A JOB APPLICATION PORTAL

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Faculty of Information Technology

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Declaration and Approval

I declare that this work has not been previously submitted and approved for the award of a bachelor's degree by this or any other University. To the best of my knowledge and belief, the work contains no material previously published or written by another person except where due reference is made in the work itself.

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Approval

The work of **<u>100855</u>** was reviewed and approved *(for examination)* by:

Supervisor's signature:

……..…….. [*Signature*]

……..…….. [*Date*]

Abstract

The human resource departments in many companies have various processes which include checking employee attendance, disbursing payrolls, applying for jobs, handling company events and training programs, handling leave and absence requests and lastly, checking on employee welfare. These processes, however, are handled manually for example job application could become tedious due to the many processes that an applicant would have to undergo at the physical establishment in order to apply for a job of choice. Such manual handling of these processes was tiring and therefore cause inaccuracy and inefficiency.

The developed solution was a web-based information system that would seek to automate these processes in the human resource department. It would be able to make job application easier for applicants and ensure that employees requesting leaves and absences would be able to do so by communicating to the right channels through the system.

The system was developed using the prototyping methodology. Other tools that were used include PHP as the programming language, Brackets as the IDE , MySQL as the DBMS and usability testing as the testing method.

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Chapter 1: Introduction

1.1 Background

Most of the companies in Nairobi have human resource departments as part of the overall task force. Human resource departments have several processes which include checking employee attendance, disbursing payrolls, reviewing job applications from applicants, handling company events and training programs, handling leave and absence requests and lastly checking on employee welfare.

Reviewing job applications by job applicants is a process that human resource employees are heavily engaged in due to the large number of people in the overall job market who are frantically searching for jobs to sustain their living standards. Job application is often tedious for applicants and human resource personnel because it involves various processes. The current application procedure involves applicants sending their CVs to the company, waiting for a response from the company, attending an interview and waiting for another response from the company. This is tedious for the applicant because it raises their anxiety. This process is also tedious for the human resource employees because they receive CVs from various applicants. CVs may get lost or be forgotten thus reducing the efficiency of these employees.

The project therefore proposed to improve the job application process by developing a web-based job application system whereby job applicants were able to apply for jobs and get feedback while at the same time enabled human resource departments in companies to review job applications and give relevant feedback.

1.2 Problem Statement

The problem addressed was the current job application procedure that was hectic for both applicants and employees in the human resource department. The current application procedure involved a job applicant looking for a job followed by the applicant preparing an updated CV. After this, a job applicant sent the CV and all other necessary documents to the company from which they awaited a response. Sometimes, a job applicant might not get a response whether they have been rejected or accepted due to wrong contact information. Human resource employees also lost CVs due to the large number of applicant data that arrived at the company that may not be properly managed.

1.3 Aim

The aim of the developed project was to create a web based job application system that enabled applicants to apply for jobs and get relevant feedback while at the same time enabled human resource employees to review the applications and also manage the large amounts of application data streaming in.

1.4 Specific Objectives

i. To identify challenges faced in job application by job applicants and human resource employees.
ii. To review techniques of solving challenges faced by job applicants and human resource employees.
iii. To develop the web-based job application system
iv. To test the web-based job application system using unit testing

1.5 Justification

Job applicants would benefit from the project because they would be able to apply for the jobs of their choice on an online platform and get feedback from the reviewing personnel.

Human resource employees always feel overwhelmed by the way they handle large amounts of data would also benefit from the project in that they would be able to review applications at a faster rate and manage large amounts of job applicants' data.

1.6 Scope and Limitations

The project featured a job applicant page where the job applicant will key in their details and get their CVs processed. The project will also feature an application page from which employees will be able to review the applicants' data and store and manage their data.

Limitations in this project included gaining permission to access the company's internal processes, adapting to the new system and the fact that the system is only web-based.

Chapter 2: Literature Review

2.1 Introduction

This chapter focused on the job application procedure. It focused on the current job application procedure, challenges facing job applicants and human resource employees using the current job application procedures and looked at the ways to overcome these challenges, the conceptual framework and related works .

2.2 Current job application process

There are several processes that are followed by a job applicant when it comes to searching for a job.

Firstly, they must search for job vacancies in their fields of interest.

Secondly, they must prepare an application for their job of choice. This involves getting a curriculum vitae ready with updated educational background, work experience and include all the necessary skills that are of use to the job being applied for. A cover letter is also included as part of the necessary documentation for application although this is highly overlooked by several applicants (Doyle, 2018).

The application is then submitted to the company offering the job via email or in person and the applicant waits for a response.

While the applicant waits for a response, the company goes into a state of applicant evaluation where its human resource department screens all the applications made by various applicants and shortlists candidates who are viable for the position based on their necessary skills.

The company then calls shortlisted candidates for several interviews. Shortlisted candidates may partake in assessment exercises which is a written interview meant to test their knowledge or competency-based interview on phone or in person or both to show how much they know about the company and gauge whether they would be a good fit for the company (UN, 2020).

After the interview, the applicant is either accepted or rejected by the company depending on how well they conducted himself/herself in the interview. Once the applicant is accepted, the applicant goes through the hiring process. This entails going through drug tests, background checks, reference checks and credit checks.

