# TRACKIT: An Employee Workforce System.

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**Submitted in partial fulfillment of the requirements of the Bachelor of Business in Information Technology at Strathmore University**

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## Declaration and Approval

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

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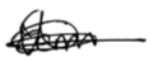

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**Abstract**

Employees are the backbone of any company, especially the ICT companies in Kenya, for this reason their management, supervision and handling plays a huge role in determining the triumph and prosperity of an organization. TRACKIT: An employee workforce system will make it easier for employers and heads of departments to keep track of all records. This system will also allow the administrator to edit employee’s information, add new employees, manage leave applications and create reports of each employee. Most importantly, the employers and heads of departments will be able to properly approve and update leave applications of their employees to do proper planning. This flexible and easy system for small and medium sized companies will provide modules for personnel information management thereby organization and companies are able to manage the crucial organization asset – people. This system brings about an easy way of maintaining the details, leave applications and tasks of employees working in any organization. The system will be easy to understand and user friendly. The aim of this project is to design and develop an employee workforce system to fill existing gaps in the electronic management of employees.

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**List of Abbreviations**

| | |
|---|---|
| **CSS** | Cascading Style Sheets |
| **EGTS** | Employee Goal Tracking System |
| **HTML** | Hypertext Markup Language |
| **ICT** | Information and Communication Technology |
| **IT** | Information Technology |
| **IDE** | Integrated Development Environment |
| **MySQL** | My Structured Query Language |
| **PDF** | Portable Document Format |
| **PHP** | Hypertext Preprocessor |
| **XAMPP** | Cross Platform Apache Maria DB PHP and Perl |

# Chapter 1: Introduction

## 1.1Background Information

Managing and articulating tasks and employees in organizations is very critical because the wholesome performance of a company is majorly dependent on the performance of the employees. That's why many organizations utilize employee management techniques to measure and check employee productivity, track their progress and also give feedback to employees. This proposed system will be able to track employee details, projects and leave applications while also sharing and acknowledging employee achievements, this will be done by cross checking tasks assigned against the deadline date. This will help enhance a culture of better performance in the workplace.

A goal is largely defined as something that an individual or group is trying to achieve. Organizations often set goals within a specific time frame so that there is a deadline for completion. Both short- and long-term goals may need to be broken down into a set of tasks, doing so substantially turns one goal into several mini-goals. These tasks, or action steps designed to work toward a larger goal, are often referred to as objectives. These objectives are measurable and specific actions that can be taken to achieve an end result. They are often planned and carried out on a shorter-term basis and may be designed to help an individual, group, or organization reach a broader and a long-term goal which is time limited.

The current way of tracking employee goals, leave applications and projects is undertaken by relying on note taking which is not only time-consuming but also ineffective, biased and provides no employee engagement. A good employee workforce system will increase employee confidence results (Noronha, 2016), improve task management by enabling managers to competently break down large projects to clear and descriptive tasks for each employee while also promoting accountability across the entire organization. This will be achieved by setting S.M.A.R.T (Specific, measurable, achievable, relevant and time-bound) goals.

The goals created should align with the organizations' culture and mission. Each IT department has its own key performance indicators. This is what will be used while creating the goals and objectives. The key performance indicators to be used include: Percentage of orders, transactions, downloads, or actions of emails sent or delivered. Hence the goals for this particular department are increasing downloads by 30% or increasing the unique clicks on certain links. Each goal and objective will have a clearly defined and realistic timeline to keep the employees on track.

### 1.2 Problem Statement

The current employee management technique of note-taking has been found to be flawed and uninformed since managers and departmental heads waste a lot of time writing down the tasks on paper, they might record the incorrect information and also lose the piece of paper which contains the employees tasks and objectives. Managers, team leaders and executives spend a lot of time note taking and breaking down large projects unsuccessfully. This traditional process promotes and brings about reduced employee engagement, decreased employee morale, ineffective project management due to the inability to break down huge company projects and futile goal setting among others.

Manual handling of employee information poses a number of challenges. The use of paper work in handling some of these processes such as project management and leave appplications could lead to human error and the papers may also end up in the wrong hands. This system will be able to show whether an employee is late to submit particular task while also highlighting those who submitted their work on time. Note taking everyday tasks in an organizations task is not only ineffective but also risky because the manager or a head of a department may forget where he put down the note where he had documented important and critical tasks, records and responsibilities.

### 1.3 Research Objectives

#### 1.3.1 General Objectives

The aim is developing an information system to solve the problem identified in section 1.2. The system solves the problem of improper project tracking and flawed leave management techniques by ensuring managers can record and manage project and leave applications for each employee while also breaking down large projects among team members thus increasing accountability in the organization. Employees will be able to know what tasks need to be addressed immediately and the task deadlines for each task and action. Also, directors and managers will have a platform to accurately track progress of their employees.

### 1.3.2 Specific Objectives

i. To investigate the current mechanism of tracking employee progress.

ii. To design the system with all the functionalities needed for the system. For example, project management and leave application.

iii. To develop a web application that will assist managers in breaking down organizational projects, accurately track the progress of employees in an organization and adequately manage the employee leave applications.

iv. To test the system.

## 1.4 Research Questions

i. What are the challenges experienced with the current employee workforce system?

ii. What types of projects can this system be able to break down?

iii. How can the current employee leave management system be improved?

iv. Does the system help to clarify corporate goals?

v. Does the system perform optimally?

## 1.5 Justification

This particular web system is critical because it will help managers, business owners and executives of IT (Information technology) companies accurately track their employee's progress, manage huge projects effectively and capably manage employee leave applications. This will help managers and business owners whenever they are conducting a performance evaluation in the organization. As proven by (Schaufeli, 2008)this will in turn lead to overall direct improvement in employee performance and motivation. It will facilitate the alignment of individual goals and objectives with those of the departments and corporate plans (Giri, 2006). A web based employee workforce system will be a better alternative to note-taking everyday employee tasks and responsibilities since it is not time consuming.

## 1.6 Scope and Limitations

### 1.6.1 Scope

The scope of this project includes creating a web application that will include employee profiles in which employees will be able to edit their personal details, manager profile where managers can add and edit employee details and also project management to assign various duties and responsibilities to employees. The system will also have leave management module where employees can apply for leave. In addition to the above, there will be a report generating module where reports can be generated which can be used to perform employee performance appraisals and reviews.

### 1.6.2 Limitation

The limitation of this project is that since the employee workforce system is web based, an internet connection must be established. Therefore, it can only be deployed on web enabled devices that are connected on the internet.

# Chapter 2: Literature Review

## 2.1 Introduction

This chapter sums up the assessment of the various literature relevant to the Employee management systems. This is done through examining different theories, concepts, approaches, methods and techniques relevant to the project. Indistinguishable and existing technologies relating to the development of TRACKIT (Employee Workforce system) are discussed.

## 2.2 Presently Used Employee Workforce Systems

Many IT organizations in Kenya have a manual (paper) based employee workforce system Kiruthu, (2018). This current system functions in the manner that a manager writes down the tasks of his employees on paper following a departmental meeting without having the ability to track the progress on the tasks each and every employee in the department is undertaking. The manager then has to ask his employees the progress on the projects or tasks. Making use of the manual system is not only prone to human error but also time consuming and resource intensive since each time the manager has to document the tasks and leave applications on paper each time he wants to update the progress of an employee.

Some managers and departmental heads even fail to record the daily or weekly tasks of their employees thereby not enhancing accountability in their businesses. A goal tracking system will ensure employees are aligned.

Research by Maglieri, (2006) depicts that goal setting has consistently been shown to increase performance under specific conditions. Without setting goals in any organization, there exists no quantifiable way to recognize when a project is concluded or finished. In order to steer clear of unnecessary elongation of a task or project and risking resources misallocation, managers can clearly set goals that define success and also provide him with insights on whether each employee is achieving his or her tasks.

### 2.2.1 Challenges faced with Manual Workforce Systems

There are several challenges associated with manual (paper) based employee workforce systems. Primarily this method is susceptible to human error, thereby may lead to a lot of compliance issues.

For instance, if you lose track of important paperwork or misplace it, you might be disregarding the states labor laws which clearly stipulate the general principles of employment records. Furthermore, plenty of paper materials put the organizations in risks such as easier fire breakouts in the office. An automated system will help the organization by ensuring reduction in data breaches since the data will be stored in a password protected database whose access is only limited to the right parties.

From the perspective of effective time management, out of date manual goal tracking systems lead to inappropriate time management since projects which were supposed to take a shorter period end up taking up much more time than they are supposed to because the project was not allocated accordingly (Demerouti, 2010). Short projects were given long periods of time whereby long, massive and monumental projects are only given short time limits.

With outdated systems and processes, a lot of time is utilized responding to employees queries about various issues such as sick days. To have the answer to these questions the employees will have to ask either the direct manager or the human resources department. This leads to wastage of time and resources since the employee is not being productive when he is doing such.

