

Criterion B: Design

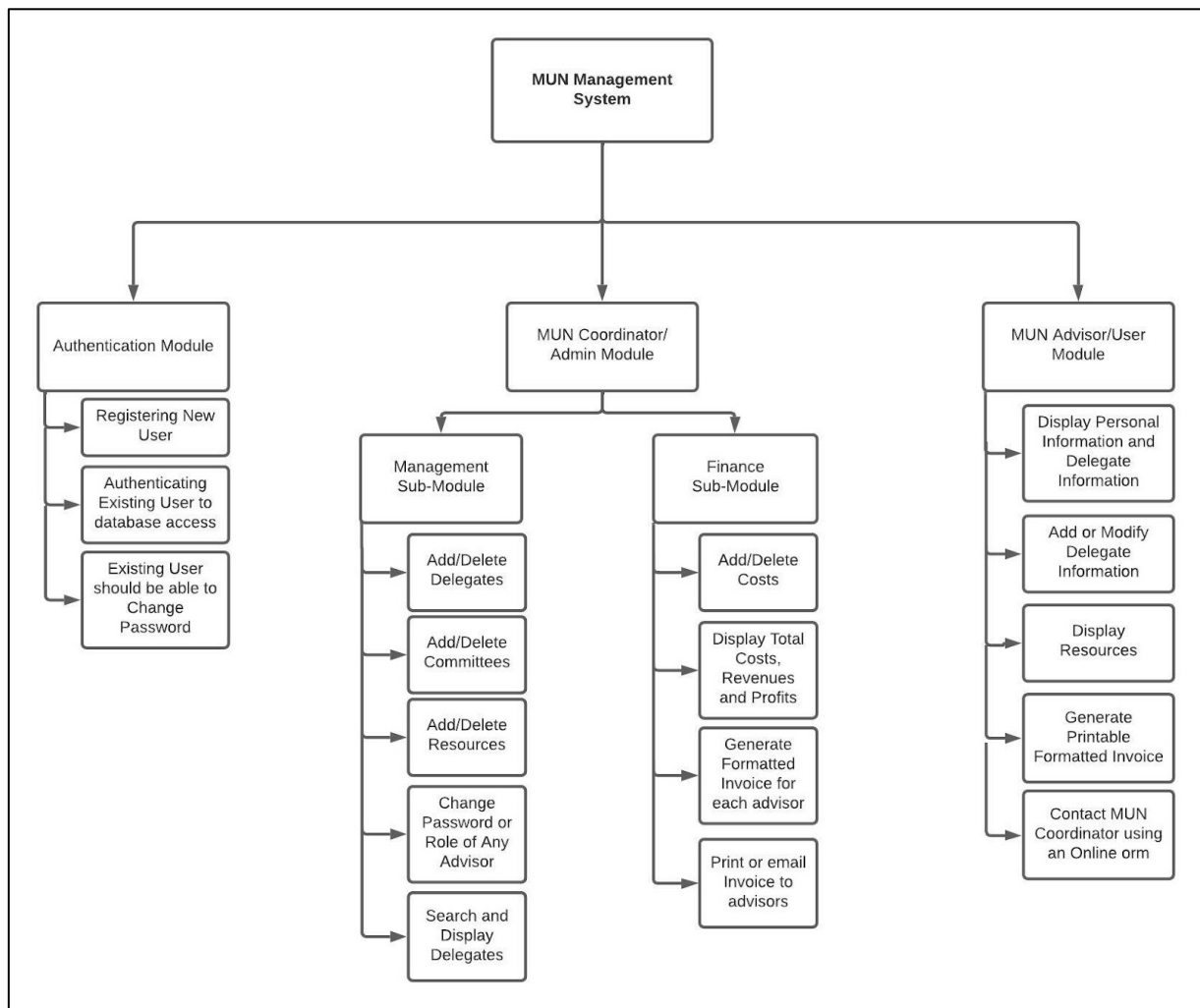
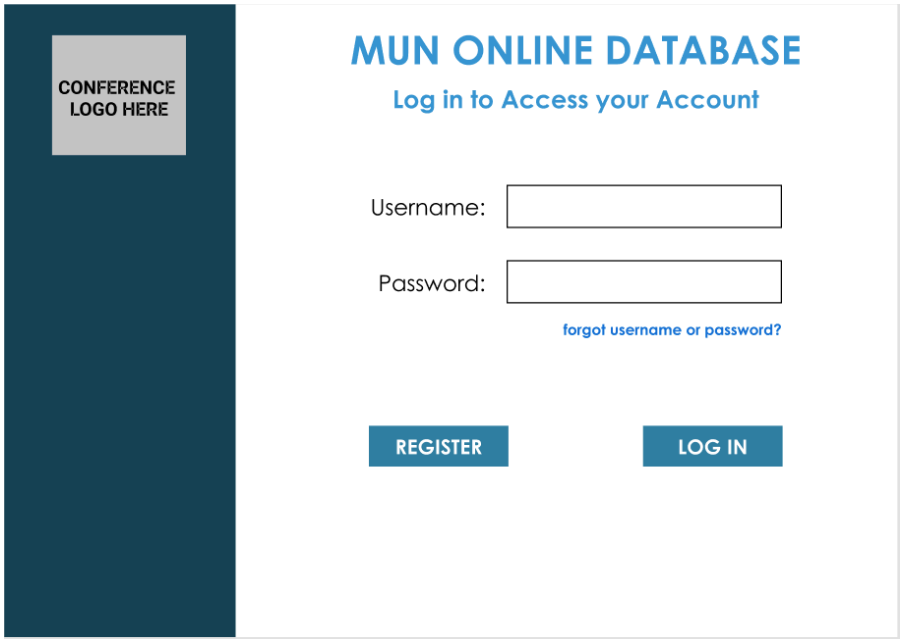