Lastly, the applicant is given a job offer from which he/she may choose to accept the job offer or reject it based on whether they find the company a good fit for them.

2.3 Challenges faced by job applicants.

2.3.1 Lack of direction

Job applicants often lack a sense of clear direction. Job applicants especially fresh graduates usually do not know the first step in applying for a job. Some graduates however find themselves applying for many jobs at a time in the hopes of getting a call back. This approach is not helpful because applicants may lose a lot of hope when they do not get a call back. (Zambas, 2018)

2.3.2 Lack of connections

Lack of connections is also a major challenge faced by job applicants. According to (Zambas, 2018), in the current job search, connections are far more likely to land an applicant a job because there is a common factor of recruitment between the company and applicant. Moreover, connections are often seen by employers as cheaper options as they save more time in terms of vetting job applicants.

2.3.3 Skipping the cover letter

Skipping the cover letter is among the challenges faced by job applicants. Applicants skip writing the cover letter due to the assumption that an employer may neither look at the cover letter nor bother to read it therefore they perceive it as a waste of the employer's time. While the cover letter is not necessarily of importance to the job application process, it is not recommended to leave it out as part of the documentation to have within reach. Cover letters give accurate information on who applicants are, their work ethic and attention in ways that a curriculum vitae cannot be able to.

2.3.4 Lack of curriculum vitae version control

Lack of version control in terms of preparing curriculum vitae is another major problem facing applicants. Applicants use one version of their CV to apply for jobs which is a move that is neither productive nor effective. This is because different jobs require different skills to be performed effectively. Using one version of a CV is likely to get an applicant rejected from getting a job because their outdated CV may include skills that are of no relevance to the company where they are seeking employment.

2.4 How the solution solved the challenges.

The solution solved the challenges faced by the job applicants in the following ways.

2.4.1 Sense of direction

The proposed solution intends to give job applicants a sense of direction by directing them to job openings that are suitable for their skills. From here, they will be able to apply for the positions of their choice thereby giving them a sense of direction.

2.4.2 Mandatory cover letter

The proposed solution intends to include a mandatory field to submit a cover letter. This is so that applicants can include a cover letter that is able to inform their employers of who they are and their skills without being rejected because of a lack of one.

2.4.3 CV version control

The proposed solution also intends to let an applicant update their CV to suit the needs of a company based on the skills they possess.

2.5 Related works

2.5.1 Kenya Electricity Generating Company Portal

KenGen is the leading electric power generating company in East Africa. Its main function is to generate electricity through the development, management, and operation of power plants. KenGen has a portal where applicants can login to the system and look for jobs by selecting a field of interest. Job vacancies are then shown after searching for the field of interest from where applicants can apply.

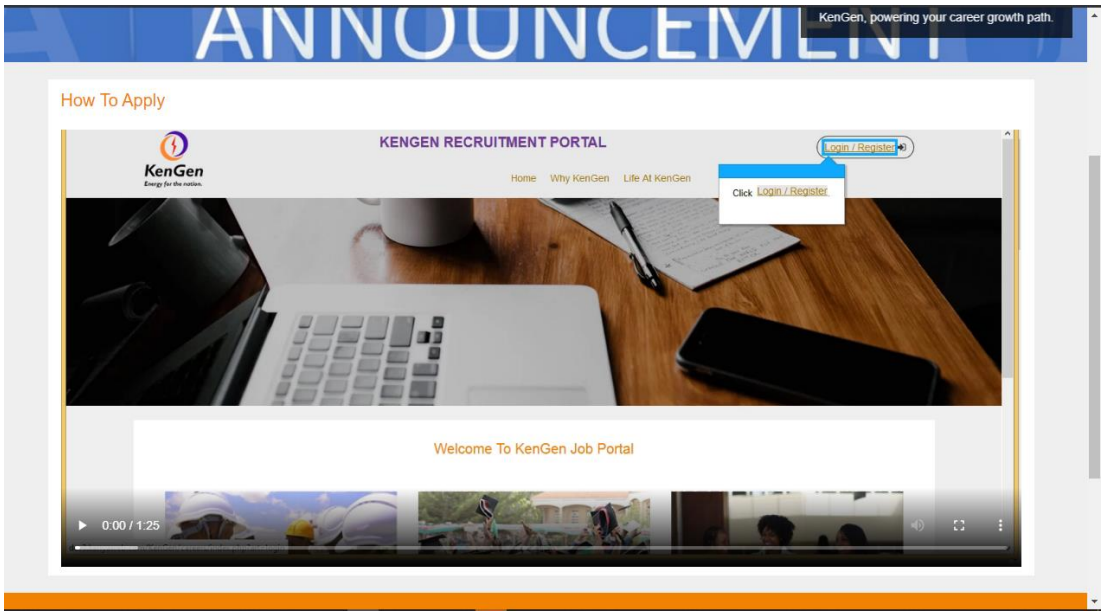


Figure 2.1: Kengen recruitment portal

2.5.2 United Nations

The United Nations is an international organisation founded in 1945. It advocates for peace, dignity, and equality for all. The United Nations careers department has a job application portal where a user login to the system, searches for a job opening and applies for the job. The UN portal however has an advantage in that a user can easily update their profile, filter their search for job openings, register in consultancy rosters, view roster members, and get notifications.

