WORKSHOP 1

STREETJOB RECRUIT SYSTEM

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INTRODUCTION

Overview: The StreetJob Recruit System is a robust, data-driven platform designed to digitize and automate the recruitment lifecycle.

- **Technology Stack:**
- **Language: C++**
- **Database: MySQL**
- **Interface: Console-based User Interface**

The StreetJob Recruit System facilitates a secure, three-way digital interaction where Administrators oversee system data and reports, Employers manage the full job posting and hiring lifecycle, and Job Seekers build professional profiles to apply for and track employment opportunities.

01

Access Control

I solved the risk of unauthorized access by implementing reusable Login and Session functions.

02

Job Management

The challenge of tracking vacancies was solved via a dedicated Job CRUDS module.

03

Application Workflow

The complex interaction between a seeker and an employer was solved by application. This decoupling allows seekers to apply instantly while employers can update statuses (Shortlisted/Hired) independently.

04

Decision Support

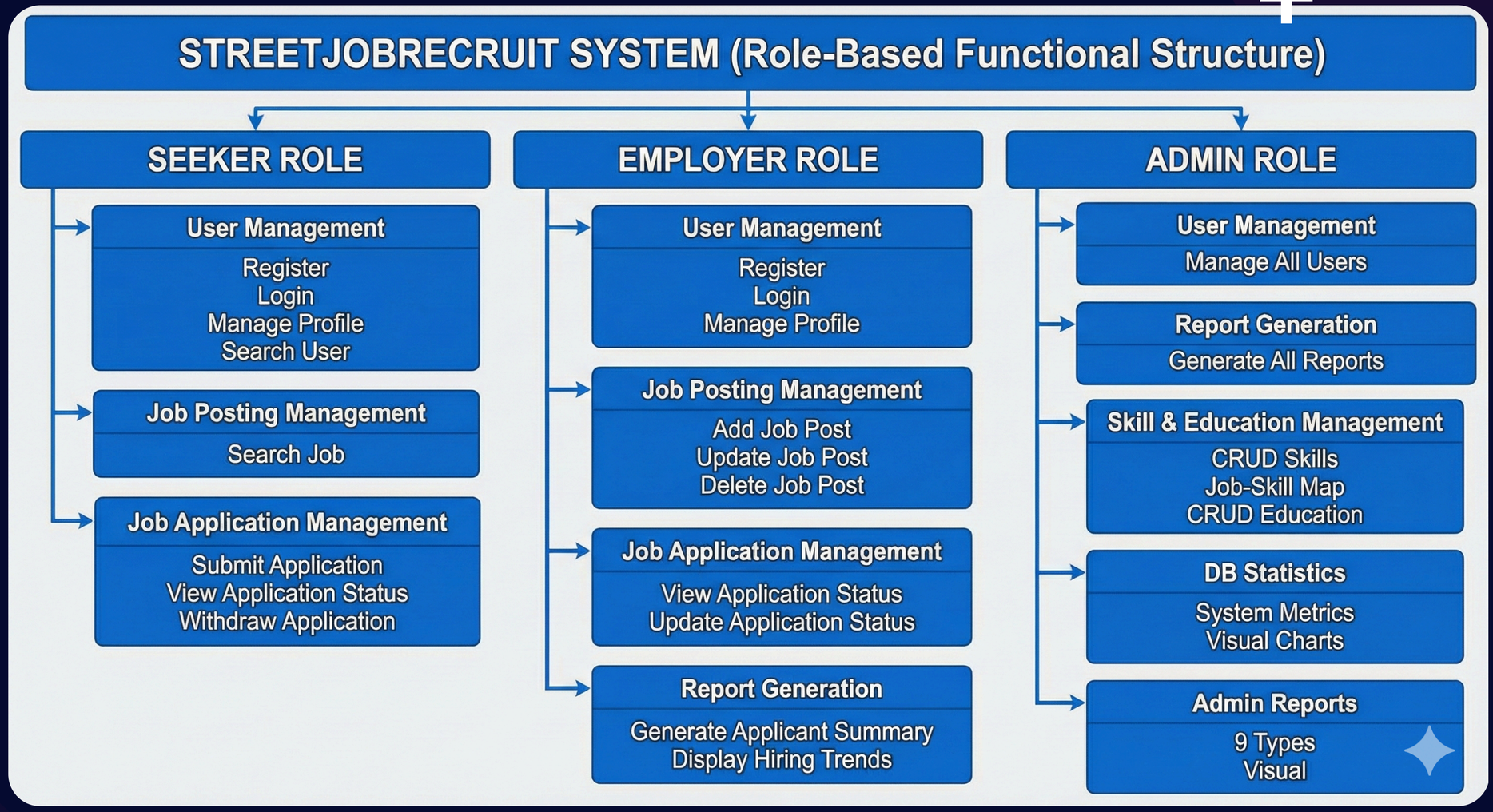
The lack of hiring insights was solved by utilizing SQL aggregate queries (COUNT, SUM, AVG). This allows the system to analyze business trends, such as identifying high-demand job categories and calculating the Job Competition Index.

