



UNIVERSITY OF  
PLYMOUTH

# MAL2020

## COMPUTING GROUP PROJECT

### PROJECT PROPOSAL

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## 1.0 Project Title

Intern Management System

## 2.0 Project Background

Internships play a crucial role in enhancing students' employability and practical readiness for the workplace. They provide opportunities for skill development, industry exposure, and professional networking, often serving as a requirement in higher education programmes (Jackson, 2015). However, many academic institutions continue to depend on fragmented and manual internship management processes—such as email communication, spreadsheets, and paper-based documentation—which limits efficiency, scalability, and administrative visibility (Ndlovu and Singh, 2019).

With increasing student numbers and growing employer demand for skilled interns, the need for a centralised, data-driven, and automated intern management system has become increasingly significant. In particular, the application of Artificial Intelligence (AI) in resume generation, candidate evaluation, and performance analytics has the potential to streamline management processes and enhance decision-making (Chollet, 2021; Jurafsky and Martin, 2023). This project aims to design and develop an AI-enabled Intern Management System (IMS) that supports students, employers, and administrators through automation, intelligent ranking, and structured communication.

## 3.0 Problem Statement

### 1. Inefficiencies in Internship Management

Current internship management approaches are highly manual and prone to delays, errors, and communication gaps. Institutions using spreadsheets, emails, and paper-based methods face administrative burdens and inconsistent workflows (Ndlovu and Singh, 2019). These outdated processes hinder scalability and accurate tracking of student progress.

### 2. Student Challenges in Resume Development and Readiness

Students often lack the skills and guidance to create professional resumes and accurately present their competencies. Research shows a gap between academic preparation and workplace expectations, particularly in areas such as communication, confidence, and practical readiness (Andrews and Higson, 2008). Without structured assessment tools, students struggle to evaluate their strengths and preparedness.

### 3. Employer Difficulties in Candidate Evaluation

Employers frequently receive large numbers of unstructured or inconsistent student applications, increasing the time required for shortlisting (Wiertz et al., 2020). The absence of AI-based ranking and standardised assessment mechanisms leads to increased hiring time and potential oversight of suitable candidates.

### 4. Limited Administrative Oversight and Analytics

Fragmented systems limit administrators' ability to monitor internship placements, track outcomes, and analyse trends. Without data-driven insights, institutions struggle to evaluate programme effectiveness or make improvements (Schwab, 2020).

## 4.0 Objectives

### **1. Improve Internship Process**

To address the inefficiencies of current internship management methods, the system will provide students with a centralized platform to create AI-powered resumes and track internship opportunities. This automation reduces reliance on manual processes such as emails and spreadsheets, making the overall management of internships faster, more accurate, and more transparent.

### **2. Help Students with Resume and Readiness**

To overcome the challenges students face in preparing for internships, the system will include an AI-driven resume builder and assessment tools. These tools will evaluate student fluency, knowledge, and experience, ensuring that each student can generate a professional resume backed by data-driven insights. This equips students with a stronger profile and greater confidence when applying for internships.

### **3. Make Hiring Easier for Employers**

To reduce the time employers spend reviewing unranked applications, the system will enable them to post jobs, review applicants, and access AI-generated candidate rankings. This ensures that employers can identify the most suitable candidates quickly and effectively, improving hiring efficiency while minimizing the risk of overlooking potential talent.

### **4. Give Admin Better Monitoring Tools**

To resolve the lack of transparency in internship management, the system will equip administrators with tools to manage students and employers while monitoring internship outcomes. It will also generate detailed analytical and overall internship reports, giving administrators real-time insights into student performance trends and employer feedback, ultimately supporting data-driven decision-making.

## 5.0 Scope of the Project

### In Scope:

The project will focus on developing a web-based Intern Management System that can be accessed by students, employers, and administrators. Each user role will have secure login access and tailored features to carry out their responsibilities. The system aims to centralize all internship-related processes, making it more efficient and transparent compared to traditional manual methods.

A major component of the system is the AI-powered resume builder. This feature will guide students through fluency assessments, knowledge quizzes, and experience evaluations to measure their readiness for internships. Using the results, the system will automatically generate professional resumes with enhanced formatting and analytical charts. In addition, employers will be able to post jobs, while students can apply directly through the platform. Interview scheduling with notifications and reminders will also be included to improve coordination between both parties.

