ITS FINAL ASSIGNMENT – GROUP 01

IKAPA CONSULTING

MANAGERIAL SYSTEM

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INTRODUCTION

The proposed system for the IKAPA Consulting Clients Database aims to provide a comprehensive solution for the manager to effectively match clients with consultants based on their respective regions and expertise. The system's primary objective is to ensure that clients located within a specific region are paired with consultants operating in the same region and possess the necessary expertise to meet the client's specific consulting service needs.

To achieve this goal, the system will include the following components and functionalities:

Client and Consultant Management Module: This module will enable the manager to store and manage their information, including attributes such as client number, name, region, and consultant number, name, and region. The system will allow the manager to add, update, and delete client and consultant records as needed.

Contract Management Module: This module will handle the details of the contracts, including attributes such as contract number, contract date, and contract amount. Each client can have multiple contracts, and each contract can cover multiple consulting classifications. The system will support the addition, modification, and deletion of contract records.

Consulting Classification Management Module: This module will handle various areas of expertise, including attributes such as consulting class number and description. Consultants can be experts in multiple classifications, and the system will allow the manager to assign or update consulting classifications for consultants.

The system will incorporate a matching algorithm that considers the client's region, consulting service needs, and consultant expertise. The algorithm will prioritize matching clients with consultants located in the same region and possessing the required expertise. However, it will also consider alternative options if an exact regional match is not possible. The system will provide search and filtering capabilities to facilitate the matching process. The manager can search for clients or consultants based on various criteria, such as region, expertise, or contract details. This will enable efficient identification and selection of suitable matches.

The system will offer reporting and analytics features to provide insights into the matching process, contract assignments, and consultant utilization. These reports will assist the manager in monitoring the effectiveness of the matching system, identifying trends, and making data-driven decisions.

LIMITATIONS OF THE PROPOSED SYSTEM:

While the system aims to match consultants and clients within the same region to minimize travel expenses, it acknowledges that this may not always be possible due to various constraints and circumstances. The system does not handle complex resource allocation scenarios, such as considering the availability and workload of consultants when assigning multiple clients or contracts simultaneously.

Overall, the proposed system will streamline the matching process between clients and consultants within the IKAPA Consulting company. By considering region, consulting service needs, and expertise, the system will ensure appropriate matches while also allowing flexibility in cases where an exact regional match is not feasible. It will provide a user-friendly interface, efficient data management, and valuable insights to support the manager in making optimal client-consultant assignments and enhancing overall operational efficiency.

However, it does not optimize travel expenses in all cases, does not consider real-time availability, and does not handle complex resource allocation scenarios.

TERMINOLOGY

- Gantt chart: A Gantt chart is a type of bar chart that illustrates a project schedule. It shows the start and finish dates of the different tasks in a project, as well as their dependencies and durations.
- WBS: A Work Breakdown Structure (WBS) is a hierarchical decomposition of a project into smaller, more manageable components. It is used to organize and define the total scope of the project.
- ERD: An Entity Relationship Diagram (ERD) is a graphical representation of entities and their relationships to each other. It is used to model the data in a database and to define the relationships between tables.
- Dependency Diagram: A Dependency Diagram is a diagram that shows the dependencies between different components of a system or project. It is used to identify which components depend on others and to help manage complex systems.
- Normalization: Normalization is the process of organizing data in a database so that it is consistent and free from redundancy. It involves breaking down large tables into smaller ones and defining relationships between them.
- Screen Design: Screen design refers to the process of designing the user interface for an application or website. It involves creating wireframes, mockups, and prototypes to help visualize how the application will look and function.
- Help Screen: A Help Screen is a screen within an application or website that provides information or guidance to users on how to use the application or website.
- Client and Consultant Management Module: A software component that allows the manager to store, update, and manage information about clients and consultants. It includes attributes like client number, name, region, and consultant number, name, and region.
- Contract Management Module: A software component designed to handle the details of contracts, including attributes such as contract number, contract date, and contract amount. This module supports adding, modifying, and deleting contract records.
- Consulting Classification Management Module: A software module responsible for managing various consulting classifications or areas of expertise. It includes attributes such as consulting class number and description. This module enables the manager to assign or update consulting classifications for consultants.
- Matching Algorithm: A set of rules and calculations that determine the best match between clients and consultants. It considers factors like client region, consulting service requirements, and consultant expertise. The algorithm aims to prioritize matching clients with local consultants possessing the required skills.
- Search and Filtering Capabilities: Features that allow the manager to search and filter client and consultant records based on specific criteria, such as region, expertise, or contract details. These capabilities facilitate the identification and selection of suitable matches.
- Reporting and Analytics Features: Functionalities within the system that provide insights and generate reports related to the matching process, contract assignments, and consultant utilization. These features help the manager monitor the effectiveness of the matching system and make data-driven decisions.
- Complex Resource Allocation Scenarios: Challenging situations that involve assigning multiple clients or contracts to consultants while considering factors like consultant availability and workload. The system does not handle these intricate allocation scenarios.

- Real-Time Availability: The system does not account for the immediate or current availability of consultants when making client-consultant assignments.

- User-Friendly Interface: A design that ensures the system is easy for the manager to use and interact with, enhancing overall usability and user experience.

- Operational Efficiency: The effectiveness and productivity of the system in streamlining the process of matching clients and consultants, leading to improved business operations.

- Travel Expenses Optimization: The act of minimizing travel costs by matching clients with local consultants. The system aims to optimize travel expenses but acknowledges that it may not always be feasible.

- Flexibility: The system's ability to adapt and provide alternative solutions in cases where an exact regional match between clients and consultants is not possible.

- Client Table: A database table used to store information about clients. It includes the following fields:
- ClientNum: A unique identifier for each client.
- ClientName: The name of the client.
- ClientRegion: The geographical region in which the client is located.

- Consultant Table: A database table used to store information about consultants. It includes the following fields:
- ConsultantNum: A unique identifier for each consultant.
- ConsultantName: The name of the consultant.
- ConsultantRegion: The geographical region in which the consultant is located.

- Contract Table: A database table used to store details of contracts between clients and consultants. It includes the following fields:
- ContractNum: A unique identifier for each contract.
- ContractDate: The date when the contract is established.
- ContractAmount: The total amount specified in the contract.
- ClientNum (Foreign Key): Links to the client for whom the contract is created.
- ConsultantNum (Foreign Key): Links to the consultant assigned to the contract.

