

UNIVERSITY OF DANANG
VIETNAM-KOREA UNIVERSITY OF INFORMATION
AND COMMUNICATION TECHNOLOGY



GRADUATION THESIS REPORT

TOPIC :

BUILD A JOB SEARCH WEBSITE INTEGRATING AI

Member

: HO DINH CANH
VO VAN VUONG

Instructors

: PhD. LE TAN

Da Nang, December 2023

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INTRODUCTION

In the current context, with the rapid development of the economy and industry, the demand for high-quality workforce is increasing. Finding and choosing a suitable job is not only a significant challenge for workers but also an important issue for businesses. In light of this reality, developing an effective job search website not only enhances opportunities for both employers and job seekers but also meets the diverse needs of the labor market.

This project aims to build a unique, convenient, and effective job search website. Through this, we hope to provide a useful solution that facilitates easy connection between job seekers and relevant employment opportunities while assisting businesses in finding candidates with skills and experience that match job requirements.

This report will detail the website development process, its key functionalities, and the technologies used to ensure stability and safety for users. Additionally, we will discuss the information gathering process, labor market analysis, and specific challenges faced during the project development.

The report will be divided into specific chapters and sections, making it easy for readers to access and understand the development and implementation process of the job search website. Each chapter will focus on a specific aspect of the project, from problem statement to implementation process and result evaluation.

We hope that through this report, our project will contribute a small yet significant part to improving the efficiency of job search for both workers and businesses. Join us in exploring the development journey of the project in the following chapters.

THANK YOU LETTER

In reality, there is no success that is not closely tied to the support, assistance, whether little or much, direct or indirect, from others. Throughout the time from researching the topic until now, I have received a lot of care and assistance from esteemed teachers, family, and friends. I sincerely thank the Board of Directors of the University of Information Technology Vietnam-Korea for creating the conditions for us to work on this project.

I would like to express my sincere gratitude to Professor Le Tan for wholeheartedly guiding me with all his dedication, creating all the necessary conditions for us to undertake this project, and providing valuable opinions throughout the project. Working with him, I have learned many beneficial things to apply in future work as well as in daily life. Due to limited time and knowledge, despite my efforts, there are still many shortcomings in the project implementation process. I sincerely hope for the supplementary contributions from the teachers and fellow students.

Da Nang, December 20, 2023.

Member

Vo Van Vuong Ho Dinh Canh

INSTRUCTOR COMMENTS

Da Nang, day ... month ... year 2023

INSTRUCTORS

PhD. LE TAN

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LIST OF ABBREVIATIONS

STT	Acronyms	Meaning
1	AI	Artificial Intelligence
2	HTML	HyperText Markup Language
3	CSS	Cascading Style Sheets
4	JS	JavaScript
5	SQL	Structured query language
6	LLM	Large language model

OVERVIEW OF THE PROJECT

1. Introduction

In the current context, with the rapid development of the economy and industry, the demand for high-quality workforce is steadily on the rise. The task of searching for and selecting a suitable job is not only a significant challenge for job seekers but also a crucial issue for businesses. Faced with this reality, the development of an effective job search website not only enhances opportunities for both job seekers and employers but also aligns with the diverse needs of the ever-evolving labor market.

2. Objectives of the project

1. Creating an Efficient Connection Platform

The main objective of the project is to build a job search website that can connect job seekers and businesses quickly and effectively. We aim to create a convenient online space where job seekers and employers can interact seamlessly, helping them search and make informed decisions intelligently.

2. Ensuring Rich Features and User-Friendly Interface

Our goal is to develop a website with diverse features to meet the needs of both job seekers and employers. Smart search features, standout personal profiles, and an automatic notification system will provide users with the best experience on our platform.

3. Enhancing User Experience and Cognitive Support

An important goal of the project is to optimize the user experience. We are committed to providing a friendly and easy-to-use interface, enabling job seekers and employers to interact effortlessly with the system. Additionally, we will integrate cognitive support technologies to provide job and candidate suggestions, enhancing their search capabilities.

4. Ensuring Safety and Information Security

Equally important is the goal of ensuring the safety and security of users' personal information. We will implement robust security measures to prevent information risks and create a trustworthy online environment.

Overall, the project aims to provide a comprehensive solution, meeting the diverse and increasingly flexible demands of the job market.

3. Topic content

- Study the theoretical foundations of web programming.
- Explore artificial intelligence.
- System analysis and design.
- Learn programming languages Java, Python.
- Explore platforms and tools like IntelliJ.

4. Functional requirements

Job Seeker:

- Create Personal Profile: Register and create a personal profile with information on education, work experience, and skills.
- Job Search: Search for jobs based on keywords, location, industry, salary, and other criteria.
- Apply Online: Submit job applications online for suitable positions.
- Recommendation System: Provide job recommendations based on search history and personal profiles.
- Profile Management: Update, manage, and track application statuses.

Employer:

- Post Job Listings: Advertise job openings with details such as job description, requirements, and benefits.
- Applicant Management: View and manage candidate profiles, receive notifications about application statuses.
- Candidate Search: Search for candidates based on criteria such as skills, experience, and education.
- Statistics and Reports: Provide statistics on job views, applicant numbers, and other relevant metrics.

General:

- User-Friendly Interface: Design an easy-to-use, friendly interface compatible with various devices.
- Safety and Security: Ensure the safety of personal information for both job seekers and employers.
- Integrated Payment System (if needed): Allow employers to pay service fees online.
- Administrative Functions (Admin):
- Manage Job Listings: Confirm and approve job listings before displaying them on the website.
- Edit or Delete Job Listings if necessary.
- Manage Job Seekers and Employers: View and manage information for job seekers and employers.
- Lock or delete accounts for violations of terms of use.

Support System:

- Receive and address support requests from users.
- Provide technical support to users encountering issues.
- Statistics and Reports: View statistics on website activity, job listings, and job seekers.
- Advertisement Management (If Applicable): Review and manage advertising content on the website.
- Access Permissions: Manage access permissions for administrative accounts, create and manage new administrative accounts if necessary.

- System Security: Manage and monitor system security, implement security measures to protect personal information and user data.
- System Interaction: Manage notification and news systems on the website.

5. Layout of the Project

After the Introduction, the report is presented specifically as follows:

- Theoretical Foundation.
- System Analysis and Design.
- Introduction of the Program and conclusion.

Chapter 1: INTRODUCTION TO THE TOPIC

1. 1 Introduction

The economy's continuous development corresponds to an increasing demand for high-quality and efficient workforce. In this context, the support of information technology plays a crucial role in facilitating a convenient and swift connection between job seekers and businesses. Simultaneously, it poses a challenge for web developers tasked with constructing job search platforms that not only meet the diverse demands of the labor market but also ensure convenience and safety for users.

This project aims to develop a unique, efficient, and user-friendly job search website. Through the integration of advanced web technology and intelligent functionalities, we aspire to provide a comprehensive solution that assists job seekers in easily discovering suitable opportunities and helps businesses connect with skilled and dedicated candidates.

The report will focus on the development process, key features of the website, as well as specific challenges encountered during the project's construction. We believe that through this project, we can make a small yet significant contribution to improving the job search process for both workers and businesses.

Join us on the detailed journey of building a distinctive and effective job search platform in the following chapters of this report.

1. 2 Research on "Build a job search website integrating AI"

1. 2. 1 Theory

Learn about:

- Understanding business activities related to job search websites.
- Front-End: HTML, CSS, JS.
- Back-End: Java, python
- Online messaging.
- Explore sending emails and text formatting (Markdown).

1. 2. 2 Functionality

Common functionalities:

- Sign in, sign up, manage personal profiles, apply online, recommendation system, user-friendly interface.

Job seeker functionalities:

- Manage job applications, profile management interface, view job statistics.

Employer functionalities:

- Post job listings, manage candidate profiles, view applicant statistics.

Admin functionalities:

- User management, account management, job listing approval, user support, system statistics, content management, system security.

1. 2. 3 Tools in use

- IntelliJ
- Visual studio code
- MySQL WorkBench

1. 2. 4 Project Objectives

a. Efficient Connection between Job Seekers and Employers:

The main goal of the project is to build an efficient job search platform, optimizing the connection process between job seekers and employers. We aim to provide a convenient online space where candidates can search and apply for suitable jobs, while employers can easily review and select candidates with the right skills and characteristics.

b. Integration of Smart Technology and User-Friendly Interface:

We are committed to integrating smart technologies such as job recommendation systems based on interests and skills, as well as improving user experience through a friendly and easy-to-use interface. The objective is to create a smooth and flexible online job search experience.

c. Enhancing Search Capability and Profile Management:

We aim to provide job seekers with intelligent search tools, making it easy for them to filter and identify the most suitable jobs based on their preferences and skills. Additionally, the personal profile management system will help them conveniently track and update their information.

d. Ensuring Safety and Information Security:

One of the most critical objectives of the project is to ensure the safety and security of personal information for both job seekers and employers. We will implement robust security measures to prevent risks and build a trustworthy online environment.

e. Optimizing Experience for Both Job Seekers and Employers:

Our goal is to create the best possible experience for both job seekers and employers. Through this project, we hope to positively contribute to the process of searching and managing human resources, helping both parties efficiently achieve their career and personnel goals.

Chapter 2: THEORETICAL FOUNDATION OF THE TOPIC

2. 1 Building a translation system

2. 1. 1 Visual Studio Code

Visual Studio Code (VSCode) is an integrated development environment (IDE) developed by Microsoft. It is a powerful and flexible tool for application development and open-source coding, widely used in the open-source software community. Here is an introduction to Visual Studio Code:

User-Friendly and Efficient Interface:

Simple and Flexible: The user interface is straightforward, user-friendly, and customizable to suit individual preferences.

Dark Mode: Supports dark mode to reduce eye strain and optimize working in low-light conditions.

Multi-Language and Multi-Platform Support:

Diverse Language Support: Supports multiple programming languages such as JavaScript, Python, Java, C#, HTML, CSS, and many others.

Multi-Platform: Works on Windows, macOS, and Linux, providing convenience for developers working across various operating systems.

Open Source Support:

Extensible and Flexible: Can be extended with available extensions in the VSCode extension marketplace.

Git Integration: Built-in Git integration for source code management and change tracking.

Debugging and Profiling:

Cross-Platform Debugging: Supports debugging for various languages and platforms.

Integrated Terminal: Provides an integrated terminal for executing commands and processes from one place.

Intelli Sense and Auto-completion:

IntelliSense: Supports automatic code completion, providing suggestions for variable names, functions, and other code elements.

Snippet Support: Integrates with snippets for quick and efficient code input.

Project Grouping and Management:

Integrated Source Control: Supports version control with systems like Git.

Efficient Project Management: Provides project management tools for quick navigation and search.

Large Community and Development Team:

Extensive Community Support: Developed and maintained by a large open-source community, facilitating feature expansion and improvement.

Frequent Updates: Microsoft and the community regularly update and add new features.

Conclusion:

Visual Studio Code has become one of the most popular and widely used IDEs in the development community. Its lightweight nature, flexibility, and robust integration capabilities make VSCode a preferred choice for many developers in their daily work.

2. 1. 2 MySQL Workbench

MySQL Workbench is a powerful database management tool developed by Oracle. It provides a graphical interface for designing databases, managing and executing SQL queries, and optimizing the performance of MySQL databases. Here is an introduction to MySQL Workbench:

Graphical Interface and Easy Interaction:

Graphical Design: Allows you to design databases through a graphical interface, dragging and dropping tables and relationships.

Interactive View: Displays a database model diagram for easy tracking of relationships between tables.

Database Management:

Create and Delete Databases: Provides tools for conveniently creating and deleting databases.

Backup and Restore: Supports the backup and restore process for data easily.

SQL Query Execution:

Query Editor: Allows you to perform and test SQL queries through a graphical interface.

Color Syntax: Supports syntax highlighting, making SQL syntax stand out and making query writing and reading easier.

User Management and Access Rights:

User Administration: Allows easy management of users and access rights.

Role Management: Supports managing user groups and roles.

Display and Performance Optimization:

Performance Dashboard: Provides a performance dashboard to monitor and optimize the database.

Query Profiling: Allows you to view and analyze the performance of queries.

Remote Connection and Integrated Combining:

Remote Connection: Supports connecting to the database remotely, facilitating database management from anywhere.

Integrations: Integrates with popular tools and languages such as Python, PHP, and others.

Comprehensive Development Environment:

Version Control Integration: Integrates with version control systems like Git.

Scripting and Automation: Supports scripting and automation through SQL commands.

Extension with Plugins:

Plugin System: Allows you to extend functionality using plugins.

MySQL Workbench is a crucial tool for MySQL developers and database administrators, providing a graphical and convenient working environment for managing and optimizing your MySQL database.

2. 1. 3 IntelliJ

IntelliJ IDEA is an integrated development environment (IDE) developed by JetBrains for the Java programming language, as well as supporting multiple programming languages through plugins. Here is an introduction to IntelliJ IDEA:

Friendly and Efficient Interface:

Creative Interface: Clean and optimized interface design for productive and fatigue-free work.

Dark Mode: Supports dark mode to reduce light and enhance comfort when working in low-light environments.

Support for Multiple Languages and Platforms:

Java and Multiple Languages: Supports Java application development and provides plugins for various languages such as Kotlin, Scala, Groovy, and even Python.

Cross-Platform: IntelliJ IDEA is available on multiple platforms, including Windows, macOS, and Linux.

Code Assistance and Refactoring:

Enhanced IntelliSense: Comprehensive support with source code suggestions, quick navigation, and automatic code completion.

Powerful Refactoring: Provides powerful refactoring tools to optimize source code.

Debugging and Testing:

Visual Debugger: Interactive debugger integrated with the development environment to efficiently track and debug errors.

Comprehensive Testing Support: Integrated with testing frameworks such as JUnit, TestNG, and various others.

Project Management and Version Control:

Efficient Project Management: Provides powerful and user-friendly project management tools.

Version Control Support: Supports version control systems like Git, SVN, and Mercurial.

Integration with Maven and Gradle:

Build Tool Integration: Supports integration with Maven and Gradle to manage the project's build process.

Web and Framework Support:

HTML, CSS, and JavaScript: Strong support for web development with HTML, CSS, and JavaScript.

Support for Spring and Other Frameworks: Supports various frameworks such as Spring, JavaFX, Android, and even JavaScript frameworks like Angular and React.

Plugins and Community Extension:

Diverse Plugins: Offers a vast plugin marketplace for different technologies and languages.

Large Community and Quick Support: Widely used, hence strong community support and rapid assistance from JetBrains.

IntelliJ IDEA is one of the most popular IDEs in the Java development community, providing powerful features and tools to enhance productivity and software quality.

2.2 Overview of MySQL

MySQL is an open-source relational database management system (DBMS) known for its popularity and robust capabilities. Here's an overview of the MySQL database:

Data Model:

MySQL employs a relational data model, organizing data into tables where each table consists of rows and columns corresponding to attributes.

Query Language:

MySQL uses the Structured Query Language (SQL) for interacting with the database. SQL provides commands like SELECT, INSERT, UPDATE, and DELETE for data manipulation.

Multitasking and Multi-User Support:

MySQL supports concurrent sessions and is capable of handling multiple users simultaneously.

Safety and Security:

Provides security features such as permissions and authentication to control access and implements safety measures like data encryption.

Reliability and Transaction Control:

MySQL supports ACID properties (Atomicity, Consistency, Isolation, Durability) to ensure transaction management's consistency and high reliability.

Search Support and Indexing:

Supports the creation of indexes to optimize search and data retrieval.

Multilingual and Character Sets:

Supports multiple languages and character sets, enabling applications to function in various regions and languages.

Open-Source Development and Community:

As an open-source project, MySQL benefits from extensive contributions and support from the open-source software community, making it flexible and capable of scalable development.

Easy Integration and Compatibility:

MySQL seamlessly integrates with various programming languages and frameworks. It also supports standards like JDBC and ODBC.

Database Management Tools:

MySQL provides management tools such as MySQL Workbench for database design, user administration, and other management tasks.

Conclusion:

MySQL stands out as a powerful, flexible, and widely used database management system in the software development community. Its lightweight nature, efficiency, and diverse features make it a popular choice for applications ranging from small projects to large enterprise systems.

2. 3 Introducing Bootstrap

Bootstrap is an open-source front-end framework widely developed by Twitter. It provides a set of design tools and resources to assist in building modern and responsive websites and web applications (compatible with various devices and screen sizes). Here's an introduction to Bootstrap:

Flexible User Interface:

Grid System: Bootstrap employs a powerful grid system, facilitating easy and flexible layout arrangement of web pages through columns and rows.

Responsive Design: Websites built with Bootstrap automatically adjust their size and layout to fit various devices such as computers, mobile phones, and tablets.

CSS and Components:

Pre-designed Interface: Bootstrap offers numerous CSS classes and components to create aesthetically pleasing and modern interfaces without requiring extensive customization.

Typography, Forms, Buttons, Tables: Includes pre-designed fonts, forms, buttons, and tables to reduce coding effort and development time.

JavaScript Plugins:

Carousel, Modal, Dropdown: Bootstrap comes with built-in JavaScript plugins, simplifying the addition of features like carousels, modals (pop-up windows), and dropdowns.

Collapse and Navbar: Provides components such as navigation bars (navbar) and collapsible elements for creating attractive and user-friendly websites.

Icons and Typography:

FontAwesome: Bootstrap supports the use of FontAwesome, a popular and versatile icon set.

Responsive Typography: Supports CSS classes for optimizing text display across different screen sizes.

Browser Support:

Cross-Browser Compatibility: Bootstrap is tested and supported on popular browsers such as Chrome, Firefox, Safari, Edge, and Internet Explorer.

Community and Resources:

Strong Community: Bootstrap boasts a large and active community with many contributors and shared resources.

Clear Documentation: Comprehensive and understandable documentation helps developers quickly familiarize themselves with the framework.

Bootstrap is a powerful tool that accelerates the web development process and ensures that your website has a modern and responsive user interface.

2. 4 Introducing python

Python is a versatile and dynamic programming language known for its simplicity and readability. Developed by Guido van Rossum in the early 1990s, Python has gained widespread popularity. Here's an overview of Python:

General-Purpose and Readable:

Python is a general-purpose programming language with a clean and readable syntax, emphasizing code readability and reducing the cost of program maintenance.

Interpreted and High-Level:

Python is an interpreted language, allowing for rapid development and testing without the need for compilation. It is a high-level language, abstracting complex details and providing easy-to-understand constructs.

Cross-Platform Compatibility:

Python is cross-platform, meaning code written in Python can run on various operating systems without modification.

Extensive Standard Library:

Python includes a comprehensive standard library that simplifies complex tasks, making it easy for developers to access functionalities without writing extensive code.

Dynamic Typing:

Python is dynamically typed, allowing developers to assign variables without explicitly specifying their data type.

Object-Oriented and Procedural:

Python supports both object-oriented and procedural programming paradigms, giving developers flexibility in designing and organizing their code.

Data Science and Machine Learning:

Python is widely used in data science and machine learning. Libraries like NumPy, Pandas, and TensorFlow make it a go-to language for these domains.

Web Development:

Python is popular in web development, with frameworks like Django and Flask facilitating the creation of robust and scalable web applications.

Community and Support:

Python has a vibrant and supportive community. Developers can find extensive documentation, forums, and online resources to aid in learning and problem-solving.

Automation and Scripting:

Python is commonly used for automation and scripting tasks due to its ease of use and quick development cycle.

Versatility in Application:

Python is employed in various domains, including web development, scientific computing, artificial intelligence, data analysis, and more.

Educational and Beginner-Friendly:

Python is often recommended as a first programming language due to its simplicity and readability, making it an ideal choice for beginners.

Conclusion:

Python has evolved into one of the most popular and versatile programming languages globally. Its ease of use, readability, and extensive community support contribute to its success across diverse applications and industries.

