

AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh

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This Report Presented in Partial Fulfillment of the Requirements for the Degree of
Bachelor of Science in Computing and Information System

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APPROVAL

This Project titled “AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh”, submitted by Mottakin Ahmed Sakib, ID: 201-16-513 to the Department of CIS, Daffodil International University has been accepted as satisfactory for the partial fulfillment of the requirements for the degree of B.Sc. in CIS and approved as to its style and contents. The presentation has been held on 31-05-2025.

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I hereby declare that; this project has been done by me under supervision of Md. Nasimul Kader, Assistant Professor, Department of Computing and Information System (CIS) of Daffodil International University. I am also declaring that this project or any part of there has never been submitted anywhere else for the award of any educational degree like, B.Sc., M.Sc., Diploma or other qualifications.

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ABSTRACT

The entire findings of my proposal, "**AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh**," may be read here. This article covers all of the procedures involved in turning the concept into a working website. In this project, there have one module: User modules. This project introduces a new smartphone application that uses artificial intelligence to deliver individualized career recommendations to Bangladesh's poor areas. The system, built in Java and powered by a large dataset, includes secure user authentication capabilities such as login, registration, and password recovery. Dataset contains almost 3761 data and features like: "experience_level, salary, company_size, age, company_name", etc are columns. For user's authentication use SQLite database. Users may utilize the thorough job search option to learn more about potential possibilities, while the AI-powered recommendation search engine examines user inputs to provide personalized job ideas. Furthermore, the program features a multilingual interface that enables for easy switching between English and Bangla, making it accessible to a wide range of users. Overall, this approach seeks to close the employment gap by linking disadvantaged job searchers with suitable work opportunities, promoting socioeconomic empowerment and progress in the region. From idea to execution, the research examines every aspect of mobile application development, including architecture, user interface design, and technologies used. The user interface was built with Java XML, while the backend was built with Python AI and Java. To set up our system application, no expensive software or computer components are required; all you need is a standard desktop computer and Internet access.

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CHAPTER 1

Introduction

1.1 Introduction

System apps display the links and interactions between various programs. The "System" page on a computer contains programming links, programs, and system administration tools. While the expression "system" might have many connotations depending on the context, the concept is essentially the same. The "AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh" creates a solid basis by combining a variety of technologies. The several components that make up this architecture apply restrictions to each system under review. Every module contains several systems.

In Bangladesh, impoverished populations frequently struggle to find meaningful career prospects owing to a lack of education, resources, and awareness of job vacancies. This project presents an AI-Driven Job Recommendation System to solve these issues by linking job searchers with appropriate work opportunities based on their talents, hobbies, and geographical location. It will apply artificial intelligence to more efficiently match workers to employers and improve upgrading/employability recommendations. This initiative develops a new smartphone app using artificial intelligence to give tailored job recommendations to the most deprived sections of Bangladesh. Use SQLite database for user authentication. Users can leverage the advanced job search to explore potential opportunities, and the machine learning recommendation search engine takes in user input to provide tailored job recommendations. Moreover the app comes with a bi-lingual interface enabling users to switch between English and Bangla which makes it apt for a wide variety of users. NHWJ follows a holistic approach to bridge the job divide amongst marginalized job aspirants and prospective employers, resulting in heightened economic empowerment and development in the region. The future job is still largely a cause of concern to the poor people of Bangladesh due to lack of employment information and carrier counselling. In order to solve this problem the project is implementing an AI-driven job suggestion system which is being developed as a mobile Java application. The application leverages the power of AI to provide customized job suggestions

to users, taking into account parameters such as prior work experience, type of employment, income expectations, and company size. It comes along with some other features and functionalities like user login, registration, password recovery, opt in to different updates, job listing with multiple details, and multi language support where users could change between English and Bangla.

CHAPTER 2

Initial Study

2.1 Project Proposal

The main aim of this project is to design an AI driven job recommender system that the underserved population in Bangladesh can leverage to find work of value. The objective of the system is to make personalized job recommendations to users driven by the inputs from the users so that the job search experience is more customized. Moreover, it is committed to enhancing access using a multilingual interface (English and Bangla) and user-friendly characteristics, such as job search, detailed job posts, secure authentication, etc. Its goal is to combat the jobs gap and offer improved job opportunities for underprivileged job seekers using AI.

1. Build out an artificial intelligence platform that suggests job options for poor people in Bangladesh.
2. Enhance employability through skill training programmes designed as per market requirement.
3. Lower employment barriers by matching jobs seekers and employers.
4. Responsive to touch allowing application access to anyone with an internet connection through a user-friendly and multi-lingual interface (Bangla & English).
5. Recommends job using AI based on inputs.

Benefits of the website:

This AI-enabled job recommendation system offers multiple advantages, particularly for low-income regions of Bangladesh. It simplifies the search process by providing job recommendations based on the user's preferences and qualifications. The software is made accessible through its multilingual features providing navigation to English and Bengali

users. Further, the secure authentication system preserves data privacy, and job search and detailed job description enable users to make informed career choices. Using AI technology, this approach is used to create work opportunities, enable job hunters and contribute to a reduction in unemployment in deprived areas.

2.2 Background of the Project

Unemployment is a significant concern and a considerable challenge in Bangladesh, especially for disadvantaged communities with limited work options and lack of access to professional guidance. Unemployment According to the Bangladesh Bureau of Statistics (BBS) unemployment is a widespread issue, especially among the young and people with poor economic status, who cannot obtain suitable employment due to lack of information and resources (BBS, 2023). Conventional means for sourcing candidates (newspaper ads, word of mouth and so on) are often slow and ineffective to meet underrepresented communities.

AI serves as an optimal solution in the field of information management research, by which individualized job matching can be achieved between user interests and qualifications (Liu et al., 2021). Algorithms driven by AI analyze factors such as experience, skills and industry demand to provide focused job recommendations that improve a job seeker's likelihood to secure employment. What's more, the inclusion of multilingual support in digital platforms has been shown to enhance access for a broad range of users, ensuring inclusivity in the job search process (Rahman & Akter, 2022). This project aims to reduce the unemployment gap by developing a smartphone app powered by AI that provides personalized job recommendations to poor communities in Bangladesh. With this addition of secure login system, job search features, and English-Bangla switch it becomes that much more accessible and practical to a larger audience. The goal of this program is to assist underprivileged job seekers by connecting them with suitable means of employment through technology that is assisted by the use of AI.

2.3 Problem Area

Unemployment and underemployment remain serious problems for the poor in Bangladesh since poverty tends to obstruct the quest for employment opportunities. Job-hunters are unable to find suitable employment in many cases due to poor quality of career advice, lack of digital skills and insufficient visibility of job opportunities. Traditional job-hunting methods – classified ads, recruitment agencies, “networking” with friends, relatives or fellow students, even career fairs – usually do not provide the job market information that is needed to find the ideal job to meet the needs and career aspirations of both the job candidate and the employer. Language barriers also restrict employment possibilities: even though the majority of digital jobsites are conducted in English, non-English speakers cannot easily navigate it. In addition, the absence of personalized job suggestions leads to unproductive job search, with individuals skimming through a lot of irrelevant ads. To address these challenges, what is needed is an ai-based job recommendation system which would help close the gap of unemployed people by providing the right job recommendations, multilingual support, and a user-friendly digital platform for job seekers in areas that are underprivileged.

2.4 Possible Solution

- The design is responsive to many screen sizes.
- The website's features are simple and easy to use, with a pleasant user interface.
- Develop an intelligence platform that recommends work options for poor folks in Bangladesh.
- Promote employability through skill training programs tailored to market need.
- Reduce obstacles to employment by connecting job seekers and recruiters.
- Ensure accessibility via a user-friendly, multilingual interface (Bangla & English).
- Apply AI for recommend jobs following by inputs.

CHAPTER 3

Literature Review

3.1 Discussion on problem domain based on published articles

Unemployment is a staggering problem in Bangladesh, where working opportunities for the poor are restricted by economic and educational challenges. Young and minority factions, especially, suffer from higher rates of unemployment as a result of the lack of knowledge about the job market and the availability of the internet (BBS, 2023). The traditional job search methods, for example, newspaper ads, personal contacts and family networks, do not provide the right-targeted jobs to the job searchers and are unsuccessful (Rahman & Akter, 2022). Moreover, it has been found that language barriers are a barrier to entry to digital job portals as most websites are predominantly in English, not allowing non-English speaking individuals to navigate employment facilities appropriately (Hasan et al., 2021). Photo by Solopreneur Diaries on Unsplash Recent work highlights AI's importance in shaping how job seekers find the right opportunity by offering personalized job recommendations that take into account the user profile, interests, and trends of the market (Liu et al., 2021). There is evidence that job matching systems facilitated by AI can diminish job search time as well as improve employment outcomes by parsing user inputs such as skills, experience, and industry preferences (Chen & Wang, 2020). In addition, integrating support for languages into job recommendation systems enhances the accessibility and inclusivity of digital labour market services, enabling jobseekers from different backgrounds to better utilize them (Islam & Saha, 2022). Based on these results, it is paramount to implement an AI-based job recommendation system with multilingual support that addresses the job problems faced by Bangladesh's lower groups.

3.2 Discussion on problem solutions based on published articles

AI-based job recommendation systems have been identified as an optimal solution to address the issue of unemployment in underprivileged areas. Machine learning algorithms

could significantly help match jobs better by considering users' profile, interests, and market trend, and thus offering better jobs. June 2011 According to multiple analyses, multilingual job websites can also contribute to improving accessibility, primarily for non-English speaking users, further contributing to an inclusive job search experience. Moreover, job seeking applications on mobile phones have also been found to be practical in emerging markets such as those in developing countries with high penetration of smart phones but limited access to traditional job opportunities (Hasan et al., 2021). This work is an effort to bridge the gap in job markets in Bangladesh using AI-based recommendations through a convenient smartphone app.

3.3 Comparison of leading solutions

1. LinkedIn.

LinkedIn is one of the most popular professional networking sites and it relies on artificial intelligence to suggest jobs. It recommends potential job opportunities based on user profiles, professional contacts, and the history of job inquiries. The program uses an AI system to determine what skills people should learn next, increasing job applicants' employability.

