

Leave Management System for Sri Lanka Teachers' Service

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A dissertation submitted for the Degree of Master of Information Technology

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Abstract

Sri Lanka Teachers' service is a main important Government service in Sri Lanka, which is included the employee group that involve with the people of future in the country. Teachers' role is doing valuable service for the whole country by intending the children to the correct path and making their lives success. So, keeping satisfaction and happy minded of teachers will be enhanced their service and it will be a good investment for the future. There are only manual procedures to handle leaves of teachers in now a day which is more time consuming with lots of paper works such kind of filling applications. It is taken more time to getting approval for some special leaves like study leaves and foreign leaves due to the approval process is included several kind of staff. So, this system is mainly designed for government school teachers as an effective solution to overcome their current leave affairs. As, this is provided the facility to teachers for applying their leaves through online without unnecessary documents, this will be increased the efficiency of teachers and the benefit affect to the school children who are the future of the country.

Simple attractive user friendly interfaces are used when developing the system in order to use easily for anyone with lack of computer knowledge. Furthermore, the system is allowed to add school details and user registration details for the relevant authorized user. Also, leave balance, approval status of leaves are presented clearly and Principals, all other users can generate leave reports when it is needed. This is developed as web based system using PHP with bootstrap framework. Testing and data validation was carried out in different stages of implementation. After completing the project, user evaluation process was carried to get the feedback and more ideas for the improvements of projects. Most of teachers and Principals were satisfied with the system and suggested with several improvements.

Declaration

The thesis is my original work and has not been submitted previously for a degree at this or any other university/institute.

To the best of my knowledge it does not contain any material published or written by another person, except as acknowledged in the text.

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This is to certify that this thesis is based on the work of Ms. D.S.D. Gonapinuwala under my supervision. The thesis has been prepared according to the format stipulated and is of acceptable standard.

Certified by:

Supervisor Name: Dr. H.A. Caldera

Signature:

Date:

Acknowledgment

I must convey my heartiest gratitude to those who contributed to my project either by their collecting or individual effort, and aiding me to successfully develop the system. So, I would like to sincerely express gratitude to my project supervisor, Dr. H.A. Caldera for the guidance, encouragement and useful advices provided me to carry out this successfully.

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Also, I would like to thank the staff of Zonal education office in Galle specially including officers in charge personnel files who helped me during the project from the gathering requirements and process details until completing works with their busy schedules.

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List of Abbreviations

CSS	- Cascading Style Sheet
HTML	- Hypertext Mark-up Language
LMSTS	- Leave Management System for Sri Lanka Teachers' Service
PHP	- Hypertext Processor
RAM	- Random Access Memory
SQL	- Structured Query Language
UCSC	- University of Colombo School of Computing
UML	- Unified Modelling Language
URL	- Uniform Resource Locator

Chapter 1 . Introduction

1.1 Introduction

This project is aimed at developing a web-based Leave Management Tool, which is important to Sri Lanka teachers' service. The leave management system is designed to automate the workflow of leave applications and their approvals. This is an effective system that will be more useful for Sri Lankan teachers to save their time. It reduces the time of filling the documents and it help to keep happy minded teachers.

1.2 Motivation

Sri Lanka teachers' service is the one of the most important service when considering government services of Sri Lanka. In public services of Sri Lanka, there is no proper leave management system available in the country. Sometimes, leaves are granted according to the favour of people due to available poor management system in government service. Also, while considering government school teachers' service, there are lots of documents to fill and have to waste more time to getting approval for leaves, as it is needed the approval from zonal director, provincial director, and Secretary of Ministry of Education in different locations. This less efficiency is caused to decrease the satisfaction of teachers and it is mainly affected to the school children. This system has been planned and designed to override the problems prevailing in the practicing manual system and this is reduced the hardships faced by the existing system. The leave management system will be caused to reduce paper work and maintains records in more efficient way.

1.3 Problem

In existing system every government school in Sri Lanka follows manual procedure and at the end of each year calculates total leaves and sends this into zonal office. This current process is more time consuming process and there are chance of losing records and misusing of leaves.

In online proposed system, data is maintained in the form of well-organized database. So, chances of losing data are not possible. Every day leaves and notification information are updated into database and this will save the time of teachers that reducing the time of filling lots of forms and getting approval of directors in different locations. This system is online application which will be making more flexible to access information.

1.4 Objectives

This system is mainly designed for government school teachers as an effective solution to overcome their leave affairs. There are only manual procedures to handle leaves of teachers in now a day. This is a web application that provides teachers to apply their leaves through online. In current system, to take medical leaves have to send tele mail or sometimes it can be informed via telephone. As soon as returned works after taking leaves, have to submit leave application form with approval of principal. The proposed system provides the facility to user to apply leaves easily while staying at home and no need to worry about with leave application forms as soon as returned to work. Also, when applying casual leave it is needed to get the approval of principal before 7 days and have to assign another worker instead of leave applicant by signing the leave application form. This system provide user to apply casual leaves easily via online without using papers and provide the facility to assign another worker. Also, other types of leaves like foreign leaves, study leaves should be applied via 3 copies of relevant necessary documents and need to get the approval of principal, zonal director, provincial director and the secretary of ministry of education according to the order and this takes more than 1 month in current manual procedures. Considering, this leave management system allows user to apply those kinds of leaves via online and getting approval with paper less and effective way without wasting time, while staying home. Also, there is lots of duty leaves related to teachers. In current manual system, always should issue an attendance certificate to getting approval of those leaves. So, there are lots of misused affairs are occurring getting duty leaves. Also, it is again needed to get the approval of zonal director. So, this newly proposed system is a good solution to avoid filling lots of forms and wasting of valuable time and this will be caused to keep mind happy of teachers and students.

1.5 Scope of the project

The Leave Management System is a Web-based system that allows the government teachers to submit leave requests via online. There are different types of leaves related to teachers such as casual, medical leaves, duty leaves, foreign leaves, study leaves, maternity leaves, etc. The leave request is forwarded to the principal who approves it or denies it with necessary documents. Approved leave requests are forwarded to the zonal director, provincial director and secretary of ministry of education when it is applicable with types of leave to approve or deny it. This System is keeping track of all these leave requests and will be calculated the leave balances of each teacher.

Main features of this program can be categorized as follows:

- Submit and cancel leave requests
- Allow user to upload necessary documents to approve leaves according to the government circulars.
- View transaction details of leaves with the balance of leaves
- Approve, reject, and forward corresponding leave requests to relevant person.
- Received notifications and email as soon as approved or request.
- Add new teachers to the database as required and allow to edit their information
- Accurately update the database system of leaves yearly and remain medical leaves carry forwarded to the consecutive three years.
- Initialize the monthly and yearly accrual process, updating the total of leaves for all teachers, and print leave reports when necessary.

1.6 Additional Information

The Leave Management System is designed for the Government School teachers. However, in the current system, teachers have to fill leave application forms and need to get the approval with relevant authorities. This is very time-consuming manual process. But, this system provides user to freely apply their leaves. Teachers, Principals, and other relevant authorities can review and approve records and the current leave balances of the employees that maintained and calculated automatically. Also, this can be improved for all government services in Sri Lanka with relevant modifications according to their service minutes and circulars.

1.7 Dissertation Outline

Mainly, six chapters are consisted in this dissertation including References and Appendix. Introduction is the Chapter 1, which describes thoroughly the problem that caused for selecting to develop the project, motivation, objectives, and scope of the project. The background study of the project and the current procedure of the Sri Lanka Teachers' service which is mainly involved in schools are described in the Chapter 2. Also, it is included the reviews and the features of similar systems and how they can be used to the newly proposed system. Analysis and Design is the Chapter 3, which describes the requirement gathering procedures, functional and non-functional requirements and the design of the system. The Implementation including hardware and software requirements and all implementation methods which were used to build the system are described in Chapter 4. Evaluation and Testing is the Chapter 5, which is consisted the testing methods and critical evaluation of the system including whether the project objectives are successfully obtained. The final chapter in this dissertation is Chapter 6 which includes the Conclusion that identifies any deficiencies in the final system and further improvements of the project.

Chapter 2. Background

This chapter provides some background information to the current status of the process and procedures related with the Leave management of government school teachers. The information obtained by reviewing the similar systems also presented in this chapter.

2.1 Background Study

When considering all over the world, lots of leave management systems have been using now. This is currently available in private sector of Sri Lanka. Also, leave Management Systems are available for download from websites freely. TrackerPal, Calamari, LeavePro Softwares are some of examples that can be download and can be used for company. These systems provide facility for users to apply leaves via online. When comparing the leave process procedures, there is a big difference with government sector, especially in teachers' service than private sector. Normally, most of private sectors are using annual leaves, casual leaves, medical leaves, sick leaves and maternity leaves. There are no annual leaves and sick leaves in Sri Lanka teachers' service. Instead of that there are study leaves, foreign leaves and parental leaves.

2.2 Current Process

In government service of Sri Lanka, there is no proper leave management system available in the country. So, lots of misused leaves related affairs are occurring due to less management and uncertain works. Specially while considering government school teachers service, there are lots of documents to fill and no proper time period and have to waste time to getting approval leaves like study leaves, foreign leaves etc. There are only manual procedures to handle leaves of teachers in now a day.

In current system, to take medical leaves have to send tele mail or sometimes it can be informed via telephone. As soon as returned works after taking leaves, have to submit leave application form with approval of principal. Also, when applying casual leave it is needed to get the approval of principal before 7 days and have to assign another worker instead of leave applicant by signing the leave application form.. Also, other types of leaves like foreign

leaves, study leaves should be applied via 3 copies of relevant necessary documents and need to get the approval of principal, zonal director, provincial director and the secretary of ministry of education according to the order and this takes more than 1 month in current manual procedures. Also, there is lots of duty leaves related to teachers. In current manual system, always should issue an attendance certificate to getting approval of those leaves. So, there are lots of misused affairs are occurring getting duty leaves. Also, it is again needed to get the approval of zonal director. So, this newly proposed system is a good solution to avoid filling lots of forms and wasting of valuable time and this will be caused to keep mind happy of teachers and students as it is avoided unnecessary works.

2.3 Review of Similar Systems and Technologies

Lots of applications that develop to manage leaves of Employees in a company are available now. However, they all have some similarities and dissimilarities that should be taken into consideration. This section will illustrate some leading applications and project works that were carried out related to Leave Management System.

2.3.1 Trackerpal

Trackerpal leave management system supports any leave category sick, privilege, casual, birthday, special off that lapse or carry forward every month/year including every conceivable leave policy holiday calendar by country and regions. So, it can easily manage leaves and track in-office and field employee attendance. Additional client visit checking available in and location tracking features for field employee attendance. This is best for Retail, Sales & Wholesale Distribution, Banking, Lending & Microfinance, Insurance, Automobile Manufacturing, Showrooms, Service Centers, Healthcare & Pharmaceuticals Maintenance of faculties.

2.3.2 Calamari

People management is made easier by Calamari allowing you to plan and track all kinds of vacation, day off and sick leave. This will track employee attendance with mobile apps and automatically generated notifications. Calamari supports companies with offices based in multiple countries/locations and supports role-based security [1]. This is often integrated with project management tools like Slack, JIRA, Office 365, Basecamp, G Suite, Asana and this

helps all businesses ranging from tech start-ups, focused on growth, through the conventional medium and small businesses where the remote work and absence tracking is vital a part of planning.

2.3.3 Vacation Tracker

Vacation Tracker for Slack helps teams to request, approve and manage leave in all over the world. This is allowed you to track all types of time off, set your own vacation policies and leave types. Keep company team informed with daily and weekly notifications, export valuable reports, and integrate with their favourite calendar and more [2]. The dashboard gives a full overview of future absences and vacation history, as well as settings where it can modify everything according to the policies of company. Vacation Tracker helps businesses all over the world whether they have teams in different locations or not, to manage leave effectively from tech start-ups to small and medium businesses.

