/receiver information, timestamp, status set to received, copy stored in archive if configured  
  
## 1.4 Email Viewing Function   
Function ID: FR-04   
Description: Administrators can view email contents from inbox or archive.   
Input: Selected email ID, administrator credentials, viewing permissions   
Output: Displayed email content including subject, sender, recipient, body, and attachments, email status updated to read  
  
## 1.5 Email Reply Function   
Function ID: FR-05   
Description: Users can reply to received emails and send responses.   
Input: Selected email to reply to, reply content (subject, body, attachments), active email account   
Output: Sent reply email, original email marked as replied, reply copy stored in archive if configured  
  
## 1.6 Email Forwarding Function   
Function ID: FR-06   
Description: Users can forward received emails to new recipients.   
Input: Selected email to forward, forwarding content (subject, body, attachments), new recipient contact/distribution group selection, active email account   
Output: Sent forwarded email, original email marked as forwarded, forwarded copy stored in archive if configured  
  
## 1.7 Email Archiving Function   
Function ID: FR-07   
Description: System can move selected emails to archive storage for long-term retention.   
Input: Selected email ID, archive configuration settings, administrator credentials   
Output: Archived email with archive date, retention period, and status set to archived  
  
## 1.8 Email Recovery Function   
Function ID: FR-08   
Description: Administrators can restore archived emails to inbox.   
Input: Selected archive record ID, administrator credentials, recovery permissions   
Output: Recovered email in inbox with recovery date, archive status updated to recovered  
  
## 1.9 Contact Management Function   
Function ID: FR-09   
Description: Administrators can add, edit, or delete contact records associated with email accounts.   
Input: Contact details (name, email address, phone number, address), distribution group association, administrator credentials   
Output: Updated contact records with status tracking, associated email account and distribution group updates  
  
## 1.10 Distribution Group Management Function   
Function ID: FR-10   
Description: Administrators can create, update, or delete distribution groups and manage their members.   
Input: Group name, description, member contacts/accounts, administrator credentials   
Output: Updated distribution groups with valid members and status tracking  
  
## 1.11 Email Account Management Function   
Function ID: FR-11   
Description: Administrators can update or delete email account records and associated data.   
Input: Email account details (username, password, status), administrator credentials   
Output: Updated or deleted email account with cascading updates to contacts and distribution groups  
  
## 1.12 Administrator Management Function   
Function ID: FR-12   
Description: Administrators can assign or remove administrator privileges from users.   
Input: Target user account, administrator credentials, access permissions   
Output: Updated administrator records with role changes and access updates  
  
## 1.13 Email Template Management Function   
Function ID: FR-13   
Description: Administrators can create, update, or delete reusable email templates.   
Input: Template name, content, creator information, email account/distribution group association, administrator credentials   
Output: Updated email template records with version tracking and archive capability  
  
## 1.14 Email Settings Management Function   
Function ID: FR-14   
Description: Administrators can configure email account preferences like themes, language, and notification settings.   
Input: Selected email account, settings parameters (theme, language, signature, notification settings), administrator credentials   
Output: Updated email settings record with applied configurations  
  
## 1.15 Archive Record Management Function   
Function ID: FR-15   
Description: Administrators can view, edit, or delete archive records.   
Input: Selected archive record ID, administrator credentials, modification parameters (tags, retention status)   
Output: Updated archive records with metadata changes, deletion tracking  
  
## 1.16 Email Deletion Function   
Function ID: FR-16   
Description: Administrators can delete emails from inbox or archive.   
Input: Selected email ID, administrator credentials, deletion confirmation   
Output: Deleted email record, updated inbox/archive status, audit log entry  
  
## 1.17 Email Formatting Function   
Function ID: FR-17   
Description: System supports formatting of emails with text styling and layout options.   
Input: Email content, formatting instructions (font style, size, color, layout)   
Output: Formatted email content ready for sending or viewing  
  
## 1.18 Email Filtering Function   
Function ID: FR-18   
Description: System allows filtering of emails based on criteria like date range, contacts, or distribution groups.   
Input: Filter criteria (date range, contact, group), administrator/user credentials   
Output: Filtered list of emails for viewing or exporting  
  
## 1.19 Email Export Function   
Function ID: FR-19   
Description: Administrators can export selected email data in specified formats.   
Input: Export criteria (email account, date range, contacts/groups), selected format (CSV, PDF, etc.), administrator credentials   
Output: Exported file with structured email data, download availability confirmation  
  
## 1.20 Email Validation Function   
Function ID: FR-20   
Description: System validates email content and recipient information before sending.   
Input: Email content, recipient information, email account status   
Output: Validation results, error/warning messages if validation fails  
  
## 1.21 Email Status Tracking Function   
Function ID: FR-21   
Description: System tracks and updates email statuses throughout its lifecycle.   
Input: Email event (sent, received, read, archived, recovered, deleted)   
Output: Updated email status field in database  
  
## 1.22 Email Template Application Function   
Function ID: FR-22   
Description: Users can apply pre-defined email templates when composing new emails.   
Input: Selected template ID, template parameters, email account   
Output: Composed email using template content, template reference tracking  
  
## 1.23 Email Storage Function   
Function ID: FR-23   
Description: System stores emails and related data in database with metadata tracking.   
Input: Email content, sender/receiver information, timestamp, status   
Output: Persisted email record in database with full metadata  
  
## 1.24 Email Access Control Function   
Function ID: FR-24   
Description: System enforces access control policies for email viewing, management, and operations.   
Input: User credentials, requested operation, target email/contact/group/resource   
Output: Access granted/denied status, operation execution result  
  
## 1.25 Email Notification Function   
Function ID: FR-25   
Description: System provides notifications for email events like new messages or archive actions.   
Input: Notification settings, email event (new email received, email sent, archive action)   
Output: Delivered notification to user/administrator  
  
## 1.26 Email Association Function   
Function ID: FR-26   
Description: System manages associations between emails, accounts, templates, and archive records.   
Input: Email ID, account ID, template ID, archive ID   
Output: Updated association records in database  
  
## 1.27 Email Error Logging Function   
Function ID: FR-27   
Description: System logs errors and warnings during email operations for troubleshooting.   
Input: Error event (invalid data, failed send/receive/archive), system status information   
Output: Recorded error log entry with timestamp and details  
  
## 1.28 Email Search Function   
Function ID: FR-28   
Description: System allows searching for emails in inbox or archive by keywords or metadata.   
Input: Search query (subject, sender, recipient, date range), administrator/user credentials   
Output: List of matching emails with relevant metadata  
  
## 1.29 Email Auto-reply Function   
Function ID: FR-29   
Description: System supports configuring and sending automated reply emails.   
Input: Auto-reply settings, trigger conditions (time-based, specific senders), template content   
Output: Sent auto-reply email, status tracking of auto-reply action  
  
## 1.30 Email Security Function   
Function ID: FR-30   
Description: System ensures secure handling of email data and credentials.   
Input: Email content, user credentials, security policies   
Output: Encrypted data storage, secure authentication, access control enforcement  
  
## 1.31 Email Audit Function   
Function ID: FR-31   
Description: System maintains audit trails for all email-related operations.   
Input: Operation type (create, send, receive, archive, recover, delete), operator information   
Output: Created audit log entry with timestamp and details  
  
## 1.32 Email Retention Policy Enforcement Function   
Function ID: FR-32   
Description: System enforces configured retention policies for email archiving.   
Input: Email metadata, retention policy rules   
Output: Automated archiving decision, email status updates based on policy  
  
## 1.33 Email Statistics Reporting Function   
Function ID: FR-33   
Description: System generates reports on email activity and archive status.   
Input: Report criteria (email account, time period, activity type), administrator credentials   
Output: Generated report with statistical data and visualizations  
  
## 1.34 Email Backup Function   
Function ID: FR-34   
Description: System creates backups of email data and archive records.   
Input: Backup schedule, selected data for backup   
Output: Created backup file, backup status confirmation  
  
## 1.35 Email Restoration Function   
Function ID: FR-35   
Description: System can restore email data from backups.   
Input: Backup file, restoration criteria, administrator credentials   
Output: Restored email data, updated status of restored items  
  
## 1.36 Email Template Validation Function   
Function ID: FR-36   
Description: System validates email templates for content and format integrity.   
Input: Template content, template configuration   
Output: Validation result, error/warning messages if validation fails  
  
## 1.37 Email Configuration Function   
Function ID: FR-37   
Description: System manages configuration settings for email operations.   
Input: Configuration parameters (server settings, archive rules), administrator credentials   
Output: Updated configuration records, system behavior changes based on configuration

# External Description

# 2. External Interfaces   
  
This chapter outlines the external interfaces of the system, detailing the user interfaces, hardware interfaces, software interfaces, and communication interfaces that facilitate interaction with external entities. These interfaces are derived from the functional requirements to ensure comprehensive coverage of all necessary components for system integration and operation.   
  
