ONLINE EMPLOYEE LEAVE MANAGEMENT SYSTEM

CASE STUDY: MEDITEX COMPUTER SOLUTIONS, MBALE CITY

BY

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A PROJECT REPORT SUBMITTED TO THE FACULTY OF SCIENCE AND EDUCATION FOR THE STUDY LEADING TO A PARTIAL FULLFILMENT OF THE REQUIREMENTS FOR THE A WARD OF THE DEGREEOF BACHELOR OF INFORMATION TECHNOLOGY OF BUSITEMA UNIVERSITY.

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DECLARATION

I OUNDO AMOS a student perusing a bachelor's degree in Information Technology at BUSITEMA UNIVERSITY ,Faculty of science and education Nagongera campus ,declare that the report is my own unaided work.it is being submitted in partial fulfilment of the above mentioned subject .it has not been submitted before for any degree or examination at any University

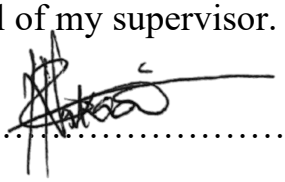
Signature: .....

Date: 15th - 01 - 24

Name: OUNDO AMOS.

Approval

This project has been submitted to Busitema University, Nagongera Campus with the approval of my supervisor.

Signature…  …….. ……

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Name: DR. NAKASI ROSE

Abstract

This report presents a comprehensive study on the implementation and impact of an online employee leave management system within an organization. The research focuses on the significance of transitioning from traditional, manual leave management processes to a technologically advanced, web-based system.

The study employs a mixed-methods approach, combining qualitative and quantitative data collection methods. Qualitative data is gathered through interviews and surveys with employees and directors, exploring their experiences and perceptions of the online leave management system. Quantitative data involves the analysis of leave-related metrics, such as approval times and overall system usage.

Key findings underscore the system's positive impact on organizational efficiency, reducing administrative burdens associated with manual paperwork and approval processes. Employee satisfaction is notably improved, attributed to the system's user-friendly interface, accessibility, and streamlined leave request workflows. The study also highlights the system's role in ensuring compliance with labor laws and internal policies, minimizing errors, and providing accurate record-keeping.

Furthermore, the report examines into the system's contribution to data analysis and reporting capabilities, showcasing how organizations can leverage leave-related data to make informed workforce management decisions. Cost savings and scalability aspects are explored, emphasizing the economic benefits and adaptability of the online leave management system in the face of organizational growth. The findings affirm that the adoption of an online employee leave management system has far-reaching implications for modern workplaces, aligning with the changing nature of work and supporting employee well-being. The study concludes with recommendations for organizations considering the implementation of such systems for optimal performance and ongoing improvement.

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I express my deepest gratitude and appreciation to all those who contributed to the successful completion of this project .Their support, insights, and dedication have played a crucial role in making this endeavor possible. First and foremost, I extend my sincere thanks to Dr Nakasi Rose my project supervisor, for her guidance, encouragement, and invaluable mentorship throughout the research process. Her expertise and constructive feedback has been instrumental in shaping the direction and quality of this study.

I am also grateful to Meditex Computer Solutions for providing the necessary resources and support, allowing me to conduct this research within a real-world organizational context. The cooperation and collaboration of the employees and the directors at Meditex Computer Solutions has been indispensable in gathering data and insights for this study.

Special appreciation goes to all the participants who took the time to share their experiences and opinions through interviews and surveys. Their candid responses have enriched the qualitative aspects of this research, providing a human perspective on the impact of the OELMS.

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Finally, I extend our gratitude to my family for their unwavering support, understanding, and patience during the course of this research. Their encouragement and belief in my abilities has been a constant source of motivation. This project

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LIST OF ACRONYMS

OELMS	Online Employee Leave Management System
MCS	Meditex Computer Solutions
SDLC	System Development Life Cycle
SAD	System Analysis and Design
DFD	Data Flow Diagram
ERD	Entity Relationship Diagram
HTML	Hypertext Markup Language
CSS	Cascading Style Sheet

PHP	Hypertext Pre-Processor
RAM	Random Access Memory
MYSQL	My Structured Query Language
GUI	Graphical User Interface

CHAPTER ONE: INTRODUCTION

1.1: Background of the study

Internship as a program at campus carries huge weight on skilling students and enhancing their knowledge about different aspects of life in the working environment. Therefore each and every student is entitled to this program at university and other study institutions to finish their studies. Internship is a program which students need to go through within a period of time (Stirling, Kerr, and Macpherson (2014). Internship is usually supervised by a supervisor assigned to the student to ensure that everything is handled and assessments are made at the end of the internship period.

Traditionally, managing employee leave has been a time-consuming and complex task involving numerous manual processes, paperwork, and potential errors and there are very few people that would use such a system. However, with the advent of modern technology, organizations can now leverage Leave Management Systems to simplify and optimize this process, saving time, reducing administrative burden, and improving overall operational efficiency.

Information Technology has revolutionized the life of human beings and has made the lives easier by the various kinds of applications. In the light of the rapid changes with the use of IT, there are many tools, technologies and systems that have been produced and invented. In the modern world, time is short so if there are many processes taken place at same time within a place there is a need for integration of all the processes, creation of paperless environment also ensures efficient task management.

Nowadays most of the institutions are shifting to computer based system. "In a world of automation and technology, relying on manual systems is like using a horse and carriage in the age of automobiles" (Ken Robinson)**.** It is increasing the demand among the customer. The Online Employee Leave Management System (OELMS) will make leave management more efficient and easier to handle with its reliable system components. Application of leave in most institutions has been a long process and time consuming since it is done manually hence the data for the current system is easily manipulated and is having challenges to keep track of the records. Some employees have reported that when an application leave is made, the application form gets lost before reaching in the office to the relevant people for approval hence the applicant is made to apply for leave again which is stationery wastage and time.

1.2 Problem statement

Leave management is keeping all the records of leave taken by an employee according to the company leave policy. Using an efficient leave management system is important in a big organization. Leave management system is an automated online stage that circles all sort of leave applications and leave regard, and the system to record various types of leaves (Nurul, 2008). This system can be applied to automate the work process of leave applications and their acceptance. It is straightforward and simple to use a system that dispenses with paper work, spares time and cash. However, the whole process of leave management is manual at Meditex Computer Solutions.

Manual processes, such as paper-based leave requests and spreadsheets, lead to errors and delays and lack of real-time visibility and coordination in managing leave creates scheduling conflicts and affects work continuity. As a result, employee satisfaction and productivity are compromised, while HR spends valuable time on administrative tasks rather than strategic initiatives. "Leave management should be a seamless experience, empowering employees to take the time they need while maintaining work continuity" (Arianna Huffington, 2015).

Consequently, basing on the problems and the challenges, there is need of a modern, online leave management system (OELMS) that fosters transparency, accuracy, and employee well-being, enabling to focus on the core objectives and create a more harmonious and efficient workplace.

1.3 Main objectives

The purpose of the study is to develop an Online Employee Leave Management System that will enable faster and more efficient leave applications amongst the employees and easy leave management for the employers within an organization. This will ease the work of the leave managers or the human resource managers as there will be reduced cumbersome work and loss of the paper work. This will basically define the system's reliability, future trend technologies and objectives.

1:4 Specific Objective

To review the literature and determine the equipment for developing an online employee leave management system

To analyze the requirements for the design of an online employee management system

To design an employee leave management system.

To implement the design of an employee leave management system.

To test the functionality of an online employee management system.

1.5 Significance of the Study

When the OELMS is successfully developed and implemented, the study shall lead to the following significances;

The study is expected to improve the management of leave applications in the company since currently the company is using a manual system to manage leave applications. The system will improve the existing system and be beneficial to the members of staff in the sense that they would not have to apply for leave manually, the authorities in charge of the approval also will not approve /reject leave manually.

The study will also help Meditex computer solutions to solve issues related with employee records.

1.6: Scope of the Study

The study encompasses both server and client-side functionalities, we realize the world is moving fast in aspects concerning ICT and technology at large so both aspects are to be covered in the project. The study was aimed at improving the standards of the employees in leave management. The project will be an online web based system to track leaves of employees and featured with whole approval process of leave approval procedure.

Companies/ organizations are opting for better leave management of their employees through the use of computerized system. This research is to analyze the leave management gap within the organizations involving the employees and the managers.

The employee leave management research was conducted at Meditex Computer Solutions which is located at Naboa Road in Mbale district. This research aimed at improving the leave management department by computerizing the whole leave application process to reduce paper work and loss of leave applications thus increasing transparency and confidentiality among employees.

The main functionalities of the system are leave request submission, leave approval workflow and notifications all these are to enable easy workflow and easy informed decision making among the leave management.

The system will have a user friendly interface that is easy to use for example the login interface with the username and the password. The system will be developed with the PHP language for the server-side, CSS for styling, JavaScript for the responsiveness and HTML for the forms and MYSQL for the database.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

There are various literature reviews trying to give the insights and vast information about the different developed leave management systems and this section provides a brief introduction on the underlying concepts of this project; sufficient background knowledge based on relevant literature reviews of related works and thoughts with respect to the advancement of this project.

The international organizations today are struggling to meet the unexpected business challenges. Organizations should be prepared to respond to the fast changing and highly competitive environment, maintaining standard and meeting stakeholder's expectations (Muduli, 2015). In the last two decades organizations in effort to standing out in the crowd has focused mostly on human resource management practices especially with the rise of strategic human resource management approach (Zehra Alakoç Burma, 2014).

The success of any organization widely depends on Human Resources. Managing Human Resources strategically has become very important for the companies. In today's world HR managers' roles and skills have developed significantly because of the adoption and use of new technologies (JAIN, 2014).

People are one of the basic achievement elements of any business. Unapproved non-appearance, absence of appropriate time/vacation arrangement, fall in profitable hours and so forth influence the efficiency of the company. Uniform application of Leave policies, accurately tracking leave balances leads to greater employee satisfaction and enables organizations to engage employees better. Implementing a good leave management solution will ensure that employees empower their organizations to plan their leaves better. This helps considerably reduce work

interruptions and at the same time reduce the time and effort spent by HR on maintaining accurate leave records (GreytHR, 2013).

At this stage, critical examination is done with respect to other related works that would make Online Employee Leave Management better and current trends of the project. Evaluation is also done on previous systems or existing systems of similar nature enumerating possible features which the current project had identified.

2.2 Online employee leave management system

The purpose of this study is to design a web-based Online Employee Leave system that will assist the company in managing all leave applications, collect reports and evaluated employee leaves.

A similar study was also carried out by Hridita Afsana, which aimed at creating an employee management system in MetLife Bangladesh at BRAC University in 2018. The study was to understand the whole Employee Leave Management process handled by HR department of MetLife Bangladesh. This employee leave management system includes the processes employees use to request time away from work and supervisors use to grant or deny leave based on organization policies.

Quing Rong Lee also carried out a similar study of Leave Management System at Tunka Abdul Rahman University College in 2015 after realizing that the paper based leave management system is inefficient and that the system can cause heavy paperwork that is tedious and hard to maintain. The purpose of the study was to create a Leave Management System that could be used to assist the leave management process of an organization by facilitating processes like apply leave, approve leave, reject leave, view leave transaction and preset leave type.

An online employee leave management system is a digital tool or software designed to streamline and automate the process of managing employee leaves within an organization. It provides a centralized platform where employees can request time off, and supervisors or HR personnel can review, approve, or reject those requests. The system offers various features and benefits to both employees and the organization as a whole.

