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1. The Domain Problem and Stakeholders

1.1. Domain Description

The goal of this project is to develop the architecture for a corporate intranet portal, i.e., an internal Web-based content management system that provides enterprise-wide information to company employees and helps the management of the management of the corporation to plan and coordinate business communications. With pervasive use of computers in all aspects of a company's business, a corporate portal is now the very backbone of a corporate communication infrastructure, helping the host company manage its entire range of operations, data, information, and application.

The specific portal functionality considered in this project is geared towards corporations in high-tech and software business, although the general ideas are independent of the nature of the corporation business.

The portal architecture planned for this project serves as the platform of communication for both the employees and the management of the corporation. It functions as the medium for workflow management, and declaration and enforcement of corporate policies. It also provides the vehicle for various employee services, such as benefits, salary management, travel, task organization, and timesheet management. Note that many of these individual functionalities are available to a corporation as separate software modules (either in-house or licensed from a third party.) An important job of the portal is to smoothly integrate such components to work in concert and to adhere to the specific policies and requirements of the hosting corporation.

1.2. Envisioned System

The portal will be implemented as a collection of Web-based services. The services will be implemented and deployed on the top of the secure intranet of the corporation, and will provide Web-based user interface for communication across the company lines. The key features of the system are (1) usability, (2) availability, and (3) security. We discuss these features in turn below.

The portal must be usable by a large cross section of the company with diverse backgrounds. Consequently, it is important for the system to provide a uniform, intuitive user interface. Most of the data access, requests, and communication will be provided through Web-based forms and graphical user-interfaces.

The portal provides critical functionality for the entire communications infrastructure of the corporation. The envisaged usage of the portal is for 24 hours a day, 7 days a week, without a halt. It is therefore critical for the portal itself to be available, tolerant of unexpected loads and requests, as well as software failures.

Finally, the sensitivity of the information communicated through the portal demands enforcement of stringent security policies. Access to the services provided by the portal will be restricted and users must have requisite authorization in order to access specific functions. The authorization of a specific user will be based on the role of the user in the corporation. Single-sign-on (SSO) functionality will be incorporated into the authentication mechanism.

1.3. Stakeholders for the Architecture

1.3.1. Consumers

1. **Business group:**
   Expectations: The application should help disseminate and collect information across the employees in the organization. It should increase employee productivity and reduce costs for the organization. It should be highly secure, reliable and scale well to support growing number of employees. The application should meet the specified functional requirements and be completed in a timely manner.
   Role with respect to development project: Business expert, End User
   Role with respect to domain: Senior management.
   Part of organization they work: Management.
   Impact: Low ROI.

2. **Human Resources group:**
   Expectations: The human resource group will use the application to cater to employee needs and queries, provide employees with resources to get ahead in their career, and in general to improve the workforce. This affects the company as a whole because employees are an organization's best asset. The application should have a easy-to-use interface and be very reliable.
   Role with respect to development project: HR expert, End User
   Role with respect to domain: Human Resource managers
   Part of organization they work: Human Resources.
   Impact: Dissatisfied employees, Unreliable application.

3. **IT infrastructure group:**
   Expectations: The application should help them cater to the IT needs of the employees. These needs could be hardware requests like - servers, monitors, computers; or software requirements like installation, troubleshooting etc. The application should be reliable and easy to use.
   Role with respect to development project: Business expert, end user.
   Role with respect to domain: IT infrastructure group.
   Part of organization they work: IT Infrastructure.

Impact: Delay in procuring the necessary hardware and software will directly impact employee productivity.

4. **Accounting group:**
   Expectations: The application should help them cater to the financial requests and claims of the employees in a reliable, cost efficient and timely manner. The system should be secure as it provides access to sensitive financial records of employees.
   Role with respect to development project: Finance expert, end user.
   Role with respect to domain: Accounting group.
   Part of organization they work: Office of Accounting.
   Impact: Sensitive information can leak out if security is compromised. An unreliable application will result in delays in processing employee requests.

5. **Employee End User:**
   Expectations: The application should provide all employees a platform for communication within a department and between departments. It should provide them access to HR, Career and Financial resources. The application should be very easy to use, reliable and available for access 24/7.
   Role with respect to development project: End user.
   Role with respect to domain: Employee
   Part of organization they work: Employees in all groups (HR, IT, Accounting etc)
   Impact: Productivity will decrease.

6. **Managers:**
   Expectations: The application should help managers to manage the requests (e.g., leave request, travel authorization request, etc.) and tasks of their team member. The application should be very easy to use, reliable and available for access 24/7.
   Role with respect to development project: End user.
   Role with respect to domain: Manager
   Part of organization they work: Management team in all groups (HR, IT, Accounting etc)
   Impact: Productivity will decrease.

1.3.2. Producers

1. **Business Analyst:**
   Vision: The application meets the requirements of the consumers.
   Contribution: Meet with the business group. HR, IT, accounting groups, end users to identify what they expect out of the intranet application.

Impact if their vision is not met: Software will fall short of business expectations.

2. **Software Architect:**
   Vision: To provide software architecture for the system that satisfies the requirements set by the business analyst and has robust, modular and extensible design. The application should be easily maintainable and be portable across different computing platforms.
   Contribution: Software architecture of the system.
   Impact if their vision is not met: The software will be unreliable and addition of new features to the application will be difficult. Also, user experience will suffer leading to inadequate ROI on the intranet portal.

3. **Software Developers:**
   Vision: To translate the software architecture into reliable, maintainable and extensible software implementation. The key requirement for the realization of this vision is a development environment that provides intuitive, extensible, and robust interfaces and libraries for developing the relevant system components. Furthermore, the relevant development tools (within the architecture framework) must be available to facilitate rapid system prototyping and development.
   Contribution: Developers will design the software components and implement them within the chosen infrastructure.
   Impact if their vision is not met: Software will not be free from bug or defects. Code will be difficult to maintain. It will not be easy to add new functionality if the application architecture is not extensible.

4. **Database Administrators:**
   Vision: To have a system with a very robust and readily available, high performance data tier. The data tier should scale well as data increases. The application must have modular and loosely coupled design. This will ease database upgrades and/or transitions.
   Contribution: Database administrators will help with database maintenance and upgrades.
   Impact if their vision is not met: Performance and availability of the data tier immediately impacts application performance.

5. **Software Quality assurance team:**
   Vision: To have a system that is reliable without any bugs or defects.
   Contribution: The Quality Assurance team will perform tests on the software developed by the Software Developers. They will employ a variety of testing methods as white box/ black box testing, integration testing, regression testing and non-functional testing like performance and load testing. These tests will provide a good understanding of the risks and defects in the implemented software.

Impact if their visions are not met: Poor quality software with bugs and defects.

1.4. Functional Requirements

1.4.1. Function Specifications

1. **Authenticate and Authorize:** This function allows the user to log in to the intranet. After receiving the user ID and password this function authenticates it against the employee database and then authorizes the user to log in to the intranet and access other functionalities in the intranet.
   Input:
   User ID [External],
   Password [External],
   Action Type (Login) [External],
   Event 'User requested Authenticate and Authorize function' [External]
   Output:
   Logged in to intranet [***all** other functions request this event*]
   Performers: Employee of the organization. They are the end users of the intranet.
   Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
   Performance locations: Office Locations of the organization, Remote work locations of the employee.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And DataReceived (User ID) And DataReceived (Password) And ActionType (Login)
   Post-condition: EventProduced (User logged into intranet)

2. **Schedule a Meeting:** This function is used to schedule a business meeting. On completion, the function sends an email to all the participants in the meeting and makes an entry in the calendar of the meeting initiator marking the duration as busy.
   Input:
   Date of the meeting [External],
   Time of the meeting [External],
   Frequency of the Meeting [External],
   Venue of the meeting [External],
   Participants current Calendar [External],
   Meeting room Availability calendar [External],
   Phone Number [External],
   Participants Email Id [External],
   Topic of the Meeting [External],
   Action Type (Send) [External],

Event 'User requested Schedule a Meeting function' [External]
Output:
Email [External],
Meeting Room Availability Calendar Updated [Reschedule/Cancel a Meeting],
Meeting Initiators Current Calendar Updated [Reschedule/Cancel a Meeting]
Performers: Meeting organizer (Employee of the organization).
Resources: Employee of the organization, Calendar Database (Meeting Room Availability, Employees Current Calendar), Web Application, Computer/Laptop, access to the intranet.
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Schedule a Meeting function) And DataReceived (Date) And DataReceived (Time) And DataReceived (Venue) And DataReceived (Frequency) And DataReceived (Topic) And/Or DataReceived (Meeting Room Number) And/Or DataReceived (Phone Number) And DataReceived (Participants email id) And ActionType (Send)
Post-condition: Sent (Email to selected participants) And/Or DataUpdated (Meeting Room Calendar) And DataUpdated (Meeting Initiators Calendar)

3. **Reschedule/Cancel a Business Meeting:** This function is used to reschedule or cancel a business meeting. The function sends an email to all the participants in the meeting and makes a new entry in the calendar of the meeting initiator and removes the old calendar entry on reschedule. On cancellation, the function sends an email to all the participants in the meeting and removes the calendar entry from the meeting initiator's calendar.
   Input:
   Scheduled meeting Invitation [Schedule a Meeting],
   Date of the meeting [External],
   Time of the meeting [External],
   Frequency of the Meeting [External],
   Venue of the meeting [External],
   Participants current Calendar [External],
   Meeting room Availability calendar [External],
   Participants Email Id [External],
   Topic of the Meeting [External],
   Action Type (Reschedule, Cancel) [External],
   Event 'User requested Reschedule/Cancel a Meeting function' [External]
   Output:
   Email [External],
   Meeting Room Availability Calendar Updated [Respond to Meeting Request],

Meeting Initiators Current Calendar Updated [External]

Performers: Meeting organizer (Employee of the organization). They are the end users of the intranet.

