

**FACULTY OF NATURAL SCIENCES**  
**DEPARTMENT OF COMPUTER SCIENCE**

**CSE2101 - Software Engineering I**



**Submission 3**

# System Design

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## **Distribution of Labor**

Work was divided among the group members as follows:

Shafeek Hiranman-

- ✓ Use Case model

Nathan Budhu-

- ✓ Activity Diagram
- ✓ Repository Architecture

Adam Singh-

- ✓ Sequence Diagram

Monipha Sagon-

- ✓ Context model

Akeem Headley-

- ✓ Class Diagram

Chris Wilson-

- ✓ Did not contribute.

We decided to split each diagram/model to an individual and we collaborated with each other ensuring that all information was in. Exchanging information through the online mediums allowed for the completion of this submission. The challenge experienced was making sure that the diagrams/models match our requirements for the design of the system. This was handled by having a thorough discussion with fellow group members.

**Signature of Final Submission**

*Akeem Headley*

*Nathan Budhu*

*Monipha Sagon*

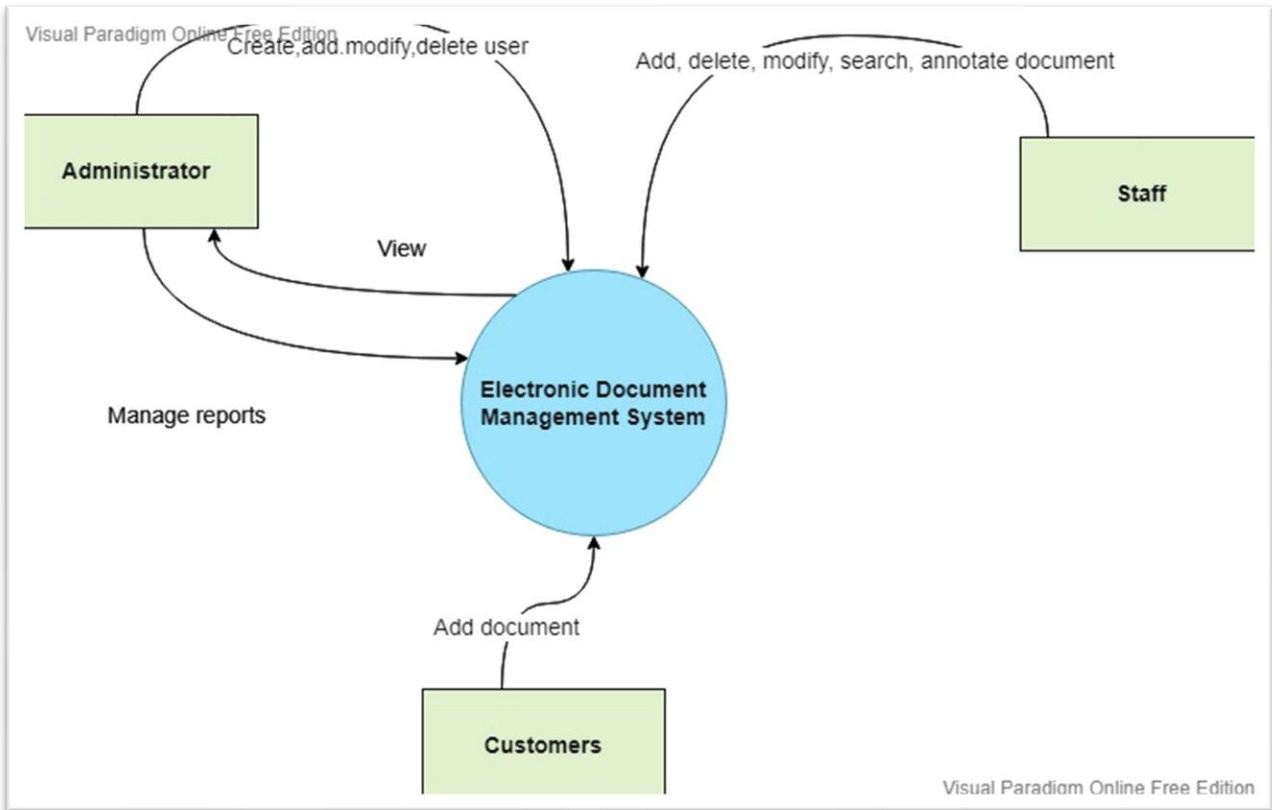
*Adam Singh*

*Shafeek Hiranman*

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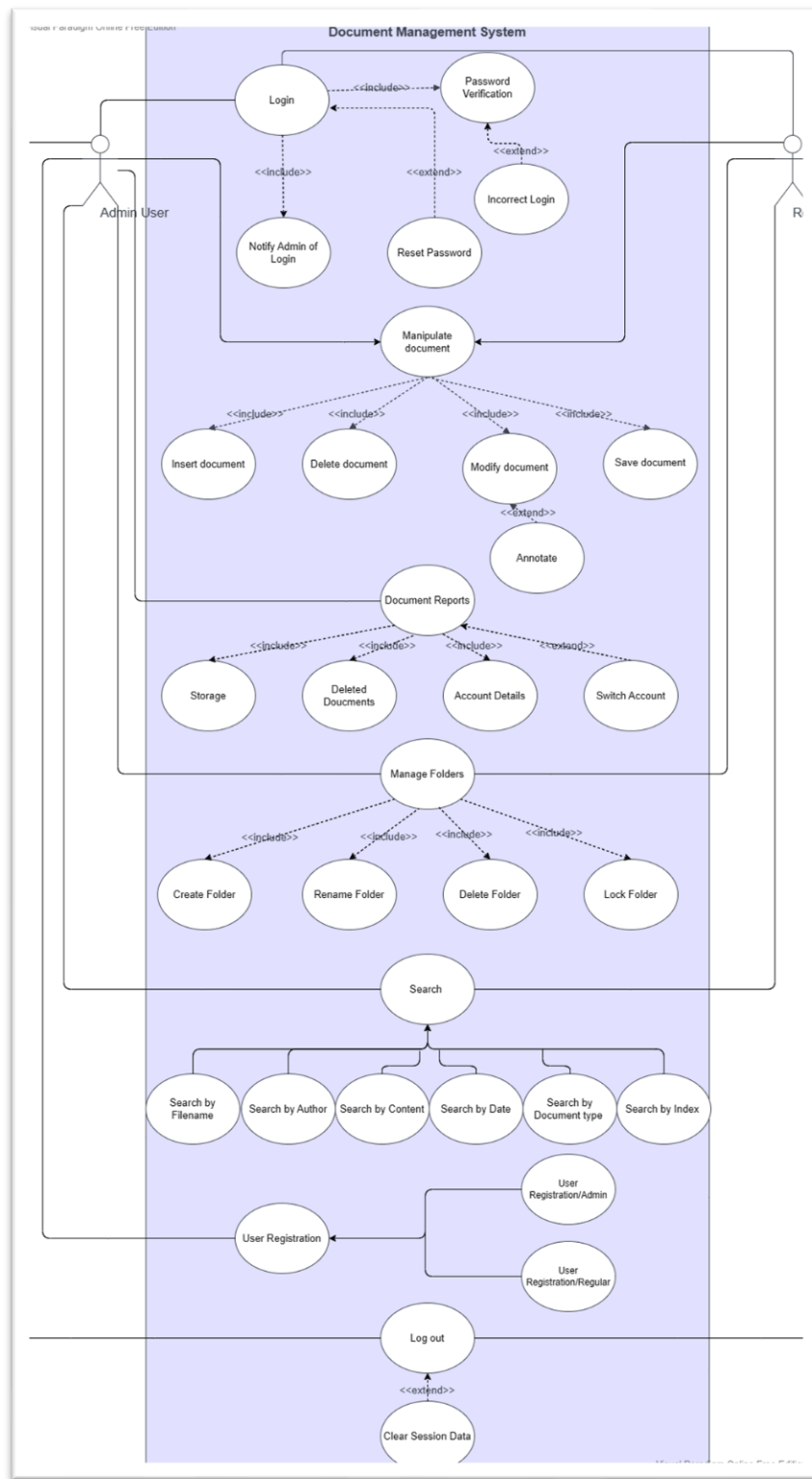
## Context Model