## 2.1 User Interface   
  
The user interface of the system is designed to support both administrators and users in performing a wide range of email and contact management tasks. The interface includes forms, menus, and dashboards that allow for intuitive interaction with the system.   
  
- \*\*Email Creation Interface\*\*: A form for administrators to create new email accounts and associate them with distribution groups. Inputs include email address, password, contact information, and distribution group selection. Outputs include confirmation of account creation and status updates.   
- \*\*Email Composition Interface\*\*: A user-friendly editor for composing and sending emails, including options for adding subject lines, body content, attachments, and selecting recipients (individuals or distribution groups).   
- \*\*Email Inbox Interface\*\*: A display area where users can view incoming emails with sender/receiver information, timestamps, and statuses (e.g., received, read).   
- \*\*Email Archive Interface\*\*: A dedicated section where archived emails are stored and can be viewed, edited, or deleted by administrators.   
- \*\*Email Settings Interface\*\*: A configuration panel where administrators can adjust preferences such as themes, language, signature, and notification settings.   
- \*\*Email Filtering and Search Interface\*\*: A control panel that allows users and administrators to filter and search emails based on metadata (e.g., sender, recipient, date range) or keywords.   
- \*\*Email Template Management Interface\*\*: A screen for administrators to create, update, and delete reusable email templates, as well as apply them when composing new emails.   
- \*\*Contact and Distribution Group Management Interface\*\*: A screen for administrators to manage contact records and distribution groups, including adding, editing, and deleting entries.   
- \*\*Email Reporting and Statistics Interface\*\*: A dashboard for administrators to generate reports on email activity and archive status, with visualizations and statistical data.   
- \*\*Email Backup and Restoration Interface\*\*: A tool for administrators to configure and execute backup and restoration operations for email data and archive records.   
  
The user interface ensures secure access through authentication and role-based permissions. It also supports audit trails for all user actions and provides feedback to users in the form of success or error messages.   
  
## 2.2 Hardware Interface   
  
The system does not require direct interaction with hardware devices beyond standard computing hardware (e.g., servers, storage devices, and client machines). However, the system may utilize hardware components for performance and scalability.   
  
- \*\*Email Server\*\*: The system connects to an email server (e.g., SMTP, IMAP, POP3) to handle the sending and receiving of emails. The hardware interface includes the communication protocols used (e.g., TCP/IP) and the server's capacity and performance requirements.   
- \*\*Storage Devices\*\*: The system may interact with external storage devices for archiving and backing up email data. The interface includes support for standard storage protocols (e.g., SCSI, SATA) and the system's data retention and retrieval requirements.   
- \*\*Network Infrastructure\*\*: The system relies on a stable network connection for communication with external services and email servers. The interface includes support for standard network hardware (e.g., routers, switches) and protocols (e.g., HTTP, HTTPS).   
  
## 2.3 Software Interface   
  
The system interacts with various software components, including databases, third-party tools, and internal modules. These interfaces are critical for data storage, retrieval, and processing.   
  
- \*\*Database Interface\*\*: The system interacts with a database to store and retrieve email data, contacts, distribution groups, templates, and audit logs. The interface supports SQL-based queries for managing records and metadata.   
 - \*\*Email Records\*\*: Stored in the database with metadata such as sender, recipient, timestamp, and status.   
 - \*\*Contact Records\*\*: Managed in the database with fields for name, email address, phone number, and address.   
 - \*\*Distribution Groups\*\*: Maintained in the database with information about group name, description, and members.   
 - \*\*Email Templates\*\*: Stored in the database with version tracking and archive capability.   
 - \*\*Archive Records\*\*: Managed in the database with details about archive date, retention period, and status.   
 - \*\*Audit Logs\*\*: Stored in the database with information about operations performed, including operator, timestamp, and details.   
- \*\*Email Server Software\*\*: The system communicates with email server software (e.g., Microsoft Exchange, Postfix) to send and receive emails. The interface includes API calls or direct protocol support (e.g., SMTP for sending, IMAP for receiving).   
- \*\*Security Software\*\*: The system interacts with security software to enforce encryption, secure authentication, and access control policies. The interface includes secure protocols (e.g., TLS, OAuth) and encryption standards (e.g., AES-256).   
- \*\*Third-Party Tools\*\*: The system may integrate with third-party tools for additional functionality, such as backup and restoration tools (e.g., rsync, Bacula) and reporting tools (e.g., Tableau, Power BI). The interface includes API-based integration for data exchange.   
- \*\*Email Export Tools\*\*: The system provides an interface for exporting email data in various formats (e.g., CSV, PDF). The interface includes data formatting and file generation logic.   
  
## 2.4 Communication Interface   
  
The system communicates with external systems and users via network-based protocols and email services to ensure seamless data exchange and notifications.   
  
- \*\*Email Sending and Receiving Interface\*\*: The system communicates with email servers via SMTP, IMAP, or POP3 protocols to send and receive emails. This interface handles authentication, encryption, and error logging during email operations.   
- \*\*Notification Interface\*\*: The system sends notifications for email events such as new messages, archive actions, or system errors. The interface supports real-time or scheduled notifications via email, in-system alerts, or integration with external messaging platforms (e.g., Slack, Microsoft Teams).   
- \*\*Archive Communication Interface\*\*: The system communicates with the archive database to store and retrieve archived emails. This interface includes mechanisms for updating statuses (e.g., archived, recovered) and managing retention policies.   
- \*\*Backup and Restoration Communication Interface\*\*: The system communicates with external storage or backup tools to execute backup and restoration operations. The interface includes support for scheduling, data verification, and status confirmation.   
- \*\*User Communication Interface\*\*: The system supports user communication via web-based access (e.g., HTTP, HTTPS) and mobile clients (e.g., IMAP over SSL). This interface ensures secure and responsive interaction with user devices.   
- \*\*System-to-System Communication Interface\*\*: The system may communicate with other internal or external systems (e.g., CRM, directory services) via RESTful APIs or SOAP-based services. The interface supports authentication, data formatting, and error handling for these interactions.   
  
These communication interfaces ensure that the system can operate efficiently in a networked environment and support collaboration between users, administrators, and external systems.   
  
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This section ensures that all external data sources and interaction methods mentioned in the functional requirements are clearly defined and categorized. Developers can use this information to design and implement the necessary interfaces for the system.

# Use Case

Use Case Name: Create Email   
Use Case ID: UC-01   
Actors: Administrator, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to create email accounts.   
3. The system has access to the Email Distribution Group and Archive modules.   
  
Postconditions:   
1. A new email account is successfully created.   
2. The email account is associated with the appropriate distribution group.   
3. The email is archived if required.   
  
