Section A

1. Project Management Approach for DATCON Search Engine and Document Manager

A). Team Selection:

As the Team Leader for this project, given the diverse requirements of DATCON Search Engine and Document Manager, assemble a cross-functional team with expertise in various areas, they include:

- System Analyst (Team Leader):
  - Responsibilities:
    - Conduct a detailed analysis of the requirements provided by NNPC.
    - Define system specifications and functionalities.
    - Collaborate with other team members to ensure a comprehensive understanding of the project.
- Database Administrator:
  - Skills: Proficient in database design and management, experience with relevant database systems (e.g., MySQL, Oracle), strong troubleshooting skills.
  - Responsibilities:
    - Design and implement a robust database structure for storing contractor and consultant profiles, documents, and other relevant information.
    - Ensure data integrity and security.
- Software Developer (Front-end and Back-end):
  - Skills: Proficient in relevant programming languages (e.g., Java, Python, JavaScript, PHP), experience in front-end and back-end development, understanding of software development life cycle.
  - Responsibilities:
    - Develop an intuitive and user-friendly interface for data entry and retrieval.
    - Implement the backend functionalities for data processing, storage, and retrieval.

- UI/UX Designer:
  - Skills: Proficient in design tools (e.g., Sketch, Figma), understanding of user-centered design principles, ability to conduct user research and usability testing.
  - Responsibilities:
    - Understand users: Research workflows, needs, pain points.
    - Craft interfaces: Design intuitive, user-friendly screens for all modules.
    - Test & refine: Conduct usability testing, iterate designs based on feedback.
    - Visualize: Develop brand-aligned, visually appealing UI.
    - Collaborate: Work closely with team, communicate design decisions effectively.
    - Stay ahead: Explore trends, recommend relevant tools & technologies.
- Security Expert:
  - Skills: Expertise in implementing security measures, conducting security audits, knowledge of encryption and access control protocols.
  - Responsibilities:
    - Implement robust security measures to protect sensitive data.
    - Conduct regular security audits to identify and address vulnerabilities.
- Quality Assurance (QA) Analyst:
  - Skills: Experience in developing and executing test cases, familiarity with testing tools, attention to detail.
  - Responsibilities:
    - Develop and execute comprehensive test cases to ensure the system's functionality, performance, and security.
    - Collaborate with the development team to address and resolve identified issues.
- Project Manager:
  - Skills: Strong leadership and organizational skills, experience in project planning and coordination, effective communication.
  - Responsibilities:
    - Oversee project timelines, ensuring adherence to deadlines.

- Facilitate communication and coordination among team members.
- Ensure that the project meets the specified requirements and quality standards.

B). Project Management Methodology:

Proposal of the use of Agile methodology, such as Scrum, for its

iterative and adaptable nature. This would involve:

i. Sprint Planning: Defining tasks and deliverables for each 2–3-week sprint, with input from all team members.
ii. Daily Scrum Meetings: Brief stand-up meetings to discuss progress, identify roadblocks, and adjust plans as needed.
iii. Regular User Testing: Involving NNPC procurement staff in testing prototypes and providing feedback throughout development.
iv. Version Control System: Using a system like Git to track code changes and ensure team collaboration.
v. Project Management Tool: Utilizing a project management tool like Jira or Asana to track tasks, manage deadlines, and communicate effectively.

C). System Design Considerations:

i. Modular Architecture: Develop the system in independent modules for easier maintenance and future enhancements.
ii. Scalability: Design the system to handle an increasing number of users and data volume.
iii. Security: Implement robust security measures like user authentication, data encryption, and access control.
iv. Integration: Integrate with existing NNPC systems for data exchange and seamless user experience.
v. Reporting & Analytics: Provide reports and dashboards for NNPC to track contractor/consultant performance and project progress.

D). Proposal Solution: Objectives and Feasibility:

The DATCON Search Engine and Document Manager project aims to enhance the efficiency of NNPC's Procurement section by addressing key challenges in managing Contractor and Consultant profiles and documents.