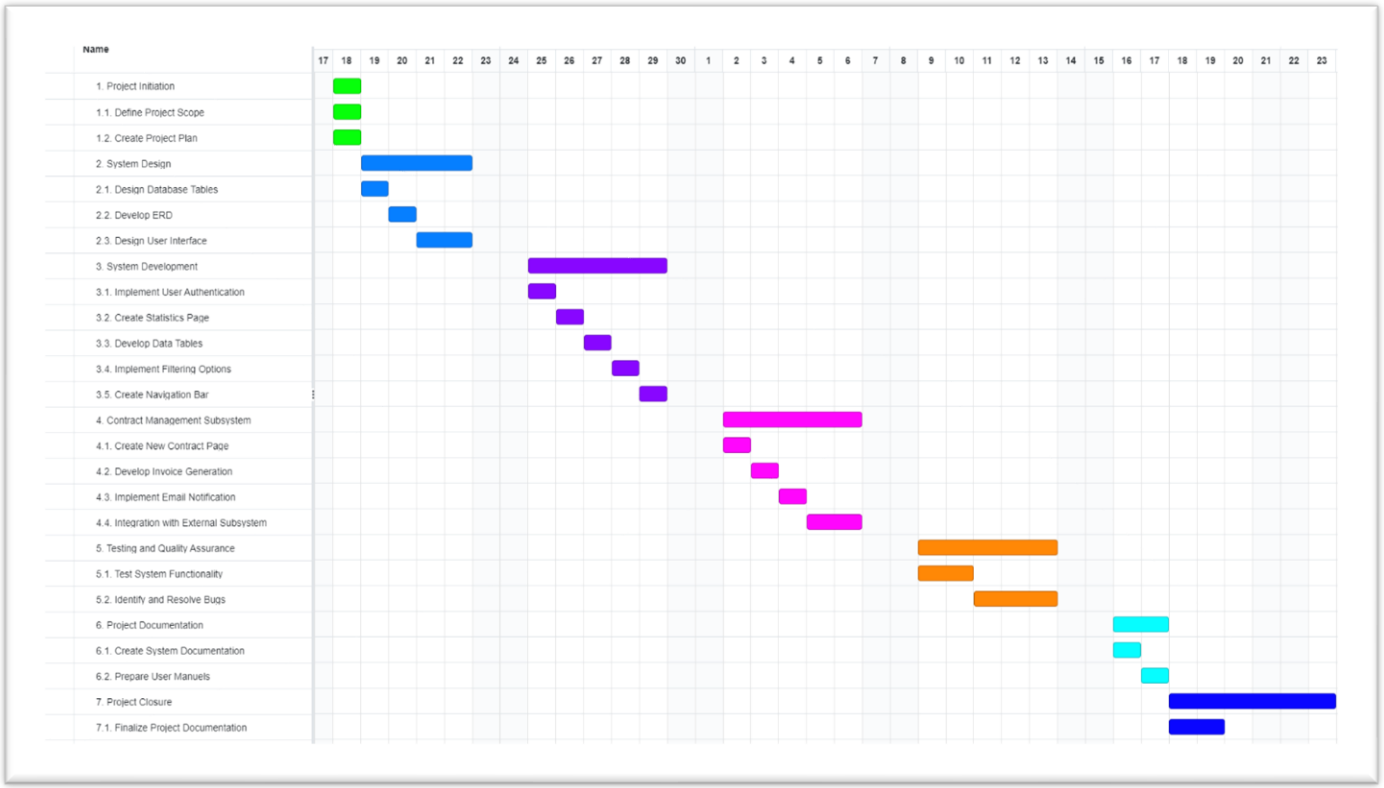
- Consulting Classification (ConsultClass) Table: A database table used to manage various areas of consulting expertise. It includes the following fields:
- ConsultClassID: A unique identifier for each consulting classification.
- ClassName: The description or name of the consulting classification, such as "Database Administration" or "Network Installations."

- Contract Services (ContractServices) Table: A database table used to record the consulting services provided within a contract. It includes the following fields:
- ContractServiceNum: A unique identifier for each contract service.
- Contract Number (Foreign Key): Links to the contract for which the service is provided.
- ConsultClassID (Foreign Key): Links to the consulting classification relevant to the service.

- Consultant Services (ConsultantServices) Table: A database table used to record the consulting services provided by consultants, detailing their areas of expertise within specific consulting classifications. It includes the following fields:
- ConsultantServiceNum: A unique identifier for each consultant service.
- Consultant Number (Foreign Key): Links to the consultant providing the service.
- ConsultClassID (Foreign Key): Links to the consulting classification in which the consultant has expertise.

GANTT CHART

The Gantt Chart below depicts the project task in order of implementation needs. The project start date was the 17th of September 2023 and ended on the 23rd of October 2023. Please zoom to view image clearly.



WORK BREAKDOWN STRUCTURE

Overview

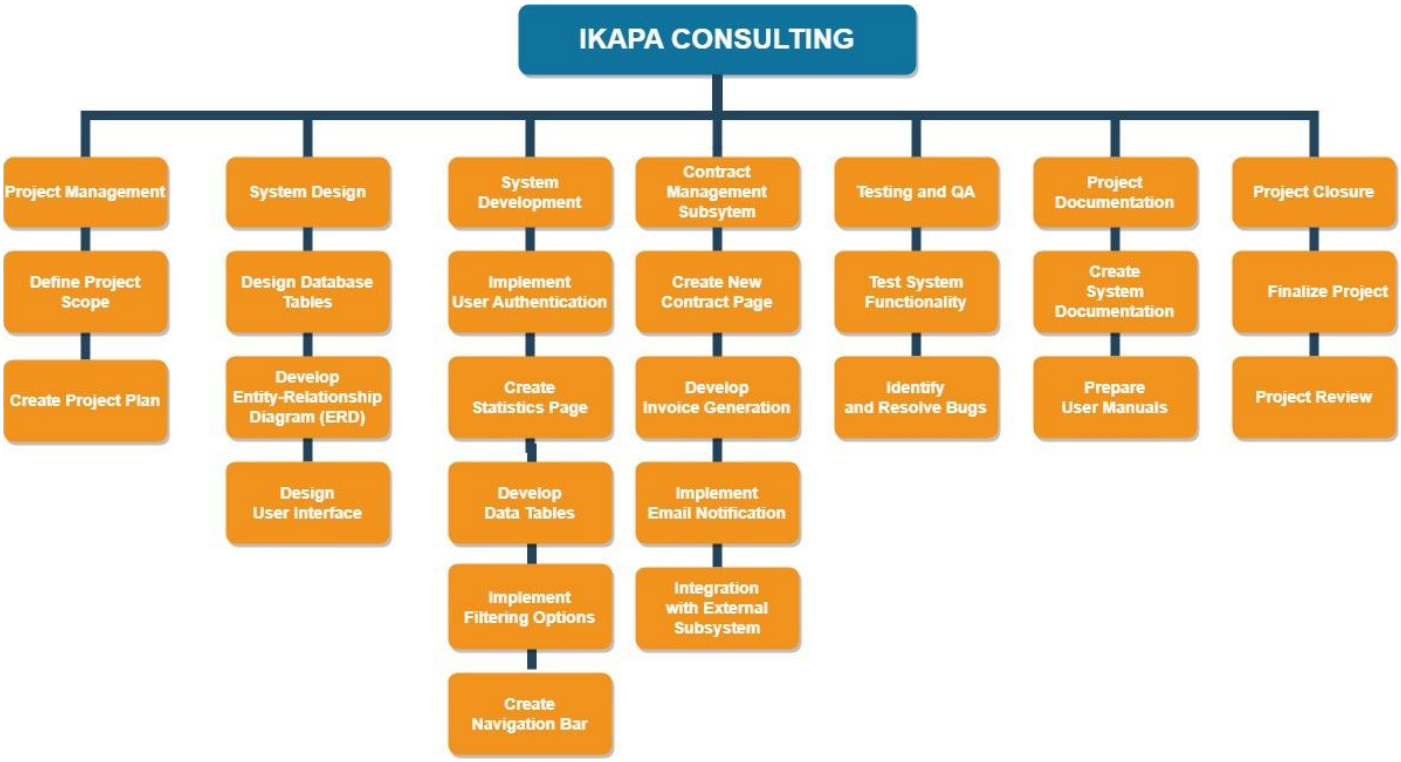
The project that this WBS is based on is the Ikapa Consulting Managerial Matching subsystem. This system is a consolidated constructing system for Ikapa Consulting. Our team comprising of 6 members have developed the system by completing the series of tasks and subtasks below.