### Description:

A context diagram outlines how external entities interact with an internal software system. In the diagram above several external entities interact with the system. Firstly, customers interact with the system. The system enables the safe and stable transmission of documents between the customer and the system. Administrators interact with the system by managing user registration, user groups, user roles, and managing reports. The system interacts with the database to access and store documents. General staff members can interact with the system by adding documents to the system, depending on their roles. Some are authorized to delete, modify, and annotate documents.

## Use case diagram



**Description:**

Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. This use case diagram illustrates the functions and relations of a document management system. The system allows for the creation of two types of users: regular and administrator users, who can both share duties such as document and folder manipulation and stick to roles that are specific to their position such as creating new users and viewing system reports.



<b>Document Management System-Login</b>	
<b>Actors</b>	Admin User, Regular User, Database
<b>Description</b>	Both admin and regular users may login into the document management system and a session shall be created.
<b>Data</b>	User's login information
<b>Stimulus</b>	User command issued by Admin/Regular User
<b>Response</b>	New session created and a notification is sent to admin via email. In case of incorrect login, message indicating "incorrect login" is displayed
<b>Comments</b>	Users must enter correct login info to successfully enter system

<b>Document Management System-Log Out</b>	
<b>Actors</b>	Admin User, Regular User, Database
<b>Description</b>	Both admin and regular users may logout the document management system
<b>Data</b>	User's login information
<b>Stimulus</b>	User command issued by Admin/Regular User
<b>Response</b>	All data is saved, and current session is terminated
<b>Comments</b>	Session data is automatically cleared upon logout

<b>Document Management System-User Registration</b>	
<b>Actors</b>	Admin User, Database
<b>Description</b>	-Allows for the registration of new users.
<b>Data</b>	Login ID and strong password, Employee details
<b>Stimulus</b>	Registration option is selected by authorized user
<b>Response</b>	A new user is created
<b>Comments</b>	Unable to create new user, if necessary, information fields are not filled

