Philadelphia University
Final year project 1

Faculty of Information Technology
Department of Software Engineering

Human Resource Management System.

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Chapter 1: Proposal

1.1 Goals and Objectives

1) Usability and efficiency of employees services

2) Generate reports of employee leaves or vacation and complaints

3) To calculate the employee salary

1.2 Brief description of the project

The HR Management system is one of the most important systems that must be available in every company because it will save time and effort to complete some simple transactions. Job description is the completion of some transactions online, the most important of which is (requesting a vacation, submitting a complaint to the manager or knowing the employee's daily working schedule, through which or Inquire about the date of receiving the salary and its value. And each employee can registration with employee id and password.

1.3 References :1)

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World Wide Web

A.projects*. "Title." Web student portal for the it and management : www.freeprojectz.com, Nov.7,2014* [March.10,3,2021].

Lecture

M. Tayee. Dr. final project, Topic: "discussing." ICT 224, Faculty of IT, University of Philadelphia, Jordan, Amman, April. 31, 2021.

E-mail

W.daabes "new message ,done?wesamdaabes98@gmail.com ". (April.3,2021).

Project Requirements (Hardware & Software)

:-

Company or organization (If applicable)

not applicable

1.4 Prerequisite

Completion of 90 study hours

1.5 Project Specialization (Software Engineering)

Software Engineering

1.6 Title : HR Management system

1.7 Introduction:

The proposed project "HR Management System" has been developed to overcome the problems faced in the practicing of manual system. This software is built to eliminate and in some cases reduce the hardships faced by the existing system. Moreover this system is designed for particular need of the company to carry out its operations in a smooth and effective manner.

It is a special system for employees in any company in which basic jobs are available for any employee, such as (vacations - working hours - employee or manager notes within work - and salary inquiries).

1.8 Objective:

1) Useability and efficiency of employees services.

2) Generate reports of employee leaves or vacation and complaints.

3) To calculate the employee salary.

1.9 Problem Statement:

Overcoming the problems facing the manual system and creating transactions electronically to make it easier for employees and management to communicate between them .

1.10 Motivation:

The motivation of the project is to provide employee services in a simple and fair way for business operations to run smoothly. Leave requests management also handle staffing requirements with ongoing policy and legal compliance.

1.11 Literature Review:

sagar informatics

HR software to retain and develop employees, drive engagement, optimize benefits, and increase productivity.

sagar Informatics is HR software that features a record of assigned tasks, employee data analysis, employee monitoring, a centralized employee database, worksheet and timesheet management, and time-off tracking.

This software has a good track record of after-sales support and other customer service resources. Issues are dealt with promptly by email or phone and they have multiple numbers at which they can be reached.

Sap SuccessFactors

HR software to retain and develop employees, drive engagement, optimize benefits, and increase productivity.

Sap SuccessFactor is an engagement-focus HR tool that offers flexible employee surveys, role-based dashboards and reporting, customizable impact reports, event-based triggers, and employee rewards programs.

Methodology:

Waterfall model because requirement are very well known , product definition is stable Technology is understood . easy to use , quality is more important than cost or schedule .

Chapter 2: Requirement Engineering Part

Requirement Engineering Part:

2.1 Domain Understanding:

HR Management System is a website used to complete some simple transactions using the Internet instead of the paper-based system. The site provides the following services: 1) Request leave or submit a complaint to the manager 2) The daily work schedule in addition to the number of additional hours desired by the employee 3) Inquire about the salary and its value this month 4) Each employee can register with the employee's identification number and password.

2.1.1 Context:

The system as is takes place of paper based system and it's objectives. But the website saves Time, Effort and Useability .

2.1.2 Scope of the systems as-is:

This project is beneficial for companies in maintaining employee record. Salary calculation for each employee and also focus on attendance of each employee and the number of leaves taken per month / year. There is also the possibility to check the salary report at any time so as not to lead to any miscalculation.

2.1.3 Stakeholders:

Actor	Interests
Managing Director	Salary, Working hours, Job security, Managing vacation request and reports.
Employees	Salary, Working hours, Job security, Vacation request or reports.
Company Owners	Business operations to run smoothly, Profit.

IT Developer	Create the website, Level of security, Privacy, Data Storage.

2.1.4 Strengths and Weaknesses of the system as-is

The Strength Of Paper System Is :

Documentation.

The Weaknesses Of Paper System Is :

1) Prone to damage: Manual documents can be easily damaged, lost, or stolen.
2) Higher costs: Because we will need more paper, printers, copiers, stationery and other office supplies.
3) Lack of security: Paper is one of the biggest information security risks for companies because printed documents can easily be lost, mishandled, or destroyed while digital data can be encrypted and kept securely in hard disks or electronic devices.

2.1.5 Glossary of Terms:

1	EIN	Employee Identification Number
2	HRMS	Human Resource Management System
3	LMS	Leave Management System
4	OP	Overtime Pay

2.2 Requirement Elicitation

1. **Retained Requirement elicitation techniques**

- *Which ones?* Questionnaire

- *Motivations?* we can't meet the employee in this time cause of corona virus

For easy access to a larger number of employees and for accurate reports and Asking the employee easily than making and save time also

2. **Requirement Elicitations Documents**

Questionnaire about HR management system

Employee information

Name :	Employee id :
Department :	Employee job title :

Please encircle only one number from 1-6 that indicates your disagreement or agreement according to your experience and impression about HR management information.

	Very Strongly Disagree	strongly Disagree	Disagree	Agree	Strongly Agree	Very Strongly Agree
Employees are regularly informed about the initiatives taken by the HR department						
In this system , it is clear what belongs to the						

tasks and what's outside the field of the HR management information						
In this system, HR procedures are easy to follow						
Employees fully understand how HR practice works in the system						
Top managers believe that HR is the key for development of the institution						
In general, the HR staff is met with much appreciation in this organization						

Does every employee have enough vacation days ?

Does HR saves time and effort ?

Are manual issues already eliminated in this HR system?

Do you recommended this HR system ?

Do you have privileges?

Please choose one of the following (Agree, disagree, neither agree or disagree)

	Agree	Disagree	Neither agree or disagree
Organization's HR executives are fully aware of the business needs and strategies			
Efforts are taken to generate awareness amongst the employees about the organization's financial position, customers' needs, quality of product/service, cost etc			
The organization's human resource requirements are systematically ascertained and an appropriate plan is formulated for satisfying the requirements			

The organization has a formal policy of career planning and development			
There are distinct career paths and internal promotion norms within the organization			

2.2.1 Requirement Specifications

2.2 Software Requirements

2.2.1 Functional Requirements

Admin:

Functional	Description
Login	Log in using the administrator number and password
Change password	The password change or restore
Add new employee	The Admin can add a new employee
Add attendance dates for employees	The Admin can add working time for employees
Accept or reject holiday or leave	The Admin can approve or deny a holidays or leave To the employee with the reason written

Calculate the salary	The Admin can Calculate the salary To the employee
view employee review	The Admin can view and respond to employee feedback

Employee:

Functional	Description
login	Log in using the employee number and password
Change password	The password change or restore
Request holiday or leave	Employees are allowed to request holiday or leave
Writ a complaint or a note to the director	Employees are allowed to submit a complaint or note to the manager
view work time	Employees are allowed to view working hours
view the salary	Employees are allowed to view the salary amount
Admin reviews	It allows employees to view the manager's notes

Non Functional Requirements

Usability: the system is easy to use by the users, we tried to provide easy control interfaces in the design.