Administrators will benefit from a dedicated dashboard that allows them to manage student and employer accounts, post reminders, and generate analytical reports on internship outcomes. Employers will also receive AI-based candidate rankings, making the hiring process faster and more effective. All data, including student profiles, job postings, applications, assessments, and reports, will be stored and retrieved using a relational database to ensure accuracy, consistency, and reliability.

### **Out of scope:**

The project will not include the development of a mobile application version, as the focus will remain solely on the web-based platform. Users will be expected to access the system through browsers on their computers or mobile devices. Additionally, the system will not support integration with external platforms such as LinkedIn or other job portals, as the intention is to create a self-contained solution.

Physical interview coordination and offline internship tracking are also beyond the project's scope. The system is designed to manage only online processes, leaving face-to-face interview arrangements and manual record-keeping outside its coverage. Similarly, real-time video conferencing or in-system video interviews will not be implemented, since the platform aims to streamline management tasks rather than replicate existing video call tools.

Finally, the system will not support non-academic job tracking or services related to full-time employment. The solution is specifically tailored to internships and academic-related placements, ensuring that all features remain focused on student career development within an academic context.

## 6.0 Literature Review / Related Works

Professional networking platforms such as **LinkedIn** provide profile building, job searching, and employer engagement tools. While its global user base and networking features are strong, LinkedIn is not designed specifically for internships and lacks AI-driven readiness assessments and automated resume generation (LinkedIn, 2024). The proposed system addresses these gaps by focusing specifically on student preparedness and institutional management needs.

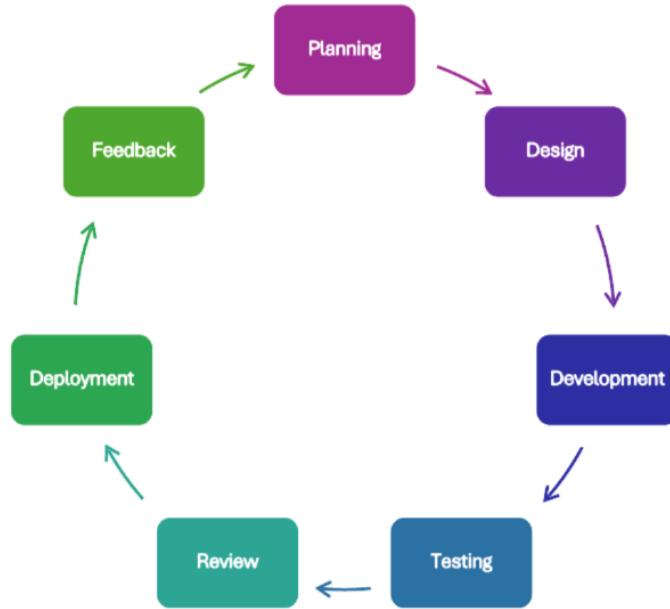
**JobStreet**, widely used in Southeast Asia, offers job postings and filtering tools but is primarily targeted at full-time employment rather than academic internships (JobStreet, 2024). It also lacks automated competency evaluations and does not integrate academic analytics, which limits its suitability for higher education environments.

Research in employability highlights the importance of skill development, structured assessments, and readiness indicators (Jackson, 2015; Andrews and Higson, 2008). Digital platforms incorporating AI and machine-learning algorithms have demonstrated improved predictive accuracy in candidate ranking and resume parsing (Kambhampati, 2023). Furthermore, the adoption of digital management systems has been shown to enhance efficiency, reduce administrative workload, and increase transparency (Ndlovu and Singh, 2019).

The proposed Intern Management System builds on these findings by integrating AI-based assessments, automated resume generation, structured ranking mechanisms, and real-time analytics tailored for academic environments.

## 7.0. Methodology

### 7.1.1 Agile Methodology



The project will adopt the **Agile** methodology to support iterative development, continuous stakeholder feedback, and flexibility—key advantages when developing complex systems with evolving requirements (Schwaber and Beedle, 2020). Agile allows for rapid adaptation to user needs among students, employers, and administrators, reducing risk and ensuring usability (Pressman and Maxim, 2020).

