

Undergraduate Final Year Project Proposal

Research and Development of Job Agency System

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Table of Contents

1. Overview	3
2. Aim.....	6
3. Objectives.....	7
3.1 Research	7
3.2 Feasibility and Risk Analysis	8
3.3 Analysis	9
3.4 Design	10
3.5 Implementation and Testing	10
3.6 Deployment	11
3.7 Evaluation	11
4. Legal, Social, Ethical and Professional issues	12
5. Research Approach	14
6. Appendix.....	15
7. References.....	18

1. Overview

The labor market experiences two related difficulties: skilled candidates lack proper job options and recruiters face challenges selecting appropriate candidates efficiently.

A new university graduate spends endless hours trying for job openings in a huge job listing pool where most applications result in no response. Small business operators remain in frustration as they try to locate their ideal candidate through a wave of inappropriate job applications. The absence of effective communication between job seekers and employers indicates that we require a job agency platform that operates with superior intelligence and ease of use.

This website achieves its goal by connecting workers directly with recruiters through modern digital services. The platform enables smooth efficient hiring through its features including personalized job recommendations along with intelligent search filters combined with broad training provider options and an extensive employer dashboard.

By leveraging modern technologies, this platform ensures that opportunities find the right people.

Current Process

1. Employer Registration

- Employers sign up on various platforms (e.g. company websites, job boards, Facebook) to begin the hiring process.

2. Vacancy Registration

- Employers post jobs on multiple platforms, manually creating listings for each site with job details.

3. Job Seeker Registration

- Job seekers search for jobs across various platforms (e.g. company websites, Facebook) and register or create profiles where required.

4. Job Matching

- Job seekers manually apply for multiple jobs by doing paperwork, uploading resumes, and submitting cover letters again and again. Without automated matching, employers manually screen resume papers to find potential fits.

5. Making Appointment

- Employers shortlist candidates from the applications and schedule interviews, often through phone calls or emails. Job seekers wait for responses, sometime without updates from employers.

6. Track Hiring Outcome

- Employers manually track which job seeker was hired for which vacancy, updating records after interviews and decisions.

7. Training Centers and Job Employers

- Training centers independently market their training courses. And seek direct relationships with employers, which can be resource intensive.
- Employers independently search for external training providers for staff training after hiring. Manually negotiate and arrange training programs, which is inefficient.

Current Issues

1. Employer Registration

- Employers lack a single platform, requiring multiple registrations, which complicates tracking and setup.

2. Vacancy Registration

- Employers manage paperwork across platforms, prone to errors and inefficiency.

3. Job Seeker Registration

- Job seekers have no centralized system, needing to search and register on various platforms repeatedly.

4. Job Matching

- Job seekers need to upload resumes and cover letters repeatedly. Employers get unfiltered applications, making screening slow and inefficient.

5. Make Appointment

- Job seekers rarely get feedback or updates if rejected. Employers need to deal with manual shortlisting and scheduling.

6. Track Hiring Outcome

- Employers manually track hiring outcomes (who was hired for which job) leading to inefficiencies and errors without automated system.

7. Training Centers and Job Employers

- Training centers struggle with high marketing and acquisition costs. And have difficulty reaching targeted employer segments.

- Employers often find it challenging to find reliable and suitable training providers. Manual processes in arranging training programs lead to wasted time and reduced productivity. Employers don't have the central platform to compare and review training providers.

Proposed System

The proposed Job Agency System serves as a platform to link jobs seekers with employers through its effective system which addresses existing recruitment challenges. The system maintains filtered job matching that gives employers applications directly from candidates who satisfy their criteria thereby cutting down unwanted submissions. The system sends job recommendations to professionals according to their abilities and work experiences thus decreasing the time necessary for finding positions across different sites. By submitting their resume and cover letter to the system once job seekers eliminate repetitive paperwork tasks. They can also track their application progress through a single platform in which they can review employer feedback to learn from rejection and succeed in future job applications.