Resources: Employee of the organization, Calendar Database, Employee Database, (Meeting Room Availability, Employees Current Calendar), Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).

Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reschedule/Cancel a Meeting function) And DataRecieved(Scheduled Meeting Invitation) And DataReceived (Date) And/Or DataReceived (Time) And/Or DataReceived (Venue) And/Or DataReceived (Frequency) And/Or DataReceived (Topic) And/Or DataReceived (Meeting Room Number) And DataReceived (Participants email id) And ActionType (Reschedule)

<div align="center">**Or**</div>

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reschedule/Cancel a Meeting function) And DataRecieved (Scheduled Meeting Invitation) And ActionType (Cancel)

Post-condition1: Sent (Email to selected participants) And DataUpdated (Meeting Room Calendar) And DataUpdated (Meeting Initators Calendar)

<div align="center">**Or**</div>

Post-condition2: Sent (Email to selected participants) And DataUpdated (Meeting Room Calendar) And DataUpdated (Meeting Initators Calendar) And EventProduced (Meeting Event not visible to Meeting Initiator)

4. **Respond to Meeting Request:** This function allows the user to accept/decline/tentatively accept the meeting invitation. The meeting initiator receives an email notification stating the response of the attendee i.e. accept/decline/tentative. Also, it makes an entry into the calendar of the attendee for the corresponding response chosen. In case of cancel meeting request, the function allows the user to accept and on acceptance removes the entry from the user's calendar.

Input:
Meeting Invitation email [Schedule a Meeting, Reschedule/Cancel a Meeting],
Action Type (Accept, Decline, Tentative) [External],
Event 'User requested Respond to Meeting Request function' [External]

Output: Participants Current Calendar updated [External],
Email [External]

Performers: Meeting Attendees (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Calendar Database (Employees Current Calendar), Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Respond to Meeting Request function) And DataReceived (Meeting Invitation) And ActionType (Accept) Or ActionType (Tentative).
<div align="center">**Or**</div>
Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Respond to Meeting Request function) And DataReceived (Meeting Invitation) And ActionType (Decline).
Post-condition 1: Sent (Email to the meeting initiator) And DataUpdated (Participants Current Calendar)
<div align="center">**Or**</div>
Post-condition 2: Sent (Email to the meeting initiator)

5. **Meeting/Calendar Event Reminder:** This function makes the system send a reminder notification to the users. The timing and type of the reminder is dependent on the preferences chosen by the user, for ex. if the user has chosen a pop up notification and time as 10 min, then the notification pops up 10 min before the scheduled meeting. Similarly, if the user has chosen email as the type of notification, the user gets an email. The user can choose both email and pop up as a form of notification.
Input:
User's current calendar [Edit a Calendar Event]   ,
User preferences for notification (Pop Up, Email, Time) [External]
Event 'System requested Meeting/Calendar Event Reminder function' [External]
Output:
Pop up [External],
Email [External]
Performers: Calendar User (Employees of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Calendar Database (Employees Current Calendar), Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (System requested

Meeting/Calendar Event Reminder function) And DataReceived
(Reminder Preference i.e. pop up and/or email, time).
Post-condition: PopUp (Reminder) And/Or Sent (Email to User)

6. **Edit a Calendar Event:** This function allows the user to
   add/edit/delete an event to/in/from the user's calendar. User cannot
   edit/delete an accepted meeting event. To delete such an event, the
   user has to decline the meeting request. The user can set the
   preferences for event frequency (for ex. daily, weekly, monthly, etc.),
   type of notifications (pop up, email, time). The system gives a warning
   to the user, if the user tries to add an event having a time overlap with
   other event.
   Input:
   User's current calendar [External],
   Type of notification (Pop Up, Email, Time) [External],
   Event frequency [External],
   Title of the event [External],
   Date of the event [External],
   Time of the event [External],
   Existing event [External],
   Action Type (Add, Edit, Delete) [External],
   Event 'User requested Edit a Calendar Event function' [External]
   Output:
   Updated personal calendar [Meeting/Calendar Event Reminder],
   User's current calendar updated [External]
   Performers: Calendar User (Employees of the organization). They are
   the end users of the intranet.
   Resources: Employee of the organization, Calendar Database
   (Employees Current Calendar), Web Application, Computer/Laptop,
   access to the intranet (Employee ID, VPN).
   Performance locations: Office Locations of the organization, Remote
   work locations of the employee.
   Precondition1: EventHasOccured (User requested Authenticate and
   Authorize function) And EventHasOccured (User requested Edit a
   Calendar Event function) And DataReceived (User's current calendar)
   And DataReceived (Type of notification) And DataReceived (Title)
   And DataReceived (Date) And DataReceived (Time) And
   DataReceived (Event Frequency) And ActionType (Add)
   <div align="center">**Or**</div>
   Precondition2: EventHasOccured (User requested Authenticate and
   Authorize function) And EventHasOccured (User requested Edit a
   Calendar Event function) And DataReceived (User's current calendar)
   And DataReceived (Existing Event) And/Or DataReceived
   (Type of notification) And/Or DataReceived (Title) And/Or
   DataReceived (Date) And/Or DataReceived (Time) And/Or
   DataReceived (Event Frequency) And ActionType (Edit)

Precondition3: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Edit a Calendar Event function) And DataReceived (User's current calendar) And DataReceived (Existing Event) And ActionType (Delete)
Post-condition1: DataUpdated (Users current calendar) And EventProduced (Event visible in the Users calendar)
Post-condition2: DataUpdated (Users current calendar) And EventProduced (Event visible in the Users calendar)
Post-condition3: DataUpdated (Users current calendar) And EventProduced (Event not visible in the Users calendar)

7. **Create and Assign a Task:** This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to create a task and assign it to the members of the group reporting to the user. Also, the user can set preferences whether to be notified when the status of the task is changed. The user who creates the task is named as the owner of the task by default.
Input:
Task Title [External],
Task Description [External],
Assignee [External],
Start Date [External],
End Date [External],
Priority [External],
Status [External],
Dependencies [External],
Blockers [External],
Attachment (if required) [External],
Select Notify on Status Change (if notification desired) [External],
Action Type (Create) [External],
Event 'User requested Create and Assign a Task function' [External]
Output:
Task added to the Task Tracker [Monitor Task Progress],
Email [External],
Task Database Updated [External]
Performers: Manager/Team lead (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Task Database, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Create and Assign a Task function) And DataReceived (Task Title) And DataReceived (Task Description) And DataReceived (Assignee) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Priority) And DataReceived (Status) And DataReceived (Dependencies) And DataReceived (Blockers) And/Or DataReceived (Attachment) And/Or DataReceived (Notify on Status change) And ActionType(Create)
Post-condition: Sent (Email to assignee) And DataUpdated (Task Tracker) And DataUpdated (Task Database)

8. **Monitor Task Progress:** This function is accessible to selected group of employees in the organization i.e. Manager/Team Lead. It helps the owner of the tasks to monitor their progress. The user can generate a report containing the list of tasks corresponding to the status selected (Open, Resolved, Work in Progress, Pending).
   Input:
   Task Status (Open, Resolved, Work in Progress, Pending) [Create and Assign a Task]
   Event 'User requested Monitor Task Progress function' [External]
   Output:
   Report [Update and Reassign Tasks]
   Performers: Manager/Team Lead (Employee of the organization).
   Resources: Employee of the organization, Task Database, Web Application, Computer/Laptop, access to the intranet (Employee ID).
   Performance locations: Office Locations of the organization, Remote work locations of the employee.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Monitor Task Progress function) And DataReceived (Task Status)
   Post-condition: DataGenerated (Report for the selected Task status)

9. **Update and Reassign Tasks:** This function is accessible to the owner and assignee of the task. The purpose of this function is to allow them to update the task status, change the responsible person for the task and upload any attachment (if required). An email notification is sent to the task owner on status change and to the assignee on reassignment of the task.
   Input:
   Task Id [Monitor Task Progress],
   Current Task Status (Open, Resolved, Work in progress, Pending) [Monitor Task Progress],
   Assignee Name [External],
   Notes (if needed) [External],
   Attachment (if needed) [External],
   Action Type (Update) [External],

Event 'User requested Update and Reassign Tasks function' [External]
Output:
Task updated [External],
Email [External]
Performers: Task Owner and Assignee (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Task Database, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Update and Reassign Tasks function) And DataReceived (Task Id) And Data Received (Current Task Status) And Data Received (Assignee) And/Or DataReceived (Notes) And/Or DataReceived (Attachment) And ActionType (Update)
Post-condition: Sent (Email to the assignee) And/Or Sent (Email to task owner) And Data Updated (Task Tracker) And DataUpdated (Task Database).