Main Flow:   
1. The administrator navigates to the "Create Email" section of the system.   
2. The administrator enters the required details for the new email account, such as email address, password, and contact information.   
3. The system validates the input data to ensure it meets the required format and rules.   
4. The administrator selects the appropriate distribution group for the new email account.   
5. The system creates the new email account and adds it to the selected distribution group.   
6. The system confirms the creation of the email account and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected distribution group does not exist, the system displays an error message and prompts the administrator to select a valid group.   
3. If the email account already exists, the system displays a warning message and prompts the administrator to choose a different email address.   
4. If the system fails to create the email account due to an internal error, the system displays an error message and logs the issue for troubleshooting.  
  
Use Case Name: Send Email   
Use Case ID: UC-02   
Actors: Email Account, Contact, Administrator   
Preconditions:   
1. The email account is properly configured and active.   
2. The administrator or user has access to the email account.   
3. The system has a valid list of contacts and distribution groups.   
4. The email content and recipient information are provided.   
  
Postconditions:   
1. The email is successfully sent to the intended recipients.   
2. The email is added to the appropriate distribution group if specified.   
3. A copy of the email is archived if required by the system or administrator settings.   
  
Main Flow:   
1. The administrator or user logs into the system and opens the "Send Email" interface.   
2. The user selects the email account from which the email will be sent.   
3. The user composes the email, including subject, body, and any attachments.   
4. The user selects the recipient(s) from the contact list or chooses a distribution group.   
5. The system validates the recipient information and checks if the selected distribution group is active.   
6. The system sends the email through the selected email account.   
7. The system confirms the successful sending of the email and displays a success message.   
8. If required, the system archives the sent email for record-keeping.   
  
Alternative Flow:   
1. If the email account is not active or valid, the system displays an error message and prevents sending the email.   
2. If the recipient list is empty or contains invalid contact information, the system prompts the user to correct it.   
3. If the selected distribution group is invalid or does not exist, the system displays an error and prompts the user to choose a valid group.   
4. If the email fails to send due to server issues or connectivity problems, the system displays an error message and logs the issue.   
5. If the user cancels the email sending process, the system discards the email and returns to the previous screen.  
  
Use Case Name: Receive Email   
Use Case ID: UC-03   
Actors: Email Account, Administrator   
Preconditions:   
1. The email account is active and properly configured to receive emails.   
2. The system is connected to the email server and able to monitor the inbox.   
3. The administrator has access to the system to view received emails.   
  
Postconditions:   
1. The incoming email is successfully received and stored in the system.   
2. The email is associated with the correct email account.   
3. The email is archived if required by system or administrator settings.   
4. The administrator is notified or can view the received email.   
  
Main Flow:   
1. The system monitors the email account's inbox for new emails.   
2. When an email is received, the system identifies the associated email account.   
3. The system stores the email in the system's database and updates the inbox.   
4. The system checks the email account's settings to determine if the email should be archived.   
5. If archiving is enabled, the system archives the email to the Archive module.   
6. The administrator is notified of the received email or can view it in the inbox.   
  
Alternative Flow:   
1. If the email account is not active, the system does not attempt to receive emails and logs the issue.   
2. If the system fails to receive an email due to server or connectivity issues, an error message is displayed, and the issue is logged.   
3. If the system cannot archive the email due to storage issues or invalid settings, it logs the error but continues with the receipt process.   
4. If the administrator chooses to delete the email before archiving, the email is removed from the inbox and not archived.  
  
Use Case Name: View Email   
Use Case ID: UC-04   
Actors: Administrator, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the email account whose emails they wish to view.   
3. The system has a received email stored in the inbox or archive.   
  
Postconditions:   
1. The administrator can view the content of the selected email.   
2. The email is marked as read if it was previously unread.   
3. The system maintains the integrity of the email data.   
  
Main Flow:   
1. The administrator navigates to the "Inbox" or "Archive" section of the system.   
2. The system displays a list of emails associated with the selected email account.   
3. The administrator selects an email from the list to view.   
4. The system retrieves the selected email and displays its content, including subject, sender, recipient, body, and any attachments.   
5. The system marks the email as read in the inbox.   
  
Alternative Flow:   
1. If the selected email does not exist or has been deleted, the system displays an error message and returns to the inbox.   
2. If the administrator does not have permission to view the email, the system displays an access denied message.   
3. If the system fails to retrieve the email due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels viewing the email, the system returns to the inbox without marking the email as read.  
  
Use Case Name: Reply to Email   
Use Case ID: UC-05   
Actors: Administrator, Email Account, Contact, Email Distribution Group   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the email account associated with the received email.   
3. The system contains the received email in the inbox or archive.   
4. The email account is active and configured for sending emails.   
  
Postconditions:   
1. The reply email is successfully composed and sent.   
2. The original email is marked as replied to in the system.   
3. A copy of the reply is archived if required by system or administrator settings.   
4. The reply is associated with the original email for reference tracking.   
  
Main Flow:   
1. The administrator navigates to the "Inbox" or "Archive" section and selects an email to reply to.   
2. The system opens the selected email and provides a reply interface.   
3. The administrator composes the reply message, including subject, body, and any attachments.   
4. The system validates the reply content and recipient information.   
5. The system sends the reply email through the associated email account.   
6. The system marks the original email as replied to and updates the inbox.   
7. If required, the system archives the reply email.   
8. The system displays a success message confirming the reply was sent.   
  
Alternative Flow:   
1. If the reply content is empty or invalid, the system displays an error message and prompts the administrator to provide valid content.   
2. If the email account is not active, the system prevents the reply and displays an error message.   
3. If the system fails to send the reply due to server or connectivity issues, an error message is shown, and the issue is logged.   
4. If the administrator cancels the reply process, the system discards the draft and returns to the inbox.   
5. If the system fails to archive the reply email due to storage or configuration issues, the issue is logged but the sending process is not affected.  
  
Use Case Name: Forward Email   
Use Case ID: UC-06   
Actors: Administrator, Email Account, Contact, Email Distribution Group   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the email account associated with the received email.   
3. The system contains the received email in the inbox or archive.   
4. The email account is active and configured for sending emails.   
5. The system has a valid list of contacts and distribution groups for forwarding.   
  
Postconditions:   
1. The forwarded email is successfully sent to the new recipient(s).   
2. The original email is marked as forwarded in the system.   
3. A copy of the forwarded email is archived if required by system or administrator settings.   
4. The forwarded email is associated with the original email for reference tracking.   
  
Main Flow:   
1. The administrator navigates to the "Inbox" or "Archive" section and selects an email to forward.   
2. The system opens the selected email and provides a forward interface.   
3. The administrator composes the forwarded message, including subject, body, and any attachments.   
4. The administrator selects the new recipient(s) from the contact list or chooses a distribution group.   
5. The system validates the recipient information and checks if the selected distribution group is active.   
6. The system sends the forwarded email through the associated email account.   
7. The system marks the original email as forwarded and updates the inbox.   
8. If required, the system archives the forwarded email.   
9. The system displays a success message confirming the email was forwarded.   
  
Alternative Flow:   
1. If the forwarded email content is empty or invalid, the system displays an error message and prompts the administrator to provide valid content.   
2. If the email account is not active, the system prevents the forwarding and displays an error message.   
3. If the selected recipient is invalid or the distribution group does not exist, the system displays an error and prompts the administrator to select a valid recipient.   
4. If the system fails to send the forwarded email due to server or connectivity issues, an error message is shown, and the issue is logged.   
5. If the administrator cancels the forwarding process, the system discards the draft and returns to the inbox.   
6. If the system fails to archive the forwarded email due to storage or configuration issues, the issue is logged but the sending process is not affected.  
  
Use Case Name: Archive Email   
Use Case ID: UC-07   
Actors: Administrator, Email Account, Archive   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the email account and the email to be archived.   
3. The system has the Archive module enabled and accessible.   
4. The email is either in the inbox or has been previously received.   
  