The objectives are as follows:

- ✓ Efficient Data and Document Management: Streamline the registration, storage, and retrieval of information, providing a centralized platform for easy access and data integrity.
- ✓ Grading and Evaluation System: Develop a module for objective grading and evaluation of Contractors and Consultants, ensuring transparency in selection processes.
- ✓ Powerful Search Engine: Implement a robust search engine to facilitate quick and accurate information retrieval based on various criteria, enhancing overall efficiency.
- ✓ Enhanced Security Measures: Prioritize the implementation of security measures, including user authentication, data encryption, and role-based access control, to safeguard sensitive information.

Feasibility:

- ✓ Technical Feasibility: Leveraging established technologies and frameworks ensures a reliable and scalable technical foundation. Industry-standard security measures and proven development tools enhance technical feasibility.
- ✓ Operational Feasibility: Seamless integration with existing NNPC systems enhances operational efficiency. The phased development approach allows for continuous stakeholder engagement, ensuring alignment with operational needs.
- ✓ Economic Feasibility: The estimated budget (₦34.5M - ₦46.5M) is economically viable, offering potential benefits such as improved efficiency and informed decision-making.
- ✓ Resource Availability: Skilled professionals and necessary resources are readily available, with planned early procurement to mitigate potential delays.
- ✓ User Acceptance: The project plan includes iterative user testing and feedback sessions, ensuring the system meets NNPC procurement staff expectations.

E). Communication and Stakeholder Management:

i. Regular communication with NNPC stakeholders through progress reports, meetings, and demonstrations.
ii. Address concerns and feedback promptly to ensure project alignment with NNPC's needs.
iii. Maintain transparency and clarity throughout the development process.

F). Risk Management:

i. Identify potential risks like technology challenges, resource constraints, and stakeholder disagreements.
ii. Develop mitigation plans to address each risk and minimize its impact on the project.
iii. Continuously monitor risks and adjust plans as needed, updating the risk log:
    - Log each identified risk: Include details like risk description, likelihood, impact (on project goals, budget, timeline, etc.), and initial mitigation strategy.
    - Assign ownership: Designate someone responsible for monitoring and updating the risk log for each identified risk.
    - Regularly review and update the log: Schedule periodic reviews (e.g., weekly, bi-weekly) to assess the status of each risk, including:
        - Changes in likelihood or impact: Update the log if the probability or severity of the risk changes.
        - Mitigation plan effectiveness: Evaluate if the mitigation strategy is working as intended. Adjust or refine the plan if needed.
        - New risks emerging: Identify and log any new risks that arise throughout the project.
    - Maintain historical data: Track the evolution of each risk in the log, including past updates, actions taken, and their outcomes. This provides valuable insights for future projects.

2. DATCON Search Engine and Document Manager Project Schedule

- Phase 1: Requirements Gathering and Analysis (2 weeks)
  - Week 1: Conduct meetings with NNPC procurement staff to understand detailed requirements (functionality, user roles, integrations).
  - Week 2: Analyze requirements, document use cases, and define system architecture.
- Phase 2: System Design and Prototyping (3 weeks)
  - Week 1: Design system modules (data model, UI/UX mockups, workflow diagrams).
  - Week 2: Develop low-fidelity prototype for user testing and feedback.
  - Week 3: Refine design based on user feedback and finalize technical specifications.
- Phase 3: Development and Testing (12 weeks - 3 Sprints)
  - Sprint 1 (4 weeks): Develop Core Functionality (user registration, data entry, basic search).
  - Sprint 2 (4 weeks): Implement Document Management features (scanning, indexing, security).
  - Sprint 3 (4 weeks): Develop Grading and Reporting modules, integrate with NNPC systems, final testing.
- Phase 4: Deployment and Training (2 weeks)
  - Week 1: System deployment, user acceptance testing, and data migration.
  - Week 2: User training, address initial issues, and document system operation procedures.
- Phase 5: Maintenance and Support (Ongoing)
  - Provide ongoing support and bug fixes.
  - Monitor system performance and usage.
  - Plan for future enhancements based on user feedback and evolving needs.

The DATCON project timeline includes key milestones such as finalizing the System Design Document by the end of Phase 2, having a prototype ready for user testing by the end of Week 2 in Phase 3, completing Sprint 1 by the end of Week 4 in Phase 3, deploying the system by the end of Week 3 in Phase 4, and finishing user training by the end of Week 2 in Phase 5. Communication and monitoring involve weekly team meetings, regular updates to NNPC stakeholders, and the use of project management tools for efficient task tracking and communication throughout the project.