### Tools and Technologies

- **Frontend:** React.js, HTML, CSS, JavaScript, TypeScript, Tailwind CSS
- **Backend:** Node.js, Express.js
- **Database:** MySQL
- **AI Tools:** NLP models (OpenAI/Hugging Face), ML scoring algorithms
- **Collaboration:** GitHub/GitLab, Microsoft Teams
- **Local Testing:** XAMPP

A three-tier architecture (Sommerville, 2016) will be used:

1. **User Interface Layer:** student, employer, and admin portals
2. **Application Layer:** assessment algorithms, resume generation, job posting logic
3. **Database Layer:** relational data storage and retrieval

Six Agile sprints will structure development, covering login, resume builder, job features, interviews, analytics, and final testing.

## Testing

- **Unit testing** of modules
- **Integration testing** for system-wide interactions
- **Usability testing** with student & employer participants
- **Performance testing** to ensure scalability

Evaluation will consider AI accuracy, user satisfaction (SUS scale), and system reliability.

### 7.1.2 Additional Ethical Considerations

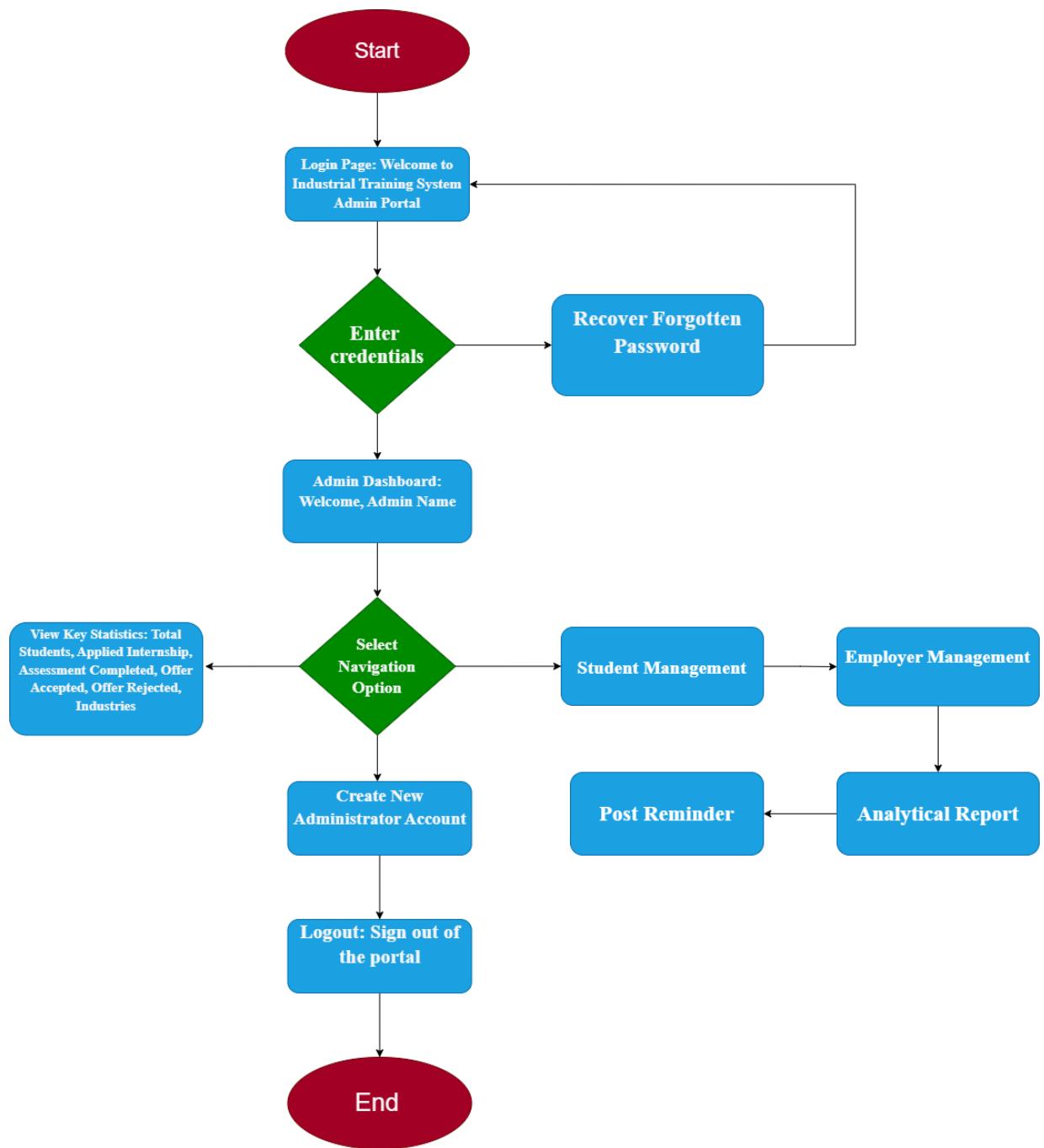
The system will adhere to **GDPR** requirements, including data minimisation, consent, secure storage, and the right to deletion. Sensitive student information will be encrypted. All participants in usability testing will provide informed consent, and no personal data will be used beyond academic purposes (Fowler, 2020).