2.2.2 Requirements Analysis

The requirement was read and it was clear and understandable and there is no ambiguity in it and it was easy to apply and it was dealt together with all transparency

2.2.3 Requirements Validation

	Question	Yes	No
1	Does it possible to implement all of the requirements?	Yes	
2	Is the maintainability of the system/software specified? Including the ability to respond to changes in the operating environment, interfaces, accuracy, performance, and additional predicted capabilities.		No
3	Have requirements for communication among system/software components been specified?	Yes	
4	Have overall function and behavior of the system/software been defined?	Yes	
5	Is the maximum memory specified?		No
6	Do the requirements define all the information that is to be displayed to the user?	Yes	
7	Are there conflicting requirement?		No
8	Is each requirement testable?	Yes	
9	Is the level of security specified?	Yes	
10	Have the software and hardware environments been defined?	Yes	
11	Are the specified error messages unique and meaningful?	Yes	
12	Is each requirement in scope for the project?	Yes	

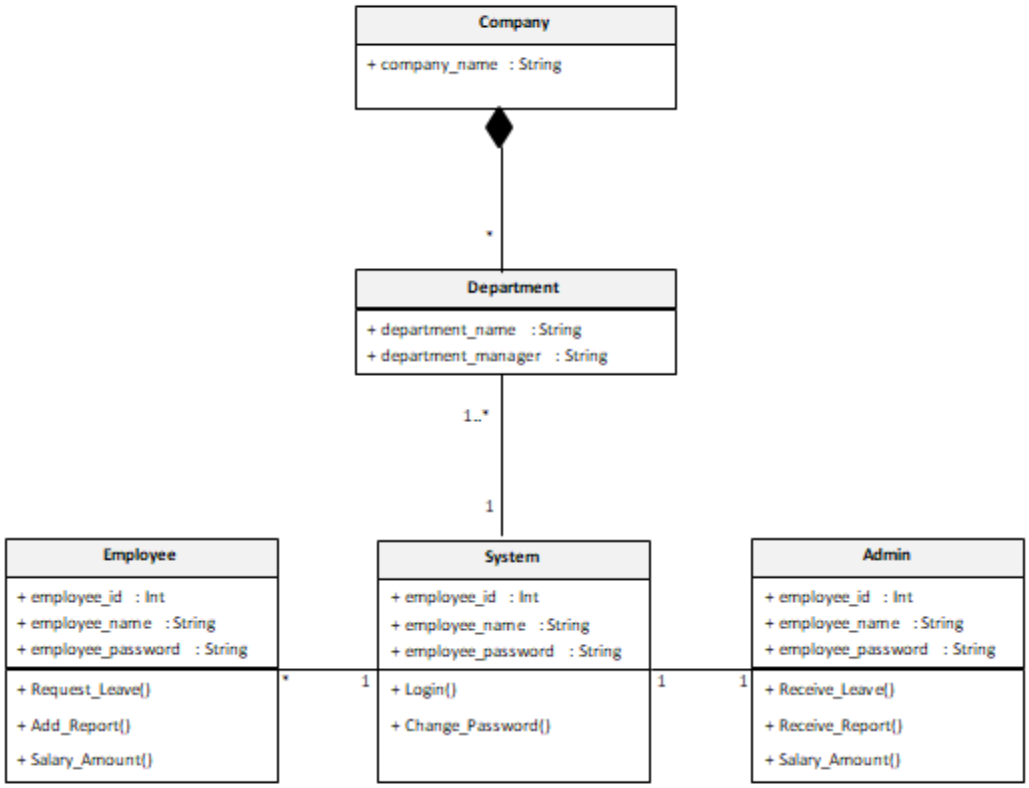
2.2.4 Requirement Modeling:

Use case:

Figure(1): Use case

Class diagram:

Here will see the class diagram for the HRMS in figure (2). That illustrate a system's structure in a detailed way ,showing its attributes ,operations as well as its relations.



Figure(2): Class Diagram

Chapter 3:Software Requirements Specification

3.1 Introduction:

This document is a Software Requirement Specification (SRS) for the Human Resources Management System (HRMS) Project. We will give a complete description for overview and list the requirements which meet the needs of the company.

3.1.1 Purpose:

The purpose of this document is to give a detailed description of the requirements of HR Management System (HRMS). This document is primarily intended to be proposed to overcome the problems faced in the practicing of manual system, reduce the hardships faced by the existing system and to particular need of the company to carry out its operations in a smooth and effective manner.

3.1.2 Scope:

HR Management System is a website used to complete some simple transactions using the Internet instead of the paper-based system. The site provides the following services: 1) Request leave or submit a complaint to the manager 2) The daily work schedule in addition to the number of additional hours desired by the employee 3) Inquire about the salary and its value this month 4) Each employee can register with the employee's identification number and password.

This website is beneficial for companies in maintaining employee record. Salary calculation for each employee and also focus on attendance of each employee and the number of leaves taken per month / year. There is also the possibility to check the salary report at any time so as not to lead to any miscalculation.

3.1.3 Definitions, acronyms and abbreviations:

1	SRS	Software Requirements Specification
2	EIN	Employee Identification Number
3	HRMS	Human Resource Management System
4	LMS	Leave Management System
5	OP	Overtime Pay
6	Admin / Administrator	Administrator who is given specific permission for managing and controlling the system

3.1.4 References

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E-mail

W.daabes “new message ,done?wesamdaabes98@gmail.com ”. (April.3,2021).

3.2 Overview:

The remainder of this document includes three chapters and appendixes. The second one provides an overview of the system functionality and system interaction with other systems. This chapter also introduces different types of stakeholders and their interaction with the system. Further, the chapter also mentions the system constraints and assumptions about the product.

The third chapter provides the requirements specification in detailed terms and a description of the different system interfaces. Different specification techniques are used in order to specify the requirements more precisely for different audiences.
The fourth chapter deals with the prioritization of the requirements. It includes a motivation for the chosen prioritization methods and discusses why other alternatives were not chosen. The Appendixes in the end of the document include the all results of the requirement prioritization and a release plan based on them.

3.2.1 Overall description:

This section will give an overview of the whole system. The system will be explained in its context to show how the system interacts with other systems and introduce the basic functionality of it. It will also describe what type of stakeholders that will use the system and what functionality is available for each type.
At last, the constraints and assumptions for the system will be presented.
This section does not state specific requirements. Instead it provides a back ground for those requirements, which are defined in section 3, and makes them easier to understand.

3.2.2 User characteristics:

There are three types of users that interact with HRMS: Employees, Managing Director/Admin and Company Owners . Each of these three types of users has different use of the system so each of them has their own requirements.

Employees: The website provides the following services for employees: 1) Request leave or submit a complaint/report to the manager 2) The daily work schedule in addition to the number of additional hours desired by the employee 3) Inquire about the salary and its value with OP working this month 4) Each employee can register with the EIN and password.

Managing Director/Admin: Manager is also an employee and his interests in the website will be: Salary, Working hours, Job security. But he has a special validity which is managing vacation request and reports. Which is mean he can accept or reject the vacation request or reports.

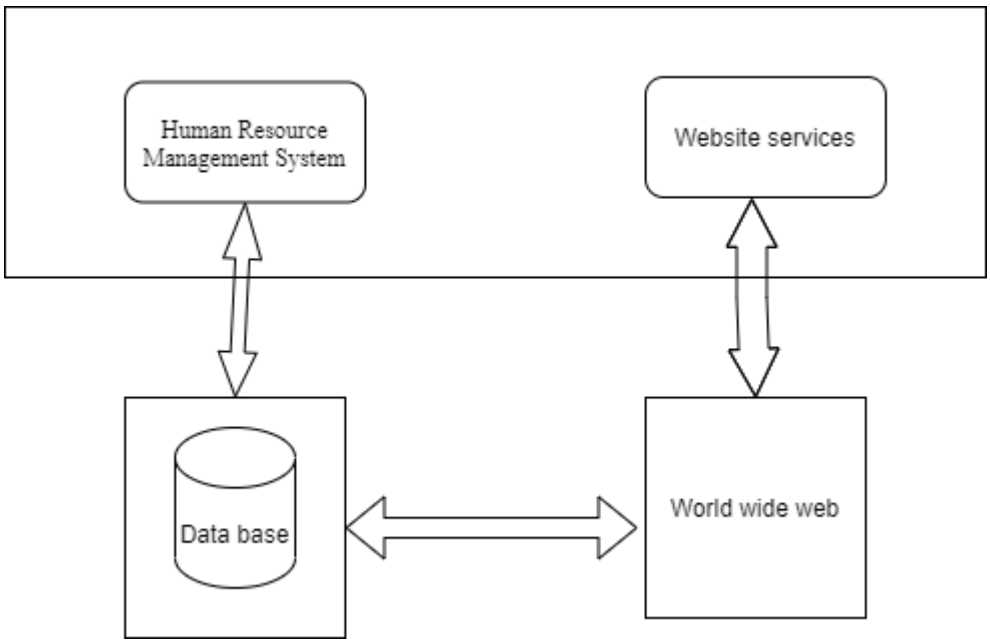
Company Owners: The only thing that company owners are interested in the website is profit and business operations to run smoothly.

3.3.3 Product perspective:

This system consists of a website. The website will be used to facilitate the process of information exchange between the two parties of the manager and the employee and the completion of transactions for the employees.

The website will need to connect to the internet from any smart device in order to be able to use it. The website will provide the employee with jobs like (vacations - working hours - employee or manager notes within work - and salary inquiries)

The functions provided by the website will be included so that the user can use the functions in the application smoothly Since this is a data-driven product, it will need somewhere to store the data. Therefore, a database will be used. The website will communicate with the database.



