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Submission date: 25-Sep-2022 11:22PM (UTC+0800)

Submission ID: 1904878552

File name: proj_reviewed.docx (759.38K)

Word count: 4945

Character count: 27551

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UNIVERSITY OF MINES AND TECHNOLOGY

TARKWA

FACULTY OF ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

A PROJECT REPORT TITLED

**11
HUMAN RESOURCE MANAGEMENT SYSTEM - THE CASE OF UNIVERSITY
OF MINES AND TECHNOLOGY**

BY

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OCTOBER 2022

DECLARATION

I declare that this project work is my own work. It is being submitted for the degree of Bachelor of Science in Computer Science and Engineering in the University of Mines and Technology (UMaT), Tarkwa. It has not been submitted for any degree or examination in any other University.

.....

(Signature of Candidate)

..... day of, (year).....

ABSTRACT

The human resource department of any organization deals with a lot of paperwork. This is due to the tasks they perform. Utilizing people effectively to achieve individual and organizational goals is the goal of Human Resource Management (Bhattacharyya, 2016). Since many HR departments have computers, a human resource management system that can help a particular HR department solve its challenges can be created. Using the University of Mines and Technology as a case study, this project designed and implemented a Human Resource Management System for simplifying the recruitment process that is carried out in the university. The system provides applicants seeking job opportunities in UMaT an easy way of applying when there are job openings.

ACKNOWLEDGEMENT

I am appreciative of the All-Powerful God's sustaining grace in my life. This project could not have been finished without the significant insights and efforts of my supervisor, Mr. Stephen Anokye.

I am grateful to my brother, Razak Issah, and sister, Osaah Rahmat Issah for their unwavering support and inspiration. My friends, Azu Kenneth Braswell Kenneth Junior, Bismark Quartey, Reuben Ekow Mensah, John-Peter Samuelis, Abubakari Maltiti Bilal, Felix Cobby Otoo, and Emmanuel Nii Ayi Tagoe also played a major role in the completion of this project. I am also grateful to everyone I have shared laughs with.

¹⁶ Finally, I will like to say a big thank you to Erica Sarfowaa Frimpong and Evelyn Kumsah.

Your support during trying times is much appreciated and well-remembered.

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CHAPTER ONE

INTRODUCTION

1.1 Statement of Problem

Utilizing people effectively to achieve individual and organizational goals is the goal of human resource management (Bhattacharyya, 2016). HRM (human resource management) makes sure an organization runs smoothly. Human resource management is a process that begins with developing the appropriate policies for the demands of a job and concludes with assuring the company's successful business expansion (Shalini, 2021). An HRMS, or human resources management system, is a group of software tools used to manage human resources and associated procedures during an employee's career (Holliday, 2020). With an HRMS, much paperwork can be avoided since employees can be provided with a platform to input their details; this will help increase data accuracy and reduce cycle time processing paperwork. Also, organizations will not need to keep many clerks to record information and process forms.

The University of Mines and Technology's HR department uses spreadsheets to help them record employee-related data. One problem with this approach is the HR data changes almost constantly. New employees are acquired, some employees are fired, an employee relocates, an employee changes their contact details, and the list goes on and on. There is a high chance that HR personnel could forget to record any of the mentioned data when it occurs. With an HRMS, an employee inputs his/her details into the system, and the records are updated in real-time. With the use of spreadsheets, there is no central source of information. This makes working with the spreadsheet-based system time-consuming since HR personnel often find themselves inputting the same information into more than one file or having to look through more than a file to extract information of interest. With an HRMS, employees have access to a back-end database that contains relevant information including paid time off accruals and balances, current benefit coverage, individual demographic information, work schedules, and retirement plan balance (Lengnick-Hall *et al.*, 2003). Regarding the recruitment process, an applicant must first download a form from the UMaT website, fill it out, and send about ten copies to the department. This project, therefore, proposes a system that will reduce the paperwork and provide a way to manage data in the department.

1.2 Objectives of Project

The objectives of this project are:

- i. Design and implement a database for the UMaT HR department.
- ii. Design and implement Representational State Transfer (REST) Application Programming Interfaces (APIs) for the UMaT HR department.

1.3 Methods Used

The methods used are:

- i. Gathering of information from the school's (UMaT) HR department.
- ii. Review relevant literature.
- iii. Consultation with Supervisor

1.4 Tools and Facilities

The tools and facilities used for the project are:

- i. Internet
- ii. Postgres
- iii. Github
- iv. Stackoverflow
- v. Spring Boot
- vi. Java
- vii. Heroku
- viii. Postman
- ix. Thunder Client
- x. IntelliJ IDEA
- xi. Spring Security

1.5 Scope of Work

The system developed is limited to only the human resource department, the deans of faculty, the heads of department and job applicants.

1.6 Organization of Work

The project is organized as follows: chapter one comprises the statement of the problem, project objectives, methods used, tools and facilities used, the scope of the project, and the organization of work. Chapter two covers reviews of literature related to HRMS. Chapter three describes the methodology. Chapter four outlines the implementation of the REST APIs. Chapter five concludes the project and provides the necessary recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Computers have revolutionized the world. Computers can be used for processing, storage, and retrieval of data. Currently, many departments of institutions employ computers in their daily activities, with the human resource department not being an exception. The HR department is in charge of locating, vetting, hiring, and educating potential employees. (Kenton, 2020). The functions carried out by the HR department require it to deal with a lot of paperwork, that is, if no Human Resource Management System (HRMS) is available. The traditional method of managing human resources is manual, which has the drawbacks of ineffective work efficiency, inadequate data, delayed updates, dispersed resources, and poor sharing (Wang *et al.*, 2021). Since many HR departments have computers, a human resource management system with capabilities to assist in resolving problems faced by a specific HR department can be developed.

Due to the internet, web-based human resource management systems can be developed. HR personnel can begin using a web-based solution right away after registering and paying for it. Li (2014), Shukur *et al.* (2021), Jawad (2020), Wang Li *et al.* (2021) and Hu (2016) adopted the browser-server architecture to design and implement a system to help automate the tasks of the HR department. The browser-server architecture is an improvement of the client-server architecture (Wang *et al.*, 2021). However, Xue *et al.* (2021) designed and implemented a mini recruitment application based on the client-server architecture.