10. **Enter Timesheet:** This function allows the users to enter hours worked in a week against each task. The data entered is used by the organization to keep track of the hours spent in each project which is used in time estimation and scheduling purposes for upcoming projects. This function also provides data to the salary module for the calculation of salary of employees in the organization who are paid on hourly basis.
    Input:
    Number of hours for each assigned task [External],
    Number of hours for other miscellaneous task [External],
    Action Type (Save) [External],
    Event 'User requested Enter Timesheet function' [External]
    Output:
    Pop up [External],
    Updated Timesheet [Approve Timesheet]
    Performers: Employees of the organization. They are the end users of the intranet.
    Resources: Employee of the organization, Timesheet Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN)
    Performance locations: Office Locations of the organization, Remote work locations of the employee.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Enter Timesheet function) And DataReceived (Number of Hours for each

assigned Task) And/Or DataReceived (Number of hours for other miscellaneous task) And ActionType (Save)
Post-condition: PopUp (Stating Timesheet updated) And DataUpdated (Hours in Timesheet)

11. **Approve Timesheet:** This function is accessible to selected group of employees in the organization i.e. Manager/Supervisor. It allows the user to approve the hours entered by the team members reporting to the user.
Input:
Team Member Name [External],
Team Member's Timesheet [Enter Timesheet],
Action Type (Approve) [External],
Event 'User requested Approve Timesheet function' [External]
Output:
Approved and Read only timesheet [External].
Performers: Manager/Supervisor (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Timesheet Database, Web Application, Employee Database, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Timesheet function) And DataReceived (Team Member Name) And DataReceived (Team Member's Timesheet) And ActionType (Approve)
Post-condition: PopUp (Stating Timesheet approved) And DataUpdated (Hours in Timesheet Database) and DataGenerated (Read only Timesheet) And EventProduced (Approved Timesheet available for salary calculation)

12. **Create and Assign Goalsheet:** This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to set goals for the members reporting to the user. The organization uses the Goalsheet for evaluation purposes of the employees to decide various factors like salary, promotion, extension of contract etc.
Input:
Team member name [External],
Appropriate goal (ex. mentoring, certifications taken, on schedule delivery etc) [External],
Action Type (Create) [External],
Event 'User requested Create and Assign Goalsheet function' [External]
Output:
New editable Goalsheet [Edit and Save Goalsheet],

Goalsheet Assigned [External],
Goalsheet Database updated [External]
Performers: Manager (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Goalsheet Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN),
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Create and Assign Goalsheet function) And DataReceived (Team Member name) And DataReceived (Appropriate Goal) And ActionType (Create)
Post-condition: DataGenerated (Goalsheet) And Assigned (Goalsheet to selected Team Member) And DataUpdated (Goalsheet Database) And EventProduced (Goalsheet available to Team Member)

13. **Edit and Save Goalsheet:** This function allows the user to enter data into the assigned Goalsheet against each goal assigned. The user can save the completely filled/partially filled Goalsheet and come back later to edit the contents and save it again.
    Input:
    Assigned Goalsheet [Create and Assign Goalsheet]
    Rating for each goal [External],
    Justification of rating [External],
    Action Type (Save) [External],
    Event 'User requested Edit and Save Goalsheet function' [External]
    Output:
    Rating updated [External],
    Justification updated [External],
    Completely filled Goalsheet or Partially filled Goalsheet [Submit Goalsheet].
    Performers: Employee of the organization. They are the end users of the intranet.
    Resources: Employee of the organization, Goalsheet Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN),
    Performance locations: Office Locations of the organization, Remote work locations of the employee.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Edit and Save Goalsheet function) And DataReceived (Goalsheet) And DataReceived (Rating for each goal) And DataReceived (Justification of rating) And ActionType (Save)

Post-condition: DataGenerated (Completely filled Goalsheet) And DataGenerated (Partially filled Goalsheet) And DataUpdated (Rating) And DataUpdated (Justification)

14. **Submit Goalsheet:** This function allows the user to submit the completely filled Goalsheet. On submission the Goalsheet is assigned to the Manager to whom the user is reporting and is no longer available to the user. The Goalsheet is available for the Manager to review, rate and approve.
Input:
Goalsheet [Edit and Save Goalsheet],
Ratings [External],
Justification [External],
Action Type (Submit) [External],
Event 'User requested Submit Goalsheet function' [External]
Output:
Read only Goalsheet [Approve Goalsheet],
Assignment of Goalsheet to Manager [Approve Goalsheet],
Goalsheet Database updated [External]
Resources: Employee of the organization, Goalsheet Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN),
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Submit Goalsheet function) And DataReceived (Goalsheet) And DataReceived (Ratings) And DataReceived (Justification) And ActionType (Submit)
Post-condition: DataGenerated (Goalsheet with user entered data as read only) And Assigned (Goalsheet to manager) And DataUpdated (Ratings) And DataUpdated (Justification) And DataUpdated (Goalsheet Database) And EventProduced (Goalsheet not visible to User)

15. **Approve Goalsheet:** This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to do performance evaluation of the team member based on the data provided and their performance. On approval the team member is able to view their rating and its justifications in read only format.
Input:
Team Member Name [External],
Team Member's Goalsheet [Submit Goalsheet],
Rating [External],
Justification [External],
Action Type (Approve) [External],
Event 'User requested Approve Goalsheet function' [External]

Output:
Rated and approved Goalsheet [External],
Read only Goalsheet [External],
Goalsheet Database updated [External]
Performers: Manager (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Goalsheet Database, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Goalsheet function) And DataReceived (Team Member Name) And DataReceived (Team Member's Goalsheet) And DataReceived (Rating) And DataReceived (Justification) And ActionType (Approve)
Post-condition: DataGenerated (Read only Goalsheet) And Assigned (Goalsheet to team member) And DataUpdated (Rating) And DataUpdated (Justification) And DataUpdated (Goalsheet Database) And EventProduced (Approved Goalsheet visible to Team Member)

16. **View Leave History and Balance** → The purpose of this function is to provide information to the user about the leave balance i.e. number of Vacation days or sick days available and leave history i.e. leaves applied in the past.
Input:
Event 'User requested View Leave History and Balance function' [External]
Output:
Users Leave Balance [Request Leave of Absence]
Users Leave History [Request Leave of Absence]
Performers: Employee of the organization. They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested View Leave History and Balance function)
Post-condition: DataGenerated (Users Leave Balance chart) And DataGenerated (Users Leave History chart)

17. **Request Leave of Absence:** This function allows the user to apply for leave. Also, it allows the user to select the type of leave (Vacation, Sick, Leave without Pay), the user wants to apply.

Input:
Date of Absence [External],
Time of Absence [External],
Reason [External],
Type of leave (Vacation, Sick, Leave without Pay) [External],
Action Type (Submit) [External],
Event 'User requested Request Leave of Absence function' [View Leave History and Balance]
Output:
Read only Leave Application [Approve Leave of Absence, Reject Leave of Absence],
Requesters Leave History Updated [External]
Performers: Employee of the organization.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID.
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Request Leave of Absence function) And DataReceived (Date of Absence) And/Or DataReceived (Time of Absence) And DataReceived (Reason) And DataReceived (Type of leave) And ActionType (Submit)
Post-condition: DataGenerated (Read only Leave application) And DataUpdated (Requesters Leave History) And EventProduced (Leave application visible to approver)

18. **Approve Leave of Absence:**This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to approve the team member's request for leave. On approval the leave data is updated for the employee in the employee database and is available for salary calculation in case of Leave without Pay.
Input:
Requesters Name [External],
Requesters Leave Application [Request Leave of Absence],
Action Type (Approve) [External],
Event 'User requested Approve Le ave of Absence function' [External]
Output:
Requesters Leave History updated [External],
Requesters Leave Balance updated [External],
Employee database updated [External]
Performers: Manager (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).

Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Leave of Absence function) And DataReceived (Team Member's Name) And DataReceived (Team Member's Leave Application) And ActionType (Approve)
Post-condition: DataGenerated (Read only and Approved Leave application) And DataUpdated (Requesters Leave History) And DataUpdated (Requesters Leave Balance) And DataUpdated (Employee Database) And EventProduced (Leave Approved visible in Requesters Leave History) And/Or EventProduced (Approved Leave without Pay available for salary calculation)

19. **Reject Leave of Absence:** This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to reject the team member's request for leave. On rejection the leave history of the team member shows that leave is not approved.
    Input:
    Team Member's Name [External],
    Team Member's Leave Application [Request Leave of Absence],
    Reason for Disapproval [External],
    Action Type (Reject) [External],
    Event 'User requested Reject Leave of Absence function' [External]
    Output:
    Requesters Leave History updated [External]
    Employee Database updated [External]
    Performers: Manager/Supervisor (Employee of the organization). They are the end users of the intranet.
    Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
    Performance locations: Office Locations of the organization, Remote work locations of the employee.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reject Leave of Absence function) And DataReceived (Team Member's Name) And DataReceived (Team Member's Leave Application) And DataReceived (Reason for Disapproval) And ActionType (Reject)
    Post-condition: DataGenerated (Read only and Disapproved Leave application) And DataUpdated (Requesters Leave History) And DataUpdated (Employee Database) And EventProduced (Leave Disapproved visible in Requesters Leave History)

20. **Raise Travel Authorization Request:** This function allows the user to raise a request for travel authorization for business purposes. The

business days during duration of travel are considered as working days for the user and the user is allows to enter the work hours in timesheet for those days.

Input:
Start Date [External],
End Date [External],
Destination Address [External],
Purpose of Travel [External],
Supporting Documents (if needed) [External],
Benefits to the organization [External],
Estimated Cost [External],
Action Type (Submit) [External],
Event 'User requested Raise Travel Authorization Request function' [External]

Output:
Travel Authorization request submitted [Approve Travel Authorization Request, Reject Travel Authorization Request], Requesters Travel history updated [External]

Performers: Employee of the organization.

Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID).

Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Raise a Travel Authorization Request function) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Destination Address) And DataReceived (Purpose of Travel) And/Or DataReceived (Supporting documents) And DataReceived (Benefits to the Organization) And DataReceived (Estimated Cost) And ActionType (Submit)

Post-condition: DataGenerated (Read only Travel Authorization application) And DataUpdated (Requesters Travel History) and EventProduced (Travel Authorization application visible to approver)

21. **Approve Travel Authorization Request:**This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to approve the requesters travel authorization request. On approval the travel data is updated for the employee in the employee database and is available to the Office of Accounting for reference during Travel Expense reimbursement.

Input:
Requesters Name [External],
Requesters Travel Authorization Application [Raise Travel Authorization Request],
Action Type (Approve) [External],

Event 'User requested Approve Travel Authorization Request function' [External]
Output:
Requesters Travel History updated [Claim Travel Expenses], Employee database updated [External]
Performers: Manager (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Travel Authorization Request function) And DataReceived (Requesters Name) And DataReceived (Requesters Travel Authorization Application) And ActionType (Approve)
Post-condition: DataGenerated (Read only and Approved Travel Authorization application) And DataUpdated (Requesters Travel History) And DataUpdated (Employee Database) And EventProduced (Approved travel authorization visible in Requesters Travel History) And EventProduced (Travel Data available to Office of Accounting)

22. **Reject Travel Authorization Request:** This function is accessible to selected group of employees in the organization i.e. Manager. It allows the user to reject the requesters travel authorization request. On rejection the Travel history of the team member shows that requested travel authorization is not approved.
Input:
Requesters Name [External],
Requesters Travel Authorization Application [Raise Travel Authorization Request],
Reason for Disapproval [External],
Action Type (Reject) [External],
Event 'User requested Reject Travel Authorization Request function' [External]
Output:
Requesters Travel History updated [External],
Employee Database updated [External]
Performers: Manager/Supervisor (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reject

Travel Authorization Request function) And DataReceived
(Requesters Name) And DataReceived (Requesters Travel
Authorization Application) And DataReceived (Reason for
Disapproval) And ActionType (Reject),
Post-condition: DataGenerated (Read only and Disapproved Travel
Authorization application) And DataUpdated (Requesters Travel
History) And DataUpdated (Employee Database) And EventProduced
(Disapproved travel authorization visible in Requesters Travel History
with the reason for disapproval)

23. **Claim Travel Expenses:** The purpose of this function is to allow the
user to claim the expenses incurred during the business travel. This
also provides information to the user about the travel request history
i.e. the list of approved and disapproved travel requests. User can
claim reimbursement for the expenses for each approved travel
requests.
Input:
Start Date [External],
End Date [External],
Destination Address [External],
Purpose of Travel [External],
Expenses Incurred [External],
Action Type (Claim) [External],
Event 'User requested Claim Travel Expenses function' [Approve
Travel Authorization Request]
Output:
Read only Claim Application [External],
Employee Database Updated [External]
Performers: Employee of the organization. They are the end users of
the intranet.
Resources: Employee of the organization, Employee Database, Web
Application, Computer/Laptop, access to the intranet (Employee ID).
Performance locations: Office Locations of the organization, Remote
work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and
Authorize function) And EventHasOccured (User requested Claim
Travel Expenses function) And DataReceived (Start Date) And
DataReceived (End Date) And DataReceived (Destination Address)
And DataReceived (Purpose of Travel) And DataReceived (Expenses
Incurred) And ActionType (Claim)
Post-condition: DataGenerated (Read only Claim Application) And
DataUpdated (Employee Database) and EventProduced (Claim
Application Visible to Office of Accounting)

24. **Request or Renew Resources:** The purpose of this function is to
allow the user to request or renew resources (e.g., Secure Card, VPN,

Desktop, Laptop, software installation etc.). Depending on the type of resource and access requested, the request either directly goes to the IT group for further processing or it goes to the Manager for Approval and then to the IT group for further processing.

Input:

Type of resource (Secure Card, Key Fob, VPN, Computer), Type of access (Admin, User) [External],

Purpose (For requesting or renewing access) [External],

Date of Request [External],

Time of Request [External],

Managers Name (if needed) [External],

Action Type (Submit) [External],

Event 'User requested Request or Renew Resources function' [External]

Output:

Resource Request generated [Approve Resource Request, Reject Resource Request]

Performers: Employee of the organization.

Resources: Employee of the organization, Employee Database, Resource Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).

Performance locations: Office Locations of the organization

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Request or Renew Resources function) And DataReceived (Type of resource) And DataReceived (Type of access) And DataReceived (Purpose) And DataReceived (Date of Request) And DataReceived (Time of Request) And/Or DataReceived (Managers Name) And ActionType (Submit)

Post-condition: DataGenerated (Read only resource request application) And EventProduced (Resource request application Visible to IT department) And/Or EventProduced (Resource request application visible to manager)

25. **Approve Resource Request:** This function is accessible to selected group of employees in the organization i.e. Manager/IT Group. It allows the users to approve the requester's access request. For certain resource access there is two level of approvals i.e. first managers' approval and second IT groups approval.