Figure(1): Product perspective:

3.2.4 Product functions:

Completing some online transactions, the most important of which are (requesting leave, submitting a complaint, sending notes to the manager or receiving them, knowing the employee's daily work schedule or from or calculating the employee's salary.

3.2.5 Constraints:

Internet connection is also restricted on the website. Since the website fetches data from the database over the internet, it is vital that there is an internet connection for the website to function.

3.2.6 Assumptions and dependencies:

One of the assumptions about the product is that it will always be used on the website accessed from any smart device. For example, users may have customized it with other websites, there may be scenarios where the website does not function as intended or even at all.

3.2.7 Apportioning of requirements:

In the case that the project is delayed, there are some requirements that could be transferred to the next version of the website.

3.3 Functional requirements:

This section includes the requirements that specify all the main actions of the software system.

Functional Requirement 1

TITLE: log in

DESC: The user must be able to enter the site and choose the employee or manager

RAT: for the user to use the website

DEP: FR1.

Functional Requirement 2

TITLE: change Password

DESC: The password change or restore

RAT: To maintain privacy

DEP: None

ID: FR3

TITLE: Add new employee

DESC: The Admin can add a new employee for the employee to use the website

RAT: for the user to use the website

DEP: None

ID: FR4

TITLE: Request holiday or leave

DESC: Employees are allowed to request holiday or leave

RAT: In order for the employee to complete the transaction

DEP: None

ID: FR5

TITLE: Writing a complaint or a note to the director

DESC: Employees are allowed to submit a complaint or note to the manager

RAT: In order for the employee to complete the transaction

DEP: None

ID: FR6

TITLE: view work time

DESC: Employees are allowed to view working hours

RAT: In order for the employee to continue working

DEP: None

ID: FR7

TITLE: view the salary

DESC: Employees are allowed to view the salary amount

RAT: So that the employee can get the salary

DEP: None

ID: FR8

TITLE: Admin reviews

DESC:It allows employees to view the manager's notes

RAT: In order for the employee to complete the transaction

DEP: None

ID: FR9

TITLE: Add attendance dates for employees

DESC: The Admin can add working time for employees

RAT: In order for the employee to complete the work

DEP: None

ID: FR10

TITLE: Accept or reject holidays or leave

DESC: The Admin can approve or deny a holidays or leave To the employee with the reason written

RAT: So that employees can get it

DEP: None

ID: FR11

TITLE: calclate the salary

DESC: The Admin can Calculate the salary To the employee

RAT: So that employees can get it

DEP: None

ID: FR12

TITLE: view employee review

DESC: The Admin can view and respond to employee feedback

RAT: So employees can get feedback

DEP: None

ID: FR13

TITLE: Request a service

DESC: The employee must be able to request a service he wants to provide to him by sharing and waiting for a response from the manager.

RAT: for the user to request a required service.

ID: FR14

TITLE: Website - Profile Page

DESC: On the website, the user must have a profile page. On the profile page, the user can edit their information, which includes password, email address and phone number.

The user must also be able to choose which language to understand. The different language options are Arabic and English.

RAT: in order for a user to have a profile page on the website.

3.4 Non-Functional Requirements:

ID: QR1

TITLE: Usability

DESC: website should be easy to learn, support speed performance, low error rate and user attitude.

RAT: In order for a user to use the system easily

DEP: None

Privacy

ID: QR2

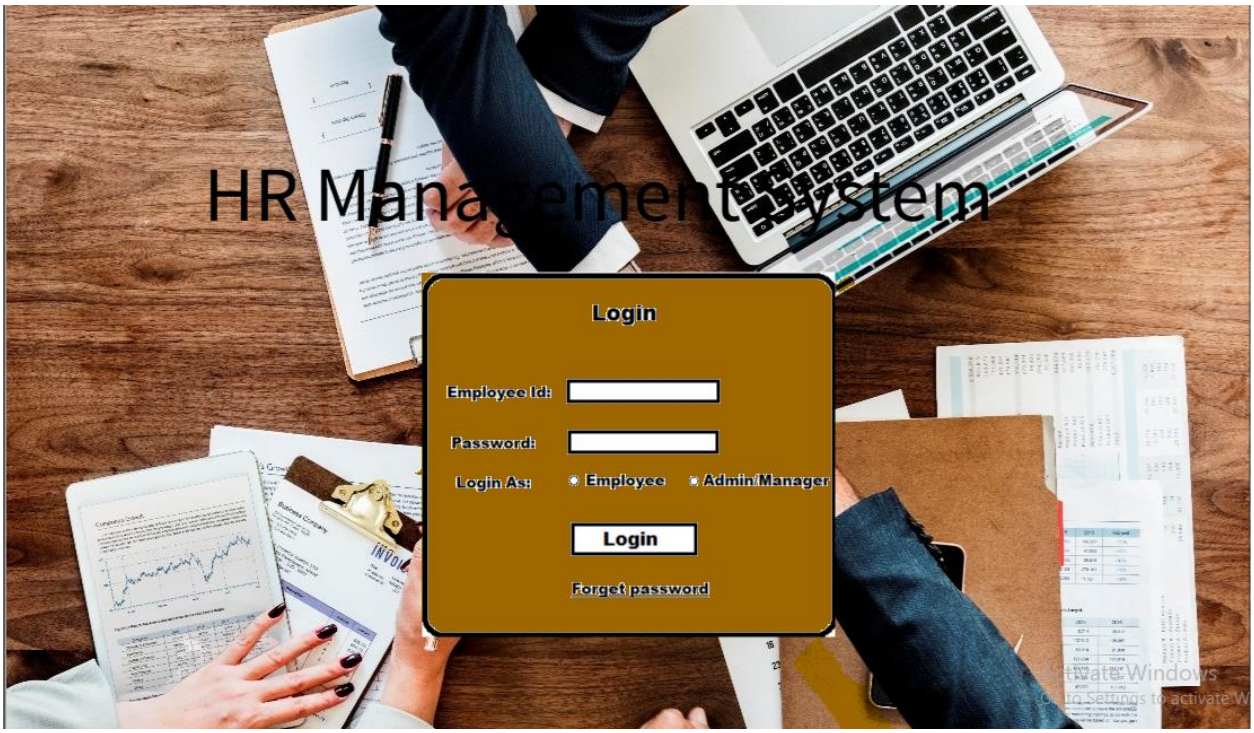
Title: Privacy

DESC: The website should support information privacy for all users and their record will be private and stored in the servers and will not be available to anyone without the user's permission.

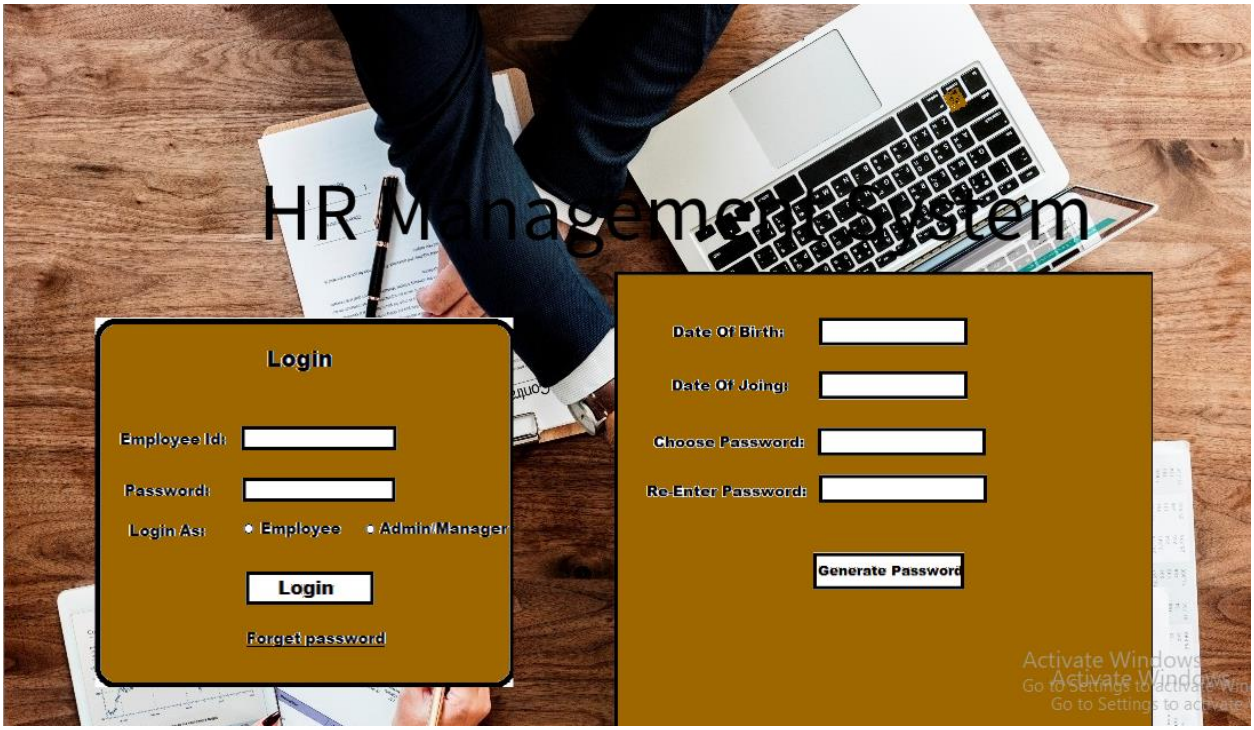
RAT: so that the user can use the system without any concerns about his data.