2.3 Review on Similar Leave Management systems

There are many similar employee management systems that have been developed and implemented however we shall basically look at some three systems that are in place. This section aims at evaluating different software solutions available in the market and compare their features, functionality, and user reviews. The goal of the review is to help organizations find the most suitable leave management system that meets their specific needs and requirements.

The review may consider factors such as ease of use, integration with other HR systems, reporting capabilities, scalability, and customer support. It may also compare the pricing plans and licensing options offered by different vendors to help organizations make informed decisions.

By conducting a review of similar systems on employee leave management, organizations can gain insights into the strengths and weaknesses of different software solutions and choose the one that best fits their organizational structure and employee leave management processes.

Below are some of the similar systems on the market;

2.3.1 PlanMyLeave- https://www.planmyleave.com

PlanMyLeave is an online leave management system designed to scale easily from small and medium businesses to large enterprises. PlanMyLeave offers fully featured flexible multi-location based settings found in enterprise class applications and offers companies a quick way to implement their HR and Leave Management System on the cloud. This results in time and cost savings as well as a rise in productivity of the organization.

Online leave management using PlanMyLeave helps to customize leave types and set up complex leave policies for any type of industry having locations in multiple countries. By automating leave approval process can curtail unexcused absences and contain HR overheads. PlanMyLeave's self-service dashboard offers an easy interface to apply and view leave request status and calendars.

The online staff leave planner allows administrators to set up employee information and leave types and policies easily. Staff leave planning using PlanMyLeave benefits both employers and employees by giving a fair and transparent leave approval workflow and show a calendar view. Employees can view current leave balances, request leaves, view past leave history, and managers can review and approve leave applications on the dashboard.

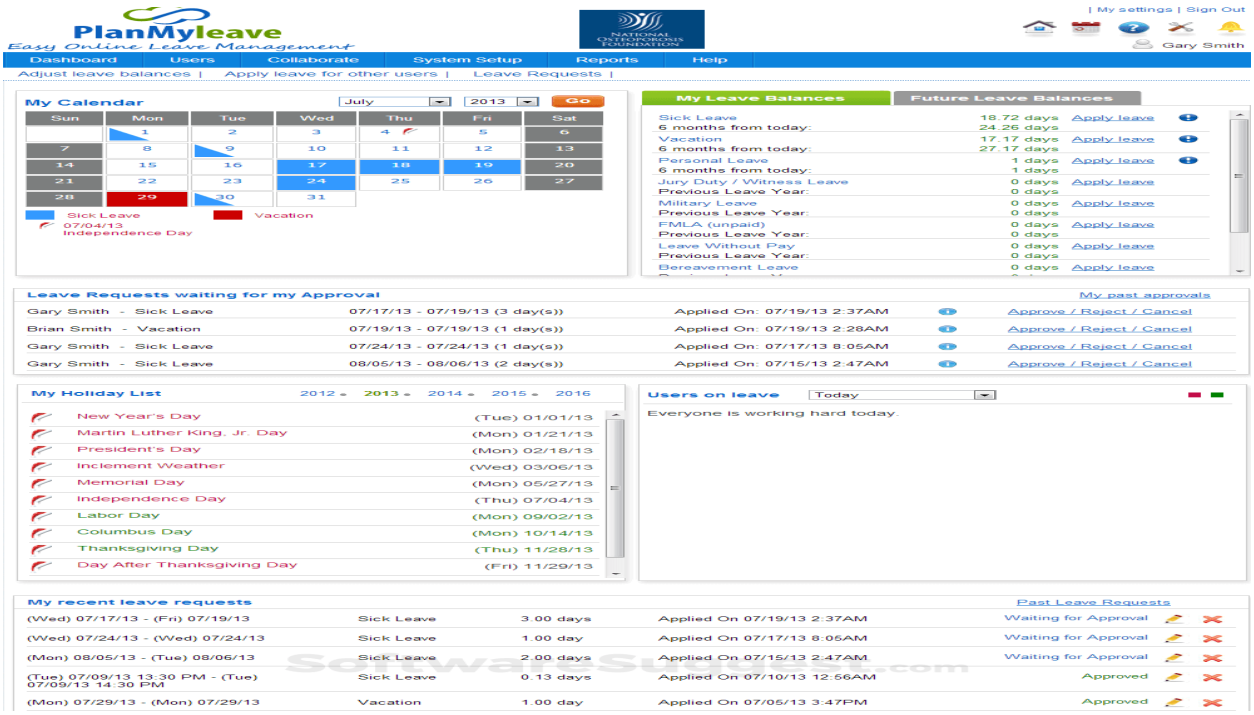


Figure 1Dashboard of planmyleave

2.3.2 Mitrefinch Leave Management System

A fully integrated workforce platform, designed to incorporate many existing business applications. Business will benefit from increased productivity software and greater profitability. Managing employee Leave are organized and full proof method of maintaining control and it is an automated system which eliminates human errors. It provides opportunity for forward leave planning via overview of work landscape and employees can manage and monitor time off requests via a user-friendly interface. It facilitate in HR department via automated email notifications for leave requests. Simple submission and approval process with automatic updating. Present default codes for various categories of paid time off and flexibility to create unlimited customizable time off codes and facilitates easy monitoring and tracking of absences.

2.3.3: Plan leave

Planleave is a comprehensive PTO (pay time off) Tracker, Vacation Tracker, and employee leave management system designed to facilitate seamless tracking and management of leaves or vacations across the organization. With Planleave, teams and managers can effortlessly handle time-off requests and various types of leave, including vacation, sick leave, and bank holidays. The software offers integration with popular communication platforms like Slack and calendar apps such as Outlook, Google Calendar, or your preferred calendar app, ensuring real-time visibility into employee availability. You can stay informed at all times about who's off and effortlessly manage leave schedules.

2.4 Loopholes of the current system

While manual employee leave management systems have been used for decades, they come with various loopholes that can negatively impact an organization's efficiency, employee satisfaction, and overall performance. With advancements in technology, automated leave management systems have become a viable solution to address these challenges, providing centralized data storage, streamlined processes, enhanced security, and real-time insights. By transitioning from manual systems to automated solutions, organizations can improve their leave management practices and create a more employee-friendly work environment.

Meditex Computer Solutions is amongst those businesses that are still dwelling onto the manual leave system which has emerged with various loopholes such as the paper based processes of leave management. Here these documents are prone to errors, getting lost and difficulties to track the leaves.

This system has emerged to have difficulties in proper leave planning, inconsistent approvals all these resulting due to the use of papers which are hard to track and they

tend to easily get lost.in addition , the manual system lacks a centralized database to keep track of all leave reports thus a burden in the leave management sector.

The manual system at Meditex Computer Solution is inaccessible when one is off the company premises, this means an employee only applies for a leave while at the company since he/she has to get a leave application form.

Therefore an employee leave management system addresses these loopholes by providing a digital, streamlined, and centralized solution. It enhances transparency, automates processes, ensures policy compliance, improves accuracy, and offers better analytics and reporting capabilities. Overall, implementing an online leave management system can lead to a more efficient, fair, and organized process for managing employee leaves.

CHAPTER THREE: METHODOLOGY

3.1: Introduction

This chapter shows the different fact finding techniques. That were used such as research design, study area, population of the study, sample techniques, system analysis and system development.

3.2 Study area

The study was conducted at Meditex computer solutions located at Naboa Road in Mbale city, Meditex computer solutions was chosen because it's accessible and it is where I conducted my internship thus identifying the problem within the company leading to study.

3.3 Population and Sampling

The population refers to the entire group of people, events or subjects of interests that the researcher wishes to investigate whereas sampling refers to the process of selecting a sufficient number of elements (sample) from the population. For better data and information collection, a few people (10) were used and amongst these people included the employees from the business and the directors of the business and the data collected was documented for further analysis. The participants were chosen considering many factors such as employment title, age, gender and other dimensions that would benefit the study.

. In this research, ten participants were involved in the study. The executive Directors, two (02) were involved and the other participants came from two focus groups that are the employee(s) and customer(s). A total sample size of five (05) male and nine (3) female participants were involved in the study,

Stratified sampling was used to determine the sample size. Respondents were grouped into strata depending on their respective departments and sampling was

used on the top most level staff. In this sampling, is where sample elements was selected by the researcher depending on the roles played at the organization.

Table 1 sample size of participants

Focus groups	Executive Director	Employee (s)	**Total**
Number of participants	02	08	10
Male	01	05	06
Female	01	03	04
Day	Day 1	Day 2	

3.4 Data collection techniques

The collection of data varied as various methods were put in action to gather the required information and data that helped in the development and implementation of the system. Below are some of the techniques that will be used to gather the data and information.

3.4.1 Interview

Interview technique was used on the board of directors. This method is the commonly used technique especially when one wants to mine factual information concerning a particular subject. It involves an interviewer conversing with the respondent who provides vivid information directed to the interviewer's interest.

The collected data was inspected, transformed, and modeled with the goal of high lighting useful information, suggesting conclusions, and supporting decision in making a system requirements specification document that will be used as input in designing the system.

3.4.2 Written documents

These written documents were used to provide vast information about the various flows and criterion used for one to access or apply for a particular leave type and the acquired data was used in developing the system. These documents were got from the paper works within the organizations and from the internet about various similar leave systems and these provided guidance while developing and implementing the system.

Such documents include reports, forms, memos, organizational charts, which will provide information about the existing system and other information about the existing employee management information systems on the internet.

3.5 Data Analysis and Presentation

The process of analyzing the collected data is a translation of the gathered data by different methodologies through research (Saunders, et al, (2019) and refer gathered data to the literature review to construct the proper results for the research and fulfill the purpose. In this research, the information gathered from interviewees was analyzed by consensus and presented descriptively in verbatim.

The qualitative data collected by interview, document review were analyzed according to the qualitative analysis method. Qualitative analysis is the use of non-quantifiable methods to evaluate investment or business opportunities and make decisions. In qualitative analysis, the data collected is structured in a proper sequence, basing on the method of collection. Categorization for the common data were approached to demonstrate the data in a suitable way for interpretation. Along with the coding process proceeded and the data based on determined themes that clarified the valuable findings of the operated discussions was described.

3.6 System design

In the design phase, the informational, functional, and network requirements identified during the initiation and planning phases were converted into unified design specifications which were used to script programs during the implementation phase. The design tools used were the entity relationship diagram and dataflow diagrams and the following tools were also used; MYSQL to design a database and PHP, HTML and CSS as interface tools for forms.

The Unified Modeling Language (UML), an object-oriented language was used to integrate the architectural and design modules to clarify and specify the working of the system with the help of the UML standards. Furthermore, the requirements specifications from the requirements analysis were studied to prepare the system design which helped in specifying the hardware and software requirements and defined the overall system architecture.

Online Employee Leave Management system (OELMS) has a home page with multiple options allowing the users log into the system. The system has a system administrator who will have the ability to add and manage employees, departments and leaves.