2.5 Introducing Java

Java is a powerful and cross-platform programming language developed by Sun Microsystems (now Oracle Corporation) in the 1990s. Here is an overview of Java:

Cross-Platform (Platform-Independent):

Java source code is compiled into bytecode, an intermediate language, making Java a cross-platform language.

Bytecode can run on any Java Virtual Machine (JVM).

Robust and Flexible:

Java is a robust language with a static type system, automatic memory management, and a large library.

Its simple and readable syntax minimizes errors and enhances maintainability.

Automatic Memory Management:

Java uses Garbage Collection to automatically free up unused memory, reducing the burden of memory management.

Object-Oriented Support:

Java is an object-oriented language, supporting features like inheritance, polymorphism, and encapsulation.

Rich Libraries and Frameworks:

Java comes with powerful libraries and frameworks like Java Standard Edition (SE) and Java Enterprise Edition (EE).

Multithreading and Concurrency:

Supports multithreading and concurrency, allowing the handling of multiple tasks simultaneously without compromising performance.

High Security:

Designed with a focus on security, Java runs applications in a sandboxed environment to mitigate risks from malicious code.

Strong Network Support:

Java offers robust and high-level libraries for network programming, including protocols like TCP/IP and HTTP.

Popular in Web Development:

Widely used in web application development, especially in content management systems (CMS) and frameworks like Spring.

Large Community and Swift Support:

Java has a large and active community, with abundant resources, forums, and open-source libraries to assist developers.

Java has become one of the most popular programming languages globally, utilized in various domains such as web development, mobile applications, desktop applications, and large-scale systems.