Figure 1. Structure Diagram for Solution

Table 1. Interface Mock-ups (Designed using Figma)

Page	Mock-up
Login	

User Dashboard

CONFERENCE
LOGO HERE

Dashboard

Resources

Account Settings

Log Out

MUN ONLINE DATABASE

Dashboard

PERSONAL INFORMATION

ID Number:

Title:

Given Names:

Family Name:

Sex:

School:

Email Address:

Contact Number:

☒ DELEGATION 1

Assignment:

Student Number:


Given Names:

Family Name:

Sex:

Date of Birth:

Nationality:



Modify

DELETE SELECTED

4

Manage Delegates

CONFERENCE LOGO HERE

Dashboard

Manage

Delegates

Account Settings

Log Out

MUN ONLINE DATABASE

Delegates

ID	Name	DOB	Committee	Delegation	...

Admin Dashboard

CONFERENCE LOGO HERE

Dashboard

Manage

Delegates

Account Settings

Log Out

MUN ONLINE DATABASE

Admin Dashboard

PERSONAL INFORMATION

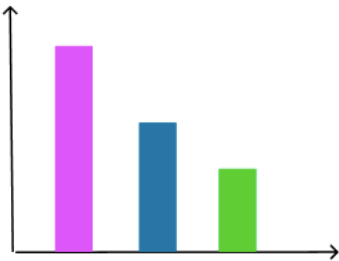
ID Number:
Title:
Given Names:
Family Name:

ID	Committee	Max_Delegation

AddDelete

ID	Resource	Resource Link

AddDelete

Contact Form	<div><div>CONFERENCE LOGO HERE</div><div><h2>MUN ONLINE DATABASE</h2><h3>Contact Form</h3><p>Name: <input type="text"/></p><p>Email: <input type="text"/></p><p>Message: <input type="text"/></p><p><input type="button" value="SEND"/></p></div></div>						
Finance Dashboard	<div><div>CONFERENCE LOGO HERE</div><div><div>Dashboard</div><div>Finance</div><div>Manage</div><div>Delegates</div><div>Account Settings</div><div>Log Out</div></div><div><h2>MUN ONLINE DATABASE</h2><h3>Finance Dashboard</h3><table border="1"><thead><tr><th>Item</th><th>Cost/Unit</th><th>Price/Unit</th></tr></thead><tbody><tr><td></td><td></td><td></td></tr></tbody></table><div><input type="button" value="Add"/><input type="button" value="Delete"/></div></div></div>	Item	Cost/Unit	Price/Unit			
Item	Cost/Unit	Price/Unit					