2.2 Client-Server (C/S) and Browser-Server(B/S) Architecture

The C/S architecture serves as the system architecture for existing Human Resource Management Systems (Wang *et al.*, 2021). Although C/S architecture has the advantages of quick responsiveness and robust security, it is difficult to maintain, thus it cannot meet practical requirements (Wang *et al.*, 2021). The usage of the browser-server architecture enables users to work without geographical restriction and client maintenance (Wang *et al.*, 2021). The B/S structure considerably reduces the system's cost and simplifies the development, maintenance, and operation by eliminating the requirement for special software that is often required to operate (Wang *et al.*, 2021). The B/S needs a browser to act as the client. Luckily, most operating systems have pre-installed browsers. For instance, Windows 10 is pre-installed with the Microsoft Edge Chromium browser while Mac

computers come with Apple's Safari web browser. Data interaction is possible as long as a client's browser and a web server's database are both installed.

2.3 Data Storage

The human resource department for any institution works with a lot of data. With this in mind, any system developed for the department will have to find a way to store this data. The system designed by Wang *et al.* (2021) uses Microsoft SQL Server 2008 to help store data. Liu *et al.* (2013) also developed a human resource information management system that uses Microsoft Access for data storage. The systems developed by Jawad (2020) and Shukur *et al.* (2021) use MySQL for data storage. Microsoft Access, Microsoft SQL Server 2008, and MySQL are all relational database management systems (RDBMS). A relational database is a type of database that stores and provides access to data points that are related to one another (Anon, 2021). Lv *et al.* (2018) also created an HRMS using cloud computing for A Group Co., Ltd. The system built by Lv *et al.* (2018) makes use of the Hadoop framework. Hadoop is a big data framework. Hadoop can analyze and process vast data.

4 Relational Database

A relational database is a particular type of database that manages and provides users with access to data points that are related to one another. The foundation upon which relational databases are constructed is the relational model, an understandable way of describing data in tables.

2.4 Big Data

Businesses collect big data, which is a collection of structured, semi-structured, and unstructured data. Big data may be used for advanced analytics projects like machine learning, predictive modeling, and other sorts of advanced analytics to mine information.

The three V's are frequently used to describe big data:

i. Volume

Data volume is important. With big data, you will need to analyze large amounts of unstructured, low-density data. Data of undetermined significance, such as Twitter data feeds, clickstreams on a website or mobile app, or sensor-enabled equipment, might be included in this. This might amount to tens of gigabytes of data for certain firms. Others could need hundreds of petabytes.

ii. **Velocity**

Velocity is the quick rate at which information is acquired and (perhaps) used.

The highest velocity of data often flows into memory without being copied to disk. Some internet-enabled smart gadgets function in real time or very close to it, necessitating real-time analysis and response.

iii. **Variety**

Variety refers to the wide range of available data types. Traditional data types had a formal structure and were ideal for relational databases. Due to the growing popularity of big data, data now arrives in new unstructured data types. For unstructured and semi-structured data types including text, audio, and video, further preprocessing is required to support metadata and extract meaning from it.

2.5 Frameworks

Frameworks help programmers to work without reinventing the wheel. It serves as a structure on which software is built. Software frameworks are adaptable, reliable, and effective because they are often created, tested, and refined by multiple skilled software engineers and programmers. When creating apps, using a software framework enables you to concentrate on the application's high-level functionality. This is due to the framework's inherent ability to handle any low-level functionality.

Hadoop

Hadoop is an open source software platform that offers easy programming paradigms for highly dependable distributed processing of massive data volumes. Hadoop enables distributed parallel processing of massive volumes of data. A Hadoop framework called MapReduce is used to create applications that can handle enormous volumes of data on huge clusters. Two crucial jobs, namely Map and Reduce, are part of the MapReduce algorithm. Map transforms a collection of data into another set of data where each component is divided into tuples (key/value pairs). Secondly, there is the reduction task, which takes the output of a map as input and concatenates the data tuples into a smaller collection of tuples.

2.6 Spring Boot and Laravel

Developed by the firm Pivotal, Spring Boot is an open-source micro-framework. It offers a foundation for beginning a production-grade Spring application that is auto-customizable for Java developers. The system designed and implemented by Xue *et al.* (2021) is based on the WeChat applet which uses the spring boot framework for the backend. On the other hand, Laravel is a reliable, open-source PHP framework that is simple to use. It adheres to the model-view-controller pattern of design. Laravel is the framework that was used by Shukur *et al.* (2021).

2.7 Deduction

The usage of a human resource management system needs to be promoted since it can increase efficiency by decreasing cycle times for paperwork processing, improving data accuracy, and minimizing the need for human resource workers.

According to Shukur *et al.* (2021), they had a System Usability scale (SUS) mean score of 85. Due to this score, it can be concluded that the system built is generally perceived to be acceptable.

CHAPTER THREE

29 METHODOLOGY

3.1 Software Development Life Cycle (SDLC)

A framework known as the Software Development Life Cycle describes the tasks that must be completed at each stage of the software development process. It aims to deliver superior software that meets or exceeds client expectations and complies with schedule and financial restrictions. For this project, the agile software development lifecycle model was used.

3.1.1 Agile

Agile is one of the most commonly used SDLC models (Rahul, 2022). Agile focuses on empowering teams to produce work in manageable, tiny increments, allowing them to easily offer value to their clients. In a dynamic business and IT environment, agile methodology presupposes that end users' demands are always evolving. Agile thrives in adaptable settings where team members are ready to make changes as needed to increase productivity. Agile methodology shortens development times and incorporates rapid updates in order to provide customers greater value (Okeke, 2021). The Agile technique is indicated in figure 3.1.



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Figure 3.1 Agile Methodology in System Development

(Source: Okeke, 2021)

3.1.2 Requirements

Requirements outline what consumers anticipate from the software application. It outlines the functions of the software and any restrictions it needs to have (Maddy, 2022). The proper collection, processing, and management of requirements are crucial because it establishes clear goals for everyone to work toward (Chima, 2018).³⁹ The HR processes and procedures need to take a lot of data into account. The process of obtaining, evaluating, representing, and validating data on a potential system is known as requirements gathering (Pereira, 2014). There are several techniques for acquiring requirements and data. The methods used in this project are:

- i. Interviews with the head of the HR department

A meeting with stakeholders to elicit or validate needs and requirements is known as an interview. The approval of stakeholders on their wants, requirements and any adjustments to them is made easier through interviews.

- ii. Collection of reports and forms.