Outline View

1. Project Management 1.1. Define Project Scope 1.2. Create Project Plan 2. System Design 2.1 Design Database Tables 2.2 Develop Entity-Relationship Diagram (ERD) 2.3 Design User Interface 3. System Development 3.1 Implement User Authentication 3.2 Create Statistics Page 3.3 Develop Data Tables 3.4 Implement Filtering Options 3.5 Create Navigation Bar	4. Contract Management System 4.1 Create New Contract Page 4.2 Develop Invoice Generation 4.3 Implement Email Notification 4.4 Integration with External Subsystem 5. Testing and Quality Assurance 5.1 Test System Functionality 5.2 Identify and Resolve Bugs 6. Project Documentation 6.1 Create System Documentation 6.2 Prepare User Manuals 7. Project Closure 7.1 Finalize Project 7.2 Project Review

WBS Hierarchy Chart

The chart below depicts the WBS is a Hierarchy Chart View. Please zoom to view image clearly.



WBS Tabular View

The table below shows the tabular form view of the WBS.

LEVEL 1	LEVEL 2	LEVEL 3	DURATION	
			START DATE	END DATE
IKAPA CONSULTING	1. Project Management	1.1. Define Project Scope	18 Sep 2023	18 Sep 2023
		1.2. Create Project Plan	18 Sep 2023	18 Sep 2023
	2. System Design	2.1 Design Database Tables	19 Sep 2023	19 Sep 2023
		2.2 Develop Entity-Relationship Diagram (ERD)	20 Sep 2023	20 Sep 2023
		2.3 Design User Interface	21 Sep 2023	22 Sep 2023
	3. System Development	3.1 Implement User Authentication	25 Sep 2023	25 Sep 2023
		3.2 Create Statistics Page	26 Sep 2023	26 Sep 2023
		3.3 Develop Data Tables	27 Sep 2023	27 Sep 2023
		3.4 Implement Filtering Options	28 Sep 2023	28 Sep 2023
		3.5 Create Navigation Bar	29 Sep 2023	29 Sep 2023
	4. Contract Management System	4.1 Create New Contract Page	02 Oct 2023	02 Oct 2023
		4.2 Develop Invoice Generation	03 Oct 2023	03 Oct 2023
		4.3 Implement Email Notification	04 Oct 2023	04 Oct 2023
		4.4 Integration with External Subsystem	05 Oct 2023	06 Oct 2023
	5. Testing and Quality Assurance	5.1 Test System Functionality	09 Oct 2023	10 Oct 2023
		5.2 Identify and Resolve Bugs	11 Oct 2023	13 Oct 2023
	6. Project Documentation	6.1 Create System Documentation	16 Oct 2023	16 Oct 2023
		6.2 Prepare User Manuals	17 Oct 2023	17 Oct 2023
	7. Project Closure	7.1 Finalize Project	18 Oct 2023	19 Oct 2023
		7.2 Project Review	20 Oct 2023	23 Oct 2023

WBS Dictionary

The table below depicts all WBS terminology and a description thereof.

WBS LEVEL	WBS CODE	WBS ELEMENT	DESCRIPTION
1	0	Ikapa Consulting	Project Name
2	1	Project Management	The initial step in project.
3	1.1	Define Project Scope	This task involves defining the scope and objectives of the Ikapa Consulting Managerial Matching Subsystem project.
3	1.2	Create Project Plan	This task involves creating a comprehensive project plan that outlines the tasks, schedule, and resources required for the project's successful completion.
2	2	System Design	The second step in implementing the project.
3	2.1	Design Database Tables	This subtask involves designing the database tables required for the Ikapa Consulting Managerial Matching Subsystem.
3	2.2	Develop Entity-Relationship Diagram (ERD)	This subtask focuses on developing the Entity-Relationship Diagram (ERD) to represent the database structure.
3	2.3	Design User Interface	This subtask involves designing the user interface for the system, ensuring user-friendly interactions.
2	3	System Development	The third step in implementing project.
3	3.1	Implement User Authentication	This subtask involves the implementation of user authentication and access control within the system.
3	3.2	Create Statistics Page	This subtask focuses on creating the Statistics Page, allowing users to view monthly project statistics.
3	3.3	Develop Data Tables	This subtask involves the development of data tables to store project information.
3	3.4	Implement Filtering Options	This subtask involves implementing filtering options for data tables, enhancing data management.
3	3.5	Create Navigation Bar	This subtask focuses on creating a navigation bar for seamless navigation within the system.
2	4	Contract Management System	The forth step in implementing the project.
3	4.1	Create New Contract Page	This subtask involves creating a page for initiating new contracts within the system.
3	4.2	Develop Invoice Generation	This subtask focuses on developing the functionality for generating project invoices.
3	4.3	Implement Email Notification	This subtask involves implementing email notifications to inform clients about contract details.
3	4.4	Integration with External Subsystem	This subtask involves integrating the system with an external subsystem responsible for client acceptance.
2	5	Testing and Quality Assurance	The fifth step in implementing the project.
3	5.1	Test System Functionality	This subtask involves comprehensive testing of the system's functionality to ensure it meets project requirements.
3	5.2	Identify and Resolve Bugs	This subtask focuses on identifying and resolving any issues or bugs encountered during testing.
2	6	Project Documentation	The sixth step in implementing project.
3	6.1	Create System Documentation	This subtask involves creating documentation for the Ikapa Consulting Managerial Matching Subsystem, including system architecture, user guides, and technical documentation.
3	6.2	Prepare User Manuals	This subtask focuses on preparing user manuals to guide users on how to effectively utilize the system.