3. Report on Resource Requirements and Cost Implications for DATCON Project

Report Title: Resource Requirements and Cost Implications for DATCON Search Engine and Document Manager Project

Executive Summary:

This report outlines the resource requirements and estimated costs associated with the development and implementation of the DATCON Search Engine and Document Manager project. The project aims to streamline contractor/consultant management within NNPC's procurement department through a centralized platform for data storage, document management, and performance evaluation.

Key findings include:

- Personnel: A team of software developers, UI/UX designers, and security consultants will be required alongside existing staff.
- Hardware and Software: Server equipment, software licenses, and document scanning solutions are necessary.
- Training and Documentation: User training and system documentation will be crucial for successful adoption.
- Total Estimated Budget: ₦33 million - ₦45 million.

Investing in DATCON will yield significant benefits such as improved efficiency, enhanced data visibility, informed decision-making, and potential cost savings in contractor/consultant management.

Introduction:

The NNPC procurement department faces challenges in managing numerous contractor and consultant profiles and documents. The DATCON project seeks to address these challenges by establishing a centralized platform for efficient data storage, retrieval, and analysis.

This report analyzes the resource requirements and cost implications associated with the project's development and implementation. It aims to provide NNPC management with a clear understanding of the necessary resources and potential financial commitments.

Methodology:

- ✓ Interviews: Discussions with NNPC procurement staff to understand specific needs and requirements.
- ✓ Market research: Analysis of existing vendor solutions and pricing for hardware, software, and services.
- ✓ Project estimates: Internal cost calculations based on resource needs and industry benchmarks.

Resource Requirements:

The project necessitates the following resources:

- ➢ Personnel:
  - o Project Team:
    The project requires existing staff for roles such as System Analyst (Lead), Software Developers, Database Administrator, Security Expert, UI/UX Designer, Project Manager, and Quality Assurance (QA) Analyst.
- ➢ Additional Personnel:
  - ▪ The include NNPC procurement staff for user testing and existing staff for System Administration and IT Support.
- ➢ Hardware and Software:
  - o Server and storage equipment.
  - o Software licenses (Database, Development tools, Security solutions).
  - o Document scanning and management software.
  - o Project management and communication tools.
- ➢ Training and Documentation:
  - o User training for NNPC procurement staff.
  - o System documentation for internal reference and future maintenance.

Cost Implications:

The estimated costs of the project are categorized as follows:

- o Personnel: ₦13.5 million - ₦19.5 million (including salaries, benefits, and contractor fees).
- o Hardware and Software: ₦17 million - ₦25 million (including equipment purchase, software licenses, and maintenance).
- o Training and Documentation: ₦2 million - ₦3 million.

Risk Assessment:

The potential risks of the projects include:

- Technology challenges: unforeseen integration issues or software development delays.
- Resource availability: difficulties in acquiring equipment.
- Stakeholder disagreements: changes in requirements or conflicting priorities during project execution.

These risks have been factored into the cost estimates and mitigated through strategies such as phased development.

Budget Breakdown:

Category	Subcategory	Cost Range (₦)	Justification
Personnel	Project Team	13,500,000 - 19,500,000	Includes salaries, benefits for new hires/consultants, and internal personnel redeployment costs.
			* Software Developers (2): 4,000,000 - 6,000,000 per year (depending on experience)
			* Quality Assurance (QA) Analyst: 3,000,000 - 4,000,000 per year
			* Security Expert (Consultant): 1,500,000 - 2,000,000 per month
			* UI/UX Designer: 3,000,000 - 4,000,000 per year
	Additional Personnel	-	Existing staff costs covered under operational budget.
Hardware & Software	Server & Storage	10,000,000 - 15,000,000	Based on required storage capacity and processing power.
	Software Licenses	5,000,000 - 7,000,000	Includes database, development tools, security solutions, and document scanning software licenses.
	Project Management & Communication Tools	500,000 - 1,000,000	Subscription fees for online collaboration platforms or purchase of dedicated software.
Training & Documentation	User Training	1,000,000 - 2,000,000	Internal or external training sessions for NNPC procurement staff.
	System Documentation	500,000 - 1,000,000	Technical documentation and user manuals for future reference and maintenance.
Contingency	Unforeseen Costs	5,000,000 - 10,000,000	Covers potential hardware/software glitches, delayed deliveries, or minor requirement changes.