LinkedIn: Jobs & Business News

LinkedIn

Contains ads · In-app purchases

4.6★
3,14M reviews

1B+
Downloads

12+
Rated for 12+ ⓘ

Install

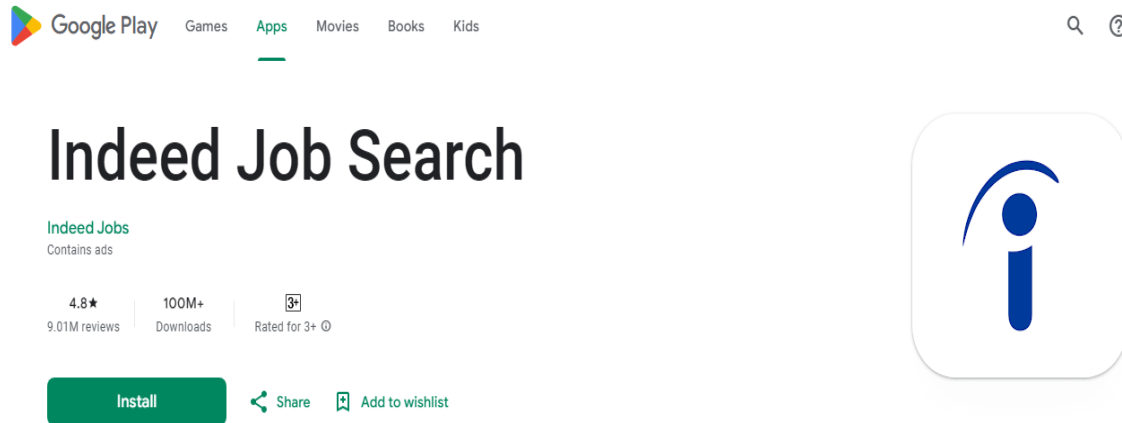
Share

Add to wishlist



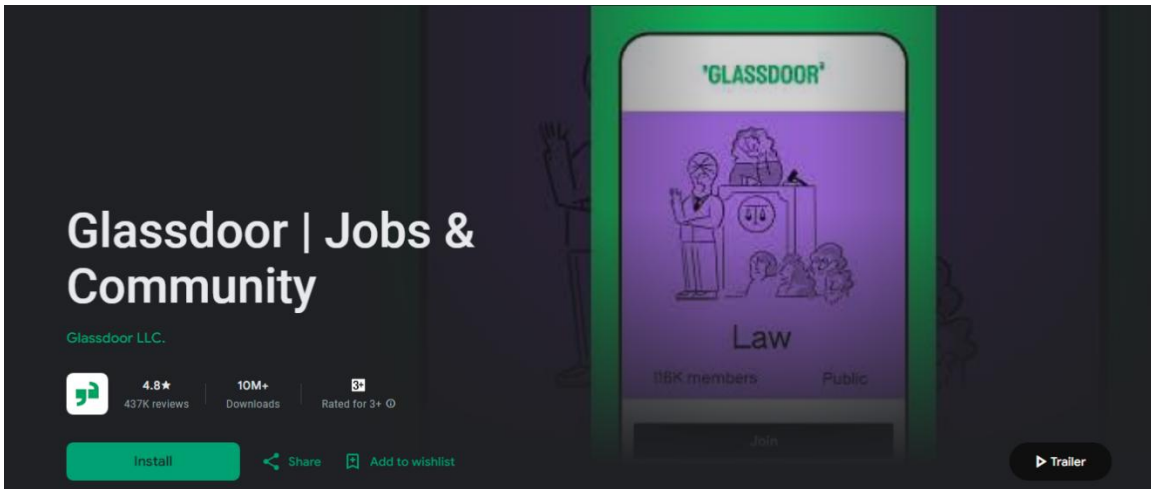
2. Indeed.

As a job search engine, indeed offers job searchers the ability to search for relevant jobs by using their resumes, search habits, and job application history matched with employer's needs or preferences with using artificial intelligence (AI). It also offers AI-based resume reviews and job alerts to help consumers to find a relevant role faster.



3. Glassdoor.

Glassdoor combines job listings with company information, employee reviews, and a wage database. Its recommendation system - powered by an AI - suggests jobs based on the user's interest, geography and previous searches. The site also helps jobseekers make informed decisions by compiling employer reviews and salary trends.



3.4 Recommended Approach

Table 1: Module's descriptions

Actuators	Functions
User	<ul style="list-style-type: none"> • Client dashboard. • Switch language (Eng to Bang / Bang to Eng). • Login. • Registration. • Forget password. • Job search and see jobs details. • Job recommended system as per inputs of users. • Logout.

CHAPTER 4

Methodology

4.1 What to Use

An AI-powered method is required to create an effective employment suggestion system suited to Bangladesh's impoverished areas. The system uses machine learning methods such as content-based filtering and collaborative filtering to deliver tailored job recommendations based on user inputs such as skills, experience, and wage expectations. TensorFlow Lite will allow AI computation within the mobile app, resulting in improved performance on low-end smartphones. A local database (SQLite Database) will hold user preferences and job listings, with Firebase Authentication handling login, registration, and password recovery. To improve accessibility, the app will incorporate multilingual support (English and Bangla). The SDLC life cycle paradigm, which provides a comprehensive structure for development, design, and other activities, is recognized as the correct approach. I'm familiar with many SDLC model types. The Big Bang, Spiral, waterfall, Agile, Iterative, and Adaptive System Construction models are some examples of software development paradigms. Each model creates an environment to help with the development and deployment of the vehicle components platform. The SDLC model's unique requirements will form the veterinary development domain, resulting in an efficient development method that is consistent with the project's job suggested system objectives.

4.2 Why to use

The system architecture must be established during the initial stage in the construction process. Identifying the parts and their interrelationships was a single component of this. The system network architecture stressed security, dependability, and scalability. This involves isolating the product's database administration and backend operations from the customer interface. Furthermore, security safeguards were built within the design to ensure safe transactions and preserve computer data. Every software project must adhere to the

agile methodology. I am familiar with a variety of terms used to describe agile approaches, including feature-driven development, scrum, quartz, flexible system development methodology, and Kanban. Nonetheless, I used the DSDM technique to achieve my goal. The DSDM approach is useful for a variety of reasons. For continual improvement, the dynamic system design method is applied, which allows for flexibility in changing needs. This method is useful when prompt delivery is necessary. The use of an AI-powered mobile app for job recommendations has several advantages, including cost savings, greater accuracy, and data-driven insights.

4.3 Section of methodology

A variety of processes or approaches may be utilized to determine how to assess the data used in this investigation. This study used a multistep approach that included model creation, expansion and enhancement, data gathering, and manufacturing.

Pre-Project Phase:

- **Feasibility study:** The feasibility study evaluates the project's infrastructure, financial viability, and functional needs. It entails analyzing the project's possible costs, benefits, and risks.
- **Collected and documented program need:** To define the project scope, you must first understand the business requirements, customer expectations, and constraints.
- **Planning:** Develop a strategic plan outlining project goals, timelines, resources, and deliverables. It is necessary to identify the project's stakeholders, define roles and duties, and build a partnership and risk management plan.

Project Lifecycle Phase:

- **Gathering Data:** I utilized Kaggle and my collected data to obtain and assess online statistics data in order to create my own dependable dataset. A large, comprehensive dataset is not readily accessible in this industry because to the difficulties in locating and gathering data for the many predictions recommended system of Jobs.

- **Data preparing:** After collecting its data Following data collecting, many data sets may have mistakes, especially if there is disruption. In terms of technology, I use the selected data set to proceed to the next phase after assessing the knowledge.
- **Data Preprocessing:** After gathering the data Following data collection, many data sets may contain errors, particularly if there is interruption. In terms of technology, I use the selected data set to go on to the next phase after assessing knowledge.
- **Model selection:** After selecting a model, train and assess it using available data for improved accuracy. AI uses a wide variety of models. Using my technique, several variations of the concept were tested to determine the best configuration for precise data calculation.
- **The assessment of Performance:** This part discusses the outcomes. Despite testing and training, our dependability in the following two courses was unsatisfactory. They developed a Java mobile solution for a job recommendation system, as well as pictures for the f1 assessment, recall, efficiency, and confusion matrix.
- **Design:** Create a software design based on requirements. It covers a wide range of design jobs, such as dataset, architectural, and user interface design, to name a few.
- **Development:** During development, software is programmed to meet design criteria. The developer writes the source code, conducts unit tests, and assembles elements to create a working software product.
- **Testing:** Testing assures software quality and functioning. It employs a number of testing strategies, such as unit, user trustworthiness, integration, and system testing.
- **Deployment:** The program is launched after permission and testing. The software's configuration, installation, and setup need to take place in the appropriate environment.

Post-Project Phase:

- **Maintenance:** After deployment, the program enters maintenance mode. This phase includes ongoing maintenance, bug fixes, and updates to ensure that the software continues to work and meets changing needs.

- **Evaluating:** Evaluate project success by comparing actual outputs to intended objectives. It helps to discover areas for improvement and lessons learned for future initiatives.
- **Closure:** The project is now officially done. It include finishing the project's documentation, keeping track of its artifacts, and doing a project assessment.

These sections provide a systematic approach to managing software development projects, from early having intentions post-deployment support, which aids in the realization of successful outcomes.

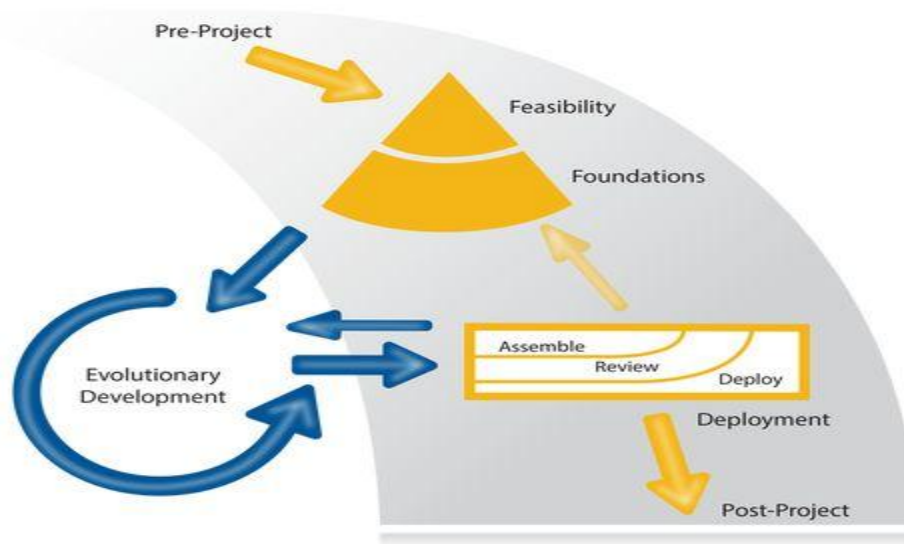


Fig 1: DSDM phase

4.4 Implementations plans

The full application is now ready for public usage. The updated system must be activated as soon as an issue has been detected and fixed. This is where you select your settings, procedures, and release requirements. If all goes according to plan, the improved system will be tested and deployed. To ensure accuracy, data gathering must occur after all future procedures are done. To make the work more manageable, I separated it into its most

significant components. To guarantee that my task is accomplished properly, I must follow these rules.

