EMPLOYEE MANAGEMENT SYSTEM

Dissertation Submitted in Partial fulfillment of the
Requirement for the Award of the Degree of

Master of Computer Application
Semester X

Session Jan-May, 2023

Submitted To:
Dr. Shaligram Prajapat

Submitted By:
Sandeep Sanwle (IC2K1868)

International Institute of Professional Studies
Devi Ahilya Vishwavidyalaya, Indore, M.P.
2023

DECLARATION

I hereby declare that the project entitled **EMPLOYEE MANAGEMENT SYSTEM** which is submitted by me for the partial fulfillment of requirement for the award of **Masters of Computer Application (5 years) semester X** to International Institute of Professional Studies, Devi Ahilya Vishwavidyalaya, Indore, is authentic record of my own work carried out under the supervision of Dr. **Shaligram Prajapat** , IIPS-DAVV, Indore.

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ZecData Technology PVT LTD
1st Floor Vardhaman house Plot no 419,
Sch. no.114-1 Near Niranjanpur Circle,
Dewas Naka, Indore MP(542010)

May 05, 2023

Dear Sandeep,

This is to certify that **Sandeep Sanwle** has successfully completed **MERN Developer** training at **ZecData Technology**. During the training, we found him sincere, honest, hardworking and dedicated with a professional attitude. He is amiable in nature and his character is well.

Training Period: **03 April 2023 – 02 May 2023**.

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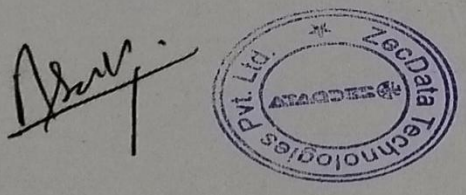

EMPLOYEE HR SERVICE

Dated: May 05, 2023

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Internal Examiner

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Name **:** _____

Date **:** _____

External Examiner

Signature : _____

Name **:** _____

Date **:** _____

ACKNOWLEDGEMENT

It is high privilege for me to express my deep sense of gratitude to those entire faculty Members who helped me in the completion of the project specially my internal guide **Dr. Shaligram Prajapat** who was always there at hour of need. My special thanks to all other faculty members, Batch mate & Seniors of COLLGE NAME for helping me in the completion of project work and its report submission

Sandeep Sanwle

IC2K1868

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ABSTRACT

Managing employees effectively is a crucial aspect of any organization, and we offer customized employee management solutions tailored to your specific needs. Our aim is to support strategic planning and ensure that your company has the right level of human resources to meet its long-term objectives. By implementing our employee management system, you can streamline processes, enhance communication and collaboration, and optimize resource utilization. Our personalized approach takes into account your organization's unique requirements, enabling you to effectively manage your workforce and drive productivity.

Our comprehensive employee management system encompasses features such as employee data management, attendance tracking, performance evaluation, payroll administration, and employee development. With our solution, you can simplify administrative tasks, improve performance management, and ensure regulatory compliance. By fostering effective communication and providing valuable insights, our system empowers you to make informed decisions and achieve sustainable growth. Implementing our tailored employee management system enables you to maximize the potential of your workforce and drive organizational success.

1. INTRODUCTION

In today's digital age, where technology has permeated every aspect of our lives, managing employee data efficiently and accurately has become increasingly important. The sheer size of the modern workforce necessitates a robust system that can handle and organize the data of a large number of employees in a company. Introducing the "Employee Management System," a solution designed to address the limitations and challenges of manual record-keeping processes.

The Employee Management System is a user-friendly software solution developed to streamline and enhance the management of employee data. By leveraging technology, this system aims to eliminate errors commonly associated with manual data entry and simplify the overall record-keeping process. The system provides a user-friendly interface, ensuring that users with varying levels of technical expertise can easily navigate and utilize its functionalities.

With the Employee Management System, administrators gain greater control and efficiency in managing employee data. They can effortlessly add new employees to the system, view and print employee records, update employee information, and even remove employees when necessary. The system's intuitive design minimizes the risk of data entry errors, reducing administrative burdens and promoting accurate and up-to-date employee records.

Overall, the Employee Management System offers a comprehensive solution for effectively managing employee data, overcoming the limitations of manual systems. By adopting this system, organizations can enhance their record-keeping processes, ensure data accuracy, and streamline administrative tasks related to employee management.

2. OBJECTIVE

The objective of this project is to develop and implement a comprehensive employee management system that revolutionizes personnel information management. This system aims to address key requirements such as employee data management, including adding and deleting employees, viewing and printing employee information, and updating employee records.

One of the primary objectives is to establish a well-designed database to store employee data securely and efficiently. This ensures that all employee information is organized, easily accessible, and properly maintained within the system.

Additionally, the system aims to provide an intuitive and user-friendly interface. This interface will allow users to interact with the system seamlessly, making it simple to navigate through various functionalities and perform tasks related to employee management.

By achieving these objectives, the employee management system will significantly enhance the organization's ability to manage personnel information effectively. It will streamline data management processes, improve accessibility, and provide a user-friendly experience, ultimately leading to improved efficiency and productivity in managing employee data.

3. METHODOLOGY

The methodology to complete this project is as follows:

MongoDB:

MongoDB is a NoSQL document-oriented database that uses JSON-like documents to store data.
It is a popular choice for web applications because it provides flexibility and scalability.
With MongoDB, developers can store and query large volumes of data quickly and efficiently.
MongoDB is easy to use, easy to scale, and supports distributed data storage.

Express:

Express is a popular web application framework for Node.js.
It provides a set of tools and features for building web applications, including routing, middleware, and templates.
Express is designed to be lightweight and flexible, making it a popular choice for building web applications.
Express also provides easy integration with other Node.js modules, making it easy to add functionality to a web application.

React:

React is a popular JavaScript library for building user interfaces.
It allows developers to create reusable UI components that can be used across different parts of the application.
React uses a virtual DOM to manage updates to the user interface, which makes it highly performant.
React is also designed to be easy to use and easy to learn, making it a popular choice for building web applications.

Node.js:

Node.js is a popular JavaScript runtime that allows developers to build scalable network applications using JavaScript.
It is designed to be lightweight and efficient, making it a popular choice for building web applications.

Node.js provides a set of built-in modules that make it easy to build web applications, including modules for handling HTTP requests,
working with file systems, and working with databases.

Here's how the MERN stack methodology works in practice:

Front-end Development:
Developers start with React, which provides a set of tools for building user interfaces.
They create React components that render the user interface, and use React Router to manage the application's routing.
They also use React libraries and tools like Redux, Material-UI, or Next.js to streamline development and enhance the user experience.

Back-end Development:
Developers use Node.js and Express to create the back-end of the application.
They define routes that handle incoming requests, and use middleware to add functionality to the application.
They may also use other libraries like Passport for authentication or Socket.io for real-time communication.

Database Integration:
Developers use MongoDB to store and manage data.
They use the MongoDB Node.js driver to connect to the database, and use Mongoose to define the schema for the data.
Mongoose is a popular Object-Document Mapping (ODM) library that provides a straightforward way to define the structure
of the data and interact with the database.