2.3.4 LeavePro

LeavePro is a complete and straightforward tool for Teams for managing leave requests of employees in a company. This is managing accurately the advance data and rules surrounding employee leave and this is not like working with spreadsheet. LeavePro, Reed Group's innovative SaaS solution, manages real-world absence needs for giant employers in the company. From a self-serve employee portal to automated eligibility rules, LeavePro has the smart ability to manage, track, and analyze absence of employee easily. Employers choose LeavePro to help their HR departments succeed, improve compliance with absence laws, and reduce legal liability[3].

2.3.5 TimeTac

TimeTac is a Cloud-based solution for recording employee time and attendance or project and task completion, with an add-in for time off management[4]. This is smart Solution to track simple arrival and duration of works of employee, or for recording the project and completion of tasks. Employees log in and track their own working time, via a desktop browser, central terminal, smartphone or employee time clock and working time templates

allow automatic calculation of actual hours worked against target hours, allowing for simple overtime calculations. Numerous statistical reports can be produced and various integration options are available through this system.

2.3.6 Jorani

Leave and overtime management system with simple workflow for approvals and the ability to support complex multi-branch organizations [5]. On-premise leave management system that helps businesses track employee leaves, overtime requests and attendance with built-in reports, email notifications, calendar integration and more requirements.

2.4 Comparison and Contrast with similar Systems

The above discussed similar systems' comparison and contrast can be summarized as the following Tables to understand easily. Table 2.1. is classified the similar system Numbering and Table 2.2 is shown comparison and contrast of similar systems.

Table 2. 1. Similar Systems Numbering

System 1	Trackerpal
System 2	Calamari
System 3	Vacation Tracker
System 4	LeavePro
System 5	TimeTac
System 6	Jorani

Table 2. 2. Comparison and Contrast of Similar Systems

	System 1	System 2	System 3	System 4	System 5	System 6
Employee Scheduling	√				√	
Approval Process Control		√		√	√	√
Leave & Absence Reporting		√	√	√	√	√
Calendar Management	√	√	√			
Leave Policy Management	√		√	√		√
Self Service Portal	√	√	√		√	

Chapter 3. Analysis and Design

3.1. Introduction

The next step is to analyse the requirements of the proposed system, after reviewing the existing similar systems. Design the system is required according to the analysis. So, all the system analysis and design descriptive details that are used to build this project complete as well as working are discussed in this chapter.

3.2 Requirements Gathering

Requirements Gathering is a fundamental part of any software development project [6]. So, the requirements were identified through the investigation of the user views and current manual procedures as the initial stage of the project workflow. One of the essential phases of any project is requirement gathering, due to the misleading requirements and information can be caused failures and many problems at the later stages of any project. Documentations, observations, interviews and questionnaires are the main methods that can be used for the process of requirements gathering.

3.2.1. Fact Finding Techniques

Some of facts - finding techniques were selected for capturing proposed development project's requirements. Several meeting sessions were held successfully with the leave clerks in Galle Zonal education office and the Principal of the school. It was very helpful to get the clear idea about the existing leave management process of teachers and problems through those meetings. Further, the discussions also were carried on about their expectations from new system, the suggestions and the way of compile with ongoing process. To capture the initial requirements properly had to be participated several meetings with leave clerks in different zonal offices and had to clarify them due to the requirements conflicting in different education zonal in Southern province. Some interviews with some government school teachers were handled regarding to know about status of current leave apply and leave approval process via contacting through the telephone. Also, the opinion of each interviewee was taken by asking whether it is helpful to them if the manual leave process move to the online system.

The questionnaire is another fact – finding method that used to capture the requirements of a large set of the user groups. Hence, printed documents consisting few questions were delivered to the school teachers in different zonal. It was help to capture the existing process which related to Sri Lanka Teachers Service, through analysing the results of the questionnaire.

Observing the working environment of zonal office, schools and government circulars were another major resource to gather the requirements. Hence, it was able to clarify the requirements that were captured in the meetings in more practical way. Further, the requirements could be easily captured from the manual maintained documents such as Leave Log books and Leave application forms in the schools.

3.2.2. Problems and Proposed Solutions

The solutions were proposed for the identified issues of the manual existing system, after the requirement capturing process. The problems and the proposed solutions for each identified problem are classified in Table 3.1.

Table 3. 1. Problems of current manual system and proposed solutions

Problem	Proposed Solution
Maintaining the leave process of government school teachers is difficult, as it is a manual process.	The system should be able to provide user friendly way to enter the details and maintain.
When applying leave without prior approval, teachers have to send tele mails.	Provide facility to apply leaves like emergency cases via online.
Have to maintain tele mails as a reference of leave applicants.	No need to maintain tele mail references, as database can keep records systematically.
Have to fill leave applications for each leave and need to maintain those things in manually. Therefore it is difficult to find them later.	No need to do keep the records manually of leave application. Records are systematically stored.

Missing the leave applications and necessary documents. So, sometimes have to re submit leave application forms.	Maintain proper database to keep records with more accurately.
Misuses the getting approval of leave in manual process.	Provide proper authorization and authentication for different users.
Difficult to get the leave transaction details and analysing, when it is needed for necessary things like transferring the school, filling promotion applications etc.	The system should provide the report facility to view the leave transaction details as required.
Since leave monitoring is done manually in log books and files, most of the times they are not properly updated.	The system should be developed with the capable of entering the log details and updating them accordingly.
Need to issue attendance certificates for duty leaves.	No need to print documents to approve duty leave with relevant authority.
Have to fill applications by own applicant with three copies while applying some kind of special leaves.	Provide user friendly way of applying special leaves without doing same thing repeating.
Have to provide certified copies for applying some kind of leaves.	Provide document upload option to overcome handling more papers.
Time consuming process of getting approval for study leaves and foreign leaves.	Provide proper approval process with more efficient way via system.

3.3. Requirement Analysis

Requirement Analysis is the process of defining user expectations for new software being built or modified [7]. It is sometimes referred to loosely by names such as requirements gathering or requirements capturing. Requirements analysis encompasses those tasks that go into determining the needs or conditions to meet for a new or altered project or product, it is included the analysing, documenting, validating and managing software or system requirements. Functional and Non Functional requirements were identified in the LMSTS can be discussed as follows.

3.3.1. Functional Requirements

In the requirement gathering stage, main functional requirements have been identified and they can be illustrated as below.

- **Apply Leave**

Teachers should be able to apply leave online without leave application forms. Also, there is an option to edit and view applied leaves before submitting the approval very easily. This will be provided teachers to save their time of filling lots of documents and getting approval process from zonal director, provincial director, and Secretary of Ministry of Education in different locations for special kind of leaves like study leave and foreign leaves. The process of getting approval for the different types of leave is shown in Table 3.2. Also, the hierarchy of leave approval process is shown in the Figure 3.1. It is hoped to reduce paper works and to maintain records in more efficient way. Further they can assign each user to the user approval process.

Table 3. 2. Leave approval Procedure

Leave Type	Leave Approver			
	Principal	Zonal Director	Provincial Director	Secretary of Education Ministry
Casual	Approval	-	-	-
Medical	Approval	-	-	-
Maternity	Recommendation	Approval	-	-
Duty Leave	Recommendation	Approval	-	-
Foreign Leave	Recommendation	Recommendation	Recommendation	Approval
Study Leave	Recommendation	Recommendation	Recommendation	Approval

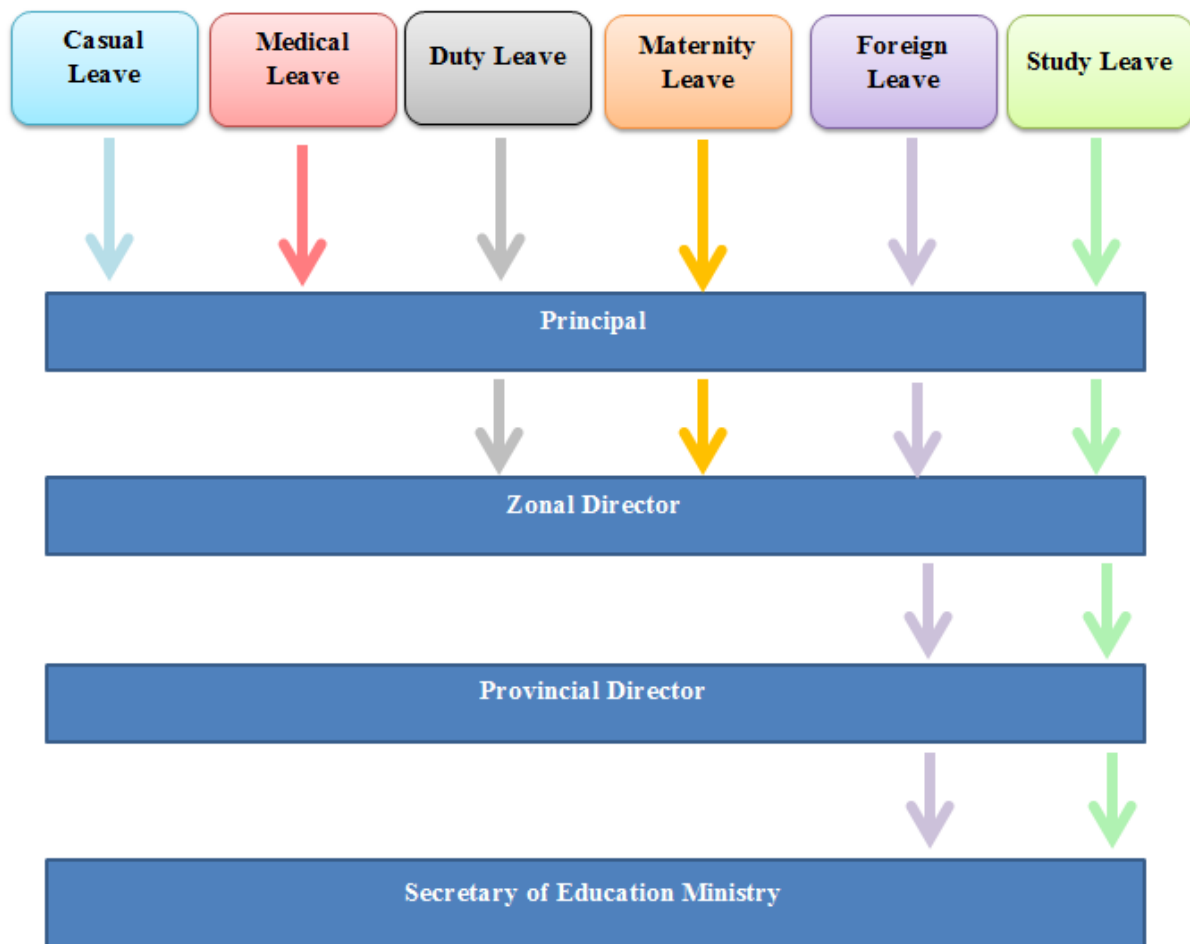


Figure 3. 1. Hierarchy of leave approval levels

- **Administration**

This system is developed to manage leave of Sri Lanka teachers Service. So, need to add teachers' details in properly with corresponding the school, zonal and province. So, the administrator of this system can be officer of zonal education office and he/she will be able to add the schools details while registering the teachers' details to the system. Also, when assigning some special leaves, it is provided the facility to add those leaves.

- **User Registration and Login**

The leave clerk of zonal education office can add teachers to the system by user registration with specific username and password. Then, those registered teachers can be log into the system by inserting their user name and password. Also, registered user can reset their password if he/she knows their current password. Otherwise officer of zonal educational office can reset the user password.

