



A Web-Based System for Evaluating SME Employees

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Declaration

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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Abstract

Small and medium enterprises (SMEs) contribute greatly to economic growth due to the vast number of job opportunities they create. For SMEs to grow rapidly, it is important to have an effective performance system in place. Employee performance evaluations assess an individual's contribution in a company. Most SMEs use informal approaches of assessing their employees. However, these informal approach limits necessary analysis of their employees for efficient performance management. As a result, businesses with ineffective employee appraisals would fail to align their labour towards their business policy

The project therefore developed a web-based information system to enable SMEs to evaluate their employees. The project used an Object-Oriented Analysis and Design (OOAD) approach and implemented the Rapid Application Development (RAD) methodology. The application was developed using Laravel, a web application framework and MySQL, a relational database management system.

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Chapter 1: Introduction

1.1 Background

Small and medium enterprises (SMEs) are important for economic growth. In Kenya, SMEs constitute 98% of all businesses and employ 30% of the working population (Wakiaga, 2019). Growth in the SME sector influences economic growth especially in countries with lower income (Nganga & Tarus, 2013). While there is no standard definition of an SME, the number of employees is a common measurement used to define these businesses. Besides this criteria, other institutions might use turnover to define these enterprises.

Turnovers are mostly determined by employees as these could be the income of a company or the rate at which employees leave a workforce and are replaced. For SME's to grow rapidly, it is important to have an effective performance system in place. Ineffective appraisal system can bring many problems including low morale, decreased employee productivity, a lessening of an employee's enthusiasm and support for the organization (Islam & Mohd Rasad, 2006).

HR practitioners claim that performance appraisal is an essential part of an organizational culture and it is required to assess organizational progress towards goals (Islam & Mohd Rasad, 2006). HR experts believe some of the benefits are that the system helps pinpoint an employee's strength and weaknesses, stocks an overall performance, determines need for further training and setting goals.

This project aims at providing the SMEs with a structured way to evaluate their performance to ensure the wellbeing of the employees and increase yield improving the overall performance of the company. The system would enable business managers to specify their desired objectives or performance indicators for different job groups present in the business. The manager would specify various evaluators who would appraise various employees through the system. The system would then generate reports based on archived evaluations and showcase overall performance of the business.

1.2 Problem Statement

The issue at hand is that performance appraisals in SMEs are not often structured or documented (Shrivastava, 2017). As SMEs tend to work on a limited budget, elaborate HR systems are perceived as costly (Shrivastava, 2017). Relying on manual human resource systems limit analysis and distribution of important human resource information, such as employee performance (Kananu & Nyakego, 2016). Additionally, many small businesses focus more on growth and managers would side-line processes such as employee appraisals (Shrivastava, 2017).

1.3 Aim

The project aims to provide a web-based system to enable SMEs appraise their employees.

1.4 Specific Objectives

The project has the following objectives it intends to achieve:

- i. To review methods SMEs use to appraise its employees.
- ii. To identify challenges SMEs face in appraising its employees.
- iii. To develop a web-based system that aids in appraising SME employees.
- iv. To test the developed system.

1.5 Justification

SME managers would benefit from the project as it provides a platform for appraising their employees and monitor their progress. The system would have centralized data on an employee's previous reviews and enable the comparison of the employee's previous performances.

Employees would benefit from the system as it would provide a structured means of being assessed. Additionally, the employees would receive needed feedback for them to know how well they are performing.

1.6 Scope and Limitation

1.6.1 Scope

The project will develop a web system for small to medium enterprises. It would cater for companies with about 100 to 250 employees. An assumption concerning the project is that employees are assessed by their respective supervisors within the business. Another assumption is that the objectives to be assessed were discussed between the employee and his evaluator prior to being recorded into the system. The system would provide a central record of the set objectives and consequent reports of performance.

1.6.2 Limitation

The project is limited by its reliance on the internet. As the system is a web application, the company requires a suitable connection to use the application.

The application is also limited by its inability to measure abstract values such as motivation. Additionally, reports generated by the application are subject to the data provided by the users.

Chapter 2: Literature Review

2.1 Introduction

Performance evaluation of an employee is designed to assess an individual's contribution in a company which then helps determine whether the goals are met. If a company is not meeting its goals, then it needs to develop an action plan to ensure that they are achieved in future. Employee performance evaluation has been practised by numerous companies since centuries as it has helped justify a wide range of human resource decision such as pay raises, promotions, demotions or even termination and lastly the employees' training needs (Kavoo-Linge, 2015).

Performance appraisal is defined as “the process of identifying, evaluating and developing the work performance of the employee in the organization, so that organizational goals and objectives are effectively achieved while, at the same time, benefiting employees in terms of recognition, receiving feedback, and offering career guidance” (Islam & Mohd Rasad, 2006). It involves evaluating past and present performance based on set standards (Kavoo-Linge, 2015) The process is thought to have emerged from the industrial revolution with the purpose of assessing the productivity of a worker (Panda, 2011).

This chapter reviews how SMEs opt to conduct employee appraisals and existing systems available in evaluating employee performance. It discusses current methods used in SMEs to evaluate employees, challenges small businesses are facing with the evaluation process, existing gaps realised in the process and the suggested solution which is a web application for evaluating employees.

2.2 Current Methods used by SMEs to Appraise Employees

Poljasevic & Petković (2013) highlight that small organizations rarely carry out formal performance appraisals compared to larger organizations. Instead, managers are likely to utilize frequent interactions between them and their employees to informally assess their employees. Informal appraisals are day to day routine evaluations. A supervisor would observe the employee's work and provide immediate feedback. An example would be a manager having bi-weekly or monthly meetings with a sales representative to review sales performance (Kokemuller, 2019).

According to Kavoo-Linge (2015), some SMEs use essay evaluation methods to appraise their employees. An evaluation essay would contain a narrative of an employee's strength, weaknesses, previous performance and suggestions on what to improve on (Aggarwal & Thakur, 2013).

In Kenya, some SMEs would adopt various human resource software to improve their operations. These software aid in streamlining human resource functions such as performance management by providing necessary reports and aiding in strategic decision making (Mulunda, 2014).

2.3 Challenges Small Businesses face when Appraising Employees

Although informal appraisals are convenient for the SMEs, since they are very cost effective, informal appraisals lack appropriate documentation. Documentation captures an employee's improvement or failure in performance over time. Information about an employee's performance history helps the management to make crucial decision for the wellbeing of the company. Effective performance management systems are among the tools for measuring and improving productivity. Therefore, organizations with poor employee appraisals would fail to align their labour towards their business policy (Kavoo-Linge, 2015).

Essay evaluations, when not combined with other rating methods, suffer from inconsistencies of evaluating employees. As the method relies on the supervisor's writing ability, evaluations may end up being misinterpreted and sometimes the supervisor might lose the written materials (University of Minnesota, 2011).

According to Roberts & Pregitzer (2007), most employees believe that they are not evaluated fairly and that the judgement of how well they performed is based on how well they get along with the managers, or factors such as their gender or age . It is also believed that the managers standards are subjective rather than objective (Roberts & Pregitzer, 2007).

As the average manager spends more than five weeks a year on appraisals as they receive and must go through reports from each employee (Sherman, 2020). On the other hand, the employees must spend an average of a week of work on appraisal-related activity (Sherman, 2020). That much time that could be used on other important areas to improve the overall performance of the employees.