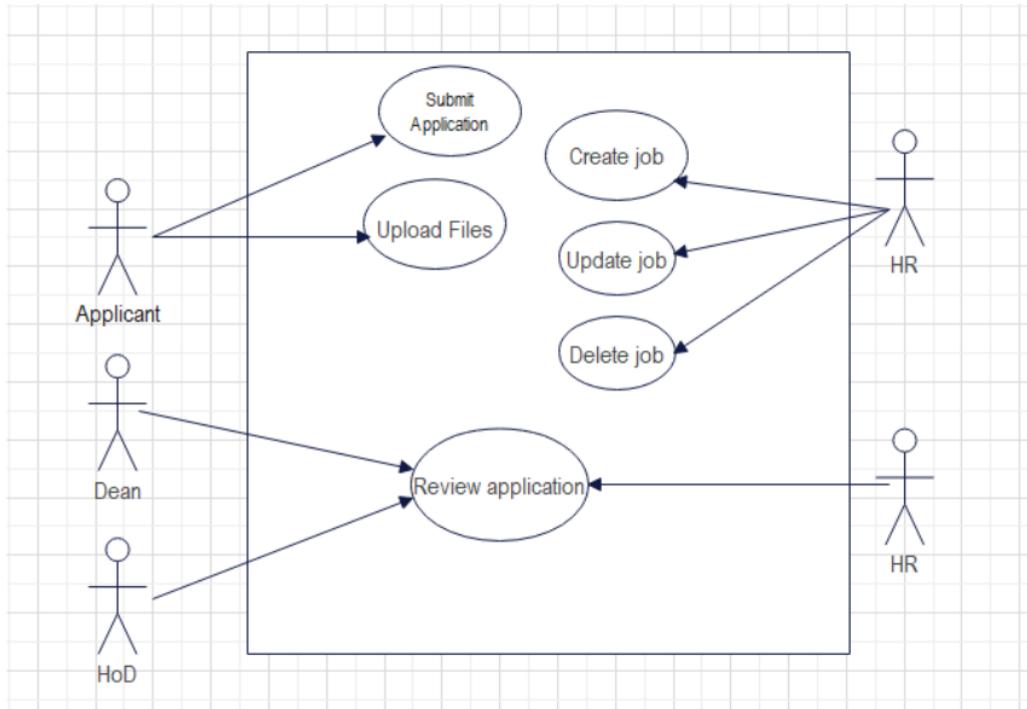
This technique involved gathering data documents. The documents that were collected are spreadsheets and application forms from the HR department.

3.2 System Modelling

System modeling is the process of creating abstract representations of systems, each of which offers a unique viewpoint on the system under study. System models are especially created to enable analysis, specification, design, verification, and validation of a system as well as to communicate specialized information.

3.2.1 Use Case diagram

Use case diagrams can be employed to horizontally illustrate a system's capabilities. Use case diagrams may be used to display all of your system's accessible capability, as opposed to only detailing certain capabilities.



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Figure 3.2 Use Case Diagram

3.2.2 Context Flow Diagram

The Human Resource Management System developed for UMaT is made up of four (4) main stakeholders. These stakeholders are the HR department, the deans of faculty, the heads of department, and the job applicants. Each stakeholder can perform a limited set of functions. Fig 3.3 shows the context flow diagram of the system.

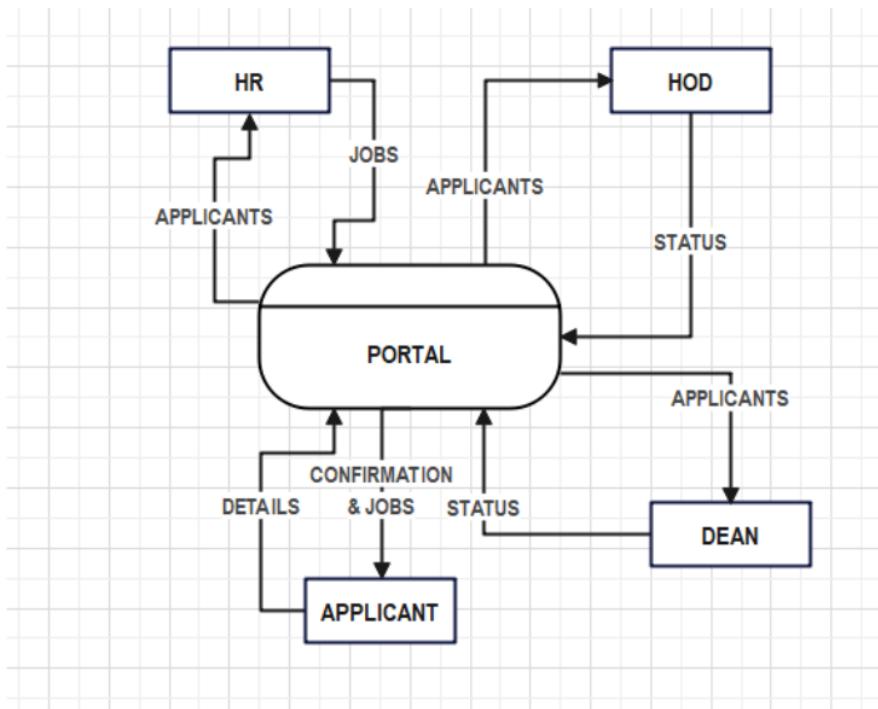


Figure 3.3 Context Diagram

3.2.3 Human Resource (HR) department

The Human Resource department is in charge of creating, deleting, and updating jobs in the system. The department is also in charge of changing the status of a job application. The application status is assigned to "approved" or "rejected" in response to what transpired during the interview process.

3.2.4 Applicant

An applicant applies for a job by providing the required details. Once an application is complete, the applicant gets a confirmation message. The message is sent to the email that the applicant provided during the application process.

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3.2.5 Heads of Department and Deans of faculty

The heads of department and deans of faculty can only view application details if and only if it was intended for their office. Upon receiving the application details, the HoD organizes Departmental Appointments and Promotion Committee; the dean organizes Faculty Appointments and Promotion Committee. The committees make sure that only qualified people are employed.

3.2.6 Job Application process

All jobs in the system are accessible to the public, that is, once the endpoint is known, anyone can get the list of all job openings in the university. After the applicant has selected a job that he/she is going to apply for, the applicant must provide the required details. The applicant is also allowed to upload all needed files or documents. After all the details are submitted, it is saved in a Postgres database and an email is sent to the applicant. The HR, the dean, and the head of a department, that is, the employees of the university with the needed credentials are allowed to have a look at an applicant's file and update the status of an application. The dean and head of the department can choose to recommend an applicant or not based on the data submitted by the applicant or what transpired during the interview process. Fig 3.4 shows the data flow diagram of the system.