- **Report Generation**

The system have the capability to generate different types of reports considering leave transaction details with corresponding to school, teacher wise and provincial wise. It is hope to provide efficient way of issuing details of a teacher in school when it is needed to consider the grade promotion, applying foreign leaves, transfers and assessments of the teachers' works yearly.

- **View Leave Balance**

This is provided the facility to view the leave transaction details like leave balance while applying new leaves and planning getting leaves later for each teacher. So, it is not need to worry about maintain documents of their leaves. Also, they can be viewed the applied leaves, approved leaves and rejected details via the LMSTS.

3.3.2. Non Functional Requirements

It is very important to consider the Non-functional requirements as well as functional requirements. Non-functional requirements can be classified as specific functions which are not directly concerned by the system. But, it is described the system's operation capabilities and constraints that enhance its functionality. They may relate with properties of emergent system like user- friendliness, response time, availability, reliability and etc. The main non-functional requirements that were captured can be summarised as follows.

- The system must have a user friendly environment with flexible interfaces.
- Any Person with minimum computer knowledge can be able to familiar with the system with training in short time period.
- The consistent and accurate should be in the system, when manipulating the fed data in proper way and showing the relevant information.
- The system must be maintainable and reusable.
- It should have the ability to adopt implementations doing in future to the system.

3.4. System Design

System design is the flow of process with defining architecture, modules, data and interfaces for the system according to the recognized related system requirements. Simply, this can be defined as the process of transforming the requirements of user to the system. The overall system architecture of the LMSTS was designed is shown in Figure 3.2.

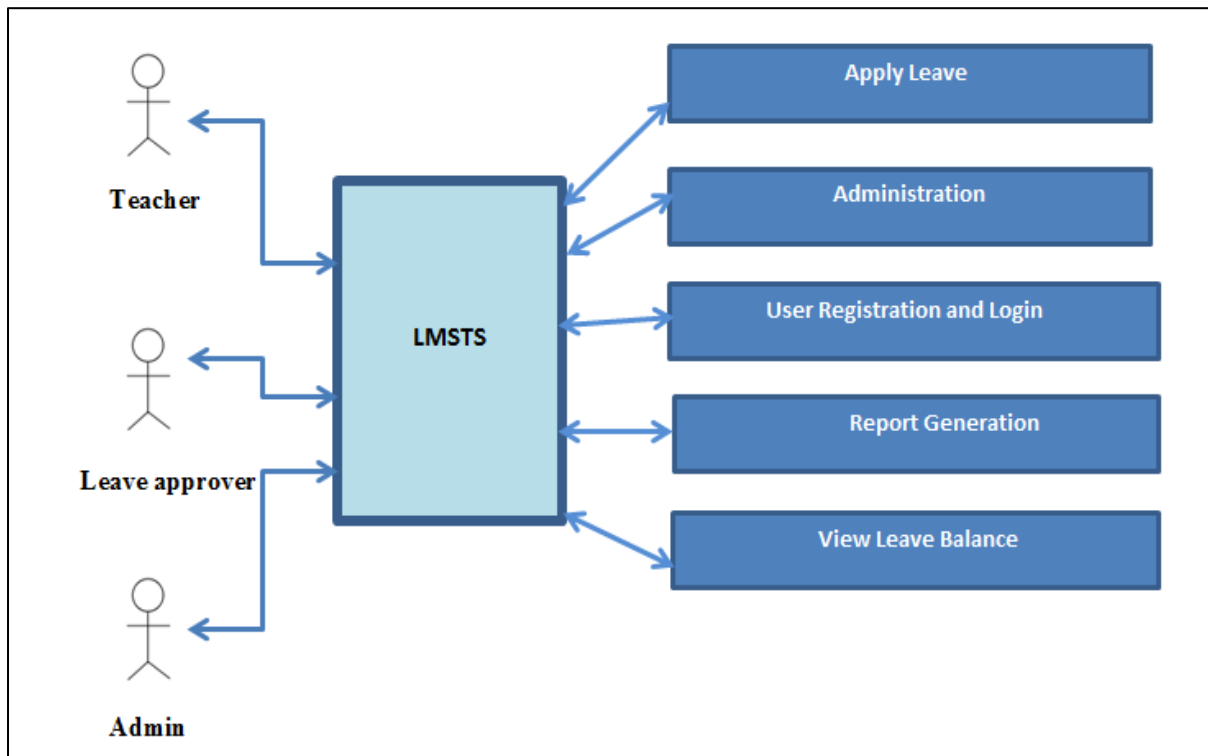


Figure 3. 2. Overall system architecture of the LMSTS

According to the functional requirements that were identified at the previous stage, the workflow and process of the system were designed to summarize the overall process. Afterward, to display them more clearly and understandable, that the use case diagram was drawn.

3.4.1. Use case Diagrams for the System

The Use case diagrams summarize functionalities of the system which are related to each user group in the system. The Use Case diagram of the LMSTS can be shown in the Figure 3.3.

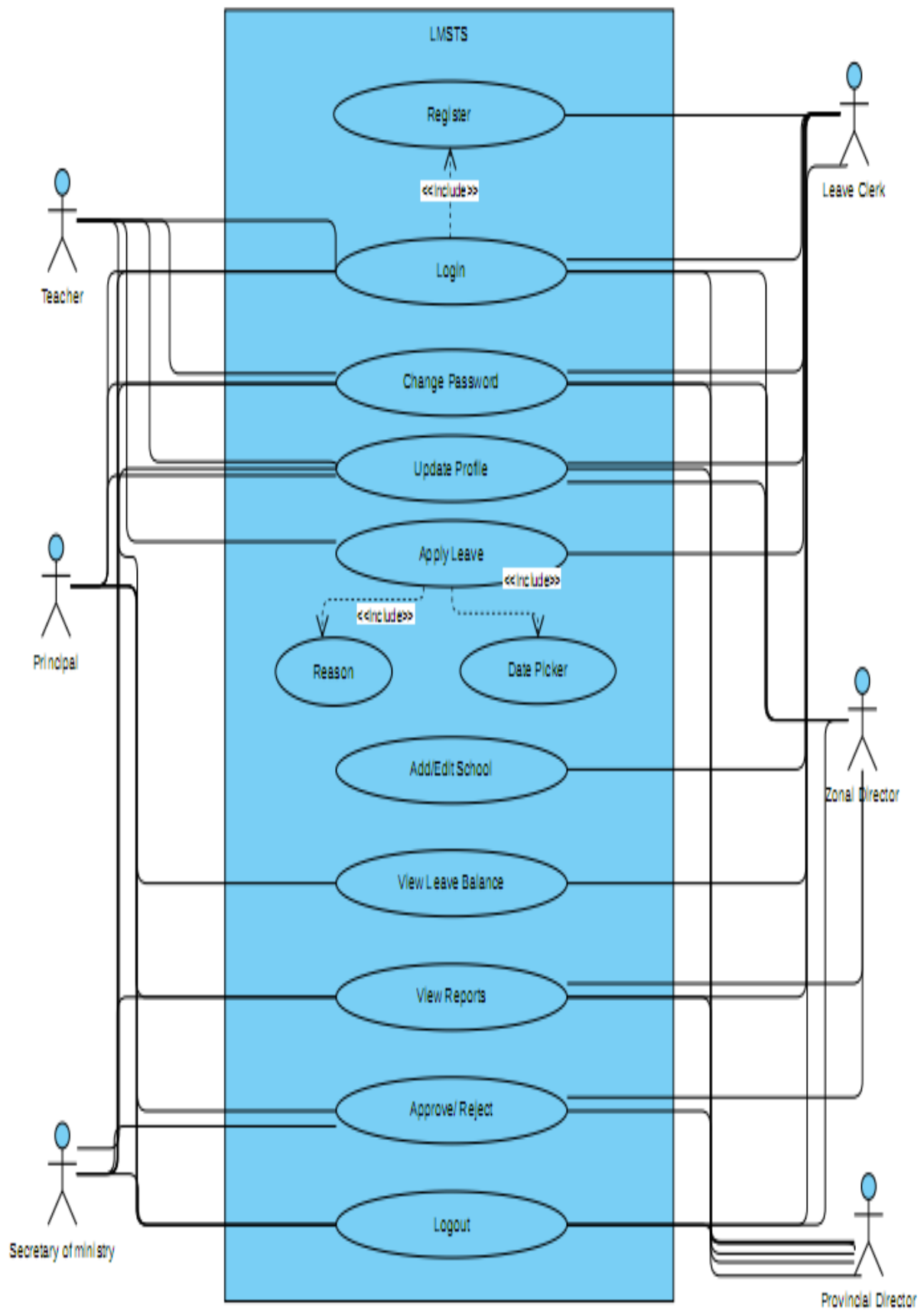


Figure 3. 3. Use Case diagram of the LMSTS

3.4.2. Class Diagrams for the System

In software engineering, a class diagram in the Unified Modelling Language (UML) is a type of static structure diagram that describes the structure of a system by showing the system's classes, their attributes, operations (or methods), and the relationships among objects [8]. The class diagram for the LMSTS is shown by Figure 3.4.

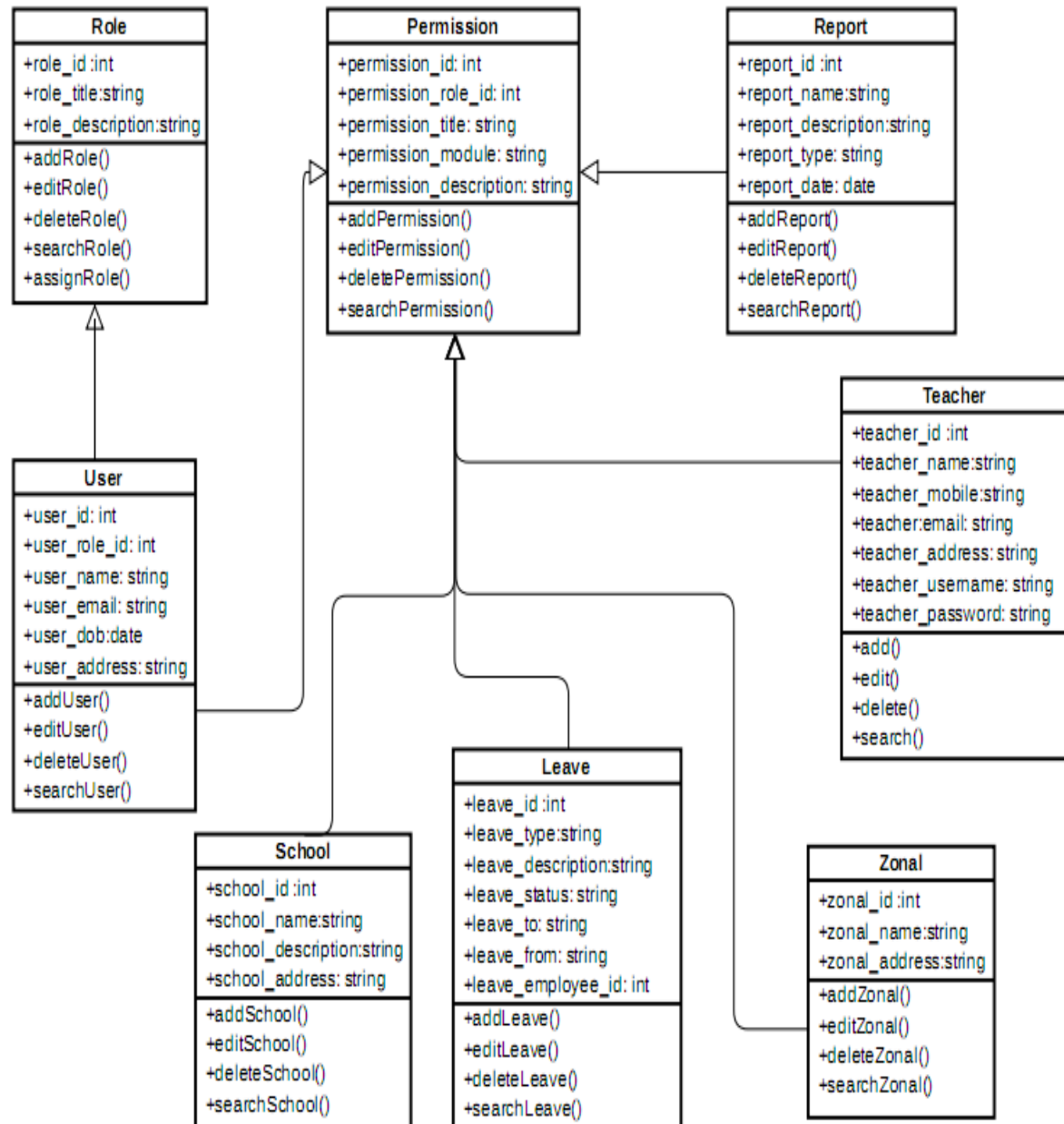


Figure 3. 4. Class diagram of the LMSTS

3.5 Database Design

Database design is involved by classifying data and identifying the relationships among them. A proper designed database improves the performance of the system and it is easy to maintain and use for further improvements. The following database design in Figure 3.5 depicts the system configuration structure of the relational database of this system.