Registration and Login Process

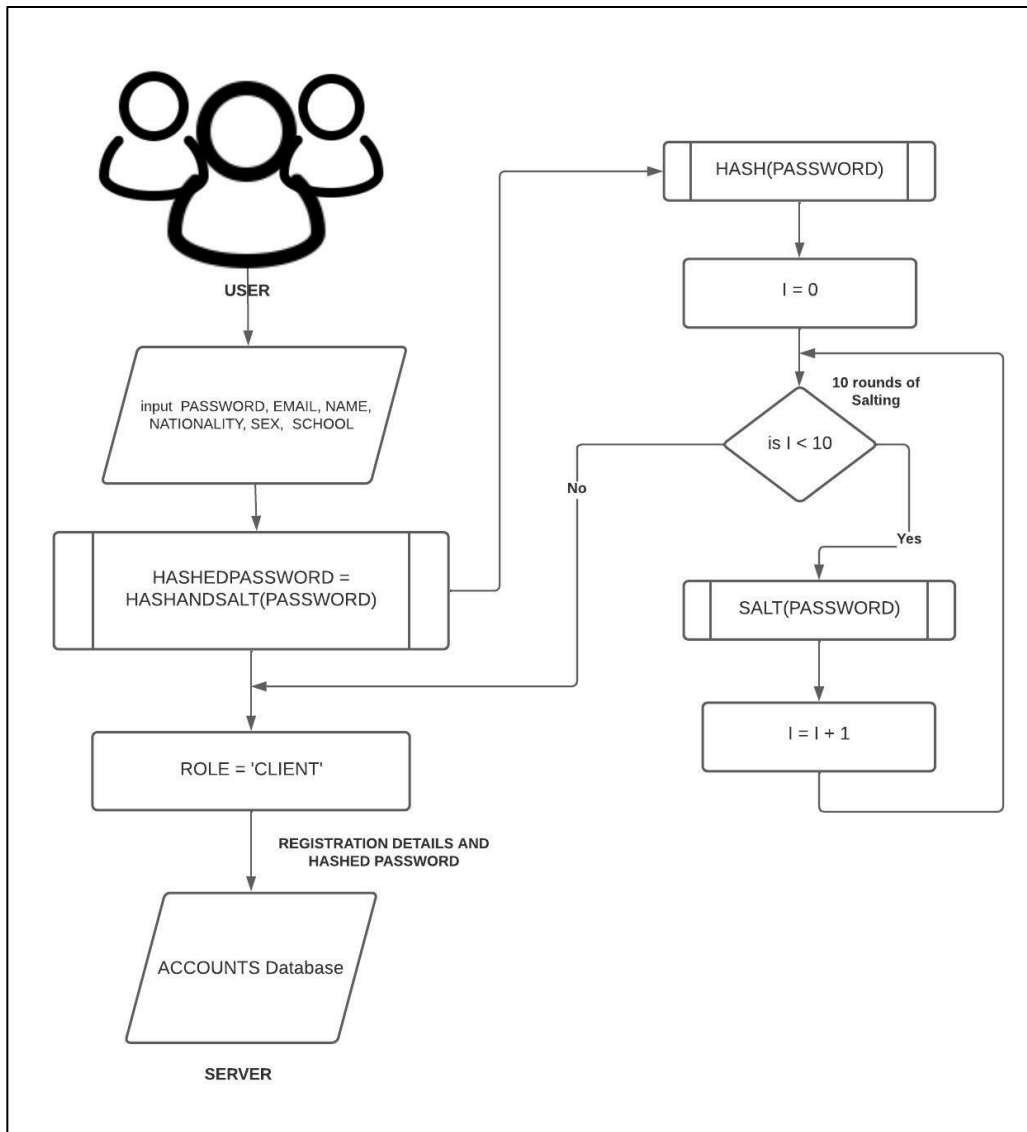


Figure 2. User Registration Process

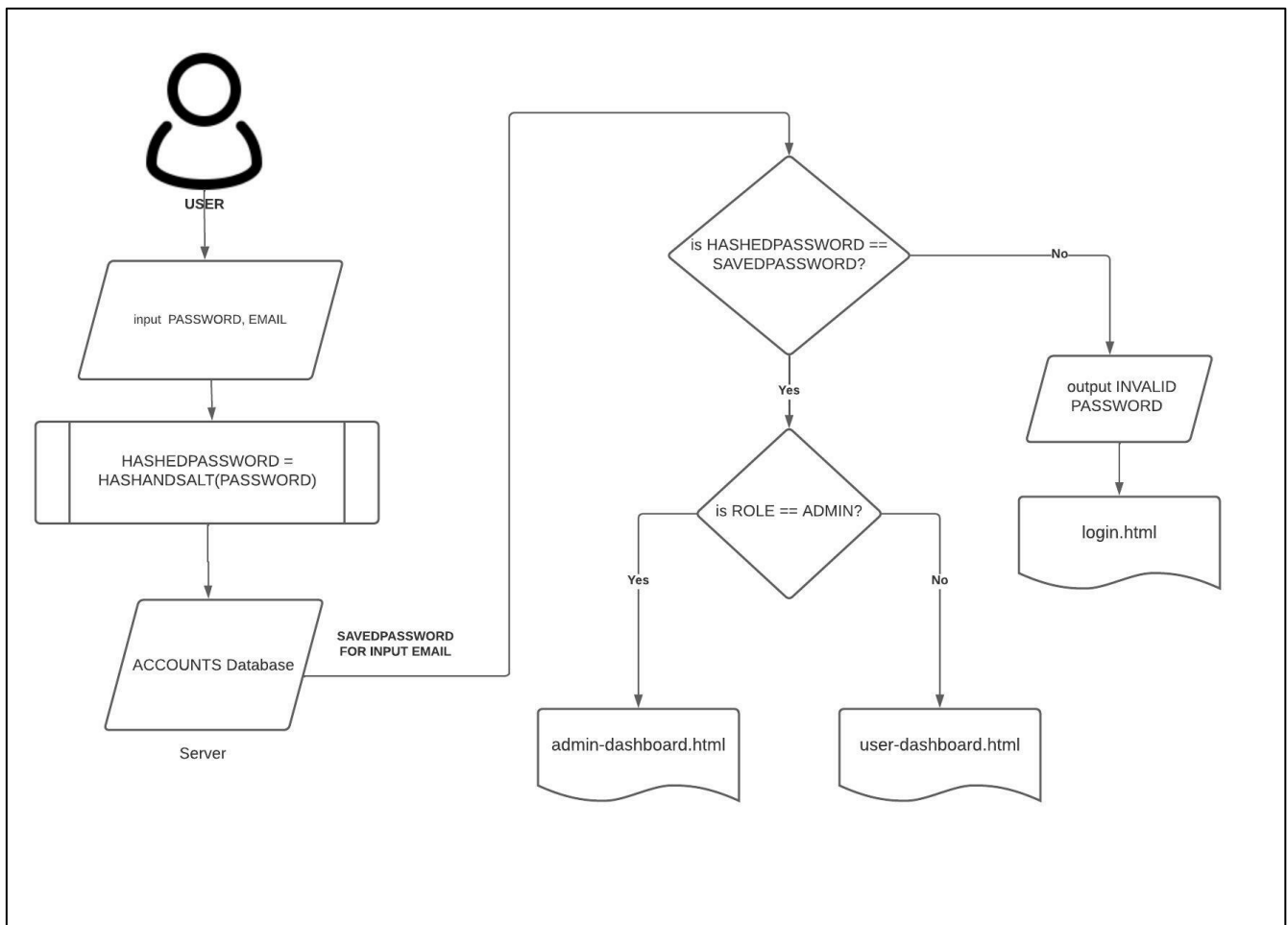


Figure 3. User Login Process

Dependency	Description
Bcrypt	Cryptographic library in hashing or salting passwords
NodeMailer	Library to send emails using the SMTP server
Passport	Helps in creating authenticating session and cookies
mysql	Connecting to mysql database
express	Handling HTML post and get requests

Table 2. List of Core Dependencies

Database information

Table: Supervisor Accounts

Field	Type	Properties
ID	INT	Primary Key, NOT NULL, AUTO INCREMENT
Salutation	VARCHAR(45)/String	
Name	VARCHAR(45)/String	NOT NULL
Password	BINARY(60)	NOT NULL
Email	VARCHAR(45)/String	NOT NULL
