CSE2004 Database Management Systems EPJ

Phase: III

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Project Title: Law Firm Application
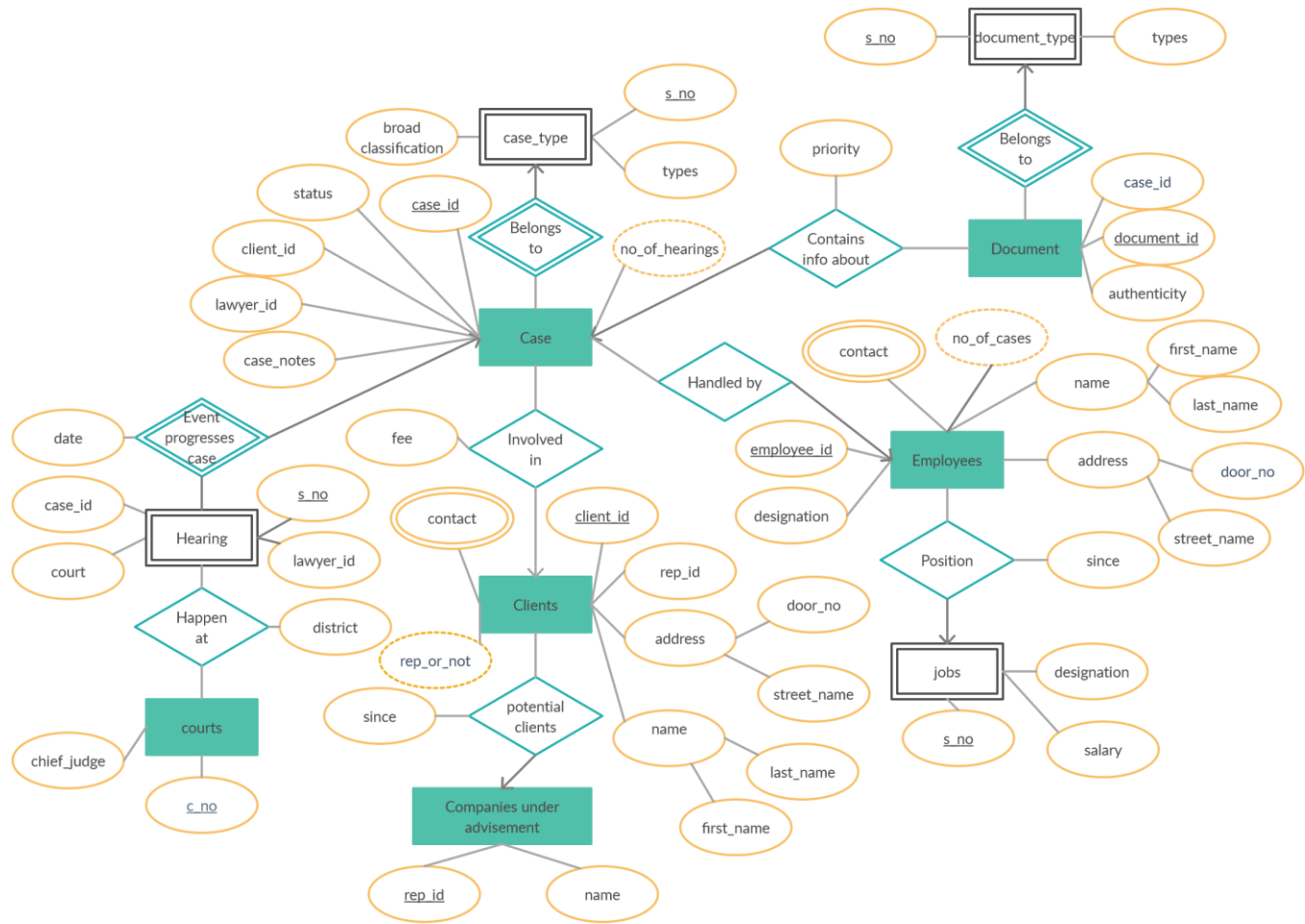
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Project type: Application