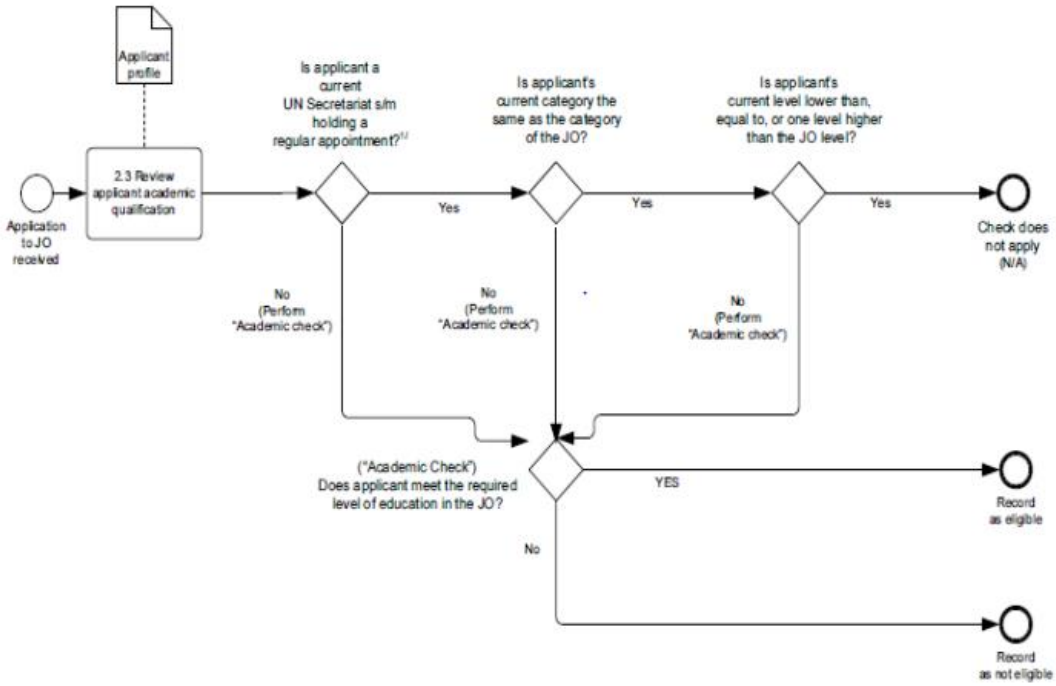


Figure 2.2: UN eligibility criteria diagram

2.5.3 Brighter Monday

Brighter Monday is another job application portal in Kenya that enables a user to apply for a job through posting job vacancies. Brighter Monday is like the UN portal because it enables one to filter job searches. Moreover, Brighter Monday gives an option for a user to view hiring companies rather than just viewing job vacancies giving it an advantage.

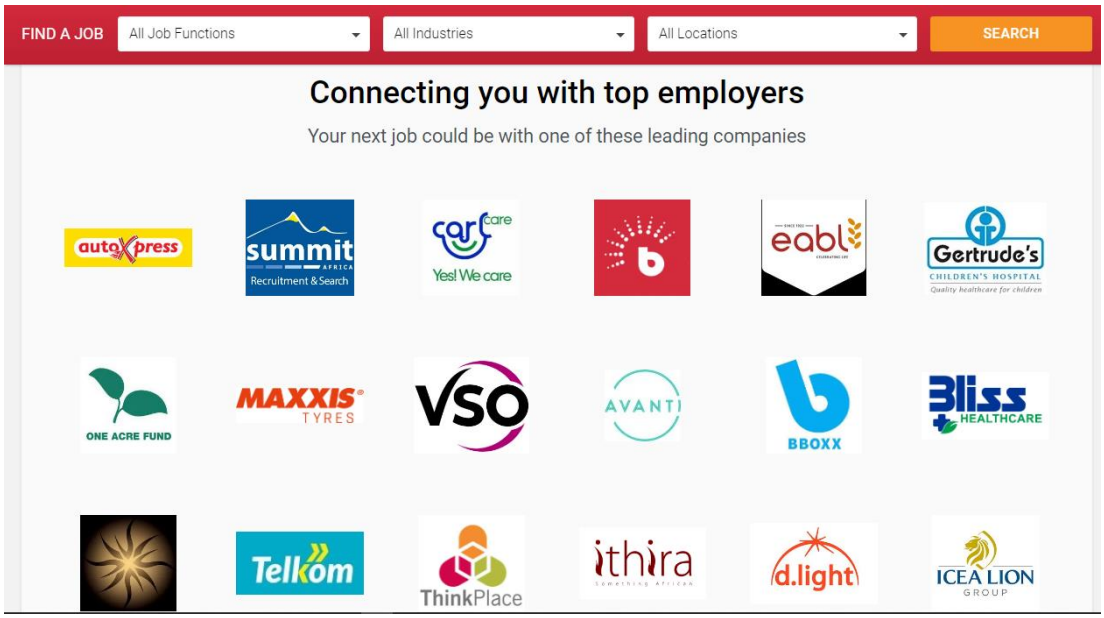


Figure 2.3: Brighter Monday portal

2.6 Gaps in related works

From the KenGen portal, there is only a login system and a job search algorithm. This makes the application process incomplete as a new applicant can only search for jobs but cannot apply for them. In addition to that, applicants are also unable to gain feedback.