Estimated Budget: ₦34,500,000 - ₦46,500,000

It is useful to note that the above is a high-level breakdown, and specific costs may vary based on vendor negotiations, chosen technologies, and project scope adjustments.

Comparative Analysis:

The project's resource requirements and costs are comparable to similar platforms implemented within other large organizations. The chosen technologies and vendor solutions offer competitive pricing and scalability for future growth.

Recommendations:

Based on the analysis, the below is recommend:

- ✓ Approval of the ₦34.5 million - ₦46.5 million budget.
- ✓ Early procurement of key hardware and software to avoid potential delays.
- ✓ Phased development approach to manage risks and ensure stakeholder engagement.
- ✓ Ongoing monitoring and reporting of project progress and costs.

Conclusion:

The DATCON project offers significant potential to improve NNPC's procurement processes and data management capabilities. By carefully planning resource requirements and understanding cost implications, successful project execution can be achieved, delivering long-term value and return on investment.

Section B

DATCON Search Engine and Document Manager Project Documentation

1. Introduction:

- Purpose:

  The DATCON Search Engine and Document Manager project aims to address the challenges faced by the Procurement section of NNPC in managing the profiles and documents of Consultants and Contractors. This document outlines the system's functionalities, technical specifications, and implementation plan.

- Scope:
  This project encompasses the development of a user-friendly web-based system with features like user registration, document management, search and retrieval, grading, security, reporting, analytics, and seamless integration with existing NNPC systems.

2. Data Documentation:

- Data Dictionary:

Entity Name	Description	Data Type	Constraints	Examples
ContractorID	Unique identifier for contractors	INT	Primary Key	1001, 1002, ...
ConsultantID	Unique identifier for consultants	INT	Primary Key	2001, 2002, ...
CompanyName	Name of the contracting or consulting company	VARCHAR(100)	Not null	ABC Contractors, XYZ Consultants
Directors	Names of the company directors	VARCHAR(150)	Not null	John Doe, Jane Smith
Address	Company address	VARCHAR(200)		123 Main St, City, Country
ScopeOfContracts	Description of the types of contracts undertaken	TEXT		Infrastructure, IT, ...
ProjectsCarriedOut	List of projects previously completed	TEXT		Project A, Project B
KeyPersonnel	Names of key personnel in the company	VARCHAR(150)		Project Manager, Lead Engineer
BasicData	Basic information about key personnel	TEXT		Educational background, experience

- Data Backup and Recovery Procedures

  To ensure the integrity and availability of the stored information, the DATCON Search Engine and Document Manager will implement robust data backup and recovery procedures. Regular automated backups will be performed on the database and associated documents. These backups will be stored in geographically diverse locations to mitigate the risk of data loss due to unforeseen events such as hardware failures, natural disasters, or cyberattacks. The recovery process will be thoroughly tested to guarantee a quick and efficient restoration of data in case of any system disruptions.

3. System Requirements:

- Functional Requirements:
  - User Registration and Management: Register and manage Contractors and Consultants, including profile creation, editing, and access control.
  - Document Management: Upload, store, categorize, and retrieve various document types related to Contractors and Consultants.
  - Search and Retrieval: Perform efficient searches based on various criteria, including keywords, document types, dates, and contractor/consultant information.
  - Grading and Evaluation: Define evaluation criteria for Contractors and Consultants, grade submitted proposals and projects, and generate reports.
  - Security and Access Control: Implement robust security measures to protect sensitive data, including user authentication, data encryption, and role-based access control.
  - Reporting and Analytics: Generate reports and dashboards to track contractor/consultant performance, project progress, and identify trends.
  - System Integration: Integrate with existing NNPC systems for data exchange and seamless user experience.

- Non-Functional Requirements:
  - Performance: The system should be able to handle a high volume of users and data with minimal response times.
  - Scalability: The system should be scalable to accommodate future growth in the number of users and data volume.

- Availability: The system should be highly available with minimal downtime.
- Usability: The system interface should be user-friendly and intuitive for NNPC procurement staff.
- Maintainability: The system should be designed for easy maintenance and future enhancements.