4. DEVELOPMENT MODELS

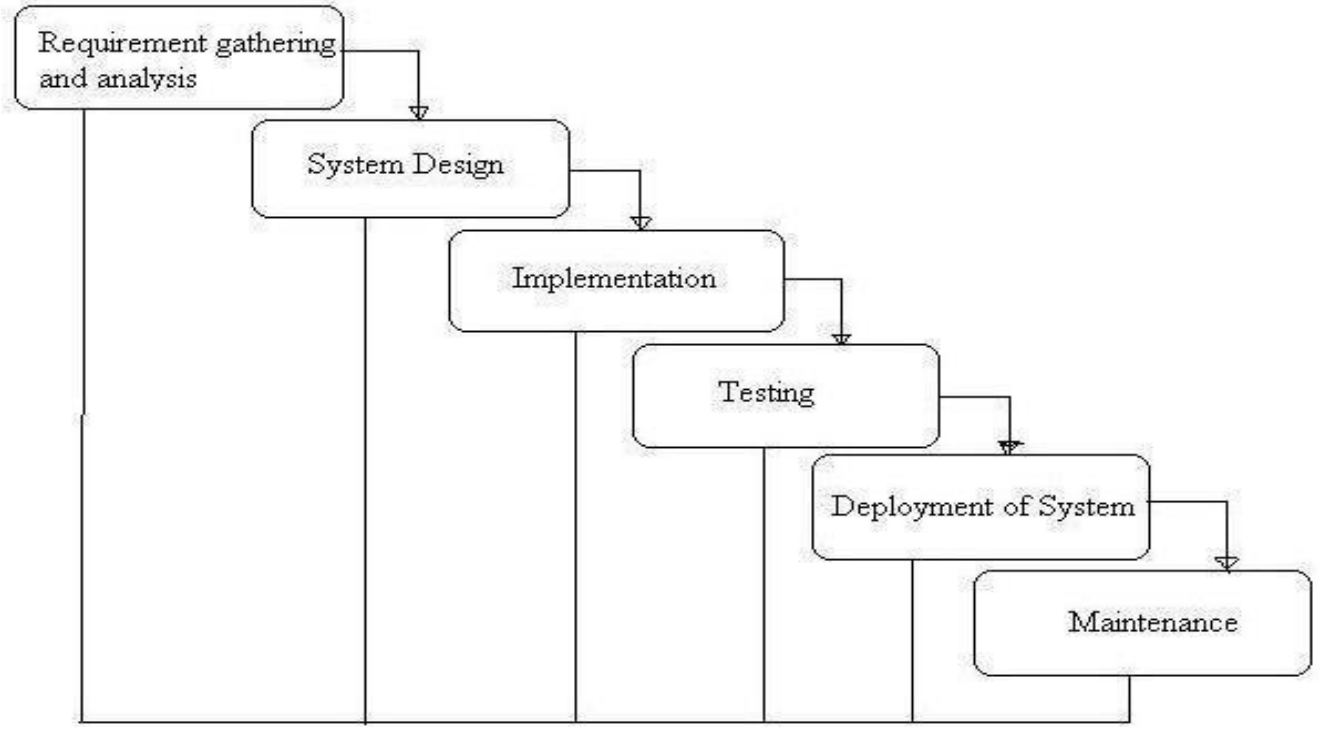
There are some Software Process Models these are listed below—

- Waterfall model
- Prototype model

Water fall Model

The waterfall model is probably the oldest and the best-known model as far as software development process models is concerned. The role of the waterfall model in software engineering is as important as its role in software testing. Of course, over the years, there are a number of other software process models which have been designed and implemented, but what is true is that a lot of them are based (in some way or the other) on the fundamental principle of the waterfall model.

On that note, let us examine the waterfall model in detail.



Advantages of waterfall model:

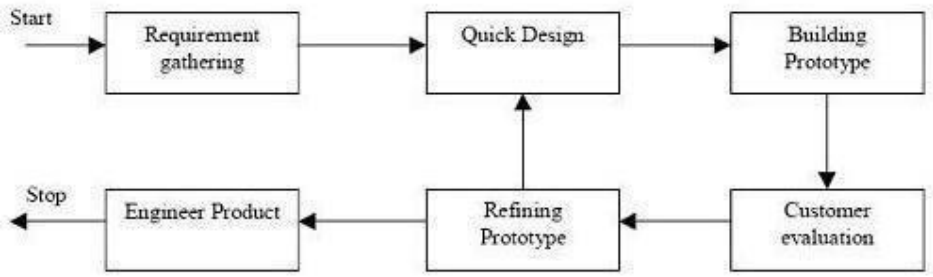
- Simple and easy to understand and use.
- Easy to manage due to the rigidity of the model – each phase has specific deliverables and a review process.
- Phases are processed and completed one at a time.
- Works well for smaller projects where requirements are very well understood.

Disadvantages of waterfall model:

- Once an application is in the testing stage, it is very difficult to go back and change something that was not well-thought out in the concept stage.
- No working software is produced until late during the life cycle.
- High amounts of risk and uncertainty.
- Not a good model for complex and object-oriented projects.
- Poor model for long and ongoing projects.
- Not suitable for the projects where requirements are at a moderate to high risk of changing.
- The project is short.

Prototype Model

The basic idea here is that instead of freezing the requirements before a design or coding can proceed, a throwaway prototype is built to understand the requirements. This prototype is developed based on the currently known requirements. By using this prototype, the client can get an “actual feel” of the system, since the interactions with prototype can enable the client to better understand the requirements of the desired system. Prototyping is an attractive idea for complicated and large systems for which there is no manual process or existing system to help determining the requirements. The prototypes are usually not complete systems and many of the details are not built in the prototype. The goal is to provide a system with overall functionality.



Advantages of Prototype model:

- Users are actively involved in the development
- Since in this methodology a working model of the system is provided, the users get a better understanding of the system being developed.
- Errors can be detected much earlier.
- Quicker user feedback is available leading to better solutions. Missing functionality can be identified easily

- Confusing or difficult functions can be identified Requirements validation, Quick implementation of, incomplete, but functional, application.

Disadvantages of Prototype model:

- Leads to implementing and then repairing way of building systems.
- Practically, this methodology may increase the complexity of the system as scope of the system may expand beyond original plans.
- Incomplete application may cause application not to be used as the full system was designed Incomplete or inadequate problem analysis.

.When to use Prototype model:

- Prototype model should be used when the desired system needs to have a lot of interaction with the end users.
- Typically, online systems, web interfaces have a very high amount of interaction with end users, are best suited for Prototype model. It might take a while for a system to be built that allows ease of use and needs minimal training for the end user.
- Prototyping ensures that the end users constantly work with the system and provide a feedback which is incorporated in the prototype to result in a useable system. They are excellent for designing good human computer interface systems.

5. DATABASE AND SOFTWARE MANAGEMENT

Database and software management involves the effective administration and control of databases and associated software applications within an organization. It encompasses various tasks such as ensuring accessibility across different devices and platforms, enabling data manipulation including adding and deleting records, facilitating data editing, retrieval, and empowering users to search through the data and generate reports based on their findings.

A critical aspect of database and software management is ensuring that the system is accessible on different devices or platforms. This allows users to access the database and associated software applications from a wide range of devices such as computers, tablets, or smartphones. This accessibility enables users to work seamlessly and access the required information whenever and wherever they need it.

The system provides functionalities to add or delete records from the database. Users can easily insert new data entries into the database or remove outdated or irrelevant information, ensuring that the database remains accurate and up to date.

Furthermore, the system empowers users to edit data within the database. This capability enables users to modify existing records, correct errors, or update information as required, maintaining the integrity of the data stored in the database.