- Dataset collections.
- Steps taken before data processing
- AI used for models used as inputs and outputs the features
- AI-powered parking system based on registered number plate databases.

CHAPTER 5

Planning

5.1 Project Plan

I freely created all of my datasets using technologies like Kaggle also I added some features of data. After that, I could begin preparing the data. Before putting the idea into action, I experimented with programming. I evaluated the accuracy of each AI model for the job-recommended system. Before launching, all projects must have their potential, budget, duration, risk management, and interaction server protocols defined. Prior to launching a project, planning is essential for reducing risks that may impact the developer's ability to complete it. Project planning includes establishing goals and objectives, managing risks, fulfilling deadlines, and completing other activities. Time boxes are an important tool for project planning, and they are often used in software projects.

5.1.1 Management plan

Describe the project team's tasks and responsibilities, as well as the project management procedure. Create communication and reporting channels to ensure the cooperation's success. Identify the issue-resolution strategy's decision-making and escalation phases.

Table 2: Management Planning

No	Task Name	Duration	Start Date	End Date
1	Introduction	5	19 Nov-2024	23 Nov-2024
2	Initial Study	4	24 Nov-2024	27 Nov-2024
3	Literature Review	4	28 Nov-2024	1 Dec-2024
4	Methodology	3	2 Dec-2024	4 Dec-2024
5	Planning	10	5 Dec-2024	14 Dec-2024
6	Feasibility	15	15 Dec-2024	29 Dec-2024

7	Foundation	5	30 Dec-2024	3 Jan-2025
8	Exploration	14	4 Jan-2025	17 Jan-2025
9	Engineering	30	18 Jan-2025	17 Feb-2025
10	Deployment	18	18 Feb-2025	7 Mar-2025
11	Testing	10	08 Mar-2025	17 Mar-2025
12	Implementation	5	18 Mar-2025	22 Mar-2025
13	Critical Appraisal and Evaluation	4	23 Mar-2025	26 Mar-2025
14	Lessons Learning	3	27 Mar-2025	29 Mar-2025
15	Conclusion	1	30 Mar-2025	31 Mar-2025
	Total	days	Total: 131 days	

5.1.2 Resource Allocation

Identify all project assets, including labor, equipment, and software. Determine the appropriate resource distribution based on the project's timeframe and workload. Assign team members jobs and duties while ensuring they possess the necessary skills and expertise.

Table 3: Resource Allocation

No	Task Name	Duration	Resource
1	Introduction	5	End User
2	Initial Study	4	Analyst
3	Literature Review	4	Analyst
4	Methodology	3	Analyst

5	Planning	10	Analyst, Designer, Developer
6	Feasibility	15	Analyst
7	Foundation	5	Designer
8	Exploration	14	Designer , Developer
9	Engineering	30	Developer
10	Deployment	18	Analyst, Developer
11	Testing	10	Analyst, Developer, Tester, Users
12	Implementation	5	Analyst, Developer
13	Critical Appraisal and Evaluation	4	Analyst, Tester and Developer
14	Lessons Learning	3	Analyst, Users
15	Conclusion	1	Analyst
	Total	Total: 131 days	

5.1.3 Time Boxing

Split the project into several timeframes or sprints for development and testing. Figure out long the time box should last, and what things and activities must occur during each iteration. Allocate time boxes with separate objectives and resources.

Table 4: Time Boxing

Time - Box	Task Name	Duration	Resource
TB1	Introduction	5	End Users, Analyst
	Initial Study	4	Analyst
	Literature Review	4	Analyst
TB2	Methodology	3	Analyst

	Planning	10	Analyst, Designer, Developer
	Feasibility	15	Analyst
TB3	Foundation	5	Designer
TB4	Exploration	14	Designer, Developer
	Engineering	30	Developer
TB5	Deployment	18	Analyst, Developer
	Testing	10	Analyst, Developer, Tester, Users
TB6	Implementation	5	Analyst, Developer
TB7	Critical Appraisal and Evaluation	4	Analyst, Tester and Developer
	Lessons Learning	3	Analyst, Users
TB8	Conclusion	1	Analyst
	Total	Total: 131 days	

CHAPTER 6

Feasibility

6.1 All possible types of feasibility

6.1.1 Operational feasibility

The analysis on the proposed AI-driven job recommendation system has a high practical feasibility because it is planned to run efficiently on mobile devices with low hardware. The AI model could locally run job recommendations with TensorFlow Lite, so it doesn't require heavy computations. With a Room Database, the user can access job posts even when offline, and included in the solution is SQLite Authentication for simple user management. Moreover, multilingual support in English and Bangla makes the system usable by a wider audience, also by people who can't speak English. Thanks to its intuitive UI and AI-powered suggestions, the system is appropriate for use in Bangladesh's poorest communities.

6.1.2 Technical feasibility

Hardware	Software
Dell Laptop, Wi-Fi, Router, Cable, Android Phone	Android Studio, Google Chrome Browser, Windows, MS Word, VS code

6.1.3 Technology

Client side	Server side	Database
Java XML	Java, Python	SQLite, Dataset.

6.2 Cost Benefit Analysis

Project managers utilize cost-benefit analysis to weigh the benefits and drawbacks of alternative project routes, including interactions, activities, business demands, and expenditures. A cost-benefit analysis identifies the most cost-effective approach to achieving my goal.

Project Name: AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh

Table 5: Cost Benefit

Equipment	1 st Year	2 nd Year	3 rd Year	4 th Year	Total
Mobile Based Application	20000				20000
Data collection		10000	10000	10000	30000
Software	1000				1000
Internet	2000	2000	2000	2000	8000
Model Training	5000				5000
Development		5000			5000
Maintenance	10000	10000	10000	10000	4000
Total					73,000 BDT.

6.3 DSDM Dynamic System Development Method (DSDM)

The DSMS itself is not an application development technique, system or technology, it is simply an agile project and technical management organization model. It emphasizes incremental development process, the frequent delivery of software, and working closely with customer and business groups. Note however, that DSDM requires the use of some tools or technologies such as Java and AI and Python. These are commonly known mobile development technologies which are anticipated to have relevance to DSDM projects.

CHAPTER 7

Foundation

7.1 Some potential approaches

7.1.1 Interview

Interviews will be conducted with job seekers in Bangladesh's impoverished regions and HR experts and companies in order to make the AI-powered job suggestion system a success. These interviews will reveal the problems job seekers face, their job search habits, and what someone would want in a mobile job suggestion app. It can also provide useful contact with employers to understand what skills are needed and how they prefer to hire. The feedback from these interviews will inform the development of an easy-to-use, efficient job matching system tailored to the needs of the region.

7.1.2 Observation

The AI-powered jobs referral system for impoverished regions of Bangladesh seeks to bridge the employment gap via mobile phones. It is built in Java and AI and users can utilize it to register, login and recover passwords. The job search system is user-friendly to the users so that they can easily find out relevant job postings and the AI driven recommendation engine displays customized job positions once certain input fields are entered. The multilingual capability of the system (English and Bangla) ensures that the platform is accessible for multilingual users, i.e., people who speak two languages with different language preferences. Such a strategy serves as an antipoverty program that helps poor communities by offering convenient work options and targeted job help to those living in that particular community, thereby stimulating the economy of the population group in question.

7.1.3 Data Collection

I have collected my dataset from Kaggle and my own collected data that I combined. I have total 3761 data for my recommendation system. Almost 12 features have been used in this dataset like: “experience_level, employment_level, job_title” etc.

work_yea	experie	employ	job_title	salary_cur	company_	company_	company_	skills	min_age	industry	salary
2023	Entry Leve	Full-Time	Applied Si	USD	US	Large	Google	General IT	22	AI & Data	90000
2023	Entry Leve	Full-Time	Applied Si	USD	US	Large	Salesforce	General IT	20	AI & Data	25000
2023	Entry Leve	Full-Time	Data Qual	USD	NG	Large	SAP	General IT	24	AI & Data	70000
2023	Entry Leve	Full-Time	Complian	USD	NG	Large	Twitter	SQL, Excel	30	AI & Data	145000
2023	Entry Leve	Full-Time	Applied Si	USD	US	Large	Oracle	General IT	26	AI & Data	42000
2023	Entry Leve	Full-Time	Applied Si	USD	US	Large	Tesla	General IT	29	AI & Data	60000
2023	Entry Leve	Full-Time	Machine L	USD	US	Medium	IBM	Python, Te	29	Software	20000
2023	Entry Leve	Full-Time	Machine L	USD	US	Medium	Uber	Python, Te	30	Software	65000
2023	Entry Leve	Full-Time	Research :	USD	US	Large	Oracle	General IT	28	AI & Data	55000
2023	Entry Leve	Full-Time	Data Engir	USD	US	Medium	IBM	General IT	32	AI & Data	55000
2023	Entry Leve	Full-Time	Data Engir	USD	US	Medium	Tesla	General IT	23	AI & Data	70000
2023	Entry Leve	Full-Time	Data Anal	USD	US	Medium	Twitter	SQL, Excel	27	AI & Data	85000

Fig 1: Sample of dataset

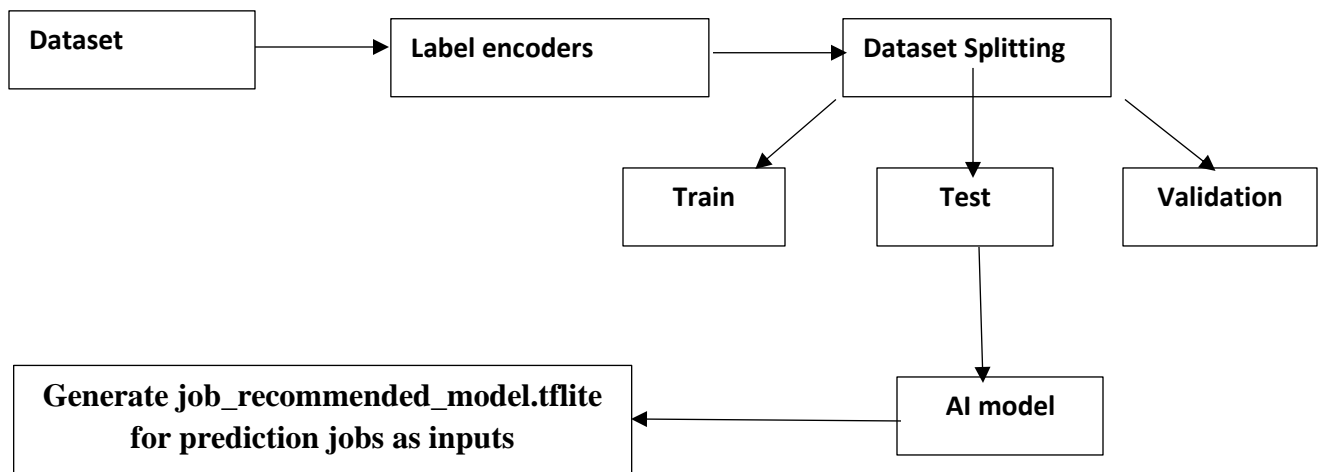


Fig 2: The recommended model for the whole research project.