Growth is very important to the long-term continuance of information technology companies. It makes it easier to acquire assets, attract new talent and fund investments. It also drives business performance and profit. As every company grows and grows, overreliance on outdated systems will significantly lead to the downfall of companies. Automated systems, on the other side, leads to better growth of the business. As each and every business grows, automated software can manage the recent employees and keep you on track as your business grows.

### 2.2.2 Correlation between employee goal tracking and productivity

Goals in Information technology companies are not to be perceived as invariable rather they are should be viewed as ever changing and constantly developing goals. A manual (paper) system of goal tracking does not make it straightforward in goal setting and tracking. Departmental managers should be to accurately update their employee’s progress on certain activities. This is because the piece of paper might be lost or even tampered with by others hence not allowing the managers to properly view and track their employee goals.

When done accordingly and appropriately goal setting will lead to better employee productivity facilitated by a boost in morale. This is because the employees will feel involved from the start to the finish in numerous activities. This will invoke a sense of belonging in them because they will have a sense of ownership and accountability in the activities they do. In relation to the theory of "goal setting", research by (Terpstra, 1994) states that employee effectiveness can be assumed as enhanced level of employee performance that would lead to higher productivity.

There are ample literature citing research done by scholars and researchers in support of the positive relationship between goal setting and organizational effectiveness. Studies by (Latham, 2004) depict that "goal setting consistently was found to increase productivity." The author Latham infers improved productivity as 'organization effectiveness. The author continues by mentioning that the constructive connection that exists between goal setting and organization effectiveness can be described as employees being largely aware of higher level objectives and priorities which they will feel a part of and be motivated to rightly finish it.

According to the studies and findings by (Tubbs, 2001), this approach to goal setting involves the consensus of many different levels of management and frontline employees. Interactive goal setting involves discussion and cooperation among management and employees. And that it is true to state that goal setting increases individual and organizational performance thereby providing evidence that goal setting applications have a positive effect on organizational outcomes.

### 2.3 Relevant Works

Some of the related works include:

#### 2.3.1 Trakstar goal tracking system

This is a system that helps organizations and its users measure the progress of their activities and goals, aligning productivity with company objectives. The app can be used by both employee as well as manager to add their own goals. This system does goal tracking through ways such as managing all employee records, work reporting by assigning tasks to employees, staff performance reports which shows how many days an employee reported late to office and also offers communication with management since employees can make direct requests inform of guided messages to their managers. Objectives and key results are used in strategic planning.

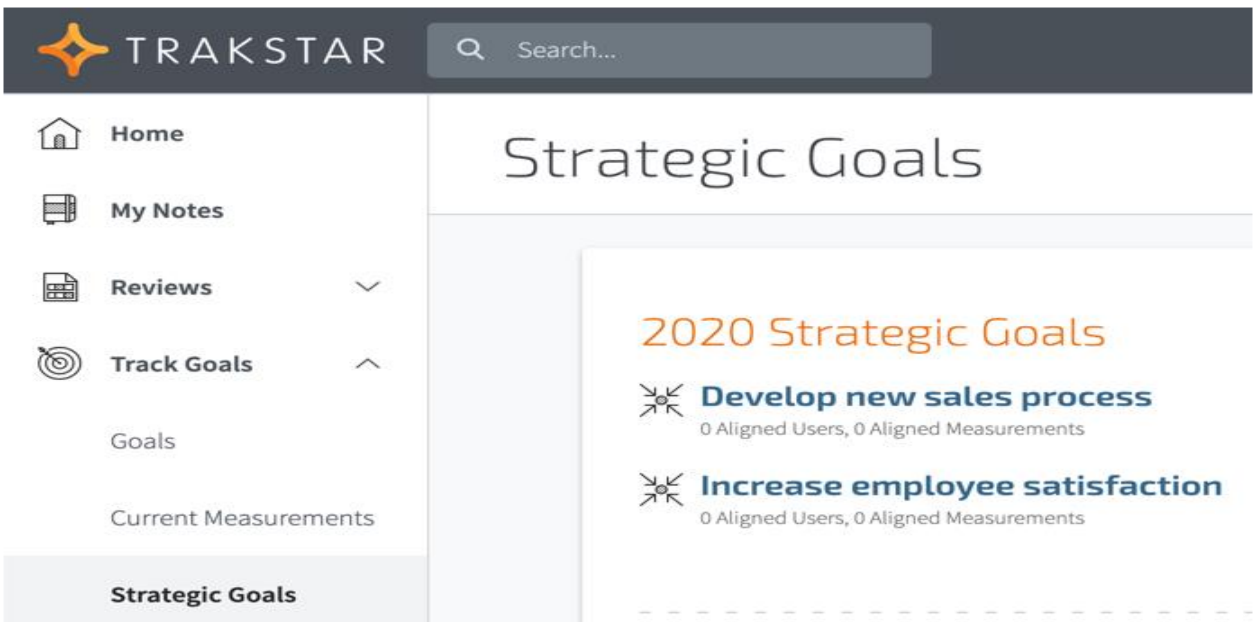


Figure 1.1 Trakstar goal tracking system

The advantage of this system is:

a) It reduces the wastage of time and material in the office.
b) Accountability for almost everything being done at the workplace.

c) Quicker time of completion of projects.
d) Accelerated company growth as realistic targets will be set and attained.

This system may be inefficient because it may be costly for a business to acquire new computers for this purpose. Some other goal tracking systems include Engagedly, Weekdone, Asana, Empxtrack and Namely.

### 2.3.2 Manual leave tracking systems in BRCK, Kenya

Like many IT (Information Technology) companies in Kenya, BRCK had a manual leave tracking system. The process of tracking employees leaves by the manager was done in the following way: after a standup meeting of the department where everyone would say what he or she is working on, the manager would have to jot down all the tasks in pen and paper and ask who is going on leave. She unfittingly loses concentration of what the employee is stating while trying to note down all the tasks. Once meeting is over, manager may forget the note book in the meeting room hence losing all the details and particulars of all the employees tasks and leave requests. The advantage of this system is:

a. It is easy for small startups because some entrepreneurs have a good way of tracking data on paper using ledger sheets.
b. Manual systems don't require expensive systems, machines and programs.

The system is inefficient because individuals are more inclined to error more than computers. A computer will be able to record and arrange data systematically. Also, a lot of time is taken to input data manually.

## 2.4 Gaps in the Existing works

The challenges experienced with this system include: long access time, this is because the business owners and managers must look for the piece of paper which contains the needed information. Also, it creates lack of privacy and security in office documents, Djoko P, (2019) since misplaced documents with sensitive company information may land in the wrong hands thus putting the organization at risk. Another challenge in a manual system is that it takes up a lot of space, hard to make changes to the original note, costly for the organization because ink and paper materials have to bought and is also very easy damageable and prone to be misplaced and lost.

## 2.5 Conclusion

The literature review in this chapter has looked at a brief overview of existing employee goal tracking systems and employee management systems. This system will solve problems of inability to set, track and monitor employee goals. This will be done through creation of a goal tracking system with modules that include employee records management, works reports and task allocations.

# Chapter 3: System Development Methodology

## 3.1 Introduction

This chapter provides a basic summary of the methodology that will be used for the proposed system. The aim of the methodology is to ensure that the proposed system will be able to improve the employee management system. The chapter will cover the following areas: development methodology, justification of the methodology, functional, non-functional requirements and tools and techniques.

## 3.2 System Development methodology

This chapter provides a detailed outline of the software development methodology to be used in this project. System development methodology refers to the structure that is followed in creation of a new system. The strength and weaknesses of the chosen methodology have been outlined. The approach to analyze and design the system is Object-oriented analysis and design (OOAD). Further, the functional and non-functional requirements of the system are explained in detail and the use cases which are a list of steps, typically defining interactions between a role and a system, to achieve a goal. According to Colter, (1986) persons developing computer-based information systems have a variety of basic methodologies and tools from which to choose. Class diagrams have been given to show detailed data modeling of the system which will be translated into code.

### 3.2.1 Waterfall model

Waterfall Model is a process of software development which is divided into separate phases. The outcome of one phase acts as the input for the next phase sequentially. This means that any phase in the development process begins only if the previous phase is complete. The waterfall model is a sequential design process in which progress is seen as flowing steadily downwards, Sharma, (2019). In this waterfall model, the phases do not overlap.