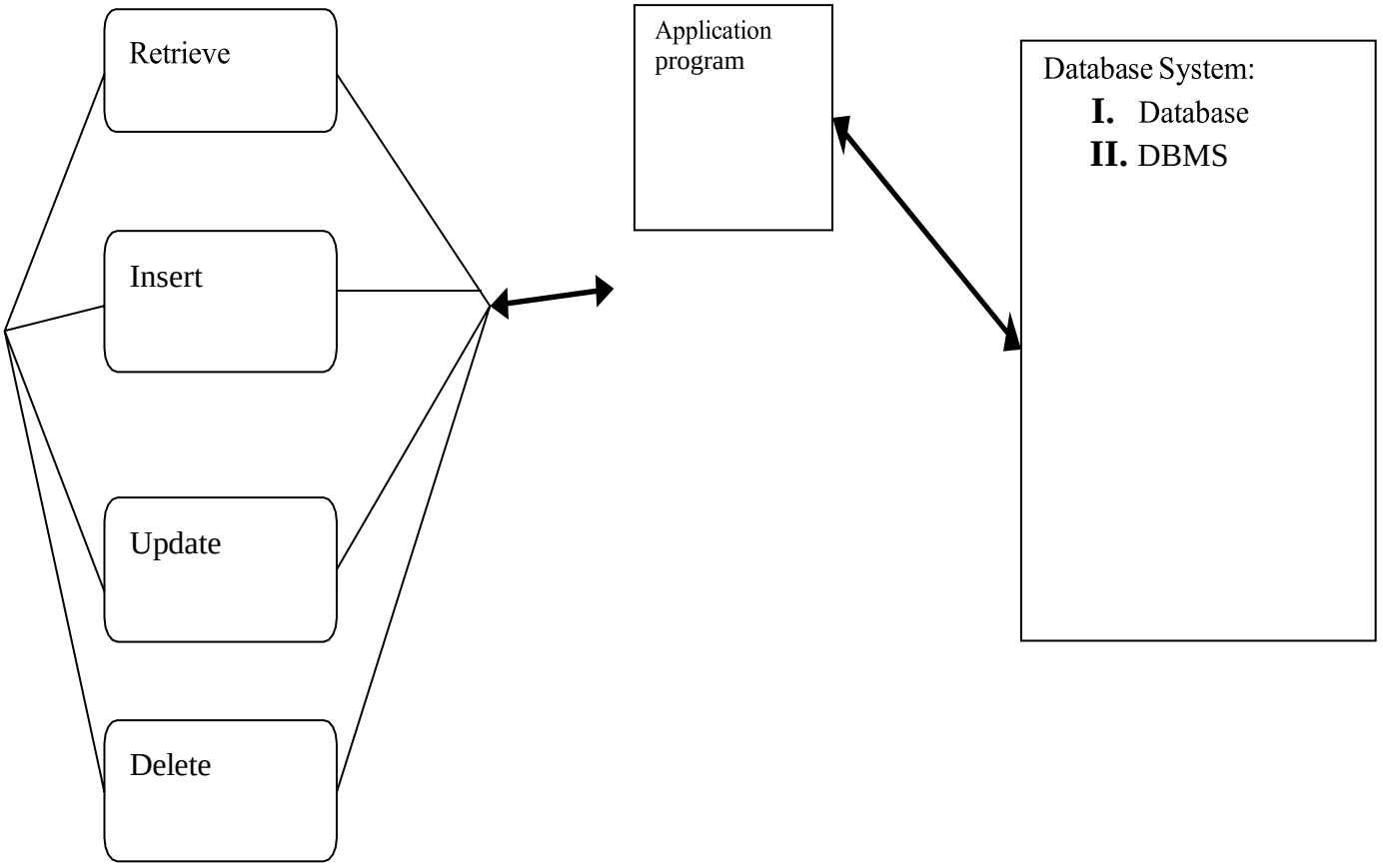
Efficient data retrieval is another key feature of the system. Users can quickly retrieve specific information or perform advanced queries to extract relevant data from the database. This ensures easy access to the required information for analysis, decision-making, or other business processes.

Additionally, the system enables users to search through the data and generate reports based on their findings. Users can utilize search functionalities to locate specific data sets or perform data analysis, and then create comprehensive reports summarizing their discoveries or insights.

In summary, effective database and software management ensures accessibility, data manipulation

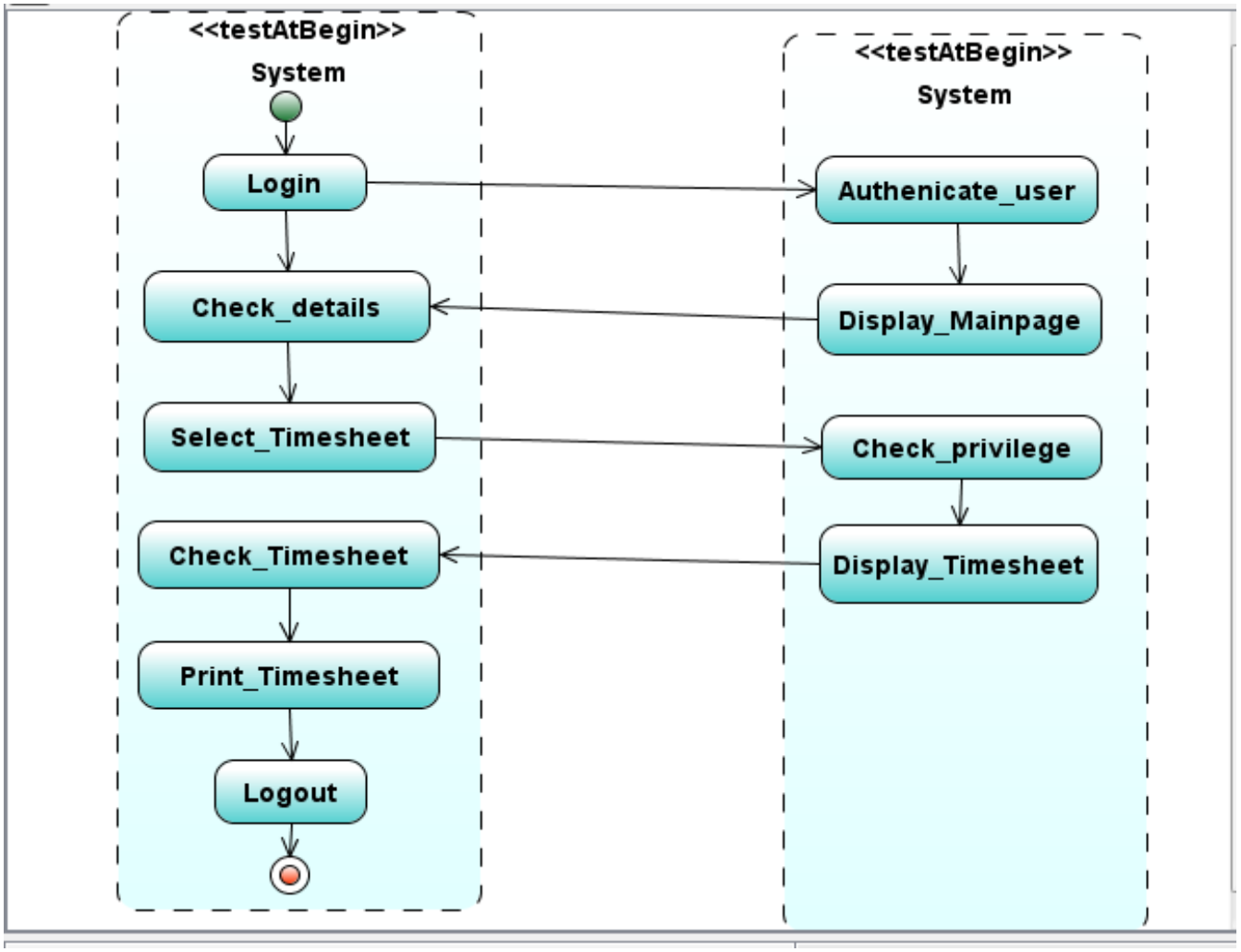
capabilities, efficient data retrieval, and the ability to search and generate reports. By efficiently managing databases and associated software applications, organizations can enhance productivity, make informed decisions, and derive valuable insights from their data.

Below is depiction of how the users will interact with the system:

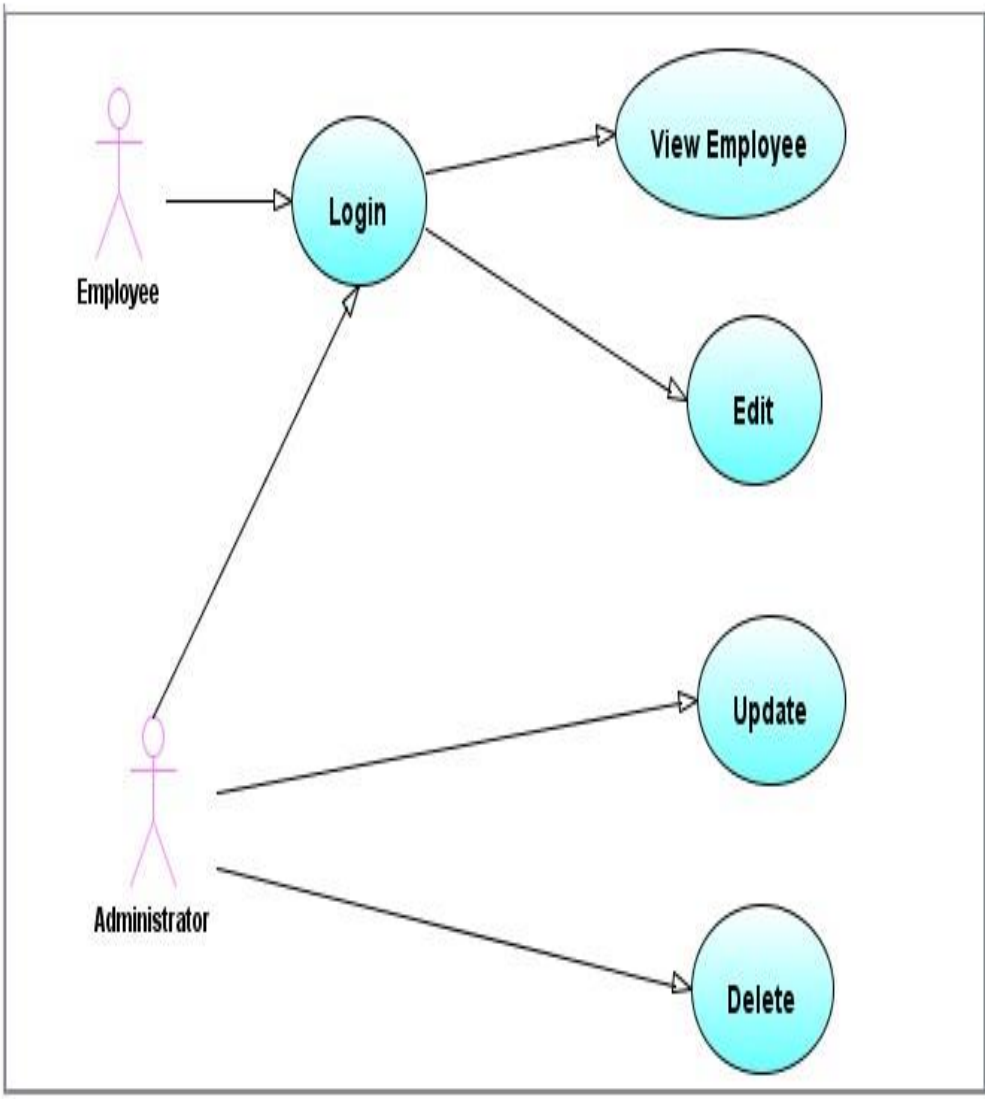


6. USER INTERACTION WITH INTERFACE

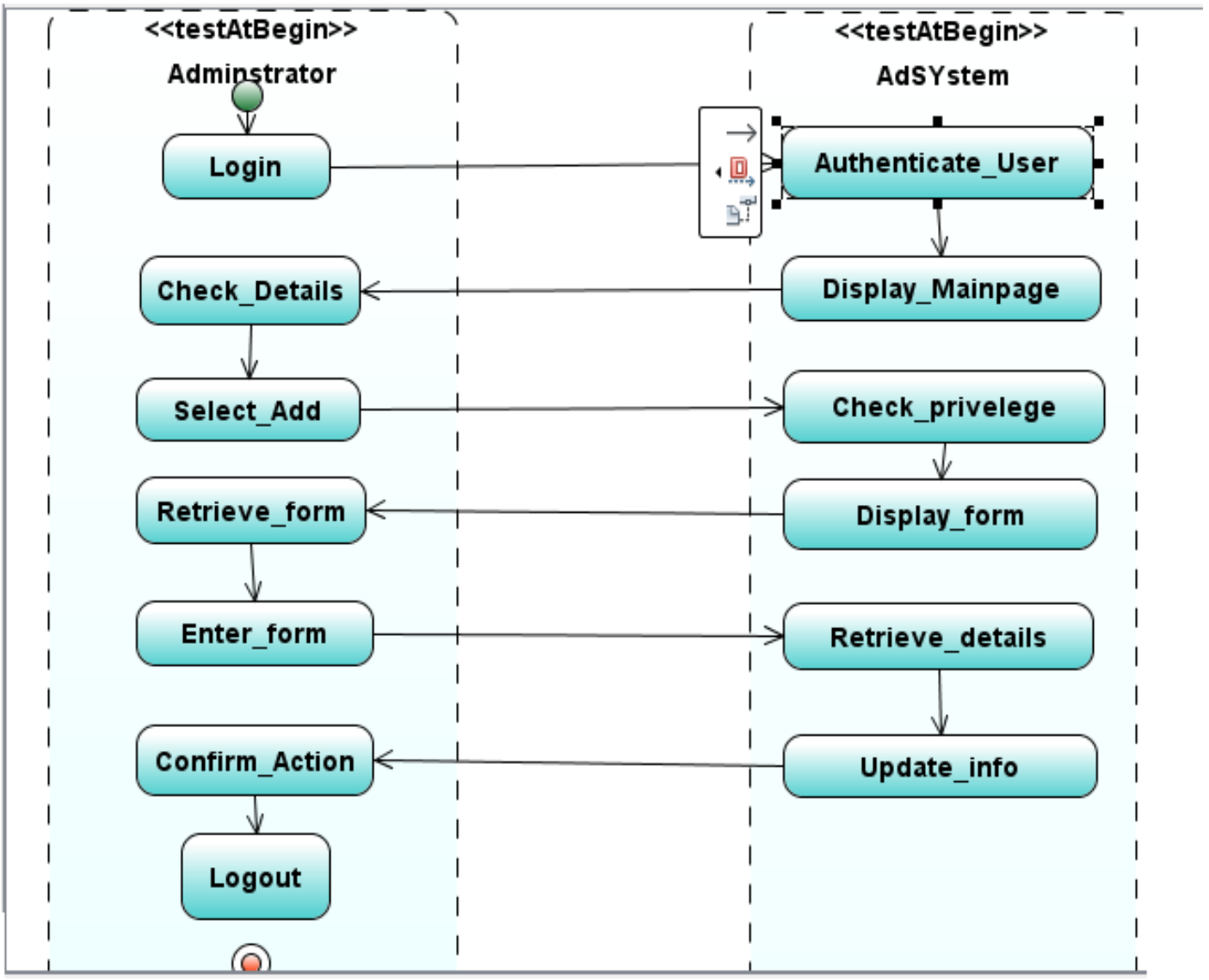
The activity diagrams below shows a summary of all the user activities. This all starts with logging into the system. The user enters his or her employee id and password. The input is authenticated by the system and when it's been successfully authenticated then the privileges are checked. The privileges are checked to ensure that the right main page is shown for each user. This is because the administrator and theemployees have different privileges to the application system. For example an employee interacts with a system such as when he/ she logs in successful is selects a link to view the worksheet. The system displaysthe particular employee's work sheet. There is also an option for downloading the work sheet. The employee selects this option; the system returns a download of the spread sheet of the work sheet.



USE CASE DIAGRAM



ACTIVITY DIAGRAM (ADMINISTRATOR)



Employee details Object:

This contains employees' personal details and qualification. This object contains record for only oneemployee.

Administrator's details:

NAME	MEANING	VALUE
Employee_id	Employee number given by the workshop	6 numbers
Personal_id	Passport or id number	10 characters
Title	Employee's title	20 characters
First name	Their given name	20 characters
Last name	Family name	20 characters
Date of birth	Their birthday/ age	date
Cellular Number	Cell phone number for the employee	10 numbers
Home Number	Home phone number/landline of employee	10 numbers
City	Current city the employee lives	20 characters
Address	Home address of employee	30 characters
Email	Email address of the employee	20 characters
Postal code	Postal code number of employee	10 numbers
Qualification	Level of qualification the employee has reached	50 characters
Current experience	Current work experience of the	50 characters
Start date	The date employee started to work at the workshop	date
End date	The date employee left the workshop	date

This contains administrator's login details:

NAME	MEANING	VALUE
Admin_Login_Id	The administrator's given id	5-20 characters
password	Chosen password	5-20 characters

7. FEASIBILITY STUDY

1. Introduction: The feasibility study aims to assess the viability and potential benefits of implementing an employee management system in the organization. The study will examine technical feasibility, economic feasibility, operational feasibility, and legal and ethical considerations to determine if the system is feasible and advantageous.

2. Technical Feasibility: Evaluate the organization's existing infrastructure and technological capabilities to determine if they can support the employee management system. Assess compatibility with current software systems and identify any potential technical challenges. Consider hardware and software requirements, as well as the availability of resources and expertise needed for system development, deployment, and maintenance.