Chapter 3: DATA DESIGN

3. 1 Account entity

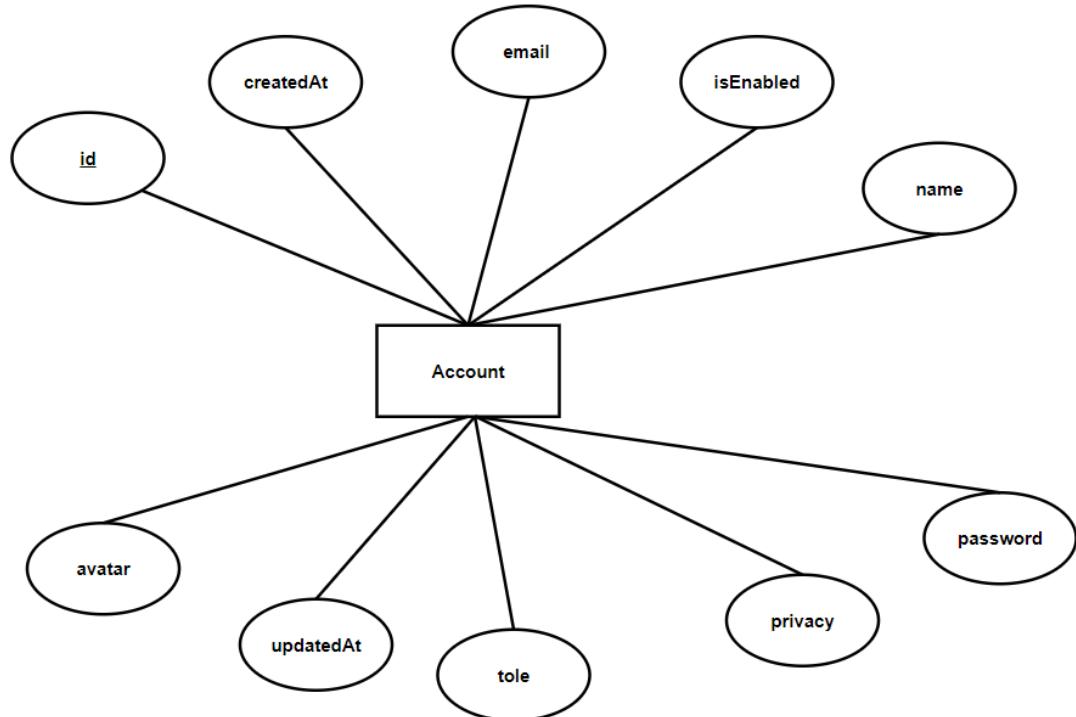


Figure 3.1-1 Account entity

3. 2 Candidates entity

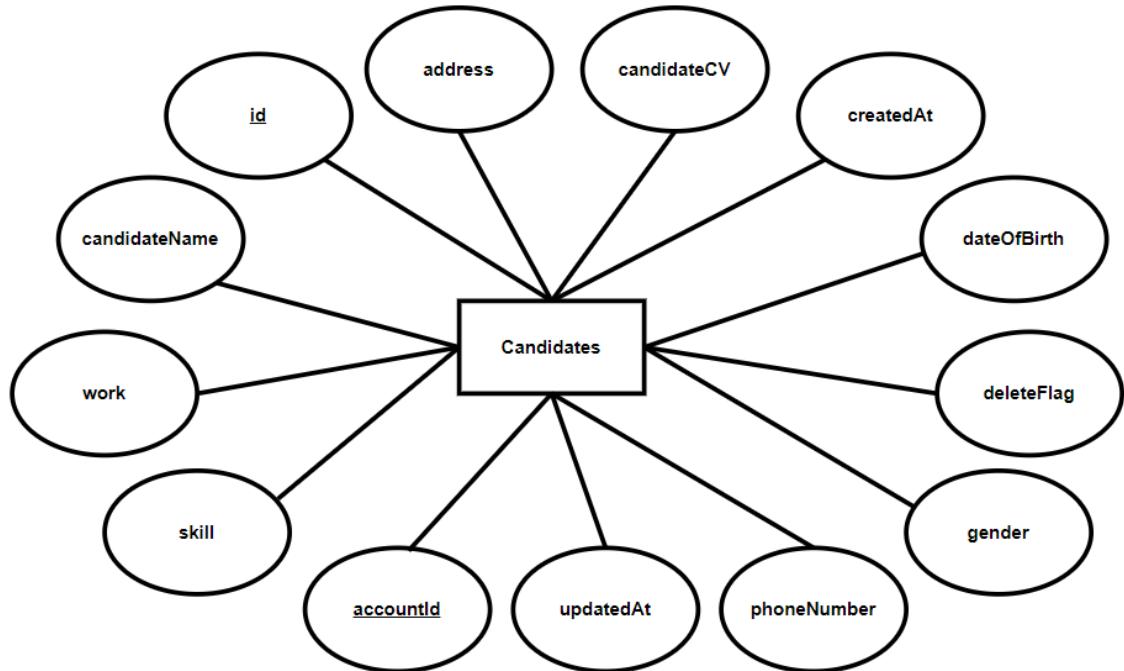


Figure 3.2-1 Candidates entity

3. 3 CandidateJobs entity

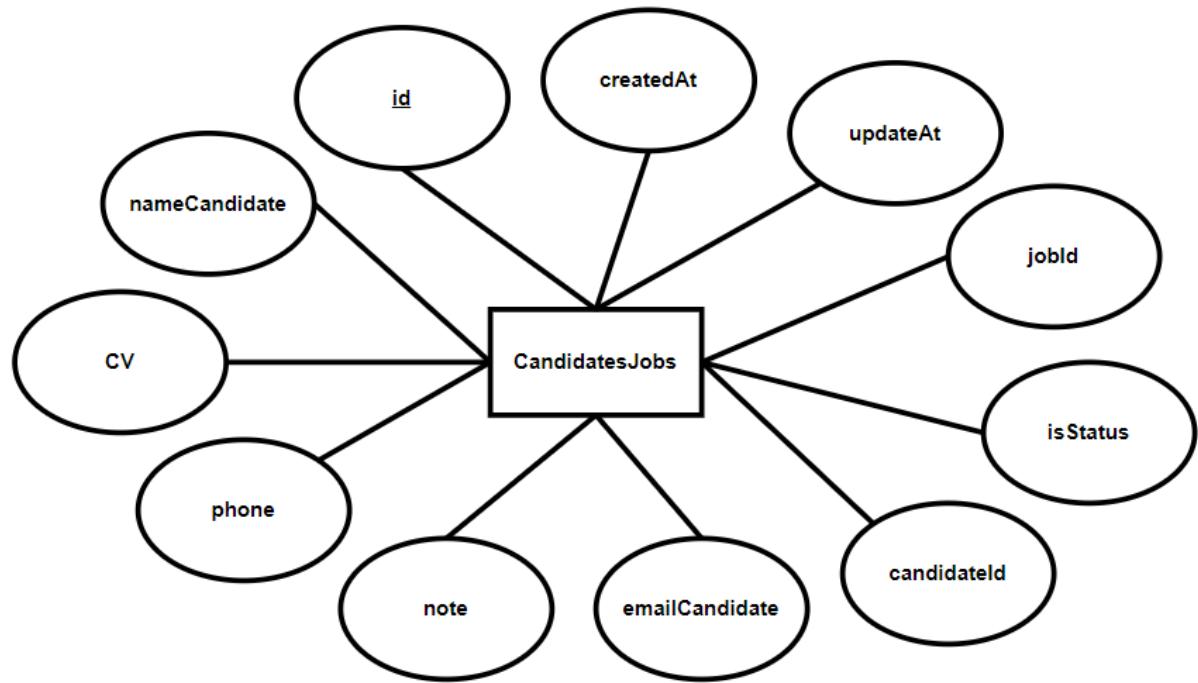


Figure 3.3-1 CandidateJobs entity

3. 4 Categories entity

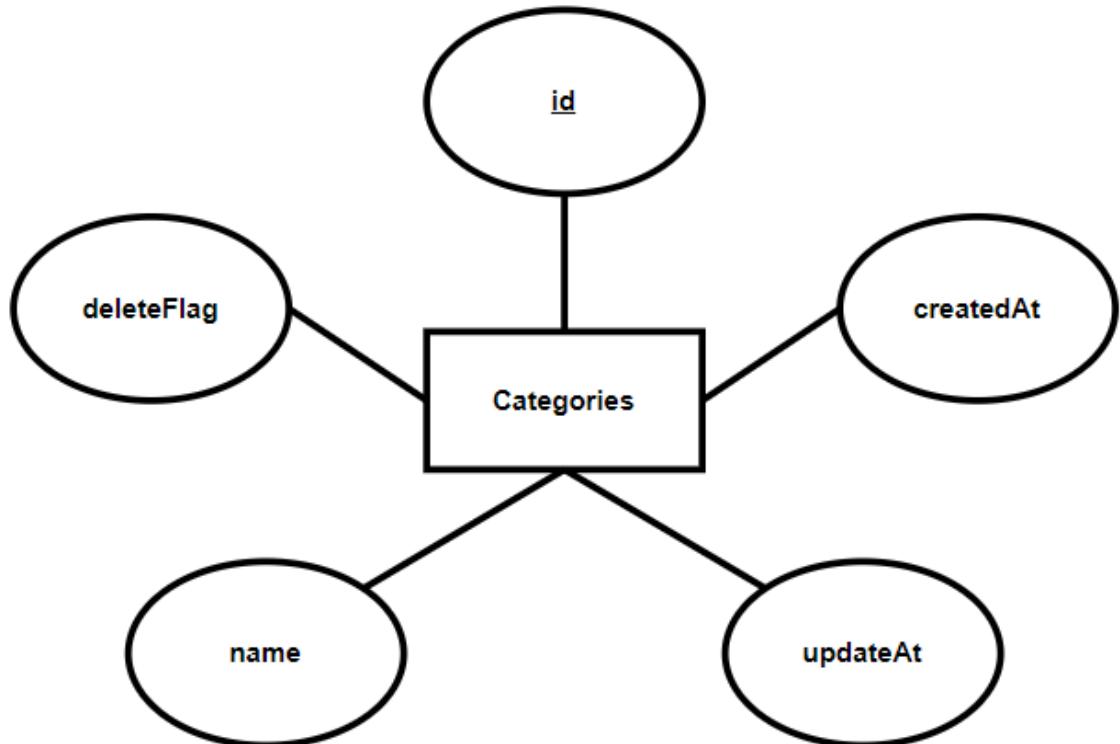


Figure 3.4-1Categories entity

3.5 Employers entity

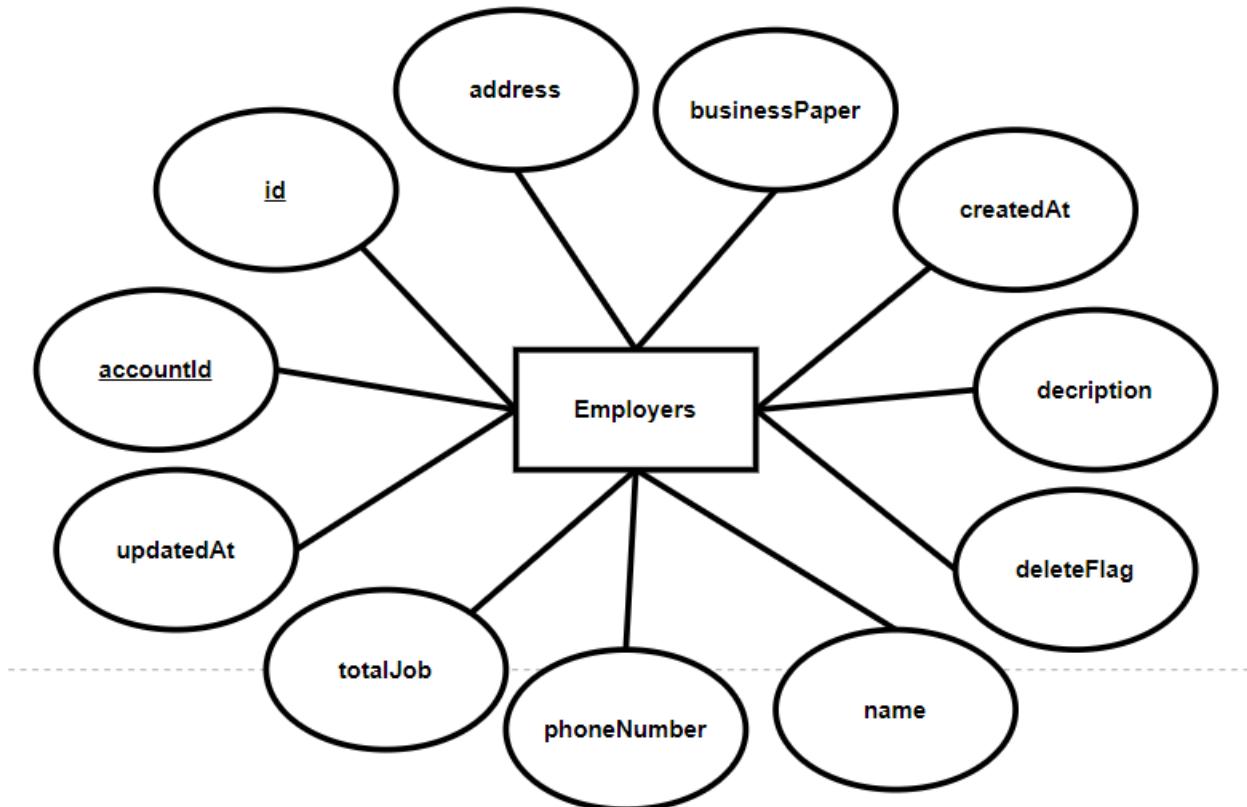


Figure 3.5-1 Employers entity

3.6 Jobs entity

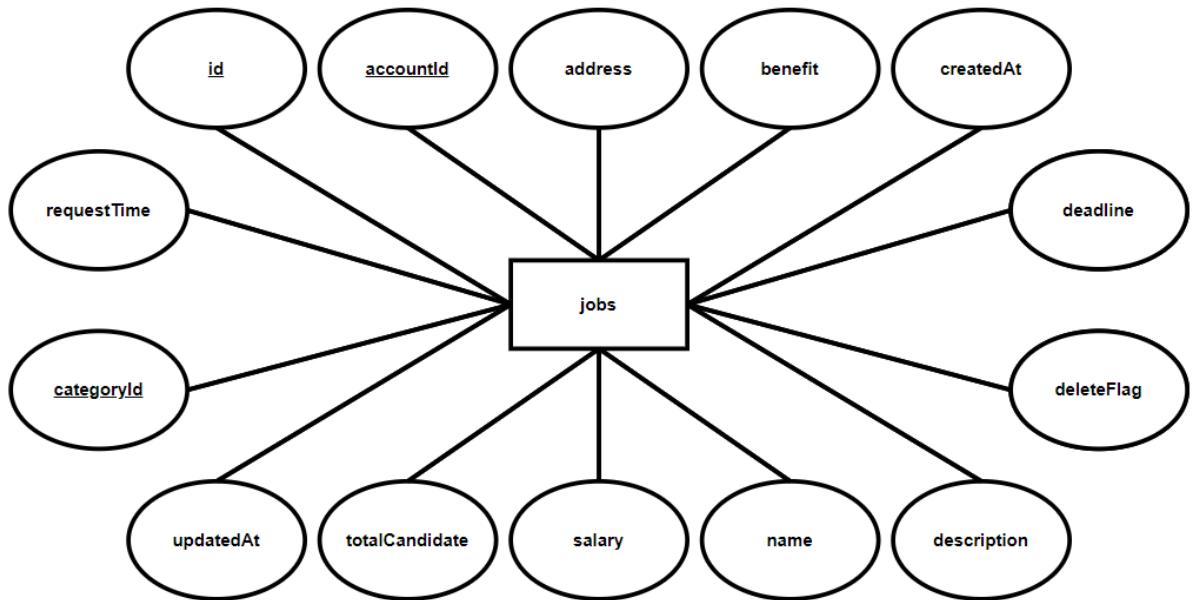


Figure 3.6-1 Jobs entity

3. 7 SaveJobs entity

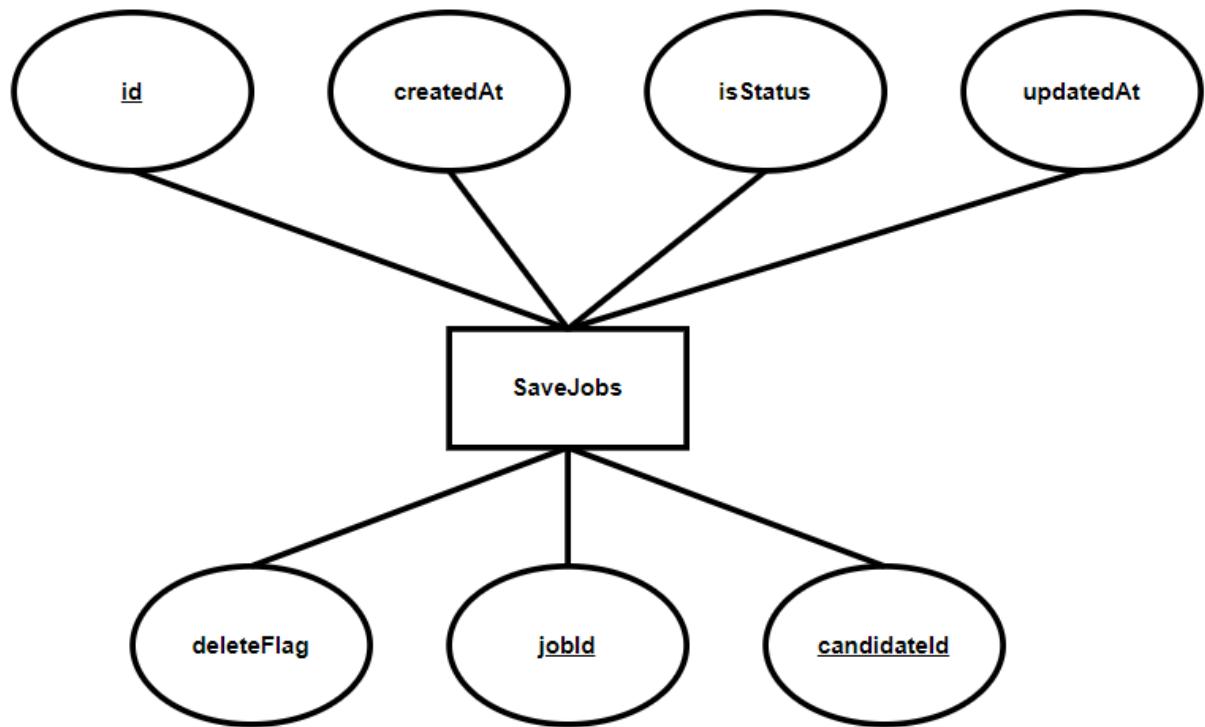


Figure 3.7-1 SaveJobs entity

3. 8 SearchCandidates entity

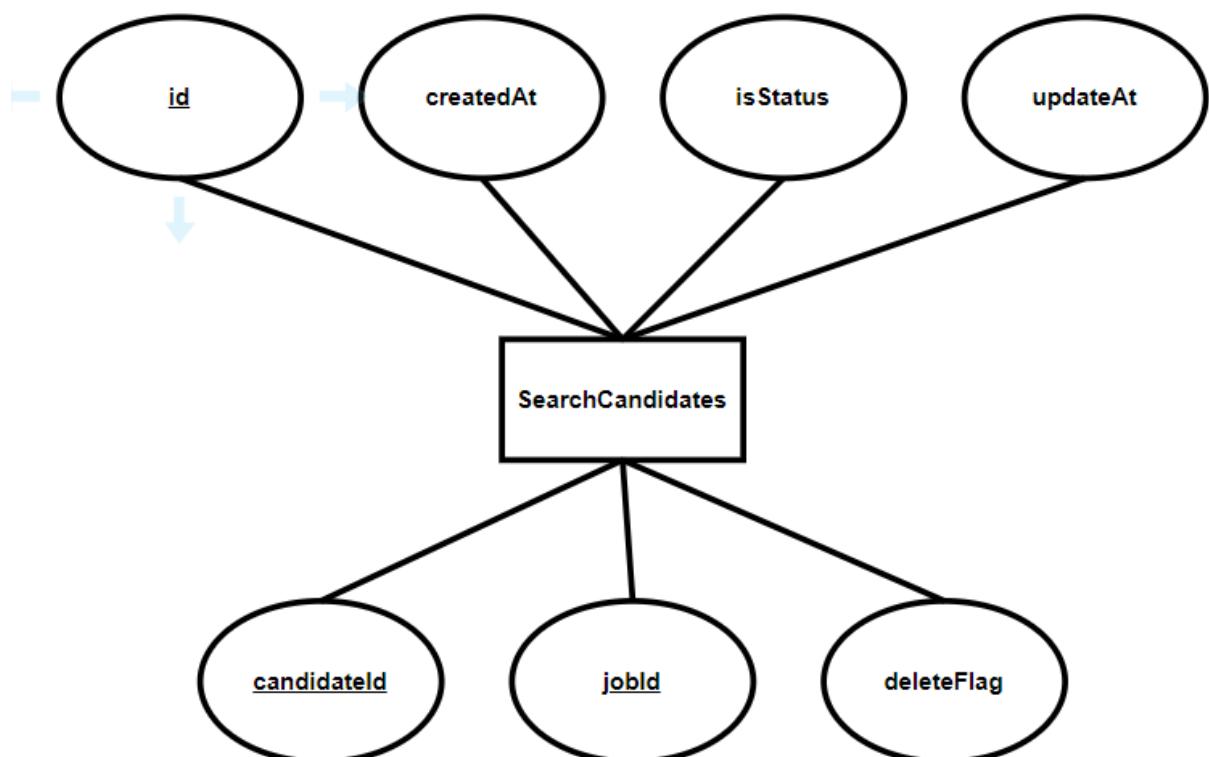


Figure 3.8-1 SearchCandidates entity

3.9 Helps entity

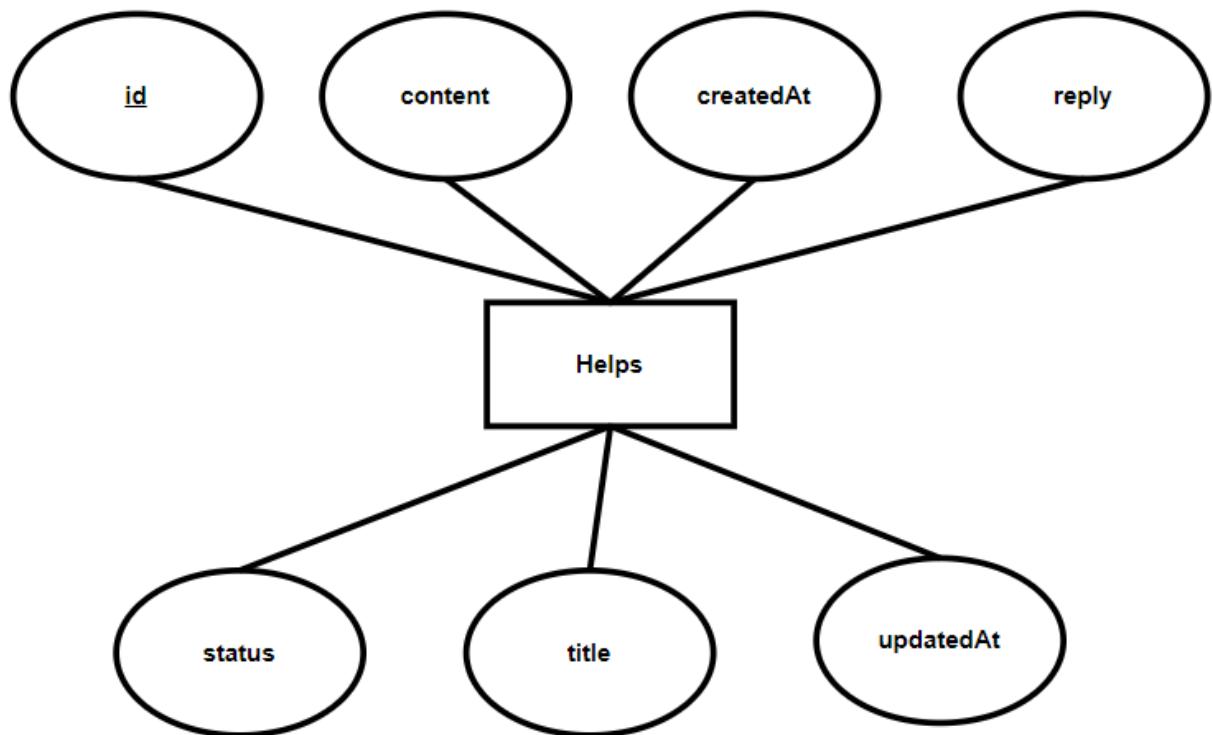


Figure 3.9-1 Helps entity

3.10 E-R entity relationship diagram

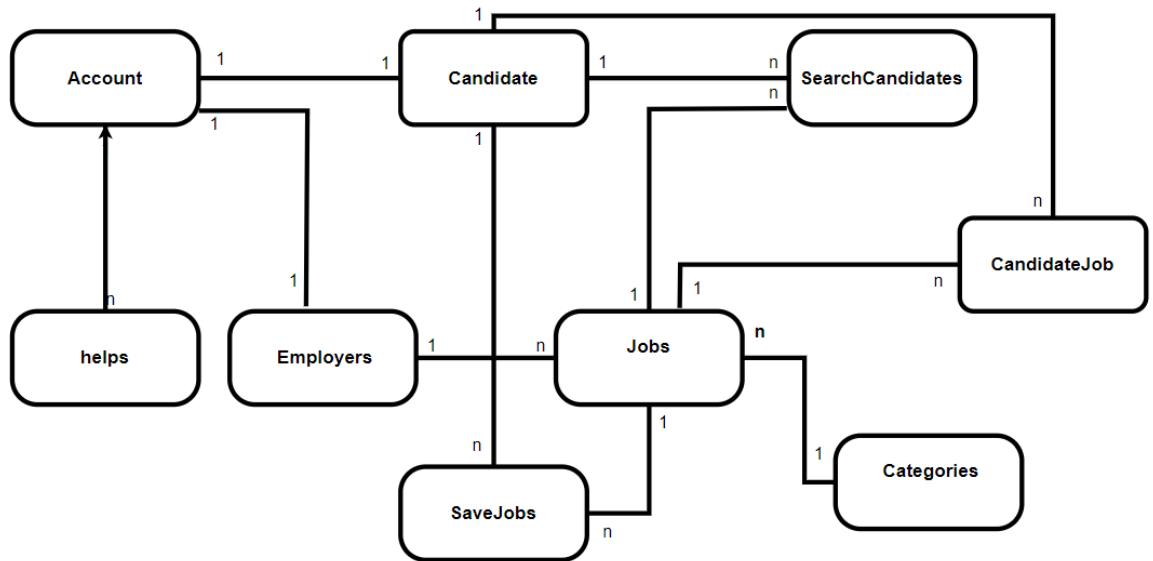


Figure 3.10-1 E-R entity relationship diagram

3.11 Database schema

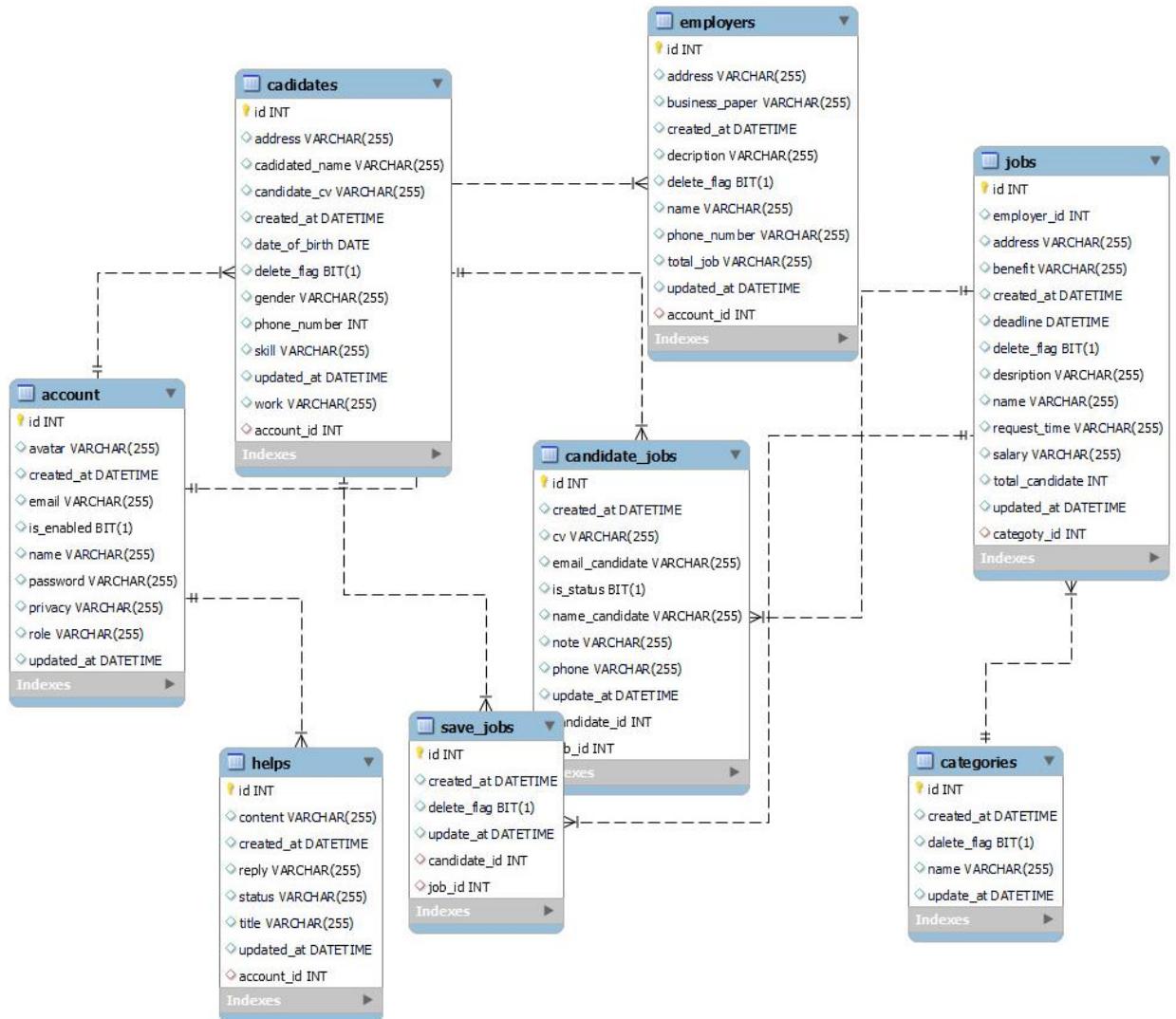


Figure 3.11-1 Database schema

3.12 Data tables

3.12.1 Account table

Table 3.12.1-1 Account table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id account
created_at	datetime	No			Day create
email	varchar(255)	Yes	NULL		Gmail
is_enabled	bit(1)	No			Block account
name	varchar(255)	Yes	NULL		Name account

password	varchar(255)	Yes	NULL		password
privacy	varchar(255)	Yes	NULL		
role	varchar(255)	Yes	NULL		role
updated_at	datetime	No			Day update
avatar	varchar(255)	Yes	NULL		avatar

3. 12. 2 Cadidates table

Table 3.12.2-1 Cadidates table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
address	varchar(255)	Yes	NULL		Address
candidated_name	varchar(255)	Yes	NULL		Name candidate
candidate_cv	varchar(255)	Yes	NULL		CV
created_at	datetime	No			Day create
date_of_birth	date	Yes	NULL		Birthday
delete_flag	Bit(1)	No			Block account
gender	varchar(255)	Yes	NULL		Gender
phone_number	int	Yes	NULL		Phone number
updated_at	datetime	No			Day update
account_id	int	Yes	NULL	Foreign Key	Id account
skill	varchar(255)	Yes	NULL		Skill
work	varchar(255)	Yes	NULL		Job apply

3. 12. 3 Candidate jobs table

Table 3.12.3-1 Candidate_jobs table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
created_at	datetime	No			Date create
job_id	int	No		Foreign Key	Id job
is_status	bit(1)	No			Hide jobs
candidate_id	int	Yes	NULL	Foreign Key	Name candidate

email_candidate	varchar(255)	Yes	NULL		Email candidate
name_candidate	varchar(255)	Yes	NULL		Name candidate
note	varchar(255)	Yes	NULL		Note
updated_at	datetime	No			Date update
phone	varchar(255)	Yes	NULL		Phone number
cv	varchar(255)	Yes	NULL		CV

3. 12. 4 Categories table

Table 3.12.4-1 Categories table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
created_at	datetime	No			Date create
delete_flag	bit(1)	No			Hide category
name	bit(1)	Yes	Null		Name category
update_at	datetime	No			Date update

3. 12. 5 Employers table

Table 3.12.5-1 Employers table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
Address	varchar(255)	Yes	Null		Address
business_paper	varchar(255)	Yes	Null		Business paper
created_at	datetime	No			Date create
decription	varchar(255)	Yes	Null		Description
delete_flag	bit(1)	No			Delete account
name	varchar(255)	Yes	Null		Name employer
phone_number	int	Yes	Null		Phone number
total_job	int	Yes	Null		Total jobs
updated_at	datetime	No			date update
account_id	int	No		Foreign Key	Id account

3. 12. 6 Jobs table

Table 3.12.6-1 Jobs table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
account_id	int	No		Foreign Key	Id account
address	varchar(255)	Yes	Null		Address company
benefit	varchar(255)	Yes	Null		benefit
created_at	datetime	No			Date create
deadline	date	Yes	Null		deadline
delete_flag	Bit(1)	No			Delete job
desription	varchar(255)	Yes	Null		decription
name	varchar(255)	Yes	Null		Name jobs
salary	varchar(255)	Yes	Null		salary
total_candidate	int	Yes	Null		Total candidate
updated_at	datetime	No			Date update
category_id	int	No		Foreign Key	Id category
request_time	varchar(255)	Yes	Null		Request time

3. 12. 7 Save jobs table

Table 3.12.7-1 Save_jobs table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
created_at	varchar(255)	No			Date create
is_status	varchar(255)	No			Hide save job
update_at	datetime	No			Date update
candidate_id	Int(11)	No		Foreign Key	Id candidate
job_id	Int(11)	No		Foreign Key	Id job
delete_flag	bit(1)	No			Delete save job

3. 12. 8 Search candidates table

Table 3.12.8-1 Search_candidates table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
created_at	varchar(255)	No			Date create
is_status	varchar(255)	No			Hide save job
update_at	datetime	No			Date update
candidate_id	int(11)	No		Foreign Key	Id candidate
job_id	int(11)	No		Foreign Key	Id job
delete_flag	bit(1)	No			Delete save job

3. 12. 9 Helps table

Table 3.12.9-1 Helps table

Column	Type	Null	Default	Constraint	Describe
id	int(11)	No		Primary key, auto_increment	Id
content	varchar(255)	Yes	Null		content
created_at	datetime	No			Date create
reply	varchar(255)	Yes	Null		reply
status	varchar(255)	Yes	Null		status
title	varchar(255)	Yes	Null		title
updated_at	datetime	No			Date update
account_id	int(11)	No		Foreign Key	Id account

Chapter 4: SYSTEM DESIGN ANALYS

4. 1 Functional Business Model (BFD – Business Function Diagram)

Functions are the work that an organization needs to do and are divided into many levels from general to detailed.

Each function has a unique name, different functions must have different names. To determine the names for functions accurately and specifically, it is possible to discuss and agree with the user.

Form of performance: Function name

Each function is decomposed into sub-functions. Child functions have a hierarchical relationship with the parent function.

Represent the functional hierarchical relationship as follows:

4. 2 Actors in the request

Based on the requirement specification, we have the following actors:

Administrator – Admin: is the individual with the highest responsibility for the system, possessing all system privileges, including (account management, category management, jobs management, company management, post management, banner management, helps management,...).

Member (Registered User): is a regular user who has registered an account with the system, having the privilege to view jobs, posts, manage the save jobs, apply jobs, and manage personal information.

Employers/Recruiters: Companies and recruiters looking to fill job positions, they use the website to post job listings, review applications, and communicate with potential candidates.

Casual Visitor (Unregistered User - Viewer): is a user who hasn't registered or logged into the website. They only have the privilege to view jobs, posts, and register for a new account.