2.4 Existing Applications used to Evaluate Employees

Performance appraisal software facilitate the evaluation of employees online. Besides functioning as an evaluation form online, it acts as an archive which stores past evaluations (Payne et al., 2009). This would be useful for necessary comparisons of evaluations over time (Payne et al., 2009). This section will highlight examples of these applications.

2.4.1 *BambooHR*

BambooHR's software collects and organizes relevant information gathered throughout an employee's life cycle. It features employee records storage, basic reporting and time-off management in its basic package. Its advanced package features tracking of employee's training and advanced employee performance insight. The application uses a pay-per-employee-per month pricing plan that starts at \$6.19 for the basic package, which may deter smaller businesses.

2.4.2 *Synergita*

This application provides solutions to engage, nurture and retain the best talents with appropriate employee engagement practices. Additionally, it aids employees adhere to organizational culture through a 360-degree rating mechanism. Similar to BambooHR, its pricing plan charges per employee.

2.5 Gaps to be addressed

The highlighted evaluation systems currently used are designed to cater for large companies. These systems' pricing plans would add additional costs to SMEs which opt to work with relatively cheaper informal approaches between managers and their employees. However, these informal approach limits necessary analysis of their employees for efficient performance management.

2.6 Conceptual Framework

The developed system is a web-based application that implemented Lavarel's model-view-controller architecture. Different users would be routed to their respective views which would provide their different functionalities.

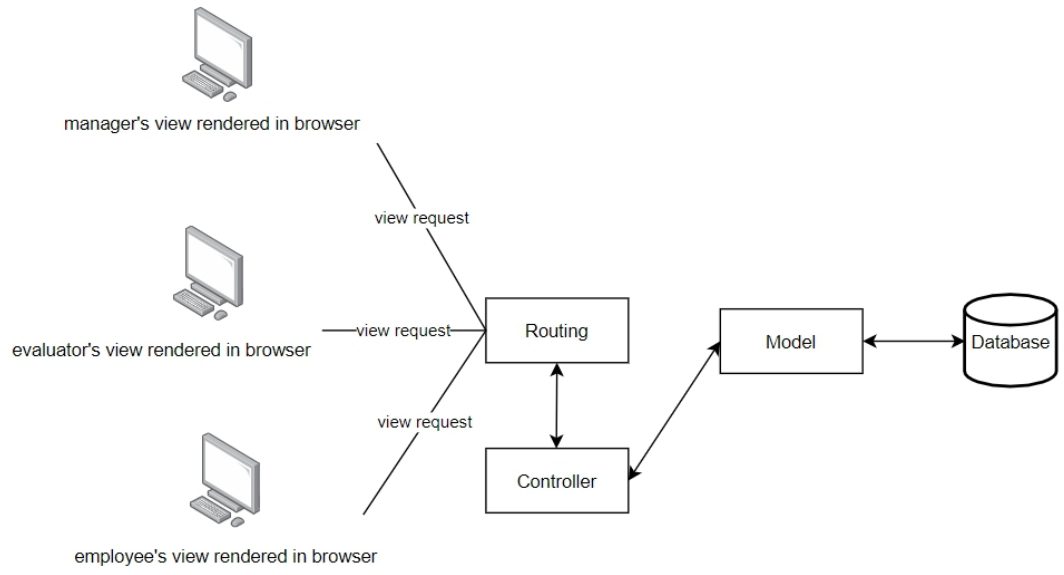


Figure 1 Conceptual Framework

Chapter 3: System Development Methodology

3.1 Introduction

This chapter describes the approach and methodology that was used to develop the system. A methodology structures the development of an information system.

The developed system used the Rapid Application Development methodology (RAD). RAD is beneficial due to its quick delivery as an application's modules are treated as separate prototypes. Treating the system's modules as separate prototypes increases overall robustness of the final system. Additionally, since RAD focuses on testing and final deployment, integrating the separate modules would be seamless and less prone to error.

3.2 Rapid Application Development Methodology

This methodology allows a quick development of information systems from its design phase to its completion. In RAD, the project is divided into modules which are treated as prototypes. RAD is broken down into the following stages:

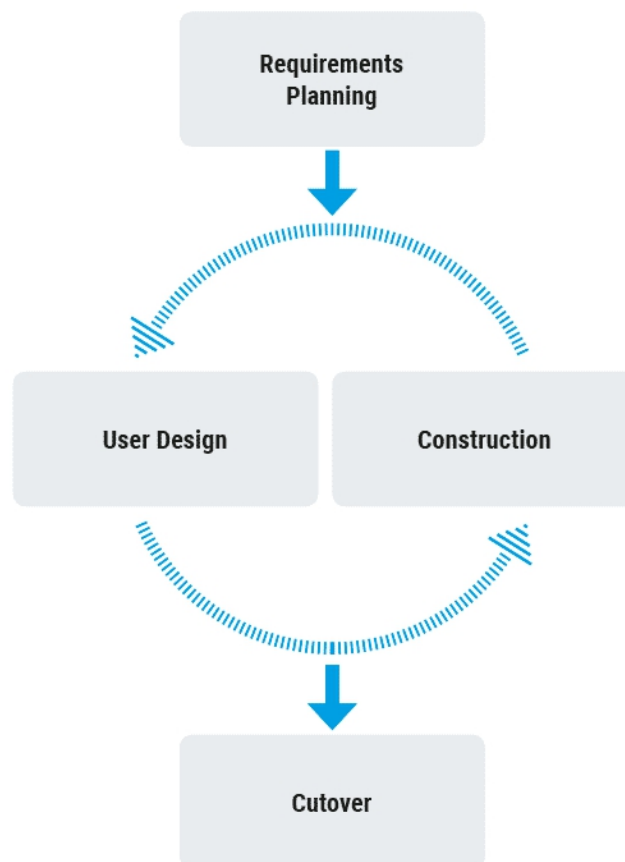


Figure 2. Rapid Application Development Cycle

3.2.1 Requirements Planning

This is the initial stage and establishes a general understanding of the problem. It involves getting familiar with existing systems and identifying various processes that would be performed by the proposed application. Requirements planning involves the following tasks:

- i. Researching the current environment
- ii. Defining Requirements
- iii. Finalizing requirements

3.2.2 User Design

This stage involves developing a design model through different prototype iterations. These different iterations help in structuring the overall application architecture. The developed application's modules was initially designed through various diagrammatic representations. The designs would then be compared against the user requirements and iterated until there is a suitable match.

3.2.3 Development

This stage combines different prototypes from the design phase into a functioning model. Here, actual coding would begin, integrating various development tools and the database environment. Various changes would be integrated to the developed system as enhancements are made to the initial designs as per the stated requirements.

3.2.4 Cutover

This involves the finished system being deployed. Periodic testing would be performed to resolve any rising problems within the system.

3.3 Requirements Analysis

Requirements analysis involves defining a software in relation to its business requirement (Lunn, 2003, p. 135). The project would apply the Object-Oriented Analysis and Design (OOAD) approach. OOAD approach would involve relating the application's environment in form of objects with specific attributes and behaviours. OOAD is beneficial since it allows real-world modelling whereby entities are organized into classes with their respective behaviour. Additionally, OOAD approach is robust due to its modularity.