3. Economic Feasibility: Conduct a cost-benefit analysis to determine the financial feasibility of the employee management system. Estimate the costs associated with system development, customization, implementation, training, and ongoing maintenance. Compare these costs to the potential benefits, such as improved efficiency, reduced paperwork, streamlined processes, and potential cost savings. Assess the return on investment (ROI) and determine if the system aligns with the organization's budget and financial goals.

4. Operational Feasibility: Evaluate how well the employee management system aligns with the organization's operational processes and objectives. Assess its compatibility with existing workflows and systems. Identify potential benefits such as increased productivity, enhanced data accuracy, improved communication, and streamlined HR processes. Consider any potential challenges or resistance to change that may arise during the implementation and adoption of the system.

5. Legal and Ethical Considerations: Ensure that the employee management system complies with relevant laws, regulations, and ethical standards. Evaluate data protection and privacy requirements to safeguard employee information. Assess compliance with labor laws and regulations related to employee data management and security. Consider ethical considerations such as avoiding discrimination or bias in employee management practices and promoting transparency and fairness.

8. IMPLEMENTATION AND RESULT

Following are the screens of the EMPLOYEE MANAGEMENT SYSTEM where you can see all the featuresof this system in use and you can also see the GUI of the system:

1. **Login frame** – This is the login frame of this system where user have to enter the required credentials to have access for the main dashboard.

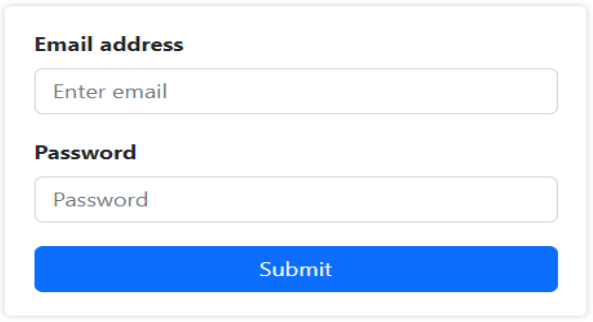


Fig. 1

2. **Main Dashboard** – After login in, user is directed to the main dashboard of this system where user can perform various operations by opening other pages like manage employee.

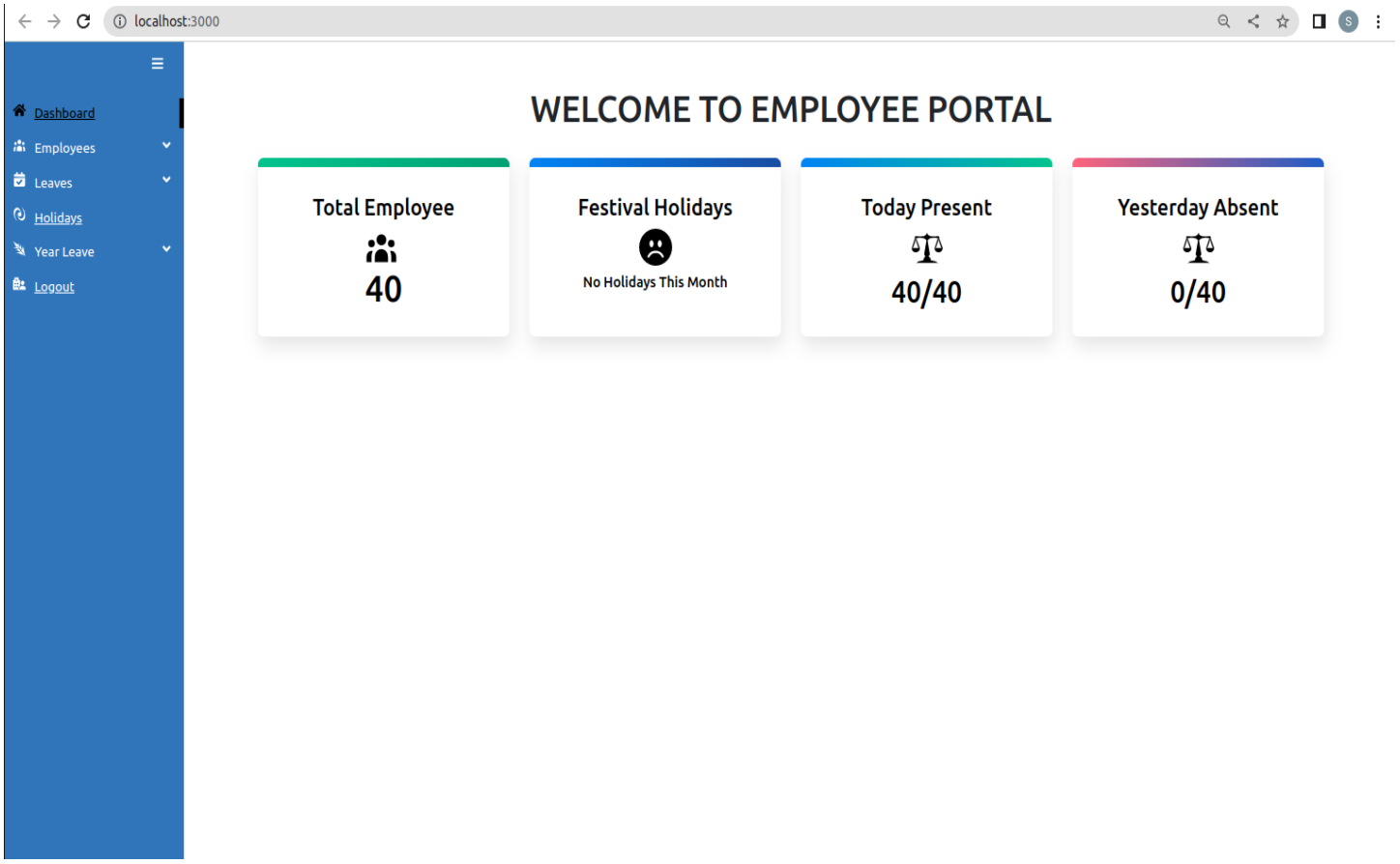


Fig. 2

3. **Add employee** – Here user have to enter all the required credentials to add a new employee to the system.