4.3 Usecase General

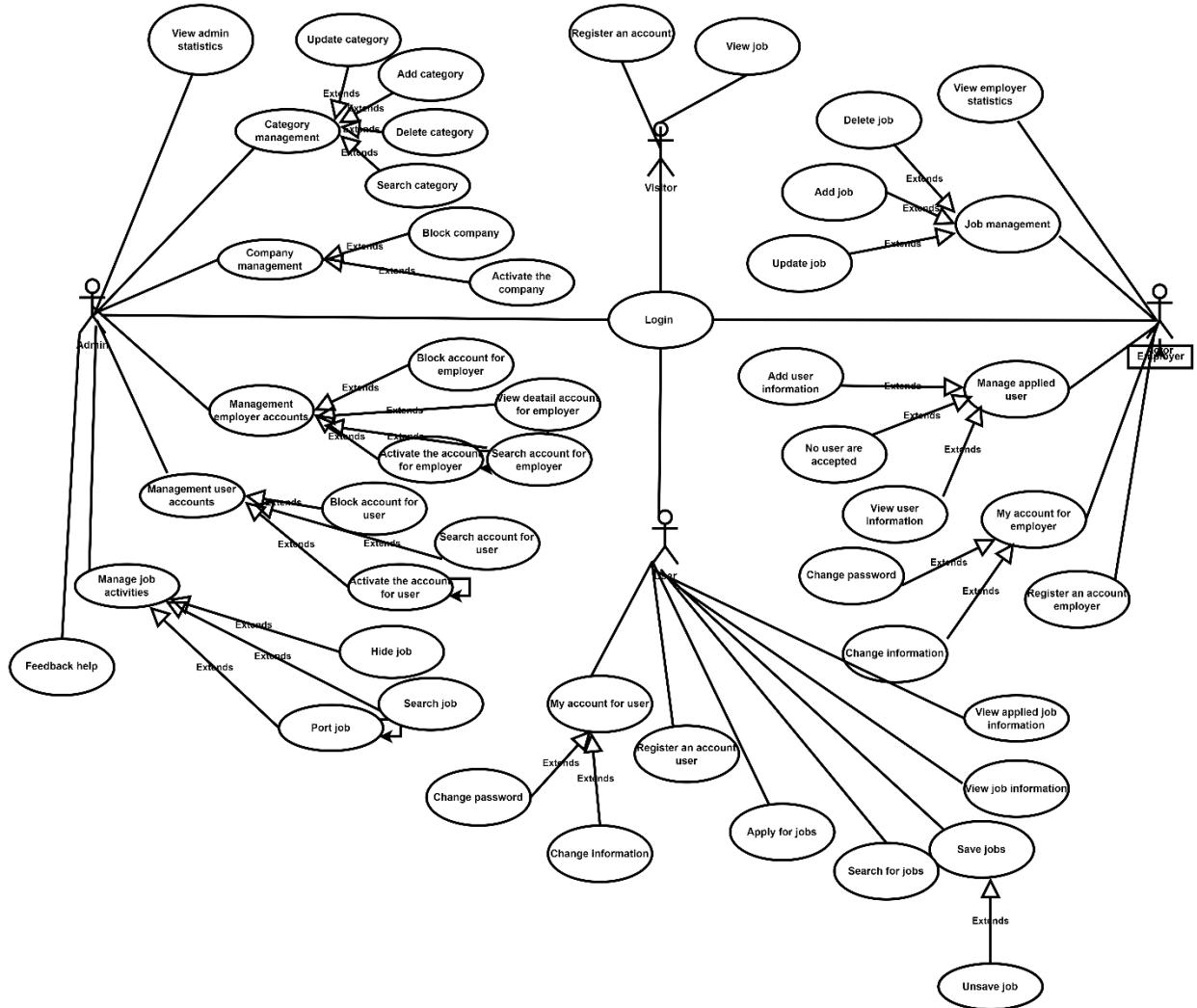


Figure 4.3-1 Usecase General

4.4 User usecase



Figure 4.4-1 User usecase

4.5 Employer usecase

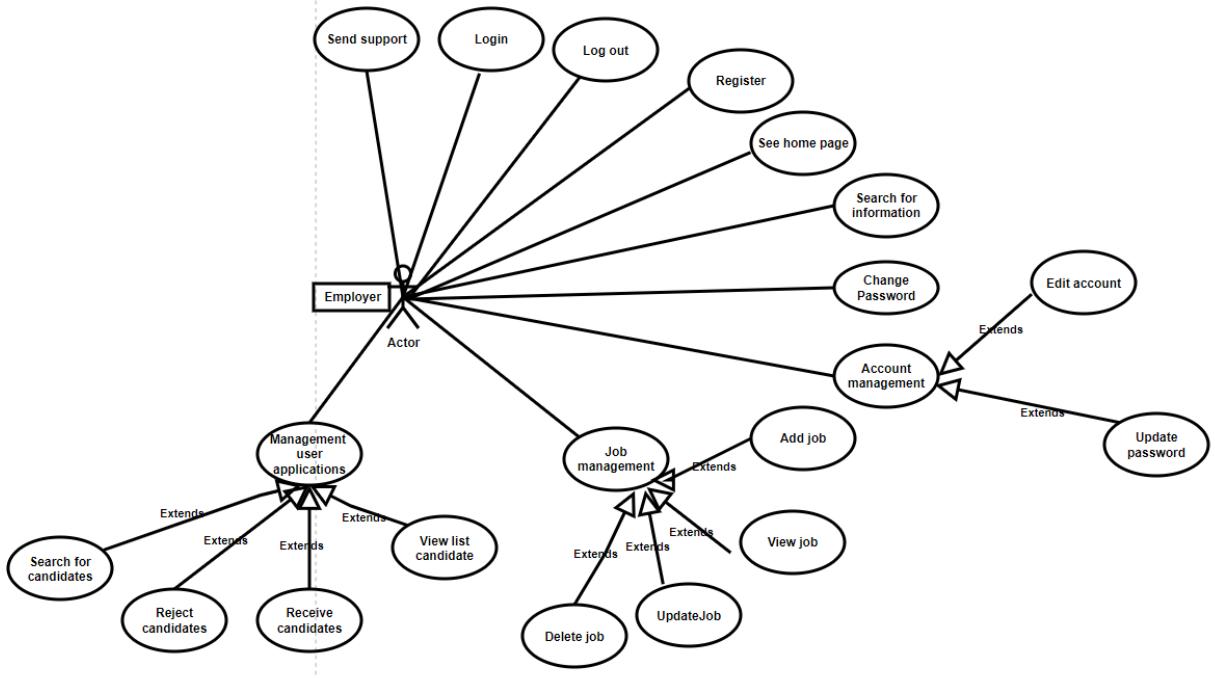


Figure 4.5-1 Employer usecase

4.6 Admin usecase



Figure 4.6-1 Admin usecase

4.7 Visitor usecase

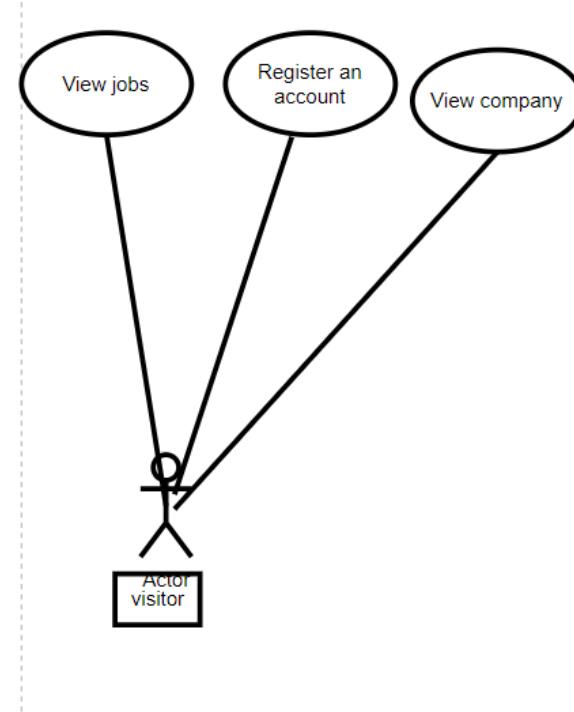


Figure 4.7-1 Visitor usecase

4.8 List of actors

Table 4.8-1 List of actors

STT	Actor	Description
1	Admin	The person with the highest responsibility for the system, has all system privileges, including user management, category management, user account management, employer account management, job management.
2	Employer	A person who can register an account, edit an account, post jobs and receive suitable candidates for the job they require and that are suitable for the company.
3	Visitor	Users who have not registered or logged into the website only have the right to view jobs, view company details, use AI chat and register an account.
4	User	As an account registrant, you can edit your account information, search for jobs or turn on job search mode, employers will contact you to find a suitable job for you...

4.9 List of use cases

Table 4.9-1 List of use cases

STT	Actor	Function	Description
		Company management	Allows admins to search or delete companies that violate terms or review and adjust company information.
		Category management	Allows administrators to view, add, edit, hide, list of categories, create hidden categories and show categories

		Job management	Allows administrators to view, search, hide and show jobs if the job does not meet any of the terms and conditions the system.
1	Admin	Statistical	Revenue and profit statistics function allows administrators to view total revenue, view total accounts and total registered companies
		Account user management	Allows administrators to lock or open user accounts if they see violations
		Account employer management	Allows administrators to lock or open employer accounts if they see violations
		Manage apply job	Allows candidates to submit CVs to apply for suitable jobs.
		Manage save job	Allows candidates to save the jobs they like and select jobs that can be unsaved
2	User	Register an account	Allow candidates to register an account to be able to find jobs faster that are more suitable for candidates.
		Edit personal information	Allow candidates to edit personal information to match the job search for the current candidate
		Change Password	Allows you to change your password when you forget your password to retrieve your account password and make it more secure
		Turn on job search mode	Turn on job search mode so employers can find and choose more suitable jobs

3	Visitor	View job Register an account	Allows visitor to see jobs that are suitable for them and can register for an account Allow candidates to register an account to be able to find jobs faster that are more suitable for candidates.
4	Employer	Register an account	Allow candidates to register an account to be able to find jobs faster that are more suitable for candidates.
		Change password	Allow to change password for security
		Job management	Allows adding, editing, deleting, viewing jobs to find suitable candidates
		Statistics management	Allows you to view statistics about jobs that candidates have applied for
		Manage job candidates	You can apply or not apply for that candidate if you feel suitable or not suitable