2.7 Conceptual framework

The applicant will login to the system from which they can search and view job openings after which they apply for the job by filling in the mentioned details. After submission, the details are sent to the respective employer from where they can review the applicant information. The employer can then give feedback to the applicant.

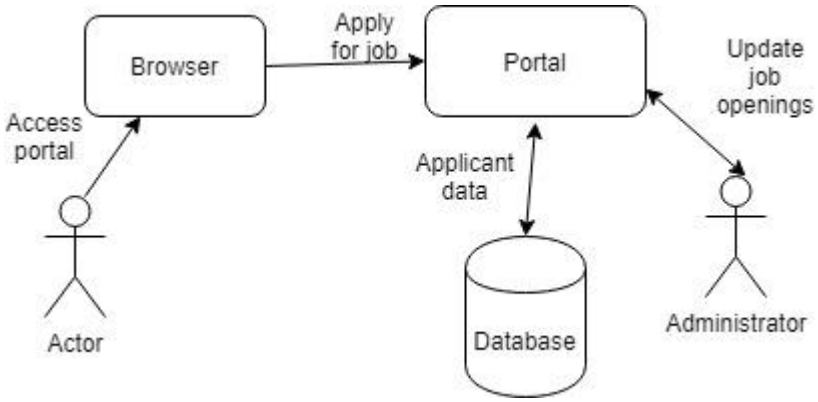


Figure 2.4: Conceptual framework

Chapter 3: System Development Methodology

3.1 Introduction

System development methodology refers to the steps that are used in the forming, planning, and controlling of the process of developing an information system. (Ngbagaro, 2016)

The methodology implemented was prototyping. A prototype is a model of a system that is like a system, but it is not the final system developed.

Prototyping is advantageous because errors can be detected in the early stages of development due to both developers and end-users being actively involved in development. Prototyping also encourages innovation and lastly, the developed prototypes can either be changed or discarded. However, prototyping is a disadvantage because it encourages excessive change requests. (Krishna, 2020)

3.2 Name of system Development Methodology

Prototyping is a system development methodology in which a prototype is built, tested, and revamped until an acceptable prototype is obtained.

3.2.1 Requirement gathering and analysis

The first stage of prototyping is requirement gathering and analysis which entails defining system requirements. In this stage, requirements are collected from the user to identify their system needs.

3.2.2 Preliminary design

A quick design is then created. This, however, does not translate to the entire design. A quick design is only intended to give the end-user a brief idea on what the system will be about.

3.2.3 Prototype building

From the quick design, a prototype is built, taking into consideration the system needs. The prototype is not the whole system, but it is only a small-scale model of the real working system.

3.2.4 Initial user evaluation

After the prototype is built, it is presented to the user and it is given an evaluation. In this stage, feedback is given from the user on the working of the prototype either in form of positive or negative feedback.

3.2.5 Prototype refining

In this stage, the prototype is refined based on the feedback. If the feedback is positive, then a final model is worked on and presented. However, if the feedback given is negative, then the prototype is reworked on until an acceptable prototype is obtained from which a final model is developed.

3.2.6 Implementation and maintenance

In the last prototyping stage, the system is tested and implemented for use. Maintenance is also done to ensure system continuity and prevent critical system failures.

3.3 Analysis

The system applied a Structured System Analysis and Design. Structured system analysis and design helps in developing better quality systems by improving project management and control. Furthermore, structured system analysis and design enables one to determine project feasibility, define system options, define requirements, and lastly determine how to design the system both logically and physically. (Rouse, 2020)

3.4 Functional and non-functional requirements

3.4.1 Functional requirements

The system should be able to validate user credentials once keyed into the system.

The system should be able to allow a user to view a job opening.

The system should be able to allow a user to apply for a job.

The system should be able to allow an administrator to view applicant data.

The system should be able to allow an administrator to post new job openings.

3.4.2 Non- functional requirements

The system should be accompanied by a system documentation that the user will use to know the working of the system.

The system should be accessed via a WiFi connection.

The system should ensure that a user can apply for a job in the least time possible.

The system should ensure that a user is able to recover in case an error occurs.

3.5 List of design diagrams to draw in Chapter 4

3.5.1 Use case diagram.

The use case diagram was designed to determine the end users of the system and what roles they play in the working of the system.

3.5.2 Data flow diagram

The data flow diagram was designed to show how data in the system flows.

3.5.3 Entity relationship diagram

The entity relationship diagram was designed to show the tables in the database and how they relate with each other.

3.5.4 Database schema

Database schema was designed to show the relationships between information and objects in a database.

3.5.5 GUI mock-ups

GUI mock-ups was designed to show different graphical user interfaces that are to be created in the system for example forms.

3.6 System Development Tools

3.6.1 Programming language

The programming language used was Hypertext Pre-processor. Hypertext Pre-processor is a scripting language that is used to make dynamic and interactive webpages. It is relatively easy to use and understand and therefore it is suitable to make a website for the project (Javatpoint, 2020)

3.6.2 IDE

Brackets was the IDE used. It is among the many HTML editors that allow colouration and autocompletion of code. It will be used to write the Hypertext Pre-processor code that will form the foundation of the webpages. In addition to colouring and completing code, it gives a preview of how the code will look like on the browser once it has been run.