The system provides employers with instant candidate selection and scheduling of interviews through its platform which resolves manual delay issues and creates a paperless hiring process that reduces various operational errors and inefficiencies. The proposed system enables a new revenue opportunity through linking employers directly to verified training facilities which they can use for employee skill advancement. This training market integration enables employers to find training providers easily while giving education centers direct contact with potential students. The Job Agency System generates commissions from training enrollments that therefore benefit all participants. The platform facilitates a streamlined and efficient recruitment experience for both companies and candidates.

2. Aim

This Job Agency Website connects job seekers, employers and training centers through an intuitive platform for seamless job search and hiring.

3. Objectives

In the following context, “[x.x]” stands for effort units where “[1.0]” stands for one full week (typically 7 days).

3.1 Research [7.0]

3.1.1 Research on how companies’ hiring process works [2.0]

3.1.1.1 Research how companies make job postings via papers, books and websites [1.0]

3.1.1.2 Research how companies manage the job applications via papers, books and websites [0.4]

3.1.1.3 Research how they contact applicants via papers, books and websites [0.3]

3.1.2 Research on job agency systems [3.0]

3.1.2.1 Research how job agency works between employer and job seekers [1.0]

3.1.2.2 Research the process of job seeker when applying for jobs [1.0]

3.1.2.3 Research existing job agency websites and their features [1.0]

3.1.3 Research on related topic areas [2.0]

3.1.3.1 Research technologies and design principles to make UI/UX [0.5]

3.1.3.2 Research pros and cons of the frameworks to choose what is suitable for the system [0.3]

3.1.3.3 Research suitable database for the system [0.3]

3.1.3.4 Research cloud hosting and deployment [0.3]

Deliverables:

Chapter 1: Research on Job Agency System

Chapter 2: Research on Technologies and tools for development (Literature Reviews)

3.2 Feasibility and Risk Analysis [4.0]

3.2.1 Feasibility Assessment [2.0]

3.2.1.1 Technical Feasibility: Analyze the available technologies and skills to build the system [0.4]

3.2.1.2 Economic Feasibility: Analyze the cost and profitability building the system [0.3]

3.2.1.3 Operational Feasibility: Analyze the maintenance and efficiency operating the system [0.3]

3.2.1.4 Legal and Regulatory Feasibility [0.4]

3.2.2 Risk identification and mitigation [2.0]

3.2.2.1 Identify Financial, Technical and Security risks [0.4]

3.2.2.2 Develop Mitigation strategies for the identified risks [1.0]

3.2.2.3 Legal and Compliance risks [0.3]

Deliverables:

Chapter 3: Feasibility Study

Chapter 4: Risk Management

3.3 Analysis [8.0]

3.3.1 Analyze the target audience [1.0]

3.3.1.1 Define the user and their roles (Job seeker, Employer) [0.3]

3.3.1.2 Find their needs and requirements: Reference from paper and case studies [0.4]

3.3.2 Analyze the core features: Create user personas to simulate the hiring process to define the core features [0.5]

3.3.3 Analyze requirements: Identify and list all requirements for the system [2.0]

3.3.4 Analyze the system architecture and design [3.0]

3.3.4.1 Analyze UI/UX design: Review the wireframes [0.5]

3.3.4.2 Analyze frontend and backend tech stack: Compatibility and performance [0.5]

3.3.4.3 Analyze database design: Performance and scalability [0.6]

3.3.4.4 Analyze hosting and deployment strategy: Performance and scalability [0.5]

3.3.5 Analyze legal and compliance [1.2]

3.3.5.1 Analyze user agreement [1.0]

3.3.5.2 Analyze Legal, Social, Ethical and Professional Issues [0.2]

Deliverables:

Chapter 5: Requirement Analysis

Chapter 6: System and technical stack Analysis

Chapter 7: Analysis on Legal, Social, Ethical and Professional Issues

3.4 Design [4.0]

3.4.1 Design System Architecture [0.5]

3.4.2 Design UI/UX [0.5]

3.4.3 Design Use case diagram [0.3]

3.4.4 Define functional and non-functional requirements [1.0]

3.4.5 Define MosCoW prioritization [0.2]

3.4.6 Make Timebox plan [0.3]

3.4.7 Design class diagram [0.3]

Deliverables:

Chapter 8: Design Implementations

3.5 Implementation and Testing [13.0]

3.5.1 Install and setup the development tools, database and frameworks [1.0]

3.5.2 Implementation and Testing for Timebox 1 [6.0]

3.5.3 Implementation and Testing for Timebox 2 [6.0]

Deliverables:

Chapter 9: Implementation and Testing Timebox 1

Chapter 10: Implementation and Testing Timebox 2

3.6 Deployment [2.0]

3.6.1 Conduct UAT and Implement the deployment process [0.2]

3.6.2 Implement backup system to safeguard the data [0.2]

3.6.3 Implement training plan for users [0.3]

3.6.4 Get user feedback to improve the user experience [1.0]

Deliverables:

Chapter 11: Deployment

3.7 Evaluation [2.0]

3.7.1 Evaluation against Aims and Objectives [0.2]

3.7.2 Evaluation on System Architecture and Design [0.2]

3.7.3 Evaluation on System Performance [0.2]

3.7.4 Evaluation on Feasibility and Risk Management [0.2]

3.7.5 Evaluation on Legal, Social, Ethical and Professional [0.2]

3.7.6 Personal Evaluation [0.2]

3.7.7 Future Enhancements [0.2]

Deliverables:

Chapter 12: Evaluation and Conclusion

4. Legal, Social, Ethical and Professional issues

Developing and operating a Job Agency System involves sensitive personal information which requires careful consideration of legal, social, ethical and professional issues.

4.1 Legal Issues

Data privacy and security in an employment system present various legal issues, as the system needs to store personal information such as resumes, contact details, and employment history. The system must ensure compliance with data protection regulations such as the General Data Protection Regulation (GDPR), which sets strict requirements for data collection, storage, and processing (European Union, 2016). It is crucial to protect against unauthorized data access and breaches, as required by GDPR Article 32. The system must also avoid discrimination in job postings and recruitment processes, adhering to laws such as the Civil Rights Act and the Equality Act (EEOC, n.d.). Furthermore, having clear and transparent privacy policies is essential to inform users of their rights and how their data is used.

4.2 Ethical Issues

The system needs to take responsibility for protecting the privacy and confidentiality of job seekers, employers and training centers. It also need to ensure transparency in data handling. Ethical guidelines such as those outlined by the ACM Code of Ethics emphasize the importance of obtaining informed consent and explaining how user data is utilized (ACM, 2018). The system should ensure that users clearly understand how their data is used and provide options to control their personal information.

4.3 Social Issues

Users using the system who have limited technological skills or internet access could face disadvantages leading to unequal access to job opportunities. Research shows that the digital divide continues to impact some users. Thus, it is important to consider accessibility and inclusivity in system design (van Deursen and Helsper, 2013). Additionally, using a digital platform may reduce face-to-face interactions that traditionally occur during recruitment processes which can limit social networking opportunities and affect candidates who benefit from personal engagement (Graham, 2012).

4.4 Professional Issues

It is necessary to clearly define the roles and responsibilities of system administrators to ensure data privacy and ethical standards as recommended by ISO 9001:2015 (ISO, 2015). Training and guidelines on the use of the system for all users are also required to maintain professional standards and compliance with legal and ethical obligations. Furthermore, professional issues such as the misuse of the platform by posting misleading job descriptions by employers or job seekers submitting fraudulent qualifications must be addressed through verification processes and reporting mechanisms (Levashina and Campion, 2007).

5. Research Approach

The research approach for the Job Agency System uses a detailed plan to connect job seekers and employers effectively. Requirements gathering and analysis will use techniques including case studies and experimental research. Case studies of platforms like LinkedIn and Indeed will show how job searching and hiring work while spotting gaps and needs of the system (Agazzi, 2020; World Bank, 2023). Experimental research on these platforms will reveal key features such as job matching and application tracking by analysing their features and user interactions (D'Silva, 2020).