3.4 System Requirements

3.4.1 Functional Requirements

Requirement ID	Requirement Description
FRQ 1	Allow a manager to set up job titles relevant to his business.
FRQ 2	Allow a manager to register employees of his business.
FRQ 3	Allow a manager to update the objectives to be achieved by different job titles.
FRQ 4	Allow an evaluator to set up a review form for an employee to be evaluated.
FRQ 5	Allow an evaluator to rate the performance of an employee regarding an objective to be achieved.
FRQ 6	Allow an evaluator to submit completed evaluations.
FRQ 7	Allow a manager to view submitted evaluations and archive them.
FRQ 8	Allow a manager to view reports of evaluations from different job titles in his business.
FRQ 9	Allow employees to view reports of their evaluation.

3.4.2 Non-functional requirements

Requirement ID	Category	Requirement Description
NFRQ 1	Usability	Allow registered employees to update their sign in credentials to use in the system.
NFRQ 2	Security	Sign in users into their respective pages based on their user role.

NFRQ 3	Usability	Generate reports on an employees' performance based on evaluations that have been archived by the manager.

3.5 System Design Diagrams

3.5.1 Use case Diagram

The use case diagram would model the relationship between actors and the system.

3.5.2 Class Diagram

The class diagram would visualize the application's structure in form of classes. Since the developed application uses an OOAD approach, this diagram would be important in conceptualizing different components' attributes and behaviours.

3.5.3 Sequence Diagram

The sequence diagram would depict the interactions of objects in a sequential order.

3.5.4 Database Schema

This would be a visual representation of the application's database. The application would use a relational database and therefore the schema would contain various tables and how they relate to each other.

3.5.5 Graphical Interface Design

This would contain illustrations of the application's user interface.

3.6 Development Tools used

The development tools that would be used are as follows:

- i. Draw.io, an online diagram platform for designing the proposed design diagrams.
- ii. Visual Studio Code, a source code editor that would be used for code scripting.
- iii. MySQL, a relational Database Management System that would control the system's database.
- iv. Laravel, a PHP web framework that would be used to develop the system's logic.

- v. Mailtrap.io, a SMTP server used for mail functionality such as password resets.
- vi. AdminLTE, an open source dashboard theme used for the application's user interface.

3.7 Method to be used to test the system

Testing would be performed to evaluate the application's specifications. Unit testing would be conducted to ensure specific modules function as expected. After unit testing, integration testing would be performed to ensure merged modules function seamlessly. Performance testing would be conducted on the application to ensure non-functional requirements are met.

The test would be documented to validate whether the identified requirements have been met.

3.8 System Modules

The developed system contains the following modules:

3.8.1 Job Title and Objectives Module

This module would be restricted to the manager and would enable him to add different job titles present in his business. The manager would then provide various objectives to be met by these positions. This module would allow the manager to specify the status of the objectives based on the needs of the business.

3.8.2 Evaluations Module

This module would enable an evaluator to set up forms which would contain an employee's evaluation. These forms would contain multiple objectives to be met based on the employee's job position. Their performance relating to the objective would then be evaluated.

3.8.3 Evaluation Reports

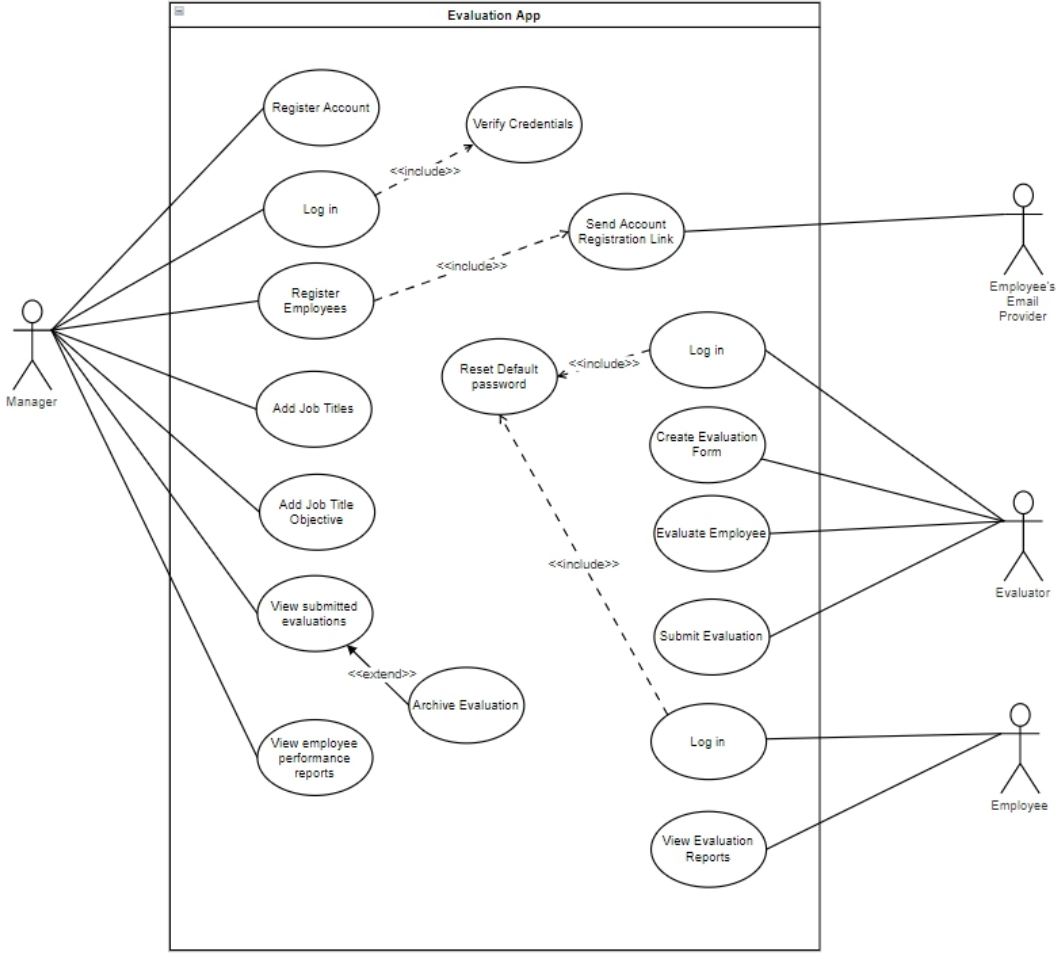
This module handles evaluations that have already been submitted and eventually archived by the manager. Reports would show how employees fared in different objectives based on their job position.