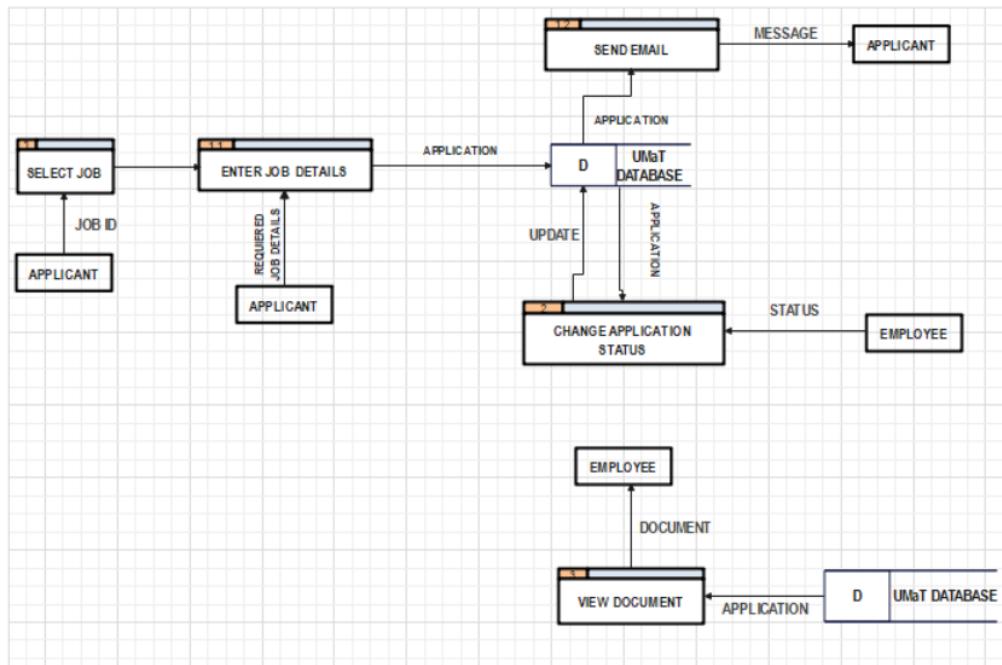


Figure 3.4 Data Flow Diagram

3.2.7 Sequence Diagram

Sequence diagrams are interaction diagrams that show the steps that an operation must take.

They demonstrate how various items interact when working together. During the application process, all data sent by an applicant goes to the Heroku server which then forwards the details to the Human resource management system. A job controller is in charge of forwarding all details submitted by any applicant to the job service. The job service checks whether an application with the same details exists in the database. It does this check by using the application repository. The job service also checks to see if a job applied for exists. If any of these checks fail, the system sends an error to the server which is sent back to the client. If the checks do not fail, the data supplied by the applicant, is saved by the user service. The data sent by the applicant is represented as an application object in the system. The application object is converted into an application successful data transfer object by the mapper. The data transfer object is then sent back to the client in a JSON (JavaScript Object Notation) format. The data transfer object contains details that are used for file upload. Fig 3.5 shows the job application sequence diagram of the system.

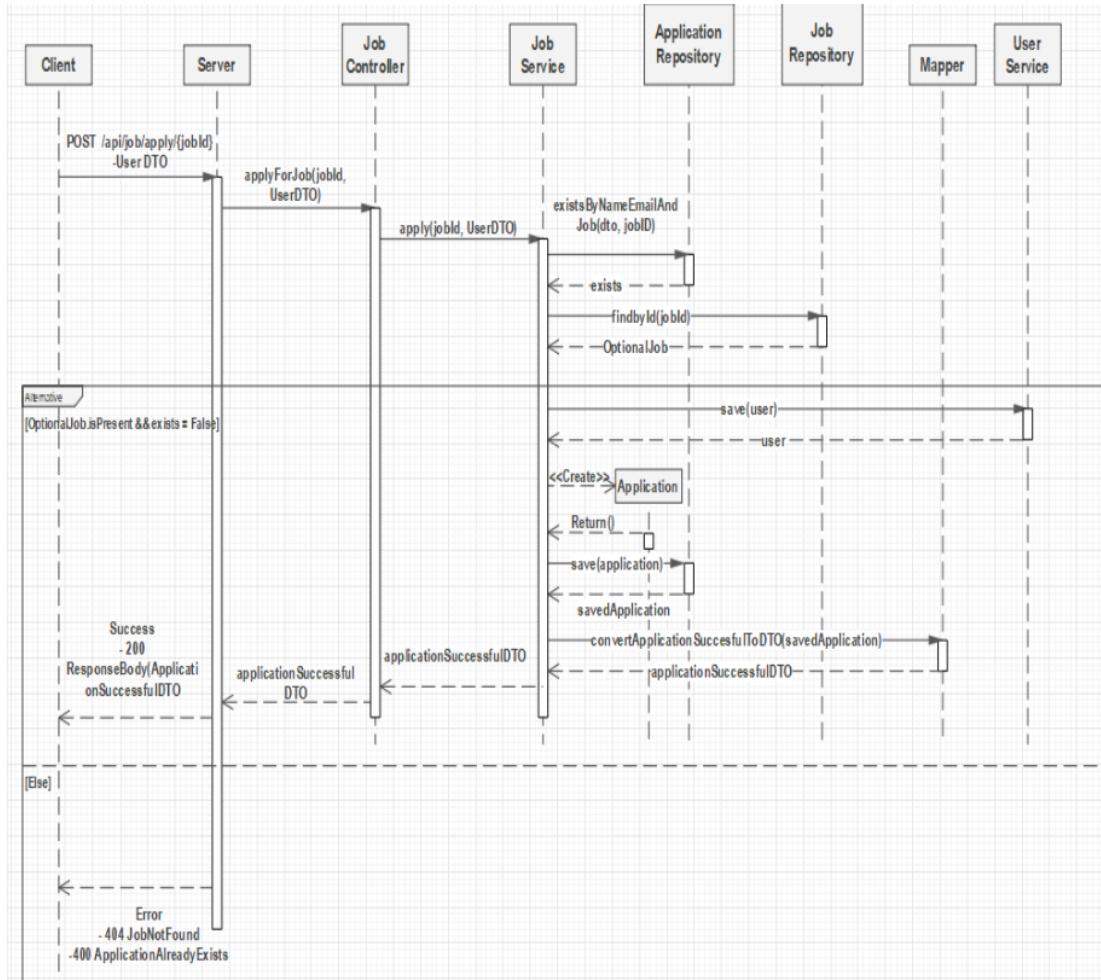


Figure 3.5 Job Application Process Sequence Diagram

3.3 File Storage and Download

All files sent to the system during the application process are stored on Wasabi. Once a request to download a file is received by the server, the server retrieves the file from Wasabi. Wasabi is S3-compatible cloud object storage that is designed to be a direct substitute for Simple Storage Service from Amazon Web Services (S3). Wasabi offers hot cloud storage that is straightforward, dependable, and reasonably priced for enterprises all around the world.