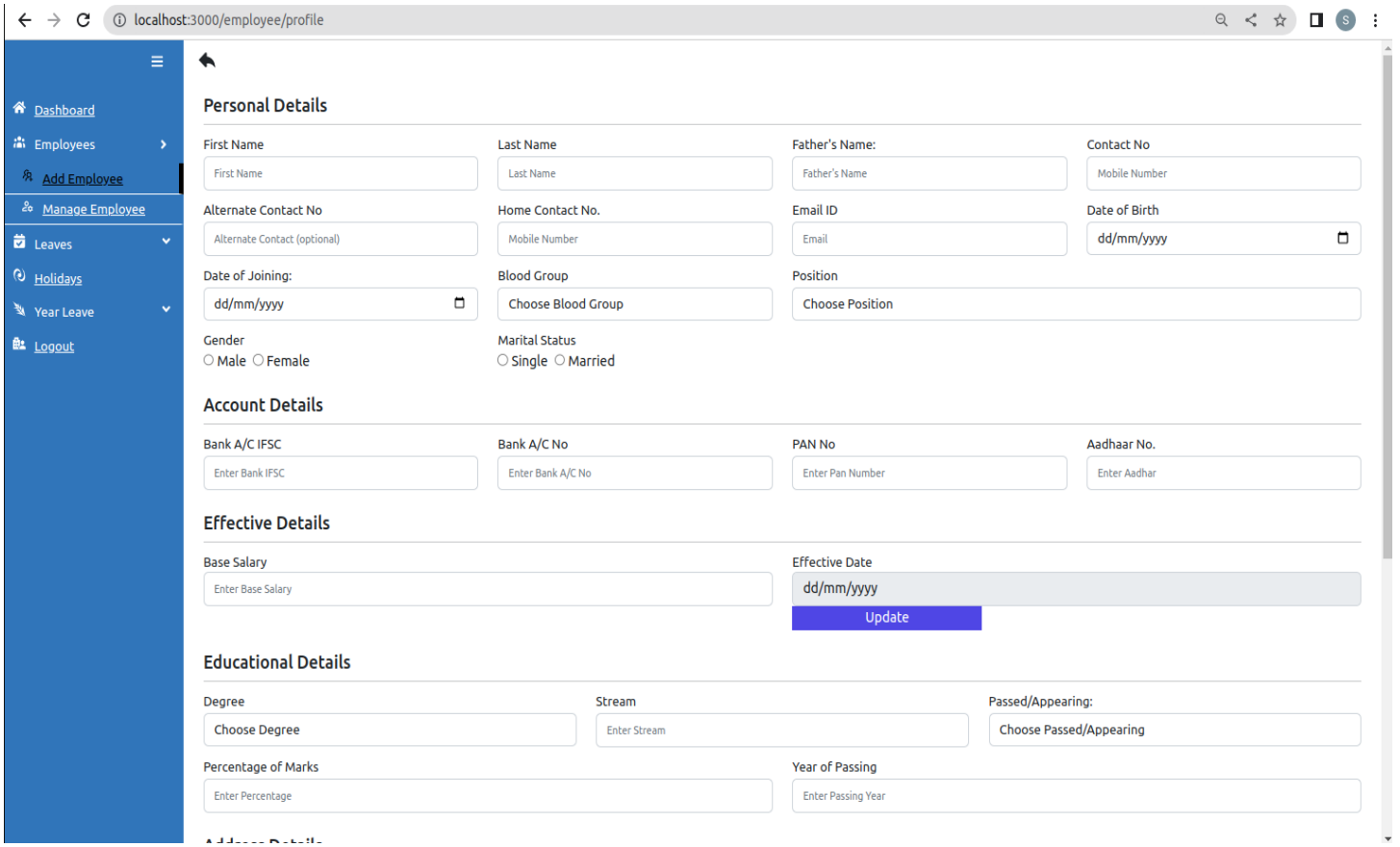


Fig. 3

4. **Holidays**– In this section user can see the holidays and types of holidays like public or weekend.

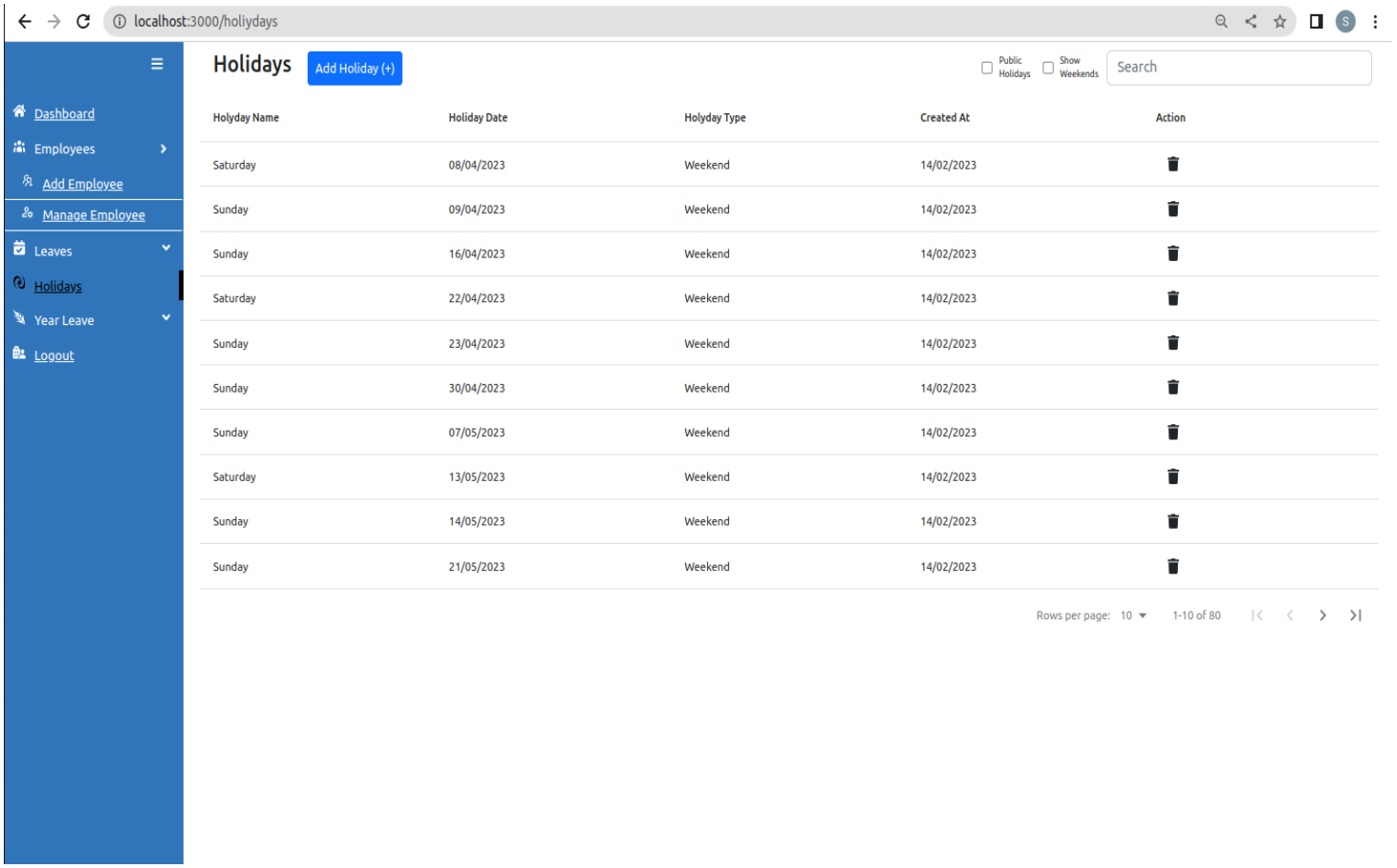


Fig. 4

5. **View and update employee** – In order to view and update employee information, the user have to enter employee ID.