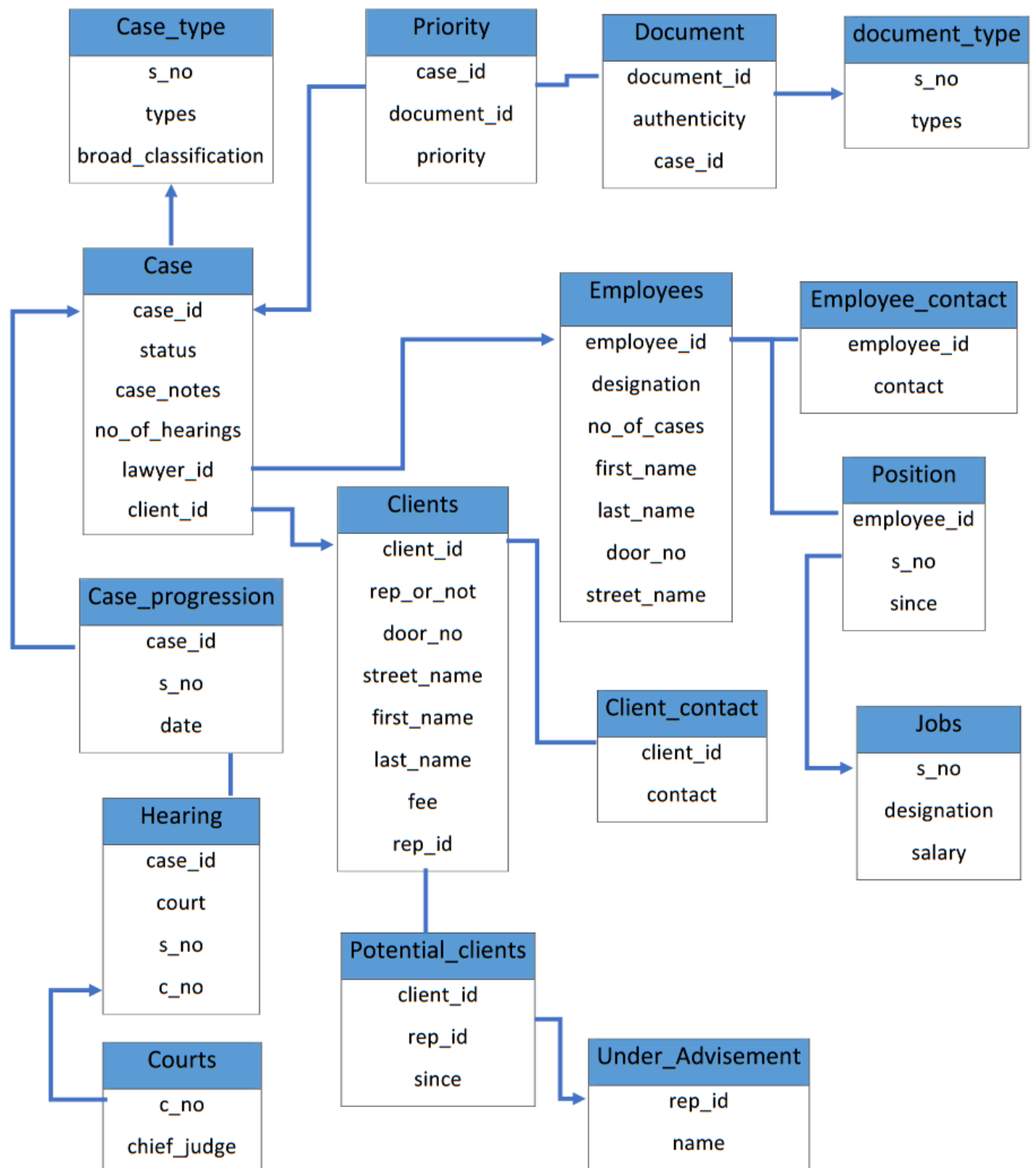# Phase I - Requirement Analysis:

In a law firm database the main requirement of the user is an easy way of keeping track and keeping a record of clients, cases and employees of the firm. The data required for such a database is given below

- The list of all active and inactive cases with the data pertaining to the nature of the case, its status etc.
- Details on the clients such as personal information and case related information.
- Details of employees such as lawyers and other staff including personal details, position, salary, etc.
- For active cases, the details of the next hearing and the court and judge who will preside over the case.
- Details of potential clients including those who have only enquired with the firm for legal advice.
- All details regarding court and legal documents.

ER Diagram:

Schemas:

Case_type
- s_no
- types
- broad_classification

Priority
- case_id
- document_id
- priority

Document
- document_id
- authenticity
- case_id

document_type
- s_no
- types

Case
- case_id
- status
- case_notes
- no_of_hearings
- lawyer_id
- client_id

Employees
- employee_id
- designation
- no_of_cases
- first_name
- last_name
- door_no
- street_name

Employee_contact
- employee_id
- contact

Position
- employee_id
- s_no
- since

Case_progression
- case_id
- s_no
- date

Clients
- client_id
- rep_or_not
- door_no
- street_name
- first_name
- last_name
- fee
- rep_id

Client_contact
- client_id
- contact

Jobs
- s_no
- designation
- salary

Hearing
- case_id
- court
- s_no
- c_no

Courts
- c_no
- chief_judge

Potential_clients
- client_id
- rep_id
- since

Under_Advisement
- rep_id
- name

Phase II

1. Table for normalization

Case

case_id	rep_id	rep_or_not	contact	fee	name		address	
					first_name	last_name	area	pincode
C0001	R0001	Yes	9238265835, 9204659275	50000	Dev	Patel	Ganapathy	641006
C0002	R0002	Yes	8294760179, 7894429475	45000	Hema	Prakash	Sulur	641037
C0003	NULL	No	9343473423, 8199289843	90000	Rohit	Karthik	Peelamedu	641045

2. Functional dependencies

client_id → contact

client_id → fee

client_id → name

client_id → address

rep_id → rep_or_not

3. First normal form

A relational schema is in 1NF when all the attributes of the relation have atomic values. A relation that contains composite, multivalued and complex attributes is not in 1NF.

The client relation has a composite attribute and a multivalued attribute. So, it is not in 1NF.

i) Composite Attribute:

Clients (client_id, rep_id, rep_or_not, contact, fee, name, address)

Clients (client_id, rep_id, rep_or_not, contact, fee, first_name, last_name, area, pin_code)

The composite attribute has been converted to 1NF

ii) Multivalued attribute:

Clients (client_id, rep_id, rep_or_not, contact, fee, first_name, last_name, area, pin_code)

Clients (client_id, rep_id, rep_or_not, fee, first_name, last_name, area, pin_code)

Client_contact (client_id, contact)

Thus the relational schema has been converted to 1NF

4. Second normal form

A relational schema is in 2NF if it satisfies 1NF and every non-prime attribute is fully functionally dependent in the primary key of the relation, i.e. there are no partial dependencies.

There are no partial dependencies, thus it is already in 2NF

5. Decomposition

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, area, pin_code)

Client_contact (<u>client_id</u>,contact)

↓

Clients (<u>client_id</u>, rep_id, rep_or_not, contact, fee, first_name, last_name, area, pin_code)

The result of joining all the decomposed relations creates the base relation again without any loss/gain in data. So, the decomposition is lossless.

6. Third normal form

A relational schema is in 3NF if it satisfies 2NF and no non-prime attribute of relation R is transitively dependant on primary key of the relation.

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, area, pin_code)

↓

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, pin_code)

Client_region (<u>pin_code</u>, area)

Thus the relational schema has been converted to 3NF.