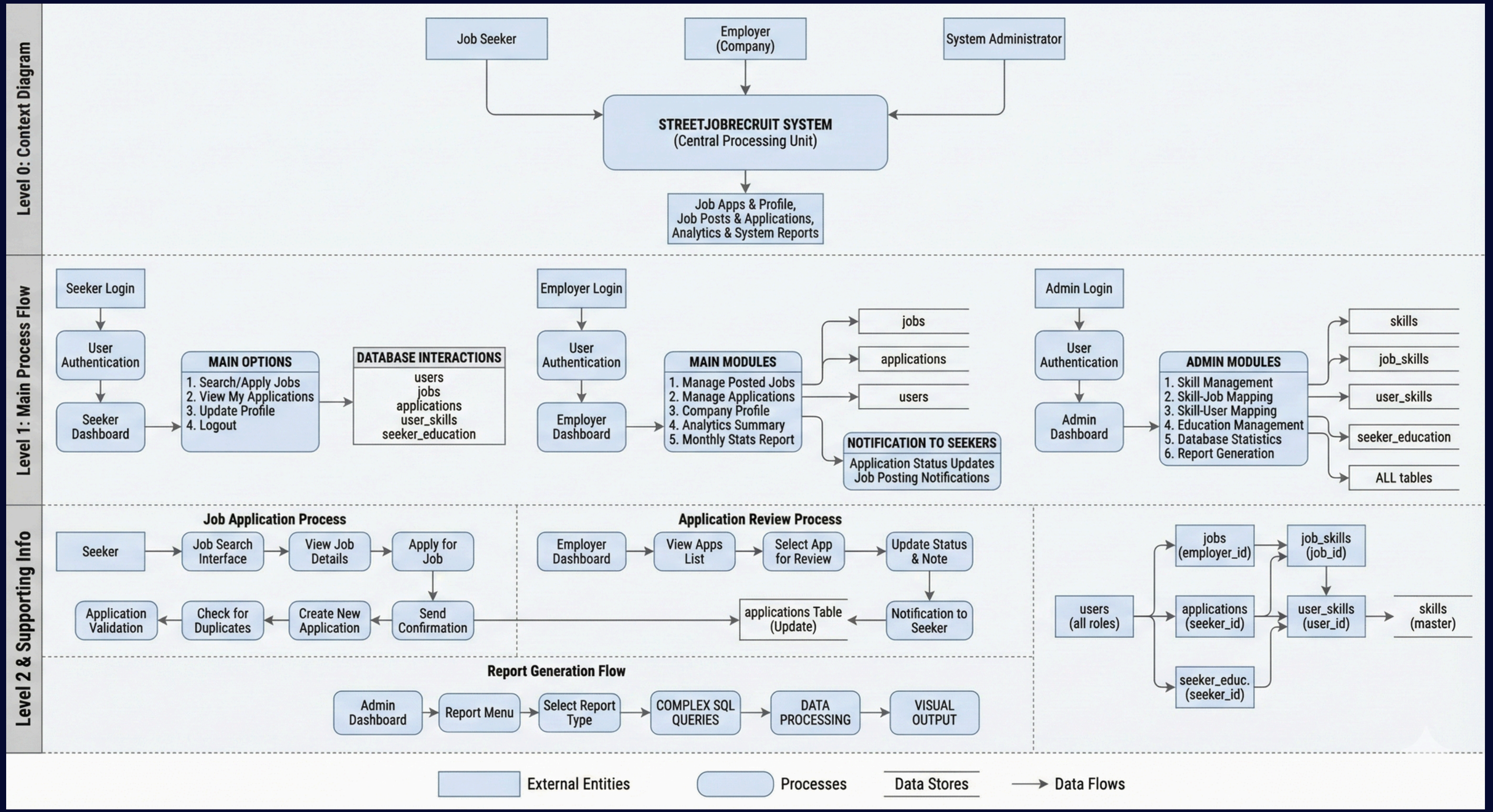
MOTIVATION

The Problem:
Traditional recruitment relies on manual spreadsheets and fragmented communication, which are inherently inefficient, prone to significant data entry errors, and lack the scalability required to manage high volumes of applicants.