2	7	Project Closure	The seventh and final step in implementing the project
3	7.1	Finalize Project	This subtask involves finalizing all project deliverables and ensuring that the project meets its objectives.
3	7.2	Project Review	This subtask involves reviewing the project's performance, documenting lessons learned, and preparing for project closure.

BUSINESS RULES

1. Client-Consultant Matching: A client within the given region should be matched with a consultant in that region, based on the client's need for specific consulting services and the consultant's expertise.

2. Multiple Contracts: A consultant can work on multiple contracts and a client can sign multiple contracts.

3. Multiple Consulting Classifications: Each contract could cover multiple consulting classifications. For example, a contract may list consulting services in database and networking.

4. Multiple Expertise: Consultants can be an expert in more than one classification.

5. Consultant Availability: A consultant's availability should be considered when matching with a client. If a consultant is already working on multiple contracts, they may not have the capacity to take on additional work.

6. Contract Duration: Each contract should have a specified duration or end date. This will help manage the consultant's workload and ensure they are not overbooked.

7. Client Budget: The client's budget for the consulting services should be considered when matching with a consultant. Some consultants may charge higher rates based on their expertise and experience.

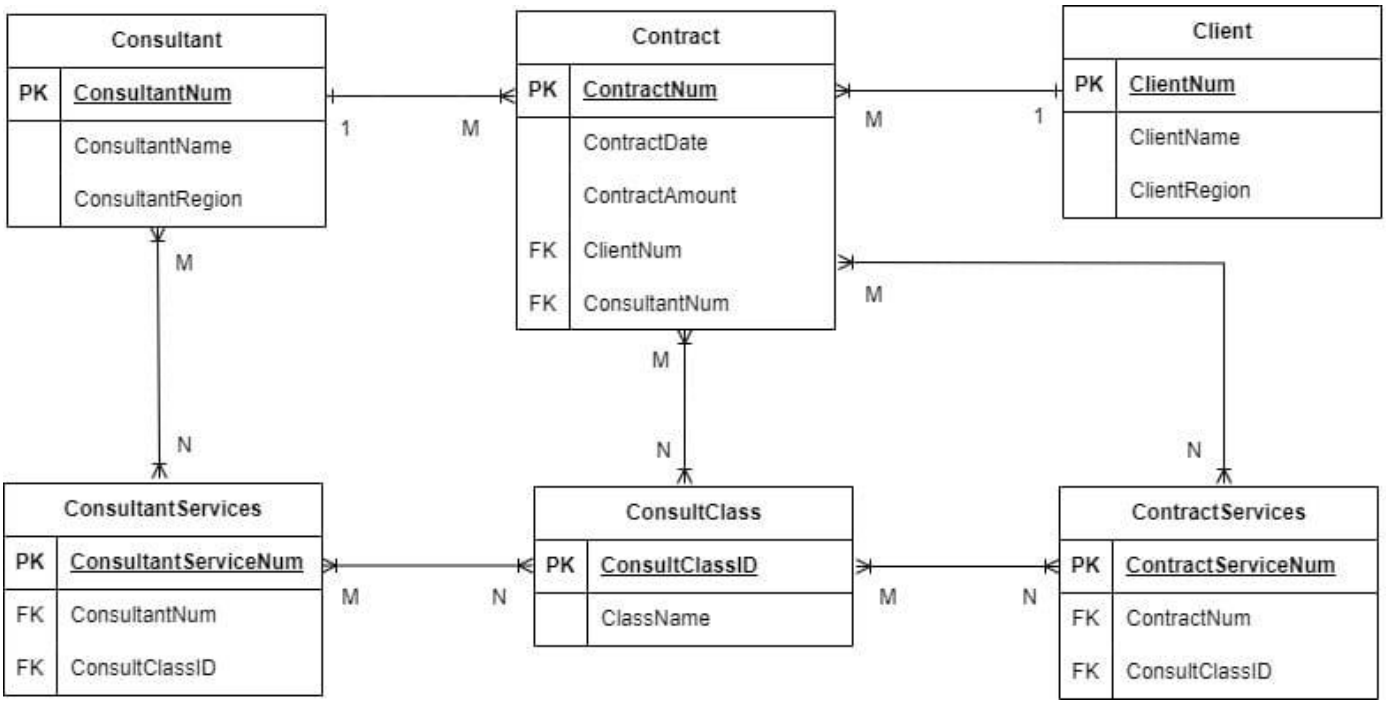
8. Travel Considerations: While the aim is to match consultants and clients within the same region to minimize travel expenses, there may be instances where this is not possible. In such cases, travel expenses should be factored into the contract for consultants who are from other regions.

9. Performance Evaluation: There should be a system in place for evaluating the performance of consultants. This can help in future client-consultant matching, ensuring that high-performing consultants are matched with clients more often.

10. Conflict of Interest: There should be rules in place to avoid any potential conflicts of interest. For example, a consultant should not be allowed to work on contracts for competing clients at the same time.