Chapter 4: System Design

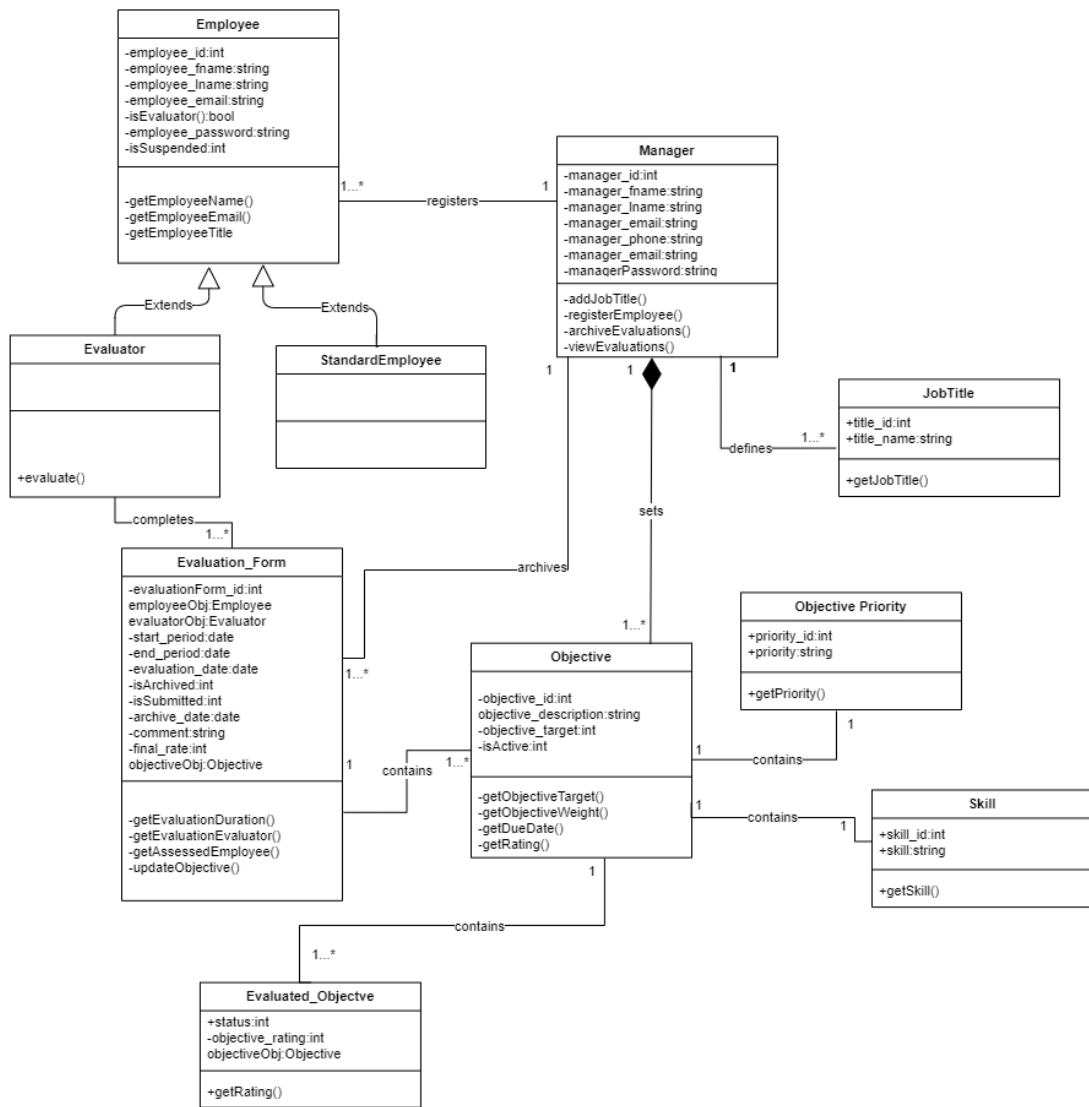
4.1 Introduction

This chapter discusses the implementation of the developed system. The design diagrams contained conceptualizes the system.