Frontend Framework: Next.js

Next.js was chosen for its built-in server-side rendering (SSR), which greatly improves initial load speed and SEO (Harrison, 2024; FocusReactive, 2025). Unlike Angular, which requires extra setup for SSR, or React, which is client-side by default, Next.js is optimized for both dynamic and static content and offers a smoother developer experience for SEO-focused and scalable web applications (Dev, 2024). It also offers easy routing and advanced features like parallel routes, making development faster and more scalable. Its strong community and modern architecture make it ideal for high-performance web apps.

Backend Framework: Node.js with Express

Node.js with Express is selected for its fast, non-blocking architecture, which is excellent for real-time features and handling many users at once (Estuary.dev, 2025). Express is lightweight and flexible, making API development straightforward. Express's minimalism allows rapid development and easy integration with frontend frameworks and NoSQL databases like MongoDB. Compared to Django or Spring Boot, Express excels at handling concurrent connections for scalable, dynamic applications (Techeconomy, 2023). Using JavaScript on both frontend and backend streamlines development and boosts productivity.

Database: MongoDB

MongoDB, a NoSQL database, is preferred over SQL databases for its flexible schema, which adapts easily to changing data needs (MongoDB, 2019). Its horizontal scaling and built-in real-time features (e.g., change streams) outperform traditional SQL databases like MySQL or PostgreSQL for these use cases. While SQL databases are better

for rigid, relational data and complex transactions, MongoDB is more agile and cloud-ready for scalable, fast-paced development. Its JSON-like structure aligns well with JavaScript, further simplifying development.

Using the Agile Scrum method will divide the development into short sprints enabling the development team to build and adjust the system step-by-step (Digitalent, n.d.). MoSCoW prioritisation will rank system functionalities while timeboxing will keep tasks on schedule (Agilemania, 2024). Use Case Diagrams will show system interactions such as job seekers browsing jobs or employers posting jobs (EdrawMax, 2021). Class diagrams will structure the system and database design (Vertabelo, 2019). Wireframes and a prototype will be made first to test ideas before coding, ensuring the system meets the requirements. This will enable the development of a robust and effective job agency system.

6. Appendix

Figures below are the Gantt Charts for the proposed Job Agency System.