Postconditions:   
1. The selected email is successfully moved to the Archive module.   
2. The email is no longer visible in the inbox unless manually restored.   
3. The system maintains the integrity and metadata of the archived email.   
  
Main Flow:   
1. The administrator navigates to the "Inbox" section of the system.   
2. The administrator selects an email that they wish to archive.   
3. The system displays an option to archive the selected email.   
4. The administrator confirms the archiving action.   
5. The system moves the email to the Archive module and updates the inbox.   
6. The system confirms the successful archiving of the email and provides a success message.   
  
Alternative Flow:   
1. If the selected email does not exist or has already been archived, the system displays an error message and returns to the inbox.   
2. If the administrator does not have permission to archive the email, the system displays an access denied message.   
3. If the Archive module is not accessible due to configuration or storage issues, the system displays an error message and logs the issue.   
4. If the administrator cancels the archiving process, the system returns to the inbox without making any changes.   
5. If the system fails to archive the email due to an internal error, the system displays an error message and logs the issue.  
  
Use Case Name: Recover Email   
Use Case ID: UC-08   
Actors: Administrator, Email Account, Archive   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the Archive module and the email account.   
3. The system has an archived email stored in the Archive module.   
  
Postconditions:   
1. The selected archived email is successfully restored to the inbox or marked as recovered.   
2. The email is associated with the correct email account.   
3. The system maintains the integrity and metadata of the recovered email.   
  
Main Flow:   
1. The administrator navigates to the "Archive" section of the system.   
2. The system displays a list of archived emails associated with the selected email account.   
3. The administrator selects an email to recover.   
4. The system verifies the email account and confirms the recovery action.   
5. The system restores the selected email to the inbox or marks it as recovered.   
6. The system updates the Archive module and confirms the recovery with a success message.   
  
Alternative Flow:   
1. If the selected email does not exist in the Archive, the system displays an error message and returns to the archive list.   
2. If the administrator does not have permission to recover the email, the system displays an access denied message.   
3. If the system fails to recover the email due to internal errors, it displays an error message and logs the issue.   
4. If the administrator cancels the recovery process, the system returns to the Archive module without making any changes.  
  
Use Case Name: Manage Contacts   
Use Case ID: UC-09   
Actors: Administrator, Email Account, Contact, Email Distribution Group   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the email account and the Contact module.   
3. The system is connected to the Email Distribution Group module.   
  
Postconditions:   
1. Contacts are successfully added, edited, or removed from the system.   
2. The email distribution group is updated accordingly if necessary.   
3. The system maintains accurate and up-to-date contact information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Contacts" section of the system.   
2. The administrator selects an action (e.g., add, edit, or delete a contact).   
3. If adding a contact, the administrator enters the required details such as name, email address, phone number, and group association.   
4. If editing a contact, the administrator selects the contact and modifies the relevant information.   
5. If deleting a contact, the administrator selects the contact and confirms the deletion.   
6. The system validates the input data and checks for consistency with existing contacts and distribution groups.   
7. The system updates the Contact module with the changes.   
8. If the contact is associated with an email distribution group, the system updates the group accordingly.   
9. The system confirms the action and displays a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the contact already exists in the system, the system displays a warning message and suggests editing the existing contact instead.   
3. If the selected email distribution group does not exist, the system displays an error message and prompts the administrator to select a valid group.   
4. If the administrator cancels the action, the system discards any changes and returns to the contact list.   
5. If the system fails to update the Contact module or distribution group due to an internal error, the system displays an error message and logs the issue.  
  
Use Case Name: Create Contact   
Use Case ID: UC-09   
Actors: Administrator, Email Account, Email Distribution Group   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the Contact module and the associated email account.   
3. The system is connected to the Email Distribution Group module.   
  
Postconditions:   
1. A new contact is successfully created and stored in the Contact module.   
2. The contact is associated with the appropriate email account and distribution group if specified.   
3. The system maintains accurate and up-to-date contact information.   
  
Main Flow:   
1. The administrator navigates to the "Create Contact" section of the system.   
2. The administrator enters the required details for the new contact, such as name, email address, phone number, and distribution group association.   
3. The system validates the input data to ensure it meets the required format and rules.   
4. The system checks if the selected email account and distribution group are valid.   
5. The system creates the new contact and adds it to the Contact module.   
6. If a distribution group is specified, the system updates the group with the new contact.   
7. The system confirms the creation of the contact and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account does not exist or is not active, the system displays an error message and prompts the administrator to select a valid account.   
3. If the selected distribution group does not exist, the system displays an error message and prompts the administrator to select a valid group.   
4. If the contact already exists in the system, the system displays a warning message and suggests editing the existing contact instead.   
5. If the system fails to create the contact due to an internal error, the system displays an error message and logs the issue.  
  
Use Case Name: Update Contact   
Use Case ID: UC-10   
Actors: Administrator, Contact, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the Contact module and the associated email account.   
3. The system contains the contact information to be updated.   
4. The system is connected to the Email Distribution Group module if group associations are involved.   
  
Postconditions:   
1. The contact information is successfully updated in the system.   
2. The contact's association with an email account and distribution group is updated if specified.   
3. The system maintains accurate and up-to-date contact information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Contacts" section of the system.   
2. The administrator selects an existing contact to update.   
3. The system displays the current contact details for editing.   
4. The administrator modifies the relevant information, such as name, email address, phone number, or distribution group.   
5. The system validates the updated data to ensure it meets the required format and rules.   
6. If a distribution group is modified, the system checks if the selected group is valid.   
7. The system updates the contact information in the Contact module.   
8. If a distribution group is associated, the system updates the group accordingly.   
9. The system confirms the update and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account is not valid, the system displays an error and prompts the administrator to select a valid account.   
3. If the selected distribution group does not exist, the system displays an error and prompts the administrator to select a valid group.   
4. If the administrator cancels the update process, the system discards the changes and returns to the contact list.   
5. If the system fails to update the contact due to an internal error, an error message is displayed, and the issue is logged.  
  
Use Case Name: Delete Contact   
Use Case ID: UC-11   
Actors: Administrator, Contact, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has access to the Contact module and the associated email account.   
3. The system contains the contact information to be deleted.   
4. The system is connected to the Email Distribution Group module if the contact is associated with a group.   
  
Postconditions:   
1. The selected contact is successfully deleted from the Contact module.   
2. If the contact is part of an email distribution group, the group is updated to remove the contact.   
3. The system maintains accurate and up-to-date contact and group information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Contacts" section of the system.   
2. The administrator selects the contact they wish to delete.   
3. The system displays a confirmation dialog to ensure the deletion is intentional.   
4. The administrator confirms the deletion.   
5. The system removes the contact from the Contact module.   
6. If the contact is associated with an email distribution group, the system updates the group by removing the contact.   
7. The system confirms the deletion and displays a success message.   
  
Alternative Flow:   
1. If the selected contact does not exist, the system displays an error message and returns to the contact list.   
2. If the administrator does not have permission to delete the contact, the system displays an access denied message.   
3. If the contact is part of a distribution group and the system fails to update the group, the system displays an error message and logs the issue.   
4. If the system fails to delete the contact due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the deletion process, the system returns to the contact list without making any changes.  
  
Use Case Name: Create Distribution Group   
Use Case ID: UC-12   
Actors: Administrator, Email Distribution Group, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to create distribution groups.   
3. The system has access to the Email Account and Contact modules.   
  
Postconditions:   
1. A new distribution group is successfully created.   
2. The distribution group is associated with the appropriate email accounts or contacts.   
3. The system maintains the integrity and metadata of the distribution group.   
  
