Department of Information and Communication Technology
Faculty of Technology
University of Ruhuna

Employee Management System

Software Requirement Specification

Group Project (ICT3183)

Project ID: GP-2024-07

Submitted by:

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Revision History

Name	Date	Reason For Changes	Version

Table of figures

1. Introduction

1.1 Purpose

The Employee Management System (EMS) aims to streamline and automate various aspects of human resource management within an organization. This system is designed to enhance efficiency, accuracy, and transparency in handling employee-related information and processes. By providing a centralized platform, it enables HR professionals and organizational stakeholders to manage, monitor, and optimize workforce activities effectively.

1.2 Document Conventions

- Document Title
  - The title of the document should be prominently displayed at the beginning, clearly indicating that it is an SRS.

- Version Control
  - Include a version number and date to track the document's revisions.
  - This helps readers identify the most recent version and understand changes made over time.

- Table of Contents
  - Provide a table of contents to outline the structure of the document and help users navigate to specific sections.

- Headers and Footers
  - Consistently use headers and footers to display the document title, section names, and page numbers.
  - This maintains a professional appearance and aids in document navigation.

- Formatting Styles
  - Use consistent formatting styles for text, such as font type, size, and color. Bold, italic, and underline can be used consistently to highlight important points.

- Section Numbering
  - Number sections and subsections to create a logical hierarchy.
  - This makes it easier for readers to locate specific information and understand the relationships between different sections.

- Bullet Points and Numbered Lists
  - Use bullet points or numbered lists for clarity when presenting lists or sequences of information.

- References
  - If external documents or sources are referenced, provide a bibliography or list of references for readers to access additional information.

- Graphical Elements
    - Use consistent conventions for graphical elements, such as charts, diagrams, and tables. Include titles, labels, and legends to enhance comprehension.

- Naming Conventions
    - If the document refers to specific entities (e.g., software components, modules), establish and adhere to naming conventions to maintain consistency.

1.3 Intended Audience and Reading Suggestions

1.3.1 Intended Audience:

- Developers
    - Individuals responsible for designing, coding, and testing the software.

- Project Managers
    - Individuals overseeing the software development project, responsible for planning, scheduling, and resource allocation.

- Testers
    - QA professionals responsible for testing the software to ensure quality and functionality.

- Documentation Writers
    - Individuals responsible for creating user manuals, help guides, and other documentation related to the software.

- Users
    - End-users who will interact with the software, including employees, administrators, or customers.

- Marketing Staff
    - Individuals involved in promoting and marketing the software to potential users or clients.

1.3.2 Description of Document Contents and Organization

The SRS document provides a detailed description of the software requirements, outlining its functionality, features, constraints, and user interactions. It is organized into sections that cover various aspects of the software, including,

- Introduction
    - Provides an overview of the software, its purpose, scope, and intended audience.

- General Description
    - Describes the context of the software, including its features, constraints, and assumptions.

- Specific Requirements

    - Details the functional and non-functional requirements of the software, including user interactions, system behavior, and performance criteria.

- External Interface Requirements
    - Describes the interfaces between the software and external systems, including hardware, software, and communication protocols.

- System Features
    - Lists and describes the specific features and functionalities of the software.

- Other Requirements
    - Covers additional requirements such as documentation, training, and support.

- Appendices
    - Includes supplementary information such as glossary, references, and supporting documentation.

1.3.3 Reading Sequence Suggestions

- Begin with the Overview Sections
    - Start by reading the Introduction and General Description sections to understand the purpose, scope, and context of the software.
    - Proceed to the System Features section to get an overview of the specific functionalities and features of the software.

- Developer and Project Manager Focus:
    - Developers and project managers should focus on the Specific Requirements section to understand the detailed functional and non-functional requirements of the software.
    - They should also review the External Interface Requirements section to understand the integration points with external systems.

- Tester Focus:
    - Testers should pay close attention to the Specific Requirements section to understand the expected system behavior and performance criteria for testing purposes.

- User Focus:
    - Users should refer to the System Features section to understand the available functionalities and how they can interact with the software.
    - They may also find the General Description section useful for understanding the context and constraints of the software.

- Documentation Writer Focus:
    - Documentation writers should review the Appendices section for supplementary information such as the glossary and references to support their documentation efforts.

1.4 Product Scope

1.4.1 Software Description and Purpose

The Employee Management System (EMS) is a comprehensive software solution designed to streamline and automate various aspects of human resource management within an organization. Its purpose is to centralize employee-related processes, data, and interactions, thereby enhancing organizational efficiency and employee satisfaction. The EMS serves as a centralized platform for managing the entire employee lifecycle, from recruitment and onboarding to performance evaluation and offboarding.

1.4.2 Benefits

- Efficiency
  - The EMS reduces manual administrative tasks, such as data entry and paperwork, allowing HR personnel to focus on strategic initiatives.
- Accuracy
  - By maintaining a centralized employee database, the EMS ensures that employee information is accurate, up-to-date, and easily accessible.
- Transparency
  - The system fosters transparent communication between employees, managers, and HR professionals by providing a unified platform for accessing and sharing information.
- Decision-making
  - With robust reporting and analytics capabilities, the EMS enables data-driven decision-making for talent management, resource allocation, and strategic planning.
- Employee Experience
  - By providing self-service tools and easy access to HR services, the EMS enhances the overall employee experience, leading to higher satisfaction and engagement.

1.4.3 Objectives and Goals

- Efficient HR Processes
  - The primary objective of the EMS is to streamline HR processes, reducing administrative overhead and improving efficiency.
- Data Accuracy
  - Another objective is to maintain accurate and up-to-date employee data, ensuring compliance with regulations and minimizing errors.
- Enhanced Communication

    - The EMS aims to facilitate transparent communication between employees and HR personnel, fostering a culture of openness and collaboration.

- Strategic Decision-making
    - The system seeks to provide HR professionals with the necessary tools and insights to make informed decisions about workforce management and development.

- Employee Satisfaction
    - Ultimately, the goal of the EMS is to enhance employee satisfaction and engagement by providing a seamless and user-friendly experience throughout the employee lifecycle.

1.4.4 Goals

- Operational Efficiency
    - By automating HR processes and reducing manual workload, the EMS contributes to overall operational efficiency, aligning with the corporate goal of maximizing productivity and resource utilization.

- Talent Management
    - The system supports strategic talent management initiatives by providing insights into workforce trends, enabling organizations to identify and nurture top talent, which aligns with the goal of attracting, retaining, and developing skilled employees.

- Employee Engagement
    - By prioritizing employee experience and communication, the EMS helps foster a positive work environment, aligning with the corporate goal of promoting employee engagement, satisfaction, and retention.

- Compliance
- Ensuring accurate and compliant handling of employee data, the EMS helps mitigate legal and regulatory risks, safeguarding the organization's reputation and integrity, thereby aligning with the corporate goal of adhering to ethical and legal standards.

In summary, the Employee Management System serves as a strategic tool that supports corporate goals and business strategies by enhancing HR processes, fostering employee engagement, and facilitating data-driven decision-making. Its objectives and goals are closely aligned with the broader objectives of the organization, contributing to its overall success and competitiveness.

1.5 References

- Dk, J. (2018) *Employee RMS SRS 1.0.docx*, *Academia.edu*. Available at: https://www.academia.edu/36634340/Employee_RMS_SRS_1_0_docx (Accessed: 23 February 2024).
- Figma
- Drow.io

2. Overall Description

2.1 Product Perspective

For a cleaning service company's employee management system, the product perspective involves understanding how the system fits within the broader context of the company's operations and how it interacts with various stakeholders and systems. Here are some considerations for the product perspective:

- System Context
  - The employee management system operates within the context of the cleaning service company's overall operations. It interacts with other systems.

- Managerial Oversight
  - Admin and supervisors use the system to oversee and manage the workforce.
  - This includes tasks such as assigning cleaning tasks, monitoring employee attendance and performance and generating reports on employee productivity and service quality.

- Interfaces
  - The system needs to interface with admin, supervisors and the accountant. Interfaces may include web portals.

- Dependencies
  - The system may depend on external factors such as internet connectivity, server infrastructure, and access to employee data (e.g., contact information, schedules) stored in other databases.

- Stakeholders
  - Stakeholders include cleaning staff who use the system to manage their schedules and tasks, managers who oversee employee performance and scheduling.

- Integration
  - Integration with scheduling software is crucial for efficiently assigning tasks to employees based on availability.

- Lifecycle Considerations
  - The employee management system should be designed to evolve with the company's needs over time.
  - This includes accommodating changes in workforce size, organizational structure, and regulatory requirements.
  - Regular updates and maintenance are necessary to ensure optimal performance and security.

- Regulatory Compliance
  - The system must comply with labor regulations regarding employee scheduling, working hours, overtime, and employee data privacy. Compliance with industry-specific regulations, such as those related to cleaning products and safety protocols, may also be necessary.

By considering these aspects of product perspective, the cleaning service company can develop an employee management system that effectively meets the needs of its workforce, managers, and clients while ensuring compliance with relevant regulations and standards.

2.2 Product Functions

Admin:

Employee Management:
- Add, Delete, Update and View Employee details
- Assign tasks to staff
- Monthly generate reports

Supervisor:

Inventory Management:
- Add, Delete, Update and View Stock
- Monthly generate report

Leave and Attendance:
- Manage staff leave
- View leave history
- Maintain Attendance
- Monthly report generates

Accountant:

Calculate Salary:
- Add salary
- Manage salary
- Calculate etf, epf
- Monthly report generates
- Message alert

2.3 User Classes and Characteristics

Admin

Frequency of Use: Daily to Regularly

Subset of Product Functions Used: Scheduling, task assignment, performance monitoring, reporting

Characteristics: Have higher technical expertise compared to cleaning staff. They require access to a broader range of functions for managing the workforce effectively. They prioritize efficiency, data accuracy, and comprehensive reporting capabilities.

Supervisors

Frequency of Use: Daily to Regularly

Subset of Product Functions Used: manage leave and attendance, inventory management, reporting

Characteristics: Have higher technical expertise compared to cleaning staff. They require access to a broader range of functions for managing the workforce effectively. They prioritize efficiency, data accuracy, and comprehensive reporting capabilities.

Accountant

Frequency of Use: Daily to Regularly

Subset of Product Functions Used: calculate salary, performance monitoring, reporting

Characteristics: Have higher technical expertise compared to cleaning staff. They require access to a broader range of functions for managing the workforce effectively. They prioritize efficiency, data accuracy, and comprehensive reporting capabilities.