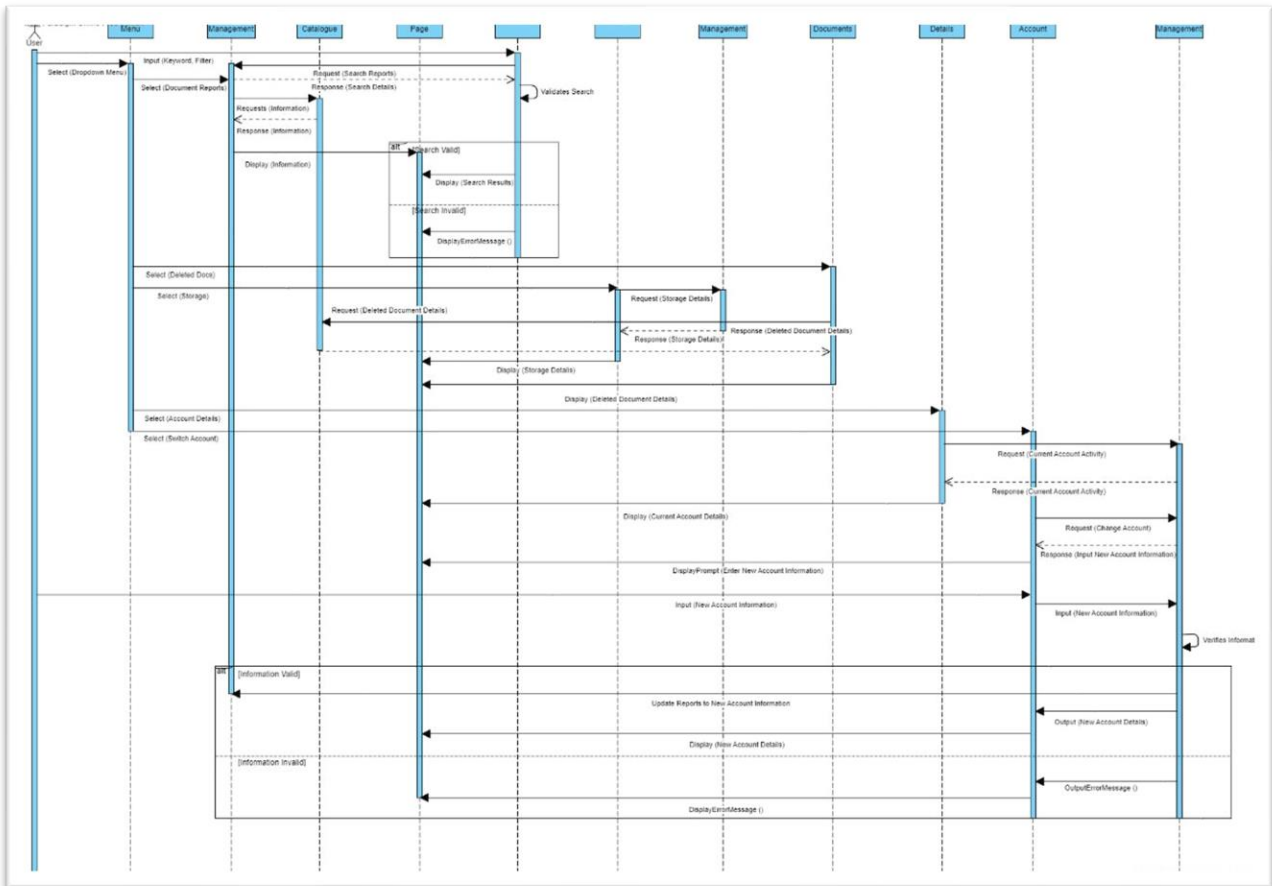
<b>Document Management System-Search</b>	
<b>Actors</b>	Admin User, Regular User, Database
<b>Description</b>	Allows users to search and retrieve existing documents
<b>Data</b>	Identifying factor of document
<b>Stimulus</b>	User selects Search option to search and retrieve a document
<b>Response</b>	Identifying factor is matched against database and all matches are displayed
<b>Comments</b>	Cannot find document if identifying factor does not match search criteria

<b>Document Management System-Manipulate Documents</b>	
<b>Actors</b>	Admin User, Regular User, Database
<b>Description</b>	Users are allowed to manipulate documents in ways such as adding, deleting, storing, modifying, and saving documents.
<b>Data</b>	Requires a document to exist
<b>Stimulus</b>	User selects an option to modify a document
<b>Response</b>	All changes made to documents are saved
<b>Comments</b>	Documents need to be present in database before it can be manipulated

<b>Document Management System-Manage Folders</b>	
<b>Actors</b>	Admin User, Regular User, Database
<b>Description</b>	Users are allowed to create, rename, delete and lock folders to aid in organization of documents
<b>Data</b>	Doesn't require pre-existing data
<b>Stimulus</b>	User command issued by Admin/Regular User
<b>Response</b>	All changes made to folders are saved
<b>Comments</b>	Folders can exist without containing any documents

<b>Document Management System-Document Reports</b>	
<b>Actors</b>	Admin User, Database
<b>Description</b>	Admin users are allowed to view available storage in the system, deleted documents and account details
<b>Data</b>	Doesn't require pre-existing data
<b>Stimulus</b>	User command issued by Admin User
<b>Response</b>	Displays relevant data according to option selected
<b>Comments</b>	Admins users can switch accounts from this tab