Main Flow:   
1. The administrator navigates to the "Create Distribution Group" section of the system.   
2. The administrator enters the required details for the new distribution group, such as group name, description, and associated email accounts or contacts.   
3. The system validates the input data to ensure it meets the required format and rules.   
4. The system checks if the selected email accounts or contacts are valid and active.   
5. The system creates the new distribution group and adds the associated email accounts or contacts.   
6. The system confirms the creation of the distribution group and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account or contact is invalid or does not exist, the system displays an error and prompts the administrator to select a valid option.   
3. If the distribution group name already exists, the system displays a warning message and prompts the administrator to choose a different name.   
4. If the system fails to create the distribution group due to an internal error, the system displays an error message and logs the issue.  
  
Use Case Name: Manage Distribution Group   
Use Case ID: UC-13   
Actors: Administrator, Email Distribution Group, Email Account, Contact   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage distribution groups.   
3. The system has access to the Email Account and Contact modules.   
4. The system is connected to the Email Distribution Group module.   
  
Postconditions:   
1. The distribution group is successfully created, updated, or deleted.   
2. The distribution group is associated with the correct email accounts or contacts.   
3. The system maintains accurate and up-to-date distribution group information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Distribution Group" section of the system.   
2. The administrator selects an action (e.g., create, update, or delete a distribution group).   
3. If creating a group, the administrator enters the required details such as group name, description, and adds members (email accounts or contacts).   
4. If updating a group, the administrator selects the group and modifies the relevant information, including members.   
5. If deleting a group, the administrator selects the group and confirms the deletion.   
6. The system validates the input data and checks for consistency with existing groups, email accounts, and contacts.   
7. The system updates the Email Distribution Group module with the changes.   
8. The system confirms the action (creation, update, or deletion) and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account or contact does not exist or is not valid, the system displays an error and prompts the administrator to select a valid option.   
3. If the group name already exists and the administrator attempts to create a new one, the system displays a warning and suggests a different name.   
4. If the system fails to update the distribution group due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the action, the system discards any changes and returns to the distribution group list.   
6. If the system fails to delete the group due to dependencies or internal errors, an error message is displayed, and the issue is logged.  
  
Use Case Name: Add Contact to Distribution Group   
Use Case ID: UC-14   
Actors: Administrator, Contact, Email Distribution Group   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage distribution groups.   
3. The system has access to the Contact module and the Email Distribution Group module.   
4. The contact to be added exists in the system.   
5. The distribution group to which the contact will be added exists and is active.   
  
Postconditions:   
1. The contact is successfully added to the distribution group.   
2. The distribution group's member list is updated to include the new contact.   
3. The system maintains accurate and up-to-date distribution group information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Distribution Group" section of the system.   
2. The administrator selects an existing distribution group to which a contact will be added.   
3. The system displays the current list of contacts in the selected distribution group.   
4. The administrator selects the "Add Contact" option and chooses the contact to be added from the available list.   
5. The system validates the contact and ensures it is not already a member of the selected distribution group.   
6. The system updates the distribution group to include the new contact.   
7. The system confirms the addition of the contact to the distribution group and provides a success message.   
  
Alternative Flow:   
1. If the selected contact does not exist or is invalid, the system displays an error message and prompts the administrator to select a valid contact.   
2. If the selected distribution group does not exist or is not active, the system displays an error message and prompts the administrator to select a valid group.   
3. If the contact is already a member of the distribution group, the system displays a warning message and does not add the contact again.   
4. If the system fails to update the distribution group due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the process, the system returns to the distribution group list without making any changes.  
  
Use Case Name: Remove Contact from Distribution Group   
Use Case ID: UC-15   
Actors: Administrator, Contact, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage distribution groups.   
3. The system has access to the Contact module and the Email Distribution Group module.   
4. The contact to be removed exists in the system and is part of the selected distribution group.   
5. The distribution group to which the contact belongs exists and is active.   
  
Postconditions:   
1. The contact is successfully removed from the distribution group.   
2. The distribution group's member list is updated to exclude the contact.   
3. The system maintains accurate and up-to-date distribution group information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Distribution Group" section of the system.   
2. The administrator selects an existing distribution group from which a contact will be removed.   
3. The system displays the current list of contacts in the selected distribution group.   
4. The administrator selects the contact to be removed and confirms the action.   
5. The system validates the contact and verifies that it is a member of the selected distribution group.   
6. The system updates the distribution group by removing the contact.   
7. The system confirms the removal of the contact from the distribution group and provides a success message.   
  
Alternative Flow:   
1. If the selected contact does not exist or is not part of the distribution group, the system displays an error message and prompts the administrator to select a valid contact.   
2. If the selected distribution group does not exist or is not active, the system displays an error message and prompts the administrator to select a valid group.   
3. If the administrator cancels the removal process, the system returns to the distribution group list without making any changes.   
4. If the system fails to update the distribution group due to an internal error, an error message is displayed, and the issue is logged.  
  
Use Case Name: View Distribution Group   
Use Case ID: UC-16   
Actors: Administrator, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to view distribution groups.   
3. The system has access to the Email Distribution Group module.   
4. The distribution group to be viewed exists in the system.   
  
Postconditions:   
1. The administrator can view the details of the selected distribution group, including its name, description, and members.   
2. The system maintains the integrity and metadata of the distribution group.   
  
Main Flow:   
1. The administrator navigates to the "Manage Distribution Group" section of the system.   
2. The administrator selects the "View Distribution Group" option.   
3. The system displays a list of available distribution groups.   
4. The administrator selects a distribution group from the list.   
5. The system retrieves the details of the selected distribution group, including its members.   
6. The system presents the group's name, description, and member list to the administrator.   
7. The system confirms the successful retrieval and display of the distribution group details.   
  
Alternative Flow:   
1. If the selected distribution group does not exist, the system displays an error message and prompts the administrator to select a valid group.   
2. If the administrator does not have permission to view the distribution group, the system displays an access denied message.   
3. If the system fails to retrieve the distribution group details due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the process, the system returns to the distribution group list without making any changes.  
  
Use Case Name: Manage Email Account   
Use Case ID: UC-17   
Actors: Administrator, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage email accounts.   
3. The system has access to the Email Account module.   
4. The email account to be managed (e.g., updated or deleted) exists in the system.   
  
Postconditions:   
1. The email account is successfully updated or deleted as per the administrator's action.   
2. The system maintains accurate and up-to-date email account information.   
3. If the account is deleted, any associated contacts and distribution groups are updated accordingly.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects an action (e.g., update or delete an email account).   
3. If updating, the administrator selects the email account and modifies relevant details such as password or contact information.   
4. If deleting, the administrator selects the email account and confirms the deletion.   
5. The system validates the input data (if updating) or confirms the existence of the account (if deleting).   
6. The system updates or deletes the email account in the Email Account module.   
7. If the account is deleted, the system updates any related contacts or distribution groups.   
8. The system confirms the action (update or delete) and displays a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete during an update, the system displays an error message and prompts the administrator to correct the information.   
2. If the email account does not exist, the system displays an error message and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to perform the action, the system displays an access denied message.   
4. If the system fails to update or delete the email account due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the action, the system discards any changes and returns to the email account list.  
  
Use Case Name: Manage Email Account   
Use Case ID: UC-17   
Actors: Administrator, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage email accounts.   
3. The system has access to the Email Account module.   
4. The email account to be managed (e.g., updated or deleted) exists in the system.   
  