4. Technical Specifications:

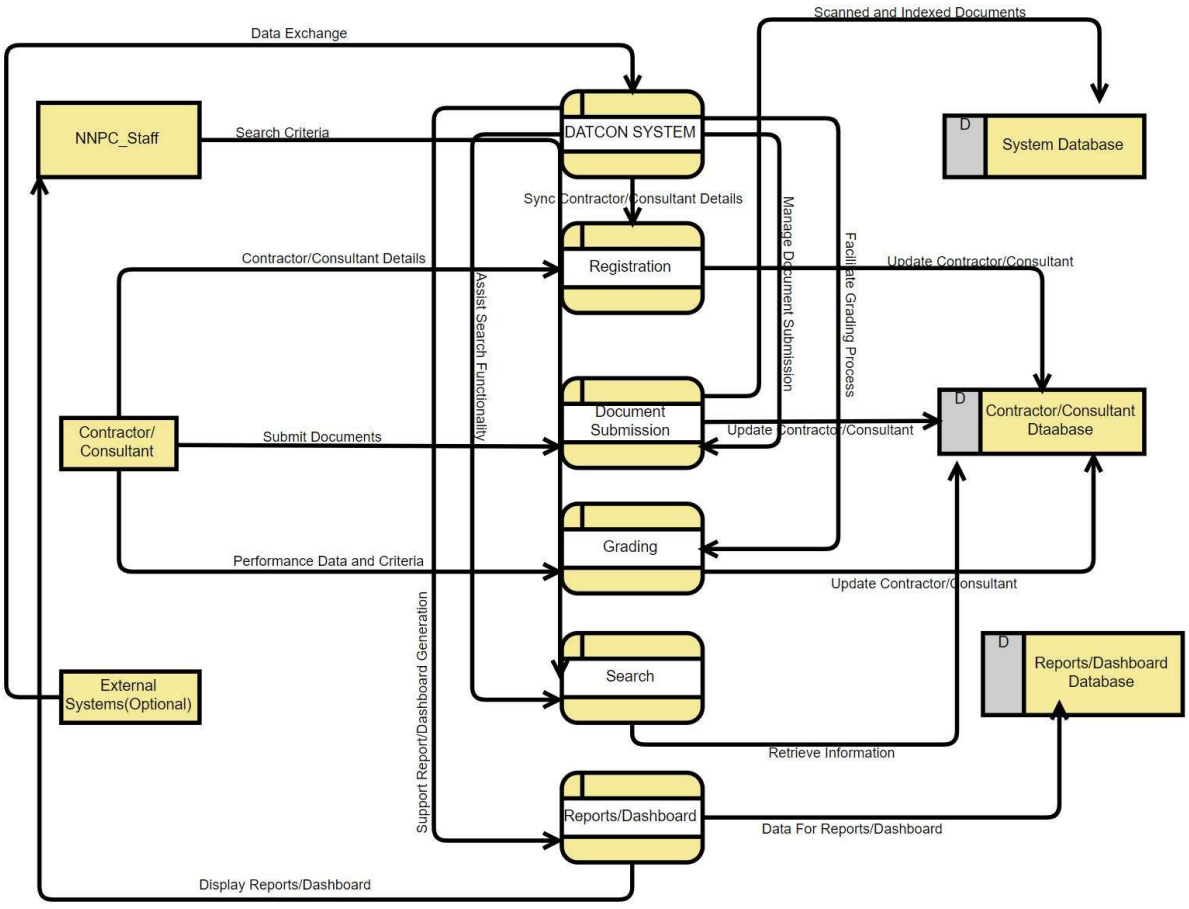
- Hardware and Software:
  - Server and storage infrastructure to handle the expected data volume and user traffic.
  - Database management system (e.g., MySQL, PostgreSQL) to store contractor/consultant data and documents.
  - Development tools and frameworks (e.g., Python, Django, ReactJS, PHP) for building the system's frontend and backend components.
  - Document scanning and management software for efficient document capture and indexing.
  - Security solutions (e.g., firewalls, intrusion detection systems) to protect sensitive data.
  - Project management and communication tools for effective team collaboration.
- System Architecture
  - High-Level Architecture:
    The DATCON SEARCH ENGINE AND DOCUMENT MANAGER system follows a three-tier architecture:
    - Presentation Tier: This tier includes the user interface (UI) implemented using HTML, CSS, Bootstrap, and JavaScript. jQuery is used for DOM manipulation, and Font Awesome provides scalable vector icons for a better user experience.