2.4 Operating Environment

The operating environment for a cleaning service company employee management system involves various hardware, software, and network components. Here's a description of the environment in which the software will operate,

1.Hardware Platform:

- The employee management system should be compatible with standard computing hardware commonly used in office environments. This includes desktop computers and laptops.

2.Operating System and Versions:

- The software should be compatible with common operating systems used in business environments, such as:
  - Windows: Windows 10 or later

3.Web Browser Compatibility:

- The system should be accessible via popular web browsers to accommodate users accessing the system from different devices. Compatibility with the following browsers is recommended:
  - Google Chrome
  - Mozilla Firefox
  - Microsoft Edge

4.Database:

- The system may require a backend database to store employee information, schedules, and other data. Commonly used databases include:
  - MySQL
  - Microsoft SQL Server

By operating within this environment, the employee management system can effectively support the needs of the cleaning service company, providing efficient employee management and enhancing overall operational productivity.

2.5 Design and Implementation Constraints

Design and implementation constraints for a cleaning service company employee management system may include:

- Regulatory Compliance
  - The system must adhere to labor regulations governing employee scheduling, working hours, wages, and data privacy.
  - Compliance with industry-specific regulations, such as those related to cleaning product safety, may also be necessary.

- Hardware Limitations
  - The system should be designed to operate efficiently on standard computing hardware commonly used in office environments.
  - Memory and processing constraints should be considered to ensure optimal performance, especially during peak usage times.

- Interfaces with Other Applications
  - The system may not need to integrate with existing software applications used by the cleaning service company, such as scheduling software, payroll systems, CRM software, and accounting software.

- Technology Stack
  - Specific technologies, tools, and databases may be mandated by the company's IT policies or chosen based on compatibility with existing infrastructure.
  - For example, the use of a particular programming language, framework, or database management system may be required.

- Security Considerations
  - The system must incorporate robust security measures to protect sensitive employee information and ensure data integrity.

- Design Conventions and Standards

  - The system should adhere to design conventions and programming standards established by the company or industry best practices.
  - Consistency in coding style, naming conventions, and architectural patterns can facilitate maintenance and collaboration among developers.

- Maintenance Responsibility
  - Clarification on whether the customer's organization or the development team will be responsible for maintaining the delivered software should be established.
  - This may impact design decisions, documentation requirements, and support agreements.

- Scalability and Performance
  - The system should be designed to accommodate potential growth in the number of employees and clients served by the cleaning service company.

- Scalability considerations should be incorporated into the architecture to ensure that the system can handle increased user loads without degradation in performance.

Addressing these constraints during the design and implementation phases will help ensure that the employee management system meets the needs of the cleaning service company while complying with regulatory requirements, maintaining security, and aligning with technical and organizational standards.

2.6 Project Documentation

Project documentation for a cleaning service company employee management system typically includes various components to ensure clarity, transparency, and ease of understanding for stakeholders involved in the project. Here are the key components that may be delivered along with the software:

1.Introduction:
- Provides an overview of the employee management system project.
- Describes the purpose, scope, and objectives of the system.
- Outlines the key stakeholders and their roles in the project.
- Introduces the structure and contents of the documentation.

2.Requirements Documentation:
- Details the functional and non-functional requirements of the system.
- Includes use cases, user stories, and acceptance criteria.
- Describes any constraints or dependencies that affect the system design and implementation.

3.Design Documentation:
- Describes the architecture and design of the employee management system.
- Includes system architecture diagrams, database schemas, and data flow diagrams.
- Documents the software components, modules, and their interactions.

4.Implementation Documentation:
- Provides instructions for installing, configuring, and deploying the software.
- Documents the coding standards, guidelines, and conventions followed during development.
- Includes details of third-party libraries, frameworks, and tools used in the implementation.
- Provides guidance for developers on how to contribute to the project and maintain the codebase.

5.User Manual:
- Guides users on how to use the employee management system effectively

6.Testing Documentation:
- Describes the testing approach, strategies, and methodologies used to validate the system.
- Provides information on unit testing, integration testing, system testing and user acceptance testing.

7.Deployment Documentation:
- Guides administrators on deploying the employee management system in production environments.
- Includes system requirements, hardware recommendations, and installation instructions.
- Documents procedures for configuring system settings, integrating with other applications, and setting up user accounts and permissions.

8.Maintenance and Support Documentation:

- Provides guidelines for maintaining and supporting the employee management system post-deployment.
- Includes information on monitoring system performance, applying updates and patches, and troubleshooting common issues.
- Documents procedures for handling user support requests, bug reports, and feature requests.

9.Change Log:

- Lists all changes, enhancements, and bug fixes made to the software across different versions.
- Provides transparency regarding the evolution of the system and the reasons behind specific changes.

The documentation may adhere to industry-standard formats such as IEEE Standard 830 for Software Requirements Specifications or be customized based on the preferences and requirements of the cleaning service company and its stakeholders.

2.7 User Documentation

For a cleaning service company employee management system, the user documentation plays a crucial role in helping users understand and effectively utilize the software. Here are the user documentation components that may be delivered along with the software,

- User Manual:
  - Provides comprehensive guidance on how to use the employee management system.
  - Includes step-by-step instructions for performing common tasks such as employee management, assigning tasks, leave and attendance, and reporting.
  - Explains the user interface elements, navigation paths, and functionalities available in the system.
  - May include screenshots or illustrations to aid understanding.

- Onboarding Guide:
  - Offers guidance specifically tailored for new users who are unfamiliar with the system.
  - Walks users through the initial setup process, including account creation, profile setup, and system configuration.
  - Provides an overview of key features and functionalities to help users get started quickly.

- Training Materials:
  - Includes tutorials, videos, or interactive demos to facilitate user training and skill development.
  - Covers advanced features and best practices for maximizing productivity and efficiency.
  - Can be delivered in various formats such as PDF documents, online courses, or recorded webinars.

The user documentation may be delivered in various formats, such as PDF documents, online help systems, or embedded within the software interface itself. It should be designed to be user-friendly, easily accessible, and comprehensive enough to address the needs of users with varying levels of expertise and experience.

2.8 Assumptions and Dependencies

Assumptions and dependencies play a significant role in shaping the development and operation of a cleaning service company employee management system. Here are some key assumptions and dependencies that could affect the requirements stated in the Software Requirements Specification (SRS),

2.8.1 Assumptions

- Internet Connectivity
    - It is assumed that users of the employee management system will have reliable internet connectivity to access the system, update information in real-time, and communicate with other users.

- User Training
    - It is assumed that users will receive adequate training on how to use the system effectively.
    - This includes understanding the features, functionalities, and best practices for managing employee-related tasks.

- Data Accuracy
    - The system assumes that the data entered by users, such as employee information, schedules, and task assignments, is accurate and up to date.
    - Inaccurate data could lead to errors in scheduling and task assignment.

- Hardware Compatibility
    - The system assumes compatibility with standard computing hardware. commonly used by employees.
    - Compatibility issues could arise if users are using outdated or incompatible hardware.

- Regulatory Compliance
    - It is assumed that the system will comply with relevant labor laws, regulations, and industry standards related to employee management, data privacy, and security.
    - Non-compliance could result in legal or regulatory penalties.

- Maintenance and Support
    - The system assumes that adequate resources will be allocated for ongoing maintenance, support, and updates.
    - This includes addressing bugs, adding new features, and providing technical assistance to users.

- Scalability
    - The system assumes that it will be able to scale to accommodate the growing needs of the cleaning service company, including an increasing number of employees, clients, and tasks.

2.8.2 Dependencies

- Data Migration
    - If migrating data from existing systems or databases, the project depends on the not successful extraction, transformation, and loading of data without loss or corruption.

- Development Tools and Libraries
    - The project may depend on the availability and compatibility of specific development tools, libraries, and frameworks used in the software development process.
    - Changes to these tools could impact the development environment and project workflow.

Addressing these assumptions and dependencies is crucial for mitigating risks and ensuring the successful development, deployment, and operation of the cleaning service company employee management system. Regular communication, collaboration, and monitoring of these factors throughout the project lifecycle are essential to minimize potential disruptions and ensure project success.