The various steps for the waterfall model include:

a) Requirement Gathering and analysis − All the possible requirements of the goal tracking system such as authentication and report generation are captured and recorded in this phase and documented in a requirement specification document.

b) System Design − the requirement specifications from first phase are reviewed in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture. This involves design and drawing of use case diagrams.

c) Implementation – Following the inputs from the system design, the system is first developed in small programs referred to as units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

d) Integration and Testing − All the units developed in the implementation phase are integrated into a system after testing of each unit. This level of software testing involves testing individual units are combined and tested as a group. Post integration the entire system is tested for any faults and failures. This testing is done to test the defects in the interfaces or in the interactions between the systems.

e) Deployment of system − Once the functional and non-functional testing is done; the product is deployed in the customer environment or released into the market.

f) Maintenance − There are some issues which come up in the client environment. To fix those issues, patches are released. Also to enhance the product some better versions are released.

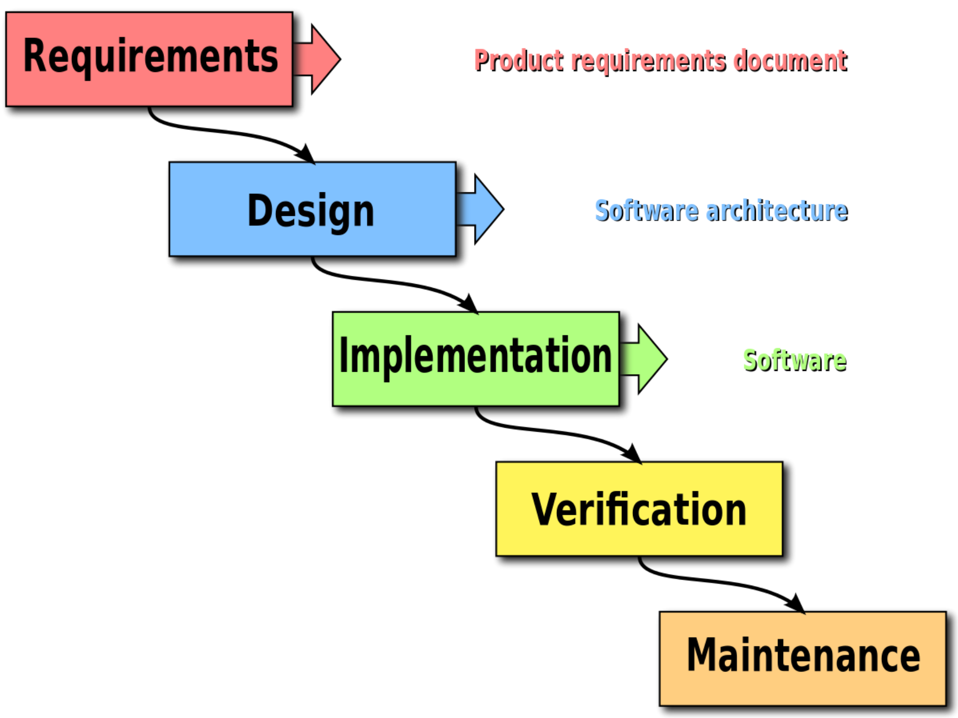


Figure 2. 1: A waterfall model as represented by Hughey, D (2009).

### 3.3 Justification of Methodology

Waterfall is the best methodology to use since it has plenty of advantages to software developers. First, the development cycle enforces discipline since each and every phase has a specified begin and end-point, and project progress can be effectively tracked and monitored by the use of milestones (Glincy, 2014) . The waterfall model also places attention on requirements and design before any coding is undertaken. This enables minimal wastage of time and effort as well as reducing the risk of customer expectations not being fulfilled.

### 3.4 Functional Requirements

The functional requirements refer to the functionality and the services that will be provided by the system in order for the system to function as intended.

#### 3.4.1 Authentication

Login-User will be able to login with his or her username and password.

Logout-The user can logout from the goal tracking system.

Login failure: if the user does not exist in the database.

This includes items such as creating departments, company history, information about the CEO, generating employee information (adding/deleting/updating employee information, feedback's, salaries) and generating unique employee ID for each employee

#### 3.4.2 Authorization

This describes the ability for administrators to manage user access to various IT resources like systems. After logging in, the user role will be checked from the database and the user interface will be displayed according to their role.

#### 3.4.3 Display

User with defined roles can display the content of the database. Being more specific, employee can only view his/her personal information. The heads of department can not only see his/her personal information but also employee's information who are under his/her department.

### 3.4.4 Edit

A user with employee role will be able to edit his/her specific personal information. Administrators will be able to edit all information related to all employees' including their user role type.

### 3.4.5 Search

Managers and heads of departments can search the content of database for the employees' who are under his/her coverage. Search feature works on specific keywords showing employee's tasks or details.

### 3.4.6 Update

This feature will only be used by admin role type. Administrator will be able to update the role type. For example, an employee got promotion and his role type will be changed from entry level software engineer to senior technical software engineer.

### 3.4.7 Task management

The administrator will be able to create new tasks for employees also having the ability to update and delete a particular task. The employee will be able to view this task and update the progress of the task.

### 3.4.8 Leave Application

1. Leave application- The user can be able to fill in leave application form in the appropriate fields.
2. Leave approval- The admin can be able to approve leave applications based on the reasons stated, length of leave as well as available HR on a department.
3. Leave days accrued- The user shall be able to check the number of leave days accrued.

### 3.4.7 Project management

This module will allow for the administrator to create various projects while also having the ability to assign employees to participate various projects.

### 3.4.8 Employee surveys

This module will allow for the administrator to create surveys and also assign employees who should take the survey.

### 3.4.9 Generating Reports

The system should be able to generate reports based on their details. This reports will contain employee data and information.

### 3.4.10 Administrator Module

This is the module in which will ensure the manager will be able to view employee details such as employee goals, incomplete and complete tasks in any easy manner.

## 3.5 Non-functional requirements

The non-functional requirements are the requirements that specifies the criteria that will be used to judge the system.

### 3.5.1 System Security

System security refers to the methods and procedures that will ensure that the system is kept safe from intruders and people who should not have access to the data. This will be done by creating a secure connection that will transport the information to the encrypted database where it would not be retrieved easily. The passwords should be hashed so to ensure that it cannot be deciphered.

### 3.5.2 Performance requirements

There is no restriction to the number of users to be added to the database. The system should be able to perform the tasks at a certain speed to ensure tasks are completed efficiently

### 3.5.3 Accuracy

This refers to the correctness of data. The data collected should be collected accurately in order to give correct results thus promoting efficiency.

### 3.5.4 Usability

This refers to the ease of use of the system that the user is interacting with. The system should not be complicated such that it requires constant challenges with its use.

## 3.6 Tools and Techniques

This refers to the tools that were used to ensure that the system will be created in an efficient manner. The IDE to be used is Visual Studio Code.

### 3.6.1 HTML

HTML is a standardized system for tagging text files to achieve font, color, graphic, and hyperlink effects on World Wide Web pages.

### 3.6.2 MySQL

MySQL stands for My Structured Query Language. It is the world's most popular open source relational DBMS. MySQL is available for free under the GNU General Public License for open source benefits/reasons related to development. The open web server that will be used is XAMMP.

### 3.6.3 Java Script

This is an interactive object oriented programming language that is used to create interactive effects within web browsers. JavaScript is preferred because it is fast and easy to debug and test.

## 3.7 Tools

The tools to be used are:

a) Visual Studio Code- This is the IDE that will facilitate the creation of the new program in the system. It is super-fast and supports many languages.

b) MySQL-This is the tool that will be used to create the database of the system. It will be used to save critical information concerning the system. Deploying a MySQL database is cheap and easy as it doesn't require special hardware or software requirements.

c) PHP- This is the programming language that will be used to facilitate the development of the web based system. PHP is an excellent choice because it's an open source technology and has a large community of users, this makes PHP a language that is easy to learn and understand, furthermore coding solutions and bugs are resolved quickly

d) JavaScript-This is the programming language that will be used in creating responsive, interactive elements for web pages, enhancing the user experience. JavaScript is easy to debug and test.

e) CSS- CSS is a style sheet language used to describe presentation and layout of HTML tags. CSS is easy to maintain and update.

# Chapter 4: System Analysis, Design and Architecture

## 4.1 Introduction

The aim of this chapter is to provide a list of the identified system requirements and highlight the approaches that were employed in the process of gathering such requirements (functional and non-functional requirements) during the system analysis stage. In addition to that, the system architecture, that entails the: web-based application accessed by both the admin and the blood donor, has been illustrated.

## 4.2 Requirement gathering

The method used to gather system requirements is quantitative in nature. That is, questionnaires were presented to a sample of the target population and the results were analyzed to understand the user's requirements in relation to the use of a location-based blood donation system in the case of emergencies.

However, a qualitative method of gathering system requirements was also used. That is, some individuals within the target population were interviewed to analyze the efficiency of current methods used to track employee leave management procedures. Moreover, the system requirements were also gathered by analyzing the existing leave management systems.

The requirements include: ease of current leave management systems, communication methods/channels to leave applicants, Information security of existing systems and the number of employees interested in a leave management system that allows companies to automatically provide a platform for employees to apply for leave.