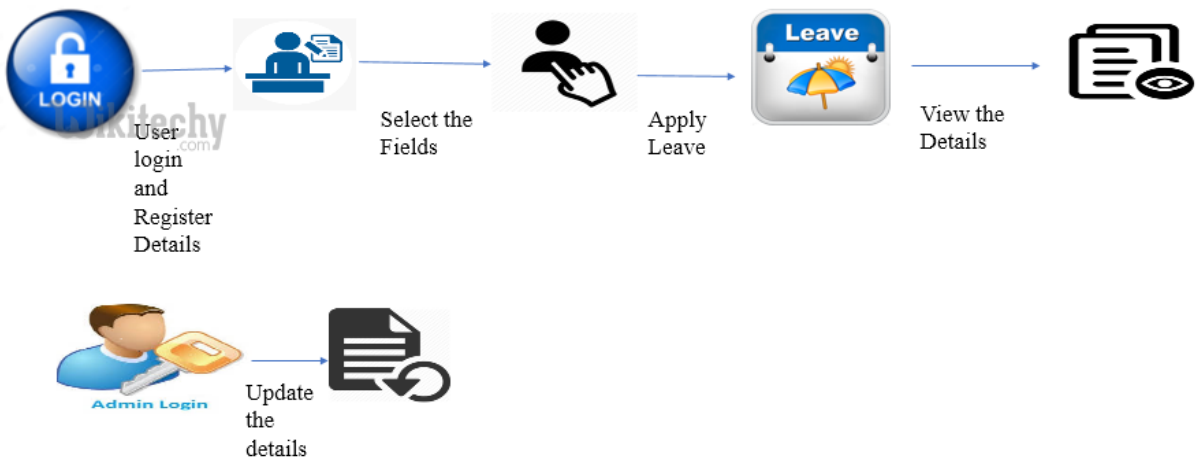


Figure 2 system design

3.7 System testing and validation

For a system to be fully implemented and to ensure appropriate operations, it is subjected or put into testing of all components and when these components integrate, they must make a fully operational system. The hardware and the software are also tested to ensure that the system complies with the required requirements and the functional and system requirements are put into consideration

Validation of the system was done to ensure that data fed into the system satisfied the pre- determined formats and complied with stated length and character requirements including other defined input criteria. For example, a field that requires digits should not allow letters.

For accurate validation, sample data should be into the system to find out if the system is able to respond correctly to the test data fed into the application that is if it is correct or incorrect data.

CHAPTER FOUR: SYSTEM DESIGN AND IMPLEMENTATION

4.1 Introduction

This chapter describes the design issues, structural layout of the data flow, software analysis requirements specification, design and implementation of the system. It also includes system architecture, context diagram Data flow Diagram, ERD and User Case Diagram.

Throughout this section, detailed description will be given for the implementation of the Leave Management system. It was implemented and designed using HTML/XHTML, design based on Cascading Style Sheets and using MS SQLServer as the database.

4.2. Current System study and Analysis

The study was carried out at Meditex Computer Solutions, Mbale. The main purpose of the study was to find out the challenges faced by employees while applying for the leaves. It involved studying the existing system to identify its strength and weakness. The information acquired from the study was done by employing a number of data collection tools including questionnaires and an interview guide where the questionnaires were analyzed to give the basis to design a new system. During the research study, I interviewed, observed and administered questionnaires to Meditex workers and found out that they get hard time when it comes to store, manage and retrieving information of employees.

At Meditex computer solutions, the current leave management system is a manual file-based system managed by the Directors as the top administrators. This kind of system has been into existence for about five years now.

When an employee wants to get a leave, he/she writes a leave letter into two copies to the director including the leave type and the leave period. The director from this point reads through the letter, he either decides to reject or approve the leave. The letter is then sent back to the respective employee and a copy is filed into the director's office for record keeping.

4.3 Strength of the current system

The current employee leave system at Meditex Computer Solutions gives employees the chance to interact with the directors physically thus explaining their problems in details.

This manual system does not rely on technology infrastructure, making it less susceptible to technical glitches, server downtimes, or compatibility issues since physical papers are used.

It does not require specific skills and knowledge in the field of ICT to apply for a leave with this system.

4.4 Weaknesses of the current system

The leave management system, while simple, can have several weaknesses that may lead to inefficiencies, errors, and challenges for both employees and management. Some of these weaknesses associated are as follows;

The manual process is prone to human errors, including miscalculations, data entry mistakes, and misinterpretation of leave policies thus resulting in inaccurate leave balances and misunderstandings.

With this system, information is only accessed physically making it challenging for employees and managers to access and update leave data outside of the workplace or during non-office hours.

Manual leave requests and approvals experience delays due to the time it takes for paperwork to move through the approval chain. This can lead to scheduling conflicts.

The leave system at Meditex lacks real-time visibility into leave balances and approvals. Employees do not have immediate access to their current leave status, leading to confusion and the potential for leave overlaps.

4.5 System requirements

The purpose of this section is to highlight on the implementation environment of the system. This covers the hardware and software environments for the implementation phase of the system design and development. A top-down design approach will be used in structuring the program. The system consists of modules and sub-modules which are linked up to facilitate easy flow of data

Table 2 showing system users and their respective requirements

System User	Summary	Requirements for each user
Director/Manager	The manager registers the different employees into the system, he manages the entire activities within the system	Login, register employees, view records, approve and reject leave applications.
Employee	The employee is a worker at the business and is expected to apply for a leave in case of need.	Login, apply leave, view dashboard, view basic information and logout

Table 3 hardware system requirements

Hardware	**Minimum system Requirement**	**Optimal requirement**
Processor	Intel,Pentium,AMD,Intel Celeron	Intel Pentium 4
Memory	512MB RAM	1 GB RAM
Disk Space	4GB	10GB
Bandwidth	10Mbps	100Mbps

Table 4 software system requirements

Software	Minimum system requirement
Operating system	Windows XP, Windows 7,8 and 10
Web server	Wamp server
Web browser	Mozilla Firefox, Chrome or Opera
Scripts	JavaScript and CSS
Database Management System	MYSQL

4.5.2: Functional requirements

Specific features and capabilities that a system must meet are described at this and the system's intended purpose. In this case, the functional requirements include features related to managing, and processing employee leave requests and some of the functional requirements of the built system include;

The system should provide secure user authentication, ensuring that only authorized personnel can access the system. Different user roles (employees, managers, administrators) should have specific permissions.

Employees should be able to submit leave requests through the system, specifying the type of leave, start and end dates, and any relevant comments or attachments.

The system should support a workflow for leave approval, allowing managers to review and approve or reject leave requests.

The system should have a visual calendar to display the leave schedule for individual employees and the team, providing an overview of approved and pending leave.

Employees and administrators should have access to a leave history, detailing past leave requests and approvals. The system should generate reports on leave utilization, trends, and other relevant analytics.

The system should send automated notifications to employees and managers at various stages of the leave request process, including request submission, approval, and any changes to the request.

The system should provide an employee self-service portal, allowing individuals to view their leave balances, submit requests, and access relevant information without administrative assistance.

4.5.3 Non- functional requirements

Non-functional requirements specify criteria that are not directly related to the functionality of the system but are crucial for its overall performance, usability, and reliability. And below are some of the non-functional requirements of the system.

The system should have a high performance in the response time in user request time frame.

The system should handle an increasing number of users and leave requests without a significant degradation in performance.

Availability of the system should be observed at all times, the system should be available for use at least 99% of the time, allowing for scheduled maintenance and downtime.

The system should have a high security mechanism such as data encryption during transmission and storage.

The system should have an intuitive and user-friendly interface, minimizing the need for extensive training.

The underlying database should scale to accommodate increasing data volume.

The user interface should be responsive and usable on various devices, including smartphones and tablets.

4.6: Architecture.

The system was created using entity framework and ASP.NET, with this framework it is able to create a web application that provides an interface to an existing database. ASP.NET automatically generates code that enables users to display, edit, create, and delete data that resides in a database table.

The ASP.NET Framework comes with advantages such as making it easier to manage complexity and it provides better support for test-driven development (TDD).

Employee Leave Management system is a web based system thus the architecture involves content, web browser and the database.

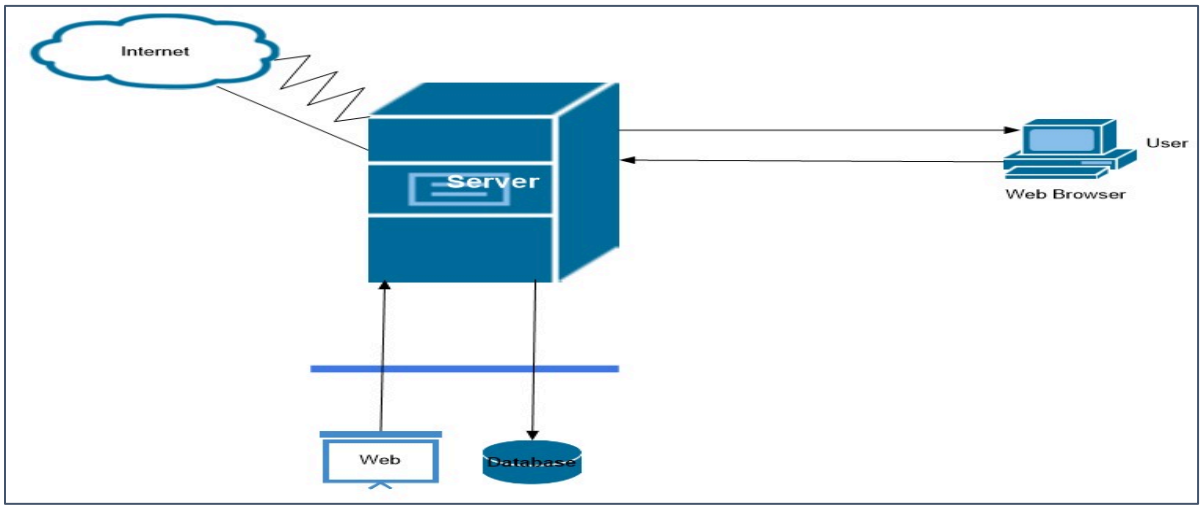


Figure 3: System architecture

4.6.1 CONTEXT DIAGRAM.

In the development and implementation of the OELMS, a context diagram was developed to provide visual representation and an overview of a system and its interactions with external entities. It is a high-level diagram that helps in understanding the boundaries and scope of the system. In the context of an Online Employee Leave Management System (OELMS), a context diagram illustrated how

the OELMS interacts with external entities such as, employees and the administrators.