Input:

Requester Name [External],

Resource request application [Request of Renew Resources], Action Type (Approve) [External]

Event 'User requested Approve Resource Request function' [External]

Output:

Email [External],

Approved Access Request [External],

Employee Database updated [External],
Resource Database updated [External],
Performers: Manager, IT group (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Resource Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Resource Request function) And DataReceived (Requester Name) And DataReceived (Resource request application) And ActionType (Approve)
Post-condition1: DataGenerated (Approved access request by IT group) And Sent (Email to requester) And DataUpdated (Employee Database) And DataUpdated (Resource Database)
<div align="center">**Or**</div>
Post-condition2: DataGenerated (Approved access request by Manager) And EventProduced (Approved request resource application visible to IT group)

26. **Reject Resource Request:** This function is accessible to selected group of employees in the organization i.e. Manager/IT group. It allows the users to reject the requester's access request. For those resources for which manager's approval is needed, the request can be rejected at any level i.e. rejection by the manager or rejection by the IT group after manager's approval.
Input:
Requester Name [External],
Resource request application [Request or Renew Resources],
Reason for Disapproval [External],
Action Type (Reject) [External],
Event 'User requested Reject Resource Request function' [External]
Output:
Email [External]
Performers: Manager, IT group (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reject Resource Request function) And DataReceived (Requester Name) And

DataReceived (Resource request application) And DataReceived (Reason for Disapproval) And ActionType (Reject)
Post-condition: Sent (Email to requester stating the reason for disapproval)

27. **Add a Training Course:** This function allows the Learning and Development (L&D) group to add a training course and the eligibility criteria for the course. After a course is added, it is available for the eligible employees to register for the course.
Input:
Course name [External],
Course ID [External],
Course Instructor [External],
Type of Course (Online, Classroom) [External],
Start Date [External],
End Date [External],
Duration [External],
Eligibility Criteria [External],
Number of seats [External],
Action Type (Add) [External],
Event 'User requested Add a Training Course function' [External]
Output:
L&D calendar updated [External],
Course Database updated [External]
Performers: Knowledge management group (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Course Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Add a Training Course function) And DataReceived (Course Name) And DataReceived (Course ID) And DataReceived (Course Instructor) And DataReceived (Type of Course) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Duration) And DataReceived (Eligibility Criteria) And DataReceived (Number of seats) And ActionType (Add)
Post-condition: DataUpdated (L&D Calendar) And DataUpdated (Course Database) And EventProduced (Course added and visible to potential participants)

28. **Add a Certification:** This function allows the Learning and Development (L&D) group to add details about a certification exam.

After a certification is added, it is available for the potential employees to register for the certification.

Input:
Certification Name [External],
Certificate Issuer [External],
Eligibility Criteria [External],
Action Type (Add) [External],
Event 'User requested Add a Certification function' [Add a Training Course]

Output:
L&D Calendar updated [External]
Certification Database updated [External]

Performers: Knowledge management group (Employee of the organization). They are the end users of the intranet.

Resources: Employee of the organization, Certification Database, Web Application, Computer/Laptop, access to the intranet (Employee ID).

Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Add a Certification function) And DataReceived (Certification Name) And DataReceived (Certificate Issuer) And DataReceived (Eligibility Criteria) And ActionType (Add)

Post-condition: DataUpdated (L&D Calendar) And DataUpdated (Certification Database) And EventProduced (Certification added and visible to potential test takers)

29. **Delete a Training Course/Certification:** This function allows the Learning and Development (L&D) Group to delete a training course or a certification. After a course or certification is deleted, it is no longer available to the employees.

Input:
Course name [External],
Course ID [External],
Certification Name [External],
Certification ID [External],
Action Type (Search) [External],
Action Type (Delete) [External],
Event 'User requested Delete a Training Course/Certification function' [Add a Training Course]

Output:
L&D calendar updated [External]
Course Database updated [External]
Certification Database updated [External]

Performers: Knowledge management group (Employee of the organization). They are the end users of the intranet.

Resources: Employee of the organization, Course Database, Certification Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).

Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Delete a Training Course/Certification function) And DataReceived (Course Name) And DataReceived (Course ID) And ActionType (Search) And ActionType (Delete)

Or

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Delete a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Delete)

Post-condition1: DataUpdated (L&D Calendar) And DataUpdated (Course Database) And EventProduced (Course deleted and not visible to potential participants).

Or

Post-condition2: DataUpdated (L&D Calendar) And DataUpdated (Certification Database) And EventProduced (Certification deleted and not visible to potential test takers) And EventProduced (Registered Applicants dropped)

30. **Register for a Training Course/Certification:** This function allows the employees to search for a course/certification and register for the course/certification. The users training list is updated either with the course/certification details when the user registers.

    Input:
    Course name [External],
    Course ID [External],
    Date Range [External],
    Certification Name [External],
    Certification ID [External],
    Action Type (Search) [External],
    Action Type (Register) [External],
    Event 'User requested Register for a Training Course/Certification function' [External]

    Output:
    Users Training List updated [External]
    Course Database updated [External]
    Users Certification List updated [External]
    Certification Database updated [External]

    Performers: Potential participant (Employee of the organization). They are the end users of the intranet.

Resources: Employee of the organization, Course Database, Certification Database, Web Application, Employee Database, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Register for a Training Course/Certification function) And DataReceived (Course name) And DataReceived (Course ID) And DataReceived (Date Range) And Action Type (Search) And ActionType (Register)

<div align="center">Or</div>

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Register for a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Register)
Post-condition1: EventProduced (User Registered to Training Course) And DataUpdated (Users Training List) And DataUpdated (Course database).

<div align="center">Or</div>

Post-condition2: EventProduced (User Registered to Certification Exam) And DataUpdated (Users Certification List) And DataUpdated (Certification Database)

31. **Drop a Training Course/Certification:** This function allows the employees to search for a course/certification and drop the course/certification already registered to. The users training list is updated and the course/certification details are removed from the list when the user drops a course. The user cannot drop the course on/after the training date and is specified as not attended in the list if the user fails to attend the training.
    Input:
    Course name [External],
    Course ID [External],
    Date Range [External],
    Certification Name [External],
    Certification ID [External],
    Action Type (Search) [External],
    Action Type (Drop) [External],
    Event 'User requested Drop a Training Course/Certification function' [External]
    Output:
    Users Training List updated [External]
    Course Database updated [External]
    Users Certification List updated [External]
    Certification Database updated [External]

Performers: Potential participant (Employee of the organization). They are the end users of the intranet.
Resources: Employee of the organization, Course Database, Certification Database, Web Application, Employee Database, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Drop a Training Course/Certification function) And DataReceived (Course name) And DataReceived (Course ID) And DataReceived (Date Range) And ActionType (Search) And ActionType (Drop)

<p align="center">Or</p>

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Drop a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Drop)
Post-condition1: EventProduced (User dropped from the Training Course) And DataUpdated (Users Training List) And DataUpdated (Course database).

<p align="center">**Or**</p>

Post-condition2: EventProduced (User dropped from the Certification Exam and removed from Users Certification list) And DataUpdated (Users Certification List) And DataUpdated (Certification Database)

32. **Ask a Question:**   This function allows the users to start a discussion thread by posting a question. It provides a common platform to employees to discuss things of interest and is a huge repository of information.
Input:
Users Name [External],
Question [External],
Action Type (Submit) [External],
Event 'User requested Ask a Question function' [External]
Output:
Discussion Thread Started [Post a Reply],
Forums Database updated [External]
Performers: Employee of the organization. They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Forums Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Ask a Question function) And DataReceived (Users Name) And DataReceived (Question) And ActionType (Submit)
Post-condition: DataGenerated (New Discussion Thread started) And DataUpdated (Forums Database) And EventProduced (Thread Visible to all users and allows to post reply).

33. **Post a Reply:** This function allows the users to select a discussion thread and post a reply to that. The posted reply is visible to all the users.
Input:
Users Name,
Discussion Thread [Ask a Question],
Reply [External],
Action Type (Post) [External],
Event 'User requested Post a Reply function' [External]
Output:
Reply posted [External],
Forums Database updated [External]
Performers: Employee of the organization. They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Forums Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Post a Reply function) And DataReceived (Users Name) And DataReceived (Discussion Thread) And DataReceived (Reply) And ActionType (Post)
Post-condition: DataGenerated (Reply Posted) And DataUpdated (Forums Database) And EventProduced (Reply Visible to all users).

34. **Search for PayStubs/Tax Documents :** This function allows the user to search for current and old PayStubs/Tax Documents. The PayStubs for the current month is available only after the first day of the next month.
Input:
Type of document (PayStub, W2, 1099, Misc Tax Doc) [External],
Date range [External],
Year [External],
Action Type (Search) [External],
Event 'User requested Search for PayStubs/Tax Documents function' [External]
Output:

PayStub links [View PayStubs/Tax Documents],
W2/1099/misc tax documents links [View PayStubs/Tax Documents]
Performers: Employee of the organization. They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Salary Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search for PayStubs/Tax Documents function) And DataReceived (Type of Document) And DataReceived (Data Range) Or DataReceived (Year) And ActionType (Search)
Post-condition: EventProduced (Users list of available Paystubs displayed) Or EventProduced (Users list of available Tax Document list displayed)

35. **View PayStubs/Tax Documents:** This function allows the user to view or download the PayStubs/Tax Documents the user selects from the list obtained after search.
    Input:
    PayStub links [Search for PayStubs/Tax Documents],
    W2/1099/misc tax documents links [Search for PayStubs/Tax Documents],
    Action Type (View, Download) [External],
    Event 'User requested View PayStubs/Tax Documents function' [External]
    Output:
    Selected PayStub [External],
    Selected W2/1099/misc tax documents [External]
    Performers: Employee of the organization. They are the end users of the intranet.
    Resources: Employee of the organization, Employee Database, Salary Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
    Performance locations: Office Locations of the organization, Remote work locations of the employee.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested View PayStubs/Tax Documents function) And DataReceived (PayStub links) And DataReceived (W2/1099/misc tax documents links) And ActionType (View) Or ActionType (Download)
    Post-condition: DataGenerated (Selected Paystub/Tax Document displayed) Or DataGenerated (Selected Paystub/Tax Document downloaded)