## 4.3 System Requirements

The system requirements, which are the features and functionality of the Trackit Employee workforce system, comprise of functional and non-functional requirements as shown respectively in sections 4.3.1 and 4.3.2 below.

### 4.3.1 Functional requirements

The system's functional requirements, which are the requirements that are related to the functional aspects of the location-based blood donation system (Tutorial point, 2019), are as listed below in table 4.1.

Table 4.1: Functional requirements

| | |
|---|---|
| FRQ1 | The system should allow the manager to sign in. |
| FRQ2 | The system should allow the registered users to sign in. |
| FRQ3 | The system should allow users to see the leave application module. |
| FRQ4 | The system should allow the users to apply for leave. |
| FRQ5 | The system should allow the manager to view his employees. |
| FRQ6 | The system should allow the update of leave applications. |
| FRQ7 | The system should allow the admin to update employee details. |
| FRQ8 | The system should allow the admin to delete leave applications. |

### 4.3.2 Non-functional requirements

The system's non-functional requirements are the requirements that do not relate to the functional aspect of the location-based blood donation system and are the expected characteristics of the system (Tutorial point, 2019). That is, they describe the environment under which the developed blood donation system will work. They are as listed below in table 4.2

Table 4.2: Non-functional requirements

| | |
|---|---|
| NFR1 | The system should allow users to navigate the user interface with ease. |
| NFR2 | The system should only grant access to registered users through the authentication middleware. |
| NFR3 | The system should provide access to registered users at any time they attempt to access the system. |
| NFR4 | The system should be adequately fast. |

| | |
|---|---|
| NFR5 | The system should provide security for users and their details.. |
| NFR6 | The system should only grant privileges to modify data within the system to authorized users. |

### 4.4 System Design

System diagrams are diagrams that illustrate the visual model of a system's components and their interactions (Glincy, 2014). Below are the system diagrams that are to illustrate the visual model of the Trackit Employee Workforce system components and their interactions. They include: a use-case diagram, a sequence diagram, a class diagram, an entity relationship diagram and a database schema.

#### 4.4.1 Use Case Diagram

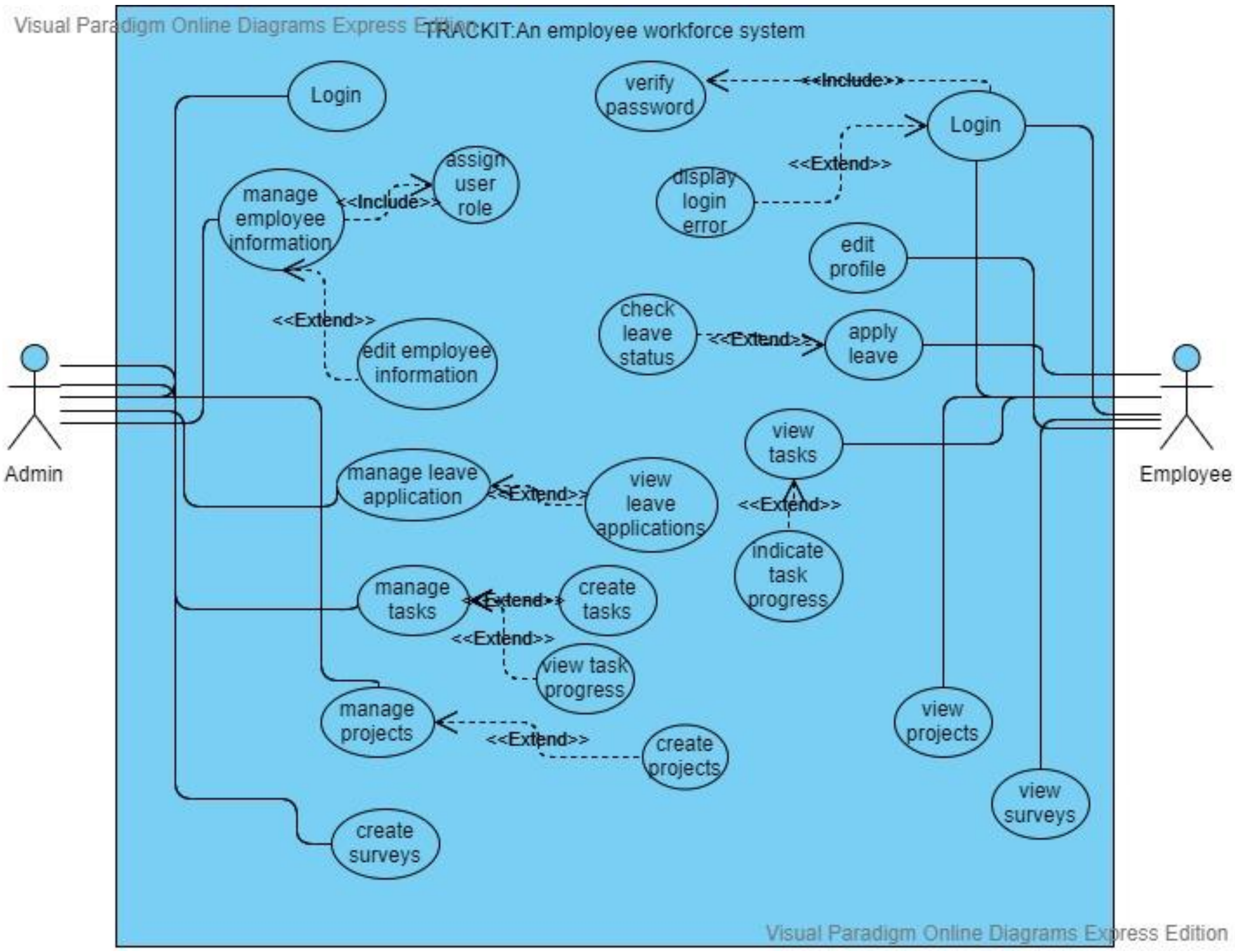


Figure 2 Use case diagram of Trackit

The use-case diagram illustrates the requirements of the various users of Trackit Employee workforce system.

### 4.4.2 Sequence Diagram

The below sequence diagrams illustrate the objects involved during the development of the Trackit Employee workforce system and the sequence of messages exchanged between them so as to fulfill the specified requirements.