7.2 Specific problem are identification and description

This initiative is addressing the lack of available and personalized career opportunities for Bangladesh's citizens living in poverty. People in these locations face barriers such as limited exposure to information about work, language barriers and difficulty moving through labor

markets. It is also not always the case - or even possible - to search for a job in the traditional way in large part as a result of technical and literacy limitations. This opens a void in which deserving people lose out on job opportunities that they are well-suited to and would enjoy. This project aims to overcome these barriers by creating an AI-based job recommendation system with language support, which enables a more personalized and inclusive job-search experience for these populations.

7.3 Possible solution

A potential solution to this challenge is an AI-based mobile phone application that provides personalized job suggestions based on needs and strengths of impoverished citizens in Bangladesh. The platform relies on machine learning to evaluate data provided by users (e.g. abilities, experience, location, and interests), and provide matched employment opportunities. The multilingual functionality guarantees that language is not a barrier that making the software more accessible to a larger audience. Furthermore, the job search capability enables users to simply peruse available job ads, increasing their chances of employment. This approach helps poor populations by making professional options more accessible and tailored, therefore reducing unemployment and improving their livelihoods.

7.4 Overall Requirement List

- Functional Requirements
- Non-Functional Requirements.

7.4.1 Functional Requirements


7.4.1.1 User

- Client dashboard.
- Switch language (Eng to Bang / Bang to Eng).
- Login.
- Registration.
- Forget password.
- Job search and see jobs details.
- Job recommended system as per inputs of users.
- Logout.

7.4.2 Non-Functional Requirements

7.4.2.1 Security

Each systems user has an account that is only accessible to those who have been granted authorization and a password. I use Java SQLite to encrypt my credentials.



Job Recommendation

LOGIN

REGISTER

FORGOT PASSWORD?

বাংলা / ENGLISH

Fig 3: User Interfaces

7.4.2.1 Performance

After receiving reliable data, the job-recommended system operated successfully.

7.4.2.2 Availability

Users only need a computer and an internet connection to access the system at any time and from any location. Android studio and physical device of android are among that may be used with this system mobile apps.

7.4.2.3 User Friendly

The technology is user-friendly and has an engaging UI.

- Ensure the mobile apps does not encounter severe slowness or downtime when several users access it simultaneously.
- The mobile apps should be able to handle massive volumes of data.
- The mobile apps design should be simple and user-friendly.
- The mobile apps should allow for simple addition of new features and capabilities without major rewrites.
- Regular mobile apps maintenance is necessary to address bugs and post-deployment concerns.

7.5 Which technology to be implemented

The software I am working on is fully mobile-based. I'm working on my project utilizing Java and Python.

Python: Python is a popular high-level, interpretive programming language that is straightforward to learn and understand, making it a good choice for both new and experienced programmers. It is multi-paradigm, including procedural, functional, and object-oriented. Python is very popular in various areas, such as machine learning, big data, system administration, automation, computer graphics, and many others. Developers can take advantage of its large standard library as well as third-party packages such as NumPy, Pandas, and TensorFlow to do very complex jobs efficiently. Python is a widely

used, high-level, powerful programming language, experience in python opens up a world of opportunities to a professional developer.

Java: Java is a widely used object-oriented language that is highly regarded for its platform independence, i.e., Java applications can be executed on any hardware environment or software platform that has a Java Virtual Machine (JVM) installed. It is known to be secure, long-lasting, and user-friendly, and is therefore a great pick for mobile apps, web apps, and enterprise software development. Java has a plethora of libraries and frameworks, like the Android SDK for mobile app development that give power to developers to make faster, reliable, and secure apps. It's flexibility and large community make it a great play for building something complex like an application that uses AI to suggest you jobs!

TFLite: TensorFlow Lite (TFLite) is a lightweight build of TensorFlow designed for mobile and embedded devices. It makes it possible to run models in the machine that aren't possible in a given platform or environment, like smartphones, due to speed, memory and battery restriction concerns. TFLite is optimal for the real-time use cases as image recognition and recommendation engines because of its offline support and decreased reliance on the cloud for processing.

SQLite: SQLite is a relational database engine that is lightweight, serverless, and self-contained. It is used to store data in mobile and desktop apps and provides a simple, quick, and effective database management solution. Unlike conventional databases, SQLite does not require a separate server process, making it perfect for low-resource applications such as mobile apps. It enables SQL queries and is completely integrated into the program, allowing you to easily integrate and manage knowledge locally on smartphones without an online connection.

A researched topic is a field of study that is currently being investigated and analyzed to clarify concepts for model building, goal setting and attainment, data gathering, management, teaching, and performance improvement. I go over the equipment and techniques I use to take measurements. NumPy supports Python programming, Microsoft

applications, and tools like Scikit-learn. Google Co Labs' facilities are only used for training and assessment. Google Colab programmers may develop complicated AI algorithms as well as Python-based data analysis.

Libraries:

- NumPy is a popular Python package for working with matrices. This section covers the Fourier change matrix operations, and the principles of algebraic geometry. The NumPy library contains Python components and tools for dealing with arrays of various sizes. NumPy enables you to generate arrays precisely and methodically. NumPy, a Python module, is used for performing numerical calculations. The term "a wide range of Python" is frequently used.
- The Python program language's operating system (OS) enables artists to connect with computer components.
- TensorFlow is a free Language math library for building deep neural networks and autonomous learning algorithms.

7.6 Recommendation and justifications

The idea is to leverage AI-driven job recommendation algorithms in conjunction with mobile app development platforms such as Java, TensorFlow Lite (TFLite), and SQLite to build an efficient and accessible platform for Bangladesh's impoverished people. AI guarantees individualized work proposals based on user data, while TFLite allows for the rapid deployment of machine learning models on mobile devices. SQLite is suggested for storing information from users locally so that it may be accessed quickly and offline. This mix of technologies guarantees that the app is scalable, quick, secure, and user-friendly, solving the target community's specific issues in discovering appropriate employment opportunities.

CHAPTER 8

Exploration

8.1 Use case

This section uses use-case data and graphics to look at both functional and non-functional needs.

User:

Following the system, the user can carry out the following tasks:

- Client dashboard.
- Switch language (Eng to Bang / Bang to Eng).
- Login.
- Registration.
- Forget password.
- Job search and see jobs details.
- Job recommended system as per inputs of users.
- Logout.

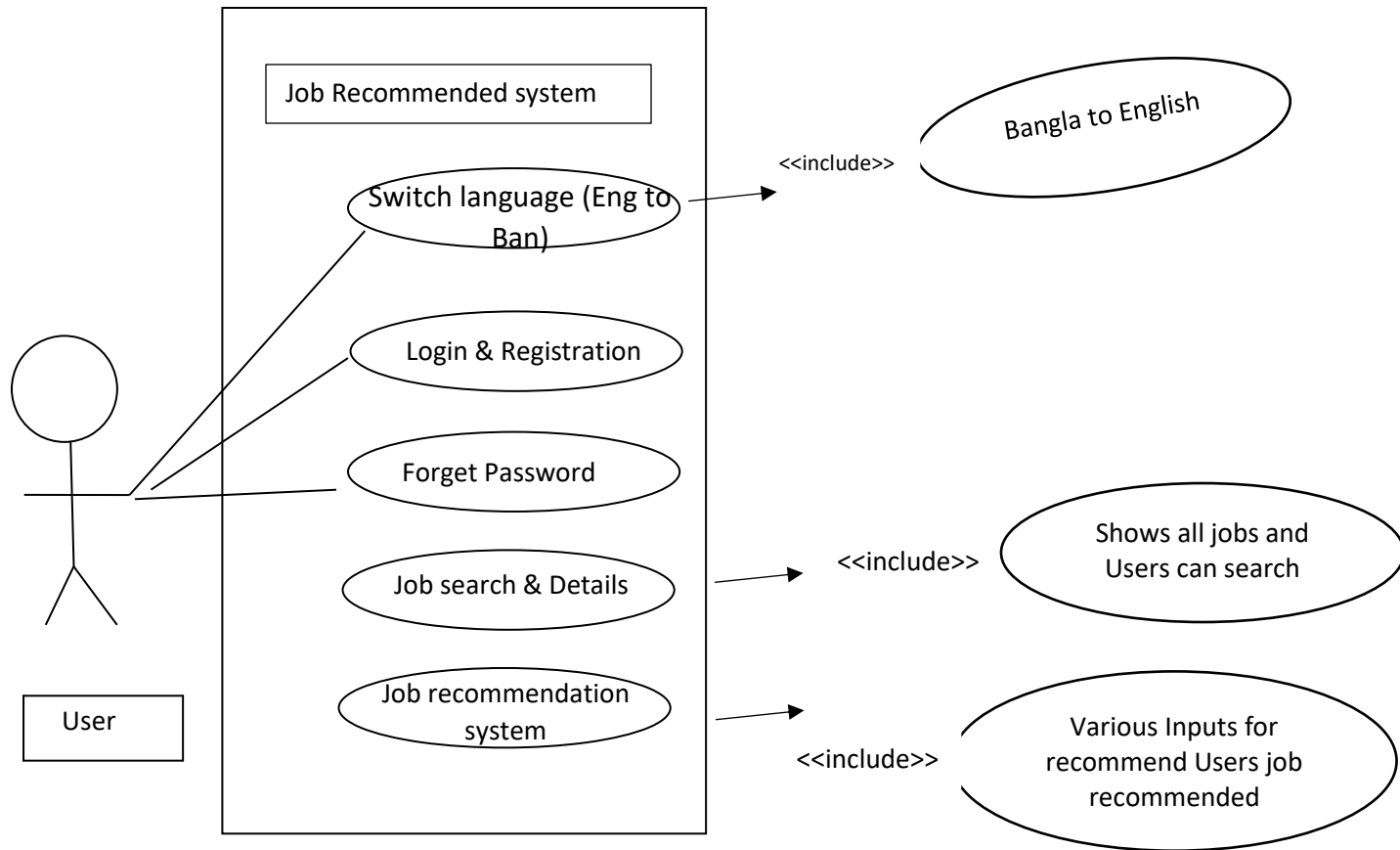


Fig 4: Use case Diagram

8.2 Activity diagram

Demonstrate how the system functions dynamically. It looks like a flow chart, showing how one job is related to another. You could utilize the activity to demonstrate how the system works. Control is therefore dispersed between activities. The general activity diagram for each module is illustrated below:

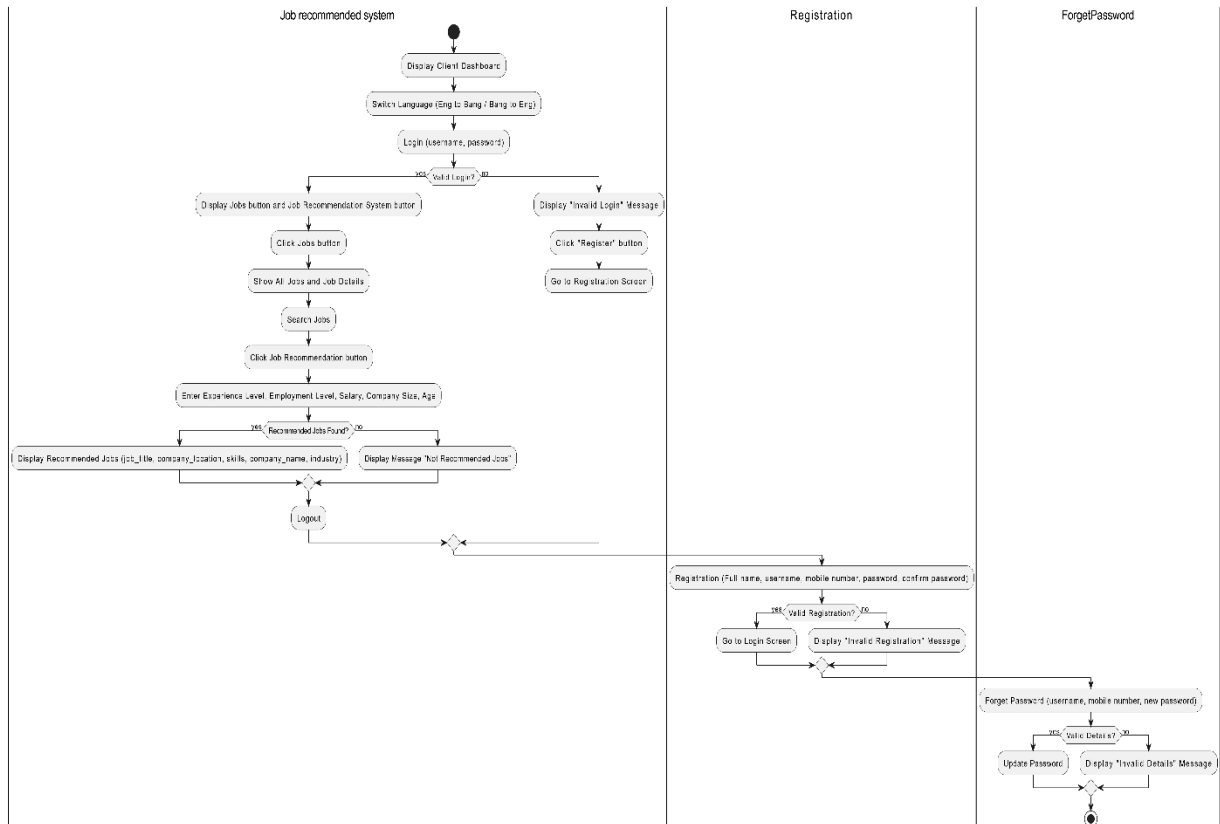


Fig 5: Activity Diagram.

8.3 Requirement catalogue

Functional requirements:

- **FR1:** Switch language (Eng to Bang / Bang to Eng).
- **FR2:** Login (username, password) After login Two button (Jobs, Job recommendation system), if not have an account then go for Registration button.
- **FR3:** Registration (Full name, username, mobile number, password, confirm password) Forget password (username, mobile number, new password) if password is forget then go for this
- **FR4:** Job search and see jobs details. After login click Jobs button shows:(all jobs with details, search jobs)

- **FR5:** Job recommended system as per inputs of users. (Experience_level, Employment_level, salary, company_size,age) after inputs of users then outputs recommended jobs according to inputs:(`"job_title"`, `"company_location"`, `"skills"`, `"company_name"`, `"industry"`) if jobs not found as per users inputs, then shows: Not recommended jobs
- **FR6:** Logout.

Non-Functional Requirements:

- **NFR1:** Records are easy to update and maintain.
- **NFR2:** Enables users to access the system from anywhere using a mobile phone and an Internet connection.
- **NFR3:** The technology is user-friendly with an appealing UI.

User Interface Requirements:

- **UIR1:** The interface is user-friendly, with straightforward navigation for quick access to features and capabilities.
- **UIR2:** Responsive design supports several screen and device sizes.
- **UIR3:** Icons provide visual cues for users to navigate and operate the system.

Security and Privacy Requirements:

- **SR1:** Use secure authentication and permissions to protect user data.

8.4 Prioritized Requirement List (PRL)

Table 6: Prioritized requirement list

Requirement ID	Requirement Description	Priority	Dependencies	Status	Validation Criteria
RQ1	Switch language (Eng to Bang / Ban to Eng)	High		Pass	Successfully change languages.

RQ2	Registration account	High		Pass	Successfully registered account.
RQ3	Forget password	High	RQ2	Pass	Successfully done
RQ4	Login system	High	RQ2	Pass	Successfully login.
RQ5	Job search & details of jobs	High	RQ2, RQ4	Pass	Successful
RQ6	Users can inputs for job recommended system.	High	RQ2, RQ4	Pass	Job recommend successfully
RQ7	Logout	High	RQ2, RQ4	Pass	Successfully logout.

8.5 Prototype of new system



Job Recommendation

JOBS

JOB RECOMMENDATION

LOGOUT

বাংলা / ENGLISH

Fig 6: Interfaces for user dashboard.

CHAPTER 9

Engineering

9.1 Class Diagram

A class was constructed to display the original content used for interclass linkages. In this scenario, the class represents an object's variables and behavior, either as a single programming description or as a standalone entity within the program.

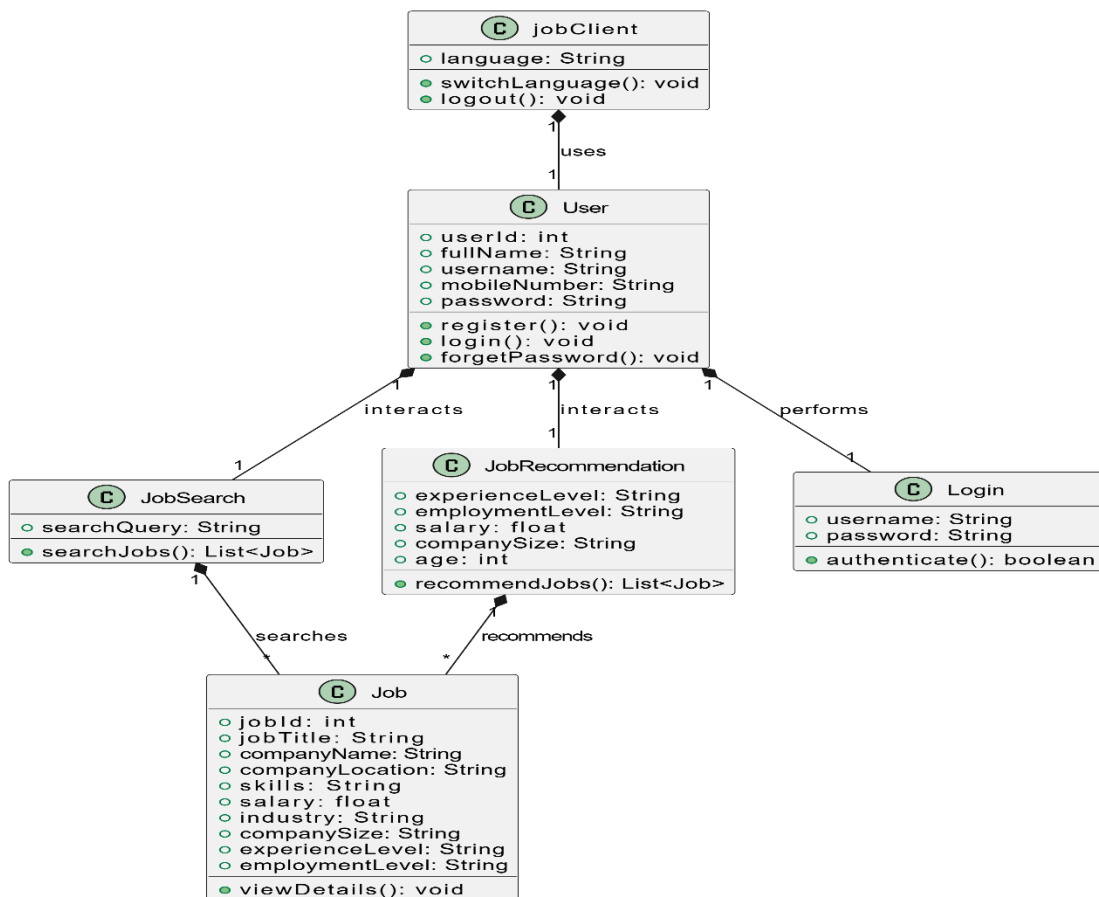


Fig 7: Class Diagram

9.2 ER diagram

Institutional communication, often called the ER model, ER Diagram, or ERD, is a structural design application. The ERD communicates and shows the major components of the

constrained system, as well as the relationships between these parts, in two separate ways. The user module's entity-relationship diagram is complete.