## Sequence Diagram



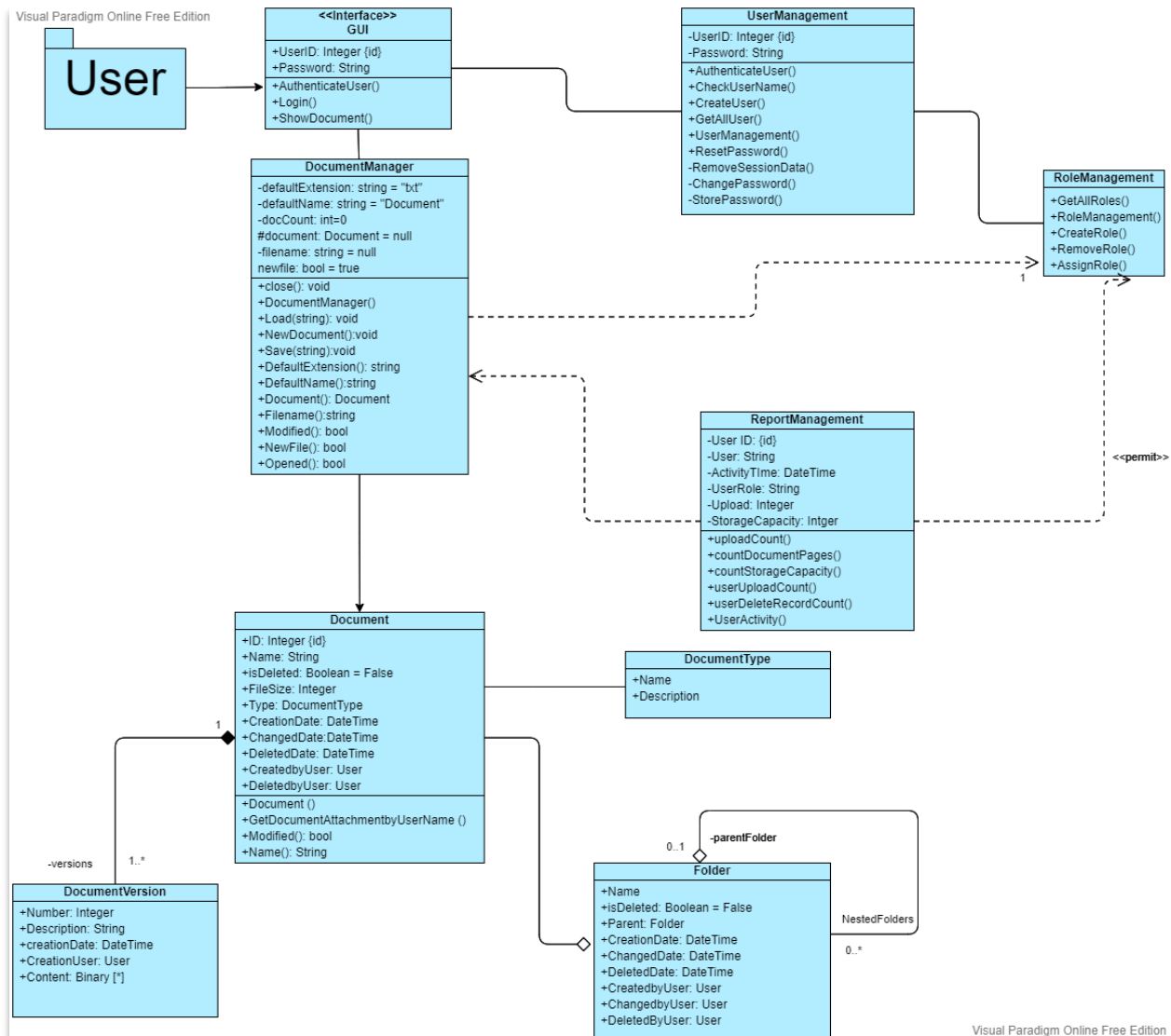
View diagram in full size here: <https://drive.google.com/file/d/1oPr9r04rE4IcJwvWrpquR-IEpvR2noei/view?usp=sharing>