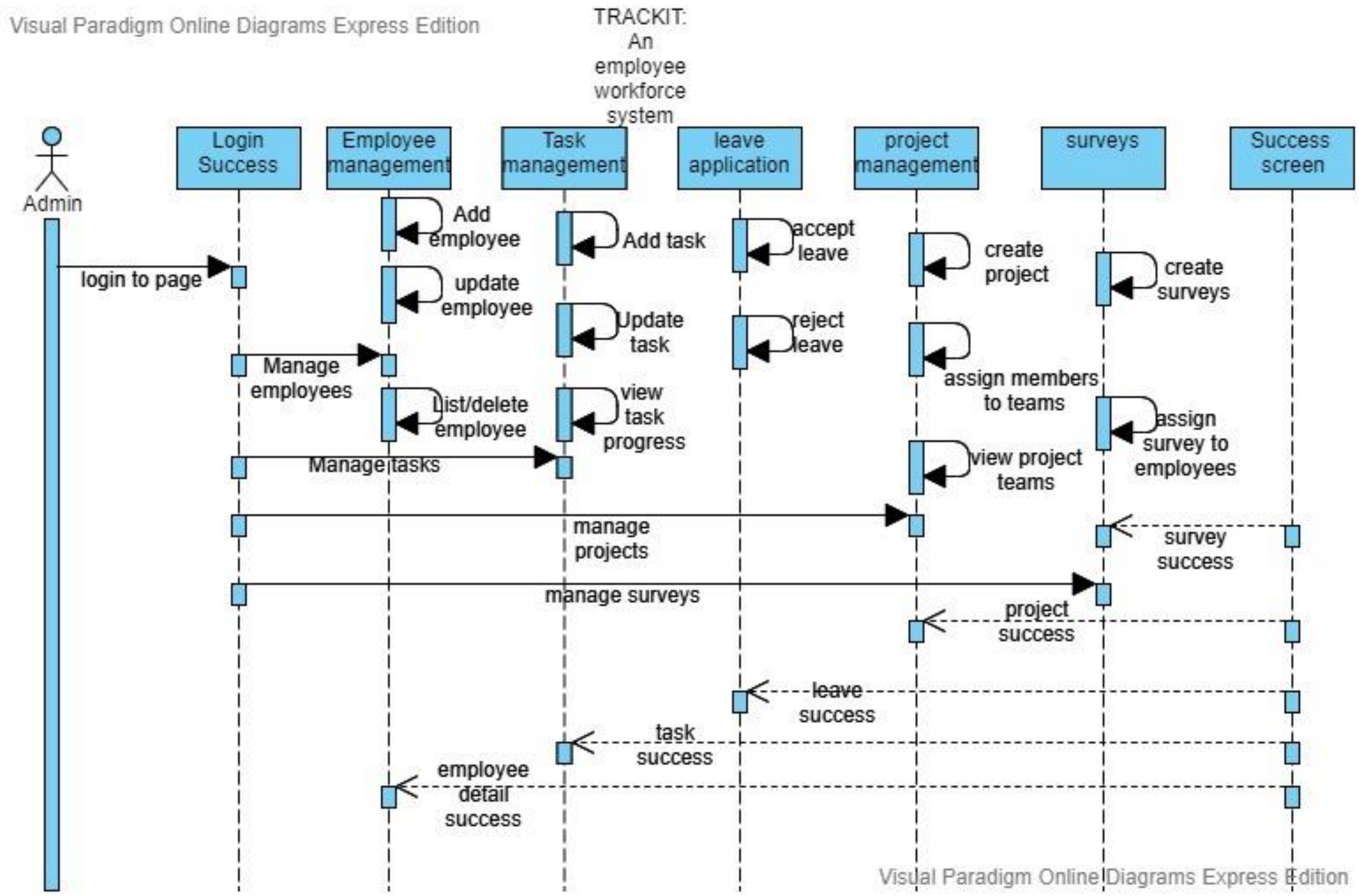


Figure 3 Sequence diagram of Trackit

Employee Sequence diagram

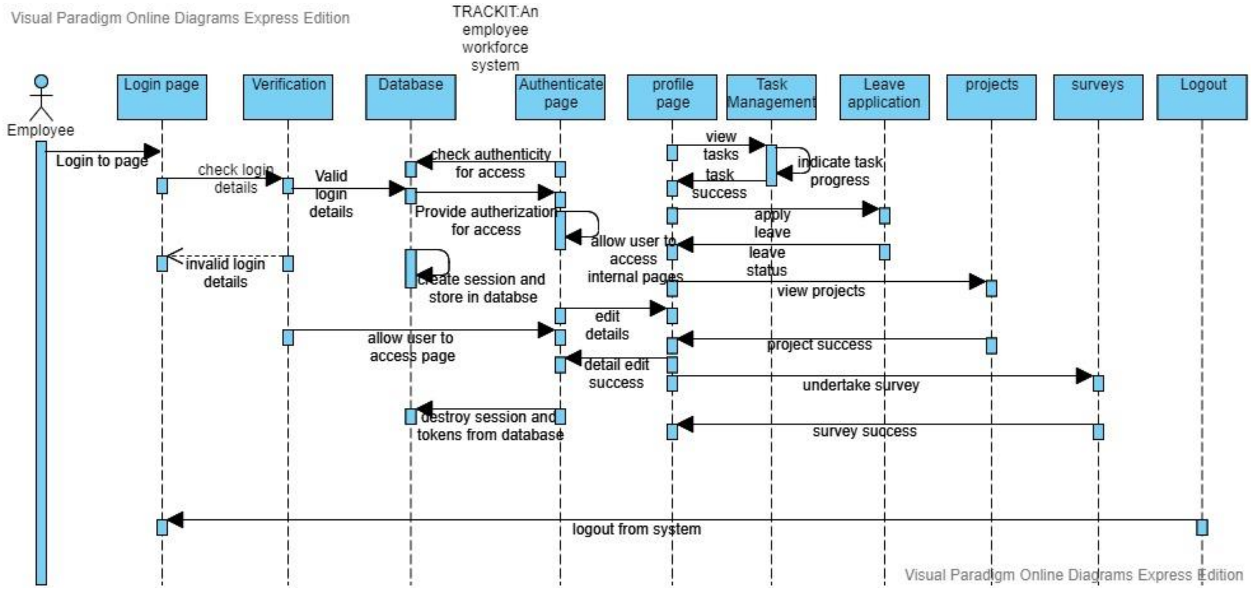


Figure 4 Employee sequence diagram

### 4.4.3 Class Diagram

The class diagram above depicts the classes of controllers and models of the web-based application system.

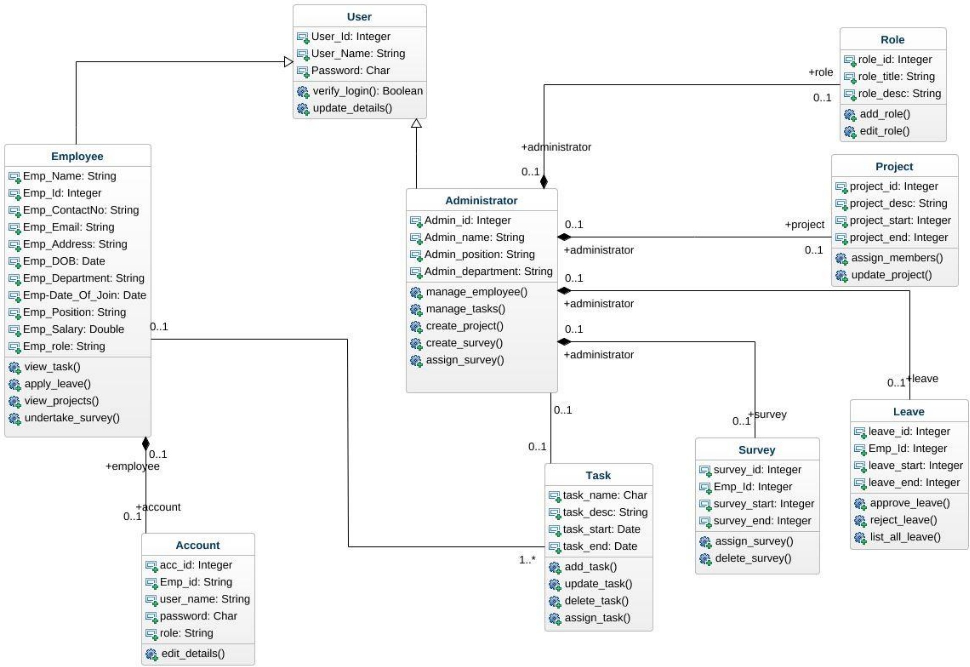


Figure 5 Class diagram Trackit

### 4.4.4 Entity Relationship Diagram

The figure below illustrates the design of the database for the Trackit employee workforce system; the system's entities, their interrelationships and how data is organized in the database.