7. Decomposition

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, pin_code)

Client_region (<u>pin_code</u>, area)

Client_contact (<u>client_id</u>,contact)

↓

Clients (<u>client_id</u>, rep_id, rep_or_not, contact, fee, first_name, last_name, area, pin_code)

The result of joining all the decomposed relations creates the base relation again without any loss/gain in data. So, the decomposition is lossless.

8. Boyce-Codd normal form

A relational schema is in BCNF if it satisfies 3NF and if for every functional dependency X → Y, X is the super key of the table.

There are no more than one candidate keys present in the above set of tables. So, it is already in BCNF.

9. Decomposition

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, pin_code)

Client_region (<u>pin_code</u>, area)

Client_contact (<u>client_id</u>,contact)

$$\downarrow$$

Clients (<u>client_id</u>, rep_id, rep_or_not, contact, fee, first_name, last_name, area, pin_code)

The result of joining all the decomposed relations creates the base relation again without any loss/gain in data. So, the decomposition is lossless.

Final Schemas:

Clients (<u>client_id</u>, rep_id, rep_or_not, fee, first_name, last_name, pin_code)

Client_region (<u>pin_code</u>, area)

Client_contact (<u>client_id</u>,contact)

Case_type (<u>s_no</u>, types, broad_classification)

Priority (<u>case_id, document_id</u>, priority)

Document (<u>document_id</u>, authenticity, case_id)

Document_type (<u>s.no</u>, types)

Case (<u>case_id</u>, status, case_notes, no_of_hearings, lawyer_id, client_id)

Case_progression (<u>case_id, s_no</u>, date)

Hearing (<u>case_id</u>, court, s_no, c_no)

Courts (<u>c_no</u>, chief_judge)

Employees (<u>employee_id</u>, designation, no_of_cases, first_name, last_name, pin_code)

Employee_contact (<u>employee_id</u>, contact)

Employee_region (<u>pin_code</u>, area)

Position (<u>employee_id, s_no</u>, since)

Jobs (<u>s_no</u>, designation, salary)

Potential_clients (<u>client_id, rep_id</u>, since)

Under_Advisement (<u>rep_id</u>, name)

Phase III

Hardware and Software Requirements:

Minimum Hardware Requirements:

- CPU: Intel Core or Xeon 3GHz (or Dual Core 2GHz) or equal AMD CPU.
- Cores: Single (Dual/Quad Core is recommended)
- **RAM**: 4 GB (6 GB recommended)
- Graphic Accelerators: nVidia or ATI with support of OpenGL 1.5 or higher.
- Display Resolution: 1280×1024 is recommended, 1024×768 is minimum.

Minimum Software Requirements:

- Windows 7 (64-bit, Professional level or higher)
- Mac OS X 10.6.1+
- Ubuntu 9.10 (64bit)
- Ubuntu 8.04 (32bit/64bit)
- The Microsoft .NET 3.5 Framework
- MySQL package

Help File:

1. Make sure the requirements are met.
2. Transfer the MySQL database to the directory. Default directory: C:\ProgramData\MySQL\MySQL Server 8.0\Data (ProgramData folder may be hidden)
3. Start the MySQL server in MySQL Workbench with Service - localhost:3306, User - root and Password – 1234.
4. Launch the .exe file of the application.
5. In the landing page select the portal you would like to use.

Client Portal:

1. Choose one of the three sections.
2. Choose the 'List' option to display the stored records of the selected section.

Partner Portal:

1. Enter the passcode. Default code is set to "1234*".
2. Choose one of the six sections.
3. Choose the 'List' option to display the stored records of the selected section.
4. Choose the 'Add' option to open the record addition section and enter the details according to the onscreen instructions.
5. Choose the 'Update' option to open the record update section and follow the instructions to update your required value of a record.
6. Choose the 'Remove' option to open the remove record section and follow the instructions to remove your required record.
7. In the Cases section 'Case Notes' can be viewed by selecting a row and pressing the button.

