TABLE OF CONTENT

LIST OF FIGURE

LIST OF TABLE

LIST OF ABBREVIATIONS

CSS	Cascading Style Sheet
HTML	Hyper Text Markup Language
HTTP	Hyper Text Transfer Protocol
ML	Machine Learning
UI	User Interface
UML	Uniform Resource Locator

1. Introduction

“JobPortal” is a web application designed to connect job seekers with employers efficiently. It allows users to create profiles, upload resumes, and apply for job listings, while employers can post job openings, review applications, and find suitable candidates. By streamlining the hiring process, JobPortal helps both job seekers and recruiters save time and effort. It also features an intelligent job-matching algorithm that ranks candidates based on their skills, experience, and job preferences, ensuring the best possible matches.

Job hunting and recruitment are crucial aspects of career growth and business success. A well-structured job portal makes the hiring process smoother by reducing the time spent searching for jobs or candidates. With automated resume screening and smart filtering, JobPortal helps job seekers discover relevant opportunities and enables employers to find the right talent quickly.

The goal of this project is to simplify the job search and hiring experience by providing real-time job recommendations and candidate ranking. By notifying job seekers about new openings that match their profiles and alerting employers about qualified applicants, JobPortal ensures a seamless and efficient hiring process.

2. Problems Statement

Many job seekers and employers struggle with the hiring process. Job seekers often face difficulties finding relevant job opportunities, while employers spend significant time and effort filtering through applications to find the right candidates. The lack of an efficient matching system leads to frustration on both ends—qualified candidates miss out on potential jobs, and companies struggle to fill positions quickly.

A lot of hiring processes still rely on outdated methods like manually sorting resumes or posting job openings on multiple platforms without proper candidate filtering. This makes the recruitment process slow and inefficient. Job seekers, on the other hand, have to browse through countless listings, many of which may not match their skills or preferences. Without an automated system to match the right candidates with the right jobs, companies risk hiring underqualified employees, leading to higher turnover rates and wasted resources.

3. Objectives

The project aims to meet the following objective:-

1. To develop an efficient Job Portal that connects job seekers with employers, making the hiring process faster and more convenient.
2. To enable resume submission and filtering, helping employers find the most suitable candidates with minimal effort.

4. Methodology

The development methodology of JobPortal is going to be the Incremental Model, where the system will be built and improved in multiple stages. Instead of developing the entire system at once, the project will be divided into smaller, manageable parts, with each increment adding new functionality to the system.

The incremental delivery approach is well-suited for projects involving a high degree of complexity or where requirements may evolve over time. By dividing the project into smaller iterations, the development process becomes more structured, manageable, and adaptable. It also allows for continuous feedback, enabling modifications and improvements along the way rather than waiting until the end of the project.

In the first increment, the basic features such as user registration, job posting, and job application functionalities will be developed. The second increment will introduce search and filtering features**,** enabling job seekers to find relevant job listings efficiently and employers to shortlist candidates. The third increment will focus on automated job suggestion, using a matching algorithm to recommend the best Jobs based on skills, experience, and job preferences.

Each increment will go through the design, development, testing, and refinement phase before moving to the next stage. This approach ensures that the system remains functional throughout development and allows for continuous improvements based on user feedback. The Incremental Model makes the development process more flexible, efficient, and structured, resulting in a reliable and user-friendly Job Portal**.**