ENTITY RELATIONSHIP DIAGRAM - ERD

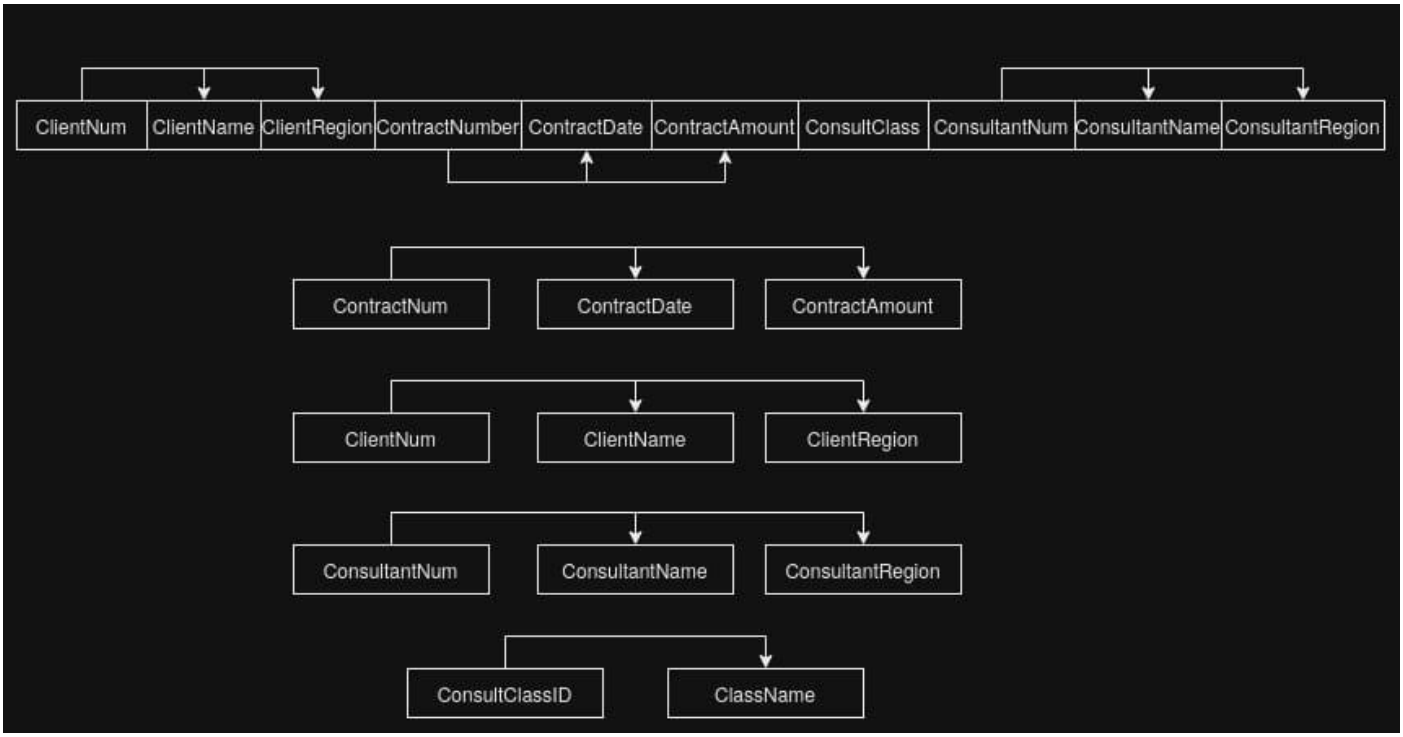
The ERD Diagram below depicts the database structure required for the system.



DEPENDENCY DIAGRAMS

The Dependency Diagram below depicts all dependencies amongst tables and normalized forms.

Please zoom to view image clearly.



NORMALIZED TABLES

- Contract Table: ContractNum(PK), ClientNum(FK), ConsultantNum(FK)

Contract Table:

ContractNum	ContractDate	ContractAmount	ClientNum	ConsultantNum
5841	2016-02-10	$298,500.00	298	29
5842	2016-02-15	$670,300.00	289	38
5843	2016-03-12	$1,250,000.00	289	25
5843	2016-03-12	$1,250,000.00	289	38
5844	2022-06-14	$1,446,000.00	299	34
5845	2023-04-06	$170,550.00	300	56

- Client Table: ClientNum(PK)

Client Table:

ClientNum	ClientName	ClientRegion
298	Marianne R. Brown	Midwest
289	James D. Smith	Southeast
299	Insegne A. Leonard	West
300	Ziyech Z. Leo	North

- Consultant Table: ConsultantNum(PK)

Consultant Table:

ConsultantNum	ConsultantName	ConsultantRegion
29	Rachel G. Carson	Midwest
38	Anne T. Dimarco	Southeast
25	Angela M. Jamison	Southeast
34	Gerald K. Ricardo	Southeast
56	Karl M. Spenser	Midwest
18	Donald Chen	West

- ConsultClass Table: ConsultClassID(PK)

ConsultClass Table:

ConsultClassID	ClassName
1	Database Administration
2	Database Design
3	Web Applications
4	Internet Services
5	Network Installations

- ConsultantServices Table: ConsultantServiceNum(PK), ConsultantNum(FK), ConsultClassID(FK)

ConsultantServices Table:

ConsultantServiceNum	ConsultantNum	ConsultClassID
111	29	1
112	38	4
113	25	2
114	38	3
115	34	5
116	56	1
117	18	5

- ContractServices Table: ContractServiceNum(PK), ContractNum(FK), ConsultClassID(FK)

ContractServices Table:

ContractServiceNum	ContractNum	ConsultClassID
11111	5841	1
11112	5841	3
11113	5842	4
11114	5843	2
11115	5843	5
11116	5844	1
11117	5845	5

Sample data included.

SCREEN DESIGNS

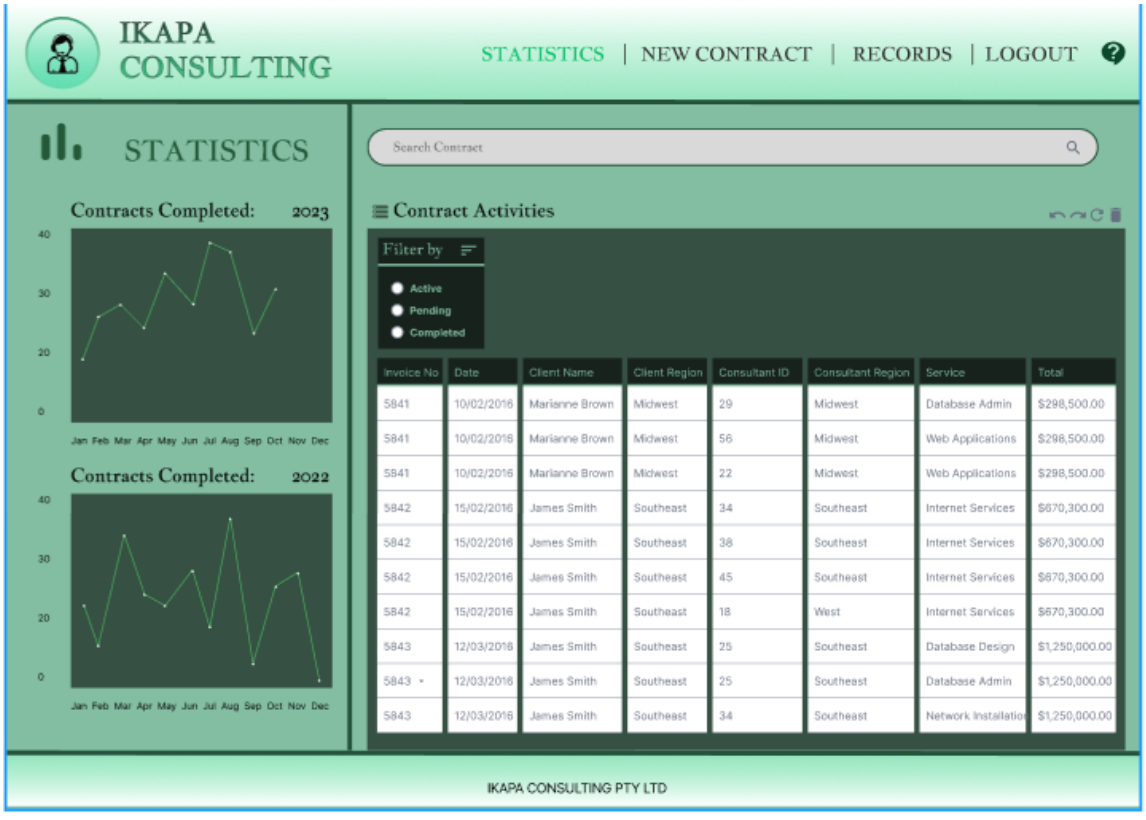
Please zoom to view image clearly.