Flow of control:
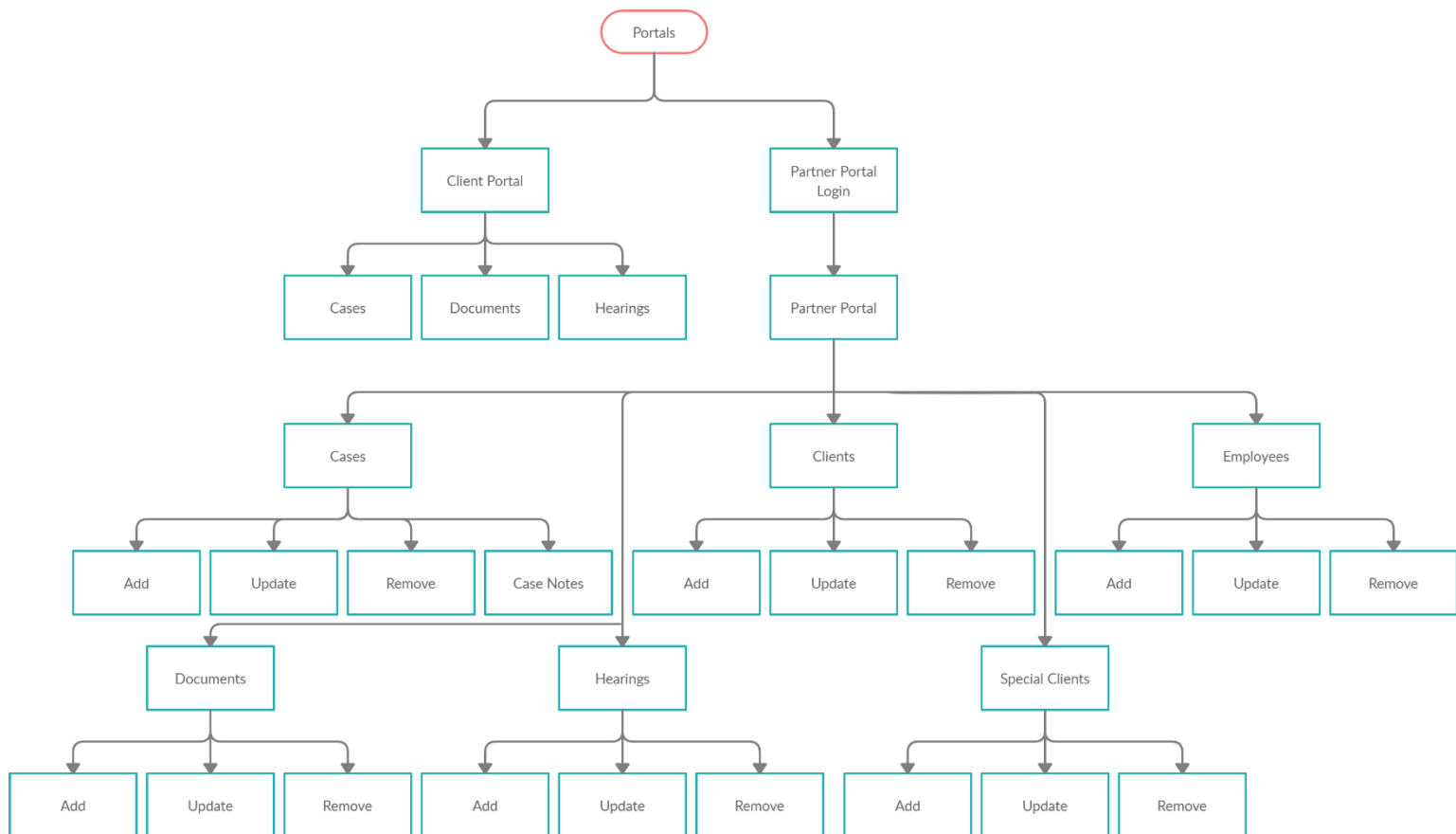
Interfaces:

Portals: There are two options. The client portal is open to all whereas the partner portal is open only to partners in the firm.