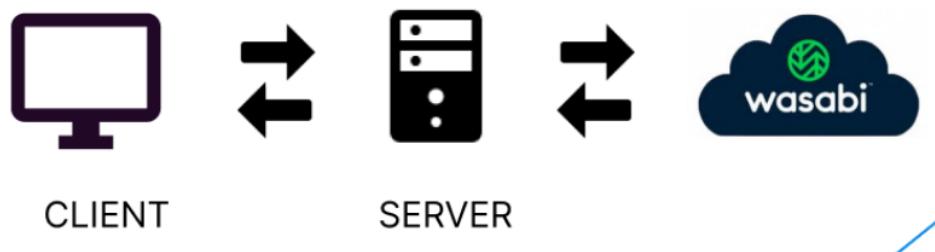


Figure 3.6 File Upload and Download

3.4 System Security

The concept of software security is to design software such that it can still operate as intended in the face of malicious assault. The system developed uses the spring security framework and JSON Web Token (JWT) to prevent unauthorized users from getting confidential information. JWTs are signed when they are created, and the same signed JWT is validated when it is received to ensure that it wasn't altered while in transit. For the creation of safe Java Enterprise Applications, the framework Spring Security offers several security capabilities, including authentication and authorization.

3.5 Deployment

The system was deployed on Heroku. Heroku is a platform as a service (PaaS) that enables programmers to create, launch, and manage applications entirely in the cloud. Heroku allows developers to deploy applications with a simple git push.

3.6 User Access Levels

3.6.1 Head of Department

- i. Get list of applicants.
- ii. Recommend an applicant or not.
- iii. Get documents uploaded by an applicant.
- iv. Get all jobs.

3.6.2 HR

- i. Get list of applicants.
- ii. Create Job.
- iii. Delete Job.
- iv. Update Job.
- v. Update application status.
- vi. Get documents uploaded by an applicant.
- vii. Get all jobs.

3.6.3 Applicant

- i. Get all jobs.
- ii. Apply for jobs.
- iii. Upload files.

3.6.4 Dean of faculty

- i. Get list of applicants.
- ii. Recommend an applicant or not.
- iii. Get documents uploaded by an applicant.
- iv. Get all jobs.

CHAPTER FOUR

SYSTEM TESTING AND RESULTS

4.1 Introduction

This chapter presents system testing to ensure that the human resource management system performs the needed functionalities it is supposed to do. Some of the API endpoints that were created cannot be accessed without providing the needed token. The endpoints created were tested with thunder client and postman.

Thunder Client and Postman

Thunder Client is a different client API testing tool from the well-known Postman utility. You may test APIs in-editor on the go with the Thunder Client VS Code addon thanks to its small size.

4.2 API (Application Programming Interface) Endpoints

A digital location known as an API endpoint is where an API receives queries regarding a particular resource on its server (Juliver, 2022). APIs make it easier to get the information required to solve customers' concerns. A universal resource locator (URL) that specifies the location of a resource on the server is often used as an endpoint in APIs. The endpoints that were created is indicated in table 4.1.

Table 4.1 System endpoints

Endpoint	Method	Function	Accessible To
/api/user/login	POST	login	HR, Dean, HOD
/api/job/save	POST	Save a job	HR
/api/job/update/{job-id}	POST	Update a job	HR
/api/job/delete/{job-id}	DELETE	Delete a job	HR
/api/job/all	GET	Get all jobs in the system	Everyone
/api/job/{job-id}	GET	Get a specific job	Everyone
/api/job/apply/{job-id}	POST	Apply for a job	Applicants
/api/job/application-doc	POST	Upload files	Applicants
/api/job/document	GET	Retrieve uploaded files	HR, Dean, HOD

/api/job/job-applications	GET	Retrieve all applications	HR, Dean, HOD
/api/job/job-applications/{id}	GET	Retrieve a job application	HR, Dean, HOD
/api/job/job-application/recommendation	POST	Recommend an applicant or not	Dean, HOD
/api/job/job-application/status	POST	Change application status	HR

4.3 Authentication

Before a user can make any request that requires authentication, the user must first log in. After a successful login request is made, the user is given a token. The tokens generated by the system take twenty-four (24) hours to expire. If a token is expired, the user must make another login request to get a new token.

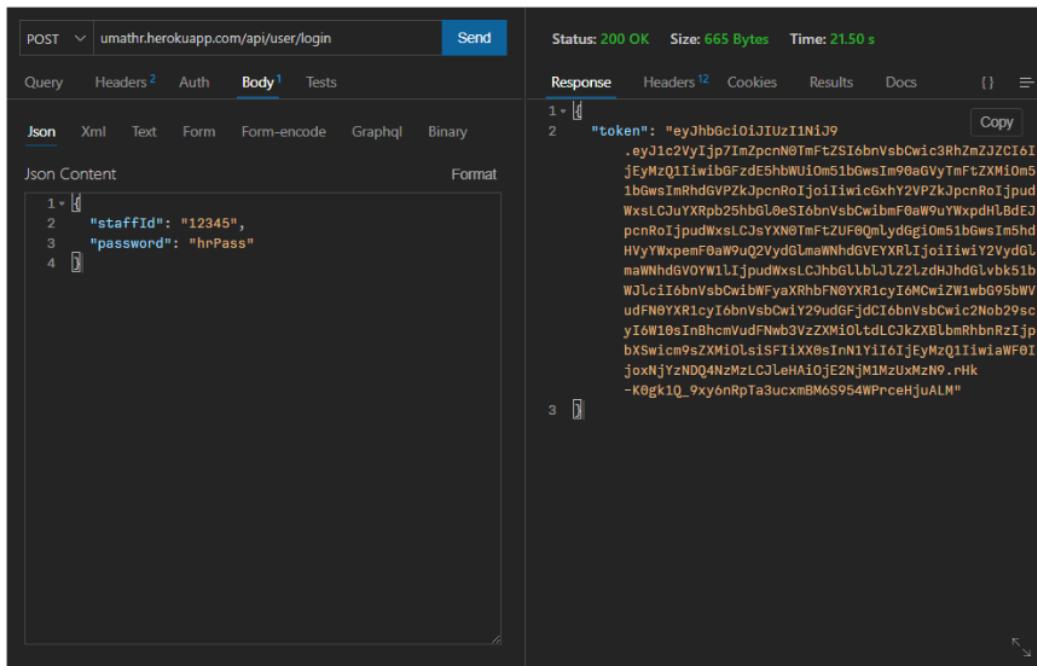
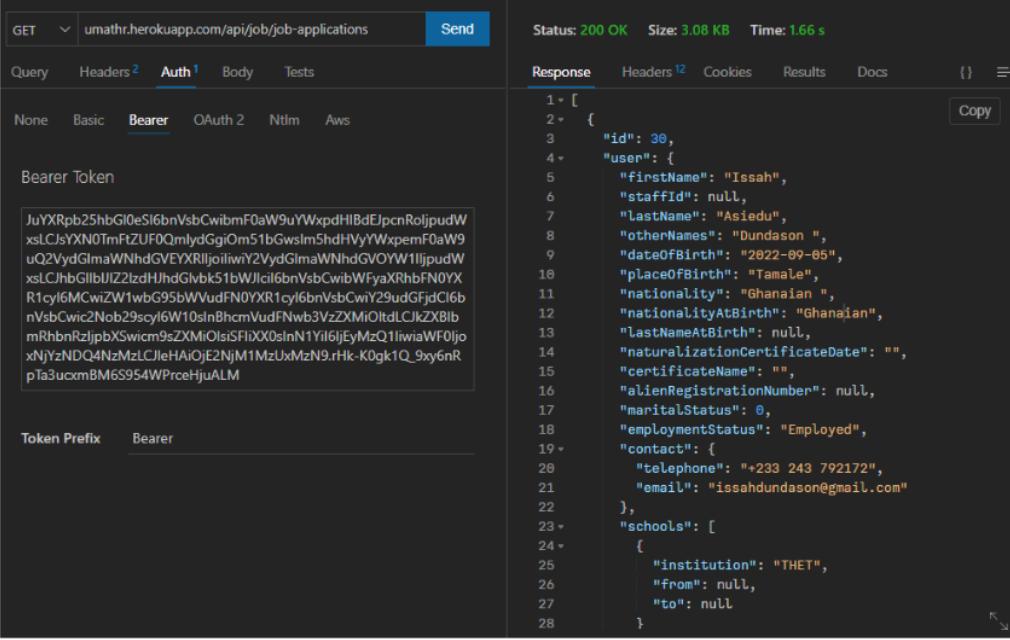