36. **Search Job Postings:** This function allows the user to search for job opportunities available to the user within the organization. Also, it allows the user to search for job opportunities for which the user can refer friends from outside the organization.
Input:
Skill/Keywords [External],
Location [External],
Listing Type (Internal, Referral) [External],
Action Type (Search) [External],
Event 'User requested Search Job Postings function' [External]
Output:
List of Jobs
Performers: Employee of the organization. They are the end users of the intranet.
Resources: Employee of the organization, Employee Database, Job Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).
Performance locations: Office Locations of the organization, Remote work locations of the employee.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search Job Postings function) And DataReceived (Skill/Keywords) Or DataReceived (Location) And DataReceived (Listing Type) And ActionType (Search)
Post-condition: DataGenerated (List of Internal Job Opportunities displayed) Or DataGenerated (List of Referral Job Opportunities displayed)

37. **Apply/Refer to a Job:** This function allows the user to Apply to the Internal Jobs displayed in the Internal Job Opportunities list after search. Also, it allows the user to Refer a friend to the Referral Job Opportunities list Displayed after search.
Input:
User Name [External],
Internal Job List [Search Job Postings],
Referral Job List [External],
Users Resume [External],
Referees Resume [External],
Action Type (Apply, Refer) [External],
Event 'User requested Apply/Refer to a Job function' [External]
Output:
Job Application sent to HR [External]
Job Application with employee referral code sent to HR. [External]
Performers: Employee of the organization. They are the end users of the intranet.

Resources: Employee of the organization, Employee Database, Job Database, Web Application, Computer/Laptop, access to the intranet (Employee ID, VPN).

Performance locations: Office Locations of the organization, Remote work locations of the employee.

Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Apply/Refer to a Job function) And DataReceived (User Name) And DataReceived (Internal Job list) And DataReceived (Users Resume) And ActionType (Apply)

<div align="center">Or</div>

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Apply/Refer to a Job function) And DataReceived (User Name) And DataReceived (Referral Job list) And DataReceived (Referees Resume) And ActionType (Refer)

Post-condition: DataGenerated (Job Application) And EventProduced (Job Application Sent to HR) Or EventProduced (Job Application Sent to HR with employee referral code) And DataUpdated (Job Database)

38. **Search Employee Directory:** This function allows the user to search the employee database for the employees contact information.

    Input:
    First Name,
    Last Name,
    Email address,
    Action Type (Search),
    Event 'User requested Search Employee Directory function'

    Output:
    List of Contacts that matches the Search Criteria

    Performers: Employee of the organization. They are the end users of the intranet.

    Resources: Employee of the organization, Employee Database, Web Application Computer/Laptop, access to the intranet (Employee ID, VPN).

    Performance locations: Office Locations of the organization, Remote work locations of the employee.

    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search Employee Directory function) And DataReceived (First Name) And DataReceived (Last Name) And DataReceived (Email address) And ActionType (Search)

    Post-condition: DataGenerated (List of Contacts that matches the Search Criteria)

1.4.2. Scenario Specifications

1. **Organize a Business Meeting:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: Schedule a Meeting
   Function3: Reschedule/ Cancel a Meeting with ActionType (Reschedule) (Note: This function is optional and is used only in case the meeting needs to be rescheduled)
   Function4: Respond To Meeting Request
   Environment: This scenario makes sense when there is need for employees to get together in a meeting to solve a specific business problem.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Schedule a Meeting function) And DataReceived (Date) And DataReceived (Time) And DataReceived (Venue) And DataReceived (Frequency) And DataReceived (Topic) And/Or DataReceived (Meeting Room Number) And/Or DataReceived (Phone Number) And DataReceived (Participants email id) And ActionType (Send)
   Post-conditions: Sent (Email to the meeting initiator) And DataUpdated (Meeting Attendees Calendar) And DataUpdated (Meeting Room Calendar)

2. **Cancel a Business Meeting:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: Reschedule/ Cancel a Meeting with ActionType (Cancel)
   Function3: Respond To Meeting Request
   Environment: This scenario makes sense when a scheduled meeting need to be cancelled due to various reasons like the problem to be discussed is already resolved; the acceptance percentage for the meeting is low etc.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Reschedule/Cancel a Meeting function) And DataRecieved (Scheduled Meeting Invitation) And ActionType (Cancel)
   Post-conditions: DataUpdated (Meeting Room Calendar) And DataUpdated (Meeting Attendees Calendar) And EventProduced (Meeting Event not visible to Meeting Attendees)

3. **Maintain a Personal Calendar:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: Edit a Calendar Event
   Function3: Meeting/Calendar Event Reminder

Environment: This scenario comes into play, when a user (employee of the organization) wants to use a personal calendar to organize their time systematically.

Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Edit a Calendar Event function) And DataReceived (User's current calendar) And DataReceived (Type of notification) And DataReceived (Title) And DataReceived (Date) And DataReceived (Time) And DataReceived (Event Frequency) And ActionType (Add)

<div align="center">**Or**</div>

Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Edit a Calendar Event function) And DataReceived (User's current calendar) And DataReceived (Existing Event) And/Or DataReceived (Type of notification) And/Or DataReceived (Title) And/Or DataReceived (Date) And/Or DataReceived (Time) And/Or DataReceived (Event Frequency) And ActionType (Edit)

<div align="center">**Or**</div>

Precondition3: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Edit a Calendar Event function) And DataReceived (User's current calendar) And DataReceived (Existing Event) And ActionType (Delete)

Post-condition1: DataUpdated (Users current calendar) And PopUp (Reminder) And/Or Sent (Email to User) And EventProduced (Event visible in the Users calendar)

<div align="center">**Or**</div>

Post-condition2: DataUpdated (Users current calendar) And PopUp (Reminder) And/Or Sent (Email to User) And EventProduced (Event visible in the Users calendar)

<div align="center">**Or**</div>

Post-condition3: DataUpdated (Users current calendar) And EventProduced (Event not visible in the Users calendar)

4. **Workflow Management:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: Create and Assign a Task
   Function3: Monitor Task Progress
   Function4: Update and Reassign Tasks
   Environment: The project owner splits the project into various phases and tasks. Each phase or task is to be assigned to a group or an individual.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Create and Assign a Task function) And DataReceived (Task Title) And DataReceived (Task Description) And DataReceived (Assignee) And

DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Priority) And DataReceived (Status) And DataReceived (Dependencies) And DataReceived (Blockers) And/Or DataReceived (Attachment) And/Or DataReceived (Notify on Status change) And ActionType(Create)
Post-condition: Sent (Email to task owner) And Data Updated (Task Tracker) And DataUpdated (Task Database)

5. **Timesheet Management** →
Sequence of Functions:
Function1: Authenticate and Authorize
Function2: Enter Timesheet
Function3: Approve Timesheet
Environment: An employee needs to complete the timesheet by last working day of the week and the manager needs to approve them by last working day of the month.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Enter Timesheet function) And DataReceived (Number of Hours for each assigned Task) And/Or DataReceived (Number of hours for other miscellaneous task) And ActionType (Save)
Post-condition: PopUp (Stating Timesheet approved) And DataUpdated (Hours in Timesheet Database) and DataGenerated (Read only Timesheet) And EventProduced (Approved Timesheet available for salary calculation)

6. **Appraisal Management:**
Sequence of Functions:
Function1: Authenticate and Authorize
Function2: Create and Assign Goalsheet
Function3: Edit and Save Goalsheet
Function4: Submit Goalsheet
Function5: Approve Goalsheet
Environment: An employee's performance needs to be evaluated either quarterly or half yearly or yearly to decide various factors like salary, promotion, extension of contract etc.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Create and Assign Goalsheet function) And DataReceived (Team Member name) And DataReceived (Appropriate Goal) And ActionType (Create)
Post-condition: DataGenerated (Read only Goalsheet) And Assigned (Goalsheet to team member) And DataUpdated (Rating) And DataUpdated (Justification) And DataUpdated (Goalsheet Database) And EventProduced (Approved Goalsheet visible to Team Member)

7. **Grant a Leave:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: View Leave History and Balance
   Function3: Request Leave of Absence
   Function4: Approve Leave of Absence
   Environment: An employee needs to apply leave and get it approved by the manager so that the manager can make necessary arrangements to take care of the work assigned to the employee on the day of leave.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested View Leave History and Balance function) And EventHasOccured (User requested Request Leave of Absence function) And DataReceived (Date of Absence) And/Or DataReceived (Time of Absence) And DataReceived (Reason) And DataReceived (Type of leave) And ActionType (Submit)
   Post-condition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Approve Leave of Absence function) And DataReceived (Team Member's Name) And DataReceived (Team Member's Leave Application) And ActionType (Approve) And/Or EventProduced (Approved Leave without Pay available for salary calculation)