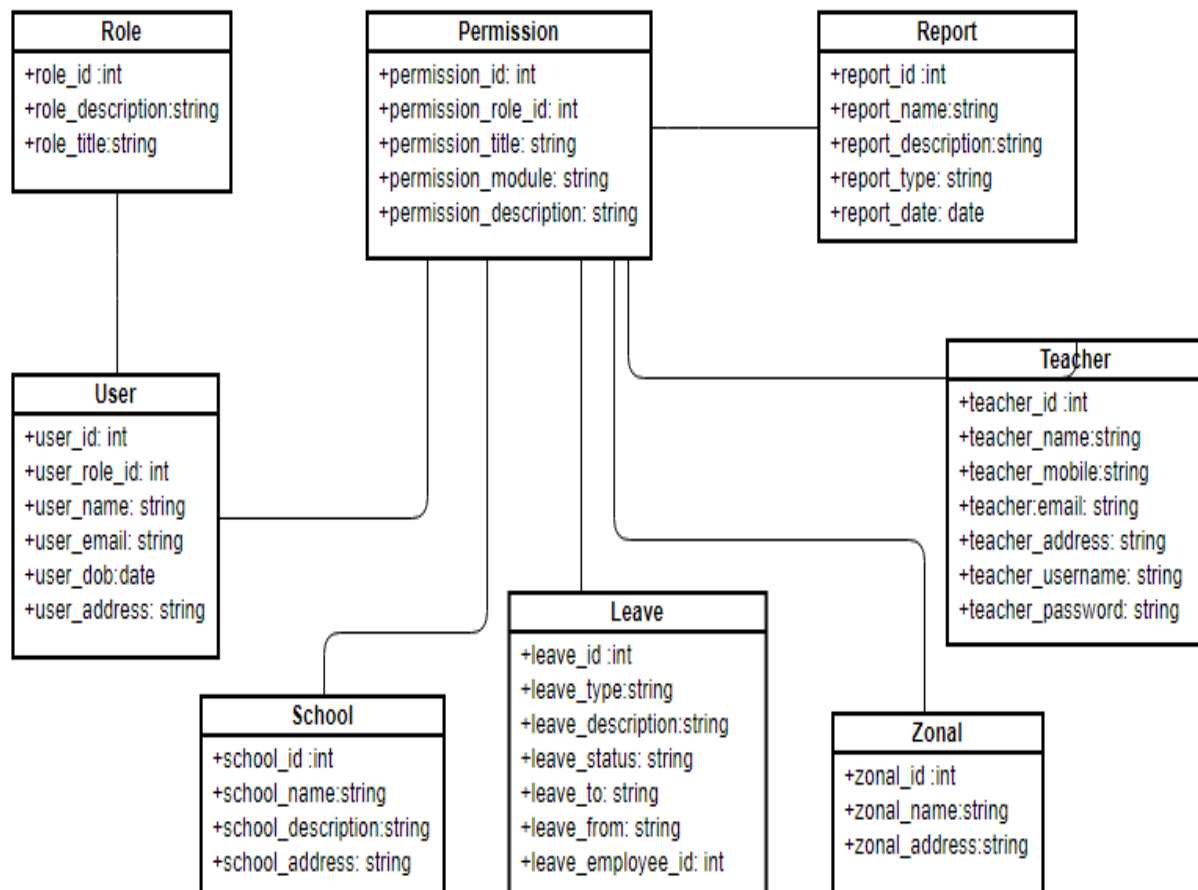


Figure 3. 5. Database Design of the LMSTS

3.6 Interface Design

Interface Design is the process of making interface in software or computerized devices with a focus on looks or style. This is the basic and very first interaction with user and the system. Therefore, it should be developed in attractive way to user. Mock-ups or Wireframes can be used to design the interface of any system.

Chapter 4. Implementation

4.1. Introduction

Implement the system was the next phase, when completing the design part of the system. All system components are developed in this stage according to the system design. Selecting suitable language for programming was necessary thing as suited to design and the requirements of the system, before starting the coding. The system implementation details, architecture, programming languages and some user interfaces of the system are described through this chapter. PHP which is free and open source powerful popular language was selected to develop the LMSTS at the beginning of this phase.

4.2. Hardware and Software Specification

Hardware and Software Requirements that used to develop the system can be classified as follows:

Hardware Requirements :

Intel Core i5 1.80GHz, 6.00 GB RAM, 700 GB Hard Disk

Software Requirements :

Front end Framework : Bootstrap 4

Language : PHP 7.3, HTML, CSS, JavaScript, JQuery

Database : MySQL

Platform : WAMP server

Code Editor : Notepad++

4.3. User Interfaces

Some of main interfaces included in the LMSTS and functionalities of them are described in this section.

4.3.1. User Login

The user should enter the correct username and password for login, in order to use the LMSTS. So, User Login interface is the initial interface of the system that LMSTS accesses are controlled accurately. Error message will be generated to prevent the access of

unauthorized into the system for the incorrect user name or password. The user login interface of the LMSTS is shown in Figure 4.1.

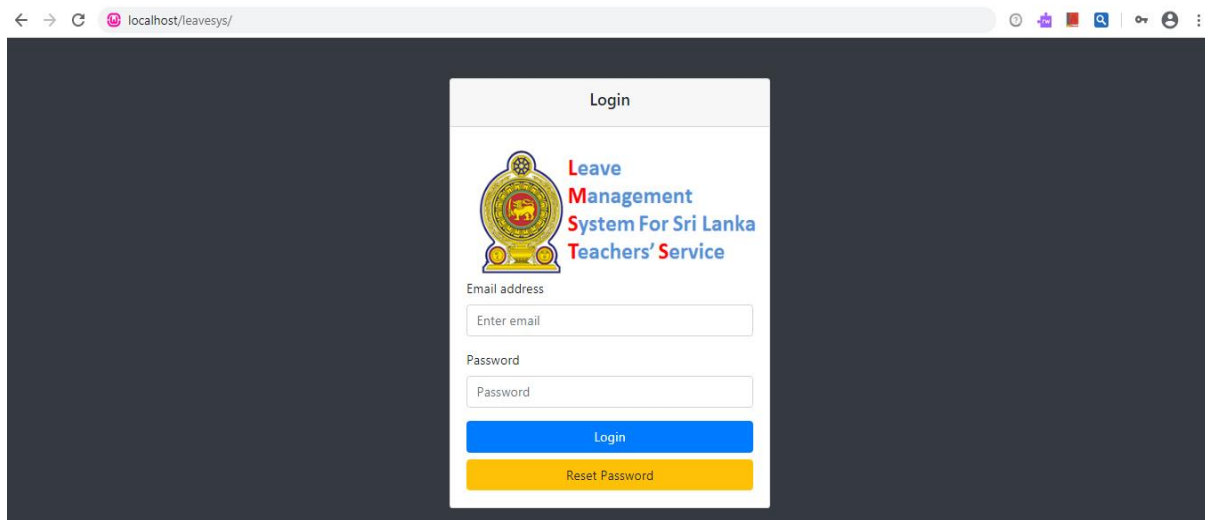


Figure 4. 1. Interface of User Login

4.3.2. Home Page

After user entered the credentials correctly, it will be prompted to the Home page corresponding to the user type. Dashboard for administrator is shown in the Figure 4.2. as well as Figure 4.3. is shown the home page for normal user login.