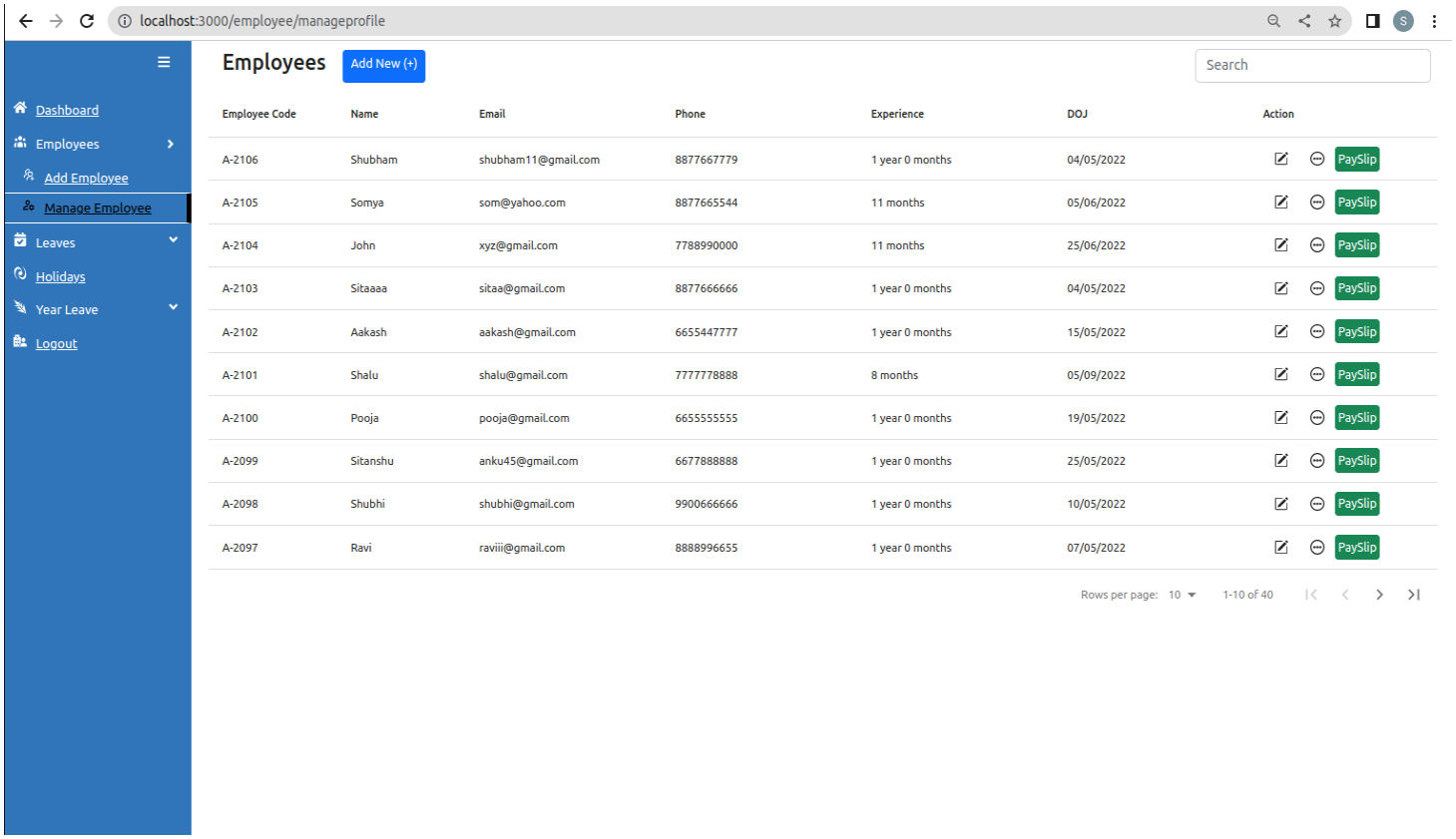


Fig. 5

6. **Leave Details** – In order to view and update employee leave information.

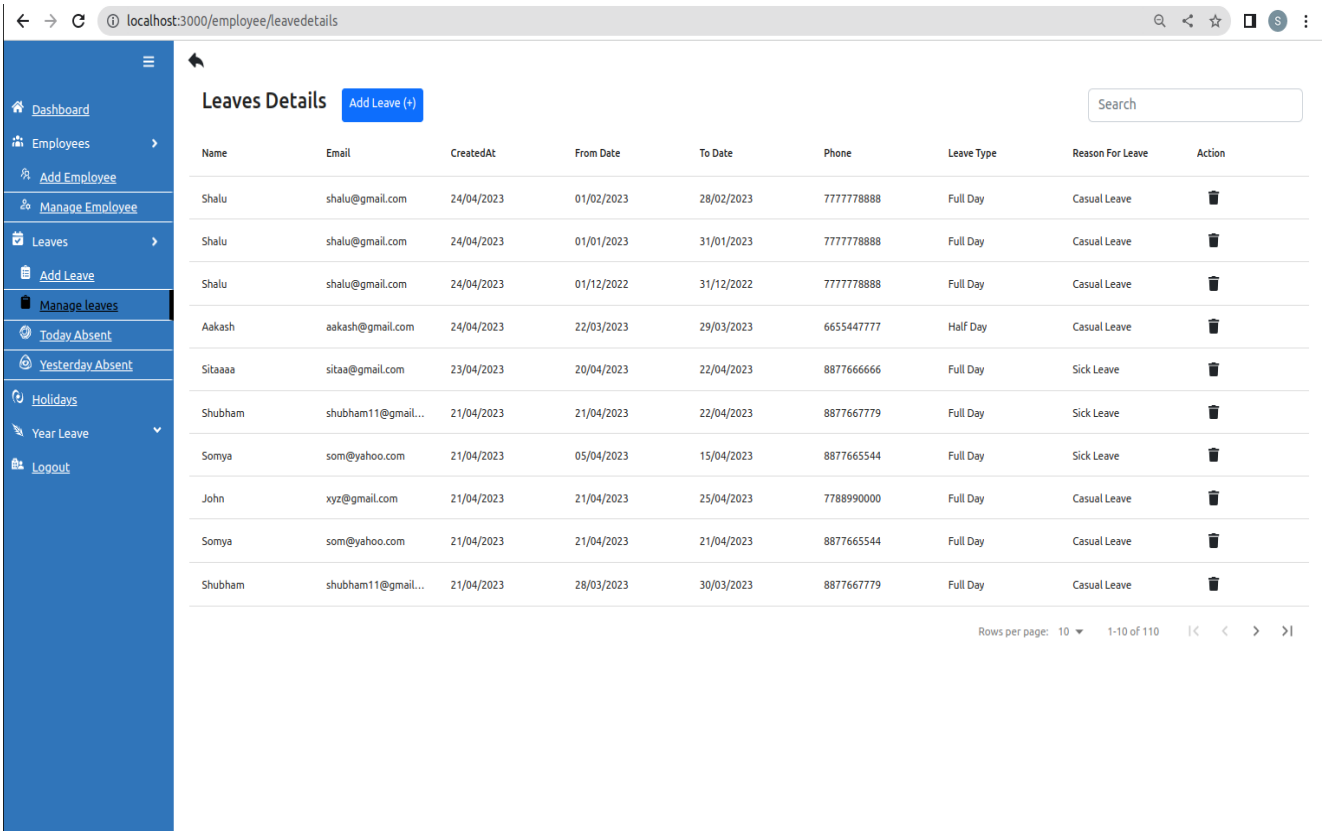


Fig. 6

7. **Add Leave** – In order to add leave.

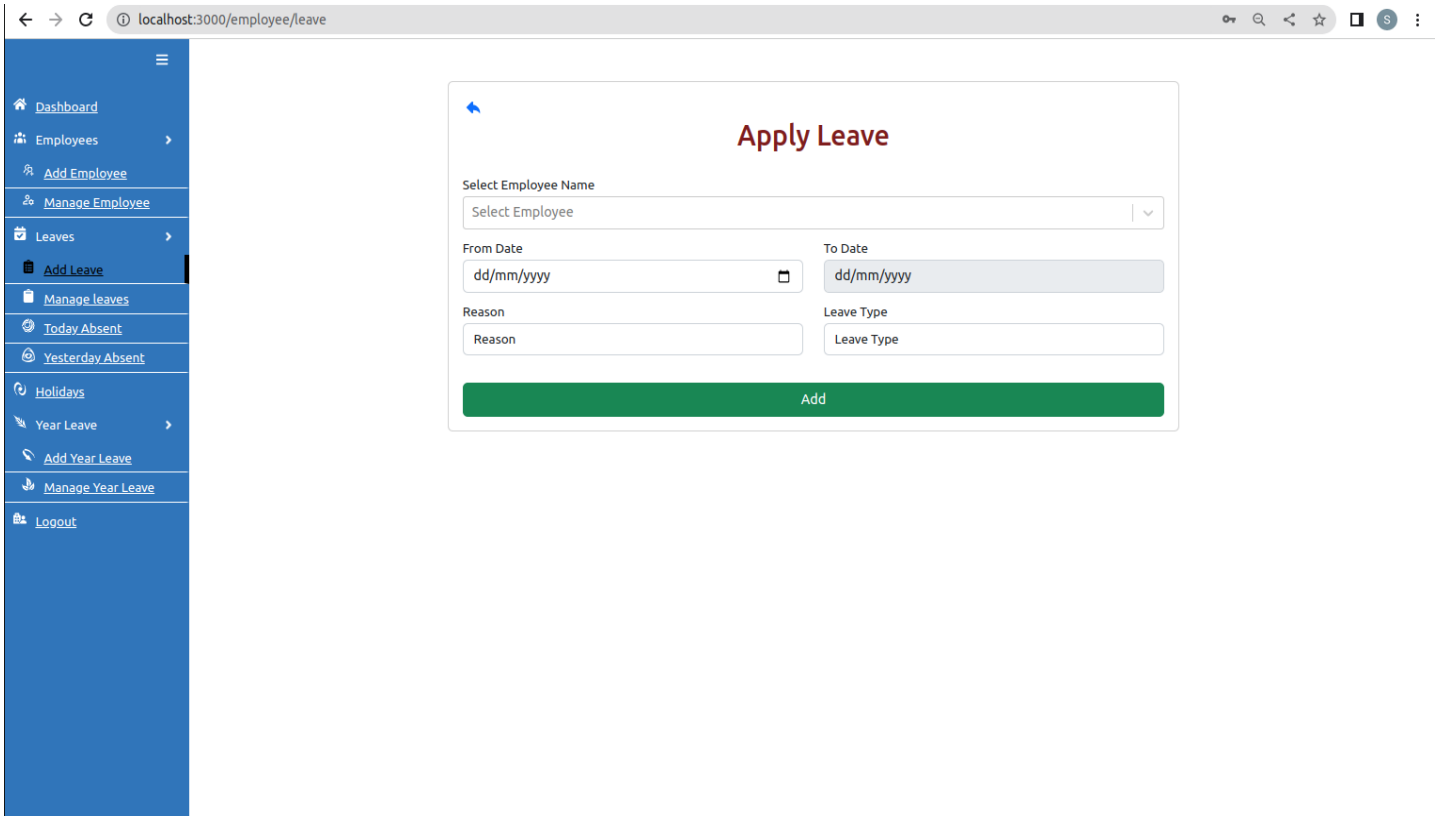


Fig. 7

9. TESTING

1.Black Box Testing:

In black box testing, the tester does not have access to the internal code or design of the system being tested. Instead, they focus on testing the system's external behavior and functionality.