8. **Reject a Leave:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: View Leave History and Balance
   Function3: Request Leave of Absence
   Function4: Reject Leave of Absence
   Environment: The manager does not approve the leave stating the reason for disapproval.
   Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested View Leave History and Balance function) And EventHasOccured (User requested Request Leave of Absence function) And DataReceived (Date of Absence) And/Or DataReceived (Time of Absence) And DataReceived (Reason) And DataReceived (Type of leave) And ActionType (Submit)
   Post-condition: DataGenerated (Read only and Disapproved Leave application) And DataUpdated (Requesters Leave History) And DataUpdated (Employee Database) And EventProduced (Leave Disapproved visible in Requesters Leave History)

9. **Reimburse Travel Expenses:**
   Sequence of Functions:
   Function1: Authenticate and Authorize

Function2: Raise Travel Authorization Request
Function3: Approve Travel Authorization Request
Function4: Claim Travel Expenses
Environment: An employee needs to claim the travel expenses incurred for a business travel.
Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Raise a Travel Authorization Request function) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Destination Address) And DataReceived (Purpose of Travel) And/Or DataReceived (Supporting documents) And DataReceived (Benefits to the Organization) And DataReceived (Estimated Cost) And ActionType (Submit)
Post-condition: DataGenerated (Read only Claim Application) And DataUpdated (Employee Database) and EventProduced (Claim Application Visible to Office of Accounting)

10. **Travel Authorization Disapproved:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Raise Travel Authorization Request
    Function3: Reject Travel Authorization Request
    Environment: An employee's travel authorization request is disapproved by the manager due to various reasons (e.g., shortage of funds, inappropriateness of the destination venue etc.)
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Raise a Travel Authorization Request function) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Destination Address) And DataReceived (Purpose of Travel) And/Or DataReceived (Supporting documents) And DataReceived (Benefits to the Organization) And DataReceived (Estimated Cost) And ActionType (Submit)
    Post-condition: DataGenerated (Read only and Disapproved Travel Authorization application) And DataUpdated (Requesters Travel History) And DataUpdated (Employee Database) And EventProduced (Disapproved travel authorization visible in Requesters Travel History with the reason for disapproval)

11. **Manage Resources:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Request or Renew Resources
    Function3: Approve Resource Request
    Or
    Function4: Reject Resource Request

Environment: Organizations need to track the resources issued to the employees.

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Request or Renew Resources function) And DataReceived (Type of resource) And DataReceived (Type of access) And DataReceived (Purpose) And DataReceived (Date of Request) And DataReceived (Time of Request) And/Or DataReceived (Managers Name) And ActionType (Submit)

Post-condition1: DataGenerated (Approved access request by IT group) And Sent (Email to requester) And DataUpdated (Employee Database) And DataUpdated (Resource Database)

<div align="center">Or</div>

Post-condition2: Post-condition: Sent (Email to requester stating the reason for disapproval)

12. **Manage Learning and Development Activities:**
   Sequence of Functions:
   Function1: Authenticate and Authorize
   Function2: Add a Training Course
   Function3: Add a Certification

<div align="center">Or</div>

   Function4: Delete Training Course/Certification
   Environment: Organizations need to provide training and certification courses to employees to have a trained and certified workforce..
   Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Add a Training Course function) And DataReceived (Course Name) And DataReceived (Course ID) And DataReceived (Course Instructor) And DataReceived (Type of Course) And DataReceived (Start Date) And DataReceived (End Date) And DataReceived (Duration) And DataReceived (Eligibility Criteria) And DataReceived (Number of seats) And ActionType (Add)

<div align="center">And</div>

   Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Add a Certification function) And DataReceived (Certification Name) And DataReceived (Certificate Issuer) And DataReceived (Eligibility Criteria) And ActionType (Add)

<div align="center">Or</div>

   Precondition3: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Delete a Training Course/Certification function) And DataReceived (Course Name) And DataReceived (Course ID) And ActionType (Search) And ActionType (Delete)

<div align="center">And</div>

Precondition4: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Delete a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Delete)

Post-condition1: DataUpdated (L&D Calendar) And DataUpdated (Course Database) And EventProduced (Course added and visible to potential participants)

<div align="center">**And**</div>

Post-condition2: DataUpdated (L&D Calendar) And DataUpdated (Certification Database) And EventProduced (Certification added and visible to potential test takers).

<div align="center">**Or**</div>

Post-condition3: DataUpdated (L&D Calendar) And DataUpdated (Course Database) And EventProduced (Course deleted and not visible to potential participants).

<div align="center">**And**</div>

Post-condition4: DataUpdated (L&D Calendar) And DataUpdated (Certification Database) And EventProduced (Certification deleted and not visible to potential test takers) And EventProduced (Registered applicants dropped)

13. **Register or Drop a Training Course/Certification:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Register for a Training Course/Certification
    <div align="center">Or</div>
    Function3: Drop a Training Course/Certification
    Environment: An employee's need to attend a training course or take a certification exam to gain knowledge and achieve advancement in career, or an employee's need to drop a training course or a certification exam due to some unavoidable reasons.
    Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Register for a Training Course/Certification function) And DataReceived (Course name) And DataReceived (Course ID) And DataReceived (Date Range) And ActionType (Search) And ActionType (Register)
    <div align="center">**And**</div>
    Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Register for a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Register)
    <div align="center">**Or**</div>
    Precondition3: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Drop a

Training Course/Certification function) And DataReceived (Course name) And DataReceived (Course ID) And DataReceived (Date Range) And ActionType (Search) And ActionType (Drop)

Or

Precondition4: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Drop a Training Course/Certification function) And DataReceived (Certification Name) And DataReceived (Certification ID) And ActionType (Search) And ActionType (Drop)

Post-condition1: EventProduced (User Registered to Training Course) And DataUpdated (Users Training List) And DataUpdated (Course database).

And

Post-condition2: EventProduced (User Registered to Certification Exam) And DataUpdated (Users Certification List) And DataUpdated (Certification Database)

Or

Post-condition3: EventProduced (User dropped from the Training Course) And DataUpdated (Users Training List) And DataUpdated (Course database).

Or

Post-condition4: EventProduced (User dropped from the Certification Exam and removed from Users Certification list) And DataUpdated (Users Certification List) And DataUpdated (Certification Database)

14. **Participate in Active Discussion:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Ask a Question
    Function3: Post a Reply
    Environment: A user asks a question providing a topic for discussion.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Ask a Question function) And DataReceived (Users Name) And DataReceived (Question) And ActionType (Submit)
    Post-condition: DataGenerated (Reply Posted) And DataUpdated (Forums Database) And EventProduced (Reply Visible to all users)

15. **View Salary and Tax Documents:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Search for PayStubs/Tax Documents
    Function3: View PayStubs/Tax Documents
    Environment: An employee wishes to view her paystubs or tax documents.

Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search for PayStubs/Tax Documents function) And DataReceived (Type of Document) And DataReceived (Data Range) Or DataReceived (Year) And ActionType (Search)
Post-condition: DataGenerated (Selected Paystub/Tax Document displayed) Or DataGenerated (Selected Paystub/Tax Document downloaded)

16. **Job Referral and In House Job Application:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Search Job Postings
    Function3: Apply/Refer to a Job
    Environment: An employee wishes to apply for a job within the organization or refer a friend to a job.
    Precondition1: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search Job Postings function) And DataReceived (Skill/Keywords) Or DataReceived (Location) And DataReceived (Listing Type) And ActionType (Search)
    <center>**And**</center>
    Precondition2: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Apply/Refer to a Job function) And DataReceived (User Name) And DataReceived (Internal Job list) And DataReceived (Users Resume) And ActionType (Apply)
    <center>**Or**</center>
    Precondition3: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Apply/Refer to a Job function) And DataReceived (User Name) And DataReceived (Referral Job list) And DataReceived (Referees Resume) And ActionType (Refer)
    Post-condition: DataGenerated (Job Application) And EventProduced (Job Application Sent to HR) Or EventProduced (Job Application Sent to HR with employee referral code) And DataUpdated (Job Database)

17. **Find an Employees Contact Details:**
    Sequence of Functions:
    Function1: Authenticate and Authorize
    Function2: Search Employee Directory
    Environment: An employee needs to find the contact information of another employee in the organization.
    Precondition: EventHasOccured (User requested Authenticate and Authorize function) And EventHasOccured (User requested Search Employee Directory function) And DataReceived (First Name) And

DataReceived (Last Name) And DataReceived (Email address) And ActionType (Search)
Post-condition: DataGenerated (List of Contacts that matches the Search Criteria)

1.4.3. Essential Scenario

The essential scenario would be **"Workflow management"** because this manages the whole task force of the organization. An organized and systematic workflow process forms the backbone of an organization. The primary advantage of workflow management is to streamline the responsibilities of each employee. This helps the organization in improving the quality of work and efficiency of each employee resulting in better product or services offered by the organization.