4. 10 Activity Diagram

4. 10. 1 Admin activity diagram

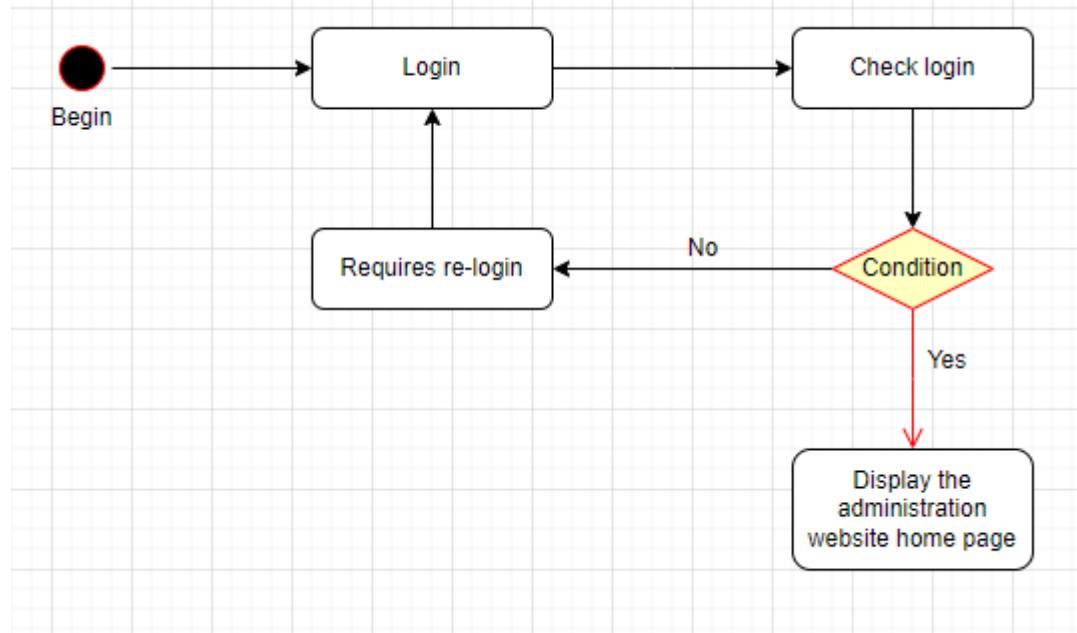


Figure 4.10.1-1 4.10.1 Admin login activity

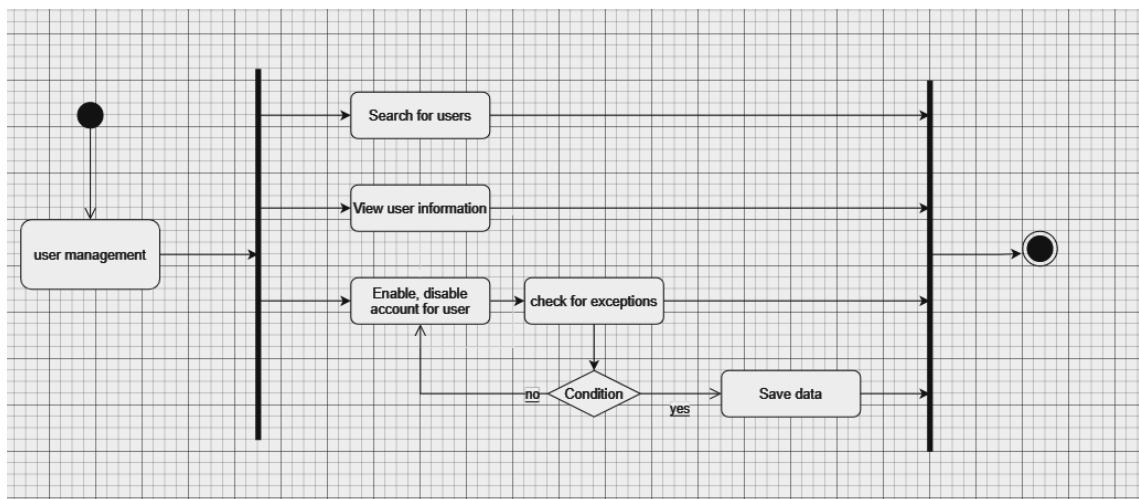


Figure 4.10.1-2 Admin management user activity

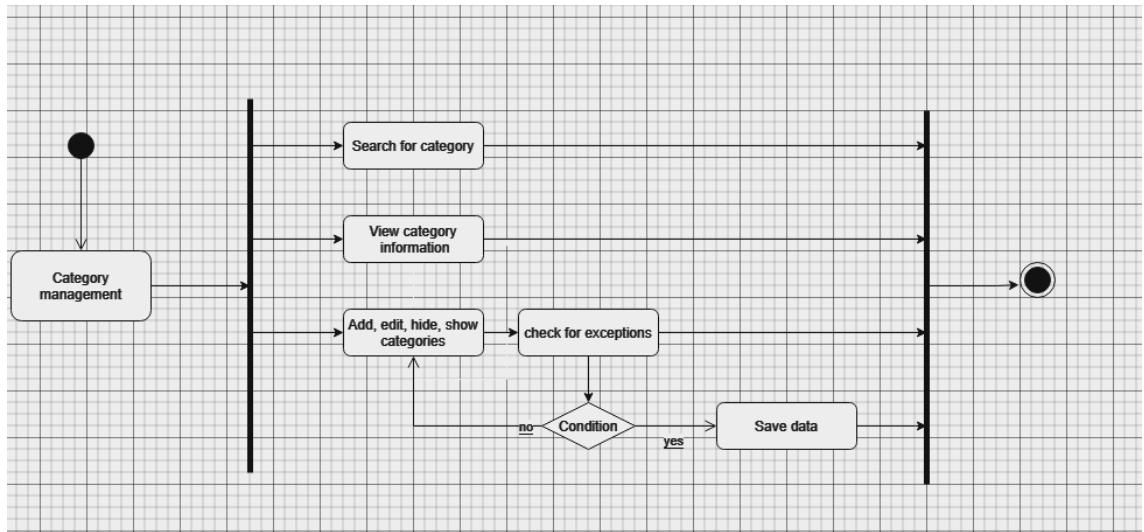


Figure 4.10.1-3 Admin management category activity

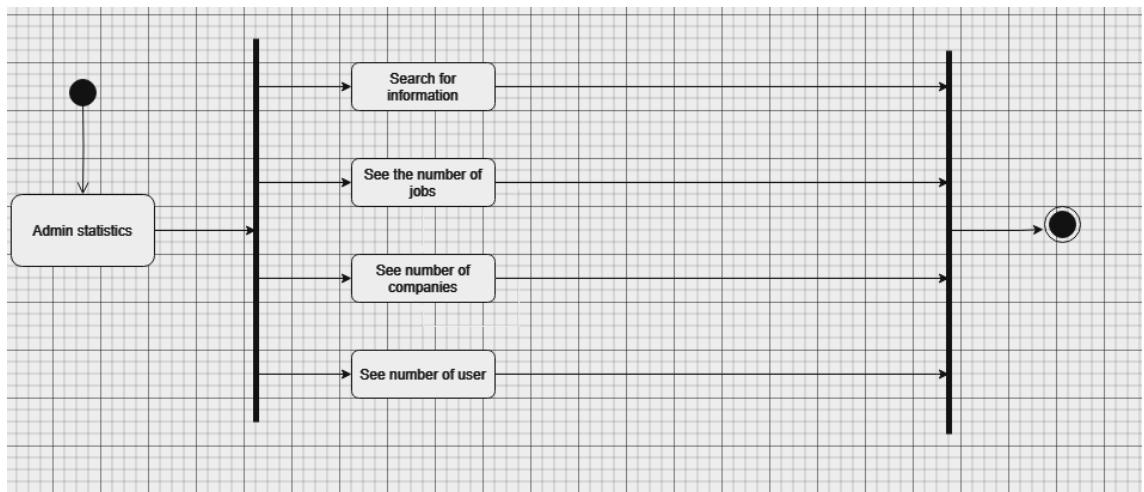


Figure 4.10.1-4 Admin statistics activity

4. 10. 2 Employer activity diagram

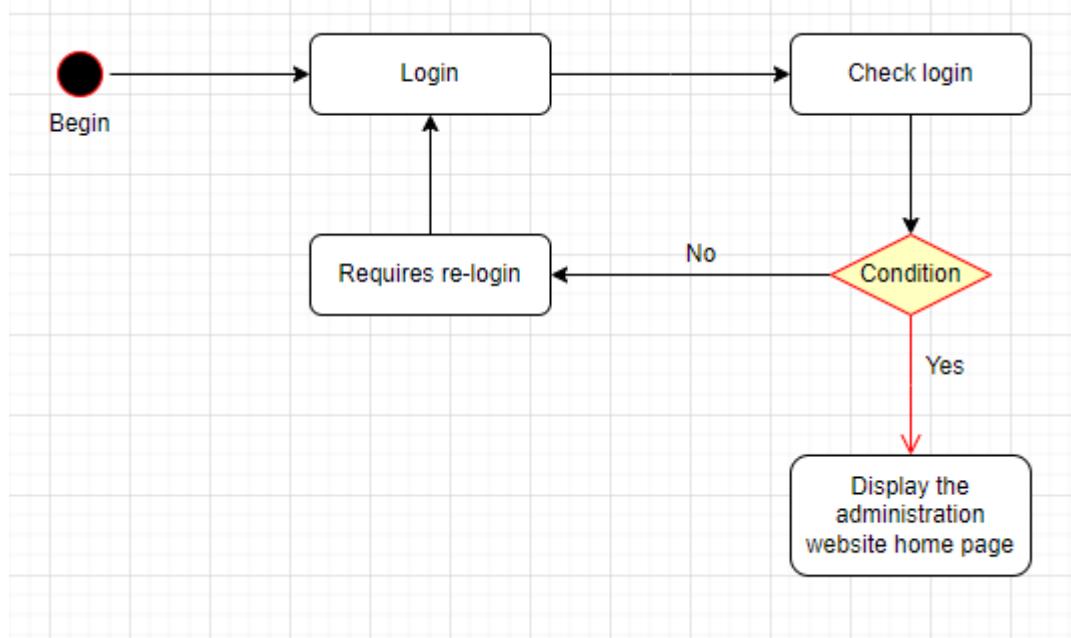


Figure 4.10.2-1 Employer login activity

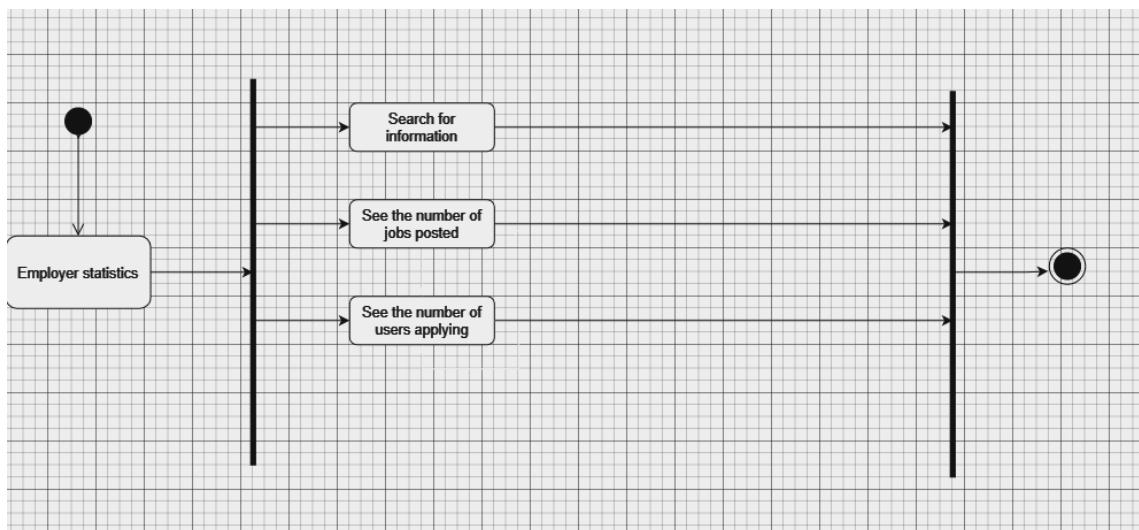


Figure 4.10.2-2 Employer statistics activity

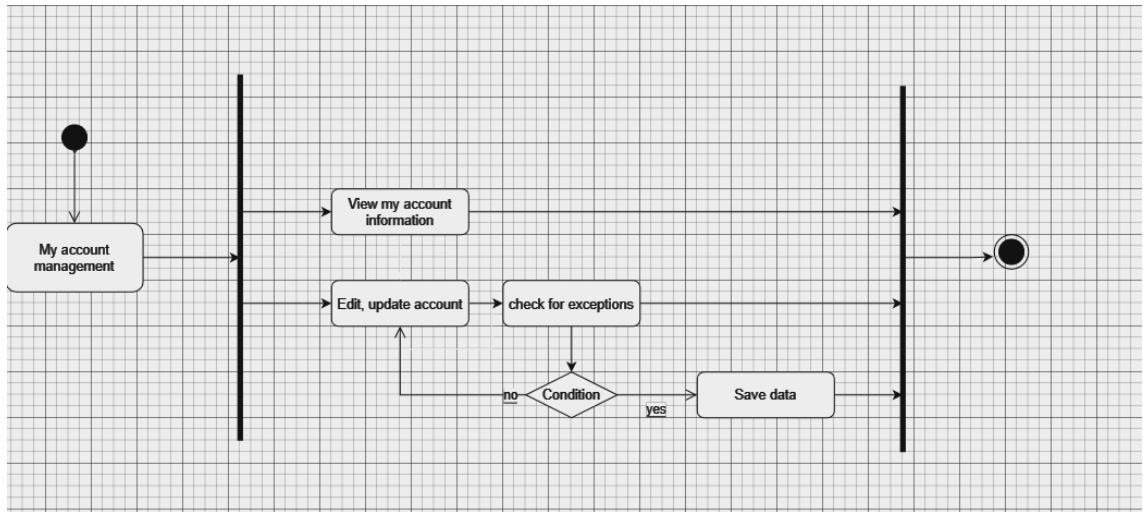


Figure 4.10.2-3 Employer setting account activity

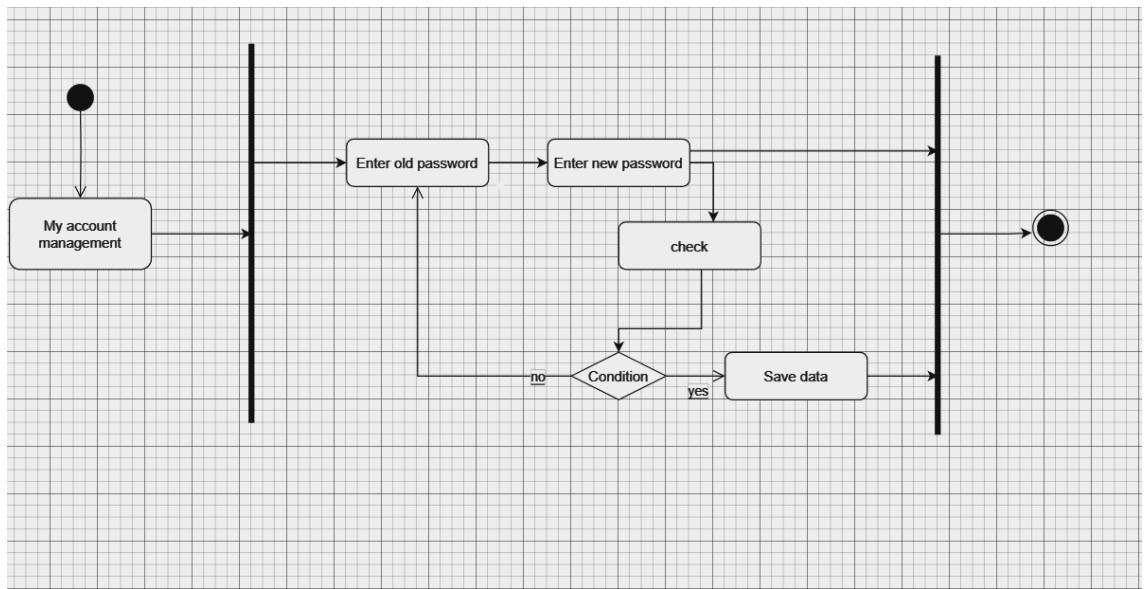


Figure 4.10.2-4 Employer change password activity

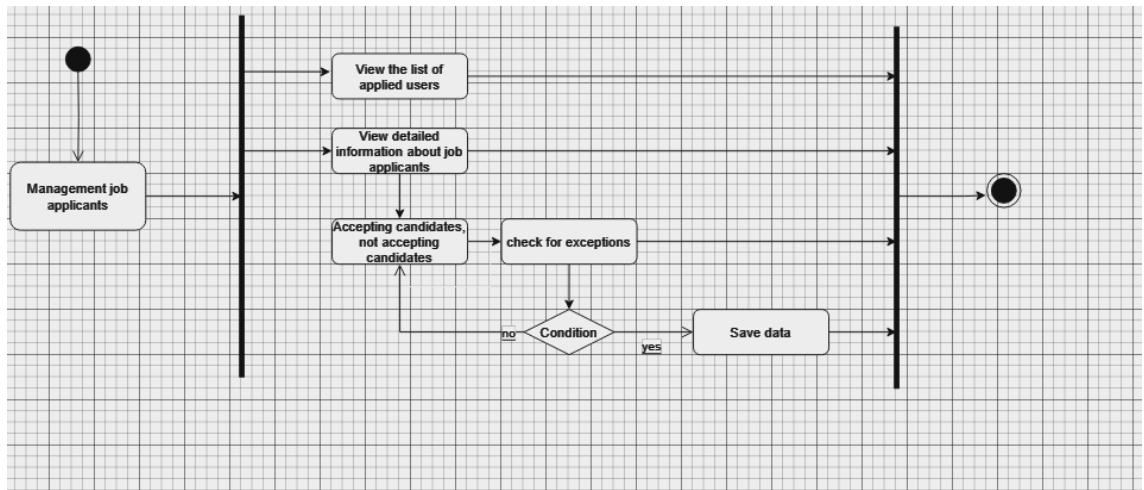


Figure 4.10.2-5 Employer management job applicants activity

4. 10. 3 User activity diagram

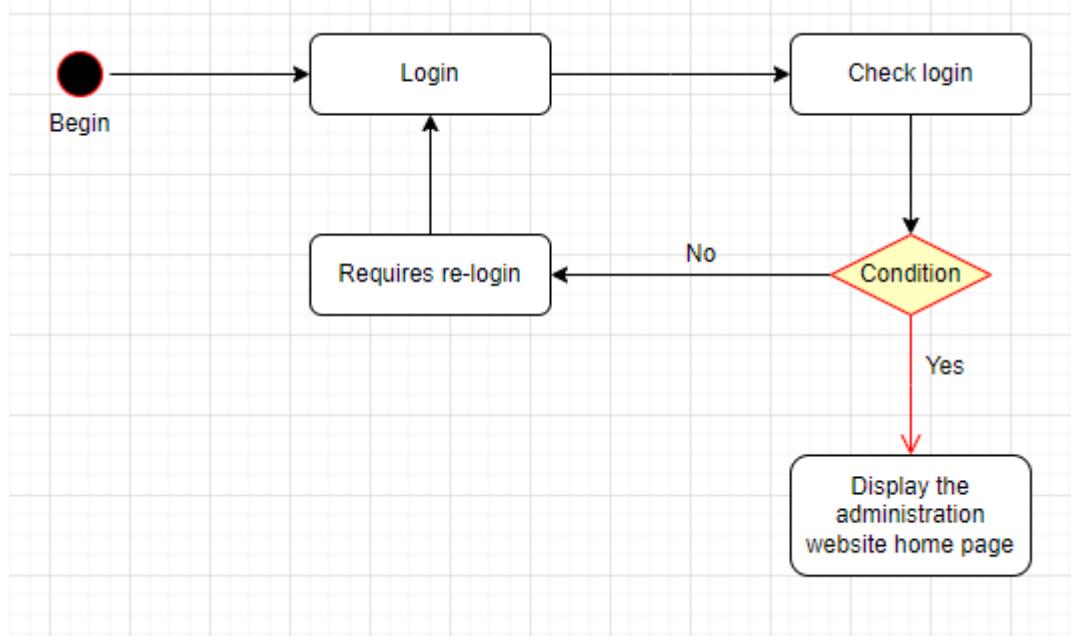


Figure 4.10.3-1 User login activity

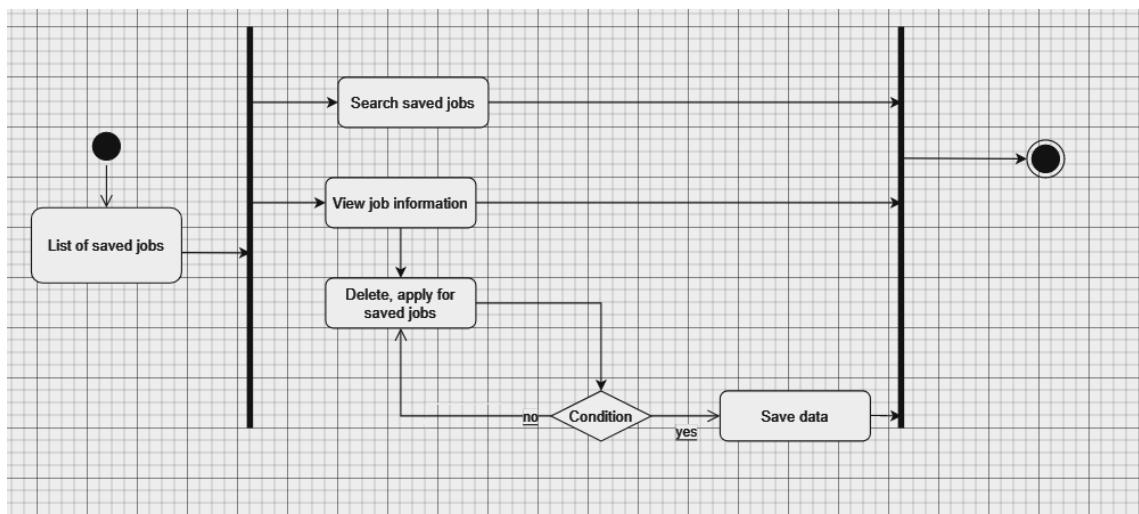


Figure 4.10.3-2 User save jobs activity

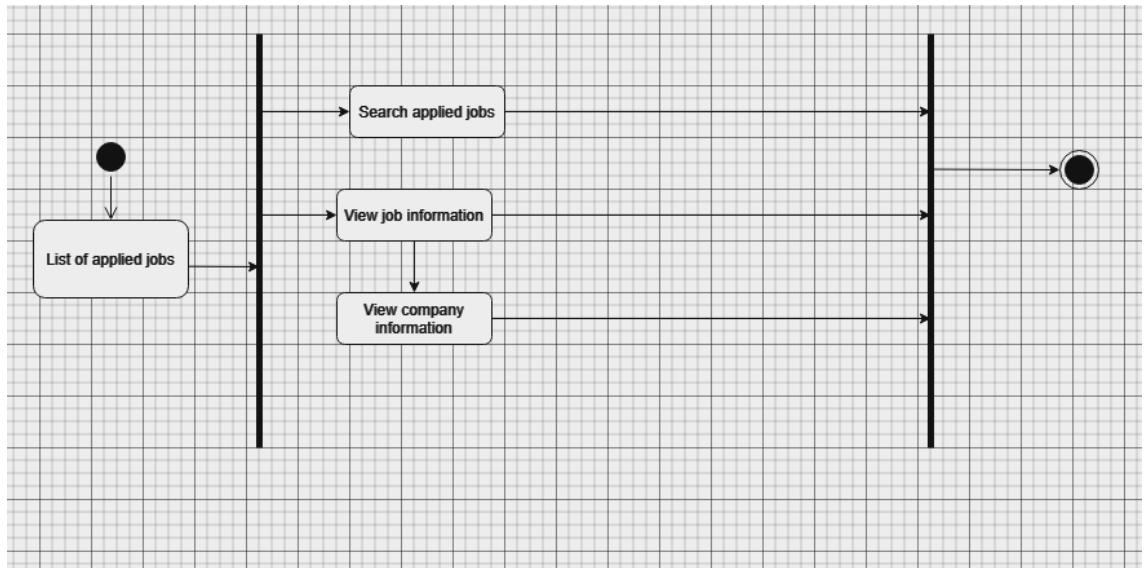


Figure 4.10.3-3 User list apply job activity

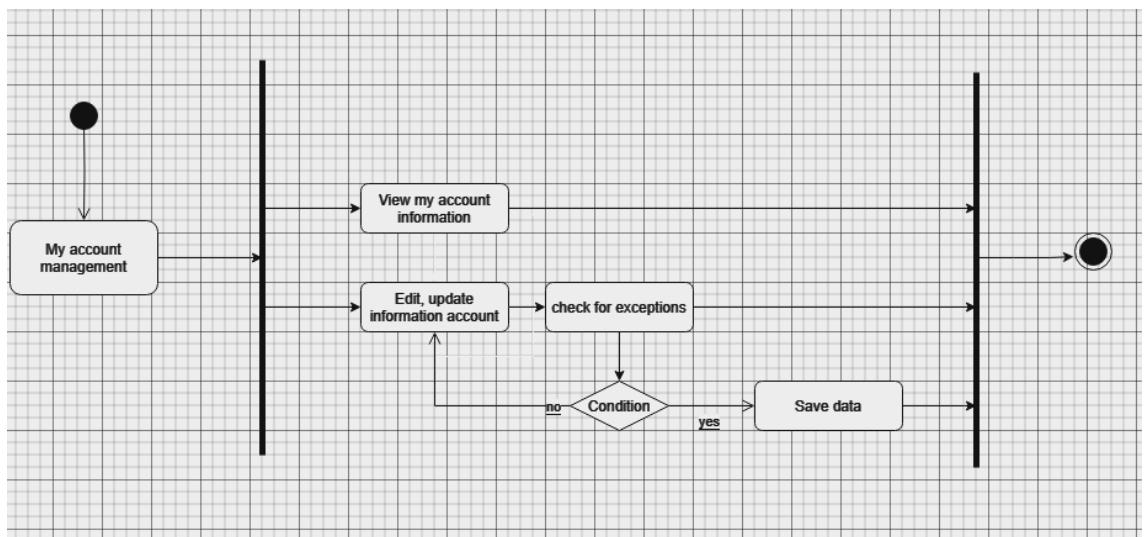


Figure 4.10.3-4 User setting account activity

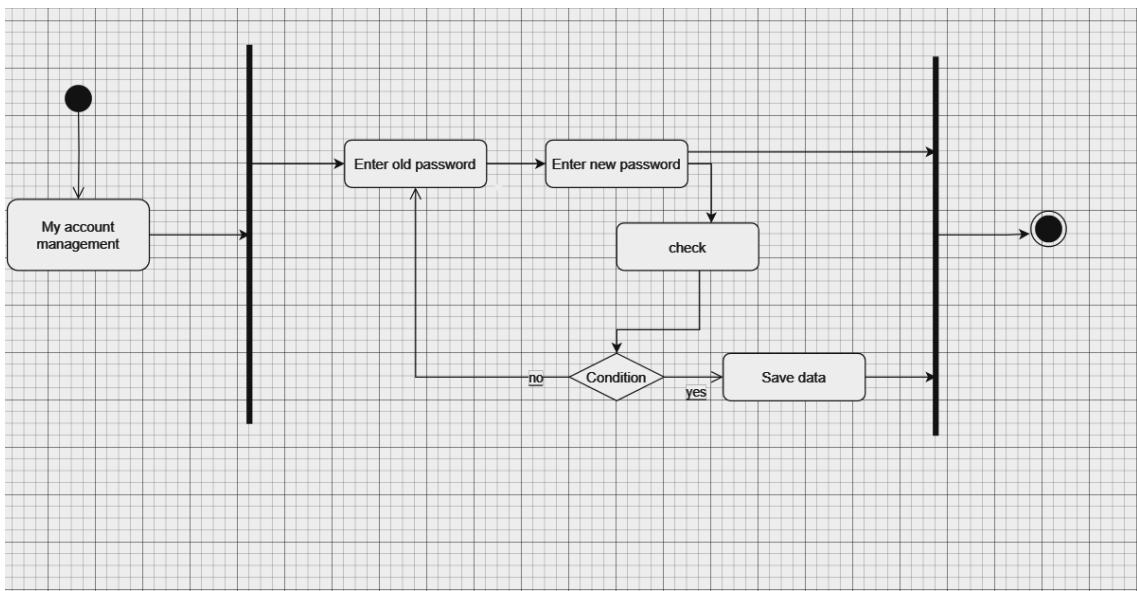


Figure 4.10.3-5 User change password activity

4.11 Realize use cases

4.11.1 Realize visitor usecases

Usecase specification for viewing job information:

- Actor: viewer
- Pre-conditions: internet works normally
- Post-condition: user does not have a login account or has not logged into the website
- Trigger: viewers, visitors
- Event stream:
 - + Access the website address
 - + Select the store section, click on the job
 - + Website displays full details of each job and job categories...

Usecase specification see article information:

- Actors: viewers, visitors
- Pre-conditions: internet works normally
- Post-condition: user does not have a login account or has not logged into the website
- Trigger: viewers, visitors
- Event stream:
 - + Access the website address
 - + Select the job item, click on each job detail
 - + Website displays full detailed information for each job and job list

Specification of account registration usecase:

- Actors: viewers, visitors
- Pre-conditions: internet works normally
- Post-condition: user does not have a login account or has not logged into the website
- Trigger: viewers, visitors
- Event stream:

- + Access the website address
- + Select registration item
- + Fill in all information
- + Click register to create an account

4. 11. 2 Realize admin usecase

User management usecase specification:

- Actor: admin
- Pre-conditions: internet works normally and admin has an account
- Post-condition: admin must log in to the admin account
- Trigger: admin
- Event stream:
 - + Access the website address
 - + Select log in, enter your account and click log in
 - + Select user account management, in which the admin has the right to view details of all accounts and view user account details to be able to block or activate the account if the account violates or qualifies.