Postconditions:   
1. The email account is successfully updated or deleted as per the administrator's action.   
2. The system maintains accurate and up-to-date email account information.   
3. If the account is deleted, any associated contacts and distribution groups are updated accordingly.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects an action (e.g., update or delete an email account).   
3. If updating, the administrator selects the email account and modifies relevant details such as password or contact information.   
4. If deleting, the administrator selects the email account and confirms the deletion.   
5. The system validates the input data (if updating) or confirms the existence of the account (if deleting).   
6. The system updates or deletes the email account in the Email Account module.   
7. If the account is deleted, the system updates any related contacts or distribution groups.   
8. The system confirms the action (update or delete) and displays a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete during an update, the system displays an error message and prompts the administrator to correct the information.   
2. If the email account does not exist, the system displays an error message and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to perform the action, the system displays an access denied message.   
4. If the system fails to update or delete the email account due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the action, the system discards any changes and returns to the email account list.  
  
Use Case Name: Update Email Account   
Use Case ID: UC-18   
Actors: Administrator, Email Account   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to update email account details.   
3. The system has access to the Email Account module.   
4. The email account to be updated exists in the system.   
  
Postconditions:   
1. The email account is successfully updated with the new information.   
2. The system maintains accurate and up-to-date email account details.   
3. If the contact information or group associations are modified, they are updated accordingly.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects the "Update Email Account" option and chooses the email account to be updated.   
3. The system displays the current details of the selected email account for editing.   
4. The administrator modifies the relevant information, such as password, contact details, or distribution group association.   
5. The system validates the updated data to ensure it meets the required format and rules.   
6. If a distribution group is modified, the system checks if the selected group is valid.   
7. The system updates the Email Account module with the new information.   
8. The system confirms the update and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected distribution group does not exist or is not valid, the system displays an error and prompts the administrator to select a valid group.   
3. If the administrator does not have permission to update the email account, the system displays an access denied message.   
4. If the system fails to update the email account due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the update process, the system discards the changes and returns to the email account list.  
  
Use Case Name: Delete Email Account   
Use Case ID: UC-19   
Actors: Administrator, Email Account, Contact, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to delete email accounts.   
3. The system has access to the Email Account module, Contact module, and Email Distribution Group module.   
4. The email account to be deleted exists in the system.   
  
Postconditions:   
1. The selected email account is successfully deleted from the system.   
2. Any contacts or distribution groups associated with the email account are updated to remove the reference.   
3. The system maintains accurate and up-to-date information for contacts and distribution groups.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects the "Delete Email Account" option and chooses the email account to be deleted.   
3. The system displays a confirmation dialog to ensure the deletion is intentional.   
4. The administrator confirms the deletion.   
5. The system verifies the existence of the selected email account.   
6. The system identifies and updates any contacts or distribution groups associated with the email account.   
7. The system deletes the email account from the Email Account module.   
8. The system confirms the deletion and provides a success message.   
  
Alternative Flow:   
1. If the selected email account does not exist, the system displays an error message and prompts the administrator to select a valid account.   
2. If the administrator does not have permission to delete the email account, the system displays an access denied message.   
3. If the system fails to update associated contacts or distribution groups, an error message is displayed, and the issue is logged.   
4. If the system fails to delete the email account due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the deletion process, the system returns to the email account list without making any changes.  
  
Use Case Name: Manage Administrator   
Use Case ID: UC-20   
Actors: Administrator, Email Account, Archive, Contact, Email Distribution Group   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage administrator accounts.   
3. The system has access to the Email Account, Archive, Contact, and Email Distribution Group modules.   
4. The administrator account to be managed (e.g., updated or deleted) exists in the system.   
  
Postconditions:   
1. The administrator account is successfully updated or deleted as per the action taken.   
2. The system maintains accurate and up-to-date administrator account information.   
3. If the account is deleted, any associated email accounts, contacts, or distribution groups are updated accordingly.   
  
Main Flow:   
1. The administrator navigates to the "Manage Administrator" section of the system.   
2. The administrator selects an action (e.g., update or delete an administrator account).   
3. If updating, the administrator selects the target account and modifies relevant details such as password, permissions, or contact information.   
4. If deleting, the administrator selects the target account and confirms the deletion.   
5. The system validates the input data (if updating) or confirms the existence of the account (if deleting).   
6. The system updates or deletes the administrator account in the system.   
7. If the account is deleted, the system updates any related email accounts, contacts, or distribution groups.   
8. The system confirms the action (update or delete) and displays a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete during an update, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected administrator account does not exist, the system displays an error message and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to perform the action, the system displays an access denied message.   
4. If the system fails to update or delete the administrator account due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the action, the system discards any changes and returns to the administrator account list.  
  
Use Case Name: Assign Administrator   
Use Case ID: UC-21   
Actors: Administrator, Email Account, Contact, Email Distribution Group, Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to assign administrator roles.   
3. The system has access to the Email Account, Contact, Email Distribution Group, and Archive modules.   
4. A valid user or account exists that can be assigned as an administrator.   
  
Postconditions:   
1. The selected user or account is successfully assigned as an administrator.   
2. The administrator's access to the Email Account, Contact, Email Distribution Group, and Archive modules is updated accordingly.   
3. The system maintains accurate and up-to-date administrator account information.   
  
Main Flow:   
1. The administrator navigates to the "Manage Administrator" section of the system.   
2. The administrator selects the "Assign Administrator" option.   
3. The system displays a list of potential users or accounts that can be assigned as an administrator.   
4. The administrator selects the user or account and confirms the assignment.   
5. The system verifies the existence and validity of the selected user or account.   
6. The system updates the administrator permissions and grants access to the necessary modules.   
7. The system confirms the successful assignment and provides a success message.   
  
Alternative Flow:   
1. If the selected user or account does not exist, the system displays an error message and prompts the administrator to select a valid option.   
2. If the administrator does not have permission to assign administrator roles, the system displays an access denied message.   
3. If the system fails to update the administrator permissions due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the assignment process, the system returns to the administrator list without making any changes.  
  
Use Case Name: Remove Administrator   
Use Case ID: UC-22   
Actors: Administrator, Email Account, Contact, Email Distribution Group, Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to remove administrator accounts.   
3. The system has access to the Email Account, Contact, Email Distribution Group, and Archive modules.   
4. The administrator account to be removed exists in the system and is not the currently logged-in user.   
  
Postconditions:   
1. The selected administrator account is successfully removed from the system.   
2. Any administrator-specific permissions and access rights are revoked.   
3. The system updates associated Email Accounts, Contacts, and Distribution Groups to remove references to the deleted administrator.   
4. The system maintains the integrity of all related data and modules.   
  
Main Flow:   
1. The administrator navigates to the "Manage Administrator" section of the system.   
2. The administrator selects the "Remove Administrator" option and chooses the administrator account to be removed.   
3. The system displays a confirmation dialog to ensure the removal is intentional.   
4. The administrator confirms the removal.   
5. The system verifies the existence and validity of the selected administrator account.   
6. The system identifies and updates any Email Accounts, Contacts, or Distribution Groups associated with the administrator.   
7. The system removes the administrator account and its permissions from the system.   
8. The system confirms the removal and provides a success message.   
  
Alternative Flow:   
1. If the selected administrator account does not exist, the system displays an error message and prompts the administrator to select a valid account.   
2. If the administrator does not have permission to remove administrator accounts, the system displays an access denied message.   
3. If the administrator attempts to remove the currently logged-in account, the system displays a warning message and prevents the action.   
4. If the system fails to update associated modules due to an internal error, an error message is displayed, and the issue is logged.   
5. If the system fails to remove the administrator account due to an internal error, an error message is displayed, and the issue is logged.   
6. If the administrator cancels the removal process, the system returns to the administrator list without making any changes.  
  
Use Case Name: View Administrator Information   
Use Case ID: UC-23   
Actors: Administrator   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to view administrator information.   
3. The system contains the administrator information in the database.   
  
Postconditions:   
1. The administrator's information is successfully displayed to the requesting user.   
2. The system maintains the integrity and confidentiality of the administrator data.   
3. No changes are made to the administrator information.   
  