Client Portal: The user can choose their required section: Cases, Documents, Hearings.

Client-Cases: The user can view the list of cases and their details.

Client-Documents: The user can view the list of documents and their details.

Client Hearings: The user can view the list of hearings and their details.

Partner Portal Login: User has to confirm they are a partner by entering the passcode known only to partners.

Partner Portal: The user can choose their required section: Cases, Clients, Employees, Documents, Hearings, Special Clients.

Partner-Cases: The user can choose to list, add, update or remove records to the section. The user can also view case notes by clicking on a row and clicking the 'Case Notes' button.

Cases-Add: The user can fill in the form to add a new record to the section.

Cases-Update: The user can fill the form to update their required record in the section.

Cases-Remove: The user can fill the form to remove their required record in the section.

Partner-Clients: The user can choose to list, add, update or remove records to the section.

Clients -Add: The user can fill in the form to add a new record to the section.

Clients -Update: The user can fill the form to update their required record in the section.

Clients -Remove: The user can fill the form to remove their required record in the section.

Partner-Employees: The user can choose to list, add, update or remove records to the section.

Employees -Add: The user can fill in the form to add a new record to the section.

Employees -Update: The user can fill the form to update their required record in the section.

Employees -Remove: The user can fill the form to remove their required record in the section.

Partner-Documents: The user can choose to list, add, update or remove records to the section.

Documents -Add: The user can fill in the form to add a new record to the section.

Documents -Update: The user can fill the form to update their required record in the section.

Documents -Remove: The user can fill the form to remove their required record in the section.

Partner-Hearings: The user can choose to list, add, update or remove records to the section.

Hearings -Add: The user can fill in the form to add a new record to the section.

Hearings -Update: The user can fill the form to update their required record in the section.

Hearings -Remove: The user can fill the form to remove their required record in the section.

Partner-Special Clients: The user can choose to list, add, update or remove records to the section.

Special Clients -Add: The user can fill in the form to add a new record to the section.

Special Clients -Update: The user can fill the form to update their required record in the section.

Special Clients -Remove: The user can fill the form to remove their required record in the section.