Login Page

Managers can login with their manager ID and password.

Landing Page

After login, this is where the manager can view monthly statistics and view contract records that are complete, active or pending (awaiting customer signiture).



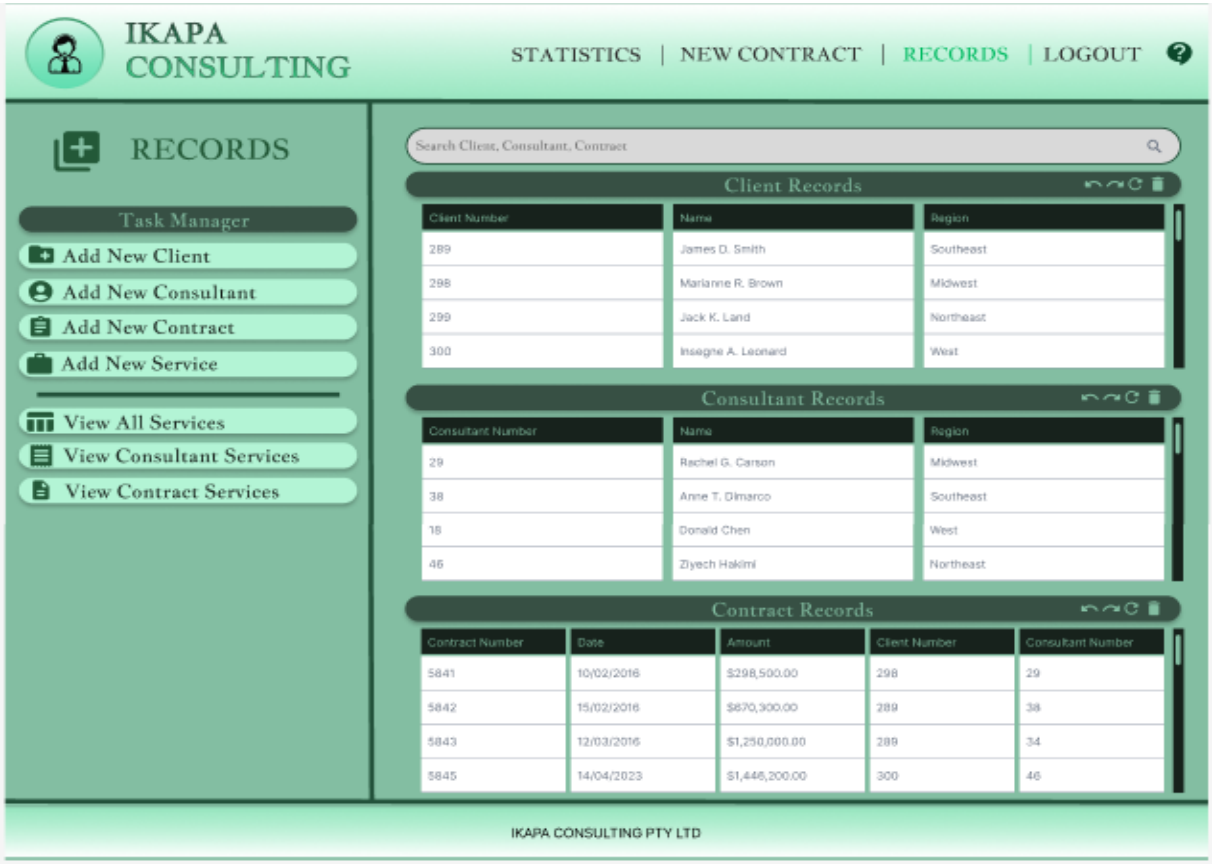
New Contract Page

This allows managers to create new contracts by entering all necessary information. When a class is chosen, and client region is entered the system will match all the consultants with the same expertise to the client's contract and the manager can select from that list. When the user clicks generate invoice, all fields will be updated in the invoice on the right.

When the user clicks generate contract, a contract is generated and can then be sent to the client. The contract will then be in a pending state until the client agrees.