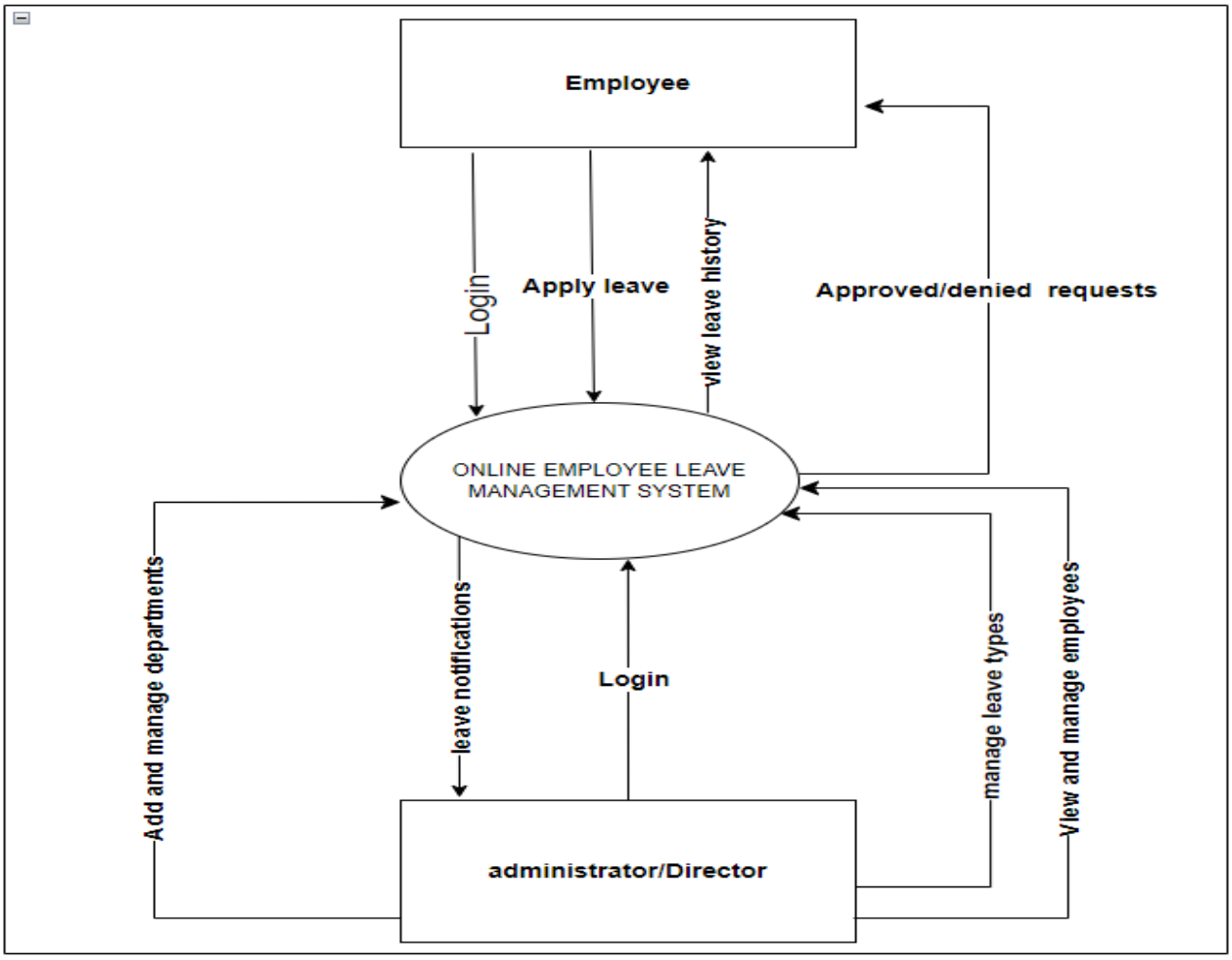


Figure 4: Context diagram

4.6.2 USE CASE DIAGRAM.

A use case diagram was sued for a visual representation to illustrate the interactions between different actors (employees and directors) and the system under consideration. In the context of an Online Employee Leave Management System (OELMS), a use case diagram helped identify and clarify the various functionalities or use cases that the system supports. Below is an illustration of the use case diagram.

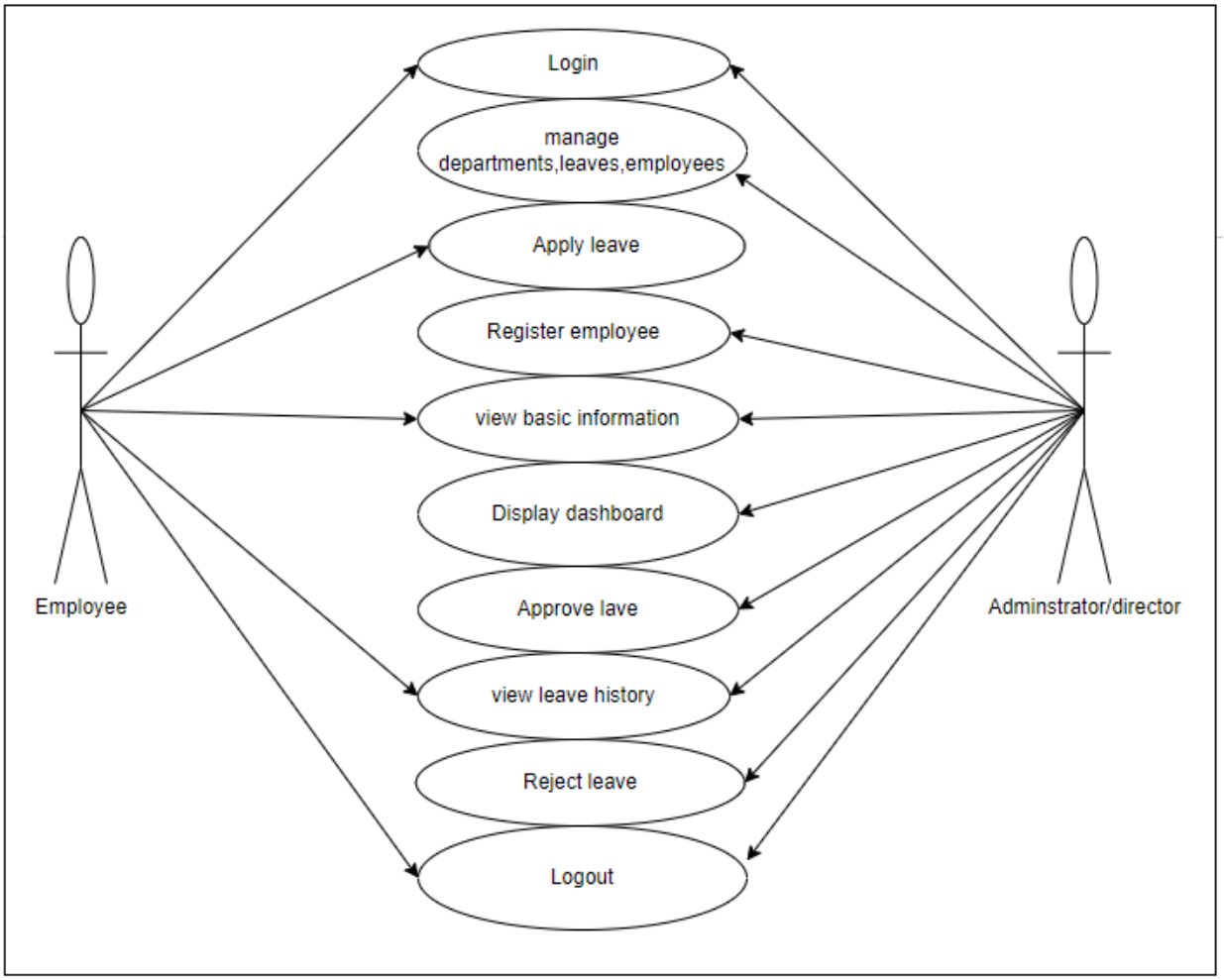


Figure 5 Use case diagram

4.6.3: ENTITY-RELATIONSHIP DIAGRAM.

The different entities and their relationships are described at this level

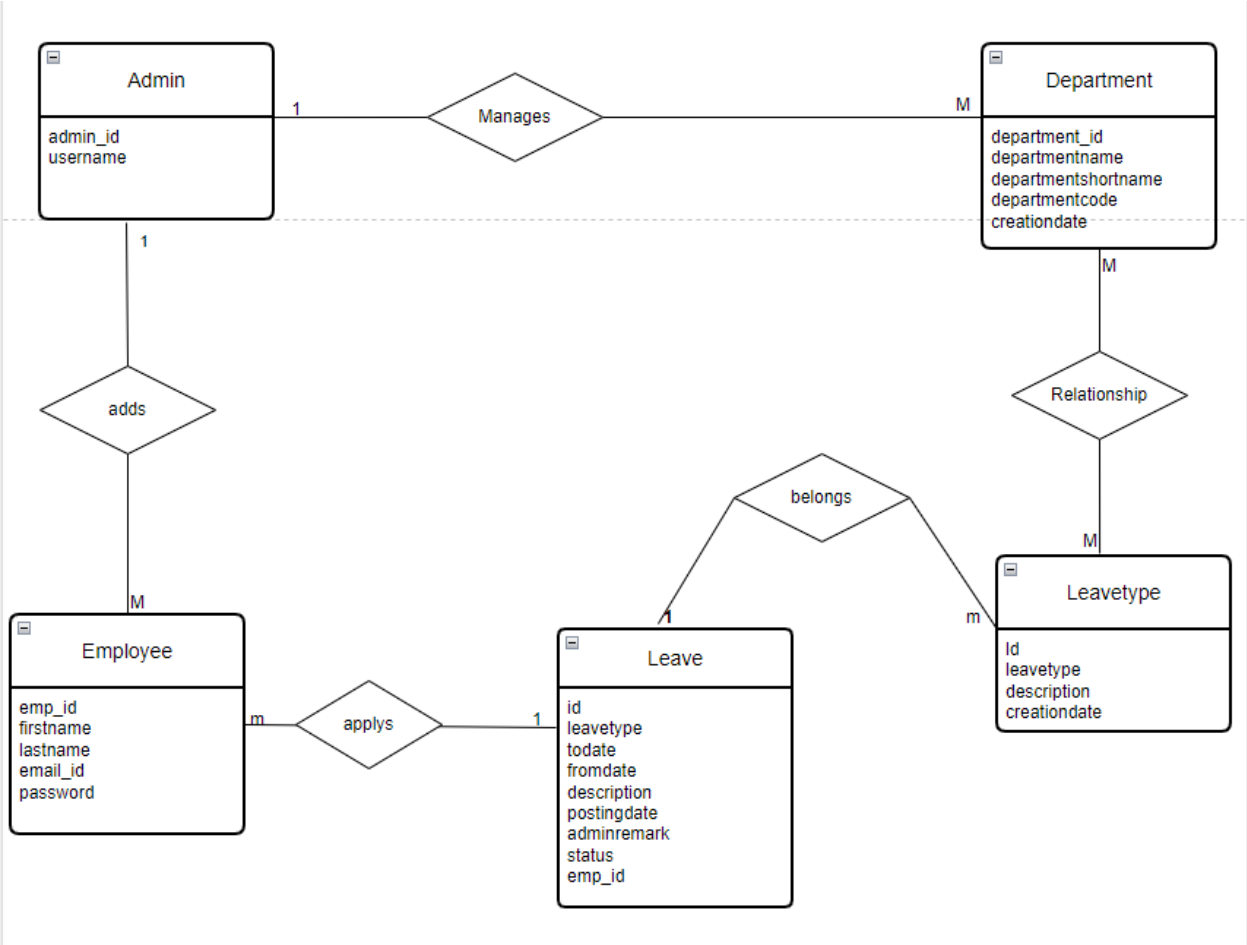


Figure 6Entity Relationship Diagram

4.6.4 PHYSCAL DESIGN OF THE SYSTEM

The physical design of a system is a crucial aspect that bridges the conceptual architecture with the tangible infrastructure. In the aspect of technology and engineering, it encompasses the tangible components, layout, and interconnections that bring a conceptual system to life. This phase involves translating abstract ideas and functional requirements into a concrete, real-world implementation.

The physical design is the tangible manifestation of a system's blueprint, where the theoretical meets the practical. This introduction sets the stage for a comprehensive exploration of the various facets involved in crafting the physical architecture of a system, emphasizing its significance in transforming abstract concepts into robust, operational realities.

i. Login page

The login page of the Online Employee Leave Management System welcomes users with a clean and intuitive interface, designed to facilitate a straightforward entry into the system. It serves as the initial point of interaction, where employees and administrators input their credentials to access the leave management functionalities.