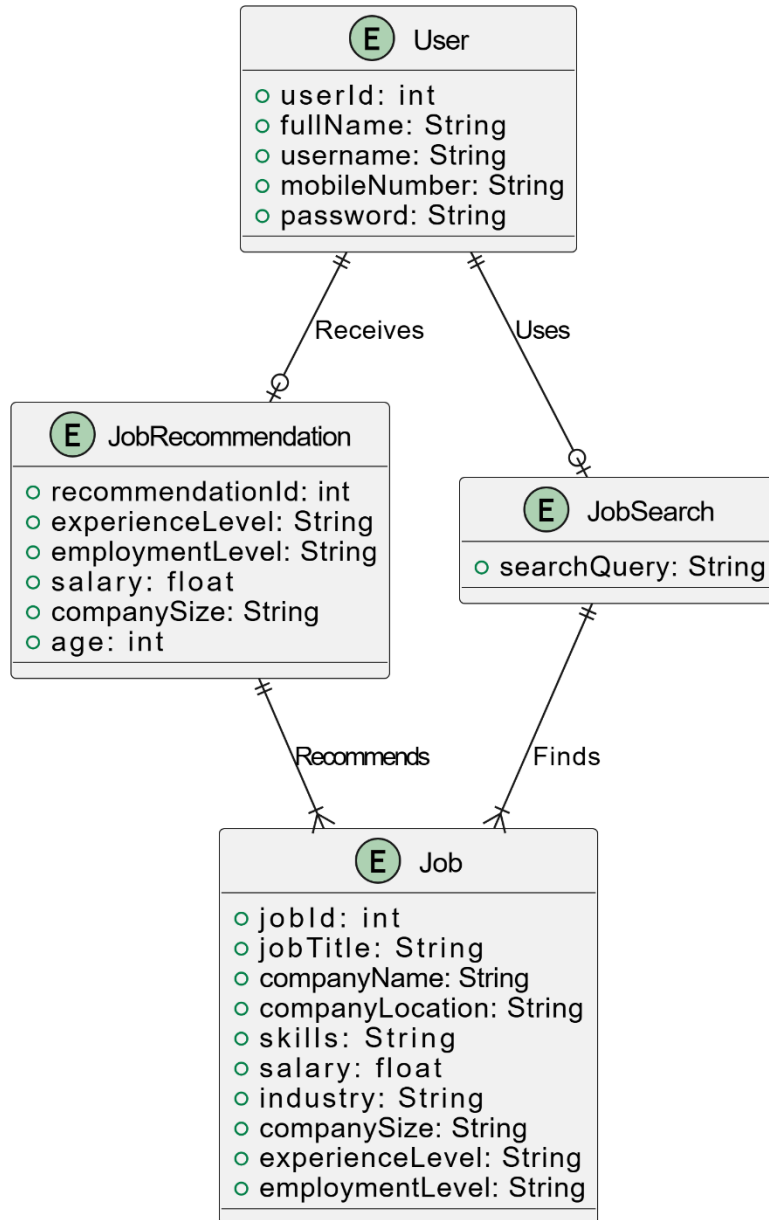


Fig 8: ER Diagram.

9.3 Sequence Diagram

This is all about one module's sequence diagram: User dashboard.

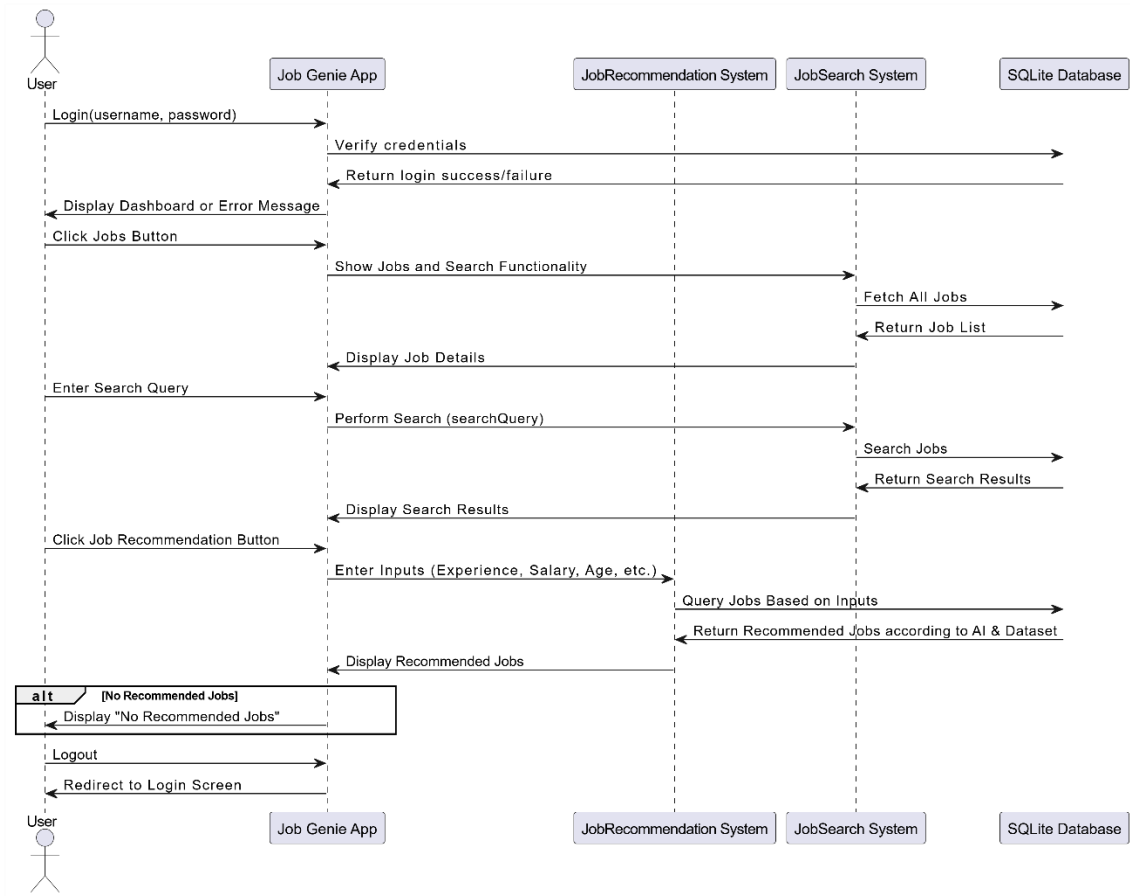


Fig 9: Sequence Diagram

CHAPTER 10

Development

10.1 Core Module Samples

```
1 package com.example.jobrecommendation.activities;
2
3 > import ...
12
13 <> public class HomeActivity extends AppCompatActivity {
14     Button btnJobs, btnJobRecommendation, btnLogout, btnLanguageSwitch;
15
16     @Override
17     protected void onCreate(Bundle savedInstanceState) {
18         super.onCreate(savedInstanceState);
19         setContentView(R.layout.activity_home);
20
21         btnJobs = findViewById(R.id.btnJobs);
22         btnJobRecommendation = findViewById(R.id.btnJobRecommendation);
23         btnLogout = findViewById(R.id.btnLogout);
24         btnLanguageSwitch = findViewById(R.id.btnLanguageSwitch);
25
26         btnLogout.setOnClickListener( View v -> {
27             Intent intent = new Intent( packageContext: HomeActivity.this, LoginActivity.class);
28             intent.setFlags(Intent.FLAG_ACTIVITY_NEW_TASK | Intent.FLAG_ACTIVITY_CLEAR_TASK);
29             startActivity(intent);
30             finish();
31         });
32
33         btnJobs.setOnClickListener( View v -> {
34             Intent intent = new Intent( packageContext: HomeActivity.this, JobActivity.class);
35             startActivity(intent);
36         });
37
38         btnJobRecommendation.setOnClickListener( View v -> {
39             Intent intent = new Intent( packageContext: HomeActivity.this, JobRecommendationActivity.class);
```

Figure 10: Code Sample

```

9 usages
9 public class DatabaseHelper extends SQLiteOpenHelper {
10
11     1 usage
11     private static final String DATABASE_NAME = "JobRecommendation.db";
12     7 usages
12     private static final String TABLE_USERS = "users";
13     1 usage
13     private static final String COLUMN_ID = "id";|
14     2 usages
14     private static final String COLUMN_FULL_NAME = "full_name";
15     2 usages
15     private static final String COLUMN_USERNAME = "username";
16     2 usages
16     private static final String COLUMN_MOBILE = "mobile_number";
17     3 usages
17     private static final String COLUMN_PASSWORD = "password";
18
19     3 usages
19     public DatabaseHelper(Context context) {
20         super(context, DATABASE_NAME, factory: null, version: 2); // Updated database version
21     }
22
23     @Override
24     public void onCreate(SQLiteDatabase db) {
25         String createTable = "CREATE TABLE " + TABLE_USERS + " (" +
26             COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT, " +
27             COLUMN_FULL_NAME + " TEXT, " +
28             COLUMN_USERNAME + " TEXT UNIQUE, " +
29             COLUMN_MOBILE + " TEXT UNIQUE, " +
30             COLUMN_PASSWORD + " TEXT)";
31         db.execSQL(createTable);

```

```
package com.example.jobrecommendation.models;

11 usages
public class Jobs {

    2 usages
    private String title, company, location, salary;

    5 usages
    public Jobs(String title, String company, String location, String salary) {
        this.title = title;
        this.company = company;
        this.location = location;
        this.salary = salary;
    }

    2 usages
    > public String getTitle() { return title; }

    2 usages
    > public String getCompany() { return company; }

    1 usage
    > public String getLocation() { return location; }

    > public String getSalary() { return salary; }
}
```

```
2
3 > import ...
17
18 public class JobData {
    2 usages
    private static List<Job> jobList = new ArrayList<>();
    1 usage
    private static Interpreter tfliteInterpreter;
    // Load Jobs from JSON
    1 usage
    public static void loadJobsFromJson(Context context) {
    24
    25     try {
    26         InputStream is = context.getAssets().open(fileName: "JOBS.json");
    27         int size = is.available();
    28         byte[] buffer = new byte[size];
    29         is.read(buffer);
    30         is.close();
    31         String json = new String(buffer, StandardCharsets.UTF_8);
    32         JSONArray jsonArray = new JSONArray(json);
    33
    34         for (int i = 0; i < jsonArray.length(); i++) {
    35             JSONObject obj = jsonArray.getJSONObject(i);
    36             Job job = new Job(
    37                 obj.getString(name: "job_title"),
    38                 obj.getString(name: "skills"),
    39                 obj.getString(name: "company_name"),
    40                 obj.getString(name: "industry"),
    41                 obj.getString(name: "company_location"),
```