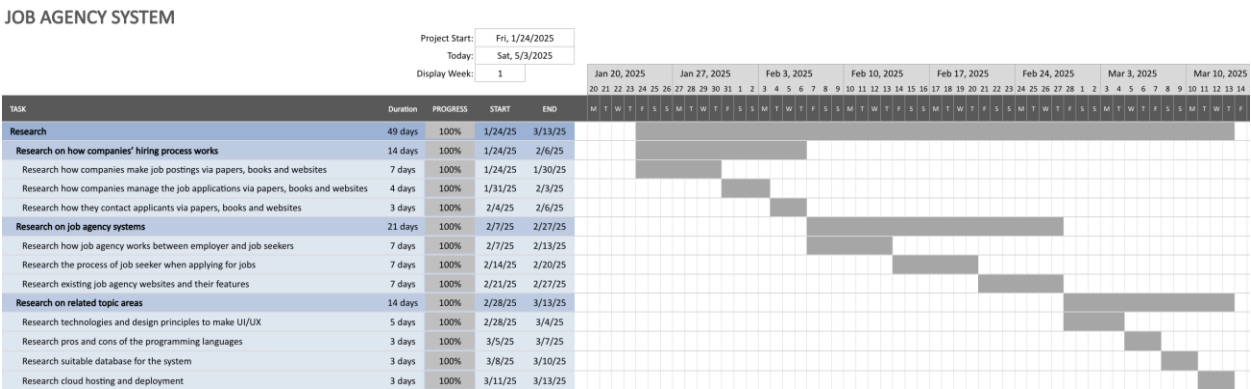


Fig (6.1) Research Gantt Chart

JOB AGENCY SYSTEM

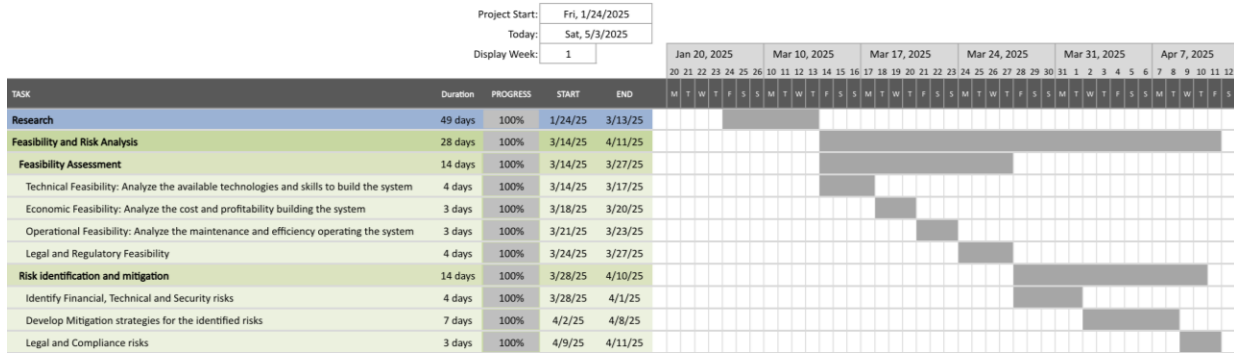


Fig (6.2) Feasibility and Risk Analysis Gantt Chart

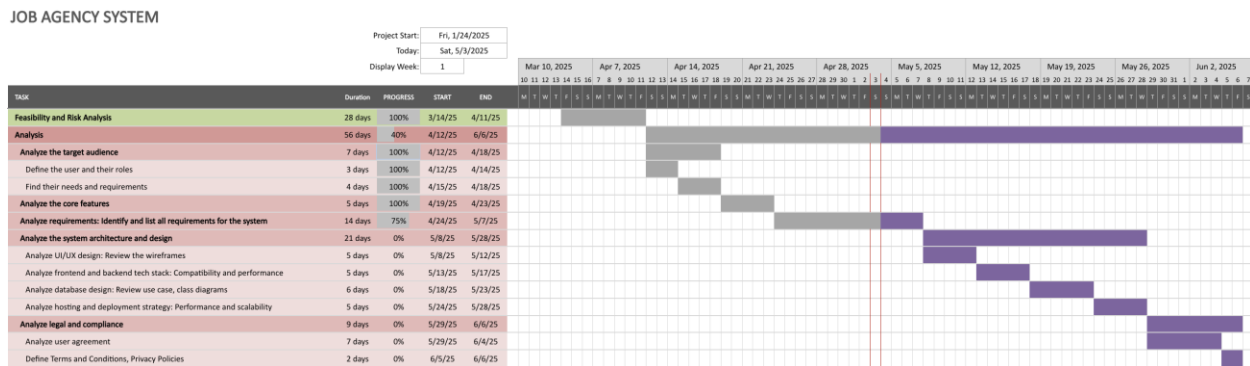


Fig (6.3) Analysis Gantt Chart

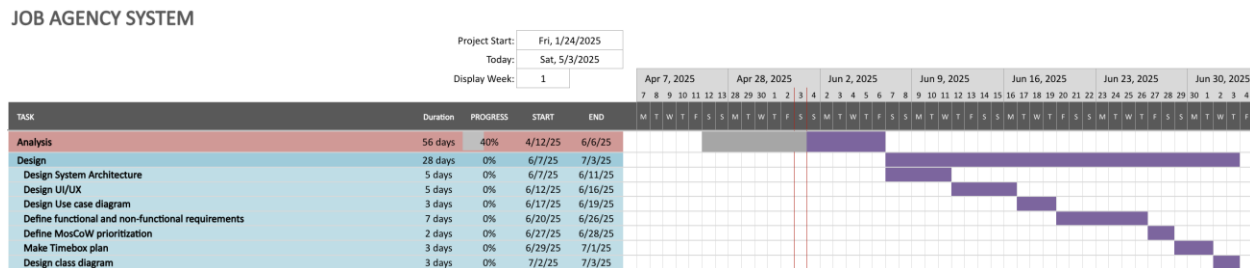


Fig (6.4) Design Gantt Chart