The Goal:
The primary objective is to replace these manual workflows with a centralized C++ and MySQL-driven architecture. This transition ensures 100% data integrity through relational database normalization and creates a smooth, automated workflow for all stakeholders

PROPOSED SYSTEM

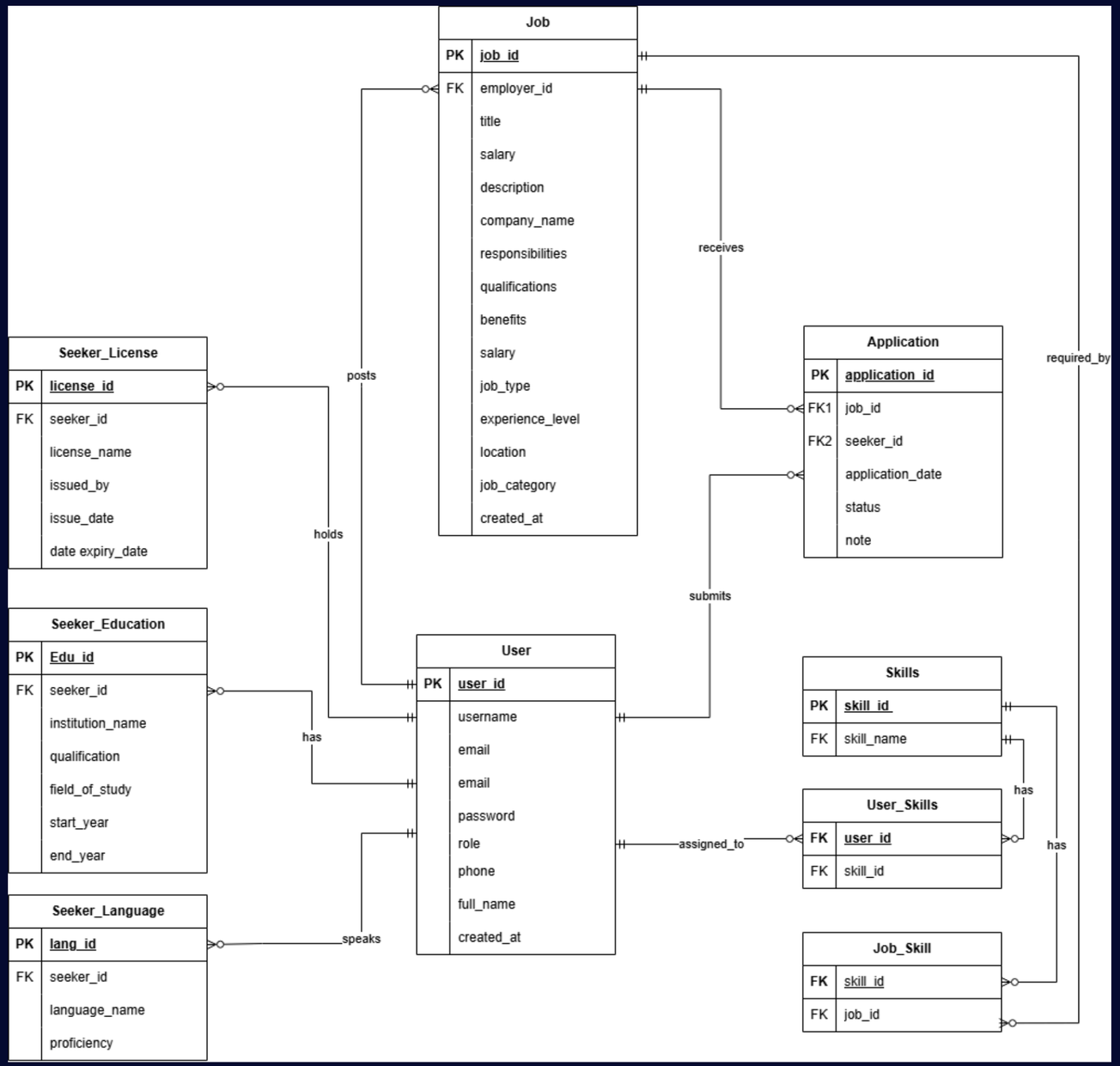



Level 0: Context Diagram
Job Seeker
Employer (Company)
System Administrator
STREETJOBRECRUIT SYSTEM
(Central Processing Unit)
Job Apps & Profile,
Job Posts & Applications,
Analytics & System Reports
Level 1: Main Process Flow
Seeker Login
User Authentication
Seeker Dashboard
MAIN OPTIONS
1. Search/Apply Jobs
2. View My Applications
3. Update Profile
4. Logout
DATABASE INTERACTIONS
users
jobs
applications
user_skills
seeker_education
Employer Login
User Authentication
Employer Dashboard
MAIN MODULES
1. Manage Posted Jobs
2. Manage Applications
3. Company Profile
4. Analytics Summary
5. Monthly Stats Report
jobs
applications
users
NOTIFICATION TO SEEKERS
Application Status Updates
Job Posting Notifications
Admin Login
User Authentication
Admin Dashboard
ADMIN MODULES
1. Skill Management
2. Skill-Job Mapping
3. Skill-User Mapping
4. Education Management
5. Database Statistics
6. Report Generation
skills
job_skills
user_skills
seeker_education
ALL tables
Level 2 & Supporting Info
Job Application Process
Seeker
Job Search Interface
View Job Details
Apply for Job
Send Confirmation
Create New Application
Check for Duplicates
Application Validation
Application Review Process
Employer Dashboard
View Apps List
Select App for Review
Update Status & Note
Notification to Seeker
applications Table (Update)
users (all roles)
jobs (employer_id)
applications (seeker_id)
seeker_educ. (seeker_id)
job_skills (job_id)
user_skills (user_id)
skills (master)
Report Generation Flow
Admin Dashboard
Report Menu
Select Report Type
COMPLEX SQL QUERIES
DATA PROCESSING
VISUAL OUTPUT
External Entities
Processes
Data Stores
Data Flows

PROJECT SCOPE

User	Module	Function
Admin	User & Skill Management	Create, Read, Update, and Delete system users and the standardized skills database.
	System Reporting	Read (Generate) Recruitment Analytics, Job Competition Index, and Category Demand reports.
Employer	Job Posting Module	Create new job vacancies, Read active postings, Update job requirements/salary, and Delete (Archive) listings.
	Applicant Review	Read applicant profiles, Update application status (Shortlisted/Hired/Rejected), and Delete records.
Job Seeker	Job Search & Profile	Read job listings, Create/Update professional profile, and Delete (Cancel) pending applications.
	Tracking Module	Read personal application history and monitor real-time status updates from employers.

Design


Job
PK job_id
FK employer_id