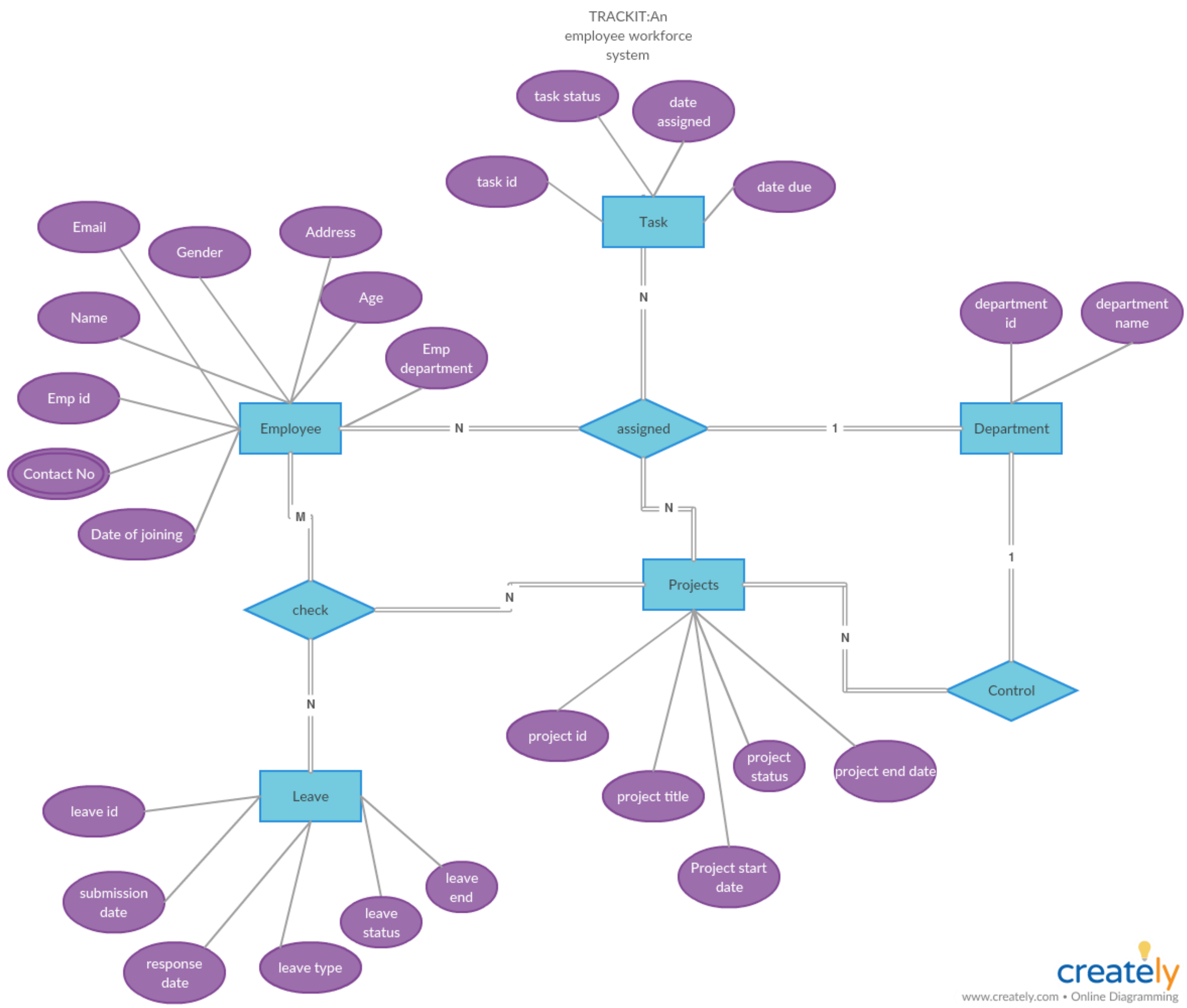


Figure 6 Entity Relationship Diagram Trackit

### 4.4.5 Database schema

The figure below is not only a depiction of the design of the Trackit employee workforce system's database in terms of entities and their interrelationships but also an illustration of the constraints of data stored in the database.

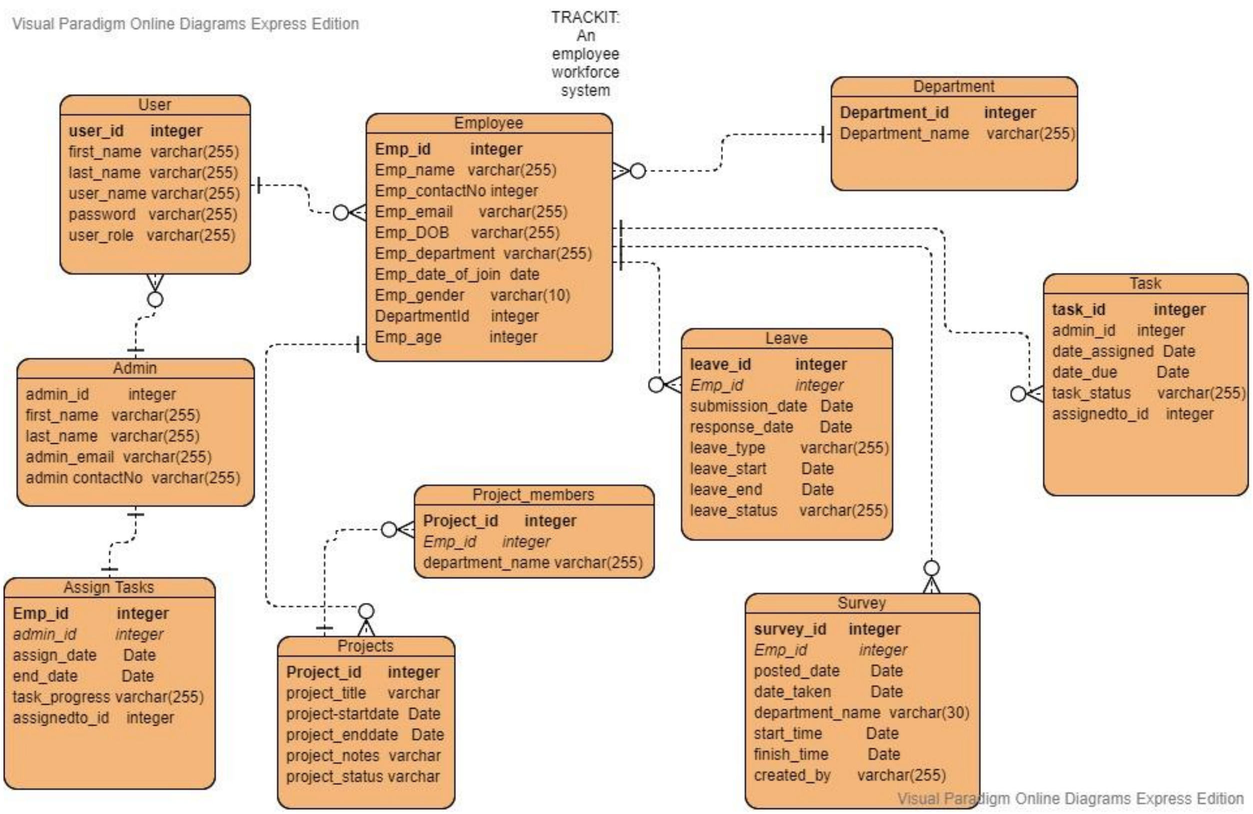


Figure 7 Database schema Trackit

## 4.5 Mockups

### 4.5.1 View leaves mockup

The below figure illustrates the mockup of the web page that is to be accessed by the admins of the company while updating the status of the leave applications.