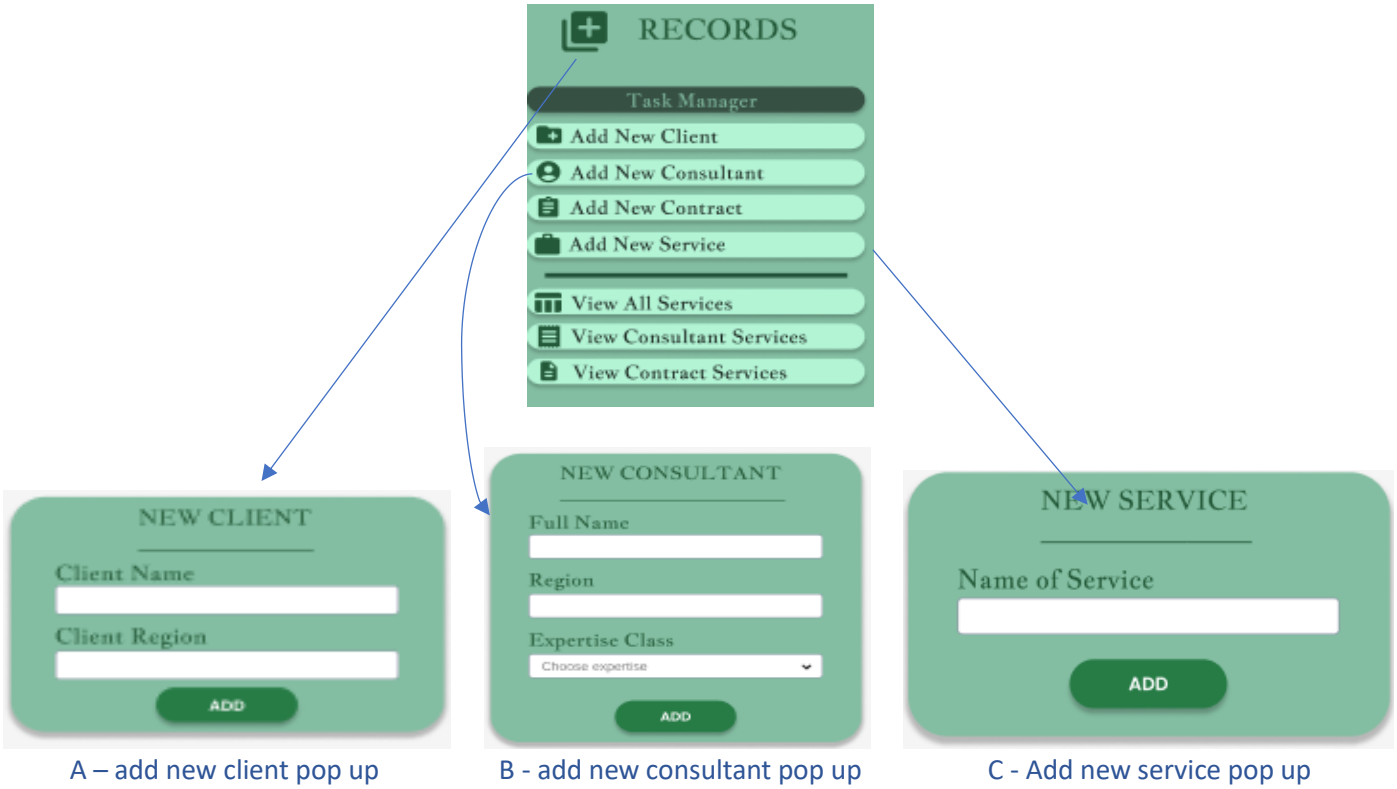
Records Page

The manager can view all records pertaining to clients, consultants, and all existing contracts active, pending, or complete. All task buttons will result in an applicable pop-up message or prompt besides add new contract which redirects user to the New Contract Page.



Records Page Pop-Ups

When the use clicks any of the designated add buttons these pop-ups will appear for user to enter applicable information.



A – add new client pop up

B - add new consultant pop up

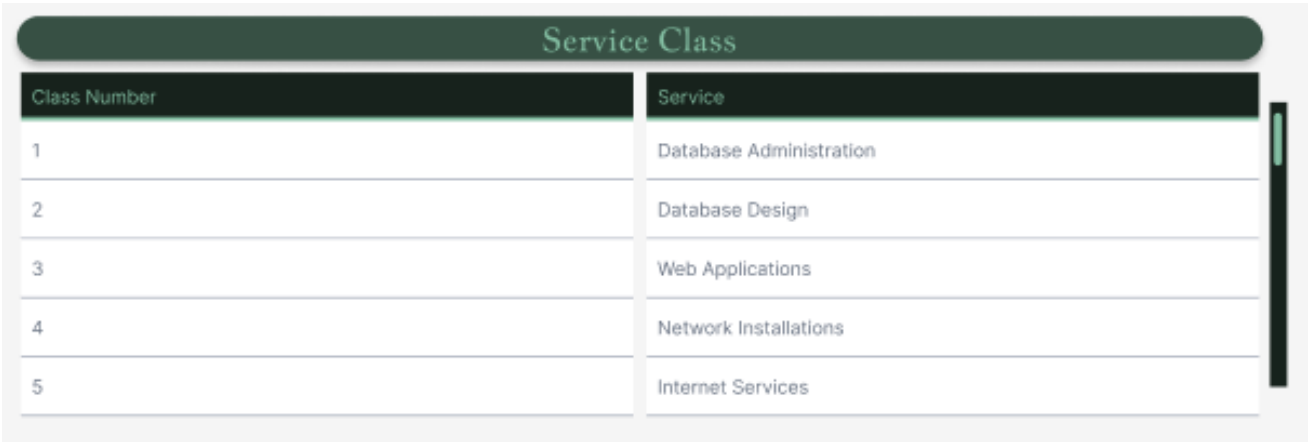
C - Add new service pop up

Records Page Table View Pop-Ups

When the user clicks on any of the designated view buttons the following table views will be created and displayed

View All Services Pop-Up Table View

These are all the services the company offers to clients



Service Class

Class Number	Service
1	Database Administration
2	Database Design
3	Web Applications
4	Network Installations
5	Internet Services

View Consultant Services Pop-Up Table View

These are the services related to consultant expertise.

Consultant Expertise

Expertise Number	Consultant Number	Class Number
111	36	1
113	36	3
114	18	5
115	46	4

View Contract Services Pop-Up Table View

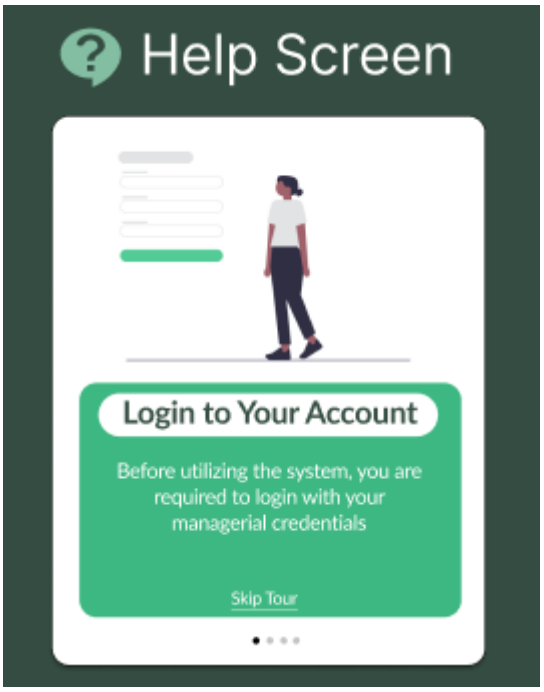
These are the services rendered to specific contracts.