Employer management usecase specification:

- Actor: admin
- Pre-conditions: internet works normally and admin has an account
- Post-condition: admin must log in to the admin account
- Trigger: admin
- Event stream:
 - + Access the website address
 - + Select log in, enter your account and click log in
 - + Select employer account management, in which the admin has the right to view details of all accounts and view employer account details to be able to block or activate the account if the account violates or qualifies.

Company management usecase specification:

- Actor: admin
- Pre-conditions: internet works normally and admin has an account
- Post-condition: admin must log in to the admin account
- Trigger: admin
- Event stream:
 - + Access the website address
 - + Select log in, enter your account and click log in
 - + Select employer company management, in which the admin has the right to view details of all company and view company details to be able to block or activate the company if the company violates or qualifies.

The usecase specification manages all categories:

- Actor: Admin
- Pre-conditions: internet works normally and admin has an account
- Post-condition: admin must log in to admin account

- Activation: admin
- Event stream:
 - + Access the website address
 - + Select log in, enter your account and click log in
 - + Click on the category, the admin has the right to add, edit and delete the search category to provide complete information
 - + Click save,add, delete to save the category (depending on usage conditions)

Job management usecase specification:

- Actor: Admin
- Pre-conditions: internet works normally and admin has an account
- Post-condition: admin must log in to the admin account
- Activation: administrator
- Event stream:
 - + Access the website address
 - + Select log in, enter your account and click log in
 - + Click on job management here, admin can view the list of jobs, see details of each job and see if the person posting the job does not have a job displayed and show the job
 - + Click save to save the information(depending on usage conditions)

Statistical usecase specification:

- Actor: admin
- Pre-conditions: internet works normally
- Post-conditions: admin must be granted management rights and must be able to log in to the administration system
- Activation agent: admin
- Event stream:
 - + Log in to the administration system
 - + Select device
 - + Select statistics section
 - + Display the statistics screen

4. 11. 3 Realize employer usecase

Set account management description:

- Actor: employer
- Pre-conditions: internet works normally
- Following conditions: the employer must be granted management rights and be able to log in to the administration system
- Activating agent: employer
- Event stream:
 - + Log in to the administration system
 - + Select my account
 - + Account owners can update account information and update password
 - + Click save, update to save the account(depending on usage conditions)

Job management use case specification:

- Actor: employer
- Pre-conditions: internet works normally
- Following conditions: the employer must be granted management rights and be able to log in to the administration system
- Activating agent: employer
- Event stream:
 - + Log in to the administration system
 - + Select job management
 - + Add delete, edit, view, search jobs
 - + Click save, update, delete, search and check to save the job (depending on usage conditions)

Specification for managing users applying for jobs:

- Actor: employer
- Pre-conditions: internet works normally
- Following conditions: the employer must be granted management rights and be able to log in to the administration system
- Activating agent: employer
- Event stream:
 - + Log in to the administration system
 - + Add, delete, view user details
 - + Click Save to save the newly changed data (depending on usage conditions)

Statistical usecase specification:

- Actor: employer
- Pre-conditions: internet works normally
- Post-conditions: employer must be granted management rights and must be able to log in to the administration system
- Activation agent: employer
- Event stream:
 - + Log in to the administration system
 - + Select device
 - + Select statistics section
 - + Display the statistics screen

4. 11. 4 Realize user usecase

Set account management description:

- Actor: user
- Pre-conditions: internet works normally
- Following conditions: the user must be granted management rights and be able to log in to the administration system
- Activating agent: user
- Event stream:
 - + Log in to the website

- + Select my account
- + Account owners can update cv, update account information and update password

Specification describes job management:

- Actor: user
- Pre-conditions: internet works normally
- Following conditions: the user must be granted management rights and be able to log in to the website
- Activation agent: user
- Event stream:
 - + Log in to the website
 - + View, search and apply
 - + Click search or apply(depending on usage conditions)

Save job management specification:

- Actor: user
- Pre-conditions: internet works normally
- Following conditions: the user must be granted management rights and be able to log in to the website
- Activation agent: user
- Event stream:
 - + Log in to the website
 - + Click on the saved job list page
 - + Save job, unsave job, apply for job
 - + Click unsave or apply(depending on usage conditions)

Specification see company information:

- Actor: user
- Pre-condition: internet works normally
- Post-condition: user must be granted management rights and be able to log in to the website - Activating agent: user
- Event flow:
 - + Log in to the website
 - + Click on the job listing page
 - + Click to view the company for that job

4.12 Chatbot AI

In recent years, large language models (LLMs) have become increasingly popular. These models are trained on massive datasets of text and code, and they can be used for a variety of tasks, including generating text, translating languages, and writing different kinds of creative content.

One of the most popular LLMs is GPT-3, which was developed by OpenAI. GPT-3 is a powerful tool, but it can be expensive to use. In addition, the data that GPT-3 is trained on is not always available to the public.

Local GPT is an open-source project that allows you to run a GPT-3 language model on your own computer. This gives you a number of advantages over using a cloud-based GPT-3 API, including:

Privacy: Your data never leaves your computer, so you can be sure that it is not being collected or shared by a third party.

Performance: Local GPT can be faster than a cloud-based API, especially for tasks that require a lot of computation.

Customization: You can customize the model to your specific needs, such as by fine-tuning it on a dataset of your own data.

4.12.1 The private LLM structure

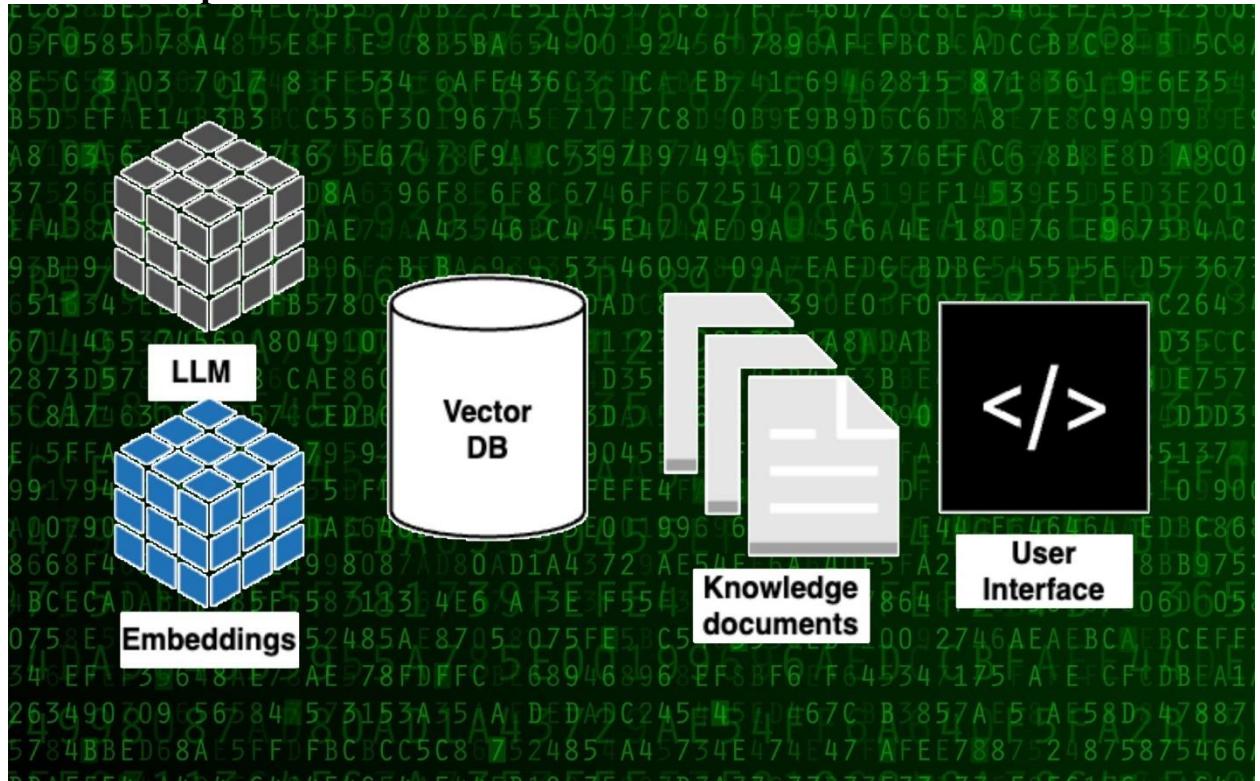


Figure 4.12.1-1 The private LLM structure

Open-source LLM: These are small open-source alternatives to ChatGPT that can be run on your local machine. Some popular examples include Dolly, Vicuna, GPT4All, and llama.cpp. These models are trained on large amounts of text and can generate high-quality responses to user prompts.

Embedding model: An embedding model is used to transform text data into a numerical format that can be easily compared to other text data. This is typically done using a technique called word or sentence embeddings, which represent text as dense vectors in a high-dimensional space. These embeddings can be used to find documents that are related to the user's prompt. The SentenceTransformers library contains a rich variety of pre-trained embedding models.

Vector database: A vector database is designed to store and retrieve embeddings. It can store the content of your documents in a format that can be easily compared to the user's prompt. Faiss is a library that you can use to add vector similarity comparisons on top of other data stores. But there are also a few open-source vector databases that you can install on your computer including Qdrant, Weaviate, and Milvus.

Knowledge documents: A collection of documents that contain the knowledge your LLM will use to answer your questions. These documents depend on your application. For example, it can be a collection of PDF or text documents that contain your personal blog posts.

User interface: The user interface layer will take user prompts and display the model's output. This can be a simple command-line interface (CLI) or a more sophisticated web application such as Streamlit. The user interface will send the user's prompt to the application and return the model's response to the user.

4. 12. 2 Private LLM workflow

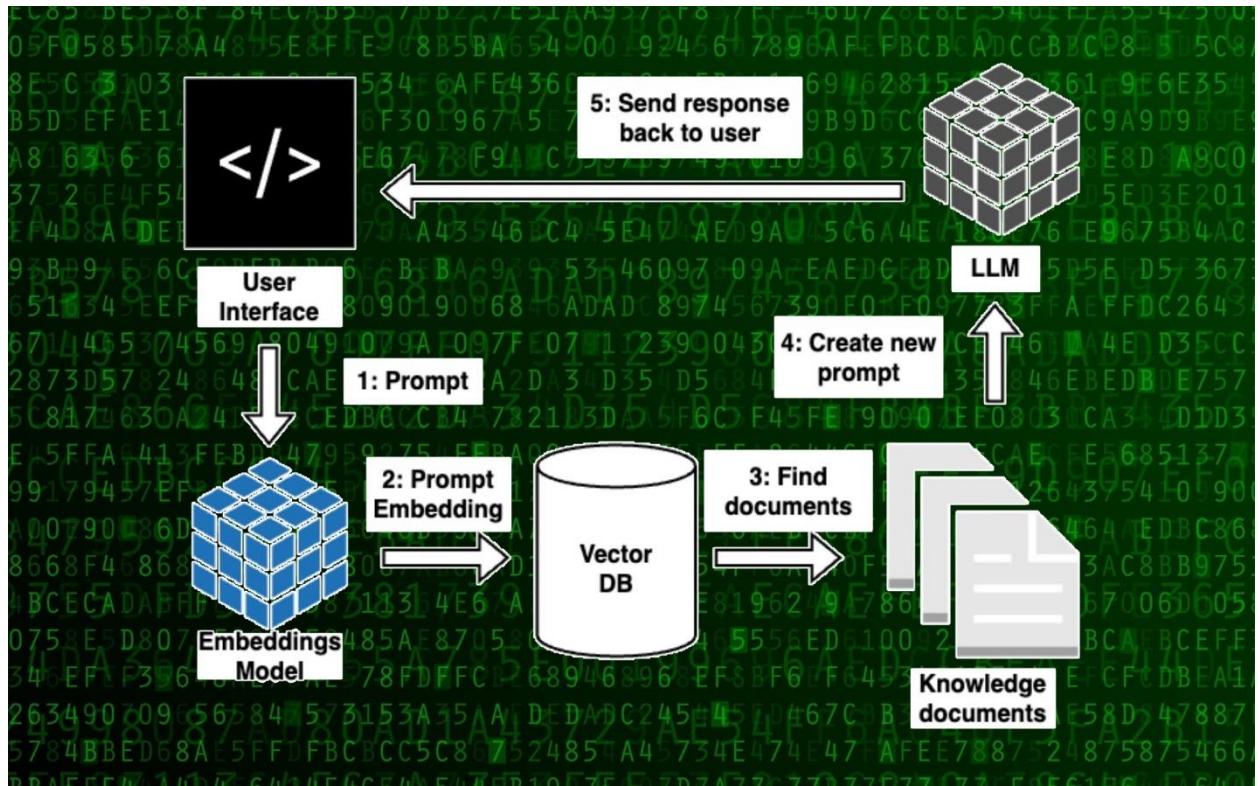


Figure 4.12.2-1 Private LLM workflow

The workflow of the private LLM:

1. The user enters a prompt in the user interface.
2. The application uses the embedding model to create an embedding from the user's prompt and send it to the vector database.
3. The vector database returns a list of documents that are relevant to the prompt based on the similarity of their embeddings to the user's prompt.

4. The application creates a new prompt with the user's initial prompt and the retrieved documents as context and sends it to the local LLM.
5. The LLM produces the result along with citations from the context documents. The result is displayed in the user interface along with the sources.

Open-source LLMs are much smaller than state-of-the-art models like ChatGPT and Bard and might not match them in every possible task. But augmenting these language models with your own documents makes them very powerful for tasks such as search and question-answering.

4.13 Recommender systems

Recommender systems are a type of information filtering system that seeks to predict the rating or preference that a user would give to an item. They are widely used in many different domains, such as e-commerce, recommender systems, and social media.

Recommender systems can be used to recommend a variety of items, such as products, movies, songs, and news articles. They work by analyzing the user's past behavior and preferences to identify items that the user is likely to be interested in.

There are many different types of recommender systems, each with its own strengths and weaknesses. Some of the most common types of recommender systems include:

Collaborative filtering systems recommend items based on the ratings or preferences of other users. For example, a music streaming service might recommend songs to a user based on the songs that other users who have similar listening habits have rated highly.

Content-based filtering systems recommend items based on the content of the items themselves. For example, a movie recommender system might recommend movies to a user based on the movies that the user has rated highly in the past.

Hybrid systems combine collaborative filtering and content-based filtering to provide more accurate recommendations.

Recommender systems can be a valuable tool for businesses and organizations. They can help to increase sales, improve customer satisfaction, and discover new opportunities.

```
public class RecommenderSystemExample {
    public static void main(String[] args) {
        try {
            // Đọc dữ liệu từ file CSV
            DataModel model = new FileDataModel(new File("path/to/data.csv"));

            // Xây dựng mô hình tương tự người dùng
            UserSimilarity similarity = new PearsonCorrelationSimilarity(model);

            // Xác định hàng xóm của người dùng
            UserNeighborhood neighborhood = new NearestUserNeighborhood(2, similarity, model);

            // Tạo một hệ thống đề xuất dựa trên người dùng
            UserBasedRecommender recommender = new GenericUserBasedRecommender(model, neighborhood, similarity);

            // Lấy 5 đề xuất cho người dùng có ID là 1
            List<RecommendedItem> recommendations = recommender.recommend(1, 5);

            // In kết quả
            for (RecommendedItem recommendation : recommendations) {
                System.out.println("Item ID: " + recommendation.getItemId() + ", Score: " + recommendation.getValue());
            }
        } catch (IOException | TasteException e) {
            e.printStackTrace();
        }
    }
}
```

Figure 4.13-1 Recommender systems

Chapter 5: DEMO INSTALLATION – INTERFACE

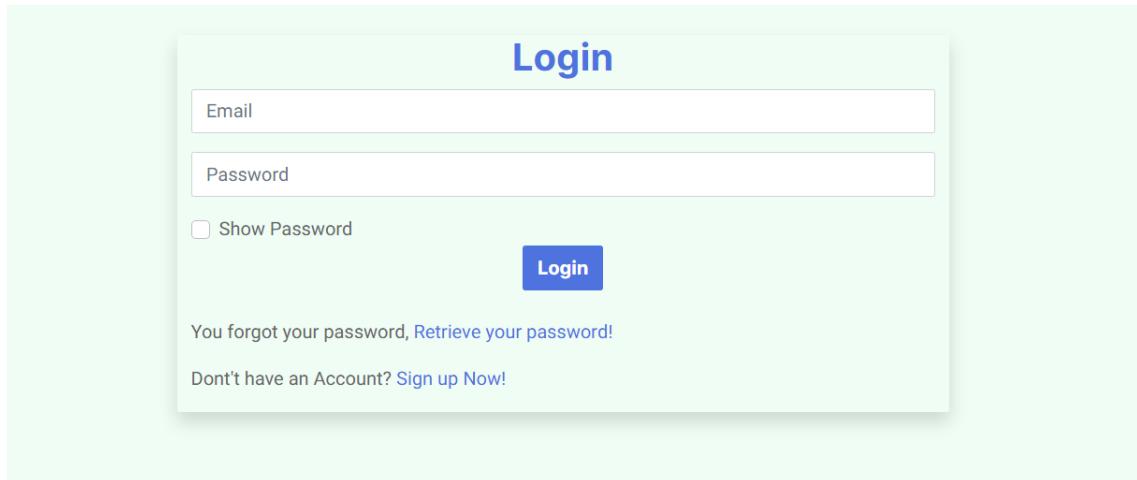
5. 1 Software required

The software required for the software to function is:

- Java 8
- Python >3.8
- Visual studio code
- Intellij

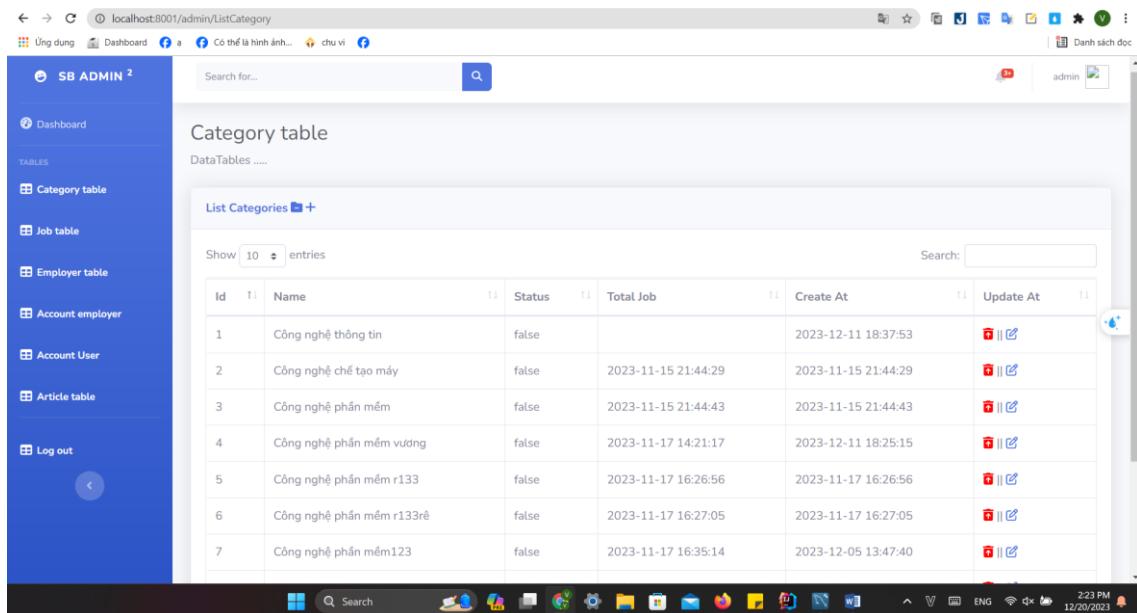
5. 2 Detail

5. 2. 1 Admin



The image shows a web-based admin login interface. At the top center is the word "Login". Below it are two input fields: "Email" and "Password". To the right of the "Email" field is a "Show Password" checkbox. Below the password field is a blue "Login" button. Underneath the login form, there is a link "You forgot your password, [Retrieve your password!](#)" and another link "Don't have an Account? [Sign up Now!](#)". The background of the page is light green.