Nationality	VARCHAR(60)/String	
Sex	VARCHAR(45)/String	
School	VARCHAR(45)/String	
Quota	INT	Default: 0
Role	VARCHAR(45)/String	Default: 'CLIENT'

Table: Delegates

Field	Type	Properties
Delegate_ID	INT	Primary Key, NOT NULL, AUTO INCREMENT
Name	VARCHAR(45)/String	
Delegation	VARCHAR(45)/String	NOT NULL
School	VARCHAR(45)/String	
Nationality	VARCHAR(60)/String	
DOB	VARCHAR(45)/String	
Supervisor ID	INT: Foreign Key	NOT NULL
Committee	VARCHAR(45)/String: Foreign Key	NOT NULL

Table: Committees

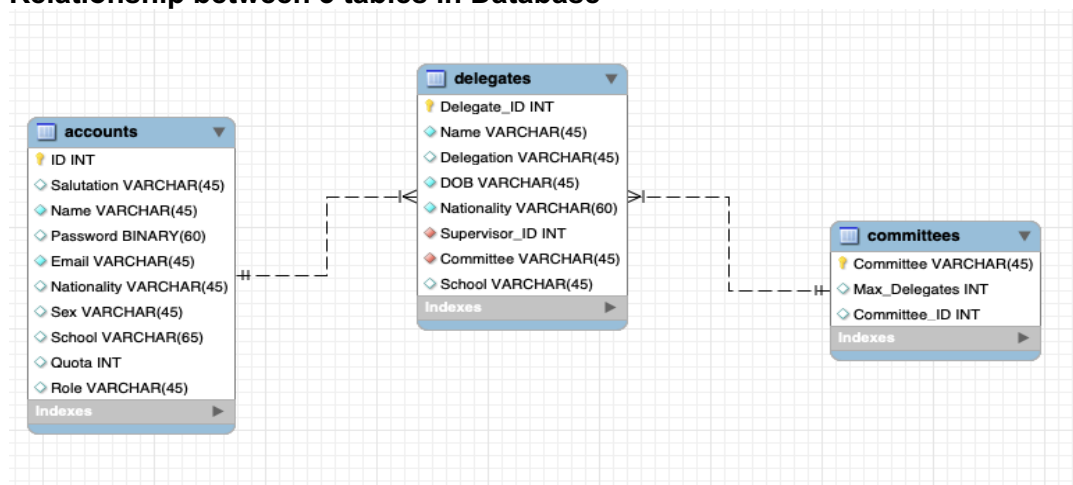
Field	Type	Properties
Committee ID	INT	NOT NULL, Unique Entry, AUTO INCREMENT
Committee	VARCHAR(45)/String	NOT NULL, Primary Key
Max Delegates	INT	

Table: Resources (Independent)