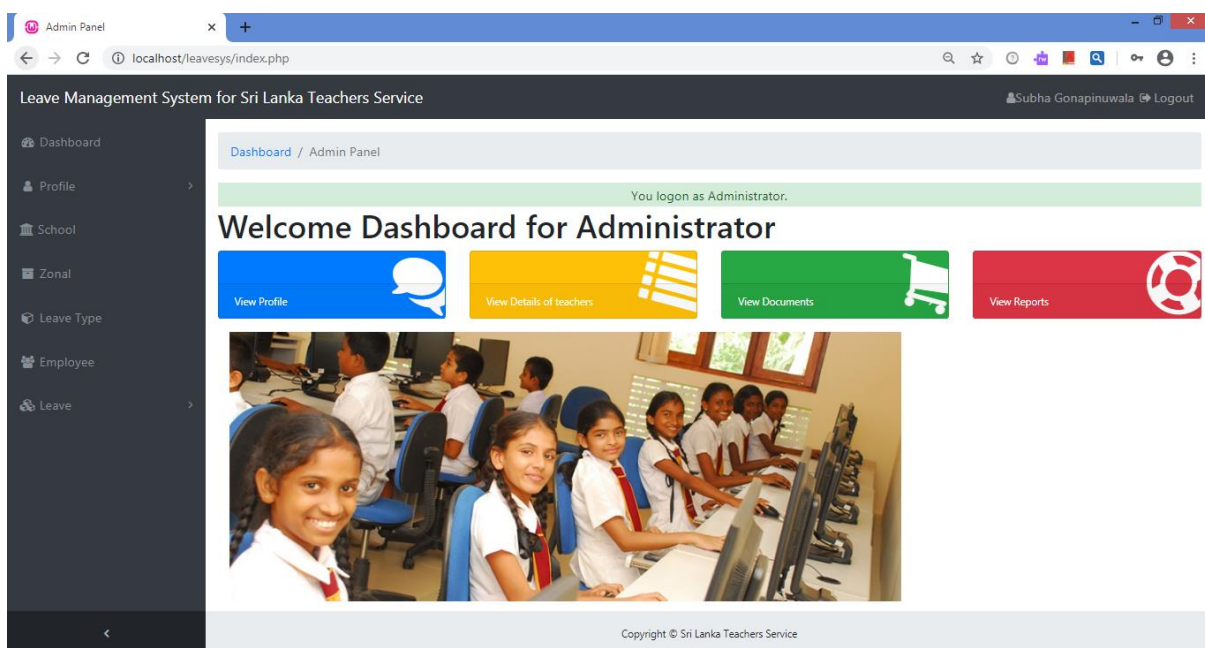


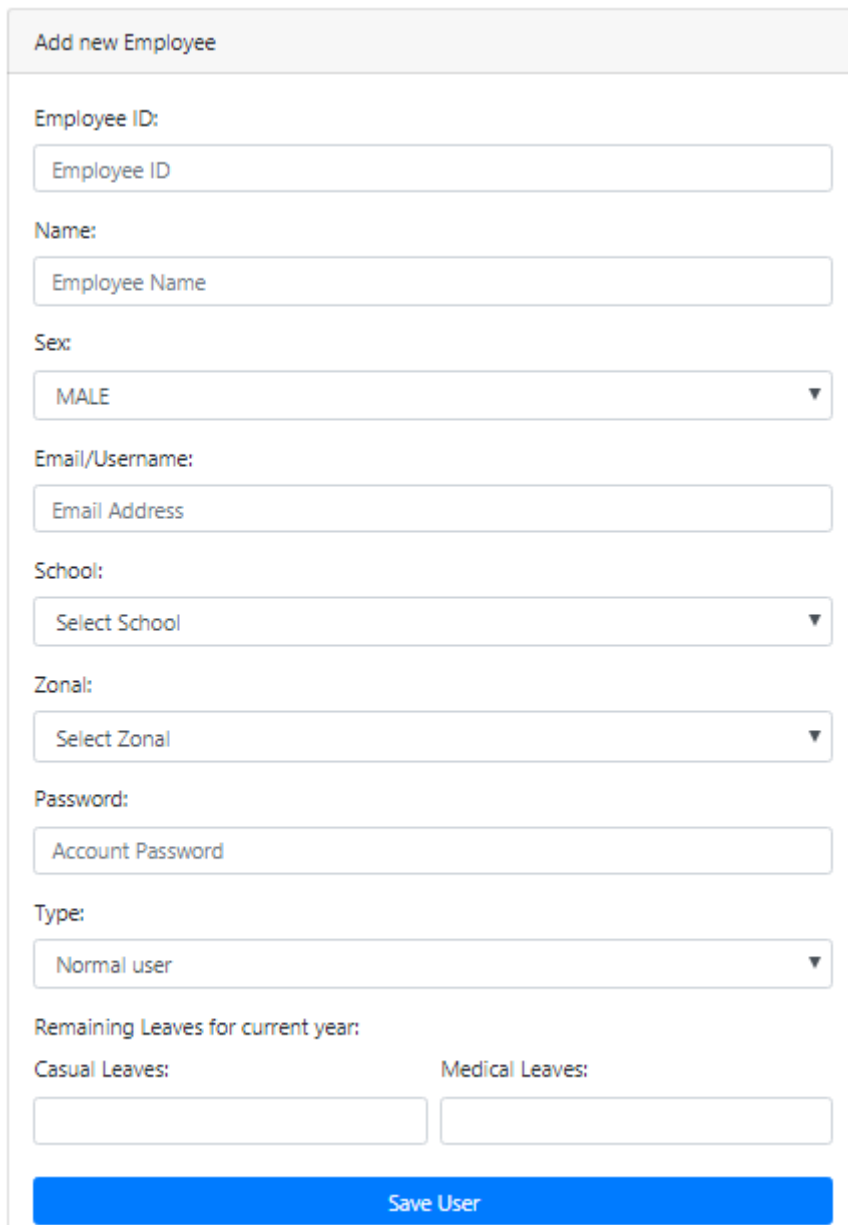
Figure 4. 2. Dashboard for administrator



Figure 4. 3. Home page for Normal user login

4.3.3. User Registration

User registration to the LMSTS is the main user interface in the employee module. This can be done through the Add new employee interface. Adding new employee to the system can be done using the following Figure 4.4 – Interface for the new user registration. This is allowed to assign the remaining available leave for the teacher as it is needed that system data is adding in the middle of the year.



The image shows a web form titled "Add new Employee" with a light gray header. The form contains several input fields and dropdown menus. The fields are: "Employee ID:" with a text box containing "Employee ID"; "Name:" with a text box containing "Employee Name"; "Sex:" with a dropdown menu showing "MALE"; "Email/Username:" with a text box containing "Email Address"; "School:" with a dropdown menu showing "Select School"; "Zonal:" with a dropdown menu showing "Select Zonal"; "Password:" with a text box containing "Account Password"; and "Type:" with a dropdown menu showing "Normal user". Below these fields, there are two more input fields labeled "Casual Leaves:" and "Medical Leaves:". At the bottom of the form is a blue button labeled "Save User".

Figure 4. 4. Interface for new user Registration

4.3.4. Apply Leave

The main module of the LMSTS is Leave and Apply leave has been taken the most important part of this module. When teacher applying leaves it is already he/she can view available remaining leaves for them and this is very easy to handle their leaves without documents like previously. The user is allow to apply their leaves in online leave application by selecting needed leave type which is shown in Figure 4.5. Interface for apply leave.

Add new Leave Application

Employee ID:
9065437893V

Name:
Pavani Gunasekara

Sex:
FEMALE

Available Leaver:

Casual Leaves :
14

Medical Leaves :
13

Date From:
mm/dd/yyyy

Date To:
mm/dd/yyyy

Shift Time:
All Day

Type Of Leave:
Select Leave

Reason :

Upload supportive documents : Choose File No file chosen

Save Leave

Figure 4. 5. Interface for apply leave

When apply leave of Study leave, foreign leave, Maternity leave and Duty leave, user have to upload the relevant documents. Also, when applying medical leaves more than 2 days executively, it is needed to upload the medical certificates. This is clearly shown in following Figure 4.6. Interface for apply special medical leaves.

localhost says

You are applying a Medical Leave more than 2 days. You need to submit a Medical Certificate.

OK

Name:

Pavani Gunasekara

Sex:

FEMALE

Available Leave:

Casual Leaves :

14

Medical Leaves :

13

Date From:

11/24/2020

Date To:

11/27/2020

Shift Time:

All Day

Type Of Leave:

Medical Leave

Reason :

Medical Checkup

Upload supportive documents :

Choose File

No file chosen

Save Leave

Figure 4. 6. Interface for apply special medical leaves

4.3.5. Manage Leaves

This LMSTS allows user to manage their leaves by viewing approved, pending and rejected leaves separately. Figure 4.7. is shown the approved leave list for the user with all leave information and Figure 4.8. clearly view the rejected leave list and the reasons and then teacher can re-apply the leaves. Further, Figure 4.9 has shown the pending leave list which is applied but not get the approval yet.

Dashboard / Leave Module

View Report

01/10/2020 - 01/11/2020 [Generate Report](#)

List of Leave Application [New](#)

Show 10 entries Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-02-19	2020-02-19	1	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-02-19	Edit
644678925V	2020-02-20	2020-02-20	1	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-02-19	Edit
644678925V	2020-05-04	2020-05-05	2	All Day	Casual Leave	Private Reason	APPROVED	N/A	2020-05-01	Edit
644678925V	2020-01-15	2020-01-16	2	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-08-08	Edit
644678925V	2020-05-19	2020-05-20	2	All Day	Casual Leave	Cousin's wedding	APPROVED	Approved. Please assign works for students.	2020-05-01	Edit
644678925V	2020-08-06	2020-08-07	2	All Day	Casual Leave	Aims giving	APPROVED	N/A	2020-08-01	Edit
644678925V	2020-08-17	2020-08-17	0.5	AM	Casual Leave	Going for zonal office	APPROVED	N/A	2020-08-04	Edit
644678925V	2020-08-07	2020-08-07	1	All Day	Casual Leave	Private	APPROVED	N/A	2020-08-08	Edit

Figure 4. 7. Interface for Approved leave list

Dashboard / Leave Module

List of Leave Application [New](#)

Show 10 entries Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-02-20	2020-02-20	0.5	PM	Medical Leave	Go to hospital	REJECTED	Please, take leave later	2020-02-20	Edit
644678925V	2020-10-05	2020-10-09	5	All Day	Study Leave	MSC Examination	REJECTED	Recommended by Principal	2020-08-09	Edit
644678925V	2020-10-05	2020-10-07	3	All Day	Casual Leave	test	REJECTED	N/A	2020-08-03	Edit
644678925V	2020-11-10	2020-11-13	4	All Day	Study Leave	Msc examination	REJECTED	N/A	2020-10-09	Edit
644678925V	2020-10-28	2020-10-31	4	All Day	Casual Leave	Aims Giving	REJECTED	N/A	2020-10-09	Edit
644678925V	2020-10-26	2020-10-29	4	All Day	Casual Leave		REJECTED	N/A	2020-10-09	Edit
644678925V	2020-11-22	2020-11-25	4	All Day	Study Leave	MSC Exam	REJECTED	Recommended By Principal	2020-10-08	Edit
685634987V	2020-02-19	2020-02-19	1	All Day	Medical Leave	Cold and fever	REJECTED	N/A	2020-02-18	Edit
795643876V	2020-03-12	2020-03-16	5	All Day	Casual Leave	Cold and fever	REJECTED	N/A	2020-02-26	Edit
9065437893V	2020-10-20	2020-10-20	1	All Day	Casual Leave	Aims Giving	REJECTED	N/A	2020-10-09	Edit

Figure 4. 8. Interface for Rejected Leave List

List of Leave Application [New](#)

Show 10 entries Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-08-25	2020-08-25	1	All Day	Casual Leave	Go to bank	PENDING	N/A	2020-08-09	Edit
644678925V	2020-08-21	2020-08-21	1	All Day	Medical Leave	Medical Checkup	PENDING	N/A	2020-08-09	Edit
644678925V	2020-09-21	2020-09-21	1	All Day	Medical Leave	To get the medical reports	PENDING	N/A	2020-08-09	Edit
644678925V	2020-09-25	2020-09-25	1	All Day	Casual Leave	Go to daughter's school	PENDING	N/A	2020-09-24	Edit
644678925V	2020-10-14	2020-10-15	2	All Day	Casual Leave	Aims Giving	PENDING	N/A	2020-10-08	Edit
703267893V	2020-08-11	2020-08-11	1	All Day	Casual Leave	Tamil Exam	PENDING	N/A	2020-08-08	Edit
703267893V	2020-08-14	2020-08-14	1	All Day	Casual Leave	Aims Giving at home	PENDING	N/A	2020-08-09	Edit
704365142V	2020-08-12	2020-08-12	1	All Day	Casual Leave	Nepev's wedding	PENDING	N/A	2020-08-08	Edit
704365142V	2020-08-10	2020-08-10	1	All Day	Casual Leave	Daughter's wedding	PENDING	N/A	2020-08-08	Edit
766092351V	2020-08-10	2020-08-10	1	All Day	Medical Leave	Scan testing	PENDING	N/A	2020-08-08	Edit

Showing 1 to 10 of 41 entries Previous 1 2 3 4 5 Next

Figure 4. 9. Interface for Pending Leave List

4.3.6. Reset Password

There is an option, if user want to reset the password and it prompt user friendly window allowing user to change their password. The interface for reset password is shown in following Figure 4.10.