3. External Interface Requirements

3.1 User Interfaces

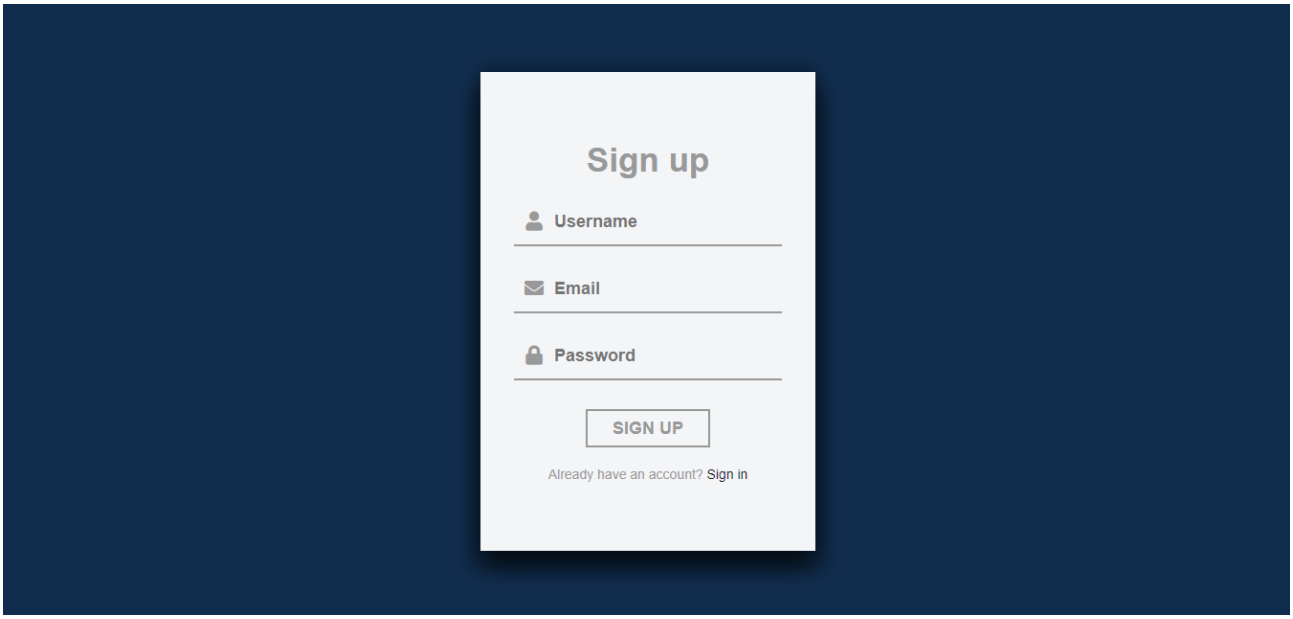

Figure 1- Sign up interface

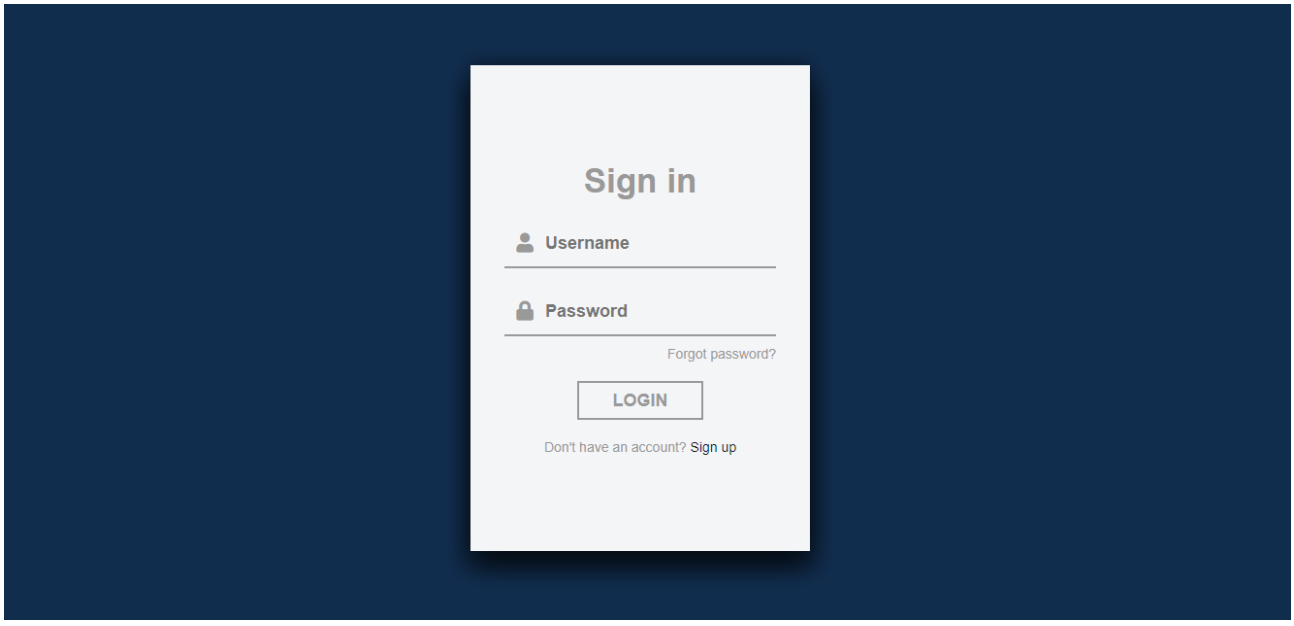

Figure 2- Sign in interface

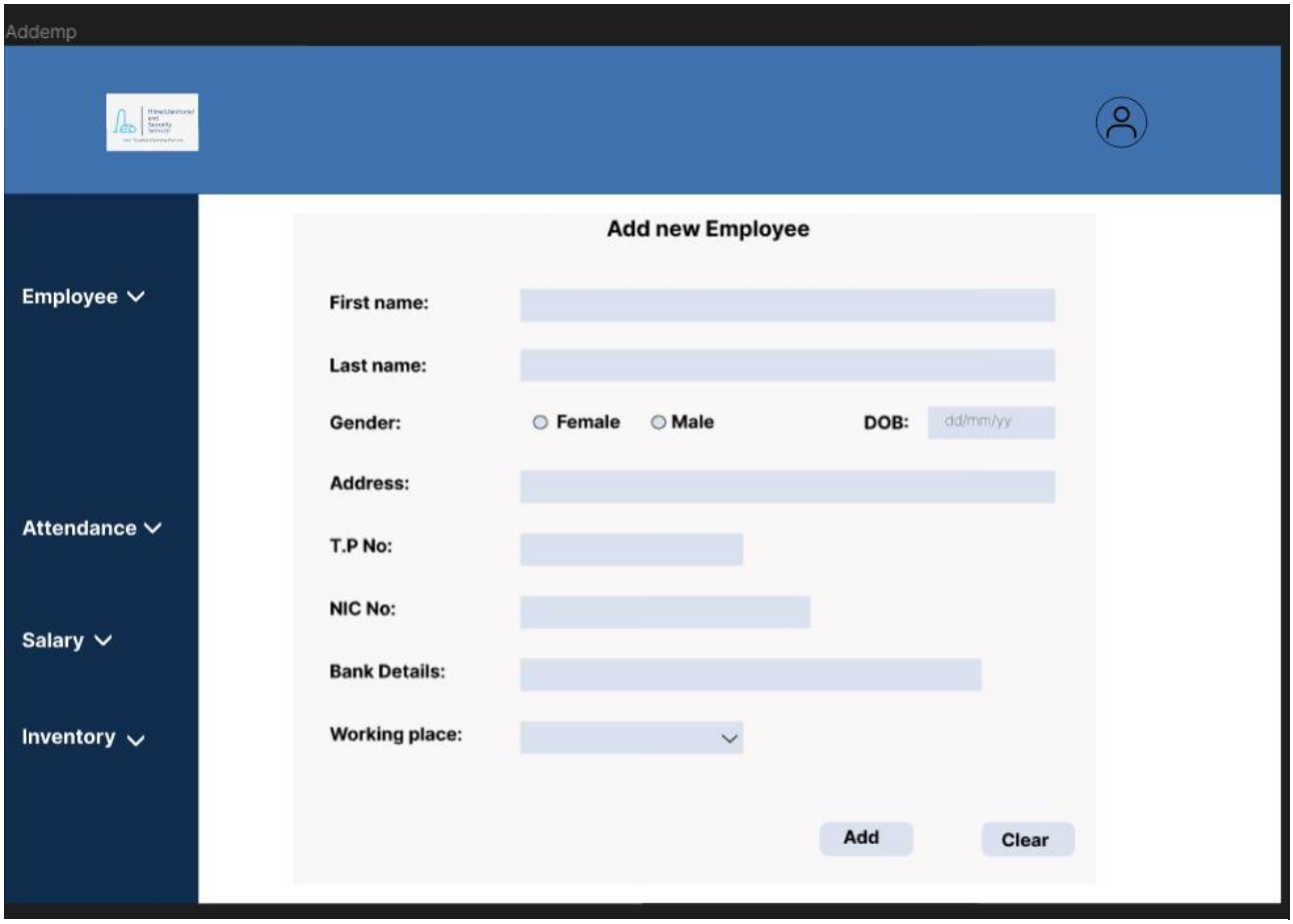

