University of Mpumalanga

School of Computing & Mathematical Sciences

Project Proposal:

Software Project Management Plan

Project Name: ump job connect

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1.Introduction

1.1. Project Overview

The **UMP Job Connect** platform is designed to improve the efficiency of student employment by offering a centralized system for posting and applying for jobs. Its primary goal is to close the gap between students and available on-campus job opportunities, streamlining the hiring process. The system uses AI-driven selection to automatically assess candidates based on predefined criteria, minimizing administrative efforts and ensuring a fair, unbiased hiring process.

This project is motivated by the need to establish a clear, accessible, and efficient recruitment system for students seeking part-time jobs, internships, and assistant roles within the university. Traditional methods of hiring typically involve manual screening, which can be slow and susceptible to bias. With the use of AI in the selection process, the platform ensures that candidates are assessed fairly based on their qualifications and merits. Additionally, the system offers real-time updates and email notifications, enhancing communication between applicants and administrators.

Currently, students at the University of Mpumalanga often miss out on on-campus job opportunities due to the reliance on email announcements, which may go unnoticed, especially if students don't check their emails regularly. This creates a lack of a centralized platform for finding jobs, making the search process inefficient and challenging.

The **UMP Job Connect** portal will resolve this issue by providing an easy-to-access online platform for students to view and apply for various on-campus job roles. These positions may include tutoring, student assistance, mentorship, housing support, research help, and Work-Integrated Learning (WIL) programs, particularly for hospitality and agriculture students.

This initiative aligns with the University of Mpumalanga's commitment to empowering students, embracing digital transformation, and fostering innovation within higher education. By integrating cutting-edge technology, the portal will offer a structured, user-friendly, and scalable recruitment system that benefits both students and university departments. Ultimately, **UMP Job Connect** aims to not only help students secure meaningful jobs but also support their professional development, financial stability, and overall success during their academic journey.

1.2 References

University of Mpumalanga Employment Policies

- **Almanac and General Rules**: University of Mpumalanga Almanac
- **PAIA Manual**: University of Mpumalanga PAIA Manual
- **Advertised Positions**: University of Mpumalanga Advertised Positions

Existing Job Portal Solutions

- **Job Portal Case Studies**: Applicants' Perception of AI in Recruitment
- **Overview of Job Portal Systems**: Artificial Intelligence in Hiring

AI-Based Recruitment Methodologies

- **Research on AI in Recruitment**: Examining the Use of AI in Recruitment Processes
- **Practical Applications**: The Impact of Artificial Intelligence in Recruitment

1.3 Project Deliverables

This Project will produce a fully functional UMP Job Connect, ensuring efficient and reliable job postings, applications and tracking. The following deliverables will be provided:

- **Software Project Management Plan**: This is the current document, which serves as an outline of technical and managerial processes required for the development and delivery of the portal.
- **Client-Developer Agreement**: A formal agreement between the university (client) and the development team, detailing the scope, requirements, and expected deliverables of the system.
- **Requirements Analysis Project**: A document defining the system's functional and non-functional requirements. It will include key models such as the use case models, functional model and dynamic model.
- **System Design Document**: This specific document will outline the overall architecture of the system.
- **Test Manual**: This will serve as a detailed manual documenting unit and system tests conducted on the portal before deployment. It will include test cases, expected outcomes, and actual results to ensure system reliability.
- **Source Code**: This will be a complete source code for all subsystems of the UMP Job Connect ensuring maintainability and future enhancements.

1.4 Evolution of SPMP

The Software Project Management Plan (SPMP) is a dynamic document that evolves throughout the lifecycle of the UMP Job Connect. As the project progresses from initiation to deployment, the SPMP will undergo regular updates to reflect changes in scope, requirements, risks and resource allocations.

Initially, the SPMP outlines project objectives, scope, deliverables and timeline. As the project moves through planning, development and implementation phases, the SPMP is refined to include:

- Detailed task assignments and development methodologies
- Testing strategies and risk mitigation plans
- Lessons learned and project performance evaluations

By keeping the SPMP dynamic and up-to-date, the project team ensures the portal remains flexible, efficient and aligned with stakeholder needs throughout its lifecycle.