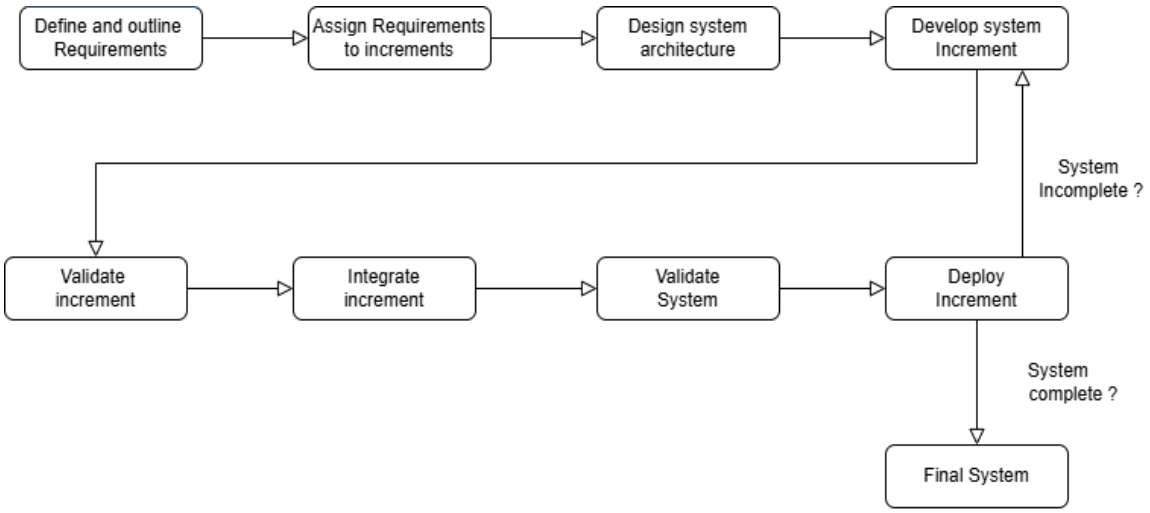

Figure 4.1 Incremental methodology of Job portal

a. Requirement Identification

The requirements for the Job Portal will be identified before starting its development lifecycle. To design and develop the system effectively, both functional and non-functional requirements will be analyzed. Additionally, a study of existing job portals will be conducted to understand their limitations and identify areas for improvement.

Requirement collection will involve gathering insights from potential users, such as job seekers and employers, to ensure the system meets their needs. This process will help define key features, including user registration, job posting, job applications, resume filtering, job matching, and interview scheduling**,** ensuring that the Job Portal is a reliable and efficient platform for both job seekers and recruiters.

i. Literature Review

People have been looking at different job websites and how they suggest jobs to users. These websites try to match job seekers with good job options based on what they're good at and what they want.

Some folks named Sharma and friends looked at how to suggest jobs using computer programs back in 2020. They checked things like what skills people had, job details, work history, and where people wanted to work. They tried out different computer methods like Decision Tree and Random Forest. The Random Forest one worked best, getting it right about 87% of the time.

Another group, Adhikari and team, made a job website just for Nepal in 2021. They put together stuff for both companies and people looking for jobs. Their website looked at job types, skills needed, how much experience was required, and salary. They mixed two ways of suggesting jobs - one based on job content and another on what other similar users liked. This combo worked pretty well, suggesting the right jobs about 82% of the time.

There was also this study by Basnet and pals in 2019 that used something called Natural Language Processing to read job posts and resumes. They used some computer methods called SVM and Naïve Bayes to match jobs with people. Their system was right about 80% of the time. It helped job hunters find jobs that matched their skills and showed what kinds of jobs were popular at the time.

ii. Requirement Analysis.

The requirement analysis for the job portal project helps identify important features and functions of the system. It also considers any challenges or limitations in development. This ensures the platform works well for both job seekers and employers by including features like job listings, applications, and user authentication.

- Functional Requirement

The goal of the requirement analysis for the job portal project is to identify the system's key features and functions while considering any limitations. This helps ensure smooth development and an effective platform for job seekers and employers.

For Job seeker

- The system should allow job seekers to search and apply for jobs but restrict access to administrative functions to authorized users only

For job job-employer

- The system shall allow employers to predict future hiring needs based on past job applications and trends.
- The system must allow employers to view applications, track hiring progress, and analyze job posting performance.
- The system must allow employers to add, update, delete, and manage job postings.

- Non Functional Requirement

The points below focus on the non-functional requirement of the system:

Performance

The job portal must be highly performant and responsive, with minimal delay when searching for jobs, applying for positions, and processing applications.

Usability

The system should have a user-friendly, intuitive interface, making it easy for job seekers to search for and apply to jobs, while allowing employers to post vacancies efficiently.

Scalability

The job portal should be scalable, capable of handling an increasing number of job seekers, job postings, and applications as the platform grows, ensuring smooth operation even with high traffic.

Availability

The portal should be highly available, ensuring no downtime or interruptions, allowing users to search for jobs and employers to manage postings without disruption.

Accuracy

The system must provide accurate job listings, application statuses, and real-time updates on new vacancies, ensuring all information is correct and up-to-date.

Reliability

The portal must be reliable, ensuring that job applications, postings, and data are consistently processed and available without errors or discrepancies.

Security

The system will implement strong security measures to protect user data, ensuring that only authorized users (employers and job seekers) can access their personal information and job-related details.

b. Feasibility Study

i. Technical Feasibility

The technical feasibility of the job portal is high, as the required hardware and software resources are widely available and easily accessible. The system requirements are categorized as follows:

Hardware Requirements:

- A computer with a minimum of 4 GB of RAM and a multi-core processor.
- A Adequate storage space to store user profiles, job postings, applications, and system data. Equate storage space to store product information, sales data, and system files.