Figure 3 - Add new employee interface

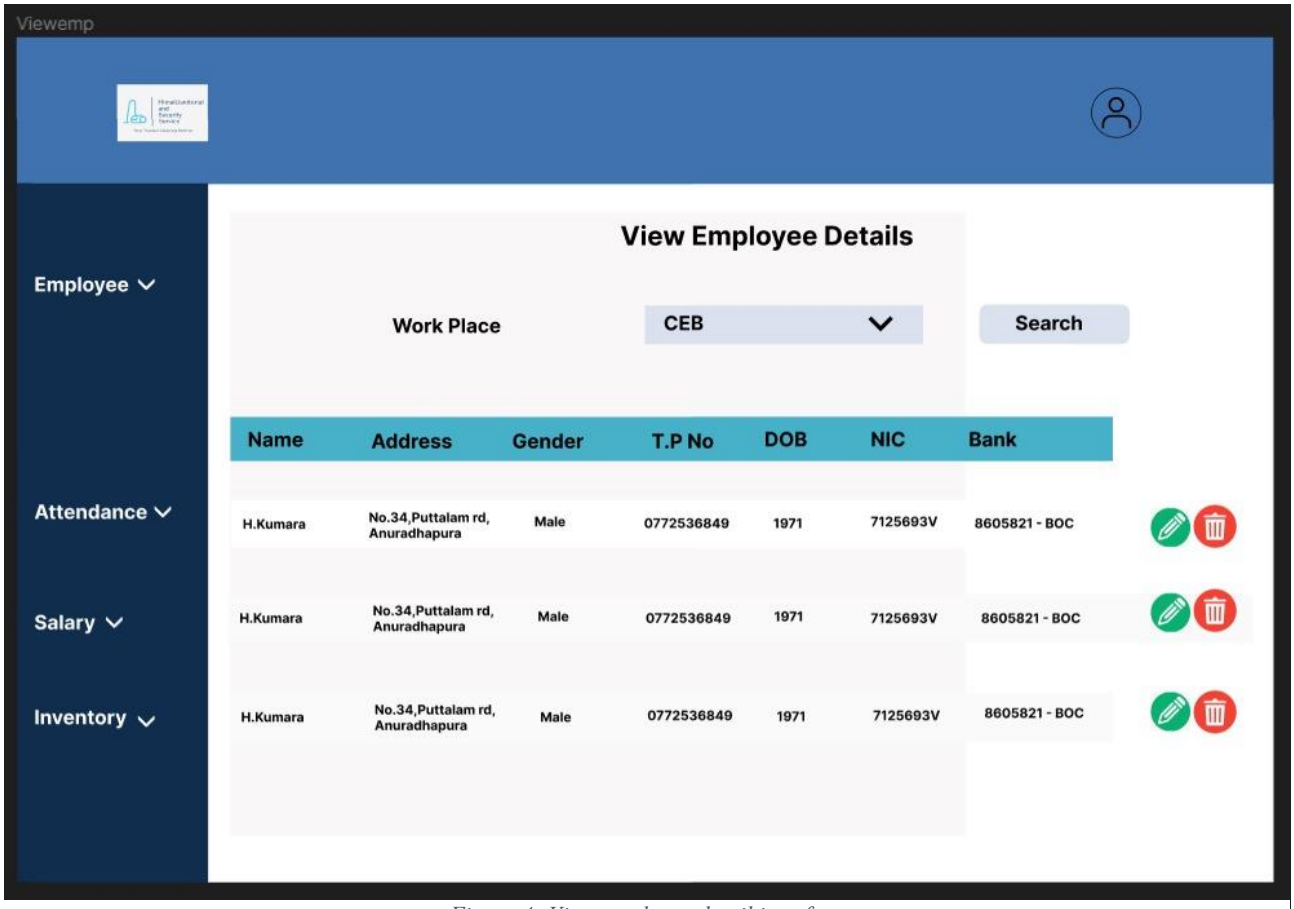

Figure 4- View employee detail interface

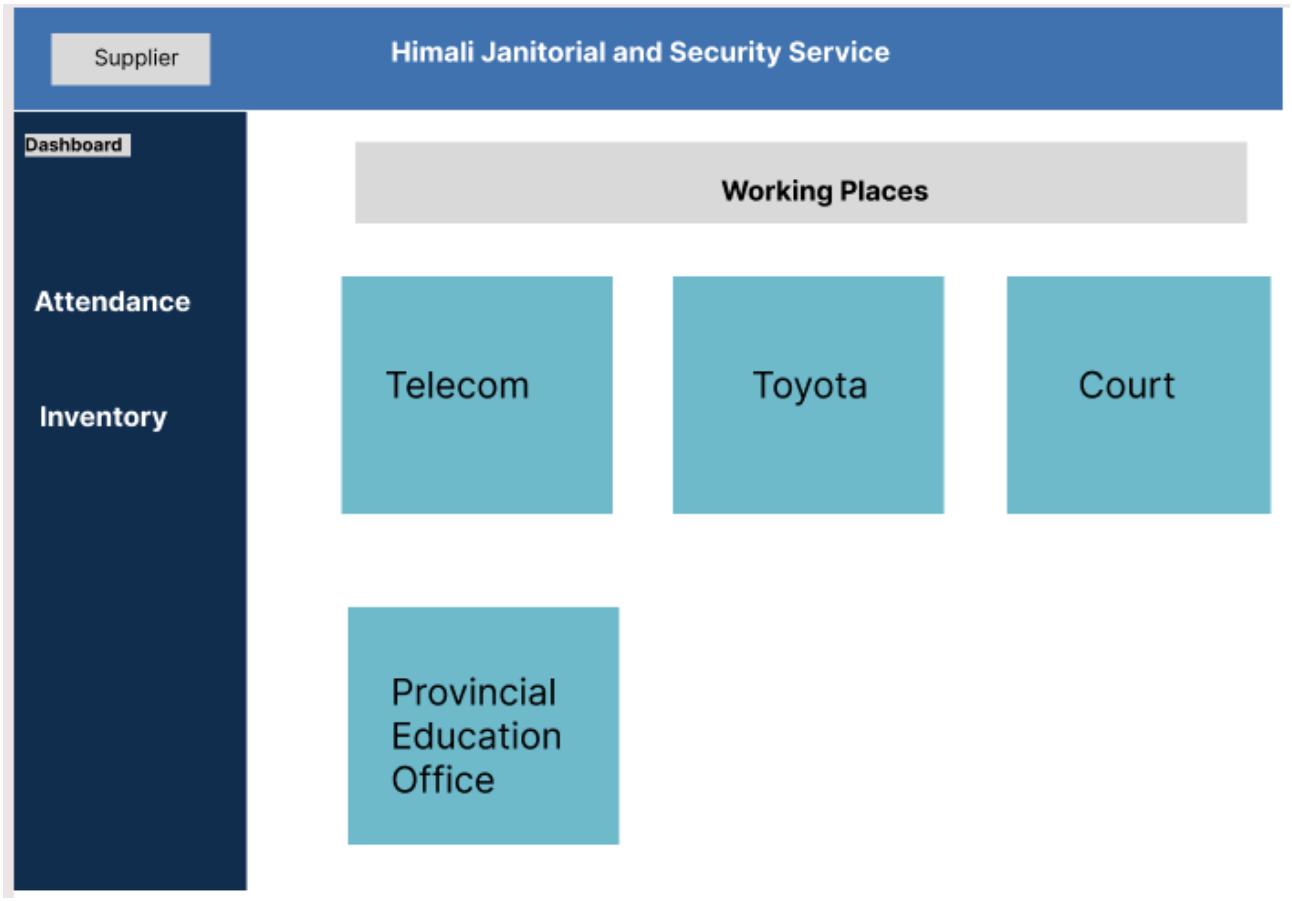

Figure 5- Supplier Dashboard interface.