Figure 5.2.1-1 Admin login



The image shows a screenshot of a web application titled "SB ADMIN 2". On the left is a sidebar menu with links: "Dashboard", "TABLES" (selected), "Category table" (highlighted in blue), "Job table", "Employer table", "Account employer", "Account User", "Article table", and "Log out". The main content area is titled "Category table" and "DataTables". It shows a table titled "List Categories" with a "Create" button. The table has columns: Id, Name, Status, Total Job, Create At, and Update At. Each row contains a set of edit and delete icons. The table shows 7 rows of data. The bottom of the screen shows a Windows taskbar with various icons and the date/time "12/20/2023 2:23 PM".

Id	Name	Status	Total Job	Create At	Update At
1	Công nghệ thông tin	false		2023-12-11 18:37:53	
2	Công nghệ chế tạo máy	false	2023-11-15 21:44:29	2023-11-15 21:44:29	
3	Công nghệ phần mềm	false	2023-11-15 21:44:43	2023-11-15 21:44:43	
4	Công nghệ phần mềm vương	false	2023-11-17 14:21:17	2023-12-11 18:25:15	
5	Công nghệ phần mềm r133	false	2023-11-17 16:26:56	2023-11-17 16:26:56	
6	Công nghệ phần mềm r133rê	false	2023-11-17 16:27:05	2023-11-17 16:27:05	
7	Công nghệ phần mềm123	false	2023-11-17 16:35:14	2023-12-05 13:47:40	

Figure 5.2.1-2 Category table

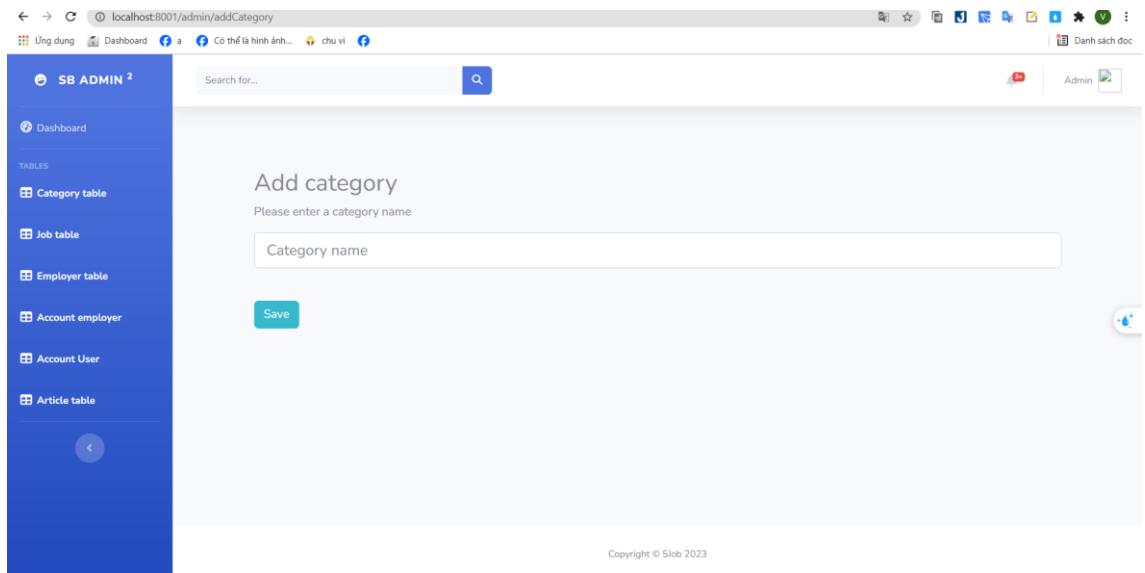


Figure 5.2.1-3 Add category

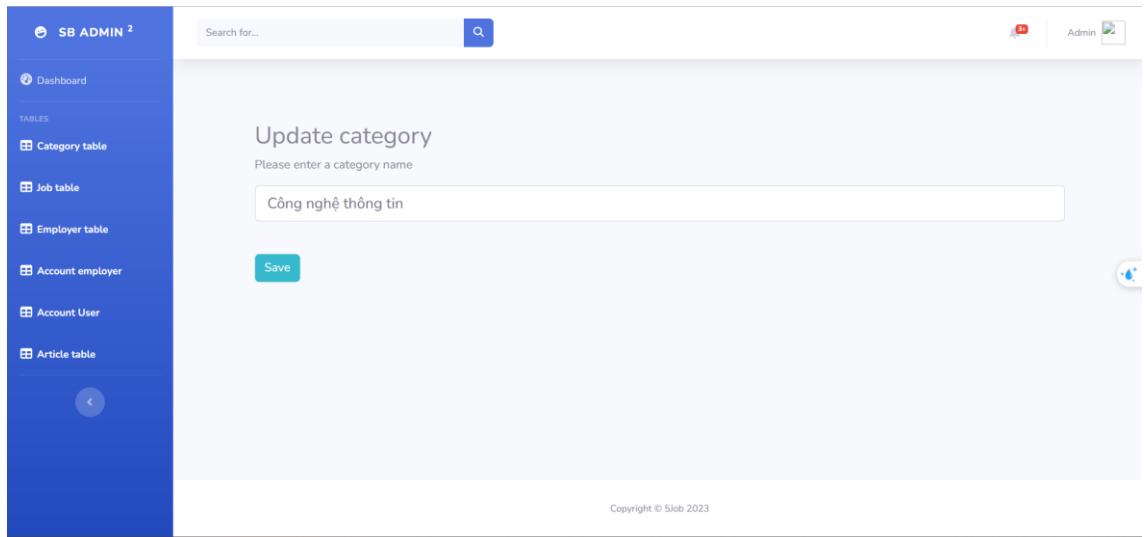


Figure 5.2.1-4 Update category

Category table

ID	Name	Create At	Update At
1	Công nghệ hoá học	2023-11-26 17:19:53	2023-12-11 18:46:47
2	công nghệ hoá học 2	2023-11-26 17:20:02	2023-11-27 23:25:02

Figure 5.2.1-5 Delete category management

DataTables Jobs

ID	Name	Address	Total candidate	Category	Create At	Update At
1	Junior Java	VV,DN,HK	6	Công nghệ hoá học Hết hoạt động	2023-12-05 21:17:26	
2	Intern1	VV, DN1, HK	5	Công nghệ ô tô Hết hoạt động		2023-11-16 19:40:56
3	Intern2	VV, DN2, HK	6	Công nghệ thông tin Hết hoạt động		2023-11-16 00:00:54
4	Intern8	VV, DN3, HK	6	Công nghệ chế tạo máy Hết hoạt động	2023-11-16 00:06:32	2023-11-17 15:42:24
5	Intern3	VV, DN5, HK	6	Công nghệ thông tin Hết hoạt động	2023-11-17 22:21:38	2023-11-17 22:21:38
6	Intern10	VV, DN6, HK	6	Công nghệ chế tạo máy Hết hoạt động	2023-11-17 22:23:34	2023-11-17 22:24:31
7	Intern4	DN7	6	Công nghệ chế tạo máy Hết hoạt động	2023-11-17 22:30:45	2023-11-17 22:30:45
8	Intern5	VN, DN	6	Công nghệ phần mềm Hết hoạt động	2023-11-28 00:17:11	2023-11-28 00:17:11
9	Fresher Java	fff	5	Công nghệ chế tạo máy Hết hoạt động	2023-12-07 11:42:42	2023-12-07 11:42:42
10	mater Java	DN, NHS	6	Công nghệ phần mềm Hết hoạt động	2023-12-11 14:41:14	2023-12-11 14:41:14

Figure 5.2.1-6 Jobs table

The screenshot shows a web application interface for managing company data. The left sidebar lists various tables: Category table, Job table, Employer table, Account employer, Account User, and Article table. The main content area is titled "Company table" and displays a single row of data in a table:

ID	Name	Address	Phone Number	Business Paper	Action Status	Created At	Updated At
1	Công ty hoa Ly		0394958482	MST:07474748543	false		2023-12-16 19:43:30

Below the table, a message says "Showing 1 to 1 of 1 entries". The bottom right corner of the page has a copyright notice: "Copyright © Slob 2023".

Figure 5.2.1-7 Company table

The screenshot shows a web application interface for managing company data. The left sidebar lists various tables. The main content area is titled "Company delete table" and displays three rows of data in a table:

ID	Name	Address	Phone Number	Business Paper	Action Status	Created At	Updated At
1	Công ty Văn Vording		0394958482	MST:07474748541	true		2023-12-16 19:43:22
2	Công ty Cảnh		0394958482	MST:07474748542	true		2023-12-18 15:43:03
3	feertrree	PP	0394958482	MST:07474748544	true		

Below the table, a message says "Showing 1 to 3 of 3 entries". The bottom right corner of the page has a copyright notice: "Copyright © Slob 2023".

Figure 5.2.1-8 Delete company management

localhost:8001/admin/listAccount

SB ADMIN 2

Dashboard

TABLES

- Category table
- Job table
- Employer table
- Account employer
- Account User
- Article table

Search for...

Account table

DataTables

List Account

Id	Name	Email	Status	Create At	Update At	
1	Vuongv	vanvuongvov700@gmail.com	false	2023-11-15 21:33:21	2023-12-18 15:34:43	<input type="button" value="View"/> <input type="button" value="lock"/>
3	vuongkk	emp@gmail.com	false	2023-11-23 22:45:58	2023-12-18 15:34:46	<input type="button" value="View"/> <input type="button" value="lock"/>
4	Vuong	emp1@gmail.com	false	2023-11-24 00:22:33	2023-12-18 15:34:50	<input type="button" value="View"/> <input type="button" value="lock"/>
5	fndfnfmfdnmdfnssmnfnmfsmd	emp11@gmail.com	false	2023-11-24 12:57:59	2023-12-13 12:49:26	<input type="button" value="View"/> <input type="button" value="lock"/>

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Figure 5.2.1-9 Account table

localhost:8001/admin/listDeleteAccount

SB ADMIN 2

Dashboard

TABLES

- Category table
- Job table
- Employer table
- Account employer
- Account User
- Article table

Search for...

Account table

DataTables

List Delete Account

Id	Name	Email	Status	Create At	Update At	
1	Vuong	vanvuongvov700@gmail.com	true	2023-11-15 21:32:42	2023-12-18 15:38:32	<input type="button" value="Active"/>
4	dfkjsdjfjsfdjk	emp111@gmail.com	true	2023-11-24 13:00:44	2023-11-24 13:00:45	<input type="button" value="Active"/>
5	feertreee	emp122@gmail.com	true	2023-11-24 13:06:22	2023-11-24 13:06:22	<input type="button" value="Active"/>

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Figure 5.2.1-10 Active account management

localhost:8001/admin/listUserAccount

SB ADMIN 2

Dashboard

TABLES

Category table

Job table

Employer table

Account employer

Account User

Article table

Search for...

Admin

Account table

DataTables

List Account +

ID	Name	Email	Status	Create At	Update At	
6	vuong	Vuong123@gmail.com	false	2023-12-01 16:53:33	2023-12-01 16:53:33	<input type="button" value="lock"/>
7	buong	vuongff1@gmail.com	false	2023-12-01 17:22:13	2023-12-01 17:22:13	<input type="button" value="lock"/>
8	vuongqew	userr123@gmail.com	false	2023-12-01 23:07:24	2023-12-01 23:07:24	<input type="button" value="lock"/>
9	khong	khong@gmail.com	false	2023-12-02 14:02:27	2023-12-02 14:02:27	<input type="button" value="lock"/>
10	khongw	khongw@gmail.com	false	2023-12-02 14:02:51	2023-12-02 14:02:51	<input type="button" value="lock"/>
11	khongvv	khongvv@gmail.com	false	2023-12-02 14:05:04	2023-12-02 14:05:04	<input type="button" value="lock"/>

Figure 5.2.1-11 Block account management

localhost:8001/admin/listUserAccount

SB ADMIN 2

Dashboard

TABLES

Category table

Job table

Employer table

Account employer

Account User

Article table

Search for...

Admin

Account table

DataTables

List Delete Account +

ID	Name	Email	Status	Create At	Update At	
2	userr	userr@gmail.com	true	2023-11-15 21:48:19	2023-12-18 15:37:47	<input type="button" value="Active"/>
3	Vuongzz	employer700@gmail.com	true	2023-11-23 22:41:15	2023-12-18 15:37:50	<input type="button" value="Active"/>
6	testuser	testuser@gmail.com	true	2023-11-28 22:30:32	2023-12-18 15:38:01	<input type="button" value="Active"/>

Copyright © 5job 2023

Figure 5.2.1-12 Delete account management

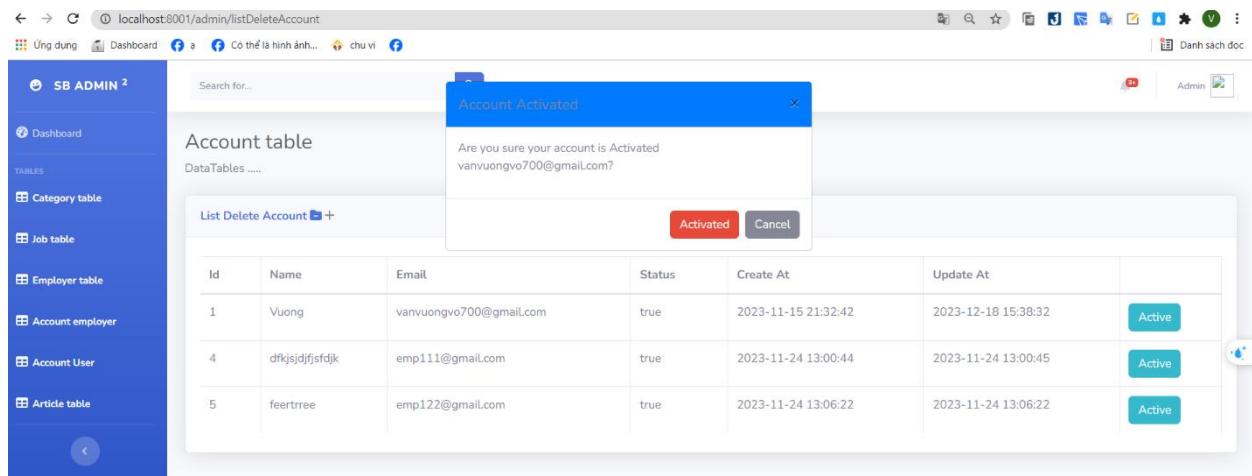


Figure 5.2.1-13 Acctive employer account

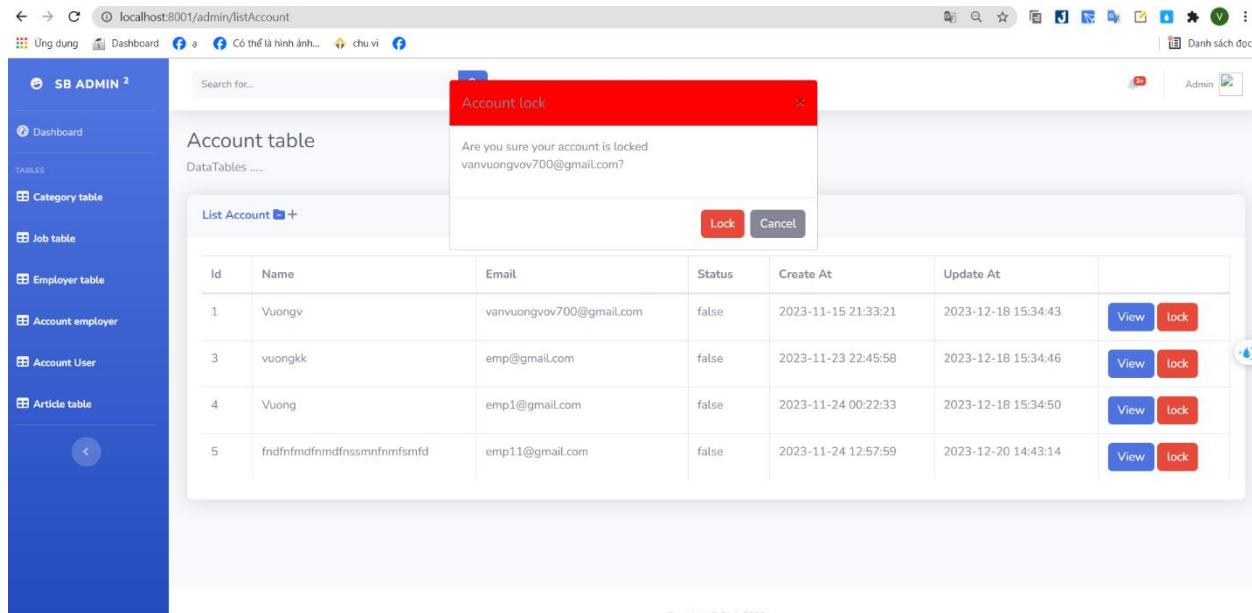
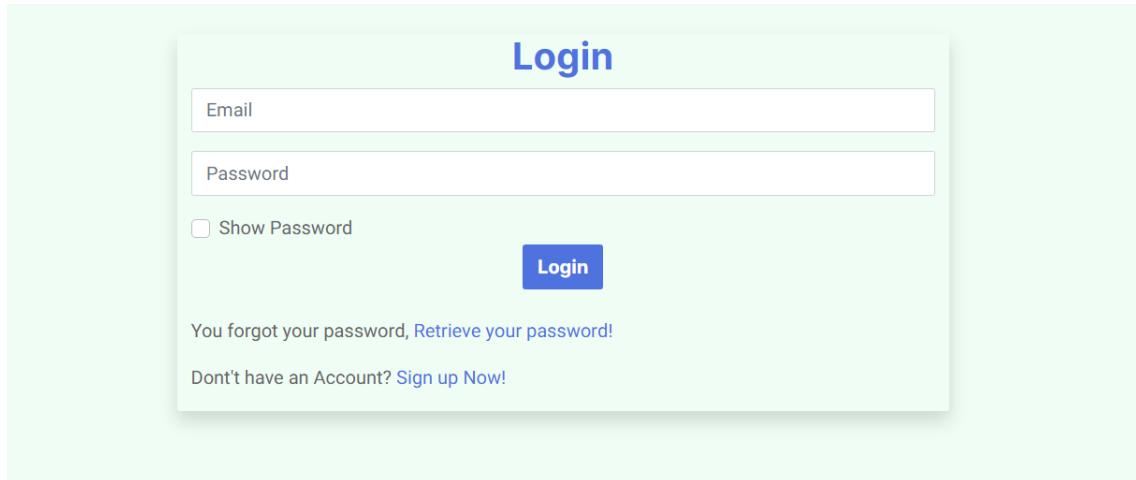


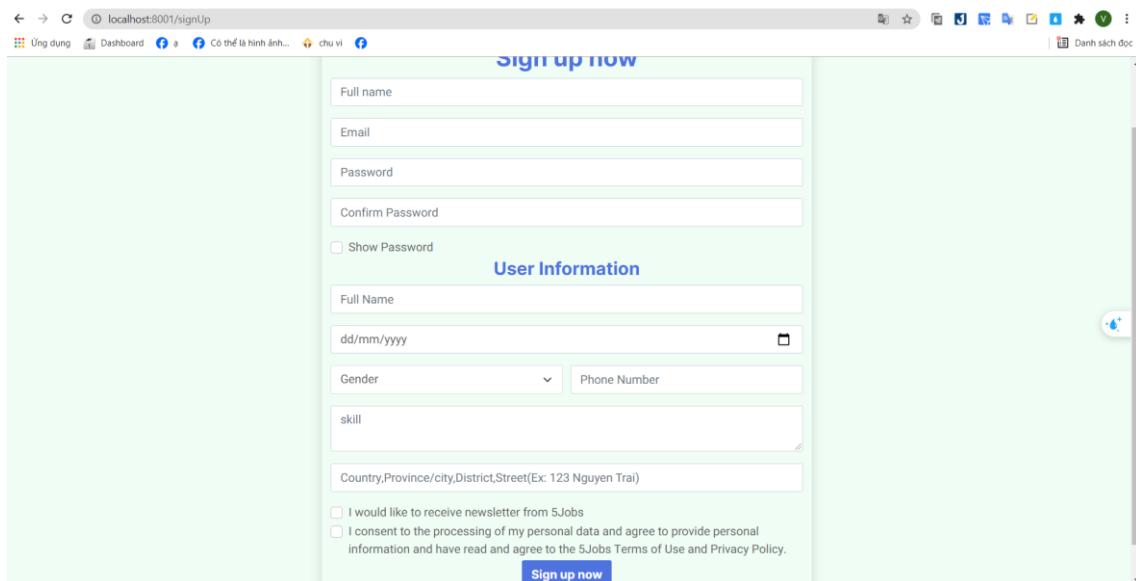
Figure 5.2.1-14 Block account

5.2.2 User



The image shows a user login interface. At the top center is a blue "Login" button. Below it are two input fields: "Email" and "Password". To the left of the "Password" field is a "Show Password" checkbox. Below the input fields is a "Login" button. Underneath the "Login" button is a link to "Retrieve your password!". At the bottom of the form is a link to "Sign up Now!".