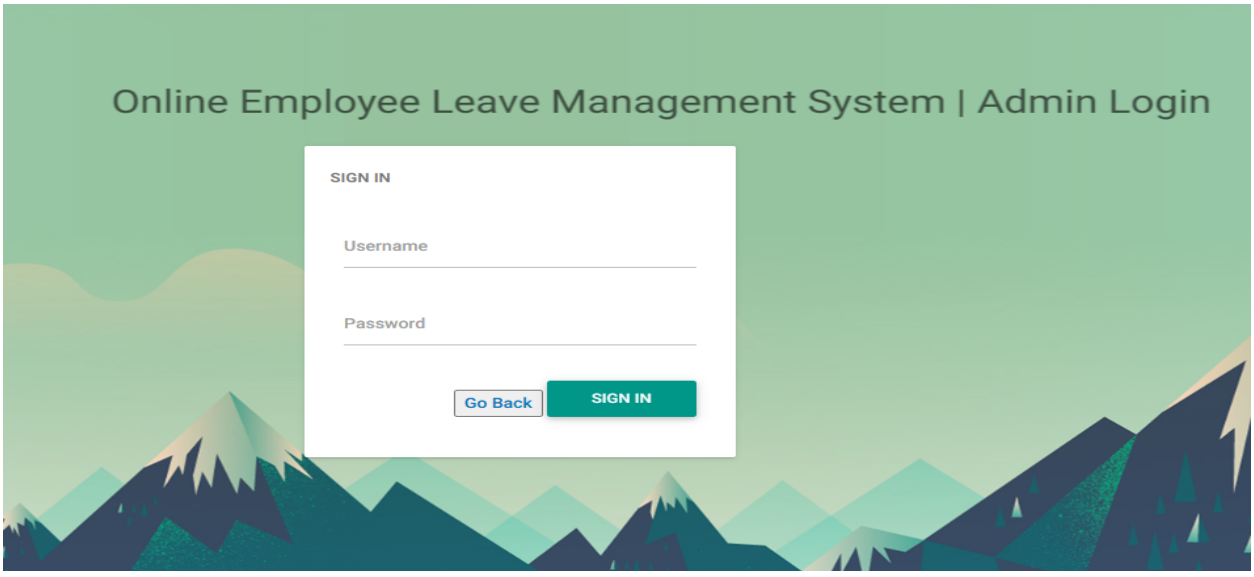
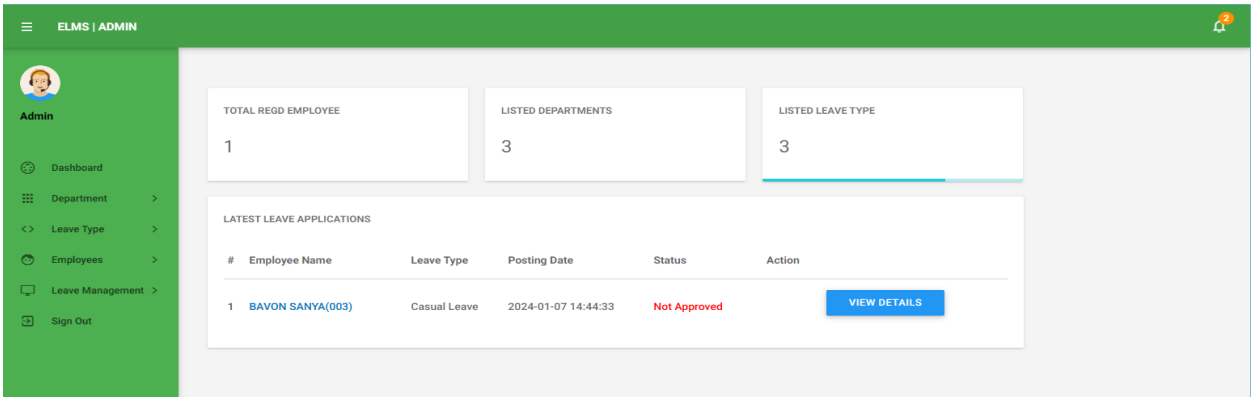


Figure 7Login page

ii. Admin dashboard

The Admin Dashboard acts as a central hub that provides administrators with a comprehensive and intuitive interface to oversee, manage, and analyze various aspects of leave-related activities within the organization



iii. Employee dashboard

An employee dashboard provides a central and personalized interface within an Employee Leave Management System that provides individuals with easy access to their leave-related information and relevant features. Here's a detailed description of the key components and features typically found on an Employee Dashboard:

CHAPTER FIVE: IMPLEMENTATION AND TESTING

5.1 Introduction

We delve into the practical realization of our proposed solution, exploring the refinements of its implementation and subjecting it to rigorous testing. This phase marks a critical stride towards transforming conceptual frameworks into tangible, functional systems.

5.2 Testing

Testing is integral part of any application development. A proper testing plan and execution produces the more reliable robust system which also meets the required expectations. Different processes are followed to ensure the systems meet the required specifications. Whenever software is developed it is required to check whether it fulfills those needs. Testing typically consumes 40-50% of development efforts, and consumes more effort for systems that require higher levels of reliability, it is a significant part of the software development. As the amount of maintenance and upgrade of existing systems grow, significant amount of testing would also be needed to verify systems after changes are made. Hence it is important to check its potential. The main goal of software testing is to know the errors of the software before the user finds them.

Therefore testing was carried out to ensure all errors are limited and the system is good to go for use.

5.3: Testing spectrum

Testing is involved in every stage of software life cycle, but the testing done at each level of software development is different in nature and has different objectives. Unit

Testing is done at the lowest level. It tests the basic unit of software, which is the smallest testable piece of software, and is often called “unit”, “module”, or “component” interchangeably.

5.3.1 The Test plan

The OELMS for Meditex Computer Solutions was tested under following criteria.

- Unit testing
- Integration Testing
- System Testing
- Regression Testing
- User Acceptance Testing

5.3.2.1 Unit testing

With unit testing, tests were made to verify the functionality of specific section of code, at the beginning of function levels.

5.3.2.2 Integration testing

Integration testing is any type of software testing that seeks to verify the interfaces between components against a software design. Normally the former is considered a better practice since it allows interface issues to be localized more quickly and fixed. OELMS system was tested with test data that made expected results.

5.3.2.3 System testing

System testing tests a completely integrated system to verify that it meets its requirements. OELMS showed positive outputs when doing testing as a whole system.

5.3.5 Regression testing

Regression testing focuses on finding defects after a major code change has occurred. Regressions occur as an unintended consequence of program changes, when the newly developed part of the software collides with the previously existing code. Common methods of regression testing include re-running previously run tests and checking whether previously fixed faults have re-emerged. The depth of testing depends on the phase in the release process and the risk of the added features.

5.2.6 User Acceptance testing

Acceptance testing performed by different roles of OELMS, is known as User Acceptance Testing (UAT). The questionnaire was given to different roles of Leave Management System and got filled questionnaire from all user roles and the end user is happy and comfortable with the system.

5.3 Interface Design

Designing the interface for an OELMS requires careful consideration to ensure it is intuitive, user-friendly, and efficient. The goal of user interface design is to make the user's interaction with the system as simple and efficient as possible, in terms of accomplishing user goals.The interface design is broken down into the following;

5.3.1: Login page

The login page of **OELMS** is the first point of interaction for users, serving as a secure gateway to access the system. The login page is accessed by both the director/admin and the employees that enables them to log into the system respectively.

Each party is assigned to a user name and password as to access the system.

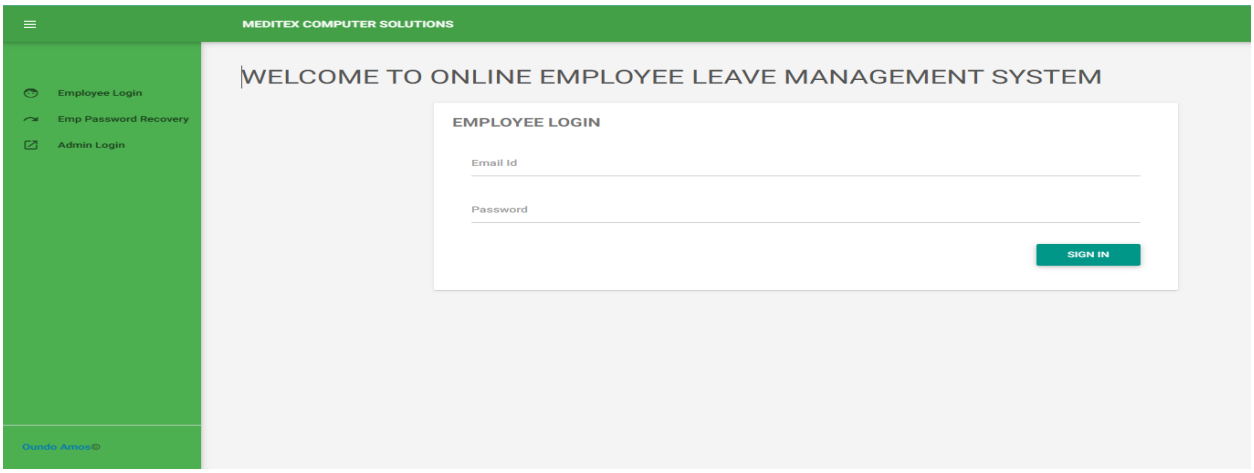


Figure 8 employee login page

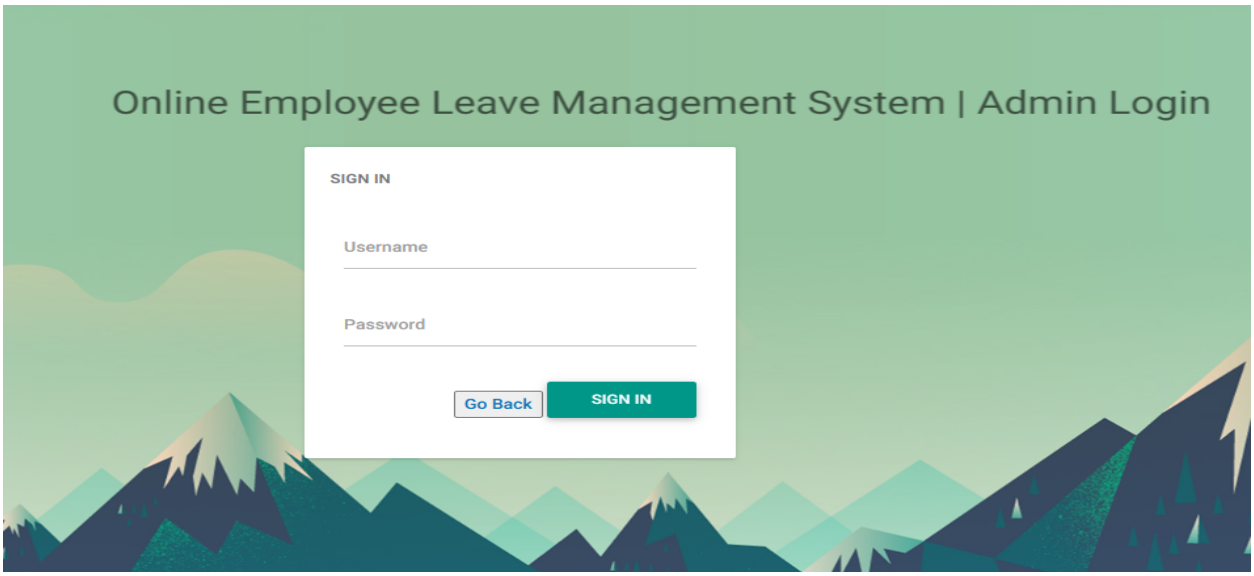


Figure 9 Admin login page

5.3.2: Change password form.