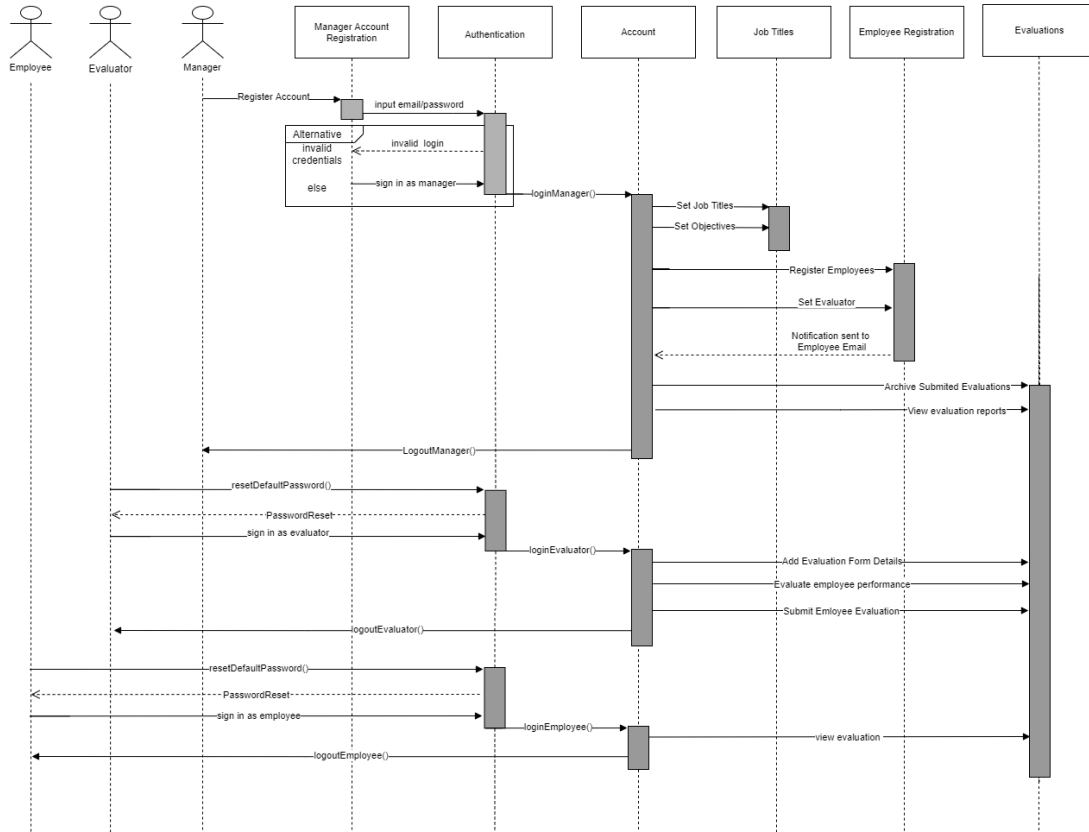
4.2 Use Case Diagram



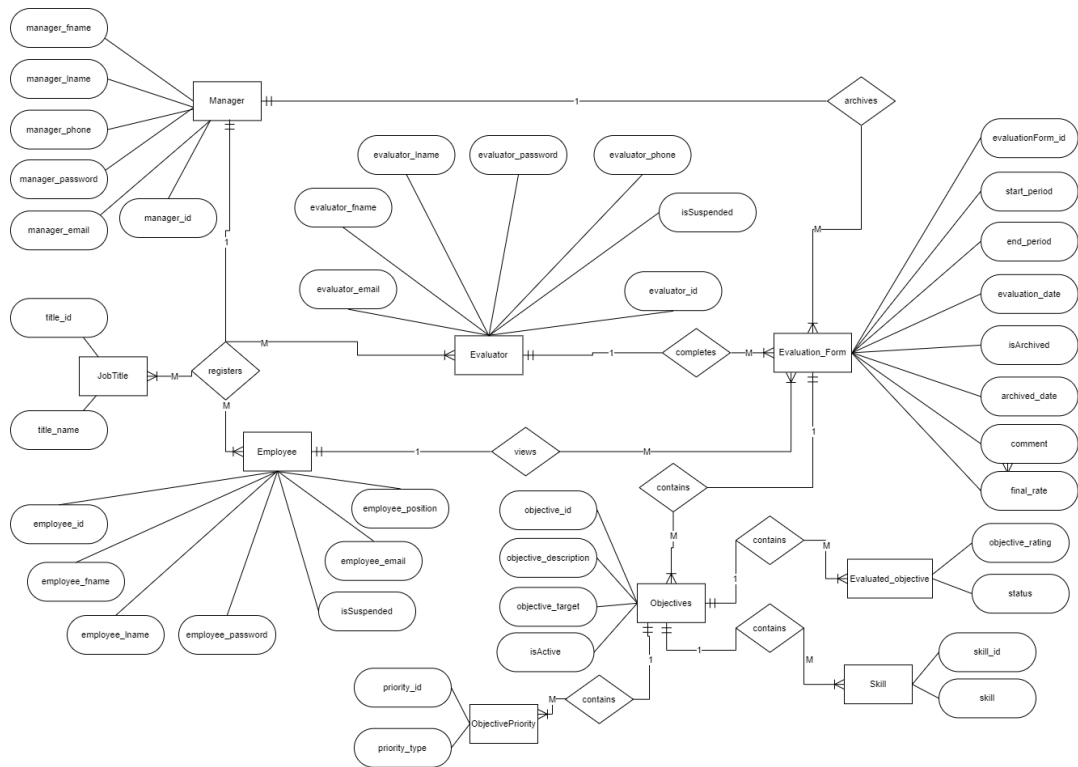
4.3 Class Diagram



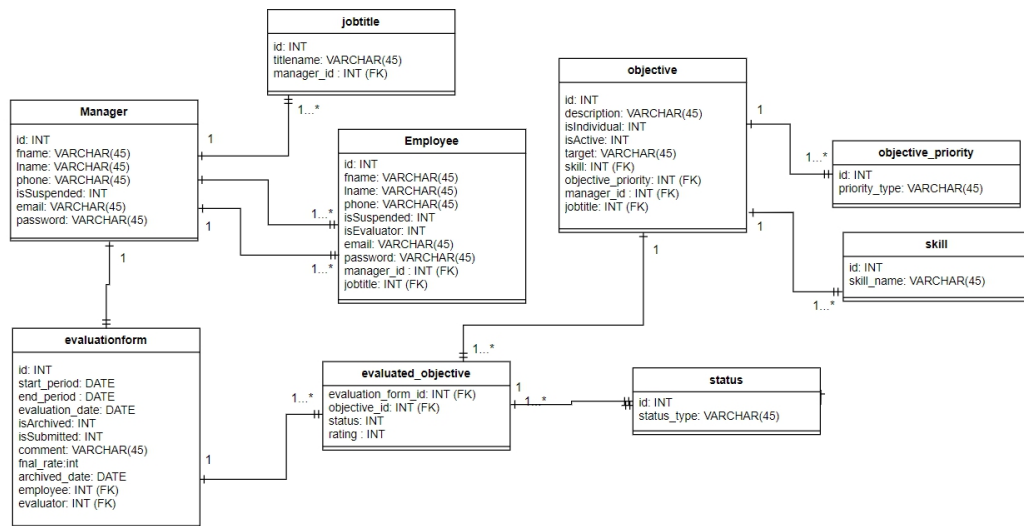
4.4 Sequence Diagram



4.5 ERD



4.6 Database Schema



Chapter 5: System Implementation and Testing

5.1 Introduction

This chapter provides the system implementation, record of tests, their constraints and results gathered from testing the requirements of the system.

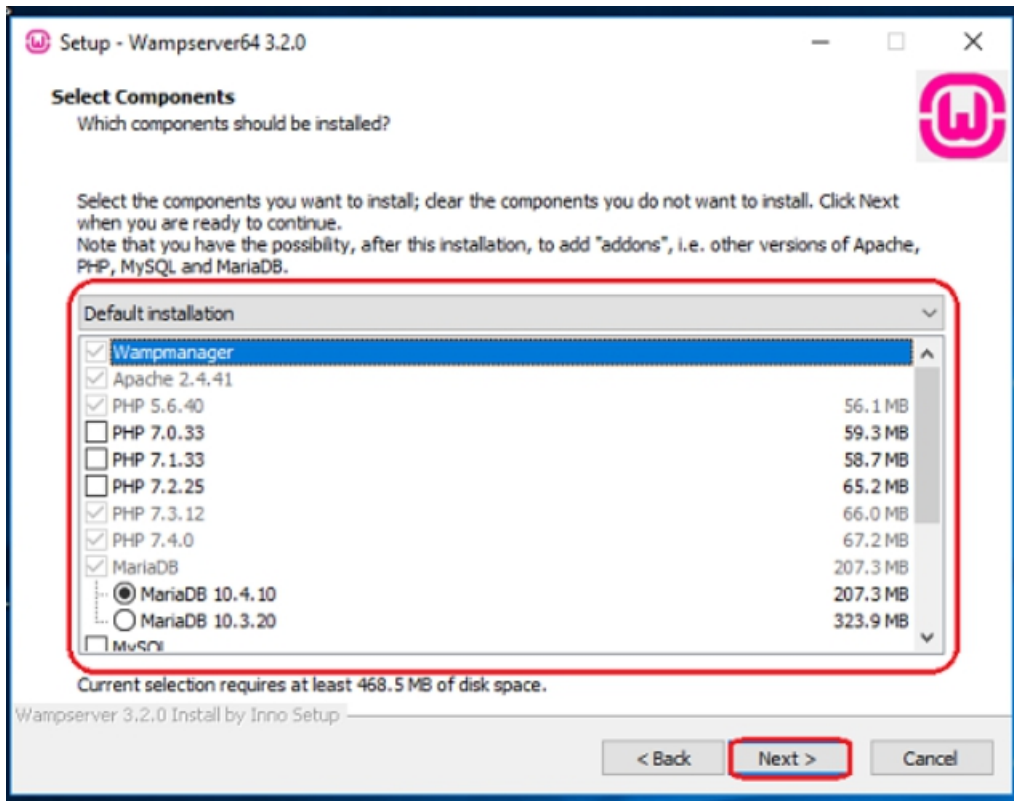
5.2 System Implementation

5.2.1 *System Manual*

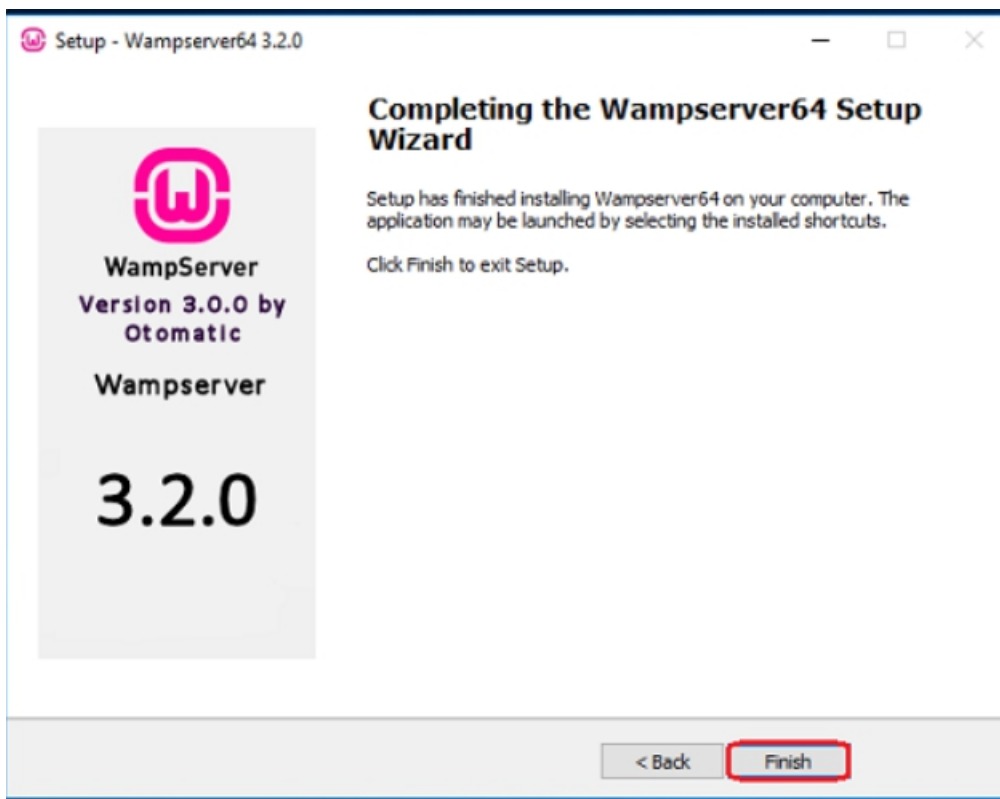
The system is an online appraisal system intended to benefit SMEs in evaluating their employees' performance. It has 2 main user roles : *manager* and *evaluator* while an auxiliary role, *employee* is used to view personal evaluations. The manager requires to register an account under which he would register his employees and evaluators. The system's functionality is only accessible to registered users of the system.