Figure 5.2.2-1 User login



The image shows a user sign-up interface. At the top center is a blue "Sign up now" button. Below it are five input fields: "Full name", "Email", "Password", "Confirm Password", and "Show Password". Below these fields is a section titled "User Information" containing four input fields: "Full Name", "dd/mm/yyyy" (with a date picker icon), "Gender" (with a dropdown arrow), and "Phone Number". There is also a "skill" input field. At the bottom of the form are three checkboxes: "I would like to receive newsletter from 5Jobs", "I consent to the processing of my personal data and agree to provide personal information and have read and agree to the 5Jobs Terms of Use and Privacy Policy.", and "Sign up now".

Figure 5.2.2-2 user sign up

We have successfully sent the privacy code to your email!

Set a new password

Email:

Confirmation ID:

A new password:

Confirm new password:

Figure 5.2.2-3 user change password

HOME LIST JOB CV VUONG →

Keyword Category Location Search

Job Listing

New job Full Time Part Time

	Job Title	Type	Salary	Location	Date Line	Action
	mater Java	Full time	788.666 ₫	DN,NHS	2023-12-13 14:41:00	Detail
	Fresher Java	Full time	788.666 ₫	fff	2023-12-16 11:42:00	Detail
	Intern5					Detail

Figure 5.2.2-4 User index

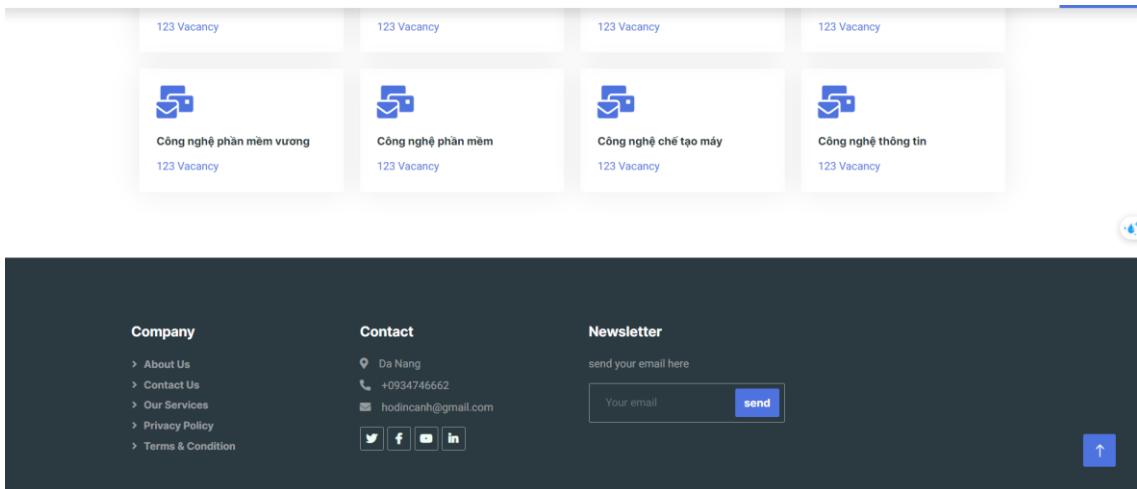


Figure 5.2.2-5 View category

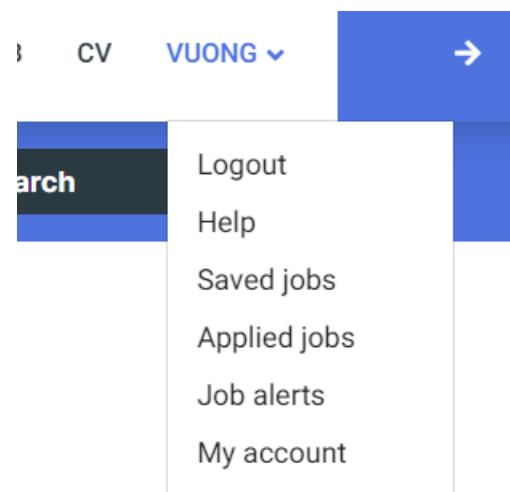


Figure 5.2.2-6 User funtions

The screenshot shows a web browser window for the '5Job' application at localhost:8001. The top navigation bar includes links for HOME, COMPANIES, 5JOB TOOL, CV, LOGIN, and a search bar. On the left, there's a sidebar with 'Danh sách đọc'. The main content area is titled 'Job Save' and displays a list of five saved job posts:

- mater Java** - Deadline: 2023-12-13 14:41:00
- Fresher Java** - Deadline: 2023-12-16 11:42:00
- mater Java** - Deadline: 2023-12-13 14:41:00
- Intern4** - Deadline: 2023-11-24 22:30:00
- Junior Java** - Deadline: 2023-11-19 21:36:00

Each job entry has 'Apply now' and 'Unsave' buttons. To the right, there's an 'Advertisement' section with placeholder text and a list of other job posts from different companies.

Figure 5.2.2-7 View save jobs

The screenshot shows a web browser window for the '5Job' application at localhost:8001. The top navigation bar includes links for HOME, LIST JOB, CV, VUONG, and a search bar. On the left, there's a sidebar with 'Danh sách đọc'. The main content area is titled 'Job Listing' and displays a list of two full-time job posts:

- mater Java**
Full time | 788666 788.666 ₫ | DN,NHS
Date Line:2023-12-13 14:41:00
- Fresher Java**
Full time | 7886665 788.666 ₫ | fff
Date Line:2023-12-16 11:42:00

Each job entry has 'Apply Now' and a heart icon. There are also tabs for 'New job', 'Full Time' (which is selected), and 'Part Time'.

Figure 5.2.2-8 View jobs full time

The screenshot shows a web browser window for the '5Job' application at localhost:8001/user/home. The header includes links for HOME, LIST JOB, CV, and VUONG, along with a search bar and a user profile icon. Below the header is a navigation bar with fields for Keyword, Category, and Location, and a 'Search' button. The main content area is titled 'Job Listing' and features tabs for New job, Full Time, and Part Time, with 'Part Time' selected. A job listing for 'Intern4' is displayed, showing details: Position (Intern4), Status (DN7), Type (Part time), ID (7886667), and a blue 'Apply Now' button. Below the job listing is a note about the date line: 'Date Line: 2023-11-24 22:30:00'. The URL in the address bar is localhost:8001/user/index.html.

Figure 5.2.2-9 View jobs part time

The screenshot shows a web browser window for the '5Job' application at localhost:8001/user/list/job. The header includes links for HOME, COMPANIES, 5JOB TOOL, CV, and VUONG, along with a search bar and a user profile icon. Below the header is a navigation bar with fields for Keyword, Category, and Location, and a 'Search' button. The main content area displays a list of job postings under the heading 'Advertisement'. The first listing is 'Junior Java' (ID: 7886660, Full time, VV,DN,HK). Subsequent listings include 'Intern1' (ID: 78866651, Full time, VV,DN1,HK), 'Intern2' (ID: 7886662, Full time, VV,DN2,HK), 'Intern8' (ID: 7886663, Part time, VV,DN3,HK), and 'Intern3' (ID: 7886665, Part time, VV,DN5,HK). Each listing includes a thumbnail image, the job title, ID, type, location, an 'Apply Now' button, and a date line. To the right of the job list is a sidebar titled 'Job suggestions' containing other job titles and descriptions. The URL in the address bar is localhost:8001/user/index.html.

Figure 5.2.2-10 List jobs

The screenshot shows a web browser window for the '5Job' application. The URL is 'localhost:8001/user/jobDetail/1'. The main content area displays a job listing for 'Junior Java' at 'Công ty Văn Vương'. The job summary includes details like 'Published On', 'Quantity: 6', 'Job Nature: Full time', 'Salary: 7.886.660 ₫', 'Location: VV,DN,HK', and 'Date Line: 2023-11-19 21:36:00'. Below the summary, there's a 'Job description' section with placeholder text and a 'Benefit' section with another placeholder. A 'Notes and skills' text area is present. On the left, there's a sidebar with a search bar and navigation links for 'HOME', 'COMPANIES', '5JOB TOOL', 'CV', and 'VUONG'. At the bottom, there's an 'Apply Now' button.

Figure 5.2.2-11 Job detail

The screenshot shows a web browser window for the '5Job' application. The URL is 'localhost:8001/user/companyInfo/1'. The main content area displays information about 'Công ty Văn Vương'. It includes a circular logo, the company name, and staff details ('MST:07474748541 emp@gmail.com 12 Staff'). Below this, there are two sections: 'Company Introduction' (with placeholder text) and 'Recruitment' (listing a 'Junior Java' position). The recruitment card shows details like 'VV,DN,HK', 'Full time', '7886660 ₫', and 'Date Line: 2023-11-19 21:36:00'. To the right, there's an 'Advertisement' section with a placeholder message and a 'Job suggestions' section listing 'mater Java' and 'Fresher Java' positions. The top navigation bar and sidebar are similar to Figure 5.2.2-11.

Figure 5.2.2-12 Company detail

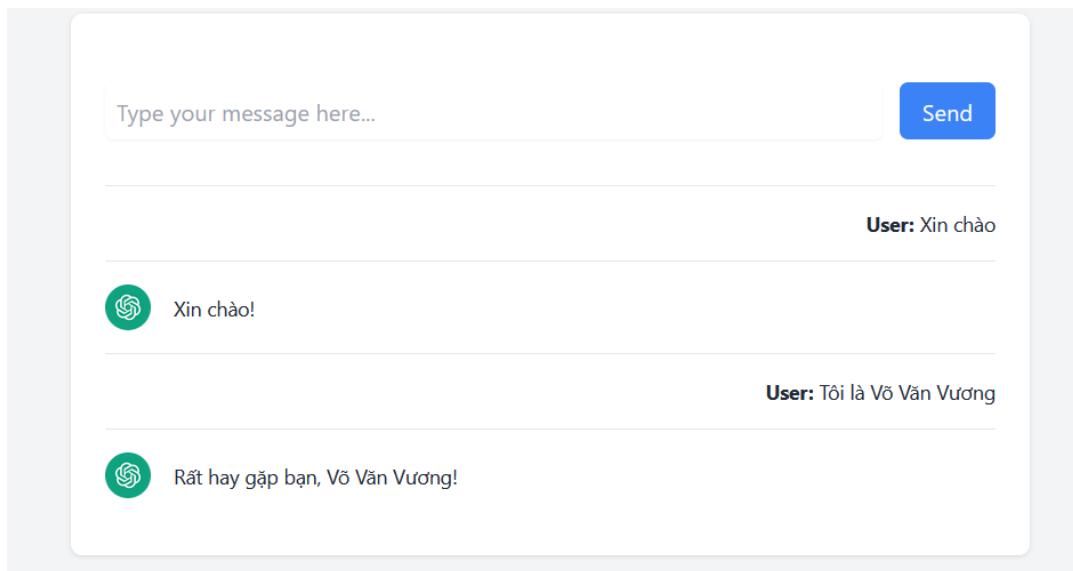


Figure 5.2.2-13 Chat bot AI

5. 2. 3 Employer

The screenshot shows a login form titled "Login". It contains two input fields: "Email" and "Password", both with placeholder text. Below the password field is a "Show Password" checkbox. A large blue "Login" button is centered below the fields. Below the button, there is a link for password retrieval and another for account creation.

Email

Password

Show Password

Login

You forgot your password, [Retrieve your password!](#)

Don't have an Account? [Sign up Now!](#)

Figure 5.2.3-1 Login for employer

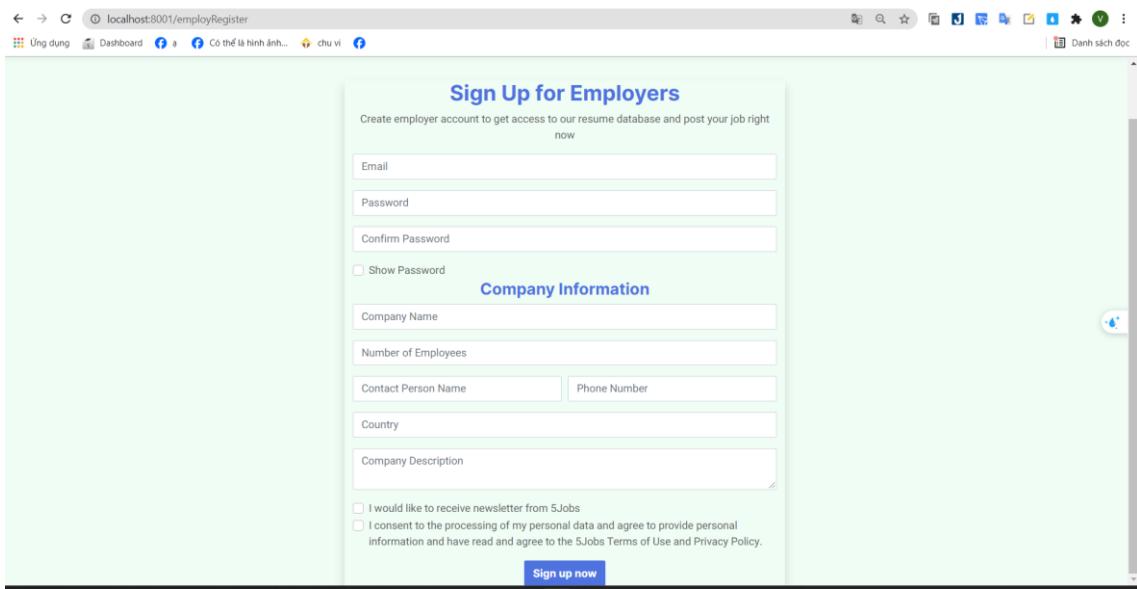


Figure 5.2.3-2 Sign up for Emmployer

The screenshot shows a login interface with the header "My 5job employer". The email address "emp11@gmail.com" is entered in the text field. The main content is titled "Password" and includes fields for "Current Password", "New Password", and "Confirm Password". Below these is a checkbox for "Show Password" and a blue "Update Password" button.

Figure 5.2.3-3 Change password

The screenshot shows a web-based application interface for managing jobs. On the left, there is a sidebar with a blue header 'SB ADMIN 2' and a list of options: 'Dashboard', 'Job table' (which is selected and highlighted in blue), and 'Setting'. Below these are 'Log out' and a circular profile picture. The main content area has a title 'Jobs table' and a sub-section 'DataTables Jobs +'. It displays a table with the following data:

ID	Name	Total candidate	Salary	Deadline	Address	Benefit & Description	Create At	Update At
1	Intern5	6	788665	2023-11-30 00:17:00	VN.DN	Benefit xin chào dhfdthfdhfdhfdhVuongVuong Description xin chào dhfdthfdhfdhfdhVuongVuong	2023-11-28 00:17:11	2023-11-28 00:17:11
2	Fresher Java	5	7886665	2023-12-16 11:42:00	fff	Benefit xin chào dhfdthfdhfdhfdhVuongVuong Description xin chào dhfdthfdhfdhfdhVuongVuong	2023-12-07 11:42:42	2023-12-07 11:42:42

At the bottom of the table, it says 'Showing 1 to 2 of 2 entries'. There are navigation buttons for 'Previous' and 'Next'.

Figure 5.2.3-4 Jobs table

The screenshot shows a 'Add job' form page. The left sidebar is identical to Figure 5.2.3-4. The main form has the following fields:

- 'Please enter the position you are applying for *' with a text input field.
- 'Please enter your work request (Full time, Part time)*' with a dropdown menu.
- 'Please enter your work address *' with a text input field.
- 'job position' and 'Salary(VND) *' with dropdown menus.
- 'Total candidate *' and 'Application deadline *' with dropdown menus.
- 'Word address' and 'please choose category *' with dropdown menus.
- 'Total candidate' and 'salary' with text input fields.
- 'dd/mm/yyyy --:-- --' with a date picker icon.
- 'Choose categories' with a dropdown menu.
- 'Candidate benefit' with a text input field.
- 'Please enter job description *' with a text input field.
- 'description' with a text input field.
- A large blue 'Add' button at the bottom right.

Figure 5.2.3-5 Add job

The screenshot shows the 'Received Application' section of the 'MY 5JOB EMPLOYER' dashboard. At the top, there are three summary boxes: 'Total applications' (5), 'Total Views' (0), and 'Post Date' (N/A). Below these are two tables:

- List of non-applicants:** A table with columns: Id, Name job, Applicant's name, Candidate email, Recruitment status, and Application period. One row is shown: Id 2, Name job Intern5, Applicant's name userr, Candidate email userr@gmail.com, Recruitment status Not applied yet, Application period 2023-12-09 15:40:52 / 2023-11-30 00:17:00. Buttons 'choose' and 'View' are at the bottom.
- List of applicants:** A table with columns: Id, Name job, Applicant's name, Candidate email, Recruitment status, and Application period. One row is shown: Id 1, Name job Intern5, Applicant's name testuser, Candidate email testuser@gmail.com, Recruitment status Brower, Application period 2023-11-29 17:25:34. A 'View' button is at the bottom.

Figure 5.2.3-6 Index page

This screenshot is identical to Figure 5.2.3-6, but it includes a modal window titled 'User Information' overlaid on the 'Received Application' section. The modal contains the following details for a user named 'userr':

- Name: userr
- Address: việt nam
- Phone: 394958483
- Email: userr@gmail.com
- Skill: Xin chào tôi muốn tìm việc

Figure 5.2.3-7 view candidate information

Figure 5.2.3-8 list of job seekers

CONCLUSION AND REPORT DEVELOPMENT DIRECTIONS

Conclude

The results were achieved

Learn about :

- Learn operations related to find jobs websites (view jobs, save jobs, apply...)
- Front end: Html, css,js
- Backend : Java, python, java spring boot, spring security, spring JPA
- DataBase: MySQL
- Learn to send email and edit text (markdown)

Limit

- Statistics are not diverse in items
- Not supported credit cards and e-wallets

Development

- Expand statistics with many chart types and statistical formats.
- C send messages with photos and videos.
- Supported credit cards and e-wallets

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