When successfully logged into the system, the employee and the admin are both prompted to change password (optional) to one of their choice, this helps to create trust amongst users because one is able to have his or her own personal information

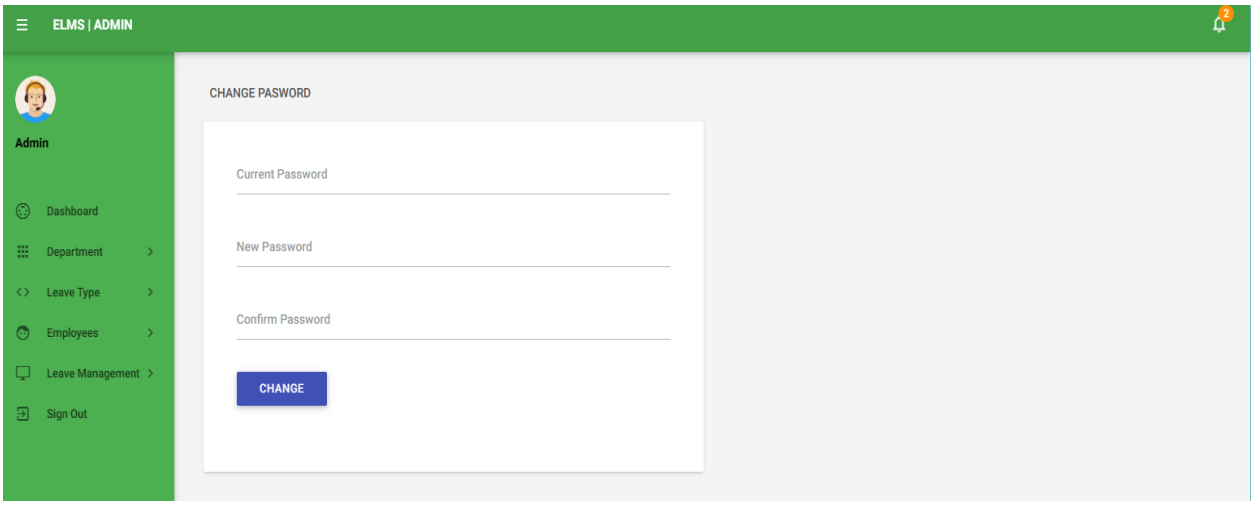
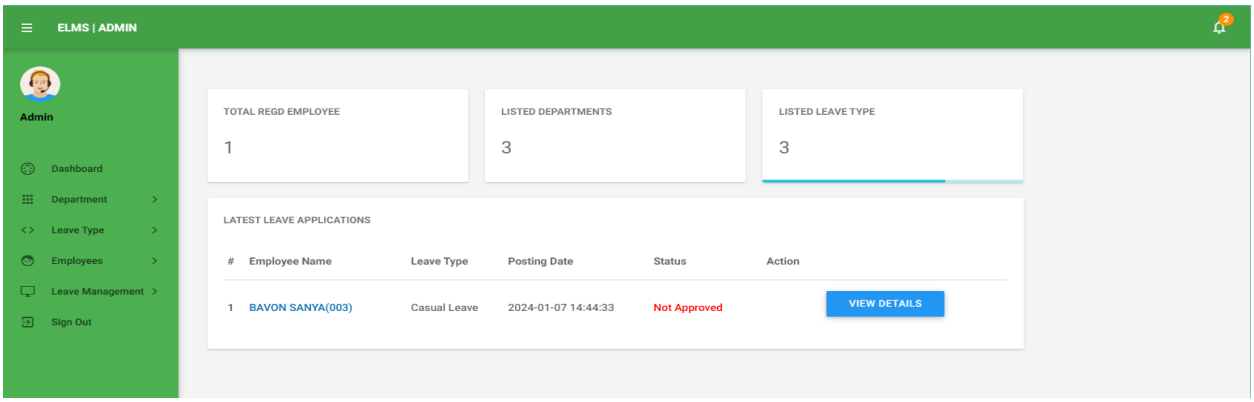


Figure 3 change password form

5.3.3: Dashboard

The dashboard serves as the central hub, offering a snapshot of essential information such as upcoming leave schedules, and pending approvals.

Figure 10 Admin Dashboard



5.3.4: Leave Request Form

This form allows the employee to request for a particular leave. It is a user-friendly leave request form with clear fields for leave type, start and end dates and description. Includes a calendar picker for date selection to enhance accuracy and ease of use as shown in figure below.

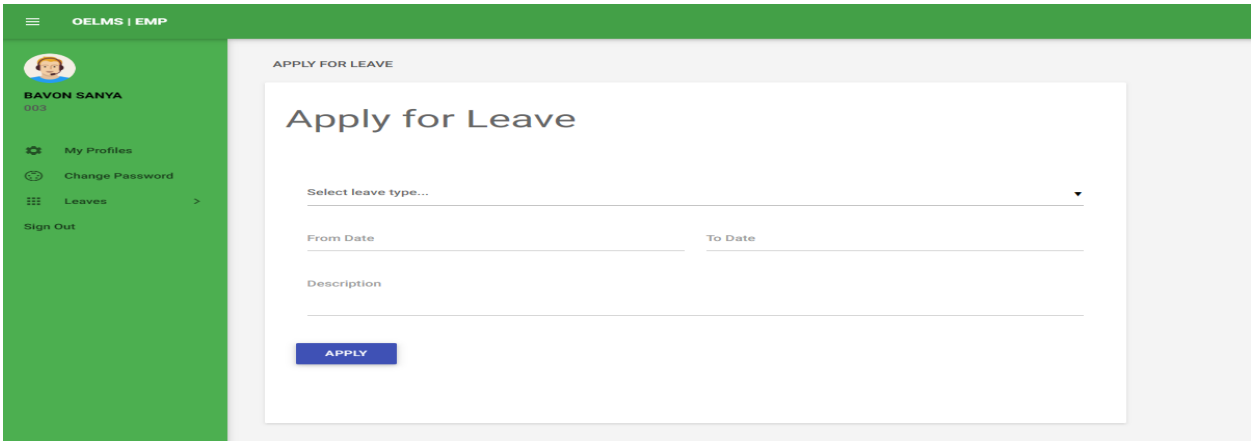


Figure 11Leave request form

5.3.5: Leave history page

This page gives a summarized view at the top of the page as it displays the leave statistics, including the total number of leaves taken, and any pending leave requests.

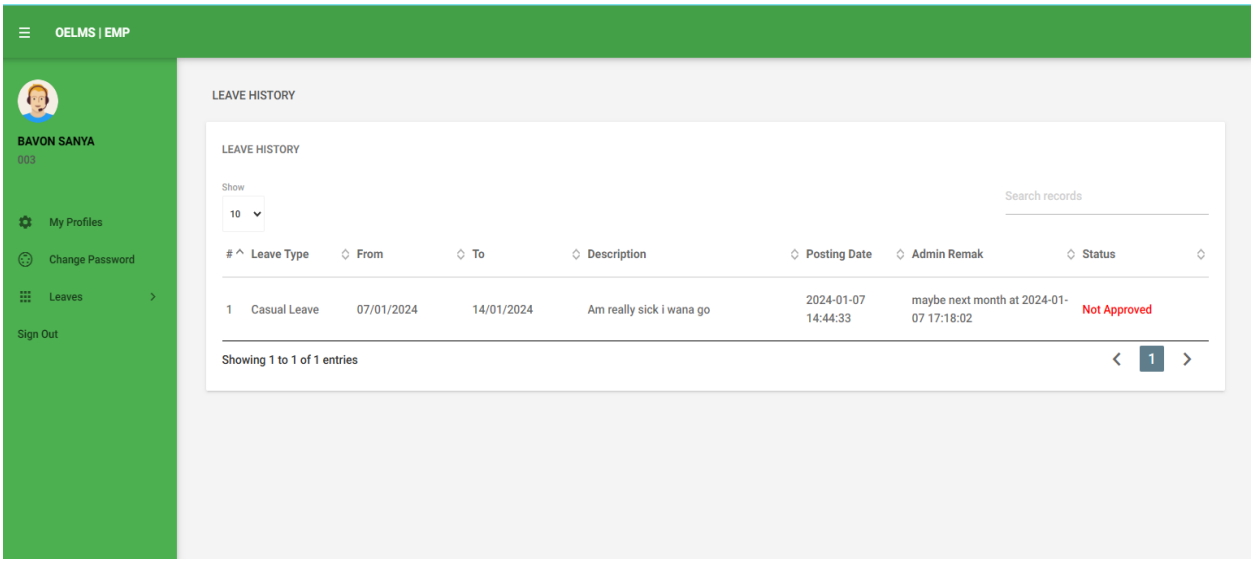
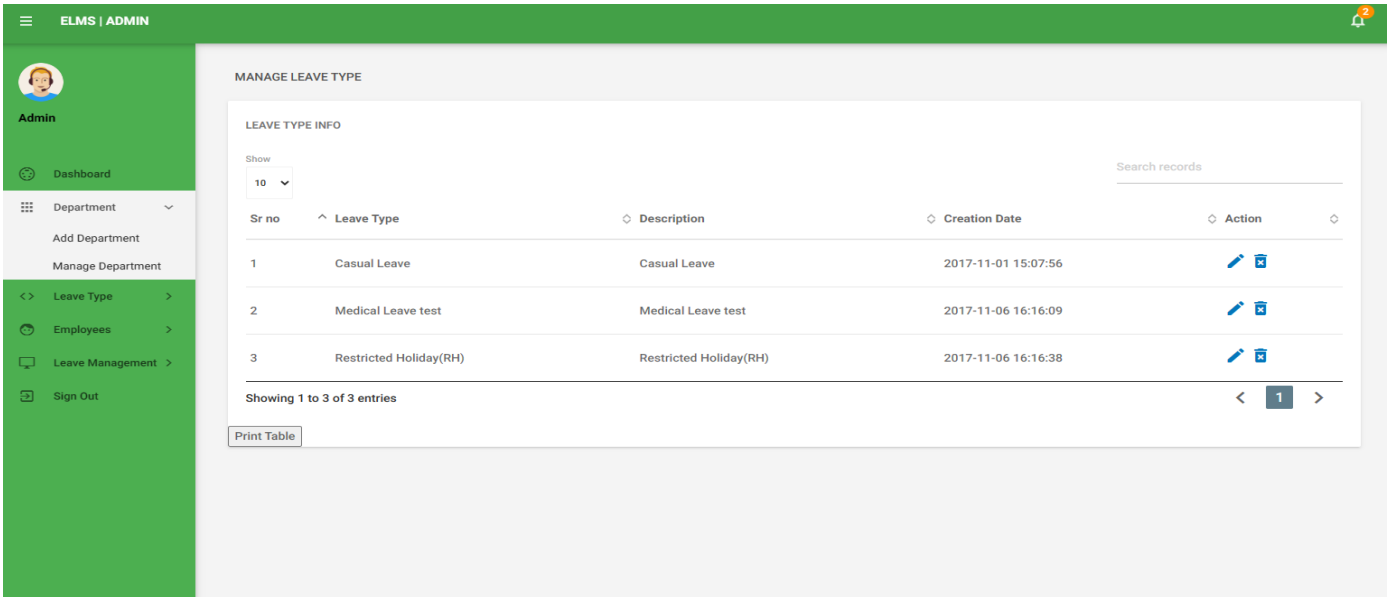


Figure 12 leave history page

5.3.6: Department

This module is viewed by the administrator, it enables him or she to add and manage the different departments in an organization that is to say, the administrator is able to take actions like delete, add and edit the departments, the administrator is able to also print out the document for record keeping as shown in the figure below.



The print page is triggered when the print button is pressed.