Change Password

Employee ID:

888073819V

Name:

Subha Gonapinuwala

Current Password

Current Password

New Password

New Password

Confirm Password

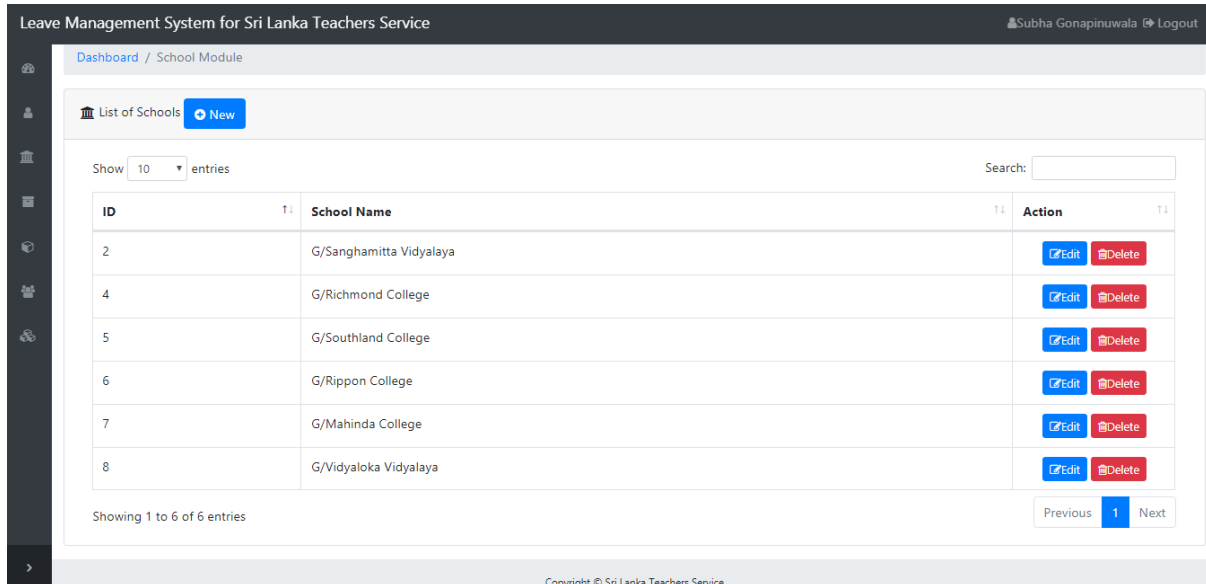
Confirm Password

Reset Password

Figure 4. 10. Interface for reset Password

4.3.7. School Module

LMSTS is developed for Sri Lanka Teachers' service which including all the Government school teachers in Sri Lanka. Leaves are mainly handled by zonal education office which the school is located in. So, this system allows the option to add any school for the system that can view the details of included schools and edit the details of schools. Figure 4.11 shows the interface for details of schools.



Leave Management System for Sri Lanka Teachers Service

Subha Gonapinuwala Logout

Dashboard / School Module

List of Schools [New](#)

Show 10 entries Search:

ID	School Name	Action
2	G/Sanghamitta Vidyalaya	Edit Delete
4	G/Richmond College	Edit Delete
5	G/Southland College	Edit Delete
6	G/Rippon College	Edit Delete
7	G/Mahinda College	Edit Delete
8	G/Vidyaloka Vidyalaya	Edit Delete

Showing 1 to 6 of 6 entries

Previous 1 Next

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Figure 4. 11. List of Schools

Chapter 5. Evaluation and Testing

Evaluation and Testing was the next phase after implementing the LMSTS to check and verify whether the developed system has been covered the correct requirements. An activity check of software testing simply can be done by comparing the each other expected result and the actual result. So, that is help to confirm that free of defect of the system. Also, identification of gaps, errors, or missing things contrary to the actual needed requirements is getting easy due to software testing. So, it is necessary to discuss about user evaluation methods and the testing strategies that were used in the system. Furthermore, the process of software testing including validation and verification is very important due to it may also be referred as control the quality of software.

5.1. Testing Approaches

Mainly, two testing approaches were used to test the system.

- Black Box Testing
- White Box Testing

5.1.1. Black Box Testing

Black box testing is also known as behavioural testing which is a software testing method in the internal structure/design/ implementation of the item being tested without knowing to the tester. These tests can be both functional or non- functional, while usually is functional. This method is named so because the software program, in the eyes of tester is seems like a black box that inside cannot see. Incorrect or missing functions, Interface errors, Errors in data structure, behaviour or performance error, initialization and termination errors can be find using this method.

5.1.2. White Box Testing

White box testing is a testing method of software solution's internal structure, design and coding. In this kind of testing, tester can be seen the code. The flow of inputs and outputs through the application is verified primarily. Also, it focuses on improving design, stability and strengthening security. White box testing is also known as Clear Box testing, Open Box

testing, Structural testing, Transparent Box testing, Code-Based testing, and Glass Box testing.

5.2. Testing Levels

There are different stages of testing that can be done in the software development life cycle. The behaviour and software testing can be checked in with many testing levels. Some of the selective testing levels have been used to test the LMSTS and they are described as following.

5.2.1. Unit Testing

Individual units or component of the system are tested in the level of testing can be described as unit testing. Every component of the LMSTS were validated and tested individually in this stage to verify its performance as designed. It is helped majority of bugs identification at the software development life cycle's earlier stage due to it is have the ability to fix the identified bugs quickly.

5.2.2. Integration Testing

The next phase is the Integration testing after the unit testing. The modules tested individually were concatenated into a group and performed the testing in this integration testing stage. Integration testing ensures that the software modules work together accurately when integrating. Also, it is led to the higher system performance and the better quality.

5.2.3. System Testing

System testing was carried out to the whole system as the next step. The whole system was tested, once all the components were integrated to check whether it meets the specified requirements as well as quality standards. This is mainly focused on the requirements of functional and non- functional requirements of the system. So, the internal code knowledge is not required in System testing.

5.2.4. Acceptance Testing

The System acceptability is checked in the software testing level of acceptance testing. This kind of testing main focus is evaluation of the compliance system with specified requirements and verify whether the acceptability of delivery to the end users.

5.3. Test Plan and Test Cases

It is necessary to prepare a test plan corresponding to the process of Software Testing Life Cycle. All the major activities related with the testing of the project like testing environment, testing schedule and deliverables are covered by the test plan. After that, test cases should be written for each scenario of the system. The test case can be simply defined as a specification of the inputs, testing procedures, execution conditions, and expected results which developed for particular test scenario. Table 5.1. is shown a sample test case prepared for of the LMSTS Login scenario.

Table 5. 1. Test case for user login

ID of test case		1				
Name of test case		Login				
Test No	Test Unit/ Description of Controls	Prerequisite	Input Data	Expected Results	Actual Results	Status
1.1	Enter accurate username and password	Login page should be loaded.	Username :- su@yahoo.com Password :- S*456	Login to the system and redirected to the dashboard	Logged to the system and directed to the dashboard	Pass
1.2	Enter incorrect username	Login page should be loaded.	Username :- ss@yahoo.com Password :- S*456	Popup message "Please enter correct username"	Gave message "Please enter correct username"	Pass
1.3	Enter incorrect password	Login page should be loaded.	Username :- su@yahoo.com Password :- 1234	Popup message "Please enter correct password"	Gave message "Please enter correct password"	Pass
1.4	Click login with empty username	Login page should be loaded.	Username :- empty	Popup message "Username cannot be empty"	Gave message "Username cannot be empty"	Pass
1.5	Click login with empty password	Login page should be loaded.	Password :- empty	Popup message "Please enter correct password"	Gave message "Please enter correct password"	Pass

5.4. User Evaluation

After the testing stage, user evaluation, feedback and suggestion are necessary due to LMSTS was developed to the environment which can be accessible by any teacher in any location of the country. So, it was decided to carry out a user evaluation survey to identify the system improvements, system weak points and etc. There-fore it was decided to carry out a real time user evaluation survey after completing the development, in a particular school. But, the prevailing situation in the country due to the Covid 19 for that moment is not allowed for that kind of evaluation. So, it was decided to create screen capturing demo video and Evaluation questionnaire and shared with teachers via google drive. User evaluation questionnaire that is used for the evaluation process is shown in the below.

		Very Good	Good	Fair	Poor	Very Poor
						
User Evaluation Questionnaire Leave Management System for Sri Lanka Teachers' Service						
Please, take few minutes to complete this survey. This will be help to improve the performance of the system. Please mark '√' for most appropriate response.						
System Quality						
1) Ease to Use						
2) System Performance						
3) Information accuracy						
4) Response Time						
User Interface						
1) Easy to understand						
2) Meaningful error messages						
3) Easy to use						
System Operations						
1) Flow of approval process						
2) Easy to apply leave						
3) Easy to upload documents						
3) Reports						
Training						
1) Easy to Learn						
2) User Manual						
Comments:						

According to the evaluation process, 90% of the users were satisfied with the LMSTS by commenting 'Very Good' and marking the response. Only few of users comment the system is fair. No one is commented system as 'Poor' or 'Very Poor'. According to the analysis of evaluation results, most of the teachers and principals have satisfied with this system and some of them have appreciate the effort of the developing of this kind of system.

Chapter 6. Conclusion

The main objective of the LMSTS is to give smooth effective solution for the Sri Lanka Teachers' service to overcome their leave affairs. Teachers of government school can be able to apply their leaves and getting approval very easily and without any stress by using this system. Therefore, this will be caused enhance the satisfaction of teachers and it will be effected to the children in positive manner.

6.1. Critical Evaluation

LMSTS is a web based proposed system to overcome the existing issues in leave apply and leave approval process in Sri Lanka Teachers' service. The project was begun with gathering requirement using different types of techniques like meetings, questionnaire. Similar Current developed systems and its features were also analysed and taken into consideration with the purpose of better successful development. Then, functional requirements and non- functional requirements of the system were clearly recognized by analysing the gathered requirements and system was designed with user friendly way to apply the leaves, view leave balance, and status of leaves. System was developed using PHP with bootstrap framework and performed testing at the various stages of development process in system. Another main important facility in this developed system is report generation which is very useful to the teachers as well as Principals for other decision making and evaluation process. Finally, a survey was done with the purpose of evaluate the LMSTS and it was concluded the users were satisfied with new developed system and it is helpful teachers to apply leave process with smooth and efficiently.

6.2. Problems Encountered

Some issues were raised at the various phases of the system. It was needed to hold meetings at several times to verify the exact requirements and to understand the leave approval process defined with government circulars. There were some conflicts of leave approval process of some kind of leaves with different zonals. So, it was necessary to clarify the right process and it was caused for more time consuming.

It was taken time for selecting best framework for the development as there were lots of available frameworks. Also, considering the leave approval process with different user roles assigning the permission levels accurately were complex process.

6.3. Future Enhancements

The LMSTS was designed for to the leave process of Sri Lanka Teachers' service. This can be improved for all government services in Sri Lanka with relevant modifications according to their service minutes and circulars.

References

- [1] (2020, Mar). Calamari [Online]. Available: <https://www.capterra.com/p/141217/Calamari>
- [2] (2020, May). Vacation Tracker [Online]. Available: <https://www.capterra.com/p/189276/Vacation-Tracker/>
- [3] (2020, May). Capterra [Online]. Available: <https://www.capterra.com/p/126549/LeavePro>
- [4] (2020, May). TimeTac [Online]. Available: https://www.timetac.com/de/?gclid=EAIaIQobChMIpYOn5cOm6QIVQgwrCh3p7wvJEAA YASAAEgJOcPD_BwE
- [5]] (2020, May). Capterra [Online]. Available: <https://www.capterra.com/p/176659/Jornai/>
- [6] (2020, May). Requirements Gathering for Software Development Projects [Online]. Available: <https://www.bbconsult.co.uk/blog/requirements-gathering>
- [7] (2020, May). Requirement Analysis Techniques [Online]. Available: <https://www.visual-paradigm.com/guide/requirements-gathering/requirement-analysis-techniques>
- [8] (2020, May). What is Class Diagram? [Online]. Available: <https://www.visual-paradigm.com/guide/uml-unified-modeling-language/what-is-class-diagram>

Appendix A : User Manual

System Overview

Leave Management System for Sri Lanka Teachers' Service (LMSTS) is a web based solution to automate the leave management and approval process of government school teachers while providing better efficient system for them. Also, this will reduce paper usage and save time of filling lots of documents.