1.5. Qualities and Constraints

1. **Security:**
   Description: The intranet has resources sensitive and private to the organization and its employees. Protecting information about company innovations is highly important to stay competitive. Consequently, the access to the intranet should be highly secure and restricted with only authorized personnel accessing sensitive information. The data sent and received should be encrypted to prevent unauthorized access. Security can be achieved through firewalls, Secure Socket layer (SSL) Transport and by setting up Virtual Private Networks for access from a remote location.
   Category: Security
   Stakeholder Source: Business group, Accounting group
   Scope: Authenticate and Authorize
   Evaluation: Zero tolerance for any unauthorized access.

2. **Availability**:
   Description: The intranet is used for facilitating communication between employees. Any down time of the intranet will have a severe impact on productivity. Availability of the system is critical for business continuity. Thus, even if any component fails there is failover functionality in place. There should be secondary servers and redundant databases that kick in if the primary server fails.
   Category: Performance
   Stakeholder Source: Business group, Software Architect, Manager, Employee End User, Database Administrators
   Scope: Schedule a Meeting, Reschedule/Cancel a Meeting
   Evaluation: The maximum tolerated down time is 15 minutes.

3. **Reliability**:

Description: According to ANSI, Software Reliability is defined as the probability of failure free software operation for a specified period of time in a specified environment. Software failures are mainly due to human errors, inadequate testing, unexpected use of the software etc. Our Intranet application should be very reliable. The quality of software should be free of bugs and defects.

Category: Reliability

Stakeholder Source: Business group, HR group, IT infrastructure group, Accounting group, Manager, Employee End User, Software Architect, Software Developers, Database Administrators, Software Quality assurance team.

Scope: Entire system

Evaluation: Various testing techniques during and after software development such as unit, functional and integration testing will expose defects early, reducing uncertainty after production deployment. Employing Quality Assurance mechanisms will improve predictability of system reliability by providing functional and QOS shortfalls for early resolution/mitigation.

4. **Usability:**

Description: Usability refers to the software's ease of use. In our case, the intranet application will be used all over the organization across all levels of employees. The intranet should be easy to use. The training, learning curve required for a user to learn how to use the system should be minimal. This will improve their productivity, which directly relates to return-on investment for the organization.

Category: Usability

Stakeholder Source: Business group, HR group, IT Infrastructure group, Employee End User

Scope: Schedule a Meeting, Edit a Calendar Event

Evaluation: The testers can test the system by using the system in same manner as the end user will use it. Application is first released to staging environment to perform these tests. The feedback can be metrics like:

How easy is it to find a particular function/feature in the application?
How may clicks does it take to navigate to a particular function and execute it?
How much time does it take for a person to get familiar with the application?
User acceptance testing also provides feedback on the usability of the application.

5. **Maintainability:**

Description: Software maintainability is the ease with which a software system or component can be modified to correct faults, improve performance or other attributes, or adapt to a changed environment. Our intranet application should be highly maintainable.

Category: Maintainability
Stakeholder Source: Software Architect, Software Developers
Scope: Entire system.
Evaluation: The software code produced should be readable by other developers. Encouraging code-reading sessions between software developers and using a robust source control system will help in producing maintainable software. Metrics which can gauge maintainability are maintainability index, lines of code, class coupling.

6. **Extensibility:**
   Description: This refers to the ability to add new functionality with ease. The intranet application should be able to grow and incorporate new features with minimum effort. Extensibility is hampered by bad design and poorly written software.
   Category: Extensibility
   Stakeholder Source: Software Developers, Software Architect
   Scope: Enter Timesheet
   Evaluation: Software code should be reviewed for design. Code should be modular, loosely coupled and well encapsulated. Design patterns should be applied wherever appropriate.

7. **Scalability**
   Description: The intranet application should be able to scale and support growing number of end-users as the number of employees in the organization increases.
   Category: Performance
   Stakeholder Source: Business Group, Software Architect, Database administrators
   Scope: Entire System
   Evaluation: Stress/load tests can be performed to estimate the system's performance under various load conditions.

8. **Software Portability**:
   Description: Portability refers to the ability of a system to run under different computing environments. The intranet application must be portable across different operating systems. It must be portable across different versions of the same application server. We should have the ability to migrate data to a different vendor's database if necessary.
   Category: Reusability
   Stakeholder Source: Software Architect, Database Administrators
   Scope: Entire system.
   Evaluation: Portability testing can be used to evaluate this metric. Results are expressed in terms of the time required to migrate the software and complete data conversions and documentation updates.

9. **Timely Delivery**

Description: The intranet application must be delivered within the estimated and planned time. The time-to-deliver must not be overrun.
Category: Project constraint
Stakeholder Source: Business Group
Scope: Entire system.
Evaluation: Milestones should be set for the project. At each milestone, deadlines and tasks completed must be evaluated for the delivered product.

10. **Cost**
Description: The budget set for this application development should not be overrun.
Category: Project constraint
Stakeholder Source: Business group
Scope: Entire system.
Evaluation: Milestones should be set for the project. At each milestone, costs incurred must be evaluated.

1.6. Deployment Environment

Applications in the organization must be developed based on an n-tier structure.
Client tier: This is also called the Presentation tier and is the topmost level of the application. This tier is presented to the end user and will contain the user interface logic.
Application Tier: Also called the middle tier, this tier contains the business logic. The encapsulated business objects and their functions will reside in this tier.
Data tier: This tier consists of the data servers. Information is stored and retrieved from this tier. Data is kept neutral from the application logic to improve scalability and portability.

Operating system: Red Hat Enterprise Linux 5 (RHEL)
Description: Red Hat Enterprise Linux is a very reliable operating system. It offers features, which will directly aid the system qualities of our intranet application like integrated clustering, dynamic resource allocation, live migration, and load balancing. RHEL delivers without compromising response times.
Stakeholder Source: Business group, HR group, IT infrastructure group, Accounting group, Manager, Employee End User, Software Architect, Software Developers, Database Administrators, Software Quality assurance team (for reliability).

Programming platform: Java 1.6
Description: The application will be developed using Java. Java offers many benefits which are ideal for our intranet application.
Portable – Write once, Run anywhere – Java can be developed on any device, compiled into a standard bytecode and be expected to run on any device equipped with a Java virtual machine.

Extensible – Java code is organized in modular object-oriented units called classes. Modular code lends easily to extensibility.
Performance – The speed of the Java VM has increased dramatically with each new release.
Stakeholder Source: Software Architect, Software Developers: for Maintainability, Extensibility, Portability.

Application Server: JBoss version 6.0
Description: JBoss is a Java EE certified platform for developing and deploying enterprise Java applications, Web applications, and Portals. JBoss Application Server provides the full range of Java EE 5 features as well as extended enterprise services including clustering, caching, and persistence.
Stakeholder Source: Business group, HR group, IT infrastructure group, Accounting group, Manager, Employee End User, Software Architect, Software Developers, Database Administrators, Software Quality assurance team: for Reliability, Scalability

Database: MySQL
Description: The intranet application will use a MySQL database for data storage and retrieval. MySQL features scalability, flexibility, high performance, high availability and robust transactions.
Stakeholder source: Business group, Software Architect, Manager, Employee End User, Database Administrators: for availability, scalability

Hardware Specifications:
CPU: 6 Core Intel Xeon Processors with 16MB cache
Memory: 64GB (DIMM slots will allow expansion up to 256 GB)
Hard drive: 800 GB (2 X 400GB)
Connectivity: Embedded 1 GB NIC with fail-over and load balancing

Glossary of Predicates

- **Precondition:**

    - **EventHasOccured:** This specifies the function requested by the user.
    - **DataReceived:** This specifies the data received as an input to the function.
    - **ActionType:** This specifies the action that needs to take place for the execution of the function.

- **Post-condition:**

    - **EventProduced:** This specifies the event that takes place on execution of the function.
    - **Sent:** This specifies that an email is being sent as an output of the function.

- **DataUpdated:** This specifies the data that is updated on the completion of the function.
- **PopUp:** This specifies that a pop up message is being received on the completion of the function.
- **DataGenerated:** This specifies the data that is produced as a result of the execution of the function.
- **Assigned:** This specifies the assignment of the generated output to a certain user.