Figure 4.1 Successful Login

4.4 Retrieval of applications and jobs

An applicant cannot apply for jobs that are not present in the database. An applicant must therefore apply for jobs that are present in the database. All job applications in the system can also be retrieved after providing an authentic token. However, no token is needed when retrieving jobs from the system.



The screenshot shows a Postman interface with a successful API call. The URL is `umathr.herokuapp.com/api/job/job-applications`. The method is GET, and the token type is set to Bearer. The response status is 200 OK, size is 3.08 KB, and time is 1.66 s. The response body is a JSON object representing an application:

```
1+ [
2+   {
3+     "id": 30,
4+     "user": {
5+       "firstName": "Issah",
6+       "staffId": null,
7+       "lastName": "Asiedu",
8+       "otherNames": "Dundason",
9+       "dateOfBirth": "1992-09-05",
10+      "placeOfBirth": "Tamale",
11+      "nationality": "Ghanaian",
12+      "nationalityAtBirth": "Ghanaian",
13+      "lastNameAtBirth": null,
14+      "naturalizationCertificateDate": "",
15+      "certificateName": "",
16+      "alienRegistrationNumber": null,
17+      "maritalStatus": 0,
18+      "employmentStatus": "Employed",
19+      "contact": {
20+        "telephone": "+233 243 792172",
21+        "email": "issahdundason@gmail.com"
22+      },
23+      "schools": [
24+        {
25+          "institution": "THET",
26+          "from": null,
27+          "to": null
28+        }
      ]
```

Figure 4.2 Using token to retrieve all applications

The screenshot shows a Postman interface with a GET request to `umathr.herokuapp.com/api/job/all`. The response status is 200 OK, size is 1.82 KB, and time is 598 ms. The response body is a JSON array of job objects, each with fields: id, title, category, verified, status, description, and department. The jobs listed are:

```
1: [
  {
    "id": 13,
    "title": "Lecturer",
    "category": 1,
    "verified": true,
    "status": 0,
    "description": "...",
    "department": "Computer Science and Engineering"
  },
  {
    "id": 15,
    "title": "Lecturer",
    "category": 1,
    "verified": true,
    "status": 0,
    "description": "...",
    "department": "Renewable Energy and Engineering"
  },
  {
    "id": 58,
    "title": "Secretary",
    "category": 0,
    "verified": true,
    "status": 0,
    "description": "...",
    "department": "Mathematical Science"
  }
]
```

Figure 4.3 Retrieving all jobs in the system

4.5 Submission of application

All applicants must submit their details when applying for a job. Once the job “id” is known, a job application request can be made. An error message is returned if the job the applicant is applying for does not exist in the system.

The screenshot shows a POST request to the URL `umathr.herokuapp.com/api/job/apply/153`. The request body is a JSON object containing personal details and contact information for an applicant named Steve Rogers. The response is a JSON object with fields `id`, `useN`, and `job`, all set to the value 153. The status code is 200 OK, and the response size is 31 Bytes.

```

POST umathr.herokuapp.com/api/job/apply/153
Send

Query Headers 2 Auth Body 1 Tests

Json XML Text Form Form-encode GraphQL Binary

Json Content Format

1+ []
2   "firstName": "Steve",
3   "lastName": "Rogers",
4   "otherNames": "Captain America",
5   "dateOfBirth": "2000-05-05",
6   "nationality": "United States America",
7   "placeOfBirth": "New York",
8   "maritalStatus": 0,
9+   "contact": {
10     "telephone": "5353533535",
11     "email": "america@shield.org"
12   },
13+   "dependants" : [
14+     {
15       "name": "Azu Braswell Kenneth",
16       "email": "captain.america@shield.org",
17       "telephone": "5353533535"
18     }
19   ]
20 []

Status: 200 OK  Size: 31 Bytes  Time: 6.27 s

Response Headers 12 Cookies Results Docs () ≡

1+ []
2   "id": 153,
3   "useN": 156,
4   "job": 153
5 []

```

Figure 4.4 Successful job application

4.6 Files Upload and Download

After an applicant has submitted his/her personal details, he/she is allowed to send all the required documents or files. If the files are successfully saved, no error message is returned and a status code of 200 is sent to the client. Files can be downloaded by HR. Deans of faculty and heads of department can only download files that are intended for their office.