DEP: None

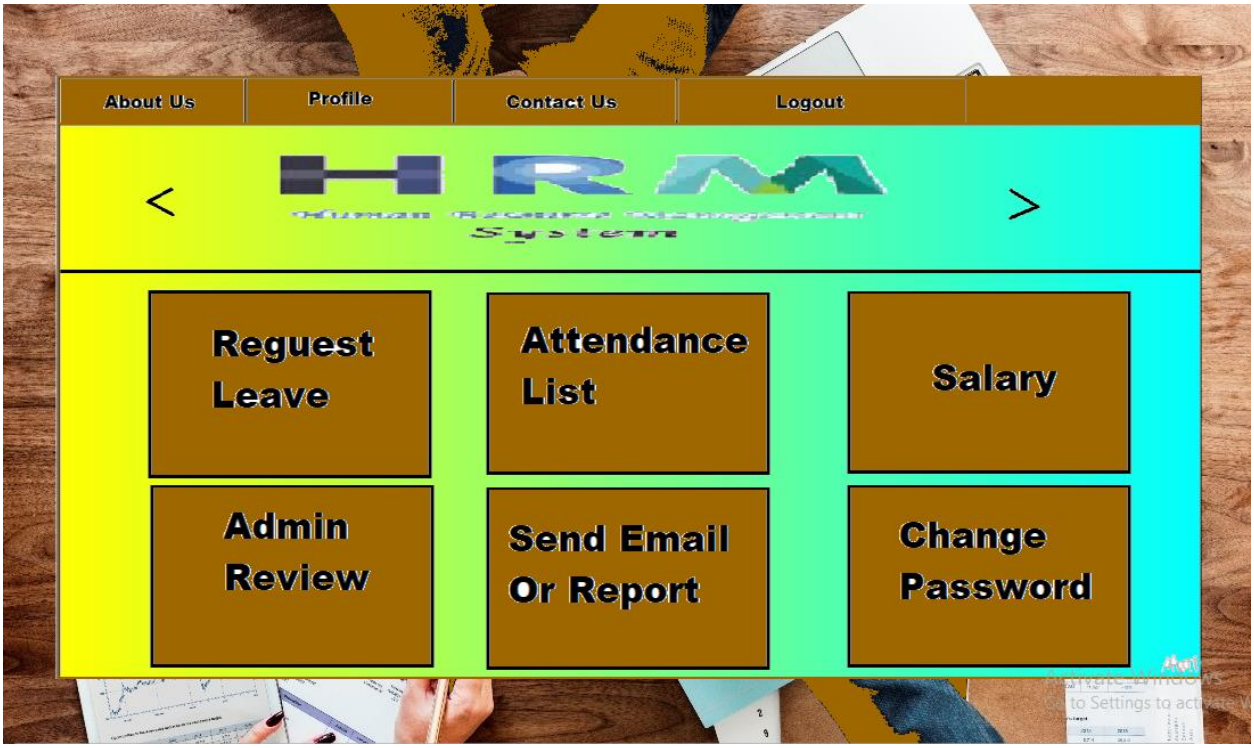
3.5 User interfaces:



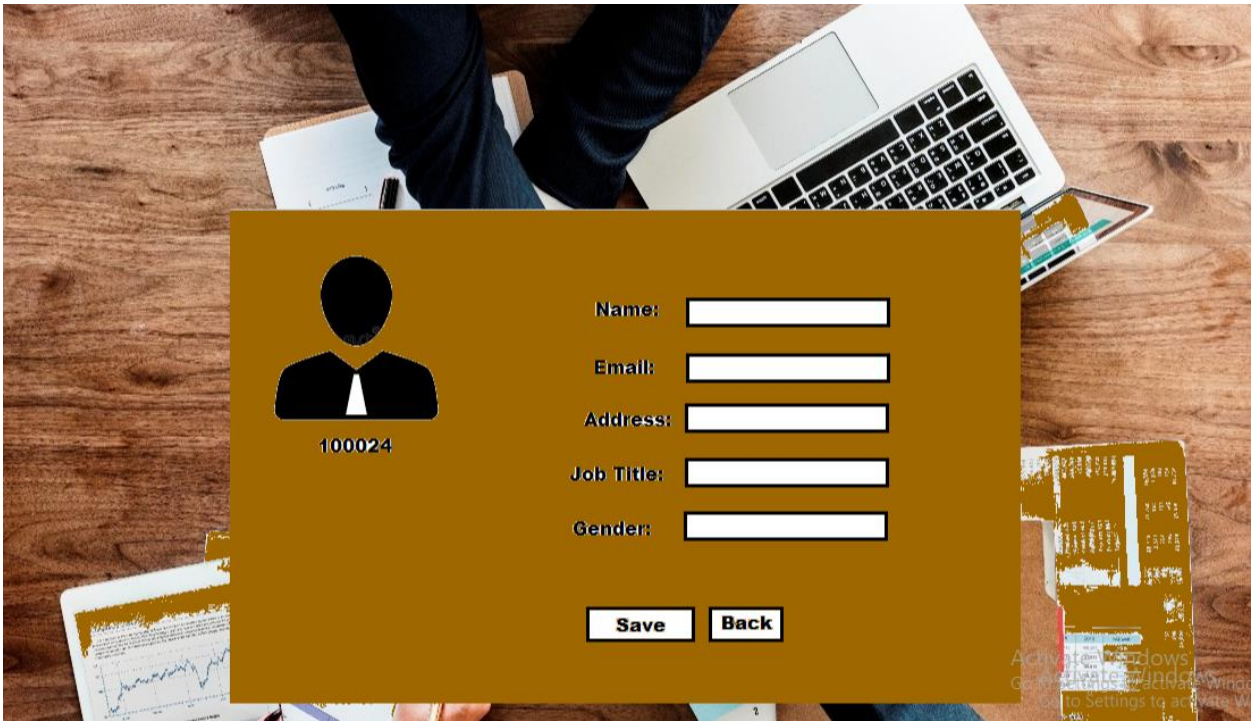
Figure(4): Login



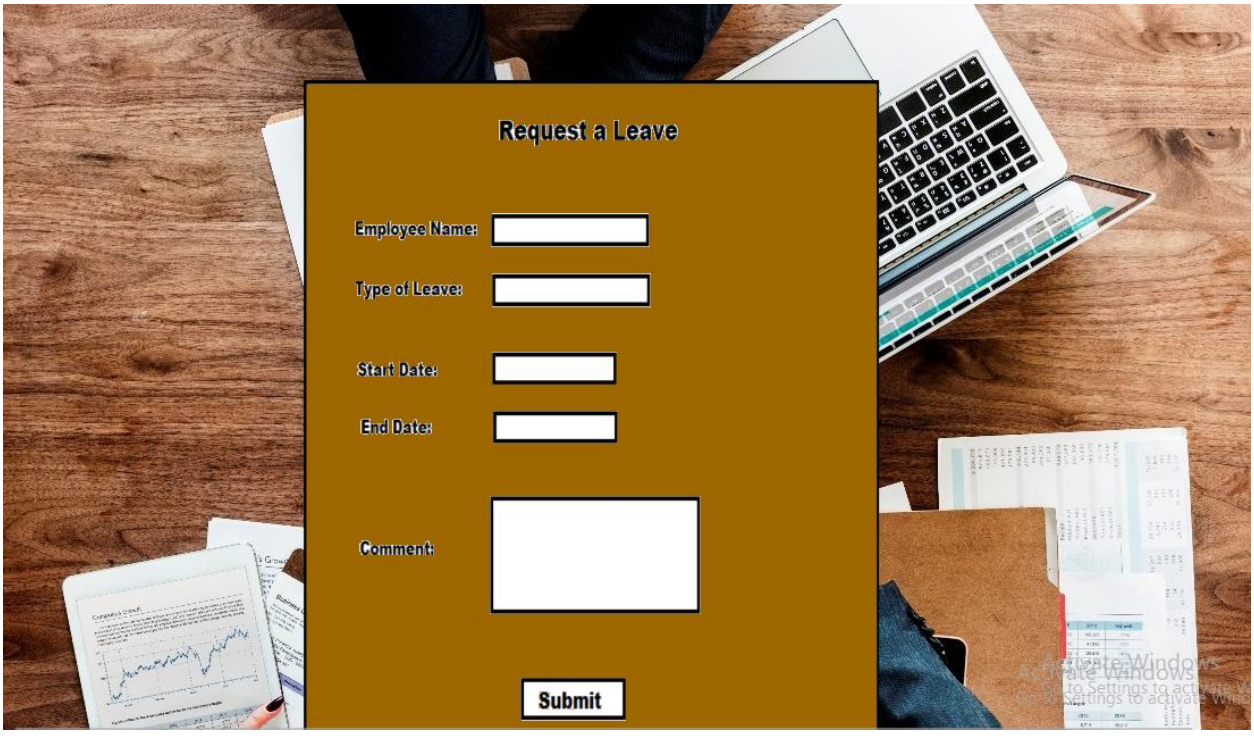
Figure(4.1): Forget Password



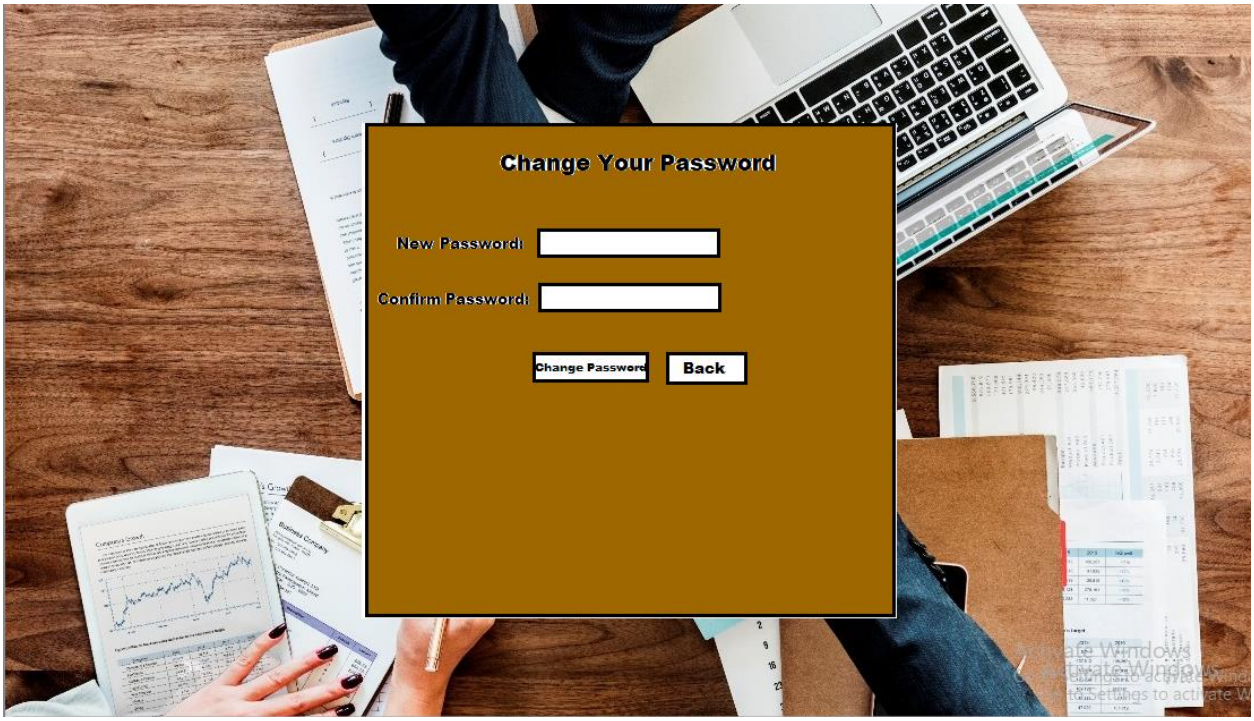
Figure(5): Employee Home Page



Figure(5.1): Profile Page

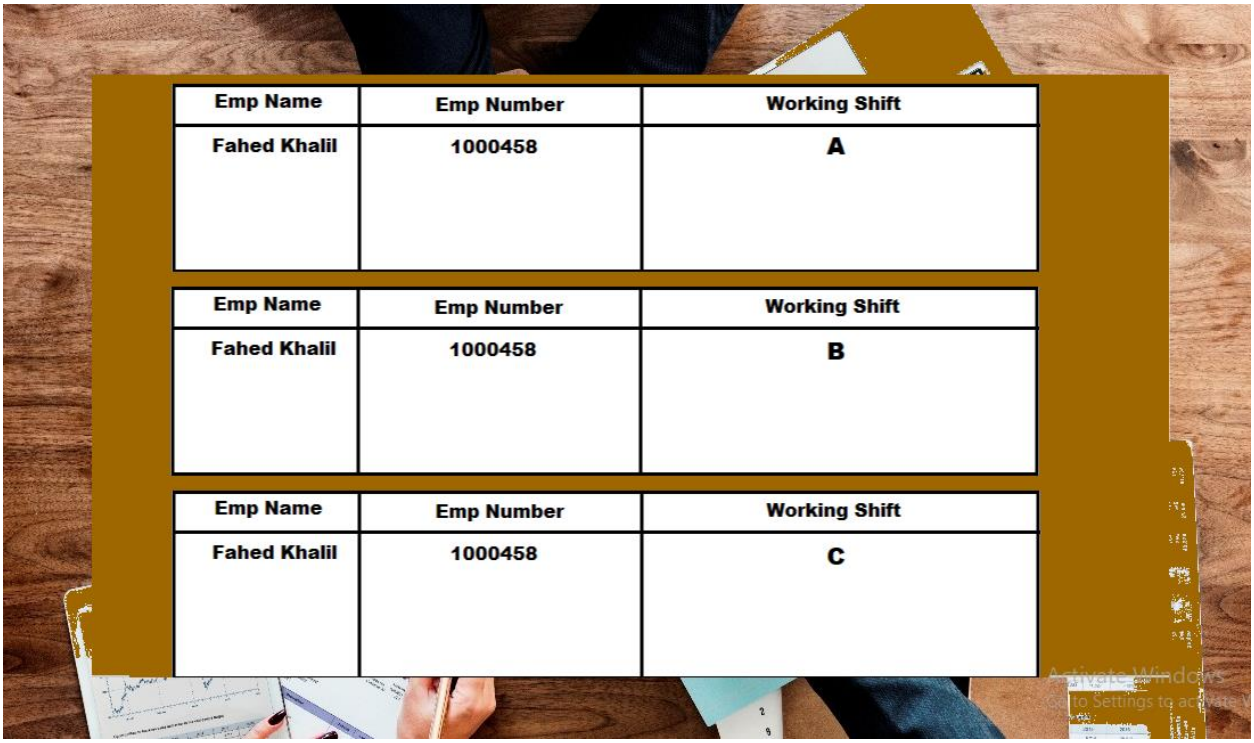


Figure(5.3): Request Leave



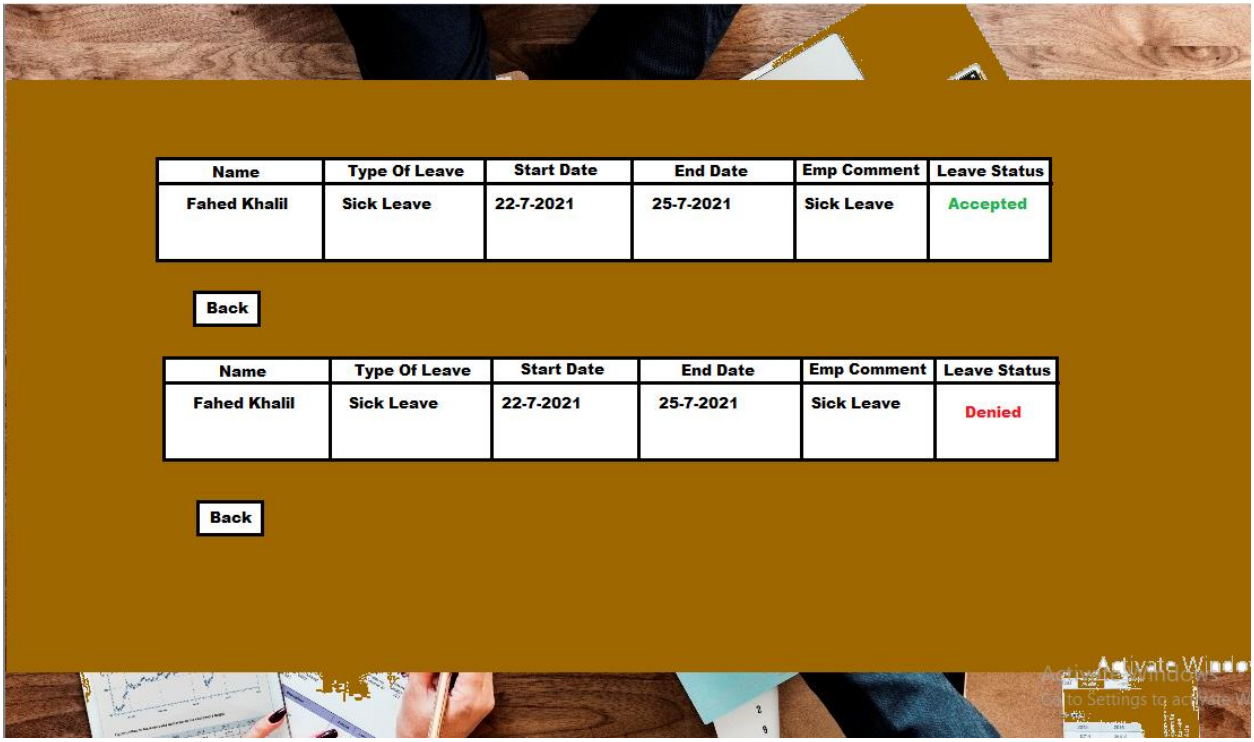
Figure(5.4): Change Password