1.5 Reference Material

The development of this SPMP was guided by industry best practices, software engineering principles, and relevant academic and professional sources. The following refence materials were used:

- University of Mpumalanga Internal Policies and Guidelines – Institutional guidelines on student employment, Work-Integrated Learning (WIL) and digital platforms. (UMP, 2024)
- PMBOK® Guide – Project Management Institute (PMI) – A globally recognized standard for project management processes and best practices. (Ahmad S Al-Shamsi, 2021)

1.6 Definitions and Acronyms

Definitions

- **Software Project Management Plan**: A document that outlines processes, methodologies, resources and schedules for managing a software development project
- **Work-Integrated Learning (WIL)**: A structured program that integrates academic learning with practical work experience.
- **Deployment**: The process of making the system available for use in production environment.

Acronyms

- **UMP**: University of Mpumalanga
- **SPMP**: Software Project Management Plan
- **WIL**: Work-Integrated Learning
- **PMBOK**: Project Management Body of Knowledge
- **PMI**: Project Management Institute

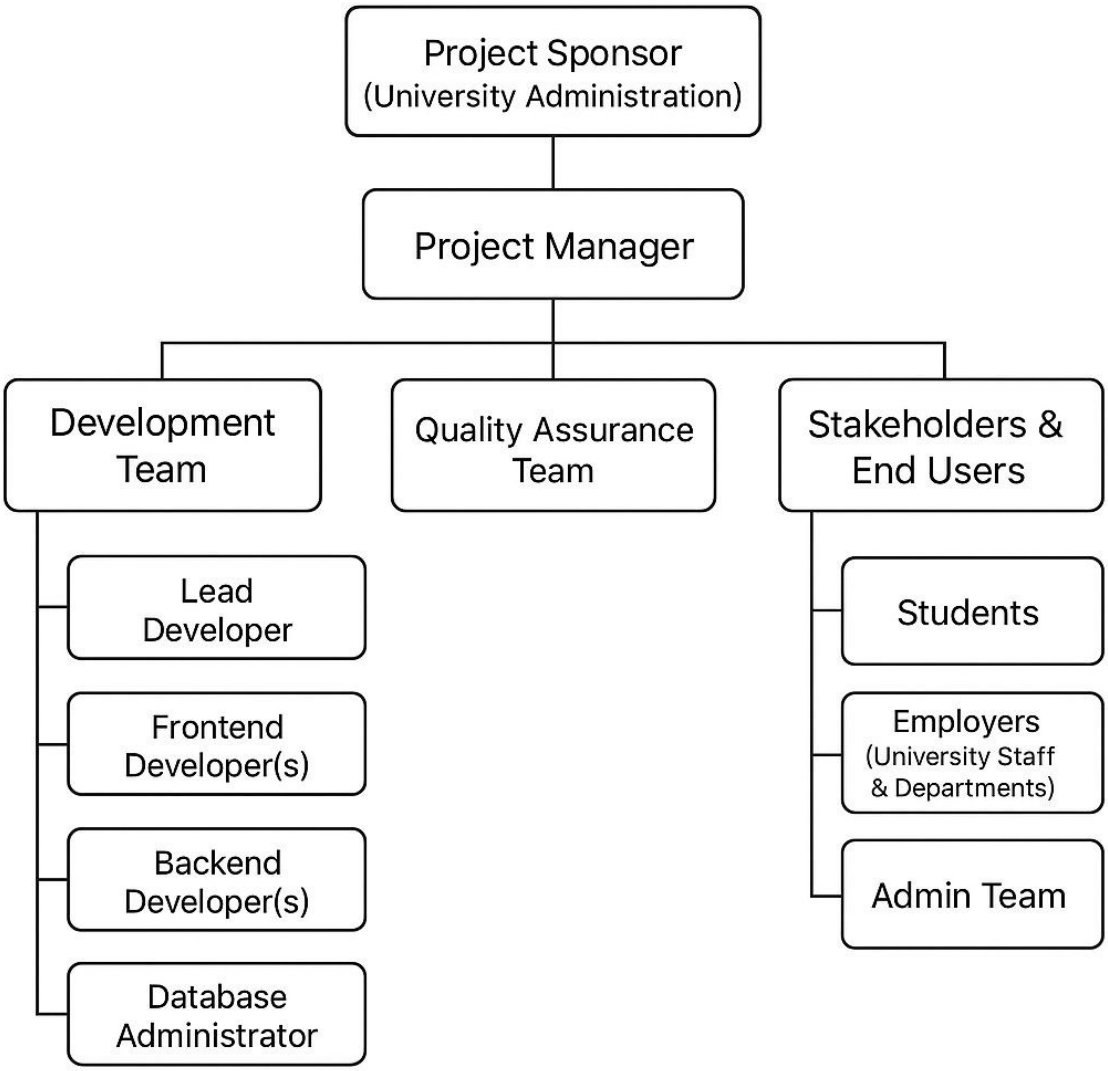
2.Project Organization

2.1 Process Model

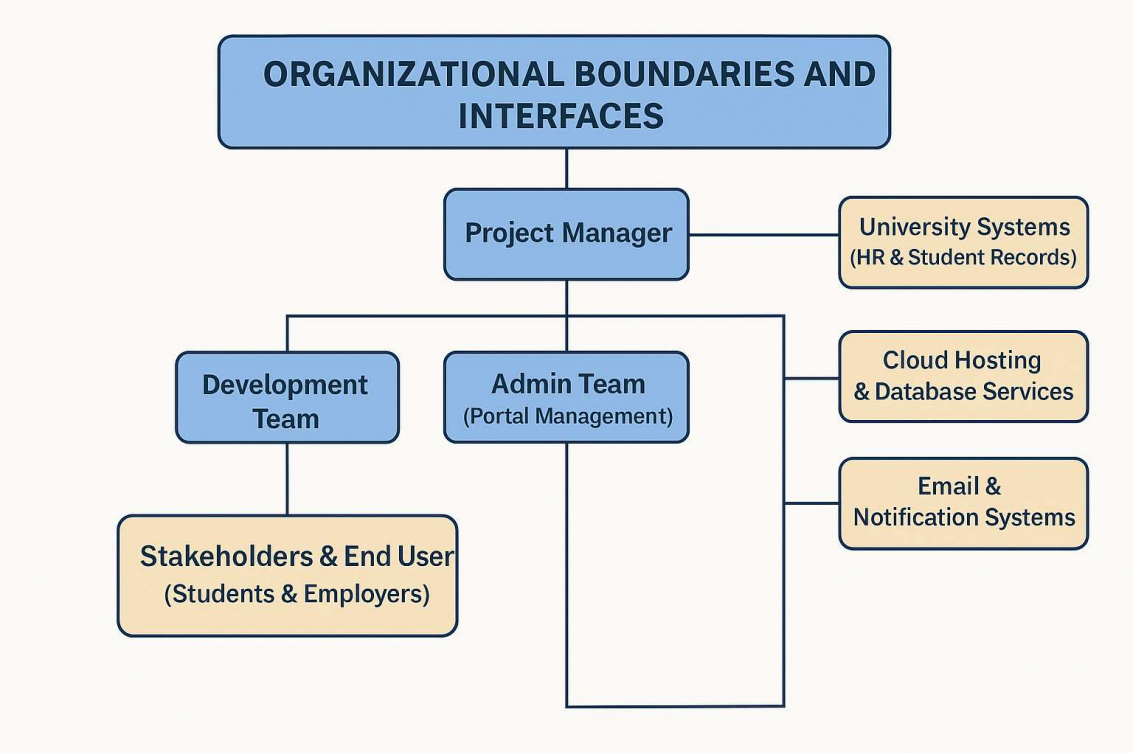
The UMP Job Connect will be using the Agile Software Development Model, Specifically the Scrum framework. This model is chosen for its flexibility, iterative nature, and ability to accommodate changes based on stakeholder feedback.