    - Application Tier: PHP is used to implement the server-side logic, handling user requests, processing data, and interacting with the MySQL database. AJAX is utilized for asynchronous communication between the client and server, enhancing the responsiveness of the application.

- Data Tier: MySQL Database serves as the backend database management system for storing and retrieving information related to Contractors, Consultants, and Documents.

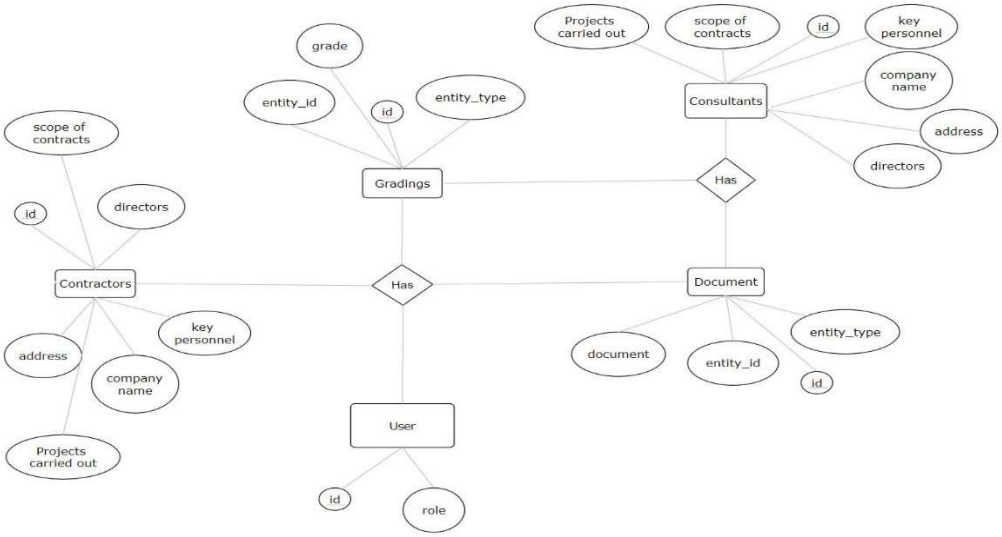
5. Data Flow Diagram (DFD):

A Data Flow Diagram (DFD) is a visual representation of the flow of data within the system. It illustrates how data moves between different components of the system. Below is a high-level DFD for the DATCON Search Engine and Document Manager:



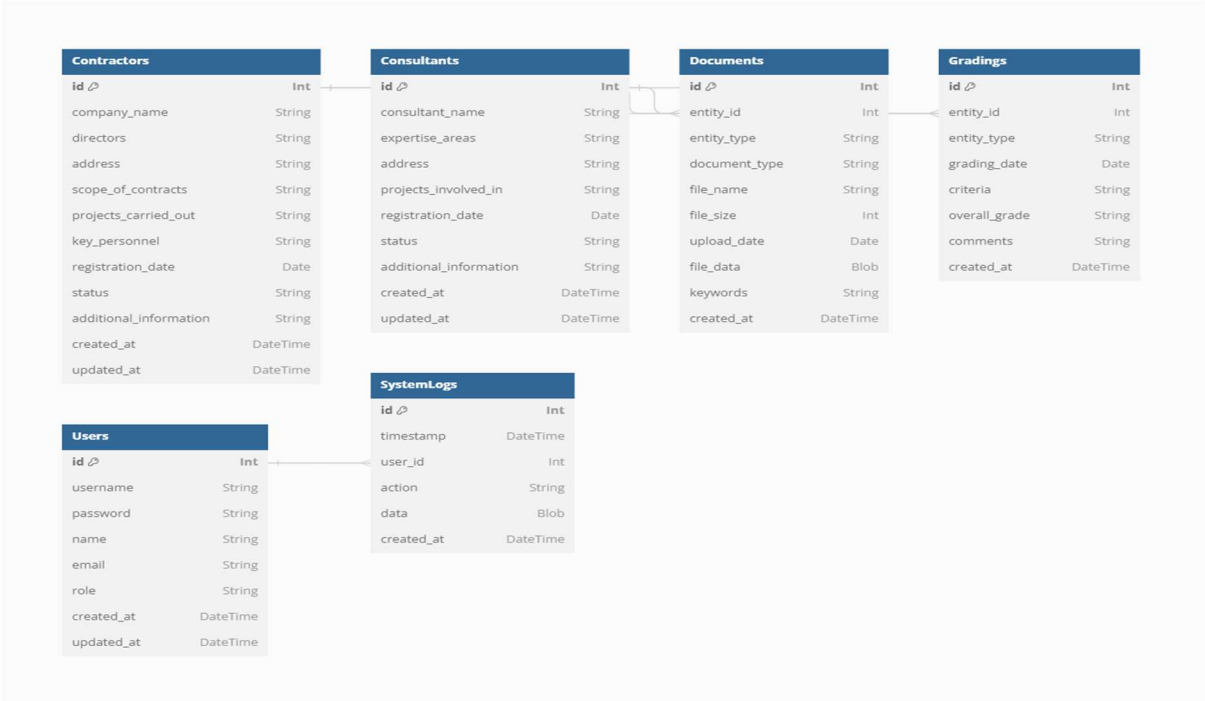
6. Entity Relationship Diagram (ERD):