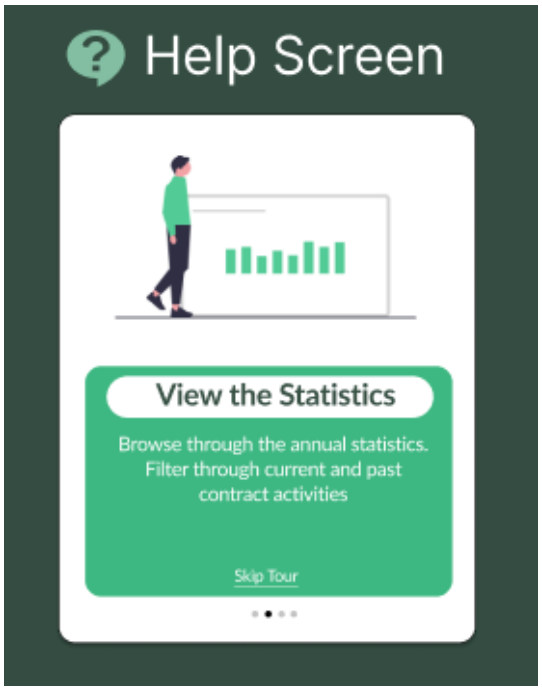
Contract Services

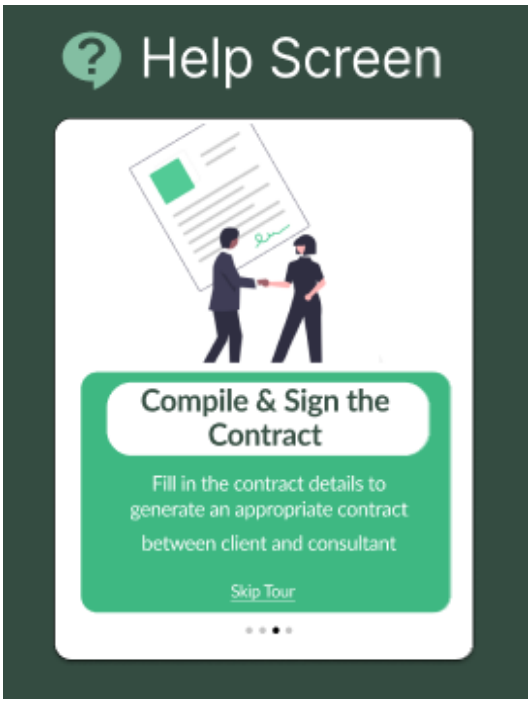
Service Number	Contract Number	Class Number
333	5841	1
444	5841	3
555	5842	5
666	5843	4

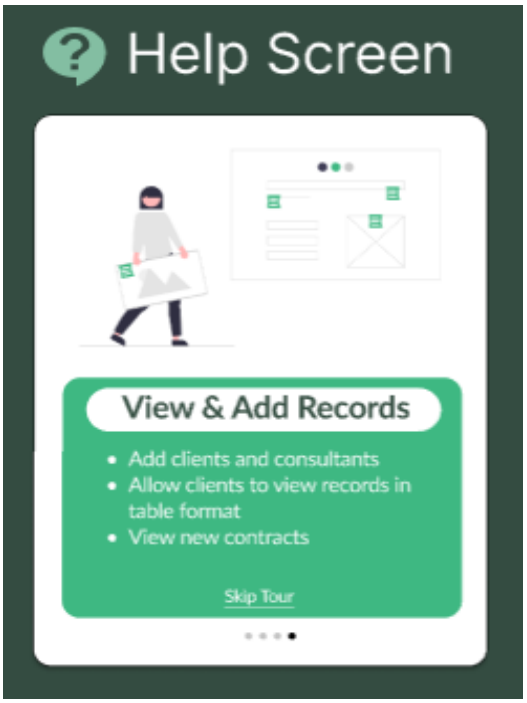
HELP SCREENS

Each page contains a help icon symbolized by a question mark which redirects the user to these HELP SCREENS which was created to assist them as to what each page does.









IDIVIDUAL REFLECTIONS AND TASKS

Anushka Anthony

My task was to work on the introduction of the proposed system for the IKAPA Consulting Clients Database. In the introduction, I aimed to provide a clear and concise overview of the systems objectives and functionality. I began by explaining the primary goal of the system, which is to efficiently match clients with consultants based on region and expertise.

To achieve this goal, I highlighted the key features of the system, such as client and consultant management, contract management, consulting classification management , and the matching algorithm. I explained that the system allows the manager to store and manage client and consultant I information, assign multiple consulting classifications to a single contract, and utilise a matching algorithm to pair client with suitable consultants.

In terms of reflection, I found the task of writing the introduction to be challenging yet rewarding. It required me to understand the overall scope and purpose of the system. I need to stoke a balance between providing sufficient details and keeping the introduction concise and engaging. I developed skill in summarising complex information and presenting its in a clear and compelling manner.

Overall, as a group, we collaborated equalling in all areas, sharing ideas, gathering requirements, and contributing to the application design. We worked together to create a comprehensive system that meets the objectives of matching clients with consultants based on region and expertise while providing efficient data management and valuable insights through reporting and analytics.

Aaishah Van Witt

The development of this project has significantly deepened my understanding of the topics covered in this module, particularly in the areas of database administration and design. While all team members contributed to various aspects of the project, my primary role involved planning and task distribution, especially when working against time constraints.

Using the Gantt chart and Work Breakdown Structure (WBS), I ensured tasks were allocated evenly and managed time efficiently. Additionally, I played a key role in the design and development of the system/application, ensuring the proper implementation of UI components and UX features. Compiling this document and meeting specified requirements was also part of my responsibilities.

As a team, we collectively overcame time constraints and effectively tackled and delivered the assigned tasks. We are satisfied with the outcome of our work and are committed to further improvement in the foreseeable future.

Uzair Rabin

Taking on this project has provided me with valuable insights and a deeper understanding of database management on the backend. As a team, we all equally contributed to the design of the tables, which has allowed me to grasp a better understanding of implementing different types of normal forms.

While focusing more on designing the Entity Relationship Diagram (ERD), I have gained a clearer understanding of the role of each table and the importance of determining the correct keys and relationships between them. This ensures that the tables interact correctly with each other.

Finally, as a team, we collectively decided to brainstorm ideas for the application's design. Our goal was to create a simple and effective application that allows users to interact with ease while achieving their objectives.

Sheldon Luke Arendse

All members of the group contributed to every element of this assignment. Some members contributed a bit more to specific sections than others, but the workload was evenly distributed.

The tasks that I mainly worked on were designing screens and creating the Entity Relationship Diagram (ERD). Both tasks presented unique challenges. The instructions for the design and help screens were quite vague, which required us to tap into our imaginative and creative sides. The part of the design process that took the longest was determining what elements needed to be displayed on each page. To address this issue, we utilized brainstorming techniques, such as word association.

The ERD section was relatively straightforward for us because we've encountered it in three other modules, making us very familiar with the concept. Once the tables were normalized, it became even easier to identify the relationships between all the tables.

Our group's collaborative effort on this assignment has allowed us to present work that we are proud of.

Logan Kalib Coghill

During this assignment, I played a role in developing the screen designs. We leveraged Figma's collaboration feature, which enabled us to work on a single copy of the designs together. I also contributed to the normalization of the tables by creating the dependency diagrams, with support from the team.

Additionally, I helped populate the tables with sample data, which added meaning to the database by showing how the records relate to each other using actual data. This assignment demanded substantial teamwork to ensure that everyone's sections were interconnected effectively.

Liam Matthews

In this project, my primary responsibilities included creating the Terminology and Business Rule sections. For the Terminology section, I conducted research to identify significant terms and concepts that have a substantial impact on the database and the overall project. This involved defining table names and their meanings, as well as other key terminologies relevant to the project.

In addition to terminology, I also formulated the business rules. This entailed identifying and explaining the business rules that could be implemented based on the provided case study, aligning them with the project's requirements. Collaborating with my group was a positive experience. We effectively delegated tasks, guided by our group leader, and encountered minimal conflicts. Our strong communication skills played a pivotal role in overcoming any challenges that arose.

Reflecting on this collaborative effort, I've come to appreciate the numerous benefits of working in a group, including heightened creativity, improved communication, and enhanced problem-solving abilities.