### Description:

The sequence diagram outlines the reports management use case. In which the user may use to attain reports on each document stored in and deleted from the system along with details on the system storage and account information of every user. By selecting 'Document Reports' from the dropdown tab, the user will be able to access sorted list of the names of every document stored in the system with a list of their information in another dropdown tab on each. The user may enter select either a filter from the filter tab or enter keywords into the search tab to attain a sorted list of related document reports. The user may select 'Storage' from the dropdown tab to view an analysis of the storage of documents on the system. They may also select 'Deleted Docs' from the dropdown tab, which will display a similar sorted list of document names and their information as the main display window, however these reports will be of those documents that were deleted from the system. The account details and activity of the current user will be displayed when 'Account Details' is selected in the dropdown tab and by selecting 'Switch Account' from the dropdown tab the user will be able to view details of another account by entering the correct account information in the prompts provided.



## Class Diagram



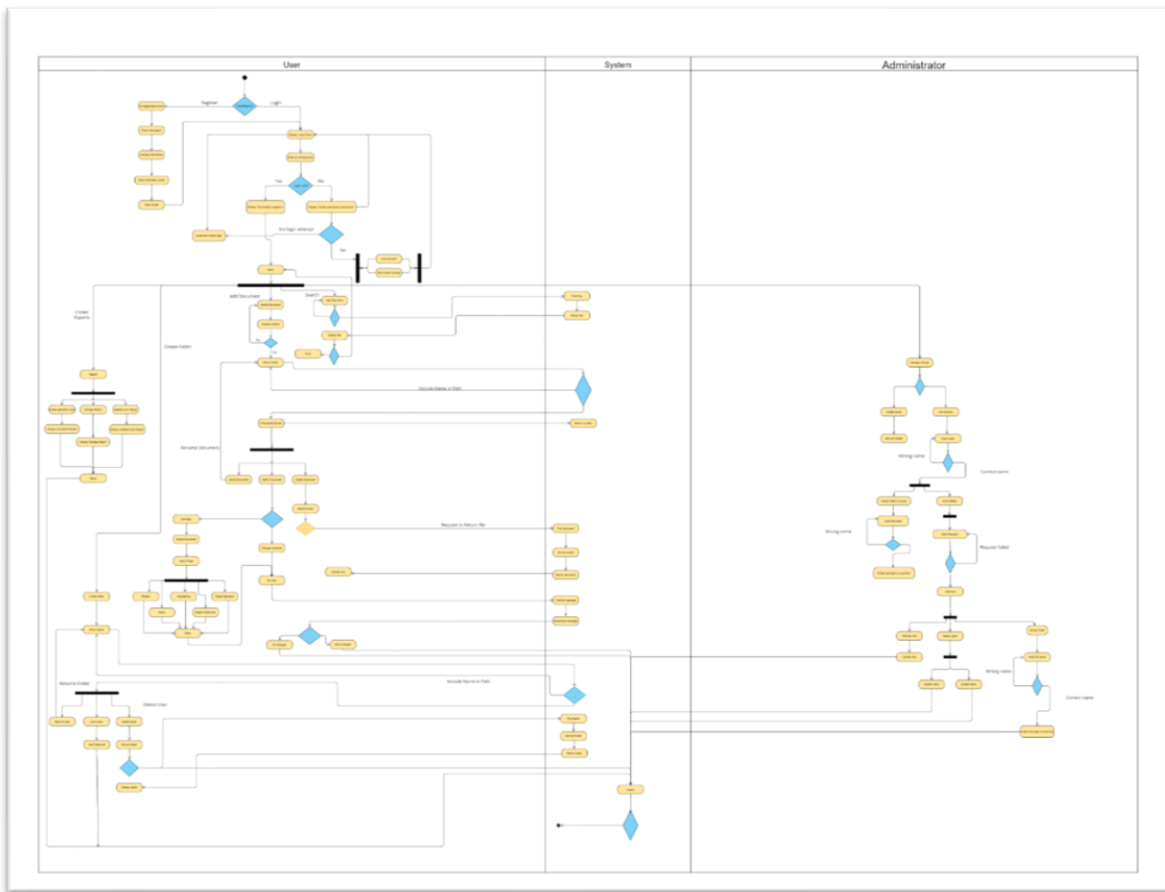
### Description:

Class diagram is a static diagram. It represents the static view of an application. Class diagram is not only used for visualizing, describing, and documenting different aspects of a system but also for constructing executable code of the software application. This class diagram shows the structure of the DMS.

- **GUI:** This display is shown to the user for login and interfacing with the system.
- **User Management:** This class is used to get the user information from the database and is also used for authenticating the users.
- **Role Management:** The class manages the user roles.
- **Document:** This class is used to process all information regarding documents.
- **Document Version:** This keeps track of the versions of documents.

- **Document Type:** This keeps track of the various document file types.
- **Role Management:** Assigns role to users and this can be done by the admin role.
- **Report Management:** This generates a report of the user activity and summary of the repository.
- **Document Manager:** Manages documents placed in the repository.
- **Folder:** Manages folders of the repository.

## Activity Diagram



**View diagram in full size here:**

<https://drive.google.com/file/d/1Z8VwDPZ2QqWyX4DSatoRUNIxpbbO92Z-/view?usp=sharing>

### Description:

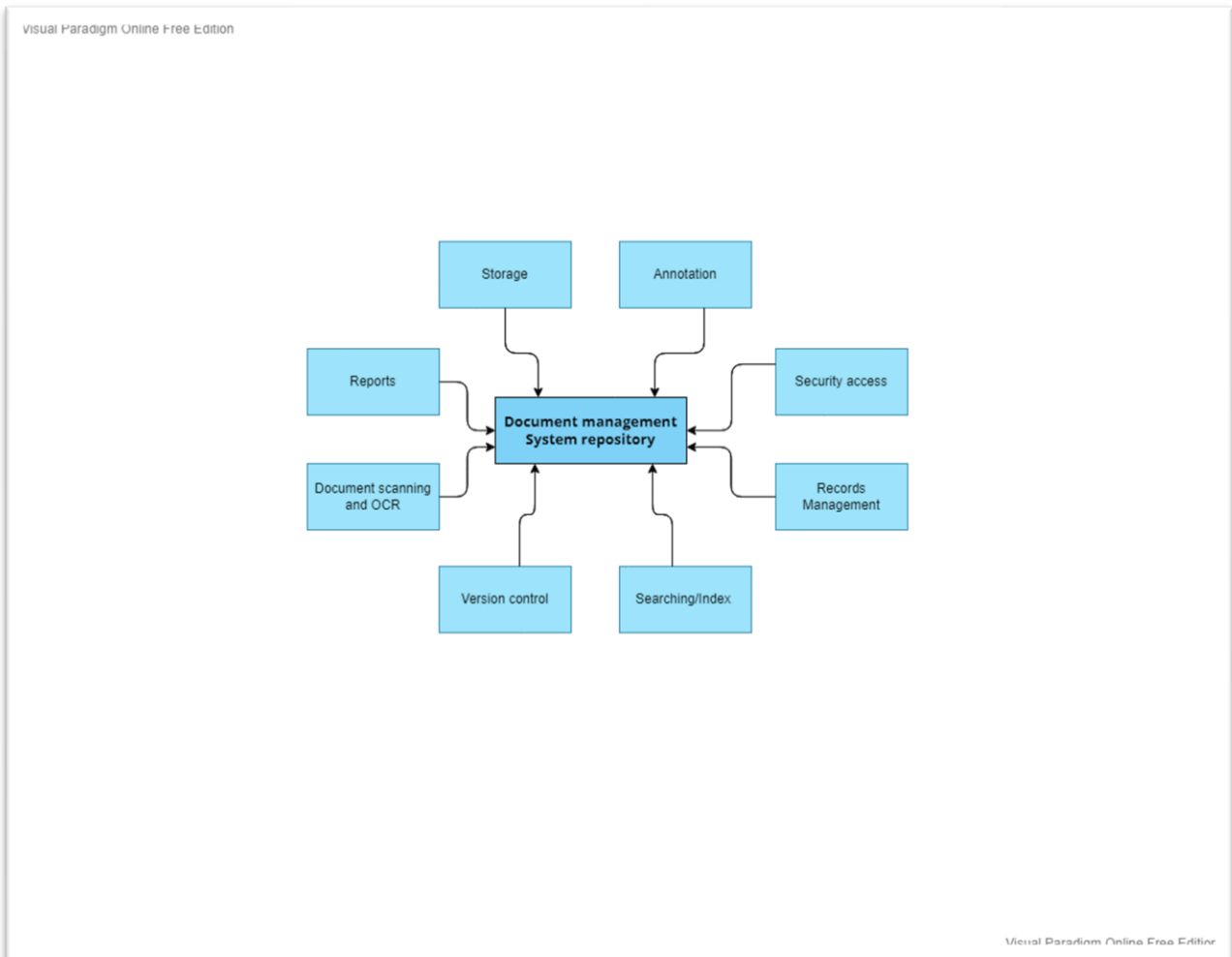
Activity Diagrams describe how activities are coordinated to provide a service which can be at different levels of abstraction. The flow begins when the user starts the application. The user chooses either to login or register. The activities are split into two. One side handles the registration while the other handles the login. After logging in the system decides the way forward conditionally. If the login is correct, a success message is shown along with the menu. If failed, the displays an error message and increments a counter. If three attempts are failed, the lock account and send email warning activities are performed. Users have a defined set of options for navigation once they log into the system:

- Document management: This tab contains several sub-sections. Firstly, the first section allows users to add\upload documents, search for documents and print selected documents.
- The second section allows rename, modify, delete selected documents. Under “modify documents”, the user has the options to annotate which includes redact, highlight, digital signature, add notes, digital watermark.

- Folder management: This tab allows users to create, lock and delete selected folders.
- Reports management: This tab allows users to generate system reports, storage reports and a deleted docs report.
- Manage groups: This tab can only be accessed by the administrator which allows them to create a new group or use an existing group. Furthermore, they can assign folder to groups and individual users and manage user roles.

## System Architectural Design

### Repository Architecture



**Description:**

- Storage - Database that stores documents and can be accessed by the system
- Annotation - Interacts through the repository to perform annotation actions on a document
- Reports - Interacts through the repository to provide various reports
- Document Scanning and OCR - interacts by scanning a document and uploading it to the system
- Version control - incrementing, tracking, and recording changes in documents or files that occur over time in a systematic manner.
- Searching/Index- This feature will allow a user to search for any document stored in the DMS by entering various parameters.
- Records management -Add, modify, store, delete documents

This diagram shows a document management system. An electronic document management system is one that accepts, stores, manages and tracks electronic documents and electronic images of paper-based information captured using a document scanner.

William is part of the reception staff of GBTI. His main responsibilities are to interact with customers and add their physical documents to the system. One day, a customer visits the bank and wishes to open a new savings account. William is prompted to enter his ID and password to access the document management system. He scans the documents using the scanner and uploads it to the system. He then chooses a file type and saves the document. The bank already has two of the required five documents to open the savings account for the customer. Thus, William uploads the documents and the version control feature updates the two documents to the latest version. He then searches for the documents by keyword and uses the annotate feature to highlight the main parts of the document. William exits the system by logging out.