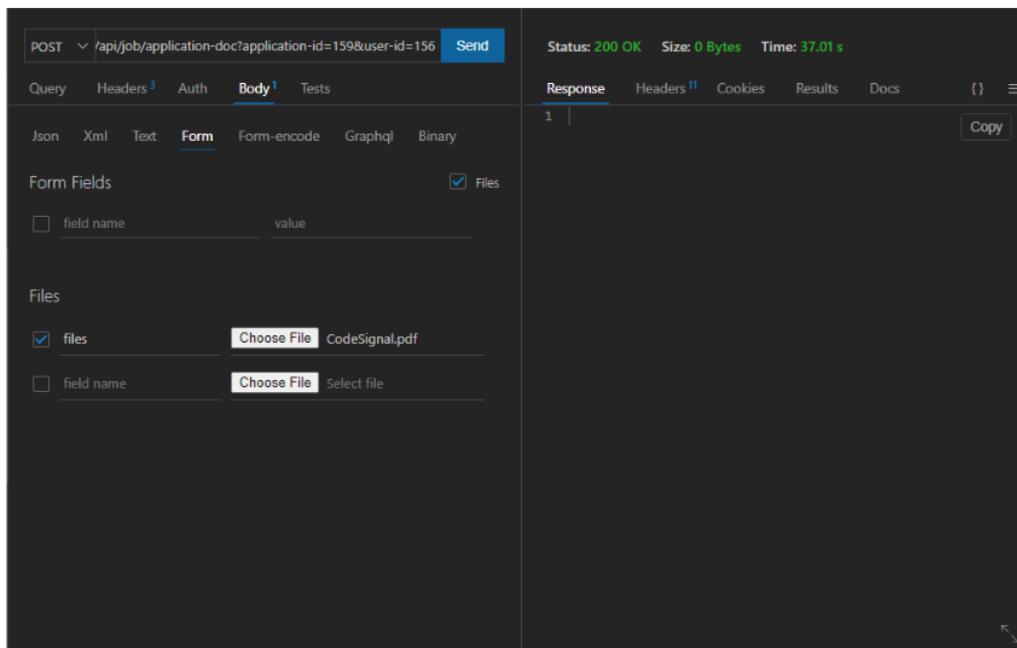


Figure 4.5 Successful file upload

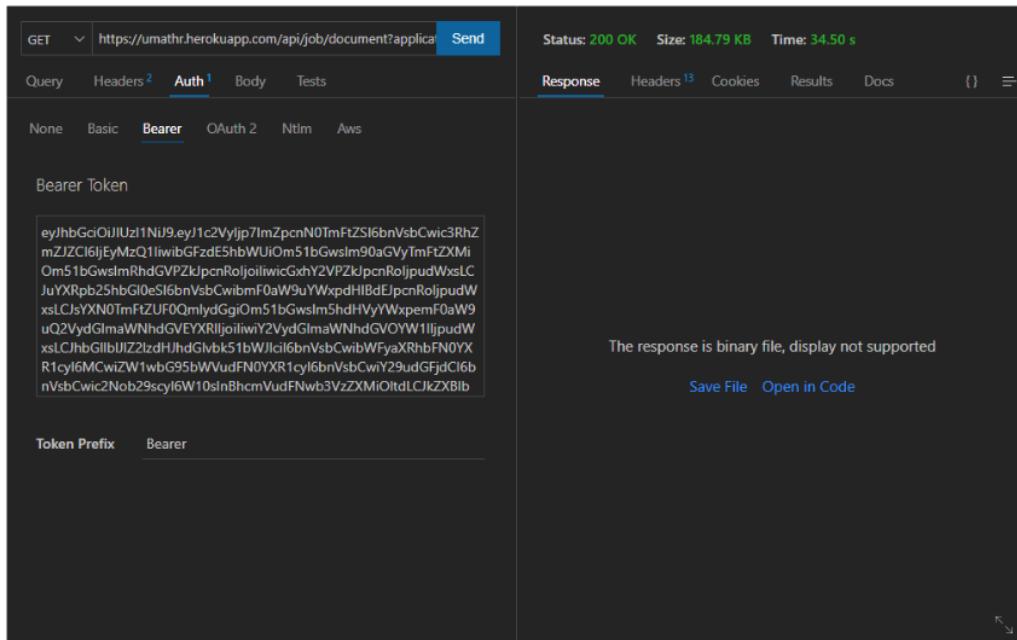
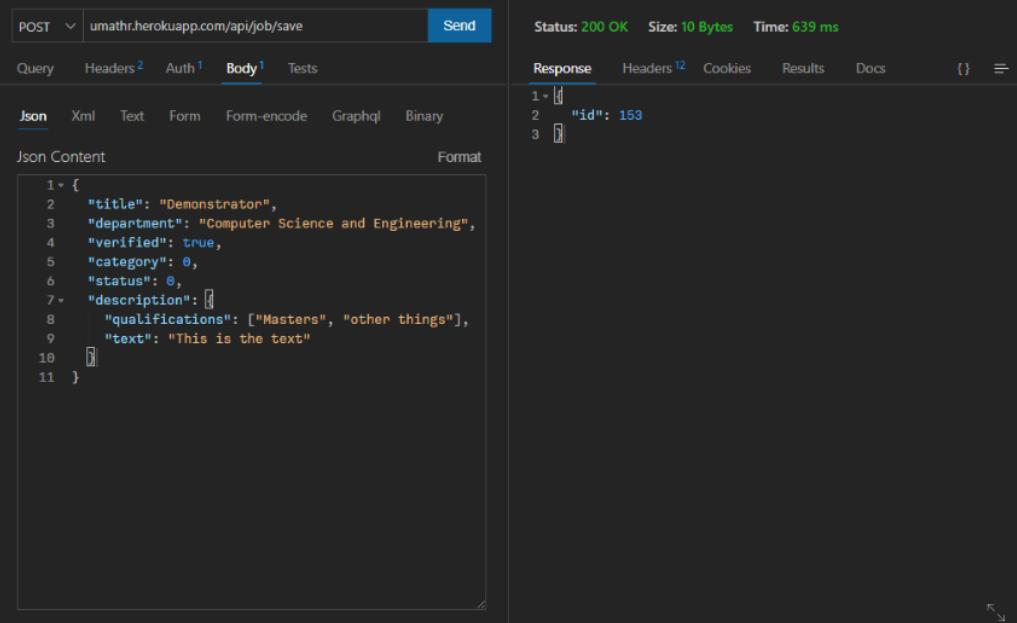


Figure 4.6 Successful file download

4.7 Creation, update and deletion of jobs

The HR department is in charge of the creation, deletion and update of jobs. The necessary details must be sent when making a job creation request. The update or deletion of non-existent jobs will lead to an exception been thrown; hence, an error message being returned to the client.