5.2.1.1 *Environment Setup*

- i. Download WAMP server from the internet. This URL can be used: <https://sourceforge.net/projects/wampserver/>
- ii. Once the executable file has been downloaded, proceed with installation. Open the file to start the installation.
- iii. The installation will suggest a default installation folder and necessary components to install. It is recommended to use the default installation, select this and proceed with the setup.



iv. Once necessary components are selected, the setup will handle the installation. Once the installation is complete press *Finish* and run the server.

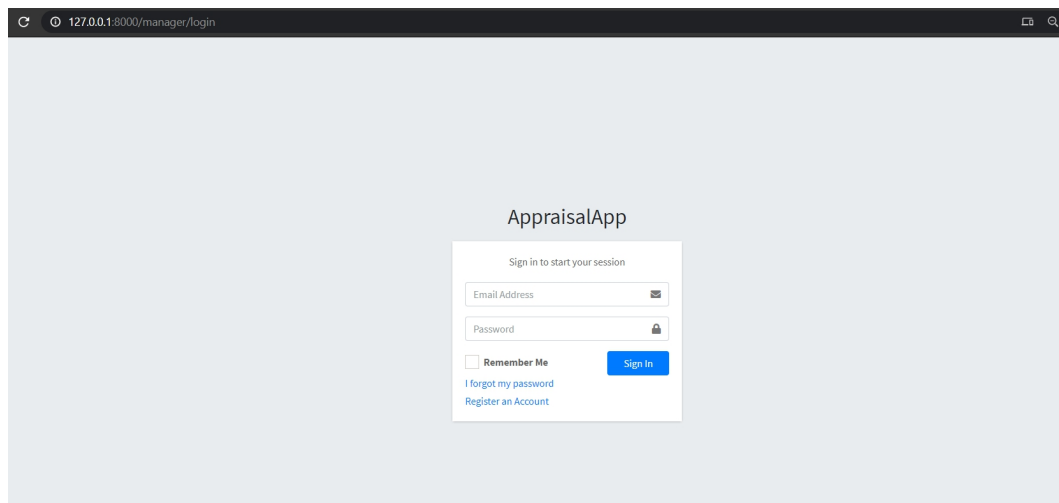


5.2.2 Retrieving the application

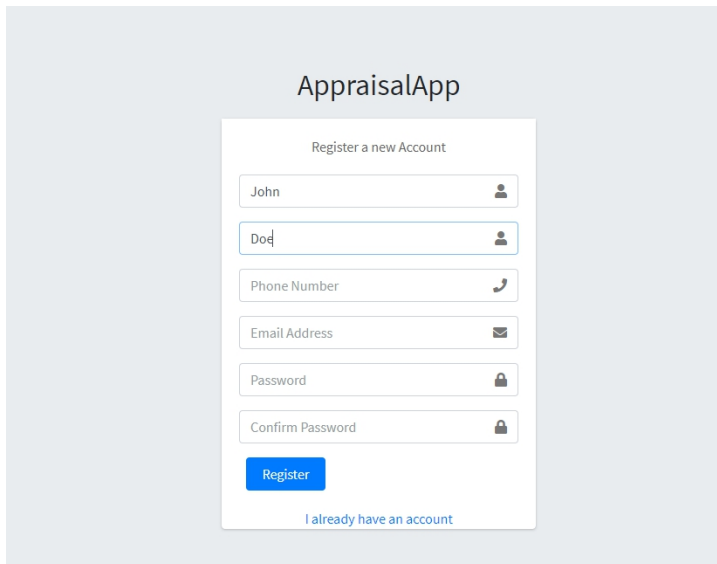
- i. The system resides on a github repository, **AppraisalApp** and can be accessed using the url: <https://github.com/Edalia>. The project can be cloned on any directory provided necessary Laravel modules are installed via composer.
- ii. Create the project's .env file to cnfigure necessary integrations between the project and WAMP's MySQL server.
- iii. Migrate the projects database migrations to generate the database tables.

5.2.2.1 Application Access

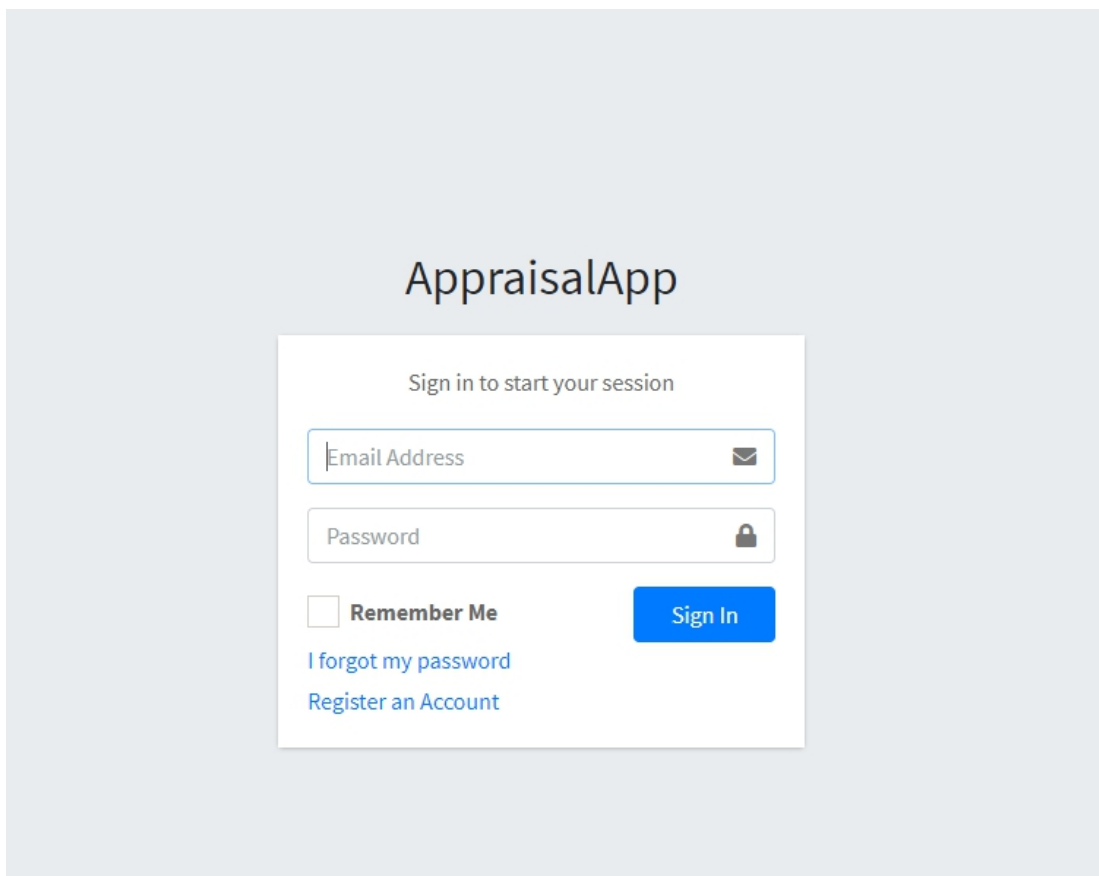
- i. Once Wamp is setup and the server is running, use a browser to access the url: <http://127.0.0.1:8000>. This is used as the application will be hosted on a local machine.
- ii. Use the URL:<http://127.0.0.1:8000/manager/login> to access the Manager Login page.