User Login

Open the web browser and go to the URL <http://localhost/leavesys> for log in to the system, It will be directed to login page of the LMSTS, that is displayed in Figure A.1. This is allowed to login the system for registered users by inserting the relevant username and password accurately

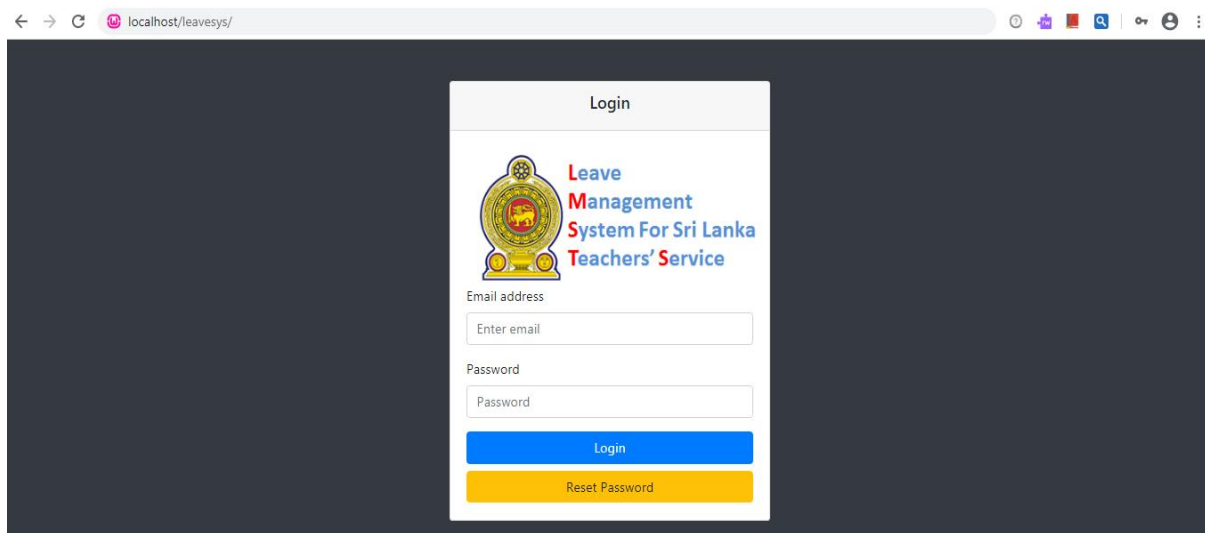
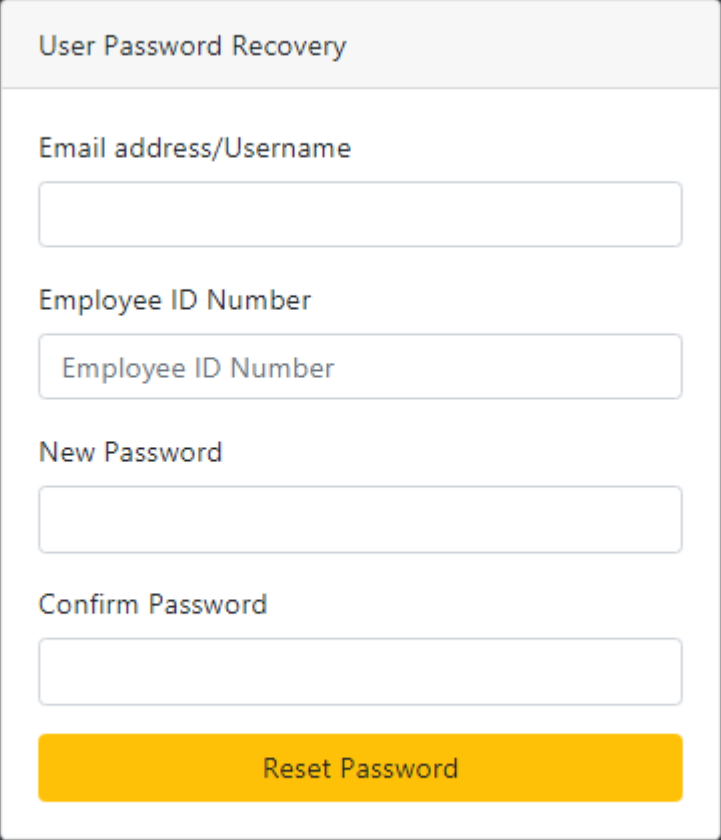


Figure A. 1. LMSTS User Login Page

If registered user forgets the password, then system allows resetting password in the system login by clicking Reset password button shown in the Figure A.1. Then, it will be directed the screen as shown in Figure A.2.

A screenshot of a 'User Password Recovery' form. The form is white with a light gray header bar containing the title 'User Password Recovery'. Below the header, there are four input fields: 'Email address/Username', 'Employee ID Number', 'New Password', and 'Confirm Password'. Each field has a light gray placeholder text. At the bottom of the form is a yellow button labeled 'Reset Password'. The form is centered on a dark gray background.

User Password Recovery

Email address/Username

Employee ID Number

New Password

Confirm Password

Reset Password

Figure A. 2. Password Recovery

System Menu

Dashboard of the relevant user will be appeared, once the user logging to the system. The main page of the LMSTS is this interface and it shows the login user's name as shown below Figure A.2.



Figure A. 3. Logged user name

Also, the navigation menu will display to the user, as shown in the following Figure A.4. This system navigation menu will be changed, corresponding with the user access level of the

logging user. The menu of navigation relevant to the system administrator, which is having full authorization to the system, has been shown in Figure A.4.

This main menu is indicating the five key system modules which are School, Zonal, Leave Type, Employee and Leave while supporting modules are displayed as other menu items.

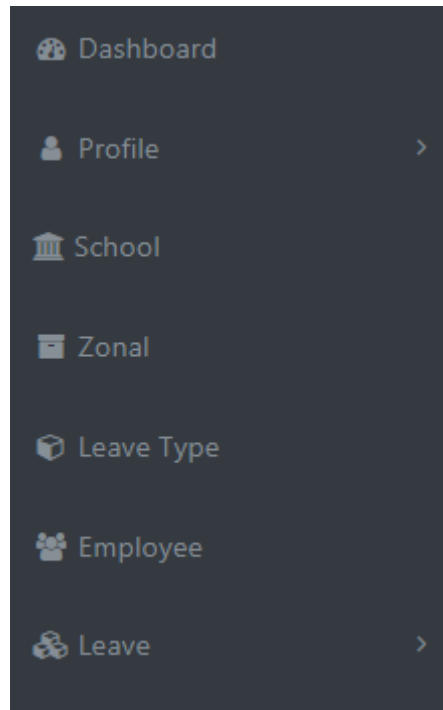


Figure A. 4. Navigation Menu

Profile

Profile menu will be navigated for two other sub menus which are view profile and reset password. User can view his/her profile through view profile and it is allowed to edit their basic information for any user like email. Following Figure A.5 is shown the update profile window.

Update Employee Account

Employee ID:

9065437893V

Available Leave:

27

Name:

Pavani Gunasekara

Sex:

FEMALE

Email/Username:

pavani@gmail.com

School:

G/Sanghamitta Vidyalaya

Zonal:

Galle

Type:

Normal user

Update Profile

Figure A. 5. Interface for Update Profile

Reset Password

Facility for reset the password is also included as sub menu in the previously described profile menu. When user wants to change his/her current password, user can change it using following form shown in Figure A.6. User should enter the current using password to change the password.

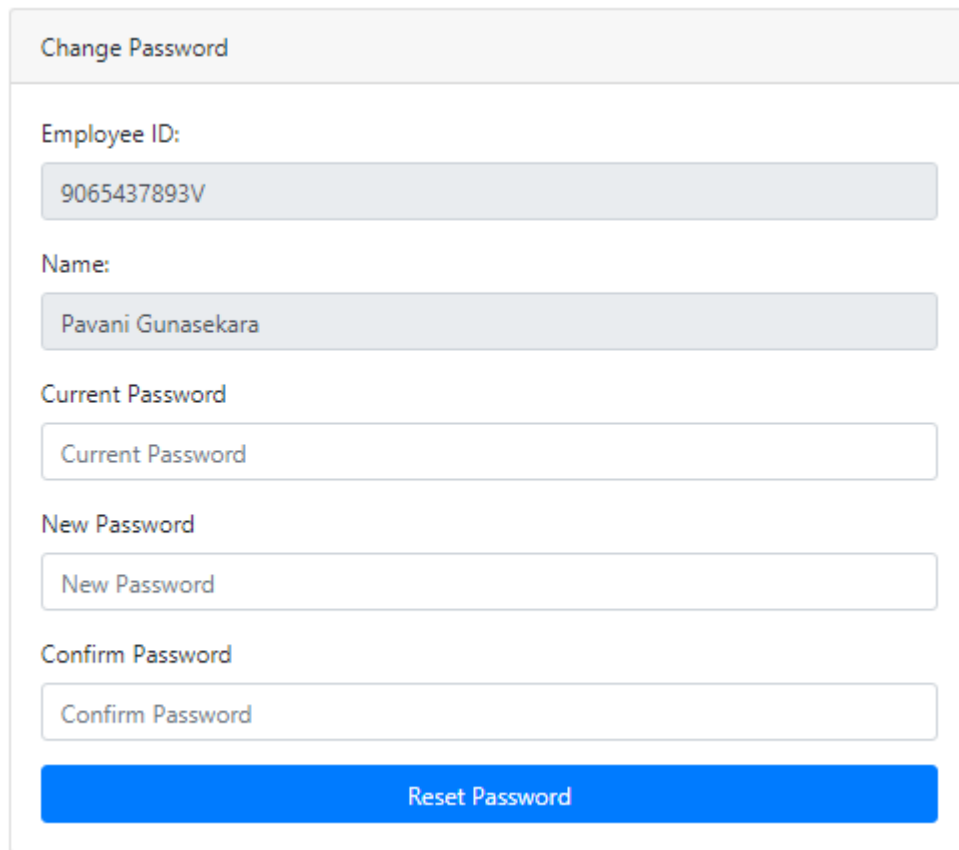
The image shows a 'Change Password' form. It has a title bar at the top. Below the title bar, there are five input fields: 'Employee ID' (containing '9065437893V'), 'Name' (containing 'Pavani Gunasekara'), 'Current Password' (containing 'Current Password'), 'New Password' (containing 'New Password'), and 'Confirm Password' (containing 'Confirm Password'). At the bottom of the form is a blue button labeled 'Reset Password'.

Figure A. 6. Change Password screen

School Module

This system is designed for all government school teachers. So, it is needed to add schools to the system to maintain the system. So, administrator in Zonal education office can add the relevant schools in current zonal. When user selects the School in navigation menu, it will be prompted to the List of schools as shown in Figure A.7. Then, it is allowed user to add new school by clicking New button in this Figure and it will be prompted to new screen for add school details. Also, user can search schools by search option and current available school details can be edited or deleted.

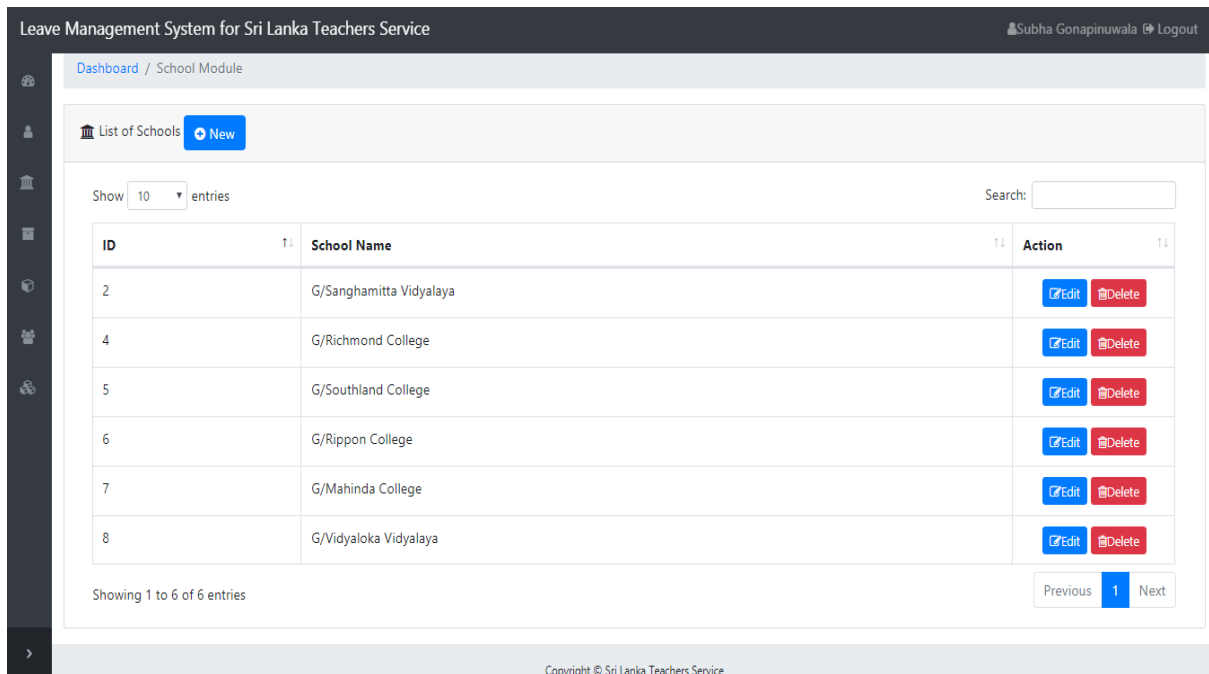


Figure A. 7. List of available schools

Zonal Module

System allows administrator to add, edit and delete zonal details to the system and following Figure A.8. is shown the list of zonal details.