Figure(5.5): Attendance List that Shows A Shift for each employee and we have 3 working Shifts: Shift A, Shift B and Shift C.



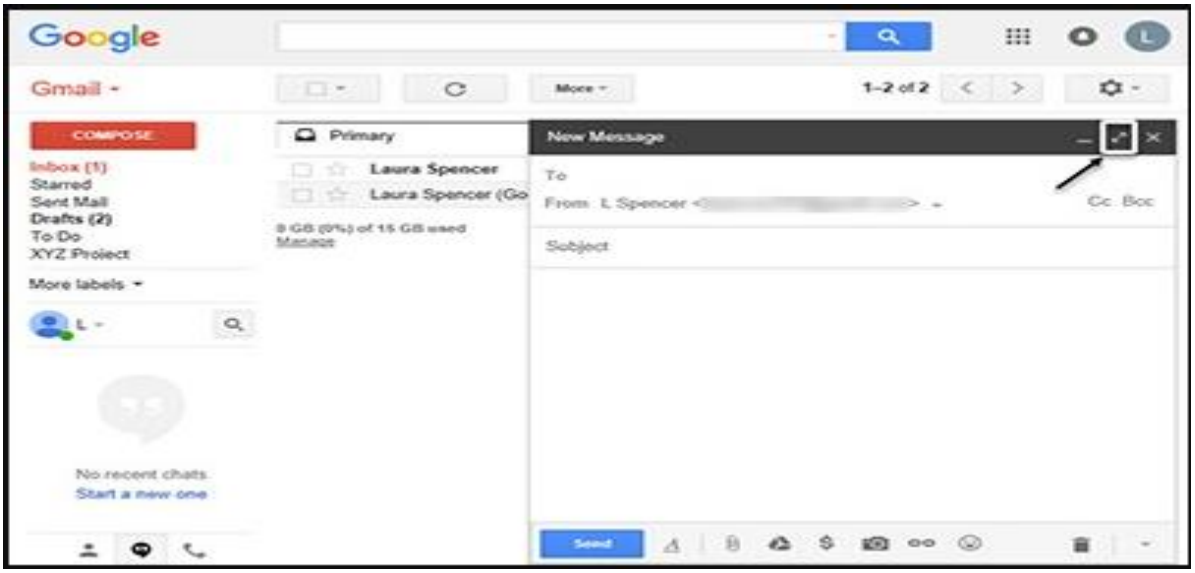
Figure(5.5): Attendance List

Figure(5.6): Is Admin Review that shows the result of leave requesting either Accepted or Denied.



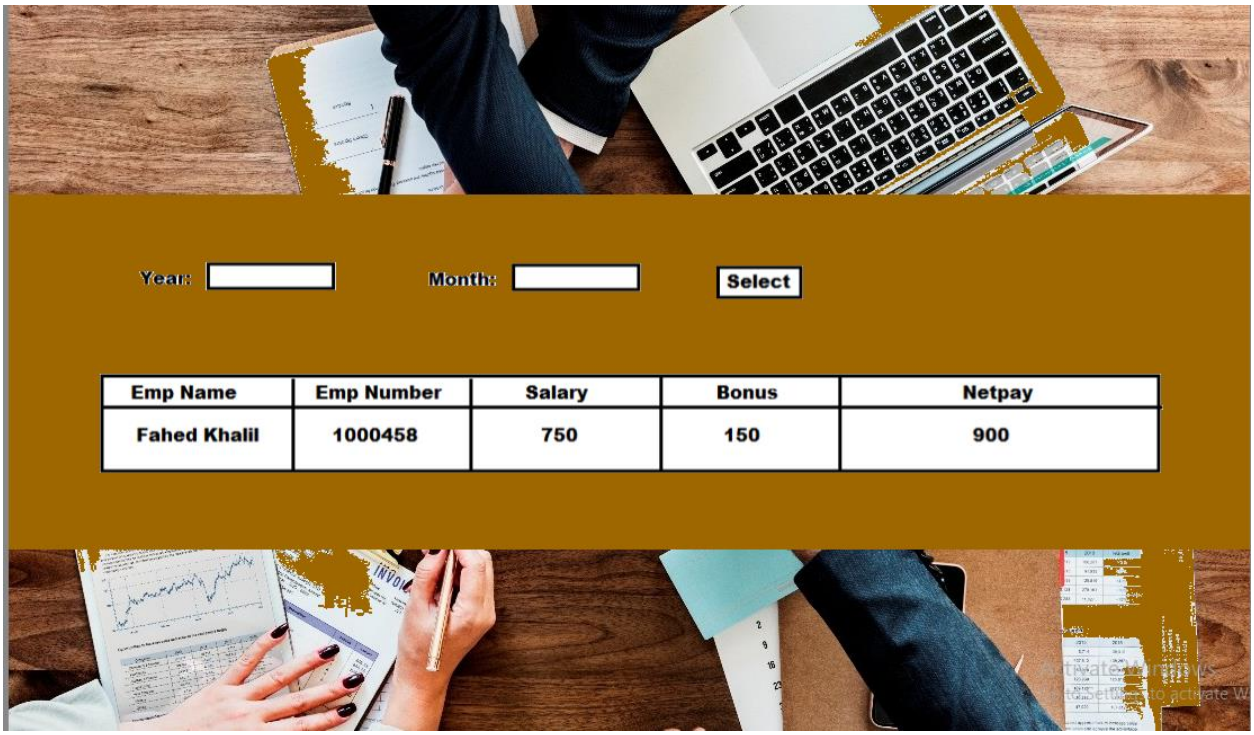
Figure(5.5):Admin Review

Figure(5.6): Is sending email in gmail while clicking on sending email or report button.