3.6.3 Database management system

MySQL was the database management system used. MySQL is relatively easy to use as compared to MongoDB which is much more complex in nature.

3.7 Method to be used to test the system

The two methods used to test the system were unit testing and usability testing.

Unit testing was done to ensure system units were functional and work as they are designed to.

Usability testing was done to determine whether the design and aspects of the system coincided with the necessary workflows such as logging in to the application.

3.8 Domain of execution

The domain of execution was web-based. It was suitable for the project because web applications are easy to access provided there is a stable internet connection and they are very secure.

3.9 Modules

The modules included in the system were profile, application, login, and administrator modules. The login module will enable the user to login to the system.

The profile module will enable the user to manipulate their profile to include their personal details. The application module will include posted job openings from which a user can apply for a job. The admin panel will enable the site admin to post job openings and add new users.

Chapter 4: System Analysis and Design

4.1 Introduction

In Chapter 4, we provided the list of the system requirements and the design diagrams that were drawn in detail. The design diagrams that were drawn were

- Context diagrams
- Data Flow Diagram Level 1
- Data Flow Diagram Level 2
- Entity Relationship Diagram
- Database Schema

4.2 System Analysis

Under system analysis, the functional and non-functional requirements for the system based on stakeholder collaboration were defined.

4.2.1 Functional requirements

ID	Description
F1	The system should be able to validate user credentials once keyed into the system.
F2	The system should be able to allow a user to view a job opening.
F3	The system should be able to allow a user to apply for a job.
F4	The system should be able to allow an administrator to view applicant data.
F5	The system should be able to allow an administrator to post new job openings

Table 4.1 Functional requirements

4.2.2 Non- functional requirements

ID	Description
N1	The system should be accompanied by a system documentation that the user will use to know the working of the system.
N2	The system should be accessed via a WiFi connection.
N3	The system should ensure that a user can apply for a job in the least time possible.
N4	The system should ensure that a user is able to recover in case an error occurs

.Table 4.2 Non-functional requirements

4.3 System Design

In the system design stage, the design diagrams were defined and drawn using Draw.io