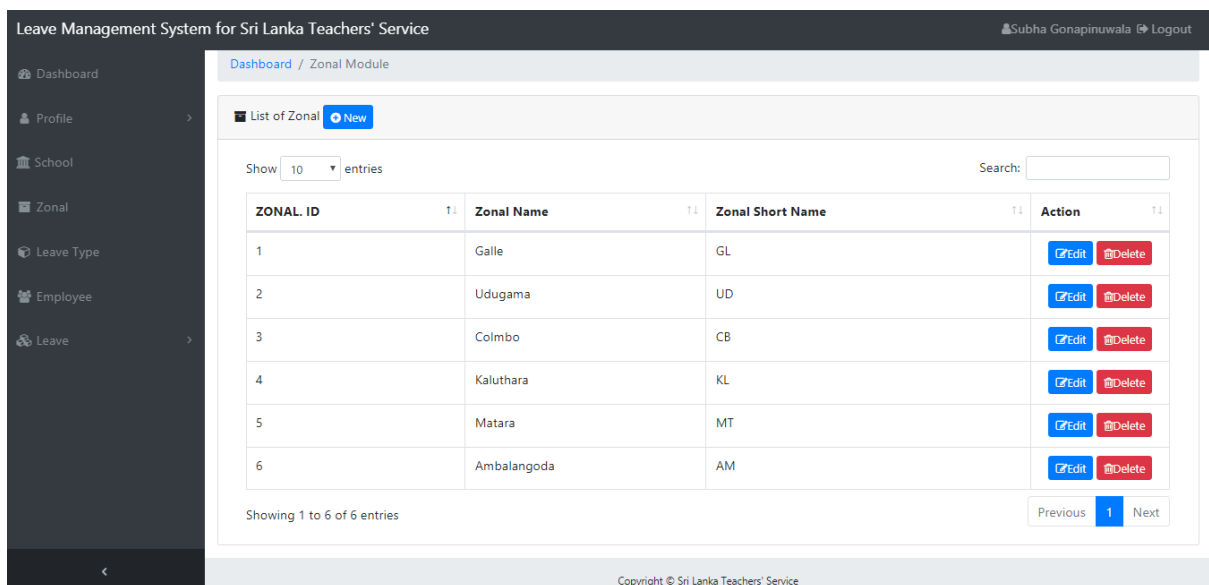


Figure A. 8. List of Zonal

Employee Module

This module allows administrator to add, edit, delete and assign roles of employees to the system. Figure A.9. is shown the List of employees and by clicking New button on the top of left corner , user allows to add new employee to the system. Then it will be prompted to the new screen that shown in Figure A.10. and it is allowed user to add new employee details.

List of Employee New								
Show 10 entries		Search:						
EMP.ID	Employee Name	Sex	Email/Username	School	Zonal	Position	Ave. Leave	Action
644678925V	Chamindu Aththilgoda	MALE	chamindua@gmail.com	G/Sanghamitta Vidyalaya	Galle	Normal user	9	Edit Add Delete
653987620V	Chandana Kalansooriya	MALE	chandana@gmail.com	G/Ukwatta Vidyalaya	Galle	Supervisor user	14	Edit Add Delete
658932517V	Bimalika Samarasekara	FEMALE	bimalika@gmail.com	G/Ukwatta Vidyalaya	Galle	Normal user	40	Edit Add Delete
685634987V	Gayan de Silva	MALE	gayand@gmail.com	G/Southland College	Galle	Normal user	15	Edit Add Delete
703267893V	Samanthi Madanayaka	FEMALE	samanthi@gmail.com	G/Ukwatta Vidyalaya	Galle	Normal user	40	Edit Add Delete
704365142V	Ranjan Amaraweera	MALE	ranjan@gmail.com	G/Ukwatta Vidyalaya	Galle	Normal user	14	Edit Add Delete
706527831V	Sahan Ekanayaka	MALE	sahan2011@gmail.com	G/Sanghamitta Vidyalaya	Galle	Super User	9	Edit Add Delete
706589473V	Devika De Silva	FEMALE	devika@gmail.com	G/Ukwatta Vidyalaya	Galle	Normal user	41	Edit Add Delete
734589527V	Vinetha Disasekara	FEMALE	vinetha@gmail.com	G/Southland College	Galle	Supervisor user	0	Edit Add Delete
766897563V	Chamida Gunawardhana	MALE	chaminda@gmail.com	G/Ukwatta Vidyalaya	Galle	Normal user	13	Edit Add Delete

Figure A. 9. List of Employees

Add new Employee

Employee ID:

Employee ID

Name:

Employee Name

Sex:

MALE

Email/Username:

Email Address

School:

Select School

Zonal:

Select Zonal

Password:

Account Password

Type:

Normal user

Remaining Leaves for current year:

Casual Leaves:

Medical Leaves:

Save User

Figure A. 10. Add employee

Leave Module

This is allowed user to apply leave, manage leaves, to view approved and rejected leaves separately and to view reports. User can apply leave by selecting the sub module of Apply leave in Leave module. Then it will be prompted to the screen shown in Figure A.11 and it is displayed the user details and allow user to apply leave according to their needs.

Add new Leave Application

Employee ID:

9065437893V

Name:

Pavani Gunasekara

Sex:

FEMALE

Available Leave:

Casual Leaves :

14

Medical Leaves :

13

Date From:

mm/dd/yyyy

Date To:

mm/dd/yyyy

Shift Time:

All Day

Type Of Leave:

Select Leave

Reason :

Upload supportive documents :

Choose File

No file chosen

Save Leave

Figure A. 11. Apply Leave

Manage Leaves

When selecting Manage leaves in navigation bar it will be prompted the Figure A.12 which is shown the list of leave applications. This is shown the approval pending leaves with other applied details for normal user. Also, relevant user can approve the leaves through this.

List of Leave ApplicationNew

Show10entries

Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-08-25	2020-08-25	1	All Day	Casual Leave	Go to bank	PENDING	N/A	2020-08-09	
644678925V	2020-08-21	2020-08-21	1	All Day	Medical Leave	Medical Checkup	PENDING	N/A	2020-08-09	
644678925V	2020-09-21	2020-09-21	1	All Day	Medical Leave	To get the medical reports	PENDING	N/A	2020-08-09	
644678925V	2020-09-25	2020-09-25	1	All Day	Casual Leave	Go to daughter's school	PENDING	N/A	2020-09-24	
644678925V	2020-10-14	2020-10-15	2	All Day	Casual Leave	Alms Giving	PENDING	N/A	2020-10-08	
703267893V	2020-08-11	2020-08-11	1	All Day	Casual Leave	Tamil Exam	PENDING	N/A	2020-08-08	
703267893V	2020-08-14	2020-08-14	1	All Day	Casual Leave	Alms Giving at home	PENDING	N/A	2020-08-09	
704365142V	2020-08-12	2020-08-12	1	All Day	Casual Leave	Nepew's wedding	PENDING	N/A	2020-08-08	
704365142V	2020-08-10	2020-08-10	1	All Day	Casual Leave	Daughter's wedding	PENDING	N/A	2020-08-08	
766092351V	2020-08-10	2020-08-10	1	All Day	Medical Leave	Scan testing	PENDING	N/A	2020-08-08	

Showing 1 to 10 of 41 entries

Previous12345Next

Figure A. 12. List of Leave applications

Figure A.13. has shown the approved leave list for the user with all leave information and Figure A.14. clearly shown the rejected leave list and the reasons and then user can re-apply the leaves.

Dashboard / Leave Module

View Report

01/10/2020 - 01/11/2020Generate Report

List of Leave ApplicationNew

Show10entries

Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-02-19	2020-02-19	1	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-02-19	View
644678925V	2020-02-20	2020-02-20	1	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-02-19	View
644678925V	2020-05-04	2020-05-05	2	All Day	Casual Leave	Private Reason	APPROVED	N/A	2020-05-01	View
644678925V	2020-01-15	2020-01-16	2	All Day	Medical Leave	Cold and fever	APPROVED	N/A	2020-08-08	View
644678925V	2020-05-19	2020-05-20	2	All Day	Casual Leave	Cousin's wedding	APPROVED	Approved. Please assign works for students.	2020-05-01	View
644678925V	2020-08-06	2020-08-07	2	All Day	Casual Leave	Alms giving	APPROVED	N/A	2020-08-01	View
644678925V	2020-08-17	2020-08-17	0.5	AM	Casual Leave	Going for zonal office	APPROVED	N/A	2020-08-04	View
644678925V	2020-08-07	2020-08-07	1	All Day	Casual Leave	Private	APPROVED	N/A	2020-08-08	View

Figure A. 13. Approved Leave List

Dashboard / Leave Module

List of Leave Application [New](#)

Show 10 entries

Search:

EMP. ID	DATE FROM	DATE TO	NO. OF DAYS	SHIFTTIME	TYPE	REASON	STATUS	REMARKS	DATE POSTED	Action
644678925V	2020-02-20	2020-02-20	0.5	PM	Medical Leave	Go to hospital	REJECTED	Please, take leave later	2020-02-20	✎
644678925V	2020-10-05	2020-10-09	5	All Day	Study Leave	MSC Examination	REJECTED	Recommended by Principal	2020-08-09	✎
644678925V	2020-10-05	2020-10-07	3	All Day	Casual Leave	test	REJECTED	N/A	2020-08-03	✎
644678925V	2020-11-10	2020-11-13	4	All Day	Study Leave	Msc examination	REJECTED	N/A	2020-10-09	✎
644678925V	2020-10-28	2020-10-31	4	All Day	Casual Leave	Aims Giving	REJECTED	N/A	2020-10-09	✎
644678925V	2020-10-26	2020-10-29	4	All Day	Casual Leave		REJECTED	N/A	2020-10-09	✎
644678925V	2020-11-22	2020-11-25	4	All Day	Study Leave	MSC Exam	REJECTED	Recommended By Principal	2020-10-08	✎
685634987V	2020-02-19	2020-02-19	1	All Day	Medical Leave	Cold and fever	REJECTED	N/A	2020-02-18	✎
795643876V	2020-03-12	2020-03-16	5	All Day	Casual Leave	Cold and fever	REJECTED	N/A	2020-02-26	✎
9065437893V	2020-10-20	2020-10-20	1	All Day	Casual Leave	Aims Giving	REJECTED	N/A	2020-10-09	✎

Figure A. 14. Rejected Leave List