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <shape xmlns:android="http://schemas.android.com/apk/res/android">
3     <solid android:color="#FFFFFF"/>
4     <corners android:radius="8dp"/>
5     <stroke android:width="1dp" android:color="#CCCCCC"/>
6     <padding android:left="10dp" android:right="10dp"/>
7 </shape>
8
```

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@android:color/white"
    android:gravity="center"
    android:padding="20dp">

    <!-- App Logo -->
    <ImageView
        android:id="@+id/appLogo"
        android:layout_width="150dp"
        android:layout_height="150dp"
        android:src="@drawable/logo"
        android:contentDescription="App Logo"
        android:layout_marginBottom="16dp"/>

    <!-- App Name -->
    <TextView
        android:id="@+id/appName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Job Recommendation"
        android:textSize="24sp"
        android:textStyle="bold"
        android:textColor="#333333"
        android:layout_marginBottom="32dp"/>
```

```
<resources>
  <string name="app_name">চাকরি সুপারিশ</string>
  <string name="login">প্রবেশ করুন</string>
  <string name="register">নিবন্ধন করুন</string>
  <string name="forgot_password">পাসওয়ার্ড ভুলে গেছেন?</string>
  <string name="fill_all_fields">সব তথ্য পূরণ করুন</string>
  <string name="login_success">সফলভাবে প্রবেশ করা হয়েছে</string>
  <string name="invalid_credentials">ভুল তথ্য</string>
  <string name="app_logo">অ্যাপ লোগো</string>
  <string name="jobs">চাকরির তালিকা</string>
  <string name="job_recommendation">চাকরি সুপারিশ</string>
  <string name="logout">প্রস্থান</string>
  <string name="reset_password">পাসওয়ার্ড পুনরুদ্ধার</string>
  <string name="enter_username">ব্যবহারকারীর নাম লিখুন</string>
  <string name="enter_mobile">মোবাইল নম্বর লিখুন</string>
  <string name="enter_new_password">নতুন পাসওয়ার্ড লিখুন</string>
  <string name="password_reset_success">পাসওয়ার্ড সফলভাবে পরিবর্তন হয়েছে!</string>
  <string name="invalid_username_mobile">অবৈধ ব্যবহারকারীর নাম বা মোবাইল নম্বর</string>
  <string name="search_hint">চাকরি খুঁজুন...</string>
  <string name="switch_language">ভাষা পরিবর্তন করুন</string>
  <string name="title">চাকরির শিরোনাম</string>
  <string name="company">কোম্পানির নাম</string>
  <string name="location">অবস্থান</string>
  <string name="salary">বেতন</string>
```

10.2 Probability problem break down

In the context of your AI-driven employment recommendation system for poor areas in Bangladesh, a probability problem might occur when predicting or proposing occupations based on user inputs. The system recommends jobs based on data (such as experience level, salary, company size, and so on), and probability is used to calculate the likelihood of a job match over a user based on their specific criteria. For example, given the user's inputs, the system computes the likelihood of a specific job matching these supplies by comparing them to the dataset. If a job's characteristics closely match the user's inputs, it is more likely to be recommended.

- **Data security and protection:** Scanned material must be handled properly to prevent unauthorized access, particularly source code and configuration files. Using strong encryption approaches, particularly when transferring scan findings or keeping them in databases, helps to protect data in transit and at rest.
- **Debugging and testing:** Identifying and resolving problems in mobile applications is crucial. Automation testing is used to find and repair issues throughout the Python coding process.
- **Quality Control and Testing:** Comprehensive procedures are utilized throughout development to discover and repair any bugs or weaknesses. Usability, efficiency, and user approval have all been assessed. One goal of security testing was to find and remedy vulnerabilities. To ensure a dependable, superior system, administrators and stakeholders were consulted prior to any changes being made.

10.3 Prioritization while developing

Prioritization	Requirements	Explanation
Core Functionality	Precise job suggestion based on job search parameters, user inputs (e.g., experience, income, firm size), and other factors.	The system must be able to search for jobs with comprehensive information and deliver precise job suggestions depending on user input.
UX (User Experience)	All users will find the design to be straightforward, easy to use, and seamlessly transfer between English and Bangla.	For poor areas with little to no computer knowledge, the design should be simple to use and support both Bangla and English.
Security and Data Management	Safe handling of user data, such as personal information, login credentials, and application information.	To ensure adherence to privacy laws and data security, user information must be safely maintained and shielded from unwanted access.

Optimization Performance	Features for job searching and suggestion are quick and fast, with little latency even in situations with significant utilization.	Even with a large user base or heavy traffic, the system must function well, offering prompt job suggestions and search results.
Integration with AI Models	smooth incorporation of AI models for user profile-based customization and accurate job recommendations.	As the system gains experience, the AI model should assess user inputs and match them to appropriate job postings, increasing the suggestions' relevancy.
Quality Assurance and Testing	Rigorous testing to ensure reliability, performance, and smooth functioning across different devices and edge cases.	The system must undergo continuous testing to ensure that it performs consistently across various devices and use cases, providing a bug-free experience.
User Feedback and Continuous Improvement	Collecting user feedback to fix issues, improve performance, and add new features based on user needs.	Continuous collection and analysis of user feedback to enhance the system, add requested features, and fix bugs, ensuring the app evolves with user needs.

CHAPTER 11

Testing

Project Name	AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh		
Name of product	AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh (Job Genie)		
Product description	AI-Driven Job Recommendation System for Underprivileged Communities in Bangladesh		
Project description	Java, Python.		
Project duration	Project Type	Testing/ Verification	
	Start date	End date	
	08 Mar-2025	17 Mar-2025	

11.1 Test Plan Acceptance

List the goals and constraints of the test. Prior to implementing the test plan, identify the important participants and secure their consent. Clearly state the acceptance requirements for every testing phase.

11.2 Unit Testing

Testing each module independently and integrating the structure as a whole are the best ways to do unit tests. Since it is the smallest part of any module, the software's architecture is the main focus of unit testing efforts. Another name for this is module testing. Every system module is assessed separately. Verify that this approach works in every browser.

11.3 Validation Testing

Software testing ensures that a system satisfies its requirements and operates as intended by using validation and verification procedures. Software quality assurance is another name for it.

11.4 Integration Testing

The problems related to the two concerns of program creation and inspection are addressed by integration testing. After software integration, many high-level assessments are carried out. This testing technique's main goal is to use unit-tested components to generate a program structure that satisfies design criteria.

11.5 TEST CASES

Table 7: Test Case

Case Id	CASE NAME	Expected Result	Actual Result	Result (Pass/Fail)
1	Switch language (Eng to Bang / Ban to Eng) for Underprivileged Communities	Successfully languages change.	Successfully languages change	Pass
2	Registration account for the job seekers.	Registration successful	Registration successful	Pass
3	Forget password	Successfully reset password	Successfully reset password	Pass
4	Login account	After registration successfully logged in.	Logged in successfully,	Pass

5	Job search & details of jobs	All job has been shows and search the specific jobs.	All job has been shows and search the specific jobs.	Pass
6	Users can inputs for job recommended system.	Recommended jobs as inputs by users.	Recommended jobs as inputs by users.	Pass
7	Logout	Logout successfully	Successfully logout	Pass

CHAPTER 12

Implementation

12.1 Training

User	Training	Time	Comment
Users or Clients			

12.2 Big Bang Implementation

The term "big bang implementation" describes a project deployment approach in which every system component is introduced all at once as opposed to in stages or phases. With this method, all features, upgrades, and modifications are implemented simultaneously throughout the system. This includes hazards, including the possibility of system failures, unanticipated problems, and difficulties with user adaption, even if it may result in a quicker implementation and instant access to the entire system. A Big Bang implementation for your AI-powered job recommendation system would include launching the entire application at once, complete with all of its capabilities, including search, job suggestions, login, registration, and language switching. If done properly, this strategy can be effective, but it has to be well tested to reduce dangers.

12.3 Scaling

Without sacrificing any performance, scaling is the practice of growing a system's ability to keep up with a growing amount of work, or a growing number of users. If more people experiencing poverty started using your AI-powered job suggestion system, you have a scaling opportunity to add features to make your app more accessible due to increased data, requests and users. That might involve optimizing AI algorithms, optimizing database queries or doing whatever is necessary on the server side to ensure that the system remains

reliable, fast and responsive as its traffic increases. Scalability ensures that your application can grow to accommodate new users without sacrificing a seamless user experience.

12.3.1 Design of scaling

Making sure your AI-driven job recommendation system can accommodate growing user counts and job data without experiencing performance issues is the main goal of scaling design. First and foremost, the application should have a modular architecture that makes it simple to expand the front-end and back-end. For example, the server capacity might be dynamically scaled using cloud-based solutions according to the number of active users. Even with big datasets, the AI algorithms should be tuned to handle job suggestions rapidly. In order to manage large traffic levels, the database should also be able to grow horizontally, dividing the load across several servers. Job listings and other frequently accessible data can be sped up with the use of caching methods.

12.3.2 Testing Performance

For every activity the scanner does, such as disclosure, sensitivity detection, static and dynamic evaluation, and analysis, a little piece of software has to be created. Teach development and architecture teams how to design scalable and effective systems. This means monitoring things like database efficiency, caching, diagonal scalability, and performance monitoring.

12.4 Experiment Result

Several discoveries were predicted by algorithms. I thus used a range of strategies. I experimented with several approaches to improve the caliber of my work. In order to apply AI approaches to the work of job recommendation system once again, this study creates a mobile application using Python modules for identification. After reviewing input task details and comparing them to a dataset, it generates a record that includes time and additional information. The suggested job has since been shown. To find the positions and make reliable job recommendations, the algorithm uses a trained dataset.

12.4.1 Descriptive Analysis

My methods of categorizing affected the results I acquired. A mobile application is produced as a result of this study, which uses Python modules for identification in order to apply AI techniques to the problem of the job suggested system another time. I make use of a promising AI model (Name). The identical data collection, which includes public ally accessible data sources, was utilized by all models. I used Matlab's built-in packages to assess the methods' soundness after finishing the dataset process. It creates a record with time and other details after verifying the task details entered and comparing the data to a dataset.

The image shows the 'Job Genie' app interface. At the top is a purple header with the text 'Job Genie'. Below the header are five filter options, each with a dropdown arrow: 'Select your experience level', 'Select employment type', 'Salary you want eg. 15000' (with an information icon on the left), 'Select company size', and 'Select your age'. Below these filters is a blue button labeled 'GET JOB RECOMMENDATIONS'. Underneath the button is the text 'Recommended jobs will appear here.'. At the bottom of the interface are two more buttons: a red one labeled 'LOGOUT' and a green one labeled 'SWITCH LANGUAGE'.

Fig 10: Apps user interface

CHAPTER 13

Critical Appraisal and Evaluation

13.1 Objective that could be met

Bangladesh's AI based job suggestion system for underprivileged people, aims to provide a system which helps people to search for suitable job opportunities that fit his/her interest, experience, and skills. The technology can increase job matching accuracy by allowing AI to recommend jobs based on each user's profile. The system as well ensures to remove the language barriers by offering the interfaces in both Bangla and English so it can be accessed by the users of all. Powerful security ensures user data is secure while an intuitive design ensures users can easily log in, register and recover passwords. The platform's long-term goal is to help marginal communities by providing them greater job opportunities and matching them to suitable employment opportunities.