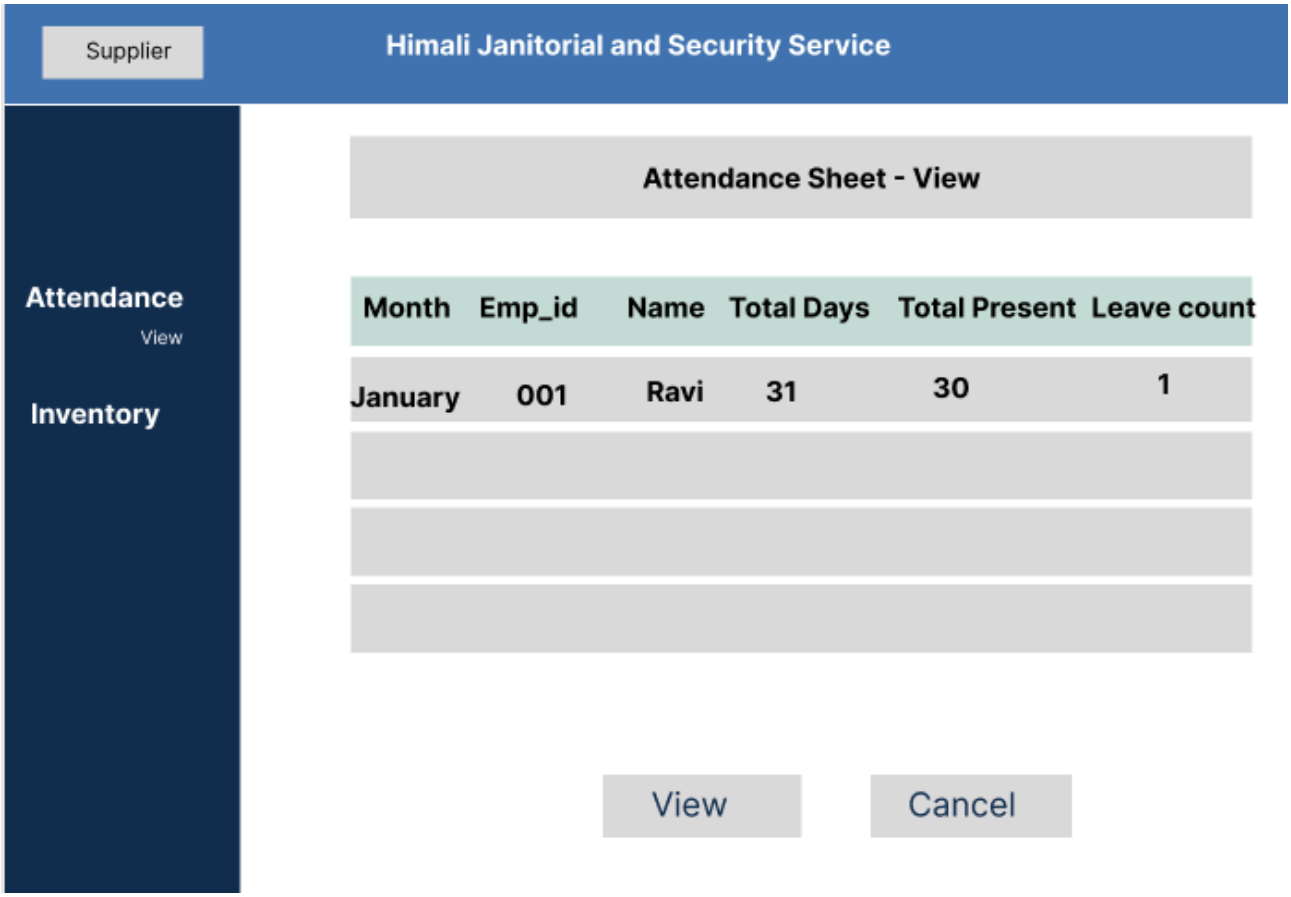

Figure 6- View Attendance interface

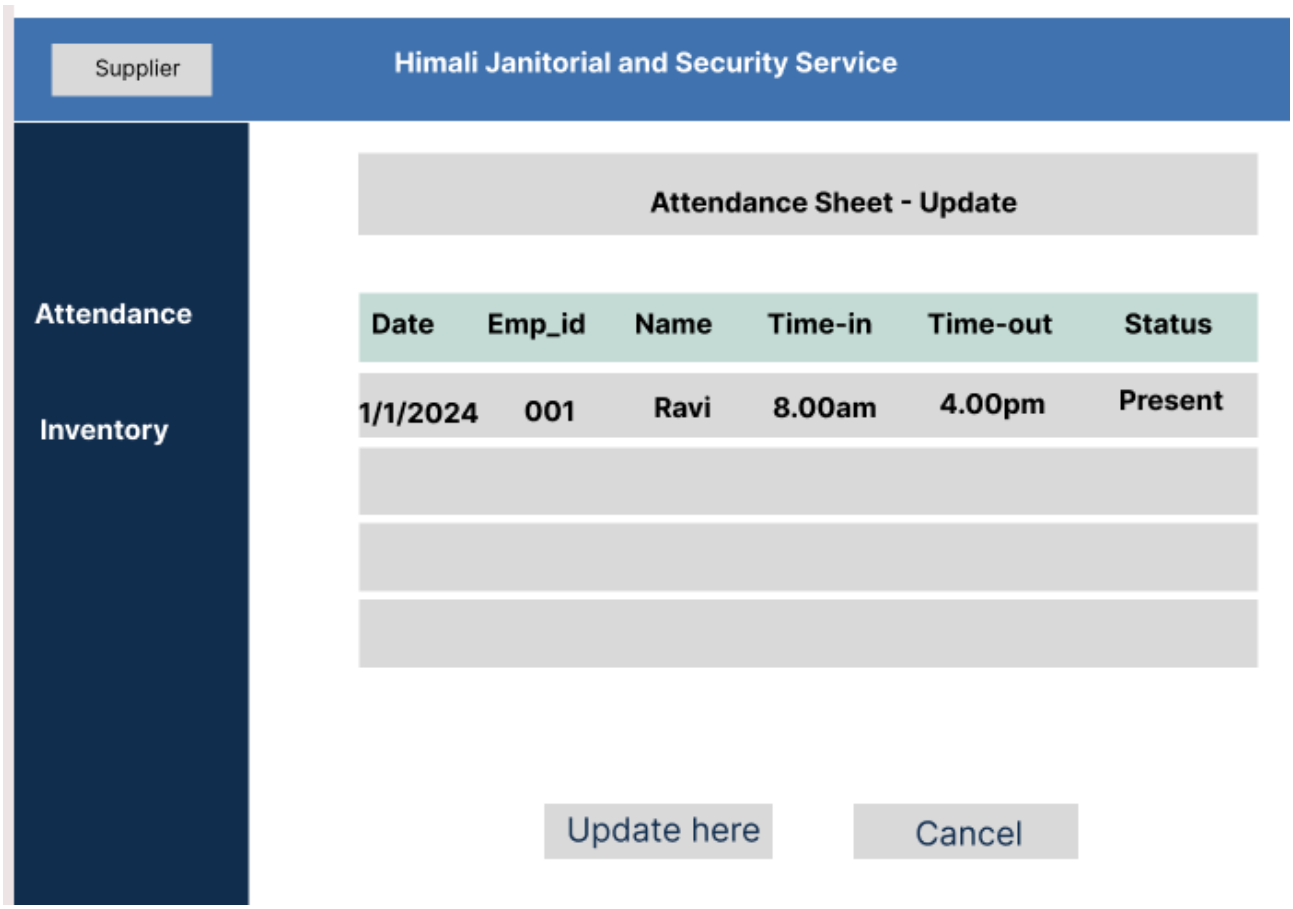

Figure 7- Update Attendance interface

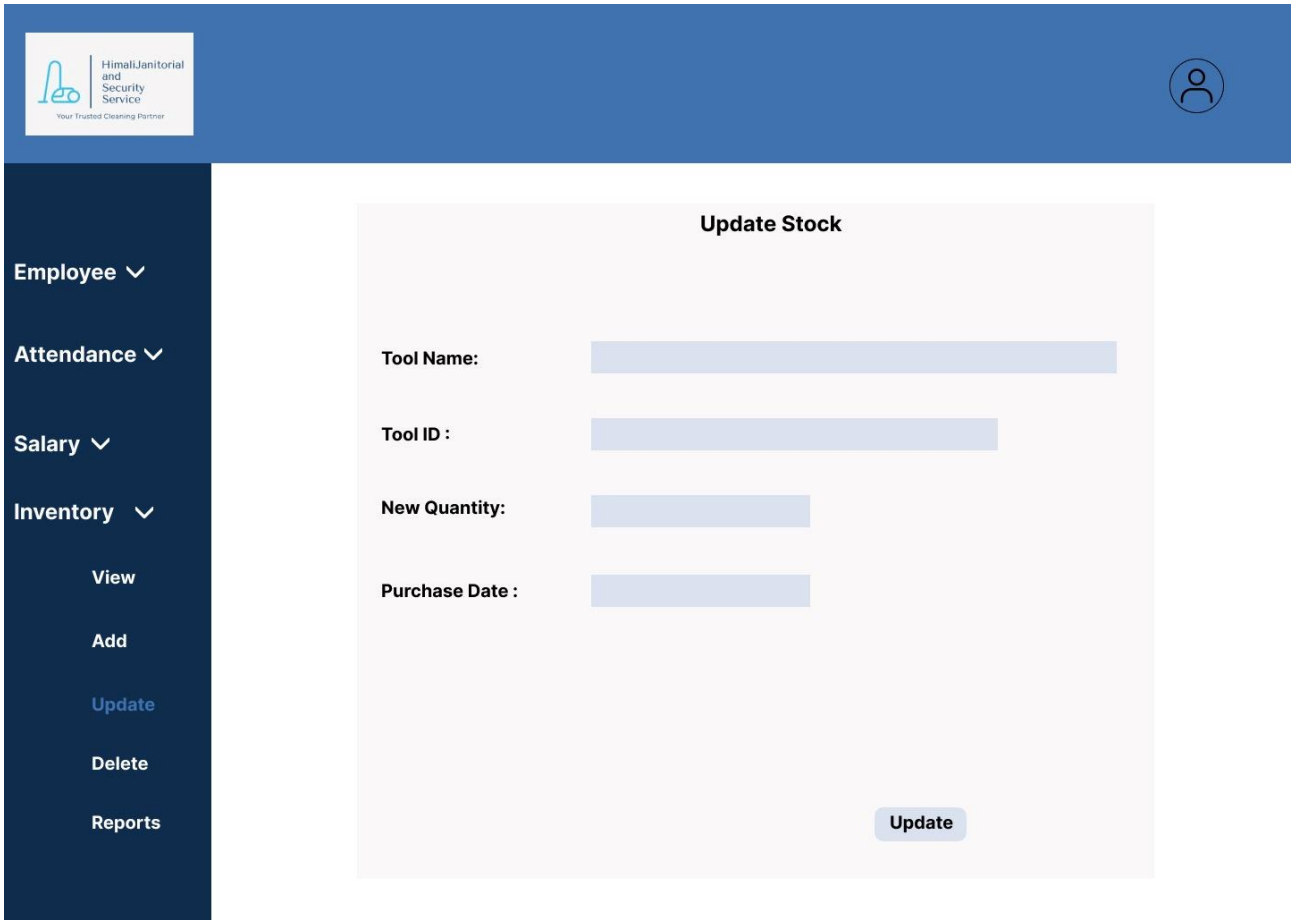

Figure 8- Update stock interface

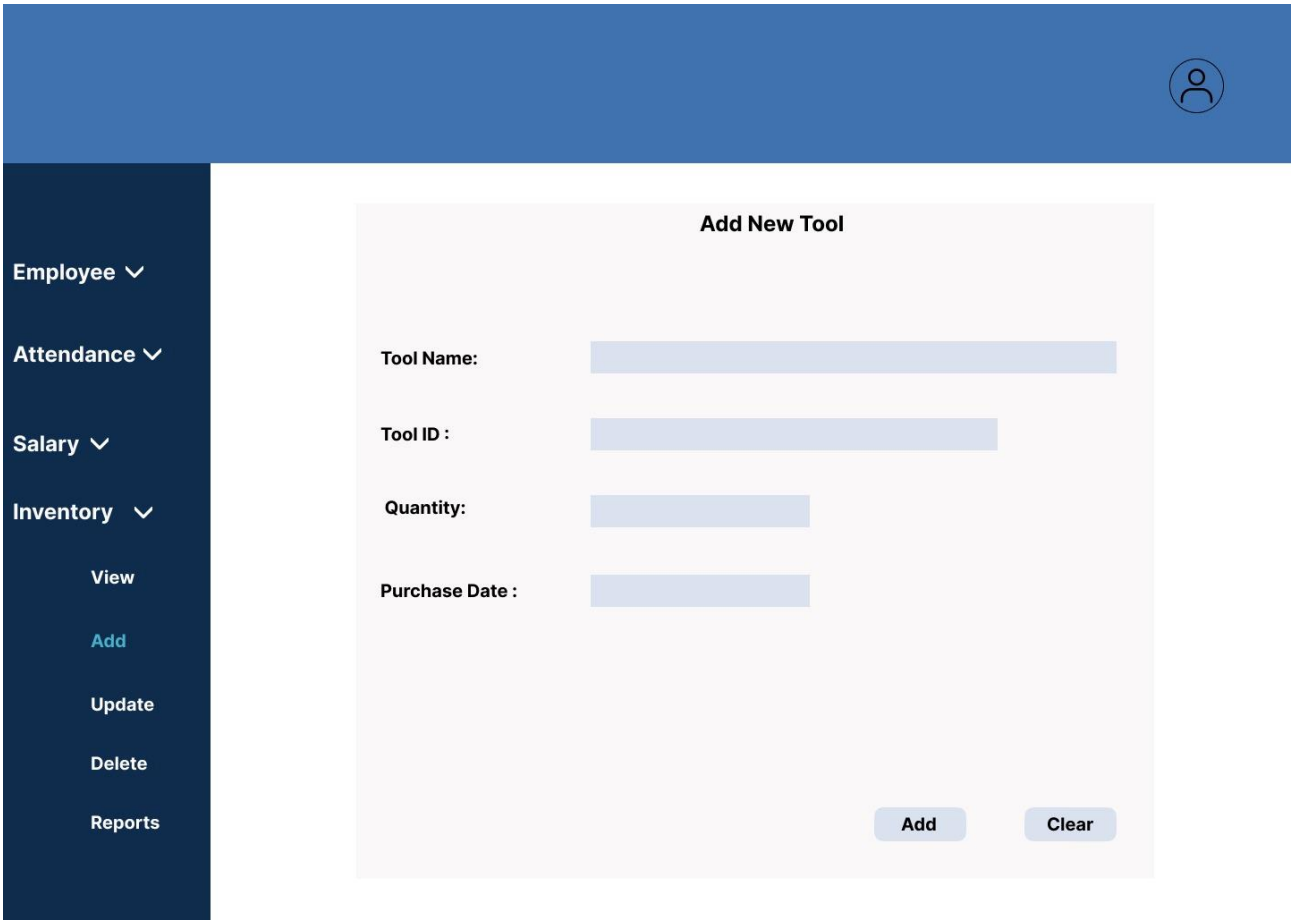

Figure 9- Add new tool interface

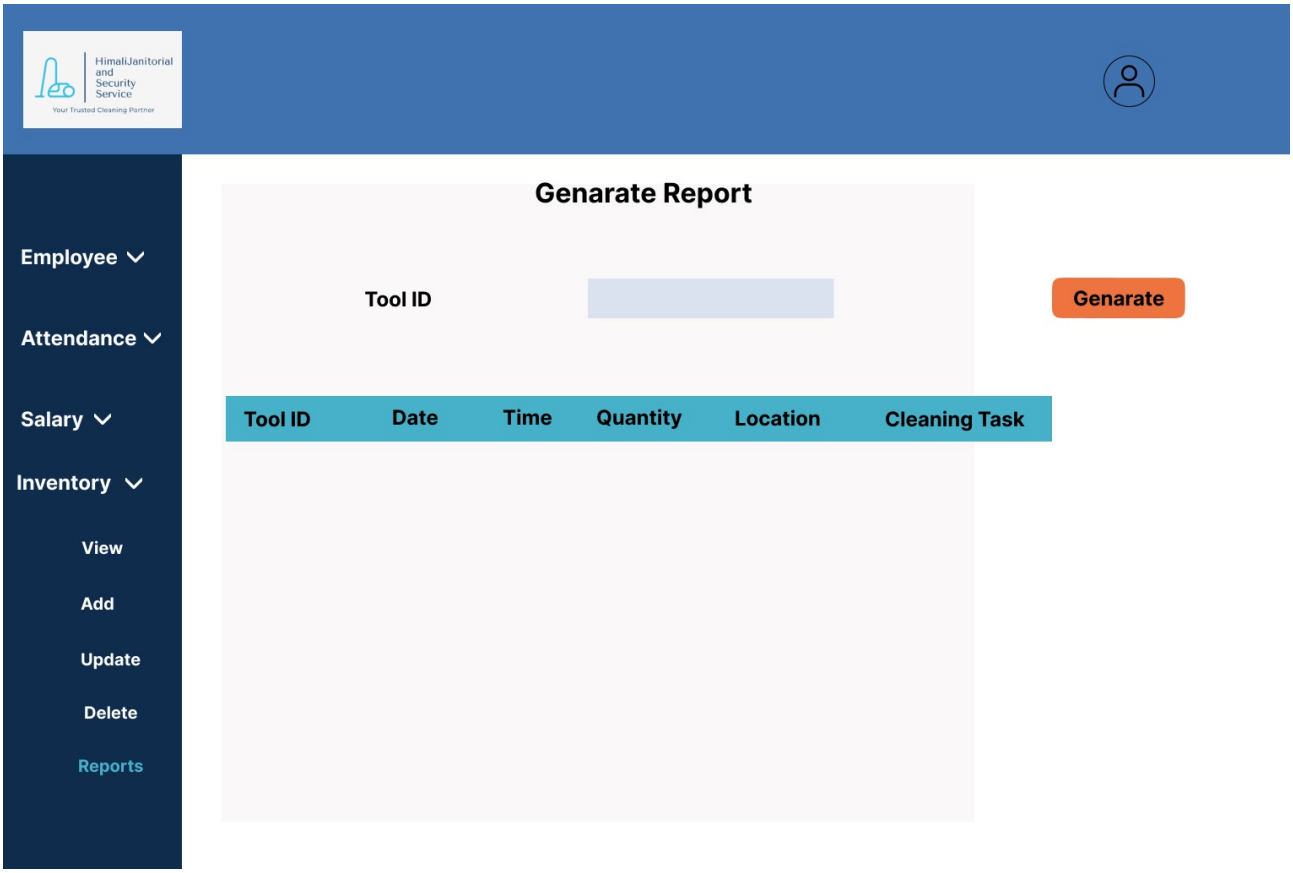

Figure 10- Generate report Interface

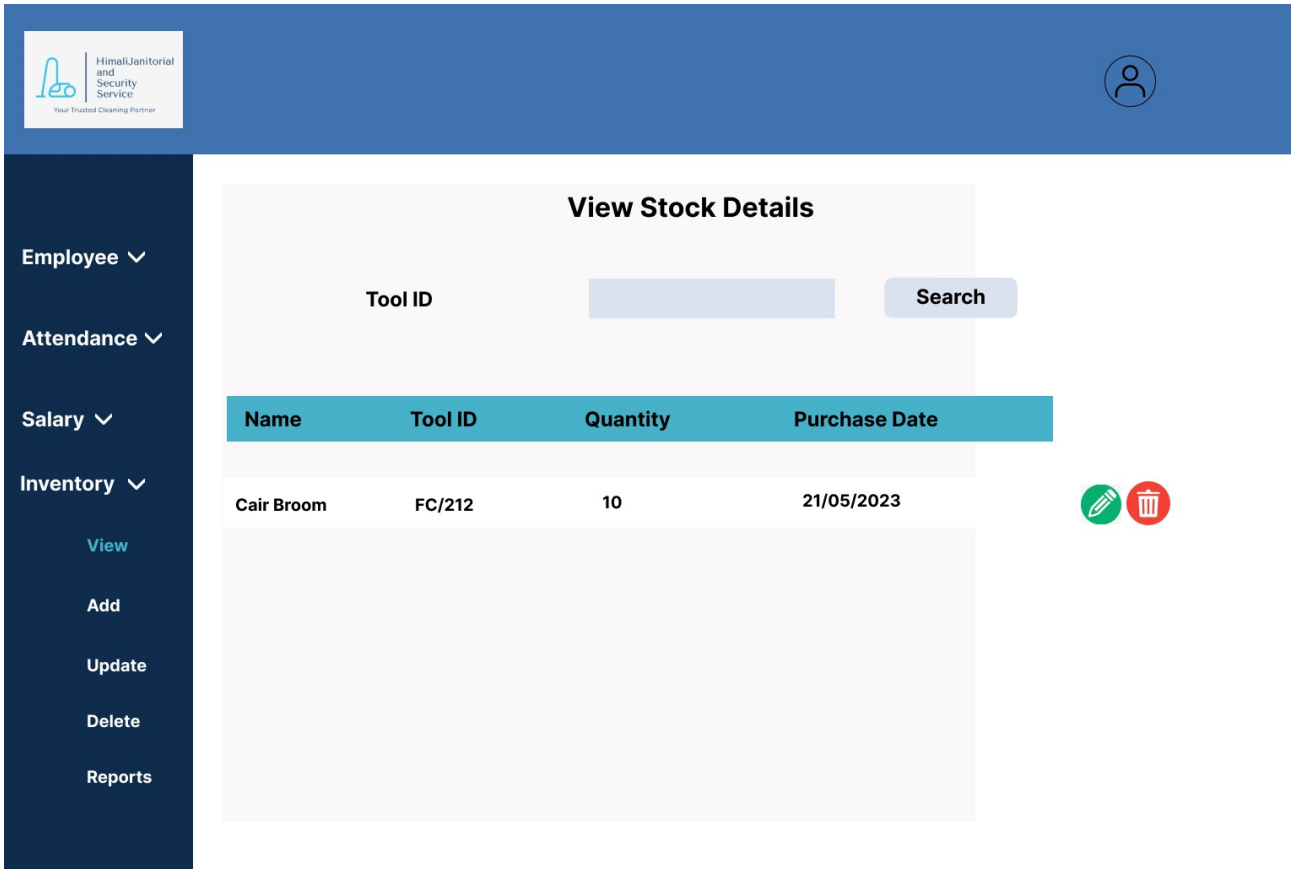

Figure 11- View stock Interface

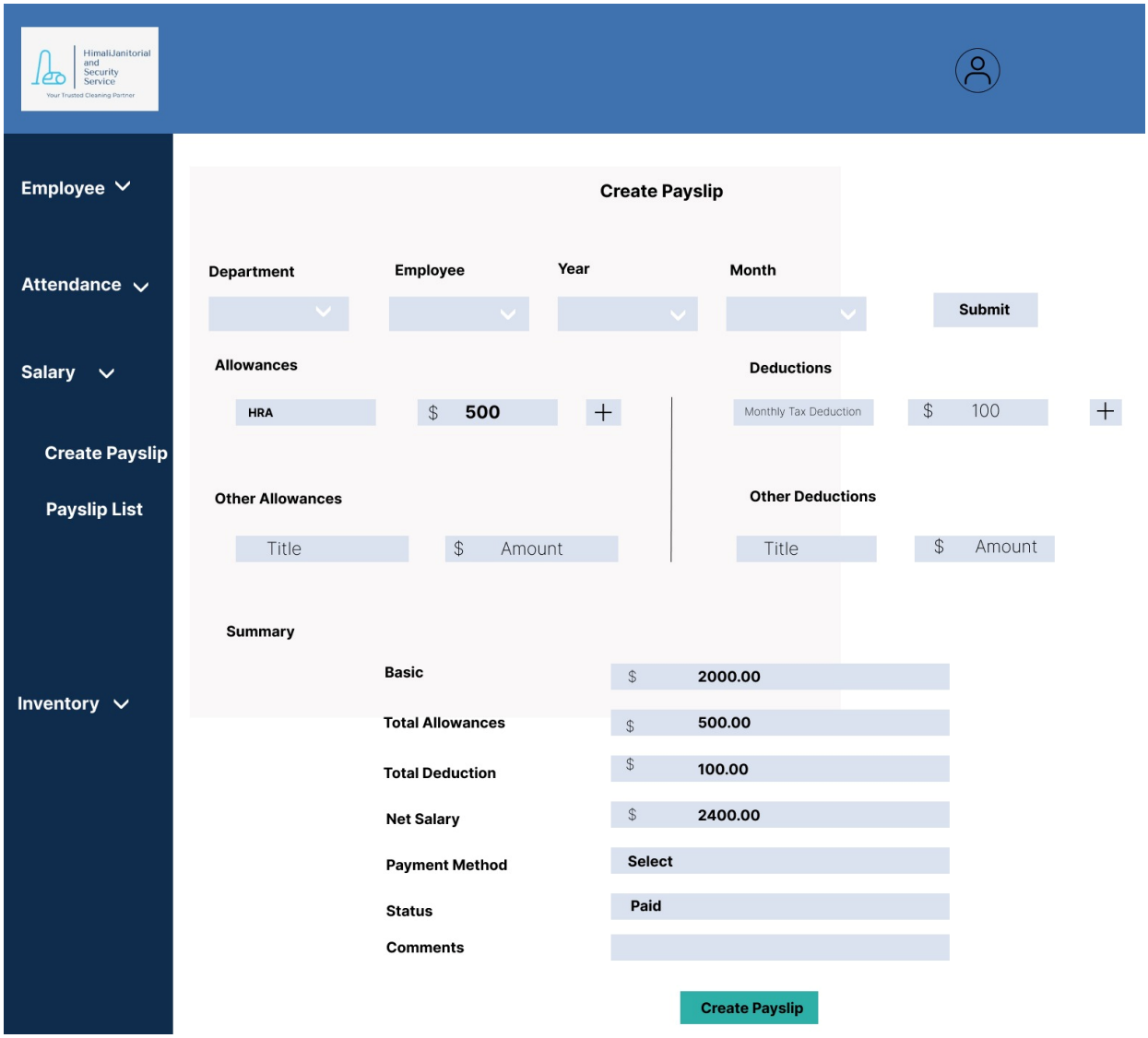

Figure 12- Add Salary Interface

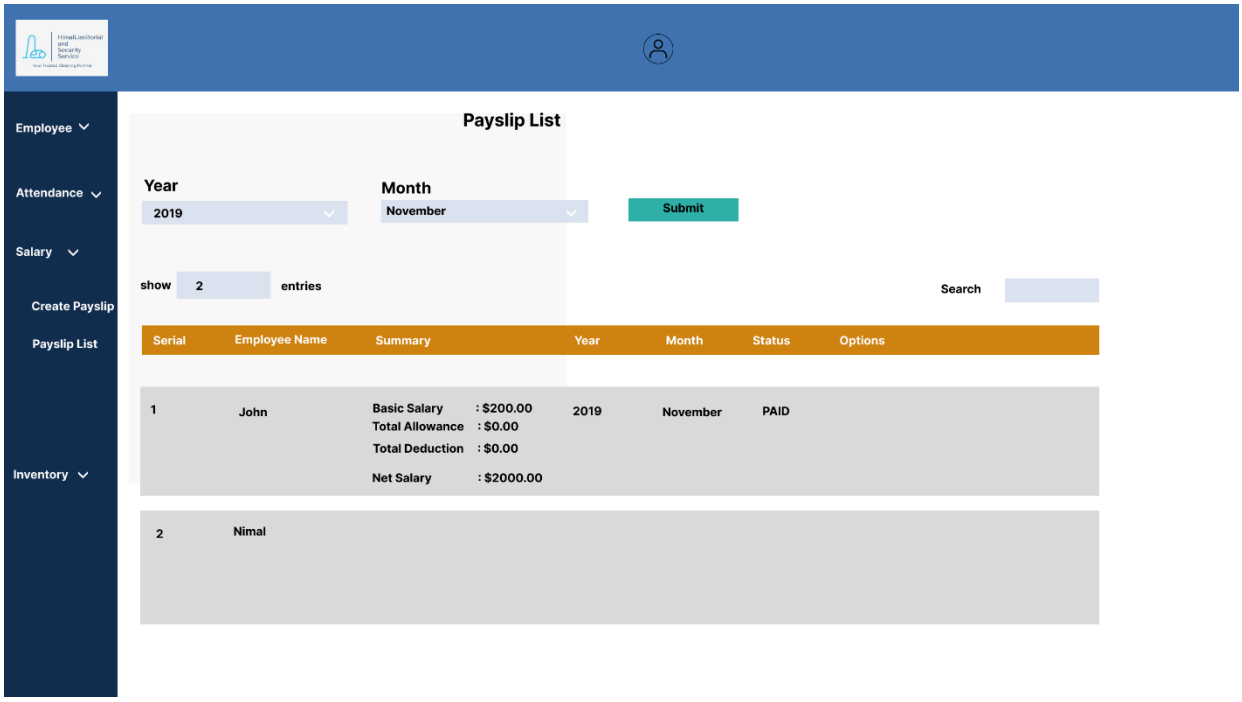

Figure 13-View Salary Interface

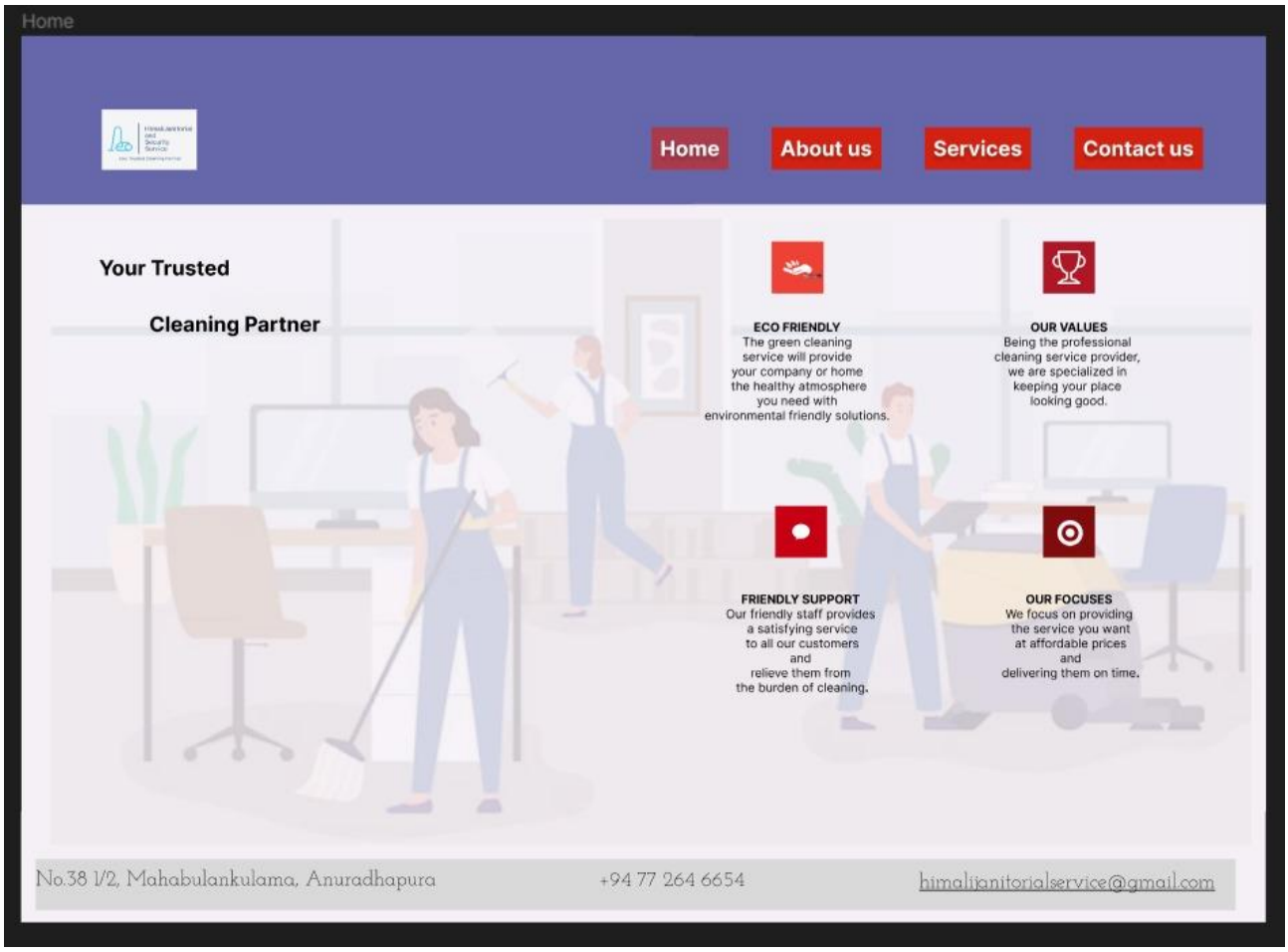

Figure 14- Web site Home page interface

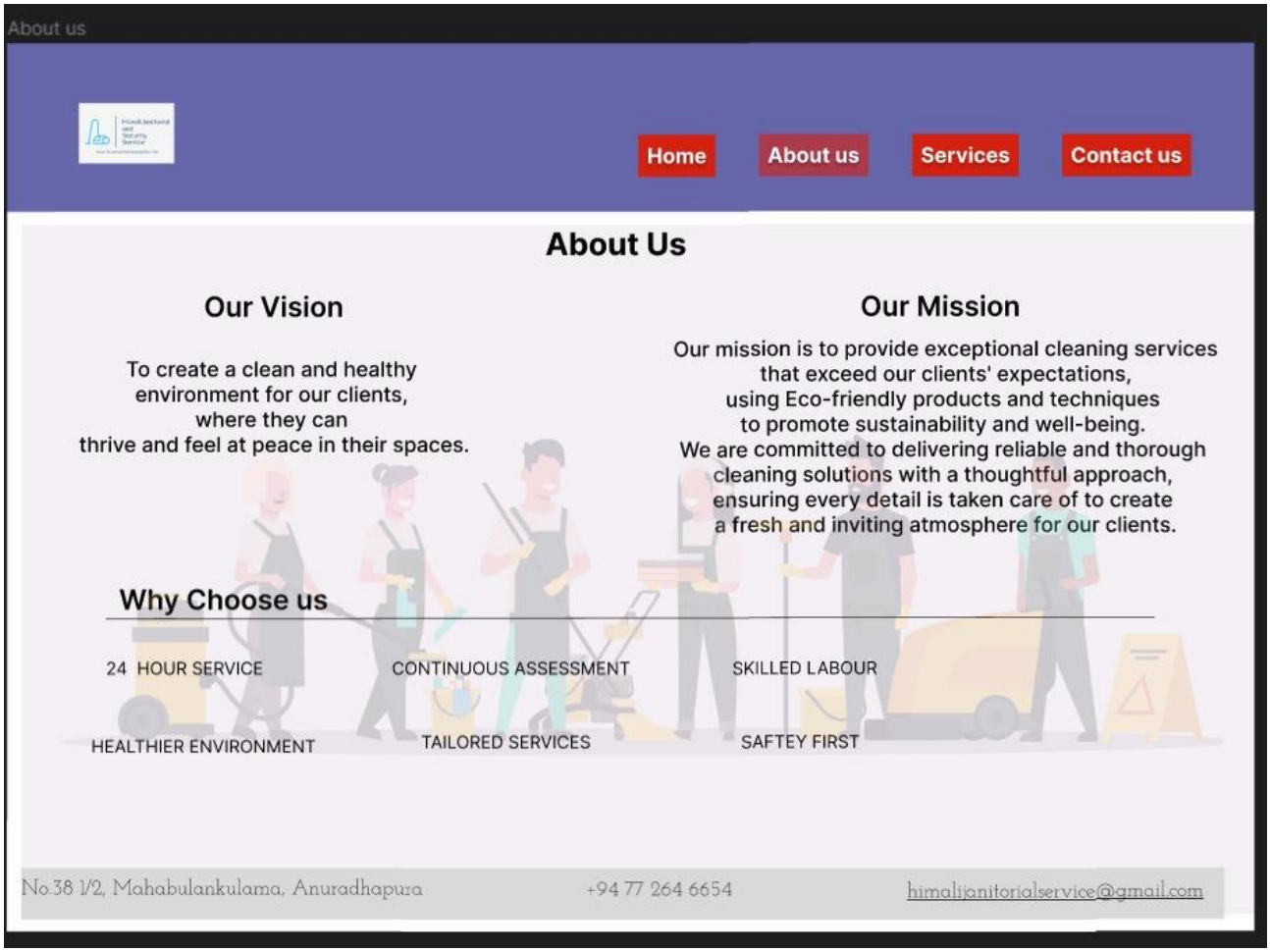

Figure 15- Web site about us interface

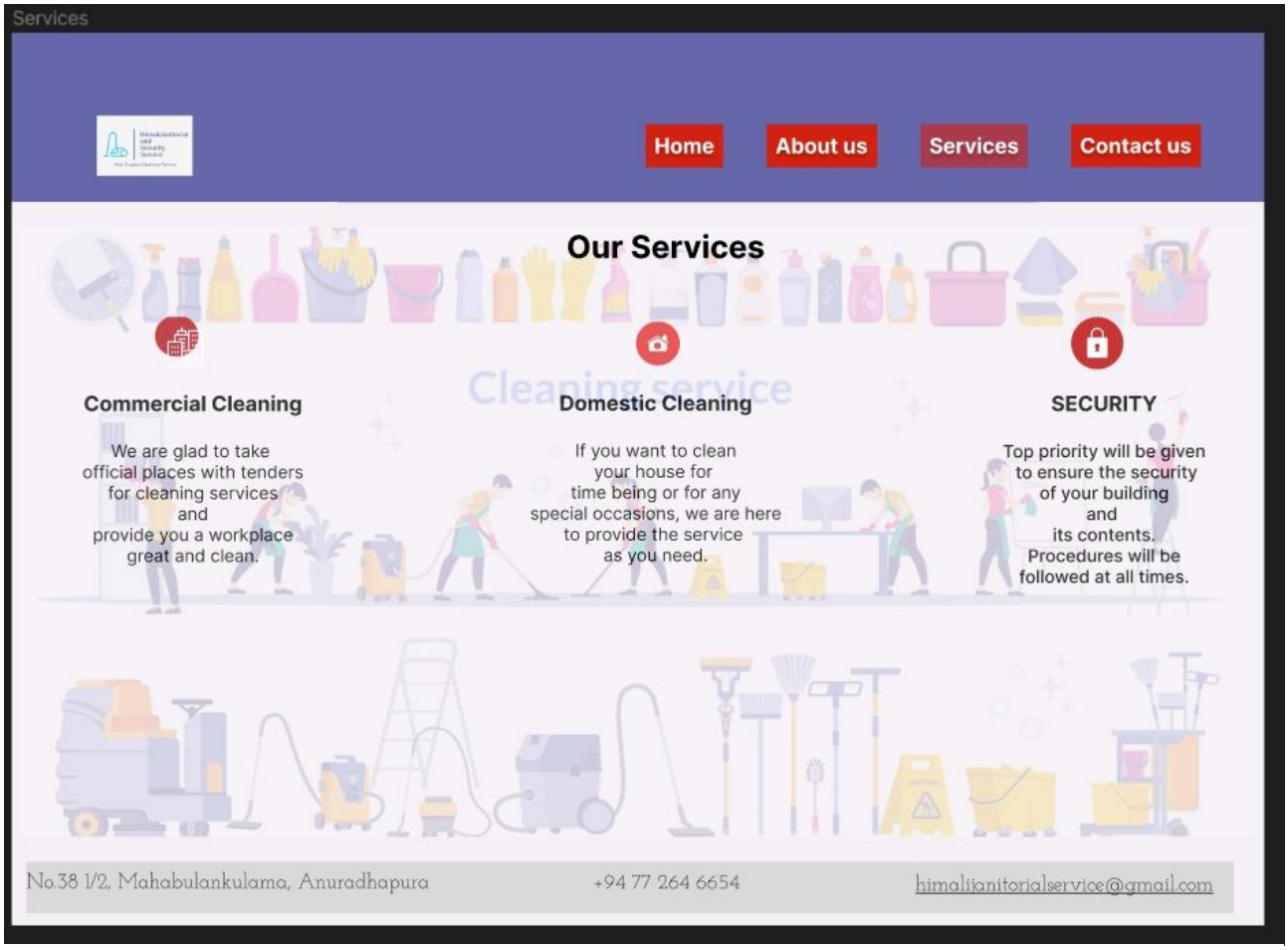

Figure 16- Web site Services interface

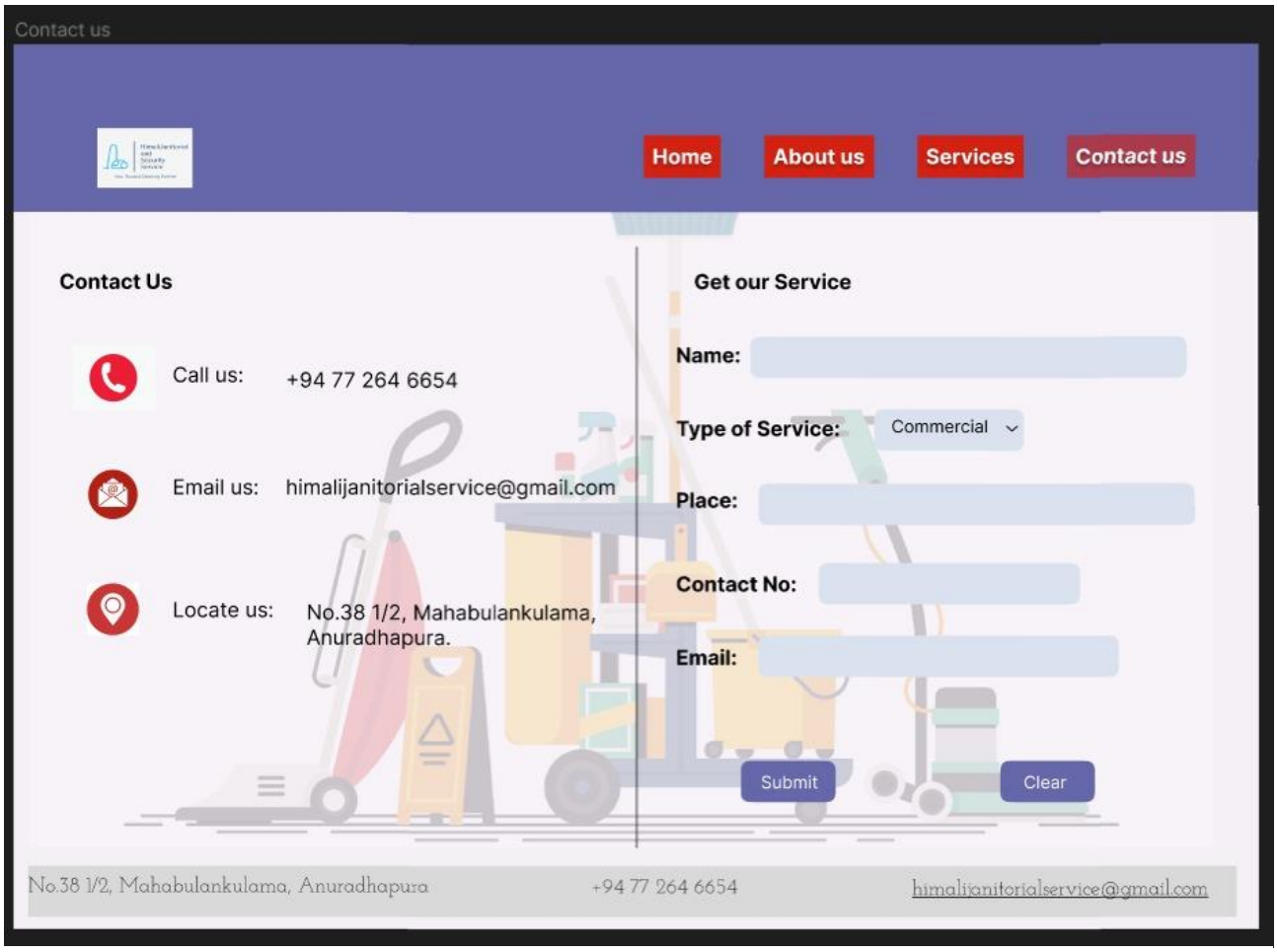

Figure 17- Web site contact us interface

3.2 Hardware Interfaces