Screenshots:
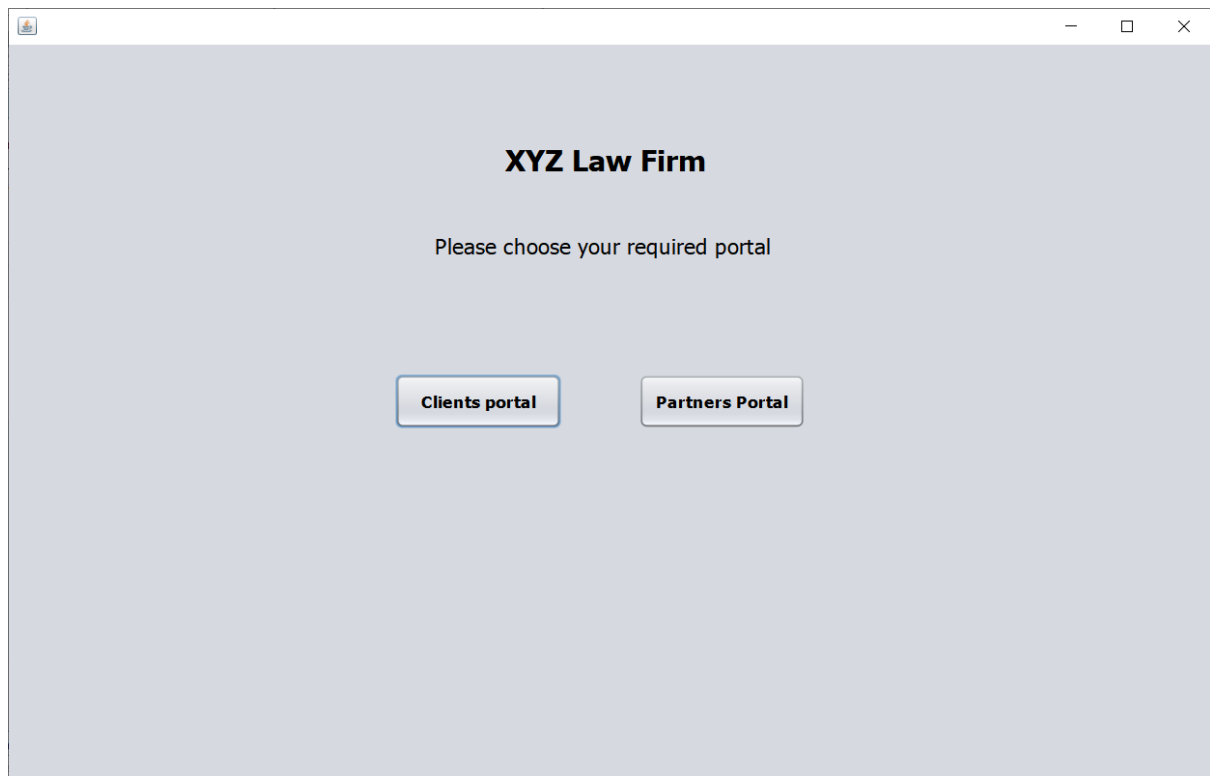
Choose a section

Cases Documents Hearings

Back

Cases

Case ID	Status	Lawyer ID	Lawyer Name	Client ID	Client Name	Type	No.of Hearings
1	active	1	Jaivant v	1	j v	1	1

List

Back

Enter passcode to continue

Passcode   *****

Ok

Back

Choose a section

| Cases | Clients | Employees |

| Documents | Hearings | Special Clients |

Back

Cases

Case ID	Status	Lawyer ID	Lawyer Name	Client ID	Client Name	Type	No.of Hearings
1	active	1	Jaivant v	1	j v	1	1

Back   List   Add   Update   Remove   View Case Notes

Cases

Case ID	Status	Lawyer ID	Lawyer Name	Client ID	Client Name	Type	No.of Hearings
1	active	1	Jaivant v	1	j v	1	1

Case Notes

No case notes

OK

Back   List   Add   Update   Remove   View Case Notes

Clients

Client ID	First Name	Last Name	Door No	Street Name	Rep ID	Contact	Since
1	j	v	1	XYZ Street	1	9383084657	2020-06-09
2	Jaivant	Vassan	2	ABC Street	1	9787466710	2020-10-10

[List] [Add] [Update] [Remove]

[Back]

Enter the details to be added

Client ID	3
First Name	Ram
Last Name	Prakash
Door No	8
Street Name	MGR Street
Rep ID	2
Contact	7039482048
Since	2020-10-12

[Add]

[Back]

Clients

Client ID	First Name	Last Name	Door No	Street Name	Rep ID	Contact	Since
1	j	v	1	XYZ Street	1	9383084657	2020-06-09
2	Jaivant	Vassan	2	ABC Street	1	9787466710	2020-10-10
3	Ram	Prakash	8	MGR Street	2	7039482048	2020-10-12

List   Add   Update   Remove

Back

Update Client Details

Enter Client ID   3

Choose the column to update   street_name

New value   MGR nagar

Update

Back

Clients

Client ID	First Name	Last Name	Door No	Street Name	Rep ID	Contact	Since
1	j	v	1	XYZ Street	1	9383084657	2020-06-09
2	Jaivant	Vassan	2	ABC Street	1	9787466710	2020-10-10
3	Ram	Prakash	8	MGR nagar	2	7039482048	2020-10-12

List   Add   Update   Remove

Back

Delete Client Details

Enter Client ID   3

Remove

Back

Clients

Client ID	First Name	Last Name	Door No	Street Name	Rep ID	Contact	Since
1	j	v	1	XYZ Street	1	9383084657	2020-06-09
2	Jaivant	Vassan	2	ABC Street	1	9787466710	2020-10-10

List   Add   Update   Remove

Back