### 7.1.3 Risk Management

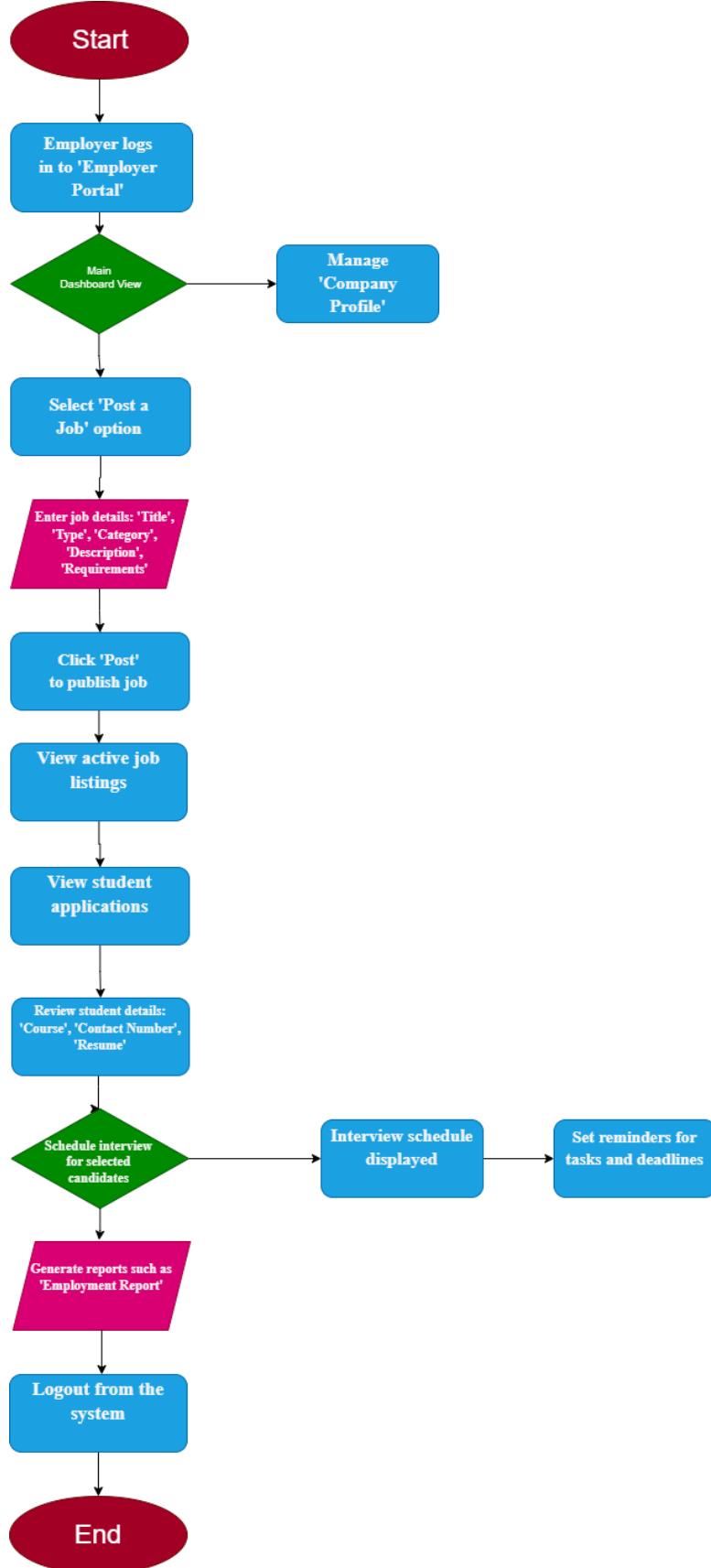
Risk	Impact	Likelihood	Mitigation
<b>Data breaches</b>	High	Medium	Encryption, access controls, secure hosting
<b>AI scoring inaccuracies</b>	Medium	Medium	Regular model testing and validation
<b>Incomplete employer/stakeholder engagement</b>	Medium	Medium	Frequent feedback sessions
<b>Scope creep</b>	Medium	Low	Strict sprint planning and change-control process
<b>System integration failures</b>	High	Low	Continuous integration and incremental testing