- Mobile Devices
  - Compatibility with smartphones or tablets for on-the-go access to the system.

- Computer Terminals
  - Integration with desktop computers or terminals for administrative tasks.

- Time Clocks
  - Integration with electronic timekeeping systems for accurate recording of work hours.

3.3 Software Interfaces

- User Authentication
  - Secure login and authentication mechanisms for different user roles (admin, manager, cleaner).

- Dashboard
  - A centralized dashboard providing an overview of key metrics such as number of employees, current tasks, and pending requests.

- Employee Profiles
  - Ability to create, view, edit, and delete employee profiles with details like name, contact information, role, and work schedule.

- Task Management
  - Functionality to assign tasks to employees, track task progress, and mark tasks as completed.

- Schedule Management
  - Tools for creating and managing employee schedules, including shift assignments, time-off requests, and availability.

- Communication
  - Internal messaging system or integration with email/SMS for communication between employees and managers.

- Performance Tracking
  - Features for evaluating employee performance, such as performance reviews, attendance tracking, and productivity metrics.

- Leave Management

    - Capability to request and manage employee leaves, including vacation, sick leave, and personal days.

- Reporting
    - Reporting capabilities to generate various reports such as attendance reports, task completion reports, and employee performance reports.

3.4 Communications Interfaces

- User Interface (UI)
    - Interface for employees to log in, view schedules, report work status, request time off, and communicate with supervisors.

- Admin Interface
    - Interface for administrators to manage employee accounts, assign tasks, generate reports, and oversee operations.

- Messaging Interface
    - Integration with email or in-app messaging for communication between employees and supervisors regarding schedule changes, task assignments, and updates.

- APIs
    - Application Programming Interfaces for integrating with other systems such as payroll, HR management, or client communication platforms.

- Dashboard
    - A centralized dashboard for supervisors and managers to monitor real-time data, track employee performance, and manage workflows efficiently.

- Notification System
    - Automated notifications via email, SMS, or in-app alerts to inform employees of schedule changes, new tasks, or important updates.

- Network Protocols
    - The EMS may utilize standard network protocols such as TCP/IP, HTTP, and SMTP for communication between client devices and the server.

- Web Services
    - If the EMS integrates with external systems or services, it may use Restful APIs, SOAP services endpoints for data exchange.

4. System Features

4.1 ER Diagram