Software Requirements:

- Operating System: Windows 10/11,
- Web Browser: Chrome, Firefox, Edge, or Brave.
- Node.js and Express.js: Required for building the backend of the system.
- MongoDB: Database to store job listings, user profiles, and application data.
- HTML**,** CSS, and JavaScript: Used for the frontend interface.

ii. Economic Feasibility

The job portal is cost-effective as it utilizes open-source technologies, significantly reducing software licensing costs. By providing a platform where job seekers can apply for jobs directly and employers can post vacancies without intermediaries, the system can save time and reduce recruitment costs. Additionally, the platform can bring long-term financial benefits by optimizing the recruitment process, improving hiring efficiency, and expanding the job market reach.

iii. Operational Feasibility

The operational feasibility of the job portal is high, as it is designed to simplify the job search and application process for users and streamline job posting for employers. The system's success will depend on its ability to efficiently handle job searches, applications, and employer-posted vacancies while ensuring smooth operations. The platform will require regular updates and maintenance to keep up with job market trends and enhance the

user experience. Additionally, training users (job seekers and employers) on how to use the system effectively may be necessary, but the intuitive interface and easy navigation reduce the learning curve significantly.

c. Data modeling

Data Modeling is the process of defining how data is structured, stored, and managed in the job portal. The system follows a relational data model, ensuring efficient storage, retrieval, and manipulation of user profiles, job postings, and applications. The data model is designed to facilitate smooth operations, including job seeker registration, job posting by employers, and application submission, ensuring all data is consistent and easy to manage.

i. Data Modeling: ER Diagram

Figure 4.3 ER diagram

ii. Process modeling: Data flow Diagram (DFD)

The Data flow diagram of saral Inventory is up to level 1. Where these data are properly handled and organized.

Level 0 DFD

Figure 4.4 Level 0 DFD

Level 1 DFD

Figure 4.5 Level 1 DFD

iii. Flowchart

The system flow of saral inventory are for admin as well as for staffs. These flowchart show the system from the beginning to the end for party's associated with this system.

For Admin:

Figure 4.6 Flowchart for admin

For Staff:

Figure 4.7 Flowchart for Staff

iv. Algorithm Description

Content-Based Filtering is a recommendation technique that matches items (e.g., jobs) with users (e.g., candidates) by analyzing the attributes of both. Here's how it can be applied in your project.

- Gather data about the jobs available (e.g., job descriptions, required skills, qualifications, etc.)
- Collect data about users, specifically their skills, qualifications, and preferences.
- Extract skills, roles, and other keywords from job descriptions
- Extract their skills and qualifications.

5. Gantt chart

The time given for the completion of this project was a whole semester. So, the project had enough time for completion. Since, the project has some algorithm mechanism the project took some more time. Hence, the project is going to be developed according to the following time schedule to make our application schedule feasible.

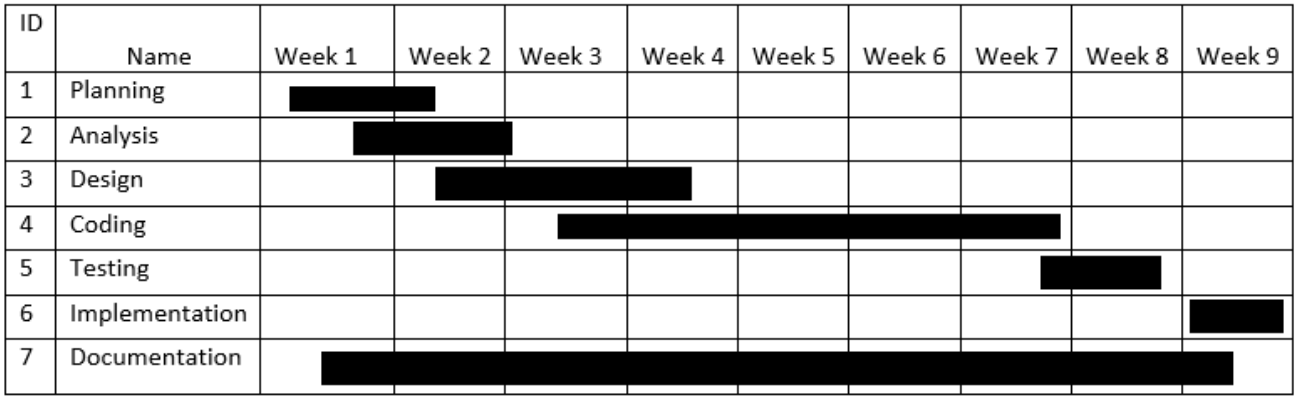

Figure 5.1 Gant chart

6. Expected Outcomes

The expected outcome of the job portal system is to provide a seamless and efficient experience for both job seekers and employers. Job seekers should be able to easily search for jobs, apply for positions, and track their application status, while employers can post job openings, manage applications, and communicate with candidates effortlessly. The system should ensure efficient data management, high availability, and fast performance, even during high traffic. It must be scalable to accommodate growing user numbers and secure to protect sensitive data. The portal should facilitate accurate job matching, improving recruitment efficiency for employers and providing relevant opportunities for job seekers. Ultimately, the system should enhance operational efficiency, reduce recruitment costs, and drive user engagement, leading to a growing, active platform.