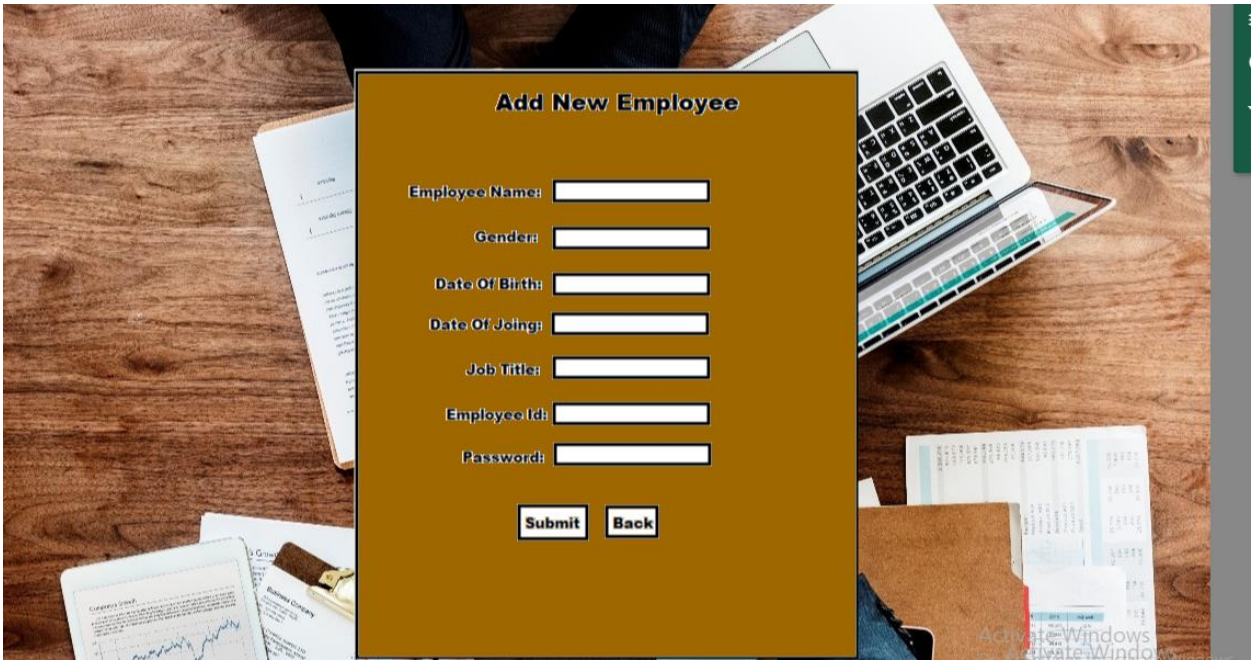
Figure(5.6): Sending Email

Figure(5.7): Shows the salary with OP per month/year.



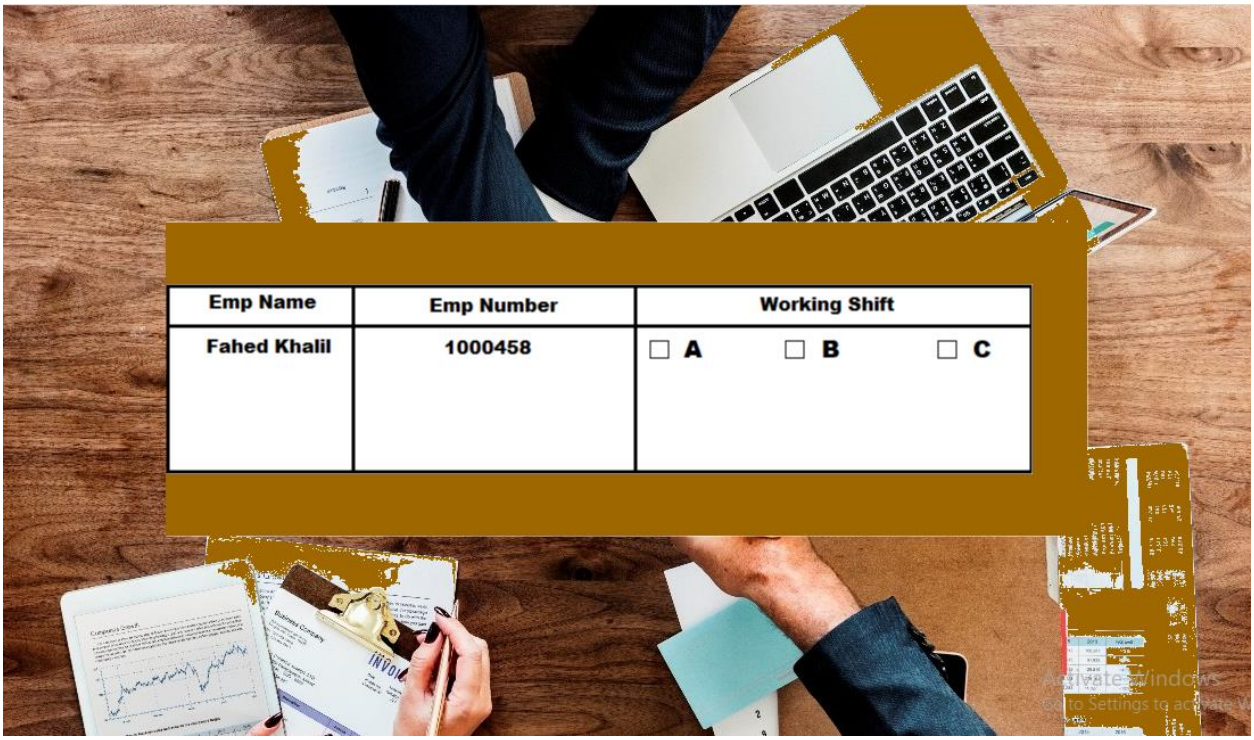
Figure(5.7): Salary

Figure(6): Admin Home Page

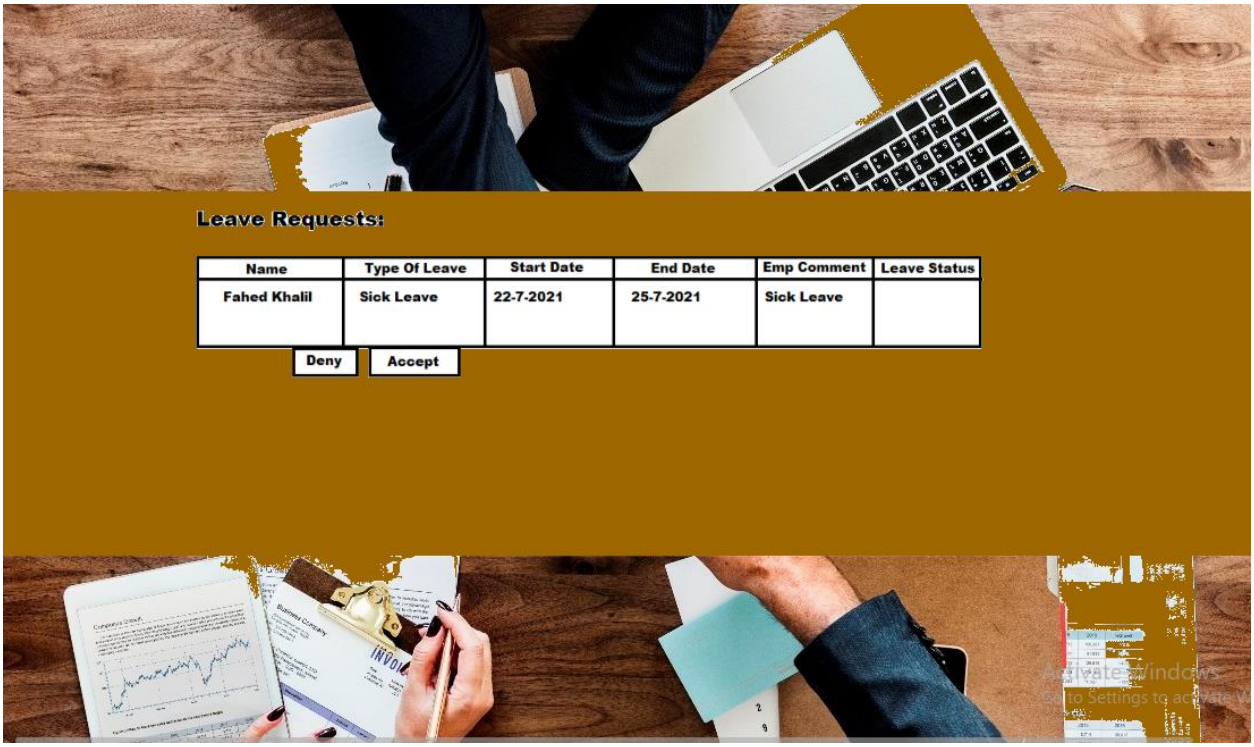


Figure(6.1): Add new employee

Figure(6.2): Attendance List that Shows Shifts for each employee and we have 3 working Shifts: Shift A, Shift B and Shift C. Each employee can take one or more shifts.