The Entity Relationship Diagram (ERD) visually represents the relationships between different entities in the database. Below is an ERD for the DATCON Search Engine and Document Manager:



7. Database Schema:

The database schema provides a detailed description of the tables, their columns, and the relationships between them. Below is a database schema for the DATCON Search Engine and Document Manager:



8. Testing Documentation:

- Test Plan

The testing strategy involves a combination of manual and automated testing. Key testing types include:

- Unit Testing: Individual components, functions, and modules are tested in isolation.
- Integration Testing: Ensures that different modules work together seamlessly.
- System Testing: Validates the entire system's functionality, including registration, document management, grading, and search capabilities.

- Test Cases

Example test cases include:

- Verify successful registration of a new Contractor or Consultant.
- Test the document scanning and saving functionality.
- Validate the grading system by applying predefined criteria.
- Check the effectiveness of the search capabilities for Contractors, Consultants, and Documents.

9. Security Measures:

The security of the DATCON SEARCH ENGINE AND DOCUMENT MANAGER is prioritized through:

- Authentication and Authorization: Users are required to log in, and access permissions are defined based on roles. Role-based access control ensures that users only have access to the functionalities necessary for their roles.

- Data Encryption: Sensitive data, such as passwords, is encrypted during storage and transmission using industry-standard cryptographic algorithms. Hashing algorithms, such as SHA-256, are employed to securely store user passwords, ensuring that even in the event of a data breach, password information remains protected.

- Secure File Handling: Uploaded documents are stored securely, and file uploads undergo rigorous validation to prevent unauthorized content.

Additionally, the system employs secure file transfer protocols to ensure the confidentiality and integrity of transmitted documents.

10. Conclusion:

Charting a Secure Future for NNPC Procurement with DATCON Search Engine and Document Manager

In conclusion, the DATCON Search Engine and Document Manager project represents a groundbreaking solution to the challenges faced by the NNPC Procurement section. With a meticulously designed system that prioritizes security, efficiency, and seamless integration, DATCON is poised to revolutionize contractor and consultant management.

By incorporating state-of-the-art security measures such as robust authentication and authorization protocols, data encryption, and secure file handling, the DATCON system ensures the utmost protection of sensitive information. The implementation of industry-standard cryptographic algorithms and stringent validation processes signifies our commitment to safeguarding user data, even in the face of potential threats.

As we embark on this transformative journey, the DATCON team envisions not just a system but a paradigm shift in how procurement processes are managed. The comprehensive project documentation, encompassing system requirements, technical specifications, and testing procedures, lays the foundation for a successful implementation.

In essence, DATCON is not just a search engine and document manager; it is a testament to innovation, collaboration, and dedication to excellence. With a user-centric approach, cutting-edge technology, and a robust security infrastructure, DATCON promises to redefine efficiency and transparency in contractor and consultant management at NNPC. Together, we are not just building software; we are shaping the future of procurement.