A screenshot of a POST request to `umathr.herokuapp.com/api/job/save`. The request body contains the following JSON:

```
1+ {
2   "title": "Demonstrator",
3   "department": "Computer Science and Engineering",
4   "verified": true,
5   "category": 0,
6   "status": 0,
7   "description": [],
8   "qualifications": ["Masters", "other things"],
9   "text": "This is the text"
10  []
11 }
```

The response status is 200 OK, size is 10 Bytes, and time is 639 ms. The response body is:

```
1+ []
2   "id": 153
3 []
```

Figure 4.7 Job creation

The screenshot shows a POST request to the URL `umathr.herokuapp.com/api/job/update/153`. The request body is a JSON object:

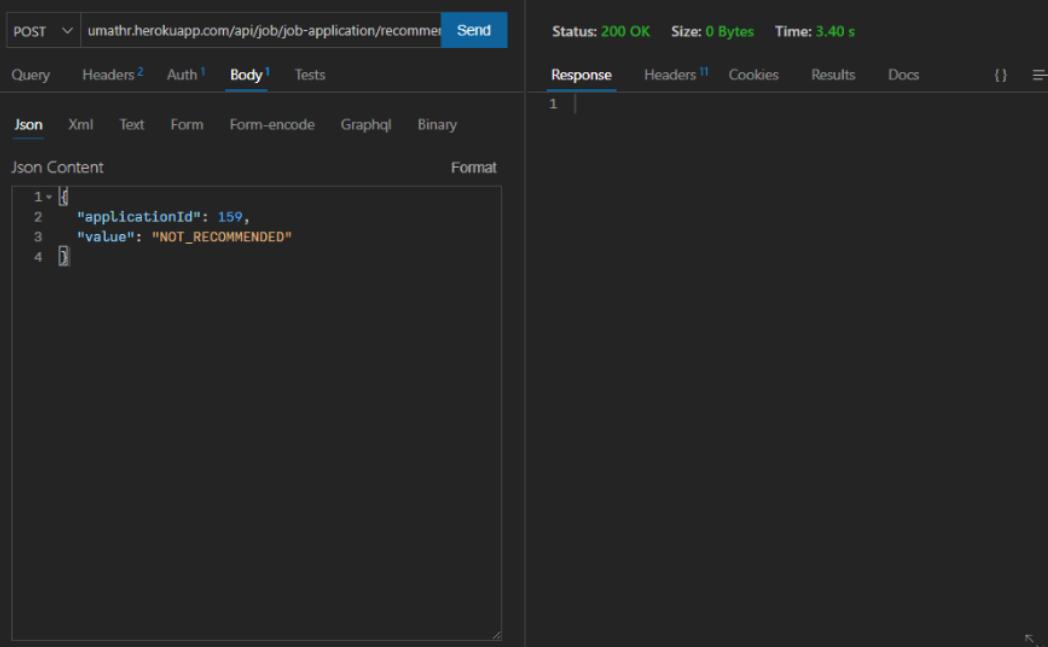
```
1 {  
2   "title": "Lecturer",  
3   "verified": true,  
4   "category": 0,  
5   "status": 0,  
6   "department": "Computer Science and Engineering",  
7   "description": {  
8     "qualifications": ["Masters", "other things"],  
9     "text": "This is the text"  
10    }  
11 }
```

The response status is 200 OK, size is 0 Bytes, and time taken is 9.79 s.

Figure 4.8 Job update

Recommendation

The Heads of Department and Deans of faculty can recommend applicants intended for their office. They do this by submitting a recommendation status.



A screenshot of a POST request to `umathr.herokuapp.com/api/job/job-application/recommend`. The request body is a JSON object:

```
1 {  
2   "applicationId": 159,  
3   "value": "NOT_RECOMMENDED"  
4 }
```

The response shows a status of 200 OK, size 0 bytes, and time 3.40 s. The response body is empty, containing only the number 1.

Figure 4.9 Recommendation of applicant

4.8 Job Application Status Update

The HR can change the status of an application. When an applicant applies for a job, the status of the application is first set to pending. The HR is in charge of changing the status from pending to rejected or approved.

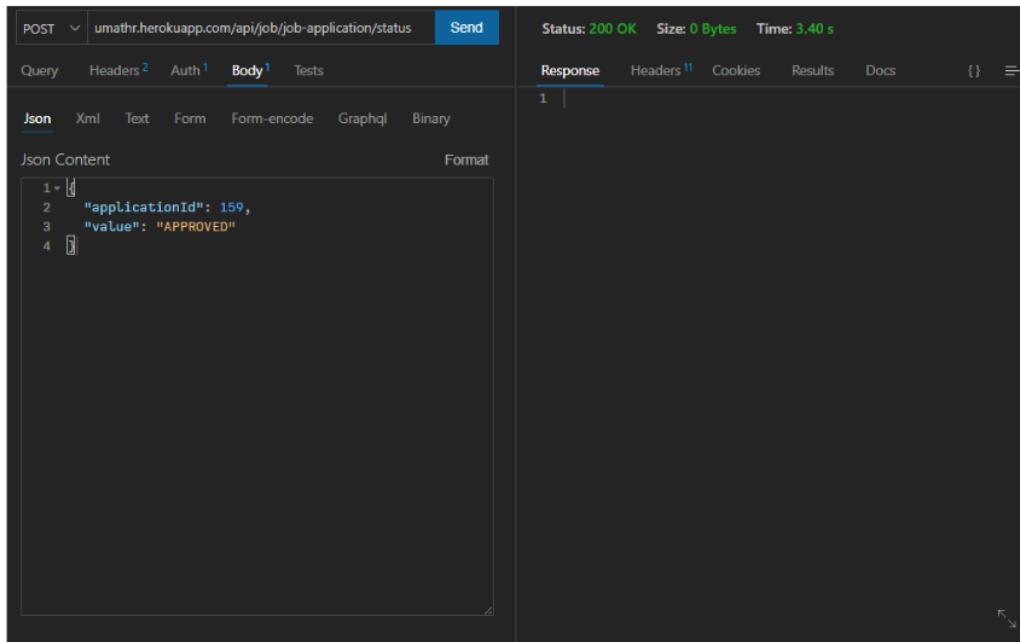


Figure 4.10 Changing of application status

CHAPTER FIVE

CONCLUSION AND RECOMMENDATION

5.1 Conclusion and Recommendation

The REST APIs created functions as expected, with the endpoints developed, a mobile application can be developed to leverage the capabilities of the system. It is recommended that new endpoints should be created to cater for all the needs of the UMaT human resource department.

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