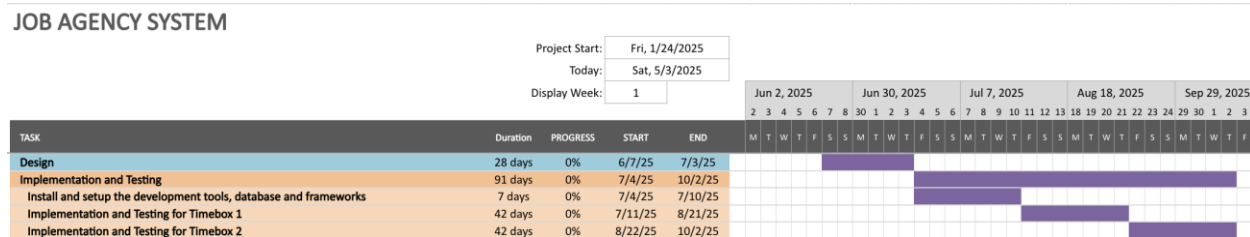


Fig (6.5) Implementation and Testing Gantt Chart

JOB AGENCY SYSTEM

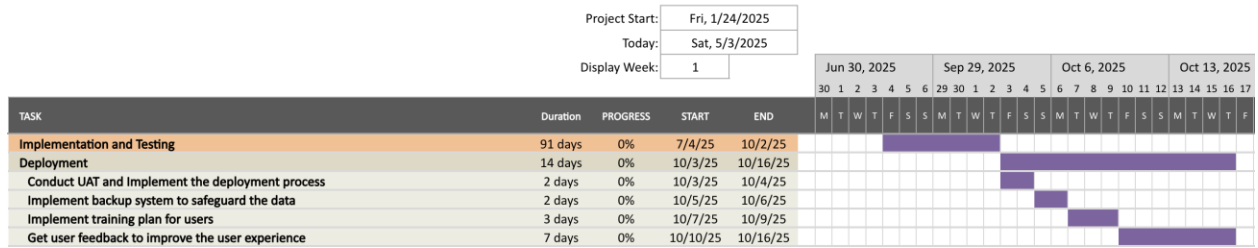


Fig (6.6) Deployment Gantt Chart

JOB AGENCY SYSTEM

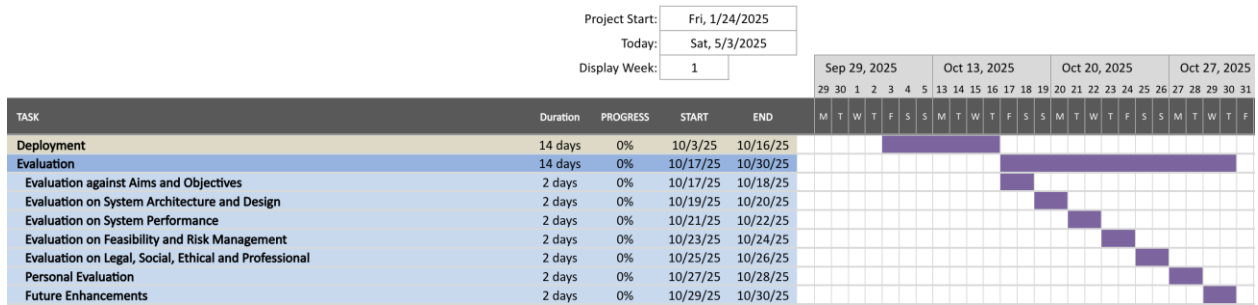


Fig (6.7) Evaluation Gantt Chart

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