Field	Type	Properties
Resource ID	INT	NOT NULL, Primary Key, AUTO INCREMENT
Resource_Name	VARCHAR(45)/String	NOT NULL, Unique Entry
Resource_Link	VARCHAR(2048)/String	

Table: Costs (Independent)

Field	Type	Properties
Item ID	INT	NOT NULL, Primary Key, AUTO INCREMENT
Description	VARCHAR(45)/String	NOT NULL, Unique Entry
Cost	DECIMAL(6,2)	
Price	DECIMAL(6,2)	

Relationship between 3 tables in Database

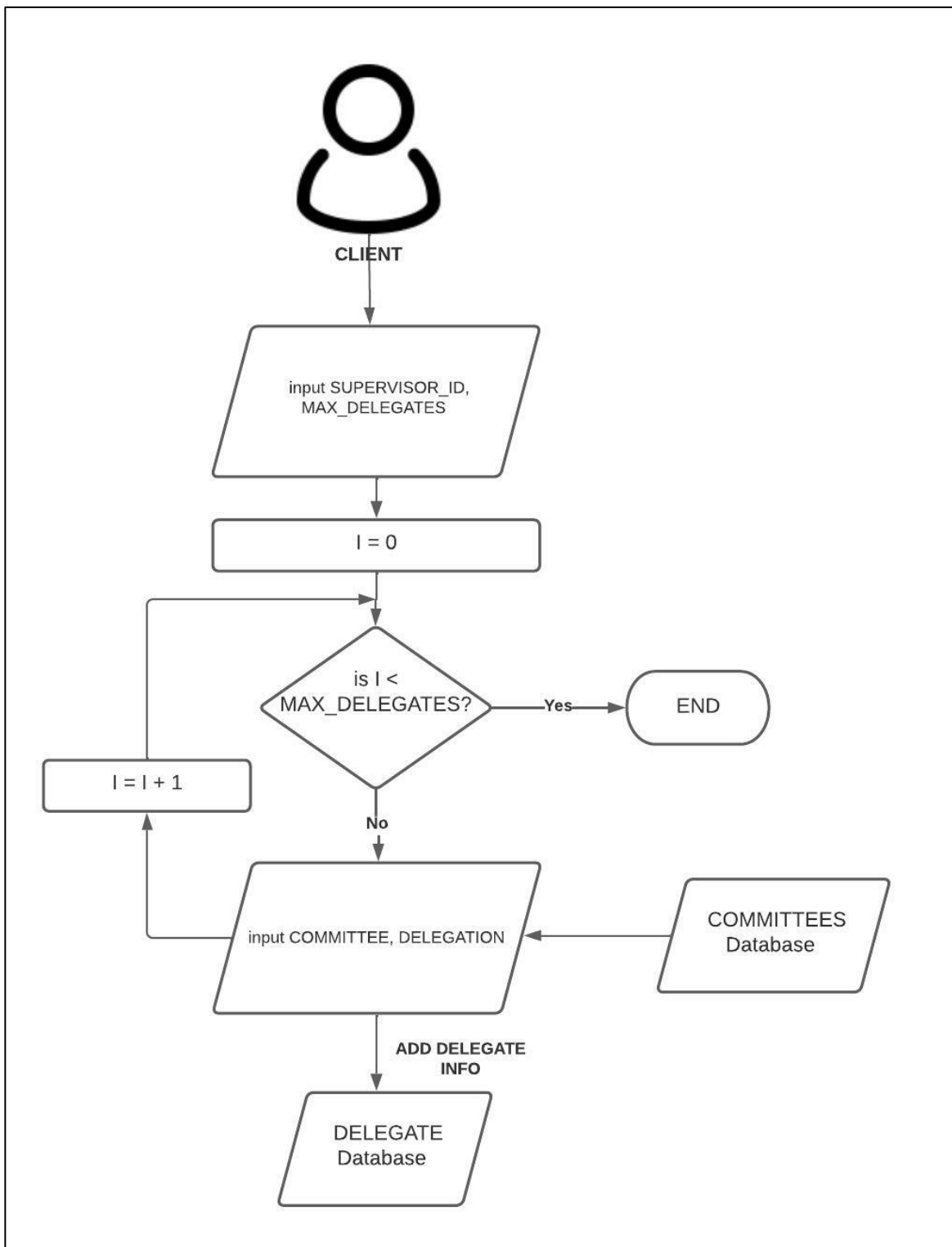


Figure 4. Assigning Delegates to supervisors

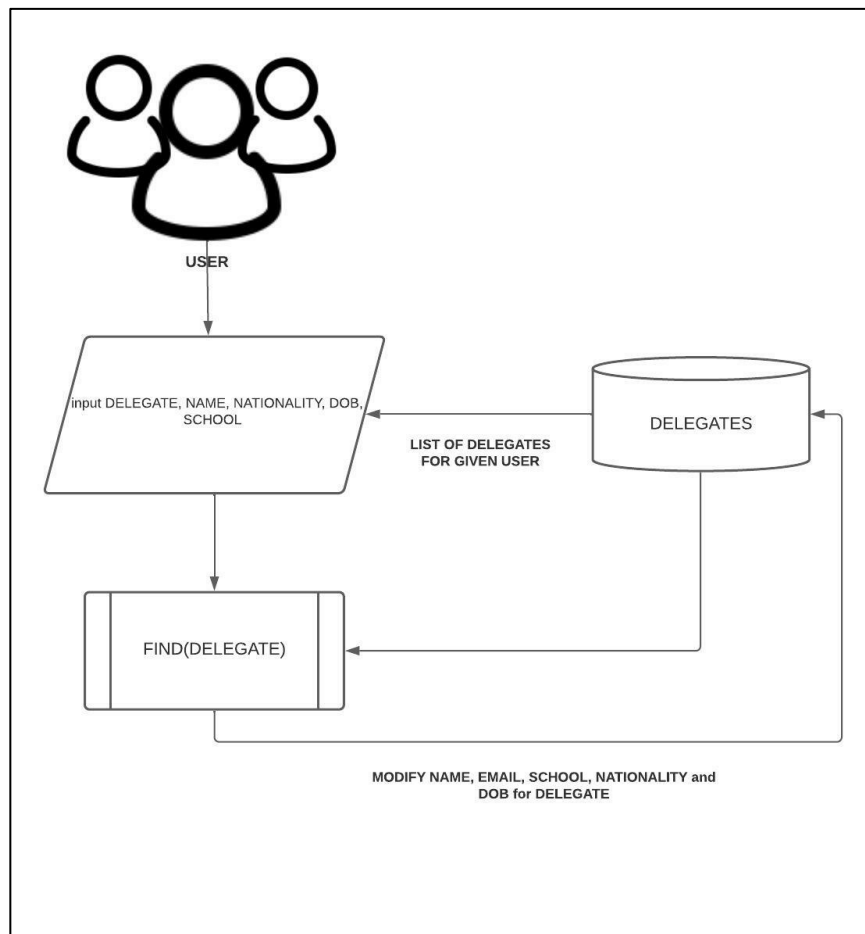


Figure 5. Modifying Delegate Information

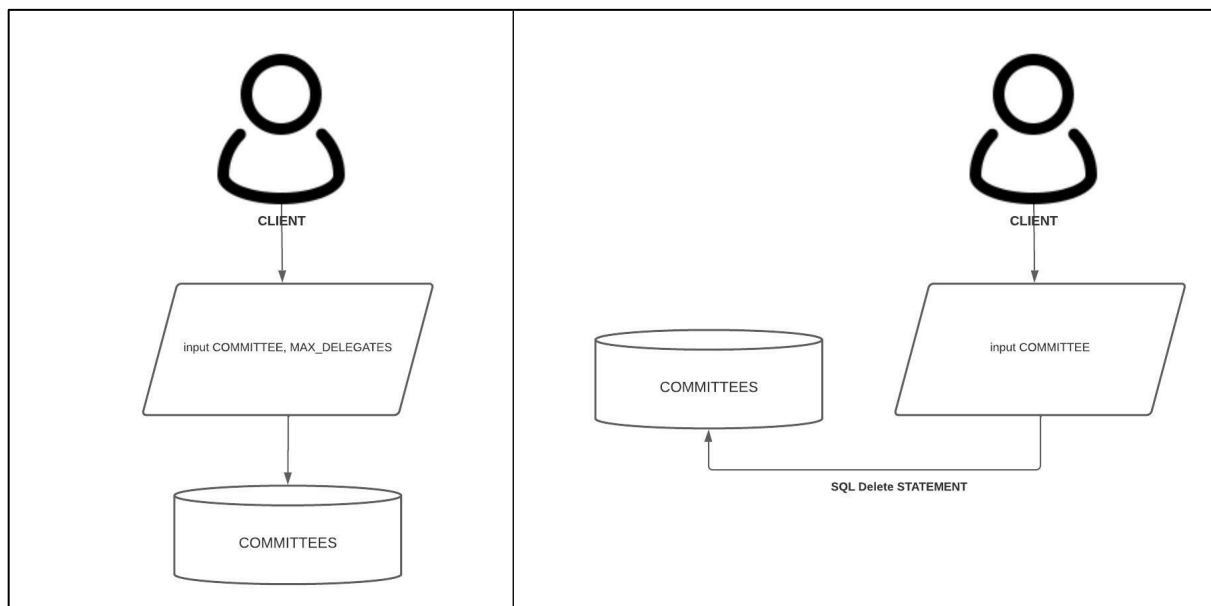


Figure 6. Adding and Deleting Committees

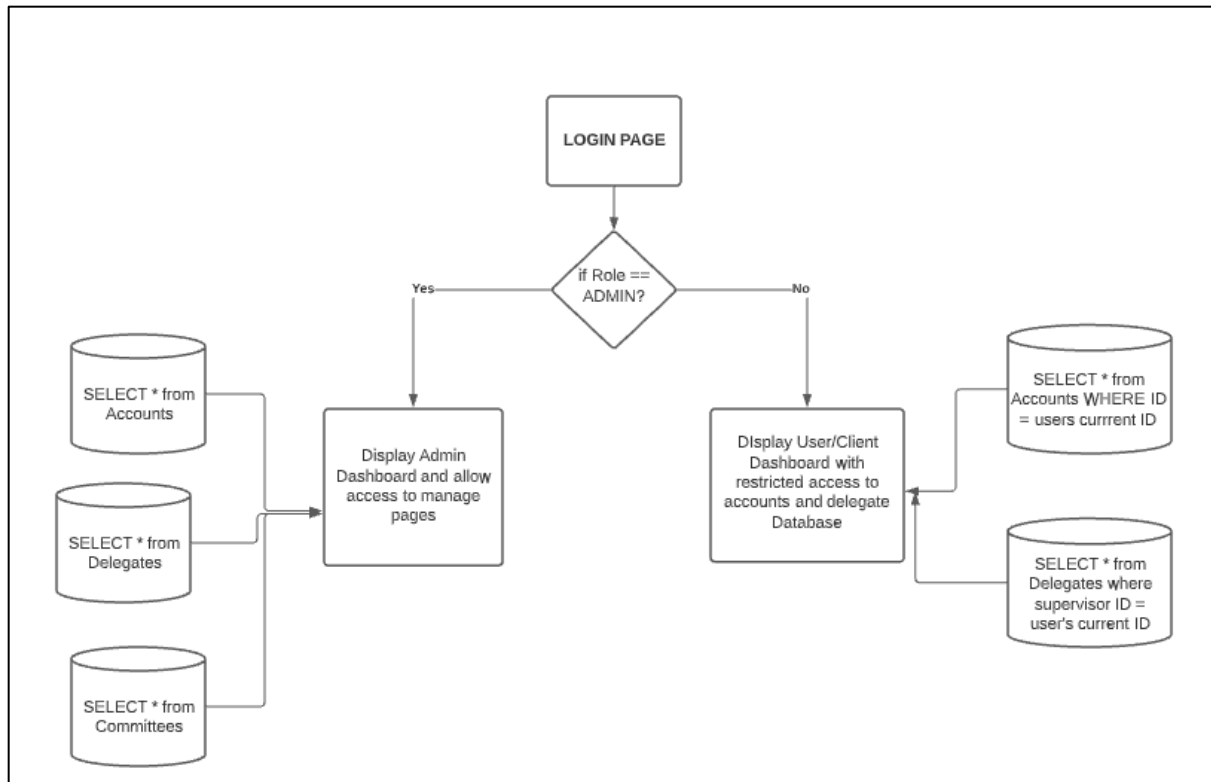


Figure 7. Database Access for different roles