## 7.2 Flowchart

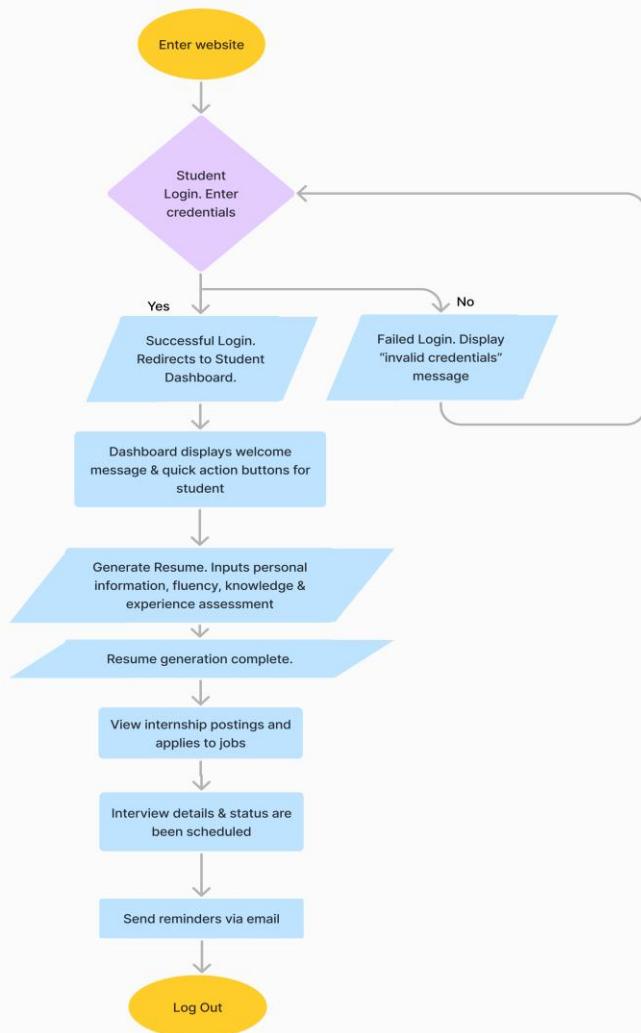
### 7.2.1 Admin Flowchart



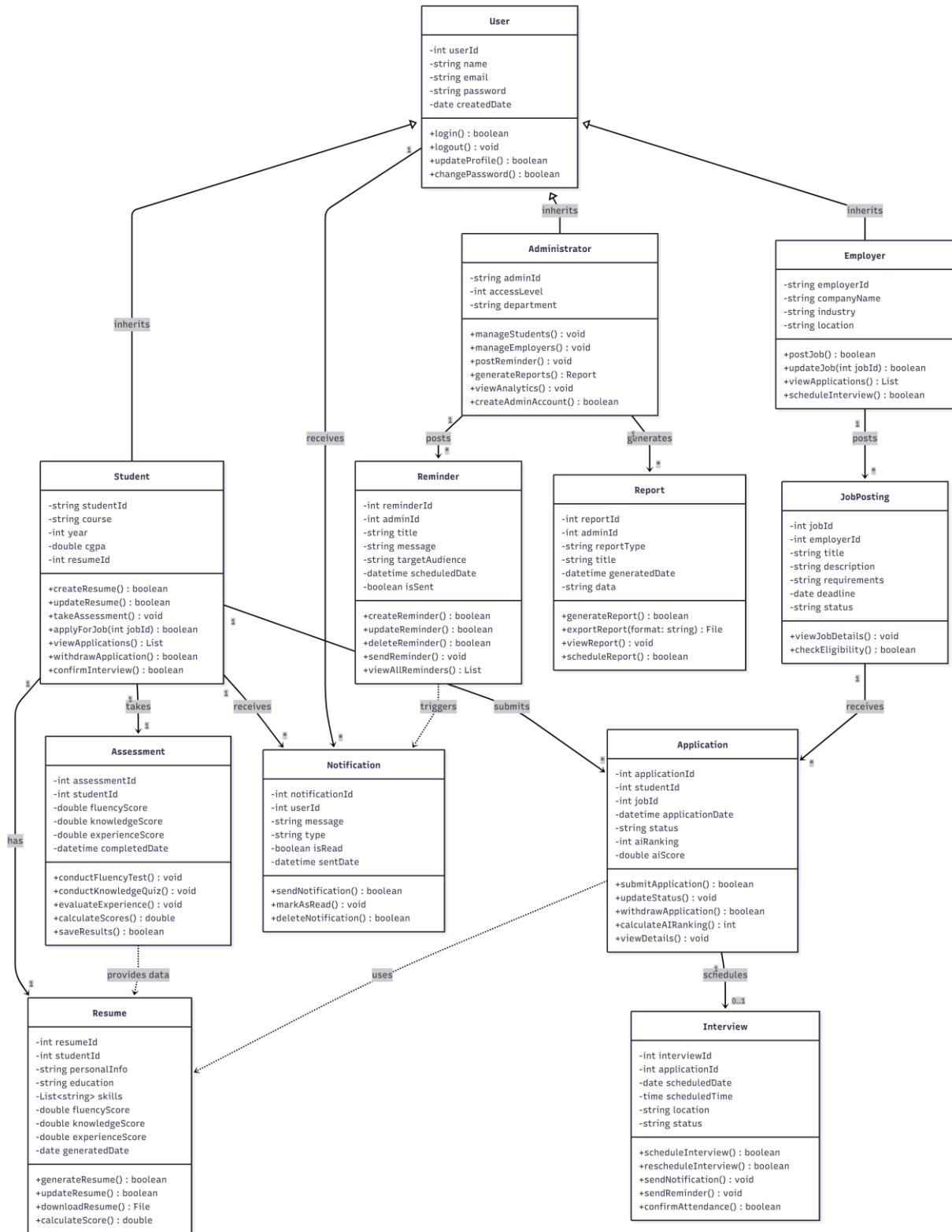
### 7.2.2 Employer Flowchart



### 7.2.3 Student Flowchart



### 7.3 UML Diagram



## 7.4 Gantt Chart

## 8.0 Expected Deliverables

At the end of this project, the expected deliverables will include a fully functional Intern Management System (IMS) web application with multiple integrated features. The system will provide an AI-powered resume builder that incorporates fluency, knowledge, and experience assessments. An employer portal will allow job posting, candidate ranking, and reporting, while an administrator portal will facilitate student and employer management alongside analytics and reporting features. In addition, the project will produce supporting documentation, including system design documents, a user manual, and testing reports. The final deliverables will also include the project report and presentation for evaluation purposes.