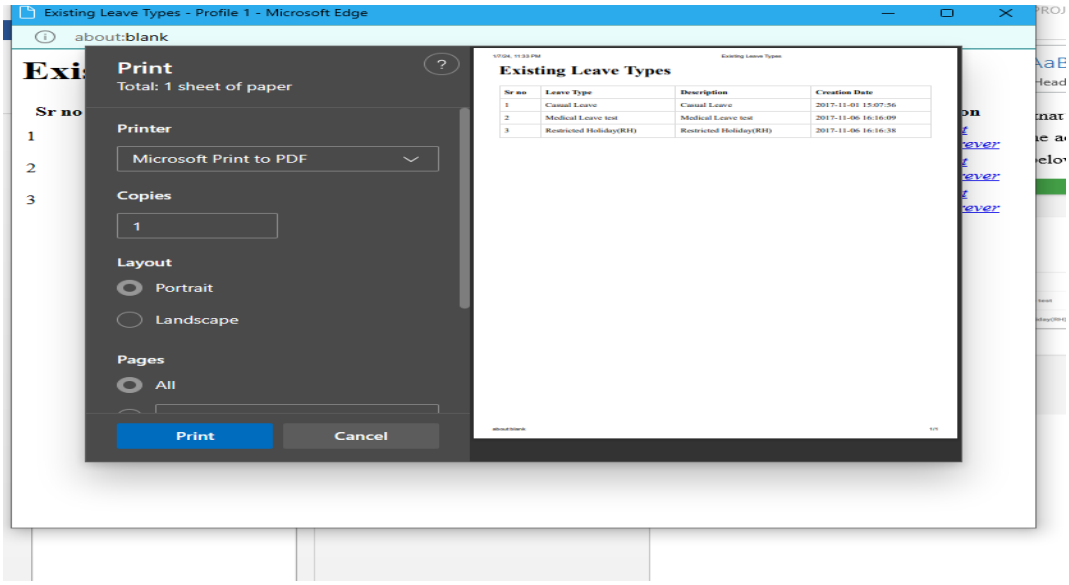


Figure 13 print page

5.3.7 Employees

The module starts with a section of adding employees and employee management that displays essential personal details, including the employee's name, employee ID, registration date and department. This information serves as a quick reference and confirmation of the user's identity.

The administrator is able to add and manage employees into the particular organisation through the employee module.

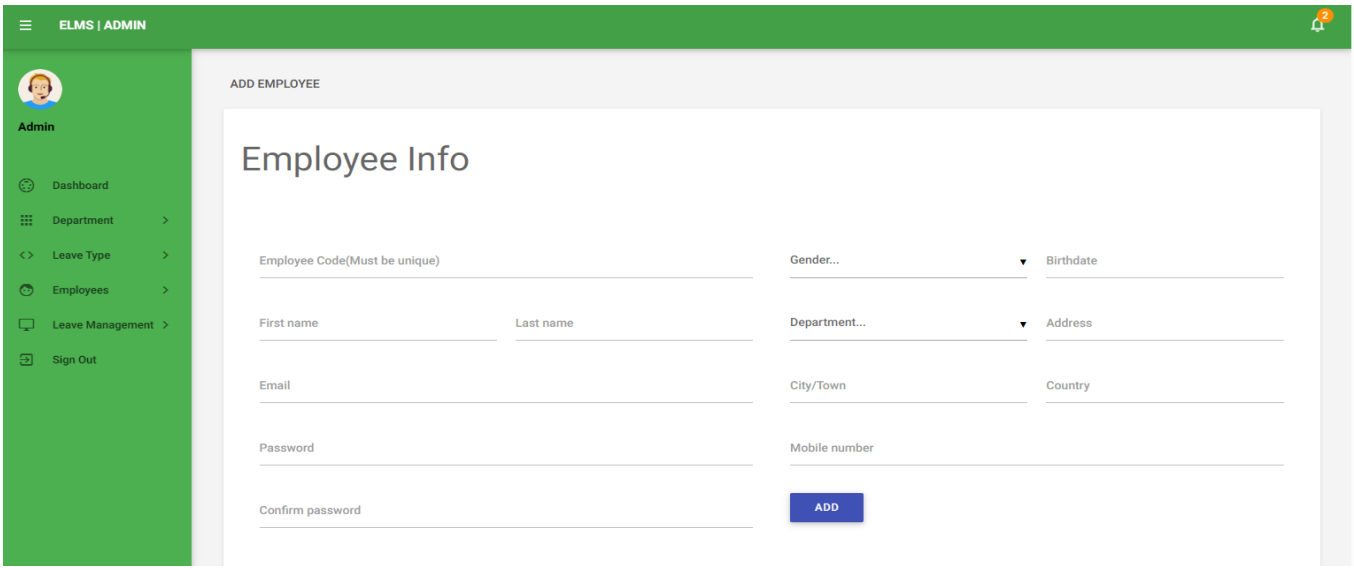


Figure 14 add employee page

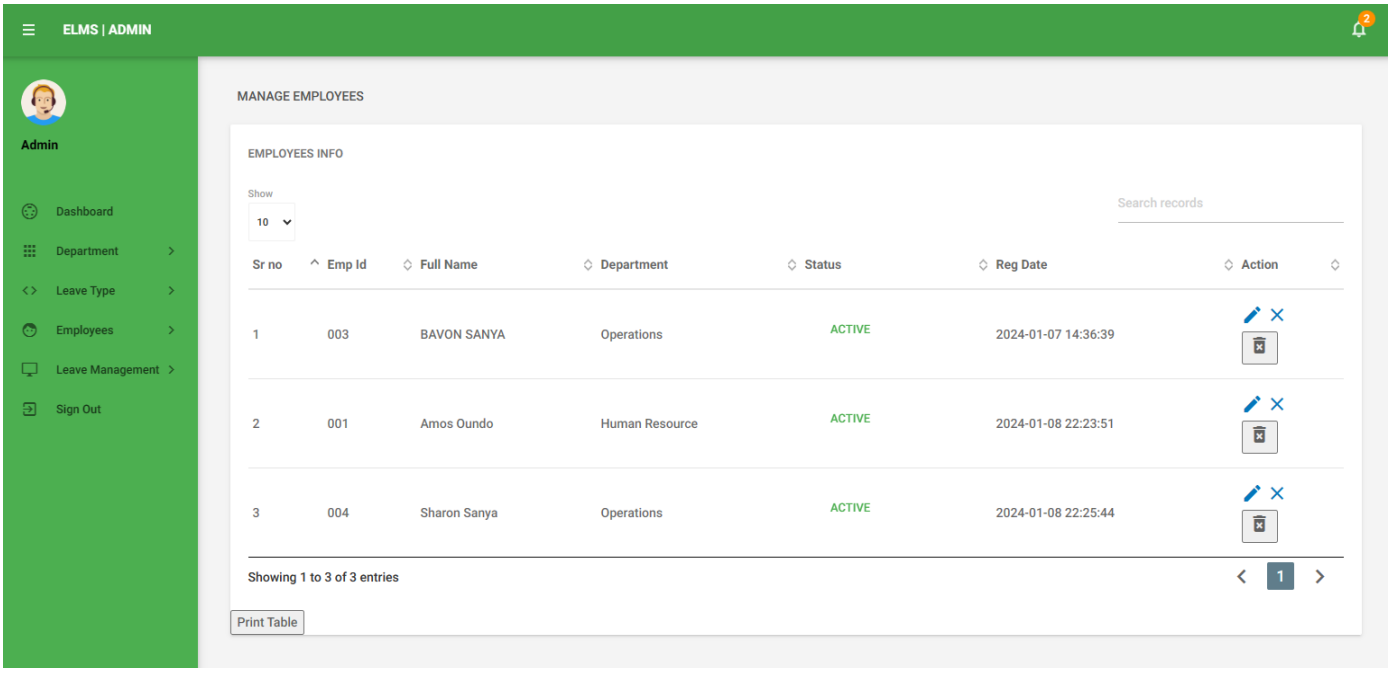


Figure 15manage employee page

5.4 Data Storage.

The storage of data in OELMS was a critical aspect that involved securely managing and organizing information related to employee leave requests, approvals, and other relevant data. A database "**elms**" was created to store all the information.

A relational database management system (RDBMS) was employed to organize and store data. MySQL, database type was used for OELMS implementations. Tables to store different types of information, such as employee details, leave requests, approval history, departments and other information were created. Each table should have well-defined columns representing specific data fields. These tables are as shown below;

Admin table

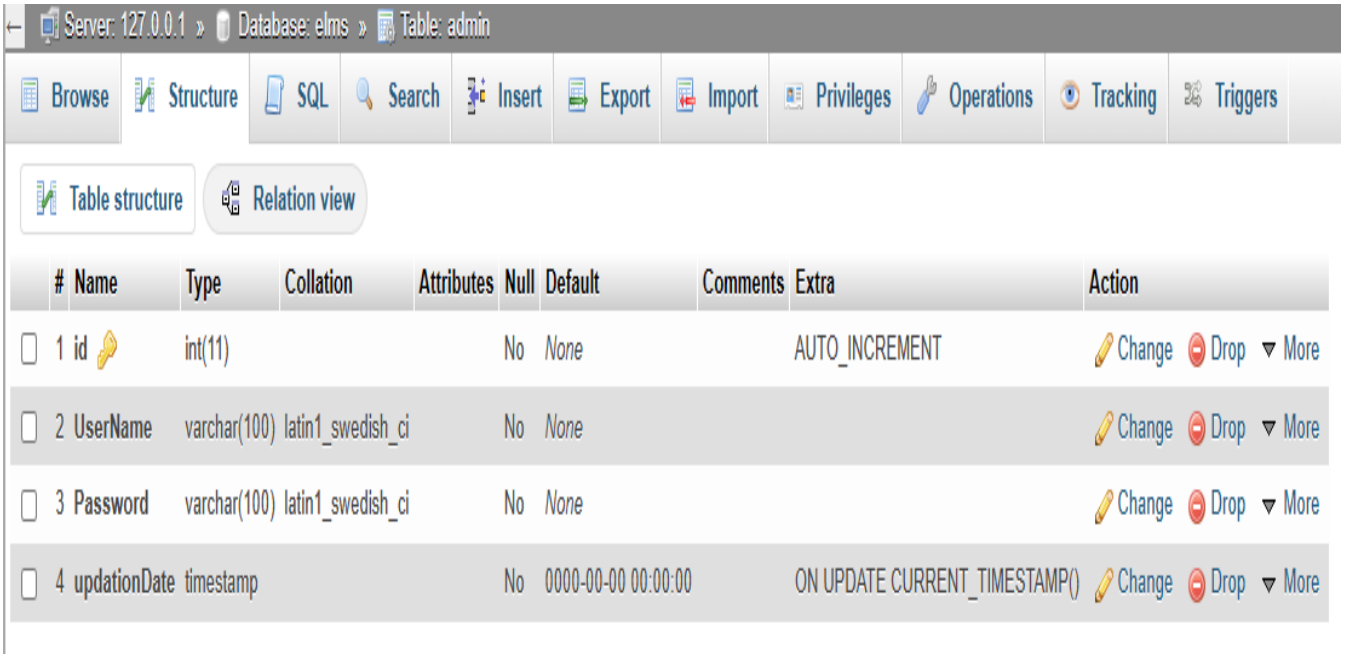


Figure 16 Admin table

Department table.