4.3.1 Context diagram

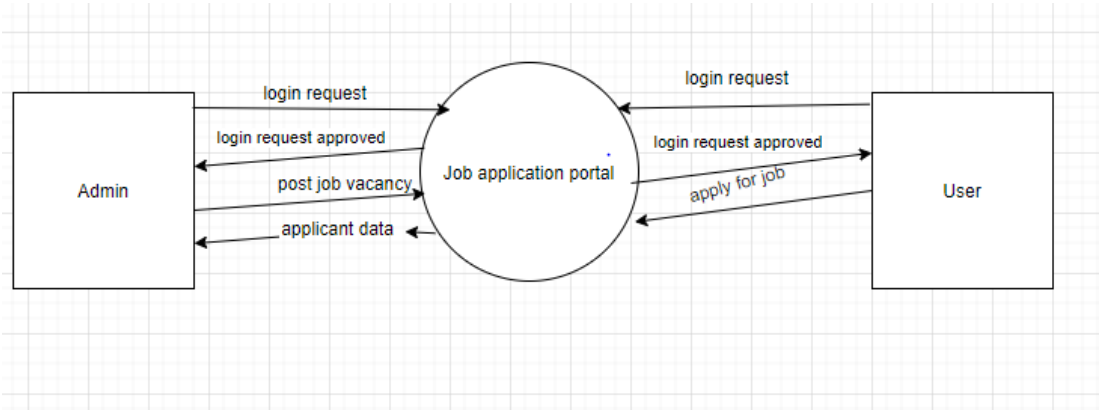


Figure 4.1 Context diagram

4.3.2 DFD Level 1

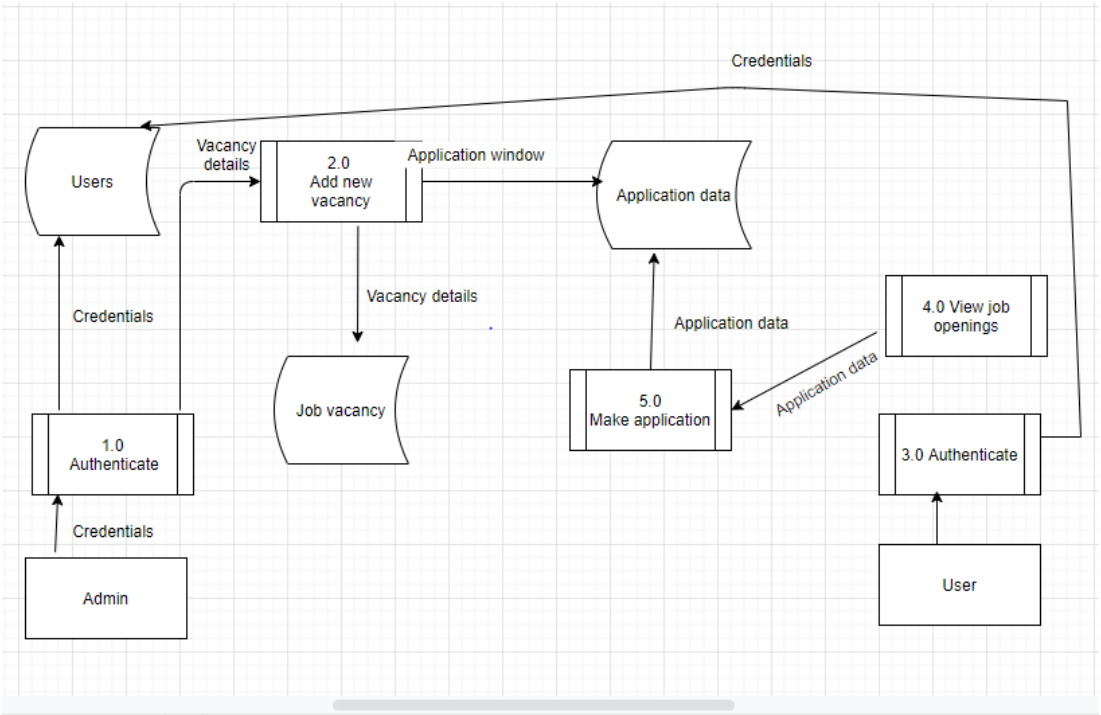


Figure 4.2 DFD Level 1

4.3.3 DFD Level 2

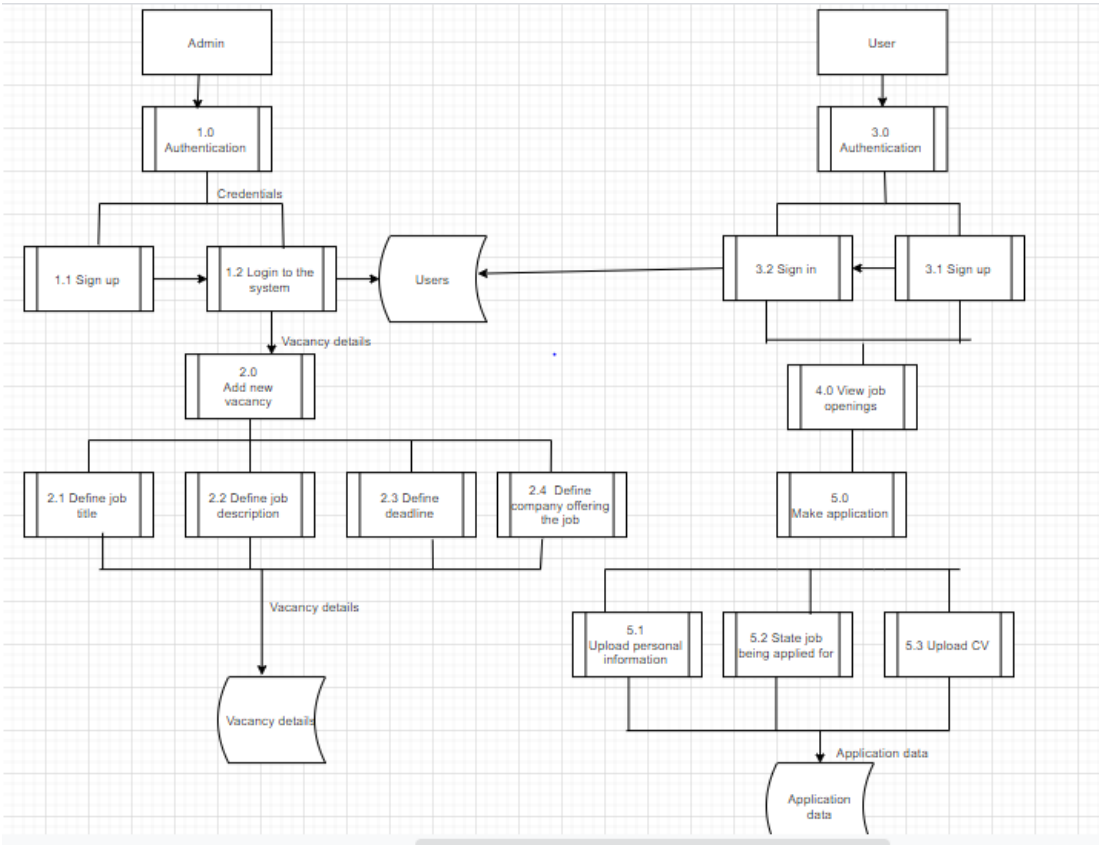


Figure 4.3 DFD Level 2

4.3.4 Entity Relationship Diagram

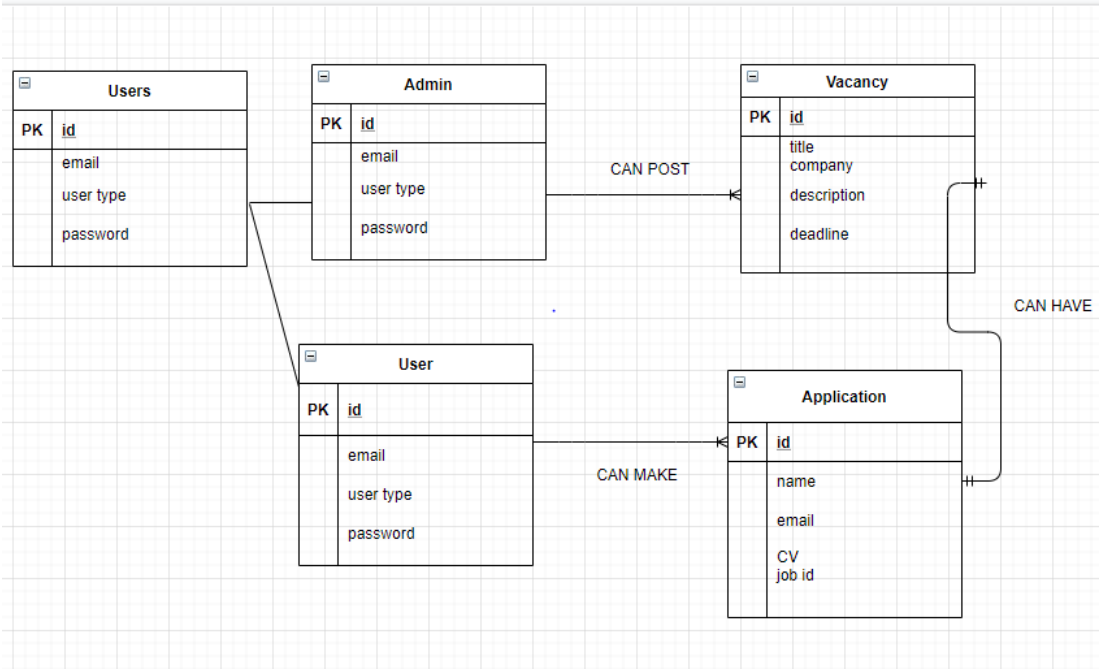


Figure 4.4 ERD

4.3.5 Database Schema

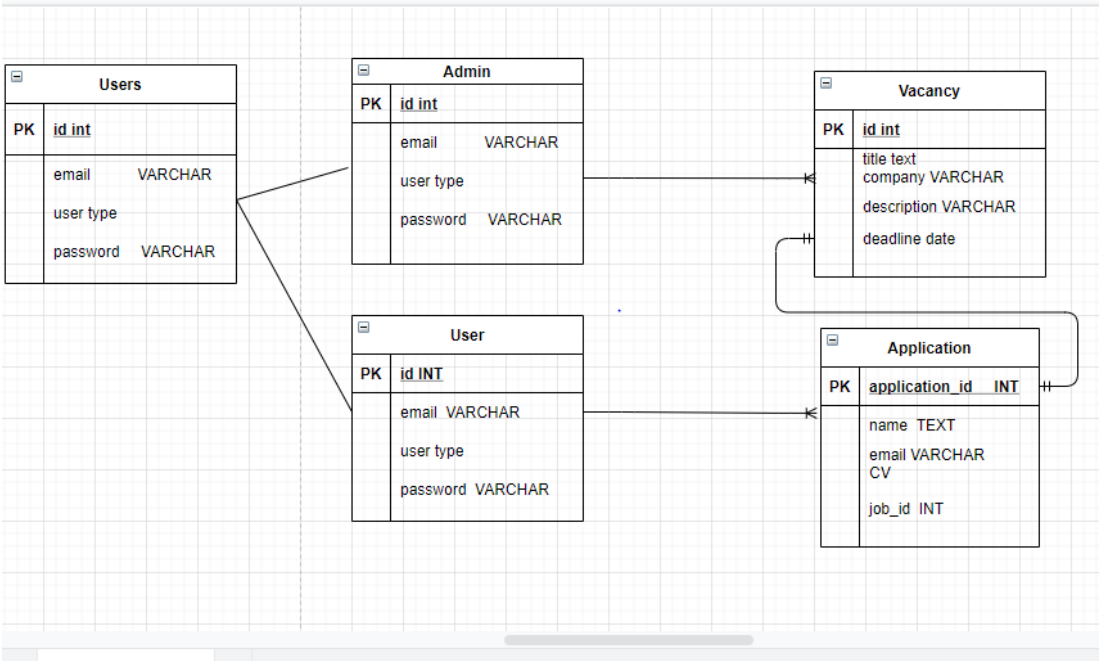


Figure 4.5 Database Schema

Chapter 5: System Implementation and Testing

5.1 Introduction

In system implementation and testing, the system was implemented by defining all the modules and how they were integrated into the system. The chapter also discussed how the system was tested and defined whether there were any errors.

5.2 Test Environment

The system was accessed and tested through the Google Chrome web browser on a Lenovo Yoga 510 laptop with a Core i3 processor. The system only required internal memory servers and therefore did not require any form of external memory.

For someone to access the system, they were required to be a registered user in the system.

5.3 Test Cases

Test ID	Requirement	Inspection check	Pre-condition	Test data	Priority level
T1	The system should be able to validate user credentials once keyed into the system.	Is there verification	Fill in all login details	Data from the user database thairu@gmail.com password: ******	High
T2	The system should be able to allow a user to view a job opening.	Does the system allow the user to view a job opening	The admin must have posted the jobs	Data from the vacancies database	High
T3	The system should be able to allow a user to apply for a job.	Does the system allow the user to apply for a job	The admin must have posted the jobs	User application details for example name, email, the CV in PDF form	High
T4	The system should be able to allow an administrator to view applicant data.	Does the system allow the administrator to view user applications	Users must have applied for the jobs posted	Data from application database	High
T5	The system should be able to allow an administrator to post new job openings	Does the system allow the administrator to post a job	All information regarding the job must be defined	Job information for example job title, the company name, job description, job deadline	High