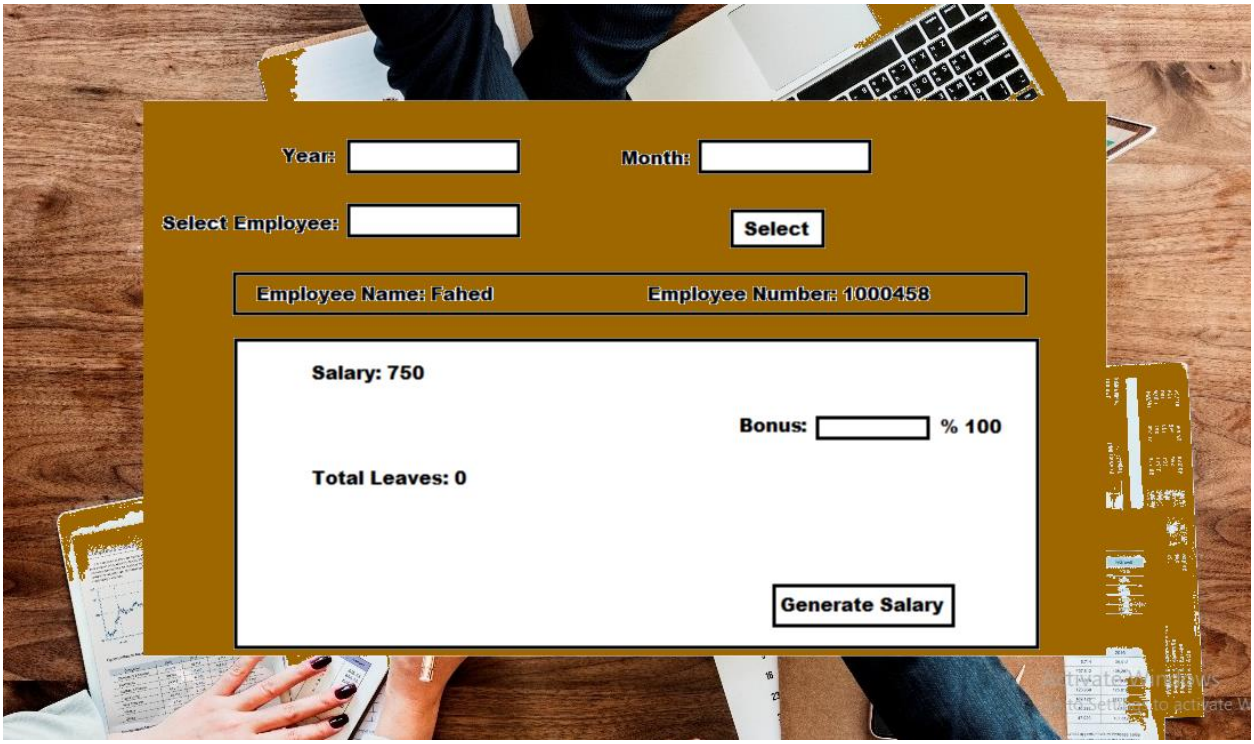


Figure(6.2): Add Attendance



Figure(6.3): Leave Requests

Figure(6.4): Salary Lists that generate the salary with OP per month/year and total of leaves.



Figure(6.4): Salary Lists

Hardware interface

3.5.1 Software interface

Hr management system is a website.

3.5.6 Communication interface

HR Management System is a website used to complete some simple transactions using the Internet instead of the paper-based system.

3.6 Software system attributes:

The Website can flexibly operate under any kind of organization structure and employee hierarchy. From the point of view of the organization's administrators, the Website is quite easy to deploy, operate and maintain.
The system is also able to audit each and every user action that results in database access (read or write). Examples include: add/edit administrative data, user login, query, distribution, and so forth.
Besides, it can be ported to different platforms with several available customizations and plug-ins.
The system is capable of scalability to increasing numbers of users, transactions, etc.
Despite the flexibility of the system, the website is designed and customized for companies.

Chapter 4:Software Architecture

4.1 Introduction:

The software architecture of a system depicts the system's organization or structure, and provides an explanation of how it behaves. A system represents the collection of components that accomplish a specific function or set of functions. In other words, the software architecture provides a sturdy foundation on which software can be built.

A series of architecture decisions and trade-offs impact quality, performance, maintainability, and overall success of the system. Failing to consider common problems and long-term consequences can put your system at risk.

There are multiple high-level architecture patterns and principles commonly used in modern systems. These are often referred to as architectural styles. The architecture of a software system is rarely limited to a single architectural style. Instead, a combination of styles often make up the complete system.

4.2 Benefits Of Software Architecture:

1. **Higher productivity:** It is easier to add new features to existing software, since the structure is already in place, and the location for every new piece of code is known beforehand.
2. **Better code maintainability:** It is easier to maintain software based on an architecture, as the structure of the code is visible and known, so it's easier to extend the software or find bugs and anomalies.
3. **Higher adaptability:** New features, such as a different front end, or adding a process rule are easier to achieve, as the software architecture creates a clear separation of concerns.
4. **Quality:** More reliable assessment of system quality attributes like performance, security, interoperability, reliability, availability.

4.3 Importance Of Software Architecture:

Meeting the Requirements:
A software architecture comprises information from various stakeholders such as domain experts, business analysts, product owners, and end-users. This information helps you identify and meet different functional, non-functional, technical, and operational requirements.
A successful requirements management can help you eliminate many project defects.

Ensuring Quality:
Software architecture can be designed to focus on specific quality attributes of a system such as performance, features, security, and interoperability. Generally, these quality attributes do not always stay in accordance with one another.

A software architecture establishes an agreed-upon and validated quality requirements and standards for the products. It also lets you predict a software system's qualities and avoid costly rework.

Facilitating Communication among Stakeholders:
Software architecture and its documentation are simple and comprehensive enough that any stakeholders can reason about the software system. It lets you communicate and explain the software system to others. It can be a basis for discussions and negotiations regarding various aspects of a project such as cost, quality and duration.

Embracing Change:
There can be many changes in a software system such as new requirements, market changes, changes to business processes, bug fixes, technology advances, and many more; especially in the modern agile development process change is the only constant. Good software architecture can help the team anticipate and adapt to these changes without necessarily having to make architectural changes.

Providing a Reusable Model:
The code and early decisions that shaped the architecture are reusable for projects that have similar requirements and structures. Not only does this save us a lot of time and effort, but this tested and proven architecture also ensures and increases the quality of products.

Estimating Cost and Effort:
The design of the software architecture itself affects the kind of tasks necessary for the implementation. In this way, the project managers can break down the work as individual tasks based on the nature and size of the project.

The project managers break down final deliverables and goals into smaller packages of work. And the developers initially start with specific tasks and then group them into packages of work. By reducing these complexities, we can achieve more accurate cost and effort estimates.

4.4 Selected technology:

1- What is your software Architecture?

It’s a three tier Architecture.

2- Why did you choose it?

• Three-tier architecture is a well-established software application architecture that organizes
applications into three logical and physical computing tiers: the presentation tier, or user interface; the application tier, where data is processed; and the data tier, where the data associated with the application is stored and managed.
• The chief benefit of three-tier architecture is that because each tier runs on its own

The three tiers in details

Three-tier application architecture is a modular client-server architecture that consists of a presentation tier, an application tier and a data tier. The data tier stores information, the application tier handles logic and the presentation tier is a graphical user interface (gui) that communicates with the other two tiers. The three tiers are logical, not physical, and may or may not run on the same physical server.

Presentation tier

The presentation tier is the user interface and communication layer of the application, where the end user interacts with the application. Its main purpose is to display information to and collect information from the user. This top-level tier can run on a web browser, as desktop application, or a graphical user interface (GUI), for example. Web presentation tiers are usually developed using HTML, CSS and JavaScript. Desktop applications can be written in a variety of languages depending on the platform.

Application tier

The application tier, also known as the logic tier or middle tier, is the heart of the application. In this tier, information collected in the presentation tier is processed - sometimes against other information in the data tier - using business logic, a specific set of business rules. The application tier can also add, delete or modify data in the data tier.

The application tier is typically developed using Python, Java, Perl, PHP or Ruby, and communicates with the data tier using API calls.

Data tier

The data tier, sometimes called database tier, data access tier or back-end, is where the information processed by the application is stored and managed. This can be
a relational database management system such as PostgreSQL, MySQL, MariaDB, Oracle, DB2,

Informix or Microsoft SQL Server, or in a NoSQL Database server such as Cassandra, CouchDB or MongoDB.

In a three-tier application, all communication goes through the application tier. The presentation tier and the data tier cannot communicate directly with one another.