Main Flow:   
1. The administrator navigates to the "Administrator Information" section of the system.   
2. The system displays a list of administrators available for viewing.   
3. The administrator selects a specific administrator from the list.   
4. The system retrieves the selected administrator's information, including name, contact details, permissions, and account status.   
5. The system presents the retrieved information in a user-friendly format.   
6. The system confirms the successful retrieval and display of the administrator information.   
  
Alternative Flow:   
1. If the selected administrator does not exist or has been deleted, the system displays an error message and returns to the administrator list.   
2. If the requesting administrator does not have permission to view the selected administrator's information, the system displays an access denied message.   
3. If the system fails to retrieve the administrator information due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the process, the system returns to the administrator list without making any changes.  
  
Use Case Name: Manage Email Templates   
Use Case ID: UC-24   
Actors: Administrator, Email Account, Email Distribution Group, Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage email templates.   
3. The system has access to the Email Account, Email Distribution Group, and Archive modules.   
4. The email templates module is active and accessible.   
  
Postconditions:   
1. Email templates are successfully created, updated, or deleted as per the administrator's action.   
2. The system maintains accurate and up-to-date email templates.   
3. Templates are associated with the correct email accounts or distribution groups if specified.   
4. A copy of the template is archived if required by system or administrator settings.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Templates" section of the system.   
2. The administrator selects an action (e.g., create, update, or delete an email template).   
3. If creating a template, the administrator enters the required details such as template name, subject, body, and optional attachments.   
4. The administrator can associate the template with an email account or distribution group, if needed.   
5. The system validates the input data and checks for consistency with existing templates.   
6. The system creates, updates, or deletes the email template in the templates module.   
7. If archiving is enabled, the system archives the template to the Archive module.   
8. The system confirms the action and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the template name already exists and the administrator attempts to create a new one, the system displays a warning and suggests a different name.   
3. If the selected email account or distribution group does not exist or is not valid, the system displays an error and prompts the administrator to select a valid option.   
4. If the system fails to create, update, or delete the template due to an internal error, an error message is displayed, and the issue is logged.   
5. If the system fails to archive the template due to storage or configuration issues, the issue is logged but does not affect the template management process.   
6. If the administrator cancels the action, the system discards any changes and returns to the template list.  
  
Use Case Name: Update Email Settings   
Use Case ID: UC-25   
Actors: Administrator, Email Account   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to modify email account settings.   
3. The system has access to the Email Account module.   
4. The email account whose settings are to be updated exists in the system.   
  
Postconditions:   
1. The email account's settings are successfully updated.   
2. The system maintains accurate and up-to-date email account settings.   
3. Any associated contacts or distribution groups remain intact unless modified as part of the settings.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects the "Update Email Settings" option and chooses the target email account.   
3. The system displays the current settings for the selected email account (e.g., notification preferences, signature, auto-reply, archive rules).   
4. The administrator modifies the desired settings.   
5. The system validates the input data to ensure it meets the required format and rules.   
6. The system updates the Email Account module with the new settings.   
7. The system confirms the update and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account does not exist or is not valid, the system displays an error and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to update the email settings, the system displays an access denied message.   
4. If the system fails to update the email settings due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the process, the system discards any changes and returns to the email account list.  
  
Use Case Name: View Email Archive   
Use Case ID: UC-26   
Actors: Administrator, Email Account, Archive   
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to view archived emails.   
3. The system has access to the Email Account and Archive modules.   
4. The email to be viewed is stored in the Archive module.   
  
Postconditions:   
1. The archived email is successfully displayed to the administrator.   
2. The system maintains the integrity and metadata of the archived email.   
3. The email remains in the Archive module and is not modified unless explicitly edited.   
  
Main Flow:   
1. The administrator navigates to the "Archive" section of the system.   
2. The system displays a list of archived emails associated with the selected email account.   
3. The administrator selects an email from the archive list to view.   
4. The system retrieves the selected email from the Archive module.   
5. The system displays the email's content, including subject, sender, recipient, body, and any attachments.   
6. The system confirms the successful retrieval and display of the archived email.   
  
Alternative Flow:   
1. If the selected email does not exist in the Archive module, the system displays an error message and returns to the archive list.   
2. If the administrator does not have permission to view the email, the system displays an access denied message.   
3. If the system fails to retrieve the email due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the process, the system returns to the archive list without making any changes.  
  
Use Case Name: Export Email Data   
Use Case ID: UC-27   
Actors: Administrator, Email Account, Archive, Email Distribution Group, Contact   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to export email data.   
3. The system has access to the Email Account, Archive, Contact, and Email Distribution Group modules.   
4. The email data to be exported exists in the system (e.g., in the inbox or archive).   
  
Postconditions:   
1. The selected email data is exported in the specified format (e.g., CSV, PDF, or other).   
2. The exported file is available for download by the administrator.   
3. The system maintains the integrity and metadata of the emails during the export process.   
  
Main Flow:   
1. The administrator navigates to the "Export Email Data" section of the system.   
2. The administrator selects the email account or filter criteria (e.g., date range, specific contacts, or distribution groups) for the data to be exported.   
3. The administrator chooses the format for the export (e.g., CSV, PDF).   
4. The system retrieves the selected email data from the relevant modules.   
5. The system formats the data according to the selected file type.   
6. The system generates the export file and provides a download link or option.   
7. The system confirms the successful export and provides a success message.   
  
Alternative Flow:   
1. If no email data is selected or available, the system displays an error message and prompts the administrator to select valid data.   
2. If the export format is invalid or unsupported, the system displays an error and suggests valid formats.   
3. If the administrator does not have permission to export the selected email data, the system displays an access denied message.   
4. If the system fails to retrieve or format the data due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the export process, the system discards the request and returns to the previous screen.  
  
Use Case Name: Manage Email Template   
Use Case ID: UC-28   
Actors: Administrator, Email Account, Email Template, Email Distribution Group, Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage email templates.   
3. The system has access to the Email Template module and associated modules (Email Account, Email Distribution Group, Archive).   
4. The email template to be managed (e.g., edited or deleted) exists in the system.   
  
Postconditions:   
1. The email template is successfully updated or deleted as per the administrator's action.   
2. The system maintains accurate and up-to-date email template information.   
3. If the template is deleted, any references to it in distribution groups or archives are updated accordingly.   
4. The system ensures that templates are available for use in future email sending processes.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Templates" section of the system.   
2. The administrator selects an action (e.g., edit or delete an email template).   
3. If editing, the administrator selects the target template and modifies relevant details such as template name, subject, body, or associated distribution group.   
4. If deleting, the administrator selects the target template and confirms the deletion.   
5. The system validates the updated data (if editing) or confirms the existence of the template (if deleting).   
6. The system updates or deletes the email template in the Email Template module.   
7. If the template is deleted, the system updates any related distribution groups or archived records.   
8. The system confirms the action (edit or delete) and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete during an edit, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email template does not exist, the system displays an error message and prompts the administrator to select a valid template.   
3. If the administrator does not have permission to perform the action, the system displays an access denied message.   
4. If the system fails to update or delete the email template due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the action, the system discards any changes and returns to the email template list.  
  
Use Case Name: Update Email Settings   
Use Case ID: UC-28   
Actors: Administrator, Email Account   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to modify email account settings.   
3. The system has access to the Email Account module.   
4. The email account whose settings are to be updated exists in the system.   
  
Postconditions:   
1. The email account's settings are successfully updated.   
2. The system maintains accurate and up-to-date email account settings.   
3. Any associated contacts or distribution groups remain intact unless modified as part of the settings.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Account" section of the system.   
2. The administrator selects the "Update Email Settings" option and chooses the target email account.   
3. The system displays the current settings for the selected email account (e.g., notification preferences, signature, auto-reply, archive rules).   
4. The administrator modifies the desired settings.   
5. The system validates the input data to ensure it meets the required format and rules.   
6. The system updates the Email Account module with the new settings.   
7. The system confirms the update and provides a success message.   
  