A Role-Based Access Control Model was opted to ensure that the client and user can use the same website.

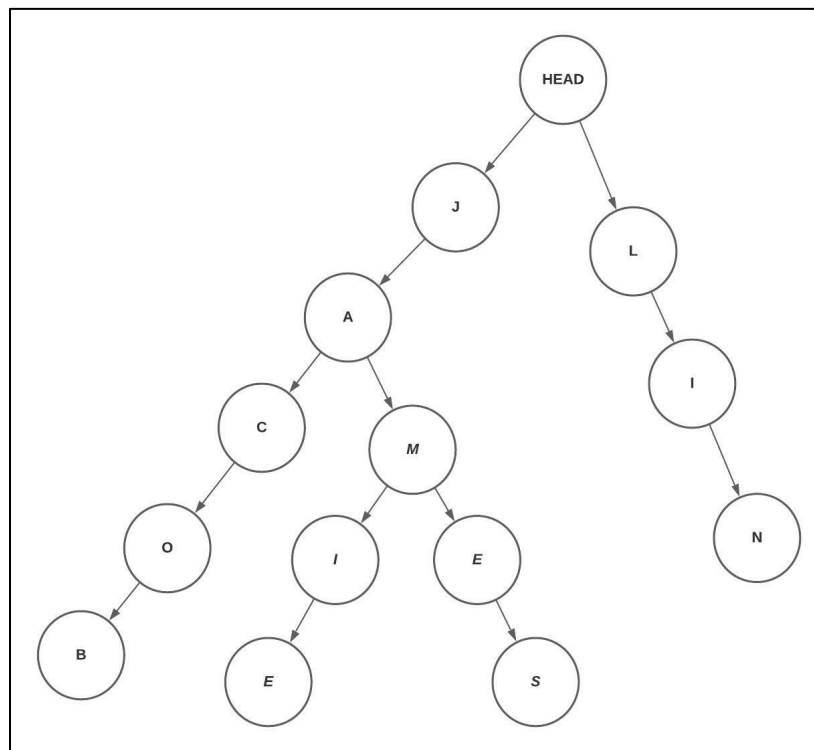


Figure 8. Sample Trie Data structure holding names of Delegates

I plan to use a Trie to store Delegate Names for the View Delegates screen. The structure can be used to ensure quick searches with an autocomplete feature. For example, 'JA' would return ['JACOB', 'JAMIE', 'JAMES'].