## 9.0 Project Timeline

Week	Task / Milestone	Expected Output
1–2	Requirement Gathering & Analysis	Requirement Specification Document
3–4	Literature Review & Related Works	Literature Review Report
5–6	System Design	UML diagrams, architecture design
7–8	Sprint 1 – Login & Role Management	Secure login & user dashboards
9–10	Sprint 2 – Resume Builder with AI	Functional resume generation
11–12	Sprint 3 – Job Posting & Applications	Employer portal with applications
13–14	Sprint 4 – Interview Scheduling	Interview management module
15–16	Sprint 5 – Analytics & Reporting	Admin dashboard with reports
17–18	Sprint 6 – System Integration & Testing	Tested integrated system
19–20	Final Refinement & Documentation	Final report & presentation

The project is planned to be executed across six months, with activities divided into structured phases. In weeks 1 to 2, the focus will be on requirement gathering and analysis, resulting in a requirement specification document. Weeks 3 to 4 will involve a literature review and study of related works, producing a literature review report. Weeks 5 to 6 will cover the system design, which includes UML diagrams and architecture design. Sprint 1 will take place in weeks 7 to 8 and will focus on implementing secure login and role management, leading to functional dashboards. In weeks 9 to 10, Sprint 2 will deliver the resume builder with AI integration. Weeks 11 to 12 will see Sprint 3, which will implement job posting and applications for the employer portal. Sprint 4, during weeks 13 to 14, will develop the interview scheduling module. Weeks 15 to 16 will be dedicated to Sprint 5, which delivers analytics and reporting for administrators. Weeks 17 to 18 will focus on Sprint 6, covering system integration and testing. Finally, in weeks 19 to 20, the project will undergo refinement and documentation, producing the final report and presentation.

## 10.0 Resources Required

The resources required for this project include hardware such as standard development laptops or PCs, along with a server for deployment, either cloud-based or institutional. The software stack will include Node.js, React.js, MySQL, XAMPP, GitHub, and APIs for AI module integration. Relevant datasets will consist of student sample data, resumes, job postings, and interview scheduling records to facilitate testing. Additionally, access to testing participants, including students, employers, and administrators, will be necessary to conduct usability and system evaluations.

## 11.0 Expected Outcome and Significance

This project is expected to deliver an AI-enhanced Intern Management System that improves efficiency and transparency in internship management. For students, the system will provide a quick and intelligent method of generating resumes while increasing their chances of securing suitable internships. For employers, the system will streamline the candidate selection process through AI-based ranking and assessments, enabling faster and more effective hiring decisions. For administrators, the platform will provide enhanced monitoring capabilities and enable data-driven decision-making through analytical reports.

The significance of this project lies in its academic, industrial, and societal contributions. Academically, it demonstrates the integration of AI into practical applications. Industrially, it provides organizations with a modern tool for efficiently managing internships. Societally, it helps bridge the gap between students and employers, ultimately enhancing graduate employability and strengthening workforce readiness.

## 12.0 References

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**GitHub Repository:**

👉 <https://github.com/PavithiraParamakurubaran/Group-2-MAL2020-COMPUTING-GROUP-PROJECT-PROJECT-PROPOSAL->

**Interim Video Link:**

👉 <https://youtu.be/LUU3sc>

**Pebblepad Link**

👉 <https://v3.pebblepad.co.uk/spa/#/public/mtw79Zr8xcjwk5MZwhmW3kpZWY>

**Figma Mockup Link**

👉 <https://www.figma.com/design/BPPFAIDQMZBOwXaSMOGHLr/Intern-Management-System?node-id=0-1&t=dKa96K3jOAJNqqxd-1>

**UML Diagram Link**

👉 <https://shorturl.at/eMnRH>

**Gantt Chart**

Link👉 <https://docs.google.com/spreadsheets/d/1S3uhBZuNQVhaLwyEk7H2JapyyFUc2sH2BDCh21OoHNk/edit?gid=0#gid=0>

**Employer Flowchart Link**

👉 <https://acrobat.adobe.com/id/urn:aaid:sc:AP:0ce90da4-eb38-4f8a-9763-5c318930c23f>

**Admin Flowchart Link**

👉 <https://acrobat.adobe.com/id/urn:aaid:sc:ap:c5639854-d529-4ff6-979a-8a5a4754b2bc>

**Student Flowchart Link**👉

<https://www.figma.com/design/KaVn58SBDgicw3B29IRIKz/Untitled?node-id=0-1&t=1XyzhMNeMrRw4yR9-1>