Alternative Flow:   
1. If the input data is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account does not exist or is not valid, the system displays an error and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to update the email settings, the system displays an access denied message.   
4. If the system fails to update the email settings due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the process, the system discards any changes and returns to the email account list.  
  
Use Case Name: View Email Archive   
Use Case ID: UC-29   
Actors: Administrator, Email Account, Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to view archived emails.   
3. The system has access to the Email Account and Archive modules.   
4. The email to be viewed is stored in the Archive module.   
  
Postconditions:   
1. The archived email is successfully displayed to the administrator.   
2. The system maintains the integrity and metadata of the archived email.   
3. The email remains in the Archive module and is not modified unless explicitly edited.   
  
Main Flow:   
1. The administrator navigates to the "Email Archive" section of the system.   
2. The system displays a list of archived emails associated with the selected email account.   
3. The administrator selects an email from the archive list to view.   
4. The system retrieves the selected email from the Archive module.   
5. The system displays the email's content, including subject, sender, recipient, body, and any attachments.   
6. The system confirms the successful retrieval and display of the archived email.   
  
Alternative Flow:   
1. If the selected email does not exist in the Archive module, the system displays an error message and returns to the archive list.   
2. If the administrator does not have permission to view the email, the system displays an access denied message.   
3. If the system fails to retrieve the email due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the process, the system returns to the archive list without making any changes.  
  
Use Case Name: Export Email Data   
Use Case ID: UC-30   
Actors: Administrator, Email Account, Archive, Email Distribution Group, Contact   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to export email data.   
3. The system has access to the Email Account, Archive, Contact, and Email Distribution Group modules.   
4. The email data to be exported exists in the system (e.g., in the inbox or archive).   
  
Postconditions:   
1. The selected email data is exported in the specified format (e.g., CSV, PDF, or other).   
2. The exported file is available for download by the administrator.   
3. The system maintains the integrity and metadata of the emails during the export process.   
  
Main Flow:   
1. The administrator navigates to the "Export Email Data" section of the system.   
2. The administrator selects the email account or filter criteria (e.g., date range, specific contacts, or distribution groups) for the data to be exported.   
3. The administrator chooses the format for the export (e.g., CSV, PDF).   
4. The system retrieves the selected email data from the relevant modules.   
5. The system formats the data according to the selected file type.   
6. The system generates the export file and provides a download link or option.   
7. The system confirms the successful export and provides a success message.   
  
Alternative Flow:   
1. If no email data is selected or available, the system displays an error message and prompts the administrator to select valid data.   
2. If the export format is invalid or unsupported, the system displays an error and suggests valid formats.   
3. If the administrator does not have permission to export the selected email data, the system displays an access denied message.   
4. If the system fails to retrieve or format the data due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the export process, the system discards the request and returns to the previous screen.  
  
Use Case Name: Delete Email   
Use Case ID: UC-31   
Actors: Administrator, Email Account, Email Archive   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to delete emails.   
3. The system has access to the Email Account and Email Archive modules.   
4. The email to be deleted exists in the inbox or archive.   
  
Postconditions:   
1. The selected email is successfully deleted from the inbox or archive.   
2. The system maintains accurate and up-to-date inbox and archive records.   
3. If the email was archived, the archive is updated accordingly.   
4. The deletion action is logged for audit purposes.   
  
Main Flow:   
1. The administrator navigates to the "Inbox" or "Archive" section of the system.   
2. The administrator selects the email to be deleted.   
3. The system displays a confirmation dialog to ensure the deletion is intentional.   
4. The administrator confirms the deletion.   
5. The system verifies the existence and validity of the selected email.   
6. The system deletes the email from the inbox or archive, depending on its location.   
7. The system updates the relevant modules (Inbox or Archive) to reflect the deletion.   
8. The system logs the deletion action for audit purposes.   
9. The system confirms the deletion and provides a success message.   
  
Alternative Flow:   
1. If the selected email does not exist, the system displays an error message and returns to the inbox or archive.   
2. If the administrator does not have permission to delete the email, the system displays an access denied message.   
3. If the system fails to delete the email due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the deletion process, the system returns to the inbox or archive without making any changes.   
5. If the email is referenced by other system components (e.g., in a distribution group or as a reply), the system displays a warning and may require manual resolution before deletion.  
  
Use Case Name: Manage Email Settings   
Use Case ID: UC-32   
Actors: Administrator, Email Account   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage email settings.   
3. The system has access to the Email Account module.   
4. The email account whose settings are to be managed exists in the system.   
  
Postconditions:   
1. The email account's settings are successfully updated or configured as per the administrator's action.   
2. The system maintains accurate and up-to-date email settings for the selected account.   
3. The settings changes are applied to the email account's functionality (e.g., auto-reply, signature, archiving rules).   
4. The system logs the settings changes for audit and tracking purposes.   
  
Main Flow:   
1. The administrator navigates to the "Manage Email Settings" section of the system.   
2. The administrator selects the email account for which settings need to be managed.   
3. The system displays the current settings for the selected email account, including auto-reply configurations, signature preferences, notification rules, and archiving settings.   
4. The administrator modifies the required settings or selects to add new configurations.   
5. The system validates the updated settings to ensure they conform to system rules and formats.   
6. The system updates the Email Account module with the new or modified settings.   
7. The system applies the updated settings to the email account's operations where applicable.   
8. The system confirms the successful management of the email settings and provides a success message.   
  
Alternative Flow:   
1. If the input data for the settings is invalid or incomplete, the system displays an error message and prompts the administrator to correct the information.   
2. If the selected email account does not exist or is not valid, the system displays an error message and prompts the administrator to select a valid account.   
3. If the administrator does not have permission to manage the email account's settings, the system displays an access denied message.   
4. If the system fails to update the email settings due to an internal error, an error message is displayed, and the issue is logged.   
5. If the administrator cancels the settings management process, the system discards any changes and returns to the email account list without making any modifications.  
  
Use Case Name: Manage Archive Record   
Use Case ID: UC-33   
Actors: Administrator, Archive, Email Account   
  
Preconditions:   
1. The administrator is logged into the system.   
2. The administrator has the necessary permissions to manage archive records.   
3. The system has access to the Archive module and the Email Account module.   
4. The archive record to be managed (e.g., viewed, edited, or deleted) exists in the system.   
  
Postconditions:   
1. The archive record is successfully viewed, edited, or deleted as per the administrator's action.   
2. The system maintains accurate and up-to-date archive records.   
3. If the archive record is deleted, it is no longer accessible unless restored from a backup.   
4. The system logs the action for audit purposes.   
  
Main Flow:   
1. The administrator navigates to the "Manage Archive Record" section of the system.   
2. The system displays a list of archive records associated with the selected email account.   
3. The administrator selects an action (e.g., view, edit, or delete an archive record).   
4. If viewing, the system retrieves and displays the selected archive record, including metadata such as date, sender, recipient, and content.   
5. If editing, the administrator modifies relevant fields of the archive record (e.g., tags, notes, or retention status).   
6. If deleting, the system displays a confirmation dialog to ensure the deletion is intentional.   
7. The administrator confirms the action.   
8. The system validates the action and updates the Archive module accordingly.   
9. The system confirms the successful management of the archive record and provides a success message.   
  
Alternative Flow:   
1. If the selected archive record does not exist or has been deleted, the system displays an error message and returns to the archive list.   
2. If the administrator does not have permission to perform the selected action, the system displays an access denied message.   
3. If the system fails to retrieve or update the archive record due to an internal error, an error message is displayed, and the issue is logged.   
4. If the administrator cancels the action, the system returns to the archive list without making any changes.   
5. If the system fails to log the action due to an internal error, the issue is logged, but the management of the archive record proceeds.