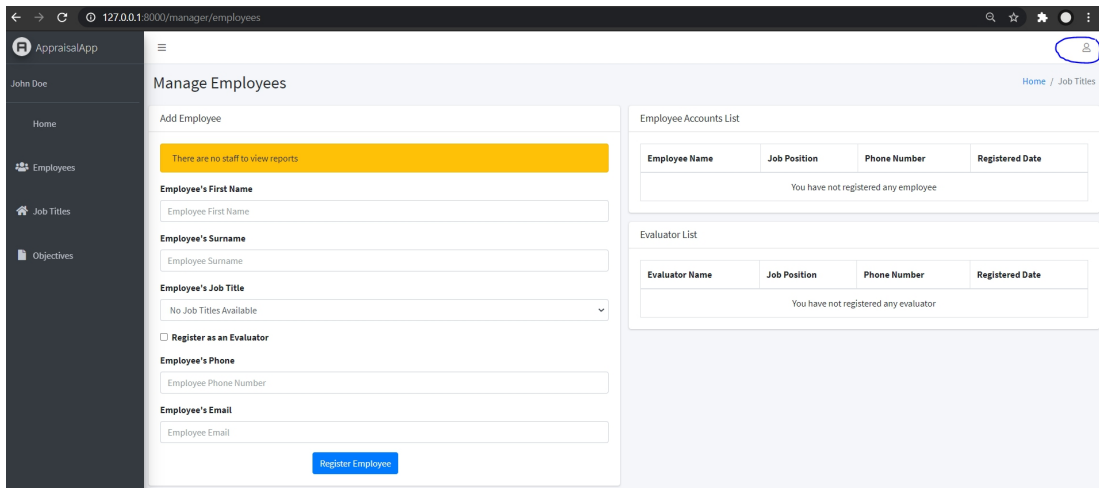
- iii. Proceed to *Register an Account* to create a manager's account. This is the only user role that can be registered outside the system.



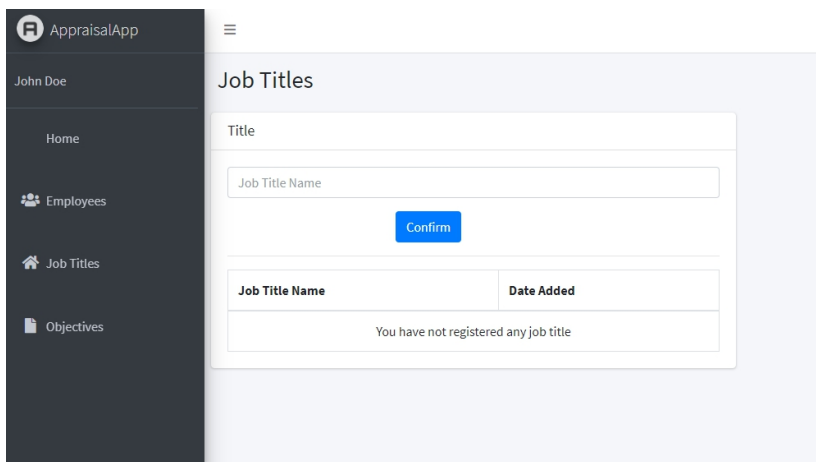
- iv. Once registered, proceed to login and sign into the account using the email and password.



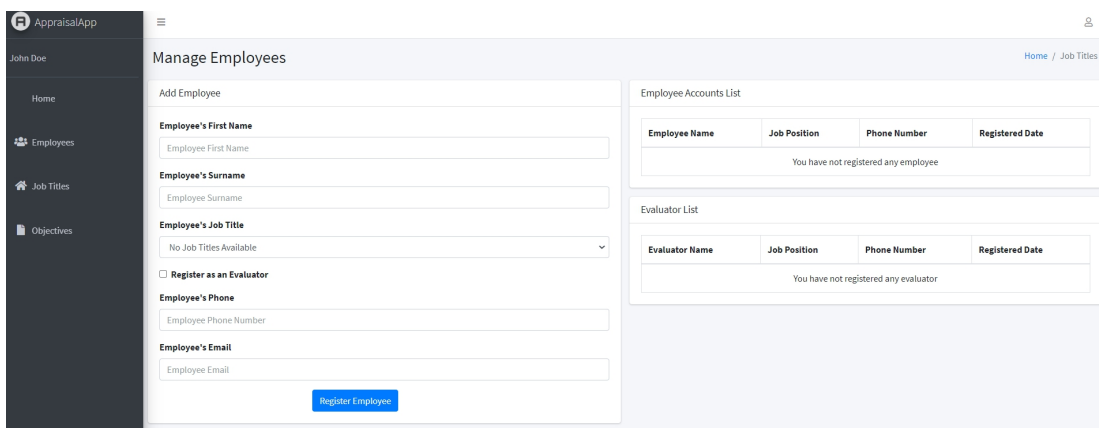
- v. A newly registered account would present this page requiring employees to be registered as default home page typically presents the manager's business reports. The icon highlighted in blue represents the logout button.



vi. Add necessary jobtitles of the business. This can be interpreted as departments within the business.



vii. Proceed to register employees within entered job titles. Evaluators can be registered here only that one needs to select the option: **Register as evaluator**.



viii. Proceed to add objectives to be used by evaluators to evaluate employees.

- ix. Evaluators can access the system using the url: <http://127.0.0.1:8000/>. However first time users need to reset their password. Only evaluators who have been registered by their managers, can reset their password.
- x. Once a password request has been sent, the evaluator would receive the link via email. The user would then reset it and use the updated credentials for login.

5.3 System Testing

5.3.1 Software Specifications

Testing was carried out on a Windows 10 64-bit operating system. The web-application used the WampServer development platform.