A BFS was favoured over a Depth-First Search (DFS) as BFS considers the siblings of a node before considering its children is more suitable for returning Delegate Names.

method BFS(QUERY)

```
RESULT[] = BeginsWith(QUERY)
/*
BeginsWith(QUERY) checks whether Query exists in Trie
returns a 2 element array,
RESULT[0]: node of last character of query
RESULT[1]: word from Trie traversal path
RESULT[0] is NULL if not found
*/

if RESULT[0] === NULL then
    return []
    //return empty array if query doesn't exist
end if

QUEUE = new Queue()
QUEUE.enqueue([RESULT[0], RESULT[1]])
WORDSUGGESTIONS = new ArrayList()

//node.last indicates whether it is the end of a word
if RESULT[0].last == TRUE then
    LIST.add(RESULT[1])
end if

loop while NOT QUEUE.isEmpty()

    WORDFRAGMENT = QUEUE.dequeue()
    NODE = WORDFRAGMENT[0]
    WORD = WORDFRAGMENT[1]
    loop I from 0 to NODE.Children.Length - 1
        if NODE.Children[I].last == TRUE then
            WORDSUGGESTIONS.add(WORD + NODE.Children[I].Val)
        end if
        QUEUE.enqueue([NODE.Children[I], WORD + NODE.Children[I].Val])
    end loop
end loop

return WORDSUGGESTIONS

end BFS
```

Figure 9. Breadth First Search Algorithm Pseudocode with Queue

Word Count: 64

Test Plan

Action to be Tested	Method of Testing	Expected Output
Check if Login and Registration Process is functional	<ol style="list-style-type: none"> 1. Create multiple accounts 2. Enter an invalid email 3. Enter the wrong password 	<ol style="list-style-type: none"> 1. Entries made in accounts database 2. Error prompting for correctly formatted email 3. Error: "invalid password"
Check if Change Password Functionality works	<ol style="list-style-type: none"> 1. Change the password of an existing account 2. Log in with old password 3. Log in with new password 	<ol style="list-style-type: none"> 1. Changes reflected in user record in account database 2. Error: "Invalid Password" 3. Successful Log in
Check whether addition of Committees works	<ol style="list-style-type: none"> 1. Add a committee as an admin on the admin dashboard 2. Refresh the page 	<ol style="list-style-type: none"> 1. New record added to committee database 2. New row added to committee table on dashboard
Check whether addition/deletion of resources works	<ol style="list-style-type: none"> 1. Add a Resource as an admin on the admin dashboard, log into a supervisor account 2. Delete Resource as an admin dashboard, log into a supervisor account 	<ol style="list-style-type: none"> 1. New resource added on client 'Resources' page 2. resource removed from client 'Resources' page
Check whether Contact form is functional	<ol style="list-style-type: none"> 1. Submit contact form on 'contact us' page 	<ol style="list-style-type: none"> 1. Email with correct information sent to client email
Assigning Delegates to supervisors	<ol style="list-style-type: none"> 1. On Accounts page as Admin, input a delegate quota of 2 for a newly-created account and enter committees and delegation 2. Log into the newly-created account 	<ol style="list-style-type: none"> 1. Negative inputs are rejected, 2 new sections created for delegate information 2. Dashboard displays assigned delegates

Verify whether the relational databases are functional	<ol style="list-style-type: none"> 1. On admin dashboard, modify the name of an existing committee assigned to a delegate 	<ol style="list-style-type: none"> 1. Manage Delegates page reflects change in the committee name
Modifying Delegate Information is functional	<ol style="list-style-type: none"> 1. As an account with assigned delegates, modify delegate DOBs and names on the Dashboard 	<ol style="list-style-type: none"> 1. Rejects invalid DOBs and user dashboard reflects changed information
Search Delegates Method is functional	<ol style="list-style-type: none"> 1. As a supervisor, modify the names of 2 or more delegates to have names starting with the same letter ('R') 2. As an admin on the delegates page, enter R into the search bar. 	<ol style="list-style-type: none"> 1. Modified information reflected in user dashboard 2. Search bar displays the recently modified delegates
Check whether finance sub-module is functional	<ol style="list-style-type: none"> 1. As an admin on the finance dashboard, add a few items on the costs table 2. As a supervisor, generate an invoice 	<ol style="list-style-type: none"> 1. New costs are reflected on the costs table and displayed graph 2. Invoice is formatted correctly with the correct costs for each invoice item