title
salary
description
company_name
responsibilities
qualifications
benefits
salary
job_type
experience_level
location
job_category
created_at
receives
required_by
posts
Application
PK application_id
FK1 job_id
FK2 seeker_id
application_date
status
note
Seeker_License
PK license_id
FK seeker_id
license_name
issued_by
issue_date
date expiry_date
holds
submits
Seeker_Education
PK Edu_id
FK seeker_id
institution_name
qualification
field_of_study
start_year
end_year
has
User
PK user_id
username
email
email
password
role
phone
full_name
created_at
Skills
PK skill_id
FK skill_name
has
User_Skills
FK user_id
FK skill_id
assigned_to
has
Seeker_Language
PK lang_id
FK seeker_id
language_name
proficiency
speaks
Job_Skill
FK skill_id
FK job_id

IMPLEMENTATION AND TESTING

Implementation Overview :

- Design: Utilizes modular functions and pointers for efficient memory management.
- Standards: Adheres to consistent camelCase naming conventions and 3rd Normal Form (3NF) database integrity.

Testing & Error Handling :

- Validation: Implements cin.fail() checks to prevent system crashes from non-numeric or negative inputs.
- SQL: Features real-time database error monitoring to catch and handle sql::SQLException during queries.
- Integrity: Blocks the deletion of active job postings that currently have pending applicant records to maintain data consistency.

SYSTEM DEMONSTRATION

CONCLUSION

Objective Reflection

Objective 1 (CRUD Operations):

- Successfully implemented full data manipulation capabilities across Admin, Employer, and Seeker modules, ensuring that all core entities (Users, Jobs, and Applications) follow 3rd Normal Form (3NF) integrity.

Objective 2 (Complex Calculations):

- Developed a robust analytical engine capable of calculating the Job Competition Index using SQL aggregate functions to classify market competitiveness as High, Moderate, or Low.

Objective 3 (Report Generation):

- Integrated a dynamic report module that transforms raw database records into visual terminal-based analytics, providing administrators with actionable insights into hiring trends.

Future Improvements

- Multi-User Web Migration Transition the local C++ console logic to a web-based framework to allow multiple users to access the system simultaneously via a browser rather than a single terminal instance.
- Automated Notification System Integrate a local SMTP server or email API to automatically send real-time status updates to job seekers when an employer moves their application from "Pending" to "Hired."
- Intelligent Skill Matching Enhance the local search engine with a matching algorithm that automatically ranks job vacancies for a seeker based on the overlap between their profile skills and the job requirements.