5.4 Test Cases

Test ID	Requirement ID	Test Case	Pre-Condition	Test-data	Priority Level
FT1	FRQ 1	Does the system enable the manager to register his business' job titles?	The manager should be registered within the system.	Manager mail: edalia@mail.com Job title 1: Sales-representative	High
FT2	FRQ 2	Does the system	The manager	Employee 1: John Kamau	High

		enable the manager to register his business' employees?	should have added a job title to register an employee under the system.	jkamau@mail.com Employee2: Mary Kamau mkamau@mail.com Evaluator James Rotich jrotich@mail.com	
FT3	FRQ 3	Does the system enable the manager to update an objective to be achieved within a particular job title?	The manager should have added a job title's objective in the system.	Objective Target: Increase revenue by 10%. Update: Increase revenue by 15%	High
FT4	FRQ 4	Does the system enable the evaluator to set up a review form for an employee to be evaluated?	There should be a registered employee within the evaluator's job-title.	Employee: Mary Kamau Objectives to be monitored: i) Increase Sales ii) Increase Revenue Start Period: 27 th January 2021 End Period: 18 th February 2021	High
FT5	FRQ 5	Does the system	The evaluator	Employee :Mary Kamau	High

		enable the evaluator to rate an employee based on the employee's performance of an objective?	should have set up a review form of this particular employee within the system.	Objective1 rating: 3/5 Objective2 rating: 2/5 Comment: Fair Performance	
FT6	FRQ 6	Does the system enable an evaluator to submit an employee's evaluation?	The evaluator should have rated the employee's performance within the system.	Employee :Mary Kamau Start Period: 27 th January 2021 End Period: 18 th February 2021 Objective1 rating: 3/5 Objective2 rating: 2/5 Comment: Fair Performance	High
FT7	FRQ 7	Does the system enable the manager to view submitted evaluations and archive them?	The evaluator should have submitted an employee's evaluation within the system.	Submitted evaluations: John Kamau Submitted on: 26th January 2021 Mary Kamau Submitted on: 27th January 2021	High
FT8	FRQ 8	Does the	The	Job title available:	High

		system enable the manager to view reports of evaluations from different job titles?	manager should have archived submitted evaluations	Sales-representative Employees: i) John Kamau ii) Mary Kamau	
FT9	FRQ 9	Does the system enable an employee to view his/her evaluation?	The employee must have been evaluated within the system.	Evaluated Employees: John Kamau Evaluated on: 26th January 2021 Mary Kamau Evaluated on: 27th January 2021	Low
NFT 1	NFRQ 1	Does the system enable registered employees to update their login credentials to use in the system?	The employee must be registered by his manager within the system.	Registered user: James Rotich Role:evaluator Email:jrotich@mail.com Password: Encrypted string generated by system.	Medium
NFT 2	NFRQ 2	Does the system load a user's view based on their user	The user must be registered within the system.	Manager: Name:Michael Edalia Role:manager User2: Name:James Rotich	High

		access?		Role:evaluator	
NFT 3	NFRQ 3	Does the system generate reports on employees' performance for the manager?	The manager should have archived submitted evaluations within the system.	Evaluated Employee: Mary Kamau Evaluation submission: 27th January 2021	High

5.5 Test Results

Test ID	Expected Result	Actual Result	Status	Remarks
FT1	The system should enable a manager to set up relevant job titles within his business.	The system enabled the manager to register his business' jobtitle: Sales-representative.	Pass	This functionality operates as expected.
FT2	The system should enable the manager to register employees within his business.He should categorize evaluators and regular employees.	The system enabled the manager to register: John Kamau,Mary Kamau and James Rotich as employees. Details that could be captured are the names, email and job-titles.Account	Pass	This functionality operates as expected.

		passwords were generated and required a reset by the user to login.		
FT3	The system should enable the manager to update an objectives attributes such as the description, target and priority.	The system enabled the manager to update the objectives target to be achieved : Increase revenue by 10% to Increase revenue by 15% .	Pass	This functionality operates as expected.
FT4	The system should enable an evaluator to set up an employee's evaluation form which would specify the period he/she would be assessed and the objectives to be evaluated.	The system enabled an evaluator to add objectives: Increase Sales and Increase Revenue to the evaluation form, which would be used to assess the employee's performance. The evaluator could also specify the period within which the evaluation would be carried out.	Pass	This functionality operates as expected.
FT5	The system	The system was	Pass	This

	should enable an evaluator to rate an employee's performance of an objective.	able to present a 1-5 scale which would be used to rate the employee's performance of an objective: Objective1 was 3/5 Objective2 was 2/5 The system also provided an area to submit a comment regarding performance.		functionality operates as expected.
FT6	The system should enable an evaluator to identify pending evaluations and enable them to submit the pending evaluation.	The system was able to submit pending evaluations which would then be visible by the business' manager.	Pass	This functionality operates as expected.
FT7	The system should enable the manager to evaluations that have been	The system was able to present an employee's submitted evaluation and had	Pass	This functionality operates as expected.

	already submitted and have an option to archive this evaluation.	an option to be archived within the system. Mary Kamau's Evaluation was archived within the system.		
FT8	The system should enable a registered manager to view reports of his employee's evaluations..	The system was unable to generate reports of employee performance across different jobtitles.	Fail	There is need to implement a reports functionality to display an employee's performance.
FT9	The system should enable a registered employee to view reports of how he/she was evaluated.	The system was unable to generate reports on the employee's evaluation.	Fail	There is need to implement a reports functionality to display an employee's performance.
NFT1	The system should enable a registered employee or evaluator reset their login credentials in order to use the system.	The system enabled the employee or evaluator reset their respective passwords using the MailTrap API.	Pass	This functionality operates as expected.
NFT2	A manager would be	Each user was redirected to their	Pass	This functionality

	logged in to the manager's page, an evaluator to the evaluator's page and a regular employee to the employees' page.	respective page upon logging in. The Manager was redirected to manager/index while an evaluator to employee/index		operated securely as expected.
NFT3	A manager would view reports on various employees depending on their job titles. Reports would be in the form of piecharts and bargraphs.	The system was unable to generate reports in form of bar-graphs and pie-charts.	Fail	There is need to implement report functionality.

Chapter 6: Conclusion and Recommendation

6.1 Conclusion

In conclusion, the project sought to address the challenge SMEs face with unstructured and undocumented performance appraisals. The project addressed this challenge by developing a web-based system for evaluating employee performance. The system enabled managers to register jobtitles , employees and add objectives which would be used as performance indicators.

The project took inspiration from existing performance management systems present in HR systems such as Zoho People and BambooHR. Although such systems are suitable for enterprises and incorporate additional functionality such as recruitment and payroll, the developed system attempted to focus only on performance evaluation.

6.2 Recommendations for Future Work

6.2.1 360-degree feedback

Although this functionality has not been implemented, it may compliment evaluations made by evaluators within the system. This is a form of evaluation that considers feedback from an employee's colleagues, subordinates and self-assessment besides that from a supervisor. The process provides different viewpoints of an employee's performance in the business.

6.2.2 Continuous Feedback System

The developed system enabled an evaluator to submit comments regarding an employee's performance. This feature could be improved upon by providing a module that enables this evaluator to give continuous feedback, which a registered employee would respond to within the system.

6.2.3 Employee Performance Analytics

Performance analytics could compliment the developed system's functionality. Such as module would be beneficial in predicting an employee's future performance based on current trends recorded within the system. The manager could then use this analytics in maximising employee productivity.

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Appendix I

Task	Start-Date	End-Date	Duration in Days
Problem set Submission	15-Apr	21-Apr	6
Concept Note Submission	22-Apr	06-May	14
Chapter 1 Submission	07-May	13-May	6
Chapter 2	14-May	25-May	11
Chapter 3	26-May	31-May	6
Proposal submission	03-Jun	03-Jun	0
Design Diagrams	10-Jun	30-Jun	20
Progress Presentation	01-Jul	01-Jul	0
Development and Documentation	05-Aug	03-Nov	90
Final Presentation	04-Nov	07-Nov	3