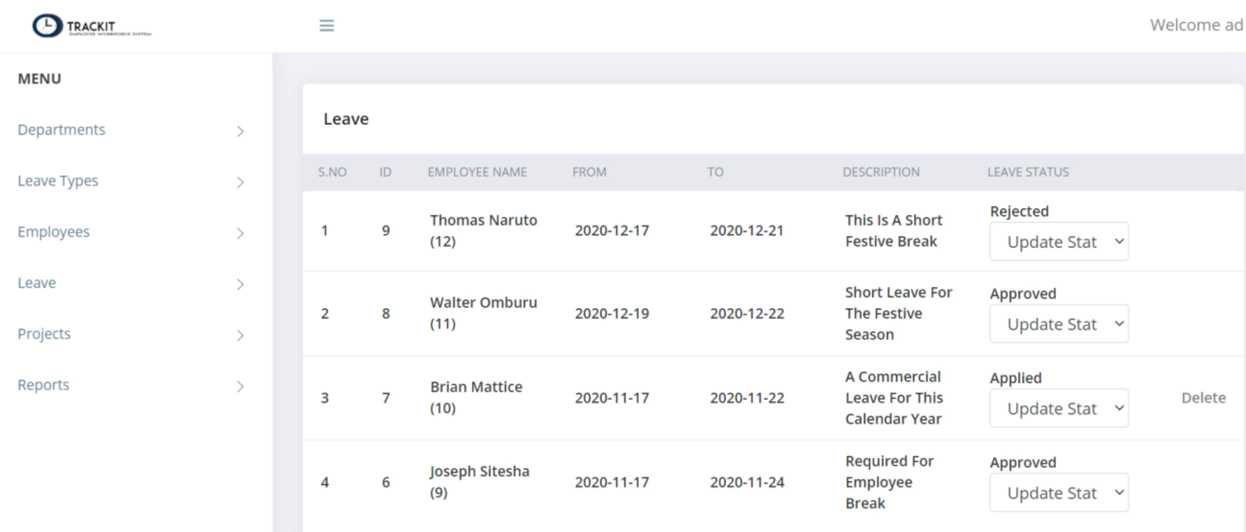


Figure 8 Update leave status

4.5.2 Apply leave mockup

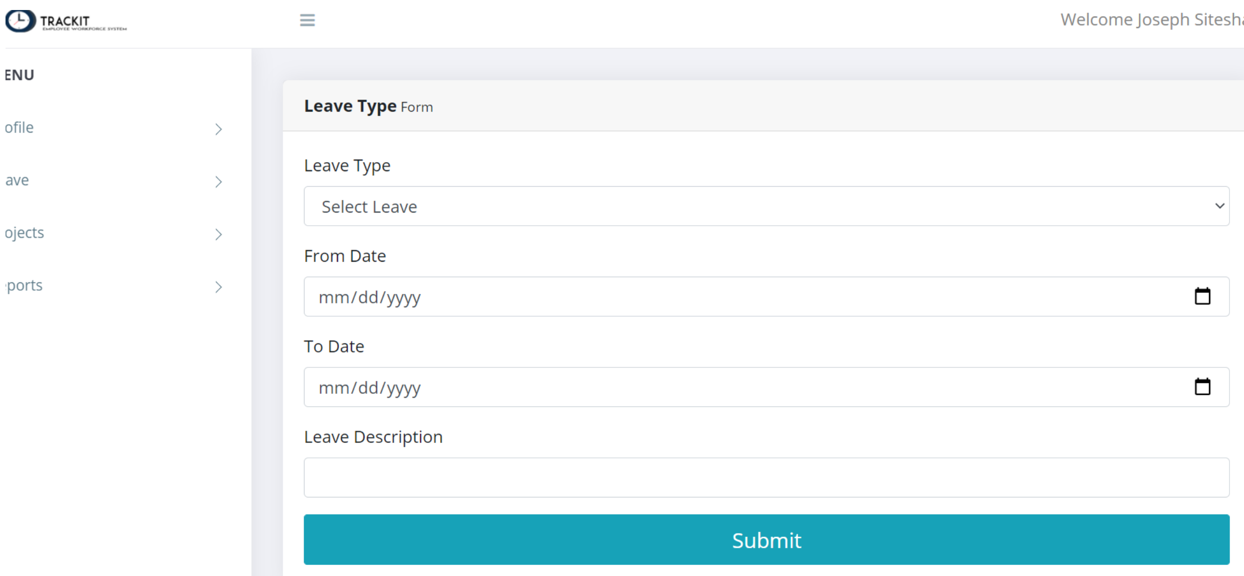


Figure 9 Apply leave

4.5.3 Employee details mockup

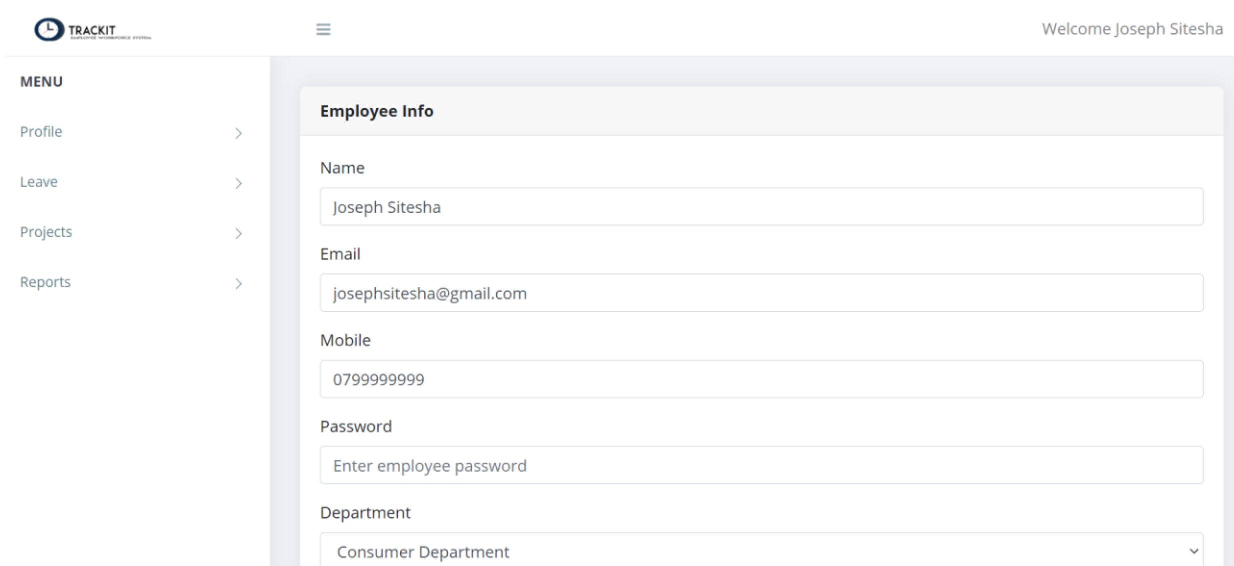


Figure 10 Employee details

## Chapter 5: System implementation and testing

### 5.1 Introduction

For the purpose of the system construction this chapter seeks to cover more on what the system entails and what is the purpose of various sections of the system. It will also focus on the system testing and where the different sections of the system have truly succeeded or not. This chapter aims at detecting system failures so that defects can be discovered before the system is fully implemented in the society. We must implement the system to know if it truly works as expected and test on whether it can handle a task no matter how it comes to the system.

### 5.2 System implementation

At the start of the system development, there was the observation and identification of the different actors that will take part and will be involved directly in using the system. The main actors identified at the start of the system development are the manager and the employees themselves. The database admin is another actor in charge of the system as a whole and making sure that the database is under proper maintenance. The next stage of the system development was identification of the different modules that will be of greater importance to the different actors in the system and putting in mind that the two main actors will have different modules that they will fully interact with at different levels. The most important activity for the employees will be the application of leave and viewing the status of their individual leave applications. Updates and deletion of leave applications will be done by the manager for the purpose of maintaining the integrity of the system. The construction and development of the system was done using PHP and HTML due to the fact that it is a website and thus will be easy to come up with the system using the above mentioned languages. The different types of design diagrams make it easy to identify how the system will work and also makes it easy identify the process flow of information throughout the system thus proving very helpful to the developer. Business requirements were earlier identified and were structured into the system. Using the proposed system development methodology, it proved easy and more applicable to develop the system by prototyping and developing each module at a time. On completion of the different module development they were later linked to come up with the system as a whole. In the process of linking the different modules it was important to maintain the logic of the system in that it was of essence to make sure that modules link together in a manner that is understandable and consistent. This means that on the click of a button the button should redirect to the next stated page and not a page that previously came before it. To begin with, there was the development of the CRUD functionality in that there was the division of the different aspects of CRUD that was to be done by the different actors of the system. The employee side that was developed was the retrieve for them to see their applications. For the overall system manager, they will be able to update, view and delete leave applications.

### 5.2.1 System Implementation

a) Login

For authentication the following was used to enhance a secure login experience for the user.

login.php

```php
<?php
require('db.inc.php');
$msg="";
if(isset($_POST['email']) && isset($_POST['password'])){
    $email=mysqli_real_escape_string($con,$_POST['email']);
    $password=mysqli_real_escape_string($con,$_POST['password']);
    $res=mysqli_query($con,"select * from employee where email='$email' and password='$password'");
    $count=mysqli_num_rows($res);
    if($count>0){
        $row=mysqli_fetch_assoc($res);
        $_SESSION['ROLE']=$row['role'];
        $_SESSION['USER_ID']=$row['id'];
        $_SESSION['USER_NAME']=$row['name'];
        header('location:index.php');
        die();
    }else{
        $msg="Please enter correct login details";
    }
}
?>
```

Figure 11 Login code

b) Database Connection

This was the script used in connecting the database with the application.

```php
db.inc.php
<?php
session_start();
$con=mysqli_connect('localhost','root','','leave_management_system');
?>
```

Figure 12 Database connection

c) Add Employees

This module allows the administrator to add employees to the system. Here he can be able to add and update the employee details including name, email, mobile, address, department and birthday.

```php
employee.php
<?php
require('top.inc.php');
if($_SESSION['ROLE']!=1){
    header('location:add_employee.php?id='.$_SESSION['USER_ID']);
    die();
}
if(isset($_GET['type']) && $_GET['type']=='delete' && isset($_GET['id'])){
    $id=mysqli_real_escape_string($con,$_GET['id']);
    mysqli_query($con,"delete from employee where id='$id'");
}
$res=mysqli_query($con,"select * from employee where role=2 order by id desc");
?>
<div class="content pb-0">
                <div class="orders">
                    <div class="row">
                        <div class="col-xl-12">
                            <div class="card">
                                <div class="card-body">
                                    <h4 class="box-title">Employees </h4>
                            <h4 class="box_title_link"><a href="add_employee.php">Add Employee</a> </h4>
                                </div>
                                <div class="card-body--">
                                    <div class="table-stats order-table ov-h">
                                        <table class="table ">
                                            <thead>
```

Figure 13 Add employees source code

d) Dashboard/ departments

This is the code for the screen which a user will see immediately after logging in to the system. This is a list of all the departments in the company.

index.php

```
<?php
require('top.inc.php');
if($_SESSION['ROLE']!=1){
    header('location:add_employee.php?id='.$_SESSION['USER_ID']);
    die();
}
if(isset($_GET['type']) && $_GET['type']=='delete' && isset($_GET['id'])){
    $id=mysqli_real_escape_string($con,$_GET['id']);
    mysqli_query($con,"delete from department where id='$id'");
}
$res=mysqli_query($con,"select * from department order by id desc");
?>
<div class="content pb-0">
            <div class="orders">
               <div class="row">
                  <div class="col-xl-12">
                     <div class="card">
                        <div class="card-body">
                           <h4 class="box-title">Department </h4>
                     <h4 class="box_title_link"><a href="add_department.php">Add Department</a> </h4>
                        </div>
                        <div class="card-body--">
                           <div class="table-stats order-table ov-h">
                              <table class="table ">
                                 <thead>
                                    <tr>
                                       <th width="5%">S.No</th>
                                       <th width="5%">ID</th>
                                       <th width="70%">Department Name</th>
```

Figure 14 Dashboard department

e) Leave application

This specifies the process and data required for a leave application. It involves pulling employee data from the database as well as also pulling departments data from the database which clearly shows the department which that specific employee is from.