Table 5.1 Test Cases

5.4 Test Results

Test ID	Expected result	Actual result	Status	Remarks
T1	The system should allow users to login	The system allowed the user to login	Pass	Verification was quick
T2	The system should allow users to view job openings	Users could see the jobs posted	Pass	
T3	The user should be able to apply for a job	The user was able to apply for a job	Pass	
T4	The system should allow admin to view applications	The admin can view all applications	Pass	
T5	The system should allow an admin to post a job	The admin was able to post the job	Pass	

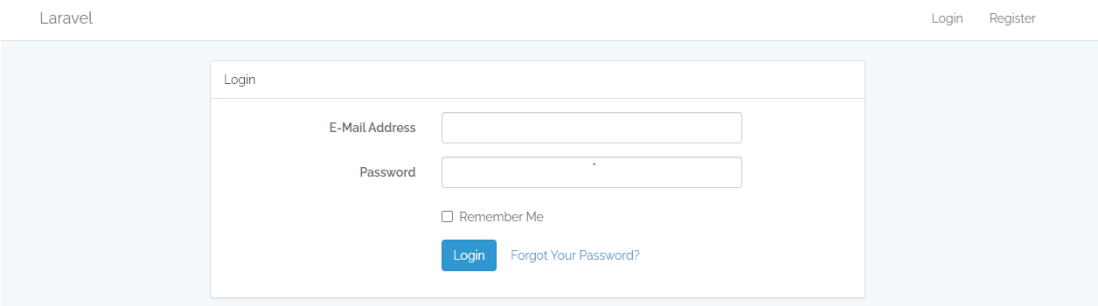
Table 5.2 Test Results

5.5 System Implementation

Here, the modules are defined and their functionalities are given.

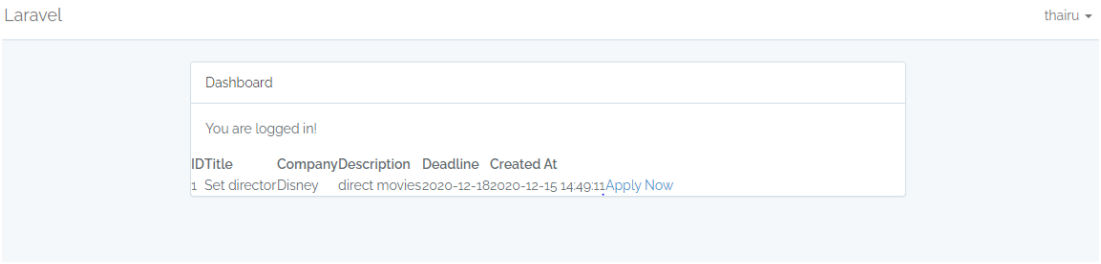
5.5.1 Login

The user logins to the portal by entering their credentials.



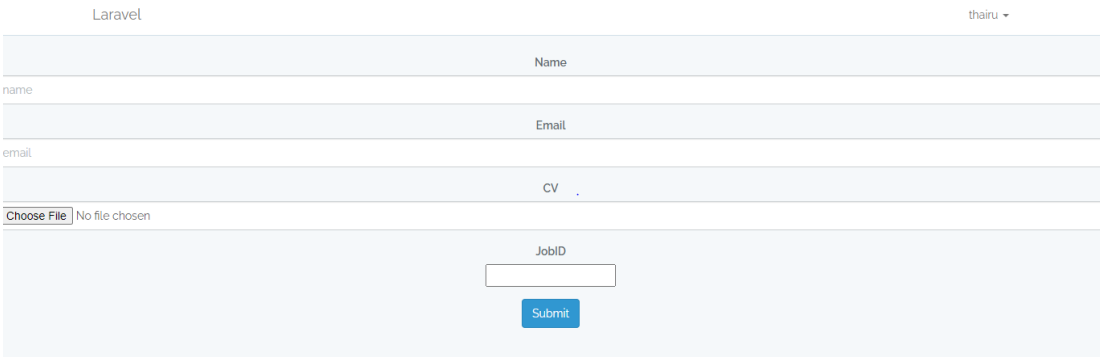
5.5.2 Home page

The home page contains the list of jobs available.



5.5.3 Application page

The application page is where the users can apply for the jobs available.



Chapter 6: Conclusions and Recommendations for Future Work

6.1 Conclusions

The job industry is ever growing and with the rate of unemployment among Kenyan citizens and the number of fresh graduates leaving university to search for jobs, this trend is not stopping anytime soon. The job portal is therefore efficient for use by these two groups of people because it will be able to help them to find the jobs of their choice. The system will also enable employers to keep track of the applications made since the applications are already listed in the system. Keeping track of the applications using the system prevents employers from losing the applications and reduces paperwork in their offices.

6.2 Recommendations for Future Work

The job portal is functional as it fulfils all the functionalities it was set to achieve. However, more aspects can be added by future developers through updates. Due to the project scope, not all areas were addressed. Therefore, future work that can be done to the system includes

- Company verification in the system instead of manual verification
- A notification panel in the system where employers and applicants can interact instead of using emails.

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Appendix A: Timeline of Activities

Add a visible diagram that shows the work to be done during specific periods in the course of the project. This should be in the form of a Gantt chart.