2.2 Organizational Structure

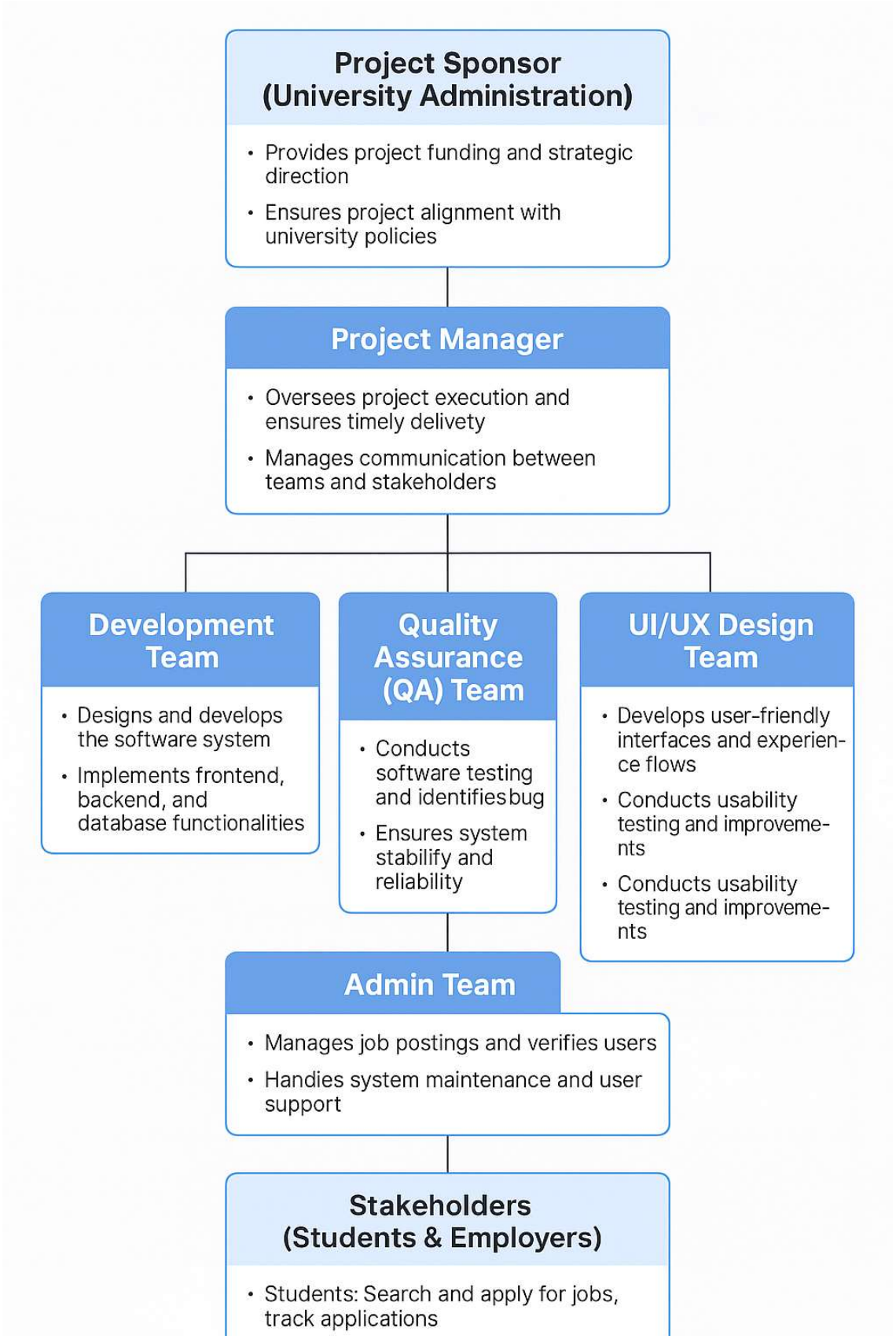
The organizational structure follows a hierarchical and functional layout, ensuring clear roles and responsibilities.



2.3 Organizational Boundaries and Interfaces



2.4 Project Responsibilities


Project Sponsor (University Administration)
• Provides project funding and strategic direction
• Ensures project alignment with university policies
Project Manager
• Oversees project execution and ensures timely delivety
• Manages communication between teams and stakeholders
Development Team
• Designs and develops the software system
• Implements frontend, backend, and database functionalities
Quality Assurance (QA) Team
• Conducts software testing and identifies bug
• Ensures system stabilify and reliability
UI/UX Design Team
• Develops user-friendly interfaces and experien-ce flows
• Conducts usability testing and improveme-nts
• Conducts usability testing and improveme-nts
Admin Team
• Manages job postings and verifies users
• Handies system maintenance and user support
Stakeholders (Students & Employers)
• Students: Search and apply for jobs, track applications

3. Management Process

3.1 Management Objectives and Priorities

Ensure a user-friendly, secure, and efficient platform for both students and administrators.

3.2 Assumptions, Dependencies, and Constraints

- Assumption: Students have access to the internet.
- Dependency: University IT infrastructure support.

3.3 Risk Management

Risk ID	Risk Description	Likelihood	Impact	Mitigation Strategy	Owner
R1	AI makes biased or inaccurate decisions	Medium	High	Train AI on diverse datasets; include human review for edge cases	AI Team
R2	Student data breach	Low	High	Implement strong encryption, secure authentication	Dev Team / IT Security
R3	Low student engagement or usage	Medium	Medium	Conduct onboarding sessions, send regular email updates	Project Manager
R4	Server downtime during critical times	Low	High	Use cloud infrastructure with failover and monitoring tools	Backend DevOps
R5	Budget overrun	Medium	Medium	Regular financial tracking, scope control	Project Manager
R6	Delayed delivery of features	High	Medium	Agile sprints, daily standups, clear prioritization	Development Team
R7	Integration issues with email services	Medium	Low	Test email APIs in staging, use reliable providers like SendGrid	Dev Team

3.4 Monitoring and Control Mechanisms

Regular progress reviews and feedback loops will be implemented.