leave.php

```
<?php
require('top.inc.php');

if(isset($_GET['type']) && $_GET['type']=='delete' && isset($_GET['id'])){
    $id=mysqli_real_escape_string($con,$_GET['id']);
    mysqli_query($con,"delete from `leave` where id='$id'");
}
if(isset($_GET['type']) && $_GET['type']=='update' && isset($_GET['id'])){
    $id=mysqli_real_escape_string($con,$_GET['id']);
    $status=mysqli_real_escape_string($con,$_GET['status']);
    mysqli_query($con,"update `leave` set leave_status='$status' where id='$id'");
}
if($_SESSION['ROLE']==1){
    $sql="select `leave`.*, employee.name,employee.id as eid from `leave`,employee where `leave`.employee_id=employee
}else{
    $eid=$_SESSION['USER_ID'];
    $sql="select `leave`.*, employee.name ,employee.id as eid from `leave`,employee where `leave`.employee_id='$eid'
}
$res=mysqli_query($con,$sql);
?>
<div class="content pb-0">
            <div class="orders">
               <div class="row">
                  <div class="col-xl-12">
                     <div class="card">
                        <div class="card-body">
                           <h4 class="box-title">Leave </h4>
                            <?php if($_SESSION['ROLE']==2){ ?>
                           <h4 class="box_title_link"><a href="add_leave.php">Add Leave</a> </h4>
```

Figure 15 Leave application code

### 5.3 System testing

This section aims to focus a lot on the system and what it does. It will majorly focus on the system testing and whether the system has succeeded or not. This section also aims to detecting system failures and the detection of defects that can be discovered before the system is fully implemented into its intended environment.

| Test ID | Related requirement | Inspection check | Precondition | Test data | Priority level |
|---|---|---|---|---|---|
| **T1** | FRQ1 | Does the system allow manager to sign in and data saved in the database | The admin of Trackit system, that is the manager, should be able to sign into the system. | First name: admin<br>Last name:<br>Email: admin@gmail.com<br>Password: ***** | Medium |
| **T2** | FRQ2 | Does the system allow authorized (registered) users to log in | The employees should be able to login if and only if they have the correct credentials | Email: Patrickmuiruri@Gmail.Com<br>Password: ******* | High |

| | | | | | |
|---|---|---|---|---|---|
| **T3** | FRQ3 | Does the system allow the viewing of leave appplications? | After logging in the user should be able to see the leave application dashboard | First Name: Patrick<br>Last Name: Muiruri<br>Email: Patrickmuiruri@gmail.com | Very High |
| **T4** | FRQ4 | Does the System allow users to apply for leave | The employee should be able to view the leave application after clicking on the leave menu | Employees can view and apply for leave applications | medium |

| | | | | | |
|---|---|---|---|---|---|
| **T5** | FRQ5 | Can the manager of the system able to view employees? | The admin should be able to view the registered employees | Employee list can be viewed by the manager/admin | high |
| **T6** | FRQ6 | Does the system allow for the manager to update leave application | The manager should be able to update the leave application details. | Manager can update leave application information | High |
| **T7** | FRQ7 | Does the manager have capability of deleting leave applications | The manager after logging in should be able to delete leave applications | Manager has the capability to delete leave applications after logging in successfully. | medium |

## Chapter 6: Discussion, conclusion and recommendations

### 6.1 Introduction

This chapter is going to cover on the system and what the system has been able to achieve at the end of its completion. There will also be the coverage on what the system was not able to achieve and make recommendations on future works that can be achieved by similar systems that aim to solving the same problem as Trackit. Discussion will particularly involve the formation of the system as whole and cover in summary of all aspects and activities that were undertaken in the formation of the system. Discussion will be on the system modules and what the different modules are able to do so far in the completion of the project. We will also be able to analyze the system developed and summarize on the data collected. On the recommendation, this will entail future suggestions on other tasks that can be achieved by the system in future or that can also be achieved by similar systems that aim to solve the same problem as the current system. This will help the current and future developers know of what areas to cover in future. Conclusion will be on conversing and stating what the system has been able to accomplish as per its completion and will also cover on the termination of the system development as a whole. This will also mark the final stage of the system completion by confirming and clarifying that the system development has come to the end of it construction as per the developer’s knowledge.

### 6.2 Discussion

As mentioned before this section will entail an analysis of the developed system and probe of the system as well. The developed system as of its completion can be used by the two main actors of the system in this case having two modules of the system. That is the customer module and the manager module who have their different tabs and functionalities depending on who is who. The customer will be the employee of the company using this system. On the side of the customer module the customer is able to login into the system after being registered by the manager and being issued with a password that they are going to use logging in to the system with their email address as well. The customer is also able to make a leave application using the form that is readily available in the system and is also advisable that they confirm the leave application before submitting it since update can only be done by the manager themselves. The customer is also able to view their leave application after applying for that leave application. The viewing of the leave application also shows the status of the already applied leave in that is the leave application accepted, rejected or pending. They are thus able to view their leave progress.

For the manager module some functionalities on the manager's side depends on the activities carried out by the customer. The manager is able to add/sign up a member into the system for the customer to later be able to login into the system using their credentials. The manager is also able to view all the registered employees and see their registered credentials. After a leave has been applied by the customer from their side the manager can also view the application from their side and view all the leave applications as well. Update of the leave applications can only be done by the manager of the system who is the only person with the access of updating the leave applications. The manager is also able to delete leave applications that were previously done, and changes made that led to this action of deleting the application. The manager is also able to delete an existing employee of the company from the system.

As per the completion of the system it is reasonable to comment that the main purpose of the system, that is leave application has been accomplished and the different actors can perform their tasks independently on their specific sides.

Upon the completion of the data collection, it was found out that with such a system it is very possible to apply a leave through the system. Data also showed that with such a system a lot of time is saved for both the customer and the manager who use the system. That instead of the employee travelling and saving time to go and view the status of his leave application, they are able to view the leave status through the system. Data also showed that is hard and not an easy task to deal with hard copy documents for leave applications in that it is quite easy for both the customer and the manager to lose the hard copy forms.  In the development process of the system there were aspects of the leave application process that were found out and the different requirements that are needed for a leave to be accepted and classified as worthy for application. There was the identification of the different leave types that a customer can apply from the system. For instance, the different types of leaves that exist include the annual leave, festive leave, sick leave etc. that have different requirements while applying for them. The different criteria for leave application was also identified that there are maximum time periods that a customer has to fulfil for the them to qualify for a leave application and the time may also vary depending on the leave being applied. The system also achieves independency in that while using the system the two actors of the system work independently of each other.

### 6.3 Conclusion

For the purpose of a leave application there are different requirements that must be fulfilled by the customer applying for the leave. For instance, the customer must provide start date, end date and details of which leave the employee is going to take.

The customer will be able to apply for a leave application depending on their specific preferences and the terms agreed with by the manager. Though they should be first registered into the system to be able to apply for a leave. After the application of a leave the employee will be able to view how he applied the leave and the details they provided while applying for the leave after which they will able to view the progress of the leave they applied for. For the purpose of a leave application there are different aspects and requirements that must be fulfilled and considered for one to fully receive a leave. He or she should be a permanent member of the company. There are also different considerations that the manager checks out to confirm an employee for a leave application. The leave application through the system has been made easier in that the customer will be able to apply for a leave within the comfort of their home or workplace and be able to monitor on the progress and status of the leave just by logging into the Trackit system. After the leave application the manager is able to view the details provided for the leave application. Leave application can also be updated by the manager to suit the requirements for the leave and can be seen by the customer from their side.

### 6.4 Recommendation

For the system to fully function as expected, there should be interaction between the customer module, manager module and the database that is used for the purpose of storing data for the company which is using Trackit workforce system. This interaction makes it easier to monitor data in this case being the leave application itself. The customer and manager modules are connected though not directly, through the database that has the same data being viewed by both modules of the system.. The customer is able to insert this data into the system through applying for a leave and the manager is able to view and adjust this data according to the required format provided by the system.

For future endeavors it will be more effective and better if the employee is able to automatically select a leave date and system is able to calculate how many days of leave the employee is left with for the entire year. As mentioned earlier the systems full functionality is facilitated by the interaction that exists between the employee and the manager. The technical aspect that makes this happen is through the database and the table that are used by both actors.

### 6.5 Future work

Trackit is a functional system as per the leave application process, but a lot of aspects and functionalities of a Workforce system like time tracking and project management can be added into the system by future developers. The system can be improved in a way that makes it possible for the employee to automatically view his remaining leave days as well as project management and communication with the management through platforms such as surveys. The system will be able to track employee progress as well as have a self-service portal which will enhance the productivity in the company and save the managers time.

To make the system more secure there could be the use of sessions that times out a user after a long inactivity period and prompts them to login again and get back to their task that they had earlier started. This will greatly facilitate the authentication process for the system and avoid future attacks by hackers into the system.

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