13.1.1 Success rate against each objective

The success ratio can be calculated by analyzing how good is the job recommendation engine achieving each of the goals. As AI can achieve high accuracy for matching jobs and user profiles, the credibility of providing correct job suggestions can be measured through criteria such as user satisfaction and the relevance of the recommended jobs. Application of both Bangla and English language features would show that the success rate is applicable to consumer goods. "When pleasantly few mistakes exist and the user is highly involved, the design of login, registration, and password recovery procedures has been effective. The applicability of security is by no illegal access or unauthorized data breach and by keeping privacy for the user. In the end, strong user retention along with a continuous job matching improvement would be indicators of success.

13.1.2 How much better could have been done

By using more sophisticated machine learning models to increase the accuracy of job matches or by adding more user data points for more customization, the AI-driven job suggestion system may have been even better. Enhancing the app's user interface with more user-friendly features, including job notifications or real-time chat help, might have increased user engagement even more. Additionally, overall performance can have been enhanced by further optimizing the backend architecture to guarantee quicker response times under high user demand. There may have been a greater range of employment options if the system had been expanded by linking with regional employment portals or governmental databases. Lastly, more thorough user testing with marginalized populations may have improved the app's usability and accessibility.

13.1.3 Why it could not be done

Because resources (e.g., time, money or cutting-edge technology) are limited, the potential of the AI-based job recommendation system may not have been reached. Additional data, infrastructure, and development may be required to use more sophisticated machine learning models or gather data from external job portals, which may be beyond the scope of this project. In addition, practical constraints such as limited access to the target population or a lack of diversity in input could have emerged during extensive field-testing in poor regions. In addition, it might have required more server capacity and more complex optimisation algorithms to scale the back-end to deal with additional traffic and ensure it can handle load easily. In the final analysis, these enhancements may not have been feasible given the original constraints of the project.

13.1.4 Which objectives have been missed

Some of the goals that may have slipped under the radar include trying to add more diverse data, like one's educational background or a person's "soft talents," to better tailor job recommendations. Additionally, the use of real-time job notifications or a

chat feature for help may also lead to greater user interaction, but such features are not known to have been actually utilized. It may have also been beyond the scope to fully connect into the local jobboards, or even civil service databases, in order to improve employment opportunities. Additionally, continuing user feedback might have resulted in more specific findings, particularly within underserved groups, although this might have been limited by time or financial reasons. These unachieved objectives may have enhanced the resilience and usefulness of the system for its target population.

13.1.5 Why these objectives have missed

A number of limitations, including time, money, and the initial project's scope, caused these goals to be overlooked. It would have taken more time, technical know-how, and maybe more money to implement sophisticated features like real-time job notifications or integration with external employment databases. Additionally, additional user data would be required for greater customization in suggestions, which would not have been easily accessible or might have caused privacy issues. It's possible that practical issues, such as accessing the target population or a lack of funding for in-depth user research, prevented further user testing in poor neighborhoods. These improvements were therefore deprioritized in order to concentrate on the app's essential features.

13.1.6 What could have been done to complete those objectives

More time and money might have been spent incorporating sophisticated machine learning models for improved customization utilizing more user data, such as education and soft skills, in order to accomplish the failed goals. The job database may have been enlarged by collaborations with regional job boards or governmental organizations, giving users access to additional options. Integrating third-party services or APIs might have sped up and improved the efficiency of implementation for real-time job notifications and chat help. Working with neighborhood community groups or implementing outreach initiatives might have helped overcome the dearth of user testing by obtaining insightful input from marginalized populations and guaranteeing that the app genuinely satisfies their

requirements. These actions would have improved user engagement and system functionality.

13.2 Objectives totally not met / touched

Due to the project's scale and funding restrictions, several goals were entirely unachievable. For example, including chat assistance or real-time job notifications was not done since it would have taken more effort, knowledge, and third-party integrations. Due to logistical issues and a lack of cooperation with outside groups, the objective of increasing employment prospects through collaborations with regional job sites or government databases was likewise unachieved. Additionally, because it required additional user data and sophisticated AI models that were outside the project's original scope, the deep customization of job recommendations—incorporating a variety of user data—was not completely accomplished. Time, money, and resource limitations ultimately prevented these goals from being met.

13.2.1 Including software and documentation

The design approach would have included regular inspection, problem solving, and user feedback to preserve the software's effectiveness and efficiency. The paperwork, which comprised servicing instructions, technical directions, and user guides, had to be extensive to ensure simple understanding and future enhancements.

CHAPTER 14

Lessons Learned

14.1 Pre-project

Prior to the project's start, the main goal was to determine the main requirements of Bangladesh's impoverished populations, especially those related to their difficulties finding employment. To identify the market gap for a job suggestion system that serves these groups, research was done. The project's goal was to use Java to create an AI-powered mobile application with functions including registration, job searching, and language switching between Bangla and English. The goal was to develop a straightforward, user-friendly platform that might close the gap by offering tailored employment recommendations based on users' tastes and experience. In order to properly do these duties, the initial planning concentrated on choosing the right AI models, creating the user interface, and configuring the backend infrastructure.

14.2 Review

Regular reviews are necessary to evaluate whether the project is heading in the right direction, to identify any divergence from the plan and to ensure that everything is on the right track. Using these evaluations, I can then evaluate how well the mobile app is performing at achieving its goals, and whether I need to make changes or additions. Regular feedback from attendees and readers can make it easier to identify areas ripe for improvement, and encourage more knowledgeable decisions.

14.3 Lessons Learned

I did a lot of study before creating this mobile application. I researched system architecture and analysis before I started working on this application. The hardest aspect of developing a system is this. Without analysis, it is challenging to deliver proper programming. After that, I studied artificial intelligence and Python. The process of learning is challenging. In their most basic versions, they may be challenging to understand and utilize, even with

their vast databases. I am aware of my shortcomings as soon as I start studying in order to be regarded for the upcoming assignments.

14.4 Problem Faced

A number of issues arose throughout the AI-driven job suggestion system's development. One major problem that affected the accuracy of job suggestions was the scarcity of varied, high-quality datasets. It was difficult to collect pertinent data from underserved locations since many users had little access to technology or access to the internet. Optimizing the AI models to guarantee precise job matching was another issue, particularly given the limitations of computer power. Maintaining accessibility for all users was further complicated by language difficulties and making sure that the app's user interface seamlessly switched between Bangla and English. Last but not least, practical obstacles to reaching the target population made user testing challenging and slowed down the feedback loop and refining process.

14.5 Problems That are solutions

Several challenges came up while building the AI driven job recommendation system that were effectively addressed. The system employed data augmentation methods, and collaborated with local organizations to expand the dataset due to the challenge of insufficient data. The AI models were iteratively validated and adjusted so that, first, they make correct work recommendations and second, they make accurate recommendations with optimal use of the computing resources available. To ensure all sorts of user access to the system in both the Bangla and English language as well, it has been developed with a good language changing feature in between Bangla and English language system. In addition, remote user tests for disadvantaged people were conducted, whereby through community outreach feedback was obtained to enhance the functionality and user interface. The struggles we faced building the system were alleviated by these patches.

CHAPTER 15

Conclusion

15.1 Summary of the project

The project was aimed at creating a mobile application that helps the users in finding opportunities for jobs based on their area of study, experience, talent and for low-income community the AI backed job suggestion system for Bangladesh poor neighborhood. With regard to options – job search, registration, login, password recovery – the application made with Java and AI. To make it accessible to mass people it also has a language switch option (Bangla/English). The novelty is that users fill in input areas — age, expected pay, experience level — and the A.I. system recommends jobs that comply with them. The challenges included restricted data sets, accuracy-driven AI model optimization, smooth language switches, and testing with users and underserved communities. However, some solutions were tried out to address these issues such as user outreach, AI model optimization and data augmentation. The overall objective of the project was to provide users with as good a career situation as possible by offering suitable job positions.

15.2 Goal of the project

The aim of the project is to build an artificial intelligent-based job matching platform that connects Bangladesh's slums with their appropriate job opportunities. The system aims to provide personalized job recommendations through AI and machine learning, considering the habits, experience, and qualifications of the users. The app is also expected to break language barriers and make the user-base broader by offering interfaces in Bangla as well as in English language. The long-term goal of the initiative is to support these communities blossom by raising their socio-economic success, and reinforcing their access to job opportunities and solid jobs.

15.3 Success of the project

This initiative has been a wonderful success. The key actions are:

- Login.
- Registration.
- Forget password.
- Job search and see jobs details.
- Job recommended system as per inputs of users.
- Logout.

15.4 Documentation

The paperwork most likely addressed the following stages, assignments, and plans:

- **Records of Previous Projects:** A job referral software that is easy to use and accessible in both Bangla and English is needed in Bangladesh's impoverished neighborhoods, according to research.
- **The Project Schedule:** With defined objectives and risk management techniques in place, the strategy seeks to create a safe, user-friendly software with job search and recommendation capabilities.
- **Technical Details:** A safe user experience is ensured by the app's Java for Android development, which uses SQLite for data storage and TensorFlow Lite for AI suggestions.
- **Documentation for Users:** Simple instructions for registering, searching for a job, changing languages, and protecting data within the app will be included in the documentation.
- **Inspection and Assurance of Quality:** To make sure the app works properly and handles heavy traffic, testing will involve unit, integration, and performance testing.
- **Plans for Deployment and Maintenance:** Following its release on Google Play, the app will receive frequent updates, bug patches, and AI model enhancements depending on user input.

15.5 Value of the project

The AI-Driven Job Recommendation System project is so important because it has the potential to assist Bangladesh's disadvantaged regions to bridge the job gap. The idea behind this is to connect users with the right job offer that matches their tastes and skills and provide a personalized job proposal platform. This increases the probability of finding a job for those whom might have difficulty in finding acceptable work otherwise. Moreover, the application is also multilingual (in Bangla and English) to ensure that a wide range of users can access it. AI increases the efficiency of job matching, and a more effective and targeted approach to job search than traditional methods. But all in all, job opportunities produced and inclusive growth fostered in marginal areas lead to the development of society.

15.6 My Experience

I can help on the mobile app project for the AI job recommendation system with soft dev, design, or PM. Because of this experience, I've been in a position to talk to stakeholders and keep track of my project deadlines, overcome technical hiccups, and implement solutions developed for the Recognize job recommendation system. I have improved my abilities in problem solving, team work, and documentation to further expand my professional skill set.

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