4. Technical Process

4.1 Methods, Tools, and Techniques

- **Frontend:** React.js or Next.js
- **Backend:** Node.js with Express / Django with Python
- **Database:** SQLITE
- **AI Model:** TensorFlow / Scikit-learn

4.2 Software Documentation

Comprehensive documentation including API endpoints, data structures, and AI model parameters.

4.3 Project Support Functions

Support includes debugging tools, version control (Git), and cloud-based hosting.

5. Work Packages, Schedules, and Budget

5.1 Work Packages

Work Package	Description
WP1: Requirements Gathering	Collecting system requirements from students, staff, and IT policies.
WP2: UI/UX Design	Designing user interfaces for students and admin panels using wireframes.
WP3: Frontend Development	Developing the web interface using React.js or Next.js.
WP4: Backend Development	Creating APIs and logic with Node.js/Express or Django.
WP5: AI Model Development	Designing and training a model for automated application screening.

Work Package	Description
WP6: Database Design	Designing and setting up the SQL or MongoDB database.
WP7: Integration	Integrating AI, frontend, backend, email service, and database.
WP8: Testing & QA	Functional, unit, integration, and user testing.
WP9: Deployment	Hosting on a cloud server and configuring domain, security, etc.
WP10: Documentation	Technical, user, and maintenance documentation preparation.

5.2 Dependencies

Dependency	Description
AI module depends on dataset	Model can't be built until student/job data is available.
Backend depends on finalized design	Backend APIs are aligned with frontend routes and functionality.
Email service setup depends on backend	Needs backend logic to trigger notifications.

5.3 Resource Requirements

Resource	Role/Use
Developers (Frontend & Backend)	Building the portal logic and interfaces
AI/ML Specialist	Developing and optimizing the AI model
UI/UX Designer	Designing layouts and user flows
Cloud Infrastructure	Hosting platform (AWS, GCP, or similar)
Email Service Provider	SendGrid, Nodemailer, or similar for email automation

5.4 Budget Requirements

Estimated budget requirements for development:

Item	Estimated Cost (ZAR)
Developer Stipends (3 people)	R60,000
Cloud Hosting & Database	R5,000
Email API Services	R2,000
Design Software (optional)	R1,500
Miscellaneous	R1,500
Total Estimated Budget	R70,000

5.5 Budget and Resource Allocation

Task	Budget %	Resources Assigned
Development	60%	Developers, PM
AI Model	15%	AI/ML Specialist
Hosting & Infrastructure	10%	DevOps
Design	10%	UI/UX Designer
Contingency & Testing	5%	QA/Testers

5.6 Schedule

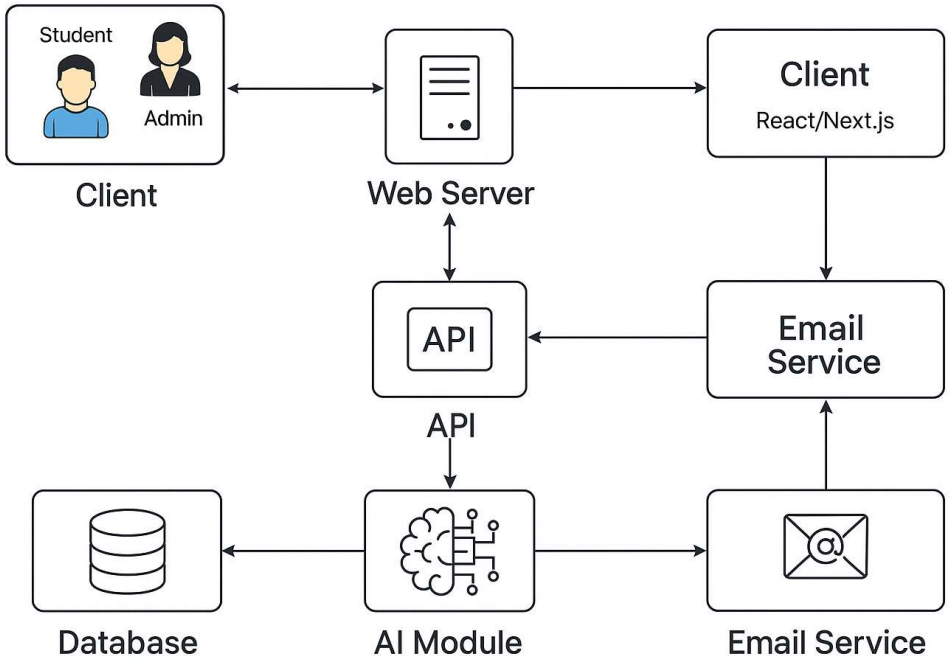
A six-month Gantt-style breakdown:

Month	Tasks
Month 1	Requirements gathering, planning, initial UI design
Month 2	Frontend development, backend scaffolding
Month 3	Continue development, start AI model training
Month 4	Finish development, AI integration, testing begins

Month	Tasks
Month 5	Full QA cycle, bug fixes, deployment setup
Month 6	Final deployment, user onboarding, documentation submission

6. Project Success Criteria

6.1 Network Diagram



6.2 Project Milestones

Milestone	Target Date	Description
M1: Requirements Finalized	Month 1	Completion of all functional and non-functional requirements
M2: Prototype UI Ready	Month 2	First version of user interface design
M3: Backend API & DB Configured	Month 3	Database schema and RESTful APIs fully functional

Milestone	Target Date	Description
M4: AI Integration Complete	Month 4	AI model connected and tested for auto-selection
M5: System Testing & Feedback	Month 5	Complete system tested with real users
M6: Final Deployment	Month 6	Fully functional portal live with users onboarded

6.3 Approval Process

- Internal approval by the Project Supervisor or University IT Head
- Acceptance by end-users (students and staff) during final testing
- Stakeholder sign-off on performance, usability, and security

6.4 Acceptance Criteria

Criteria	Expected Outcome
Usability	Students and admins can navigate and use the system easily
Functionality	All key features work as described in requirements
AI Selection Accuracy	80–90% match between AI decision and human evaluation
Email Notification	Timely and reliable email status updates
Security	Data encryption, proper authentication in place

6.5 Critical Success Factors

- User Adoption: At least 70% of eligible students use the portal
- AI Accuracy: AI decisions align with admin choices in ≥85% of cases
- System Availability: 99% uptime during operating hours
- Response Time: Pages load within 3 seconds
- Feedback Score: ≥4 out of 5 average rating from pilot user feedback

7. Success Criteria

Criteria	Description
System Usability	The platform should be intuitive and easy to use for both students and administrators.
AI Decision Accuracy	The AI-driven application selection should match admin decisions with ≥85% accuracy.
User Adoption Rate	At least 70% of eligible students should register and apply for jobs on the portal.
System Reliability	The portal should maintain an uptime of 99% during operating hours, with minimal downtime.
Performance Metrics	Pages and job listings should load within 3 seconds for a smooth user experience.
Security Compliance	The portal must meet university data protection standards and maintain secure user authentication.
Email Communication Efficiency	Email notifications should be sent on time and accurately reflect application status.
Student Feedback	Positive feedback, with an average rating of 4 out of 5 for user satisfaction and overall system functionality.
Administrative Efficiency	Admins should be able to post jobs, review applications, and manage the system with minimal effort and time.

8. Summary

The **University of Mpumalanga Job Connect** is a web-based platform designed to streamline the campus hiring process by connecting students with on-campus job opportunities. The system integrates an AI-powered application selection process, ensuring that job applications are efficiently evaluated based on predefined criteria such as GPA, experience, and skills.

Key highlights of the project include:

- **AI-Driven Selection**: The system leverages AI to evaluate applications, reducing the time and effort required by administrators while maintaining fairness and consistency in the recruitment process.

- **User-Friendly Interface**: Both students and administrators will benefit from an easy-to-navigate interface, ensuring seamless interaction with the platform.
- **Email Notifications**: Students will receive timely updates about their application status, and admins will be able to monitor approvals and rejections through regular reports.
- **Database and Cloud Infrastructure**: The portal will be backed by a robust database (PostgreSQL or MongoDB) and hosted on a reliable cloud service to ensure scalability and security.

The project is designed to improve the efficiency of hiring on campus, enhance student experience, and empower the university's administration to manage job postings and applications more effectively. With a detailed roadmap and clear success criteria, the portal is set to provide lasting value to students and staff at the University of Mpumalanga.