Here are some examples of black box testing that can be applied to an employee management system:

Boundary Testing: Test the system's ability to handle the maximum and minimum limits of employee data inputs, such as employee ID, salary, or number of hours worked per week.

Usability Testing: Test the system's user interface and user experience, and ensure that it is easy to navigate, intuitive, and user-friendly.

Error Handling Testing: Test the system's ability to handle various types of errors and exceptions, such as invalid data inputs or server downtime.

Compatibility Testing: Test the system's compatibility with different web browsers, operating systems, and mobile devices.

Performance Testing: Test the system's ability to handle large volumes of employee data, and ensure that it can handle multiple user requests without slowing down or crashing.

2.White Box Testing:

In white box testing, the tester has access to the internal code and design of the system being tested. They focus on testing the system's internal logic, algorithms, and data structures. Here are some examples of white box testing that can be applied to an employee management system:

Unit Testing: Test individual functions and methods within the system's code to ensure that they work as expected and that the code is error-free.

Integration Testing: Test the system's ability to integrate different modules and components together and ensure that they work seamlessly.

Code Coverage Testing: Test the percentage of code that is executed during testing, and ensure that all code paths are covered.

Security Testing: Test the system's code for vulnerabilities and potential security threats, such as SQL injection attacks or cross-site scripting (XSS) attacks.

Stress Testing: Test the system's ability to handle high volumes of employee data and user requests

under stress or high load conditions.

Both black box and white box testing can be used to ensure that an employee management system is reliable, accurate, and user-friendly, while also verifying the security and performance aspects of the system

Test each point of an employee management system:

- Employee Onboarding and Offboarding: Create test cases to ensure that new employees can be added to the system, and that their data is stored accurately. Test cases should also include the process of offboarding employees from the system.

- Employee Personal and Contact Information: Create test cases to ensure that employee data is entered correctly, and that the system can store and retrieve this information accurately. Verify that the system can handle different data types, such as phone numbers, addresses, and emergency contact information.

- Employee Attendance and Leave Records: Create test cases to verify that the system can accurately track employee attendance and leave records. Test cases should include scenarios such as calculating employee attendance, tracking time off requests, and handling different types of leaves, such as sick leave and vacation time.

- Employee Performance Reviews and Progress Reports: Create test cases to ensure that the system can generate and store employee performance reviews and progress reports accurately. Test cases should include scenarios such as creating performance goals and tracking employee progress towards those goals.

- Security Measures: Create test cases to verify that the system has adequate security measures in place to protect sensitive employee data. Test cases should include scenarios such as verifying user access controls, testing password strength requirements, and verifying encryption of sensitive data.

- Employee Schedules and Shifts: Create test cases to ensure that the system can generate and manage employee schedules and shifts accurately. Test cases should include scenarios such as scheduling employee shifts, assigning employees to different shifts, and handling shift changes or swap requests.

- Employee Salary and Benefits: Create test cases to verify that the system can generate and manage

employee salary and benefits accurately. Test cases should include scenarios such as calculating employee pay, handling different types of employee benefits such as insurance and retirement plans, and generating pay stubs.

- Employee Management Reports: Create test cases to ensure that the system can generate various reports related to employee management accurately. Test cases should include scenarios such as generating attendance reports, performance reports, and payroll reports.

- Multiple Employee Roles and Job Titles: Create test cases to ensure that the system can handle multiple employee roles and job titles accurately. Test cases should include scenarios such as assigning different roles to employees, managing job titles and promotions, and handling transfers between departments.

- Integration with Third-Party HR Systems: Create test cases to verify that the system can integrate with other third-party HR systems or applications accurately. Test cases should include scenarios such as importing employee data from other HR systems, exporting data to other systems, and verifying compatibility with different file formats.

Test ID	Test-Purpose	Test-Condition	Expected-Output	Output	Remark
TC1	Check Username & Password	If user details are not correct, display error message	Grant access to main dashboard.	Access granted to main dashboard	Test successful
TC2	To add new user to the system	If user already exists, error message should be displayed.	New user should be added.	New user added successfully	Test Successful
TC3	To view existing employee information	If employee exists, then information should be displayed, else error message should be displayed.	Employee information should be displayed.	Employee information displayed.	Test Successful
TC4	To remove an employee	If employee exists, then employee should be removed else error message should be displayed.	Employee should be removed.	Employee removed successfully.	Test Successful
TC5	Update employee information	If employee exists, then information should be updated.	Employee information should be updated.	Employee information updated successfully	Test Successful

10.CONCLUSION

In conclusion, the implementation of the Employee Management System brings about a digital transformation in personnel databases within organizations, providing administrators with computer-based access to employee information. By adopting this software as an information system, businesses can securely store and manage their employee database for an indefinite period of time.

The Employee Management System simplifies and streamlines key tasks related to employee data management. Administrators can easily add new employees, delete outdated records, access relevant information, and make necessary changes, all within a user-friendly interface. This system empowers organizations to efficiently organize and maintain employee data, ensuring its accuracy and accessibility.

Furthermore, the Employee Management System offers enhanced security measures to safeguard sensitive employee information. With built-in data protection features, organizations can trust that their data is stored securely, minimizing the risk of unauthorized access or loss.

By leveraging the capabilities of the Employee Management System, organizations can improve their operational efficiency, eliminate manual record-keeping challenges, and promote data accuracy. This system not only simplifies administrative tasks but also provides valuable insights and data-driven reports that enable informed decision-making.

Overall, the Employee Management System serves as a comprehensive solution for modernizing employee data management. Its user-friendly interface, data security features, and simplified processes contribute to the overall effectiveness and productivity of organizations, ultimately supporting their goals and driving success in the digital era.

11. FUTURE SCOPE

The Employee Management System holds significant potential for future enhancements and advancements to cater to the evolving needs of organizations. One area of future scope involves integrating the system with other HR systems, such as payroll management, performance evaluation, and training modules. This integration would facilitate seamless data flow across different HR functions, improving overall efficiency and reducing the need for manual data entry.

Another aspect of future development is the incorporation of advanced analytics and reporting capabilities within the Employee Management System. By leveraging data analytics techniques, organizations can gain valuable insights into employee performance, engagement, and trends. This data-driven approach empowers decision-makers to make informed choices and implement targeted HR strategies to drive organizational success.

Furthermore, introducing an employee self-service portal as part of the Employee Management System can enhance employee engagement and satisfaction. This portal would enable employees to access and update their own information, such as personal details and leave requests, reducing the administrative burden on HR personnel and fostering a sense of ownership among employees.

The development of a mobile application for the Employee Management System is another future scope. This application would allow employees and administrators to access the system using their smartphones or tablets, providing convenient and on-the-go access to essential HR services. Additionally, integrating artificial intelligence (AI) technologies into the system can automate routine tasks, improve data accuracy, and provide intelligent recommendations for HR decision-making.

Data security and privacy enhancements should also be a focus for future development. Continuously updating the system to comply with evolving data privacy regulations and implementing robust security measures will ensure the protection of employee information and maintain trust within the organization.

Lastly, exploring cloud-based deployment options for the Employee Management System offers scalability, flexibility, and easier accessibility. Cloud deployment enables seamless updates, reduces infrastructure costs, and facilitates remote access for distributed teams, providing organizations with

greater flexibility and agility.