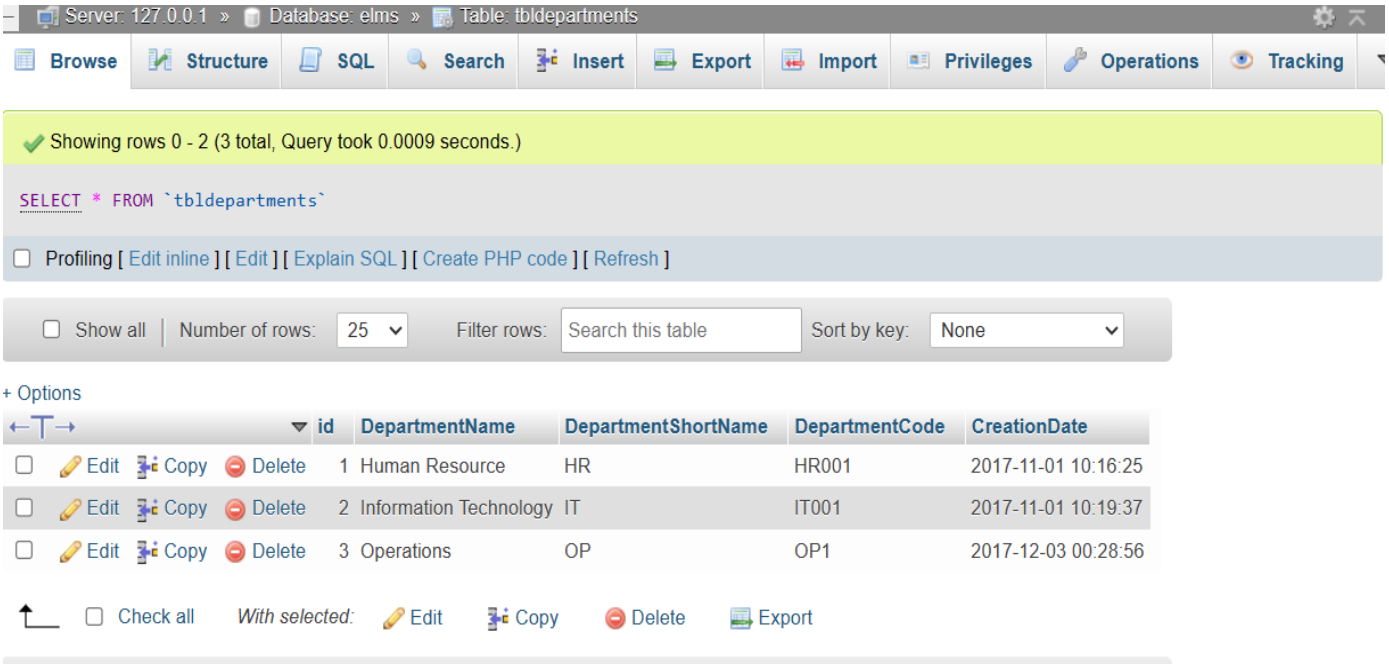
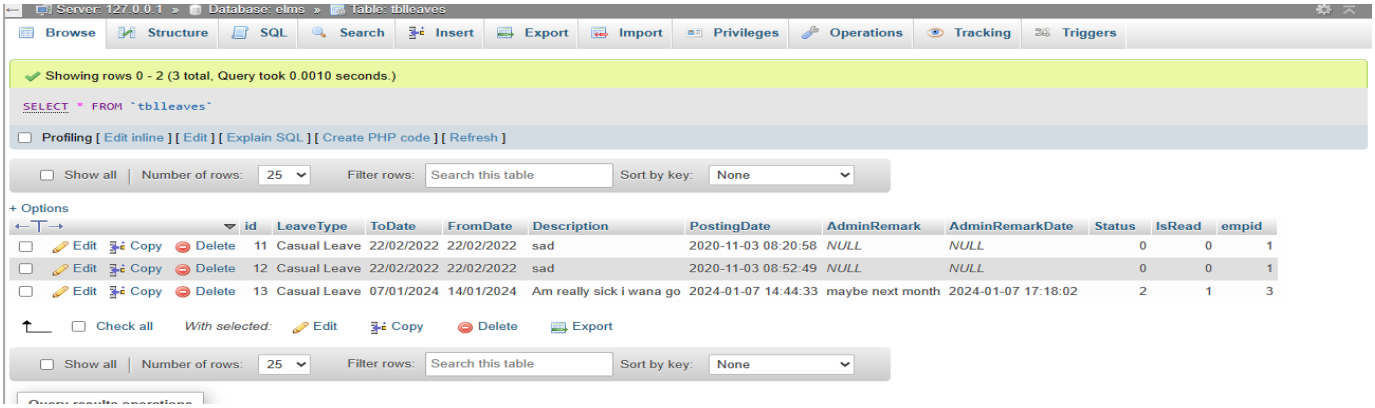


Figure 17 Department table

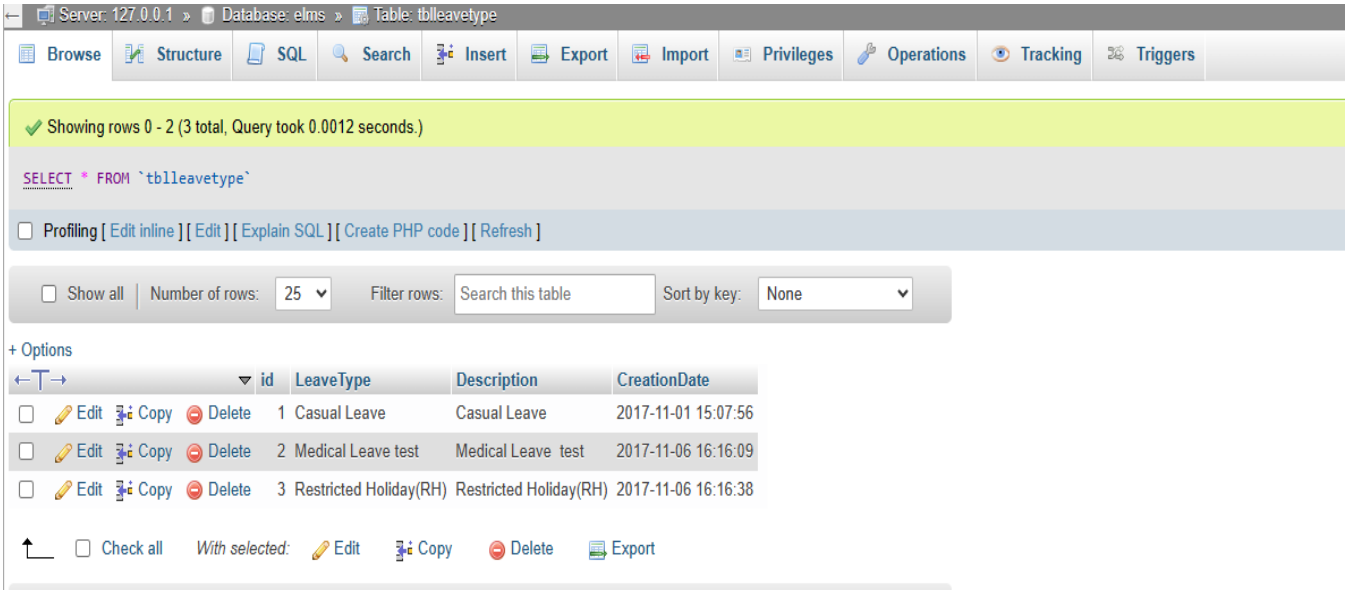
Leave table.

When an employee applies for a leave, the information entered is stored into this table plus the administration remarks.



Leave type table

This table stores the different leave types created or added by the administrator which are later retrieved when an employee applies for a leave.



CHAPTER SIX: Discussion of results

6.1 Introduction

The chapter provides a summary of the major findings of the study, conclusions and the researcher's recommendations. The recommendations are based on researcher's analysis and interpretations of the findings as well as suggestions of the research.

6.2 Result Discussion

The OELMS was easily adopted by the employees. High adoption rates suggest that the system is user-friendly and meets the needs of the workforce. Feedback from employees was gathered about their satisfaction with the system. Positive feedback indicated that the system was perceived as beneficial and easy to use. This information was obtained using interview method where employees and the directors that interacted with the system provided the information.

The system has proven to be accurate in leave management and there was verification of reduced errors and improved precision of leave data compared to the manual processes.

There has also been improved efficiency within the system in terms of time savings for both employees and directors. The system has well streamline leave requests and approvals.

Online Employee Leave Management system also has a well communication system for the leave application, s approvals and rejections through the notification alerts that help in keeping everyone informed.

By analyzing the above aspects, you can gain a comprehensive understanding of how well the online employee leave management system is performing.

6.3 Project Constraint

Just like any other system development process, the development of OELMS came up with various constraints and these simply refer to the limitations or the boundaries that can impact the development, implementation, and operation of the system. Here are some common constraints associated with the development and implementation of OELMS.

- Limited financial resources impacted in the implementation as it wasn't possible to host the system online.
- There was a limited time constraint due to tight schedule that limited the amount of time available for system development, testing, and deployment.

6.4 Recommendation

Based on the evaluation results, I would recommend that OELMS be considered as the preferred leave management system for organizations. This system consistently showed user-friendliness, features, scalability support, security, and cost-effectiveness compared to the previous system (manual) that was used at Meditex computer solutions.

6.5 Future Work

The future work for an online employee leave management system involves addressing emerging trends, technology advancements, and evolving organizational needs. Below are some of the areas in OELMS for potential future development and improvement;

Integration of artificial intelligence (AI) and automation to streamline leave approval processes, automating routine tasks, and providing intelligent insights into leave patterns and trends.

Developing predictive analytics capabilities to forecast leave trends, enabling better workforce planning and resource allocation. This can help organizations proactively address potential staffing gaps.

Adapting the system to accommodate the increasing trend of flexible work arrangements and remote work by including features for managing remote work schedules and leave policies tailored to flexible work environments.

Introduce real-time collaboration features, allowing team members and managers to coordinate and communicate regarding leave schedules and adjustments efficiently.

Improving integration capabilities with other HR systems, such as payroll, performance management, and time and attendance, to create a seamless HR ecosystem.

Regularly assessing the evolving needs of the organization and staying informed of technological advancements in HR management will be critical in shaping the future development of an online employee leave management system.

6.6 Conclusion

In conclusion, the thorough evaluation of online employee leave management systems has provided valuable insights into the strengths and weaknesses of each option.

The user-friendliness, robust features, scalability, and responsive employee support of OELMS position it as a solution that aligns seamlessly Meditex’s leave management needs. As I moved forward with the implementation of OELMS, I anticipated improved transparency, reduced administrative burden, and increased employee satisfaction with the user-friendly interface. The system's scalability

ensures that it can adapt to the evolving needs of Meditex Computer solution as the business continues to grow.

However, the journey doesn't end here. Continuous feedback and monitoring will be essential to ensure the system remains aligned with the business goals and adapts to any changes in leave policies, regulations, or workforce dynamics.

In summary, OELMS is not just a system; it is a partner in the journey towards optimized Human resource management and a more productive and satisfied workforce.

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APPENDICES:

APPENDIX: TIME SCHEDULE ESTIMATE FOR ONLINE LOGISTICS MANAGEMENT SYSTEM.

S/NO	ACTIVITY	DURATION
1.	Feasibility study	1 week
2.	Proposal	1 week
3.	Data collection	1 week
4.	Analysis	3 weeks
5.	Design	2 weeks
6.	Implementation	4 weeks
7.	System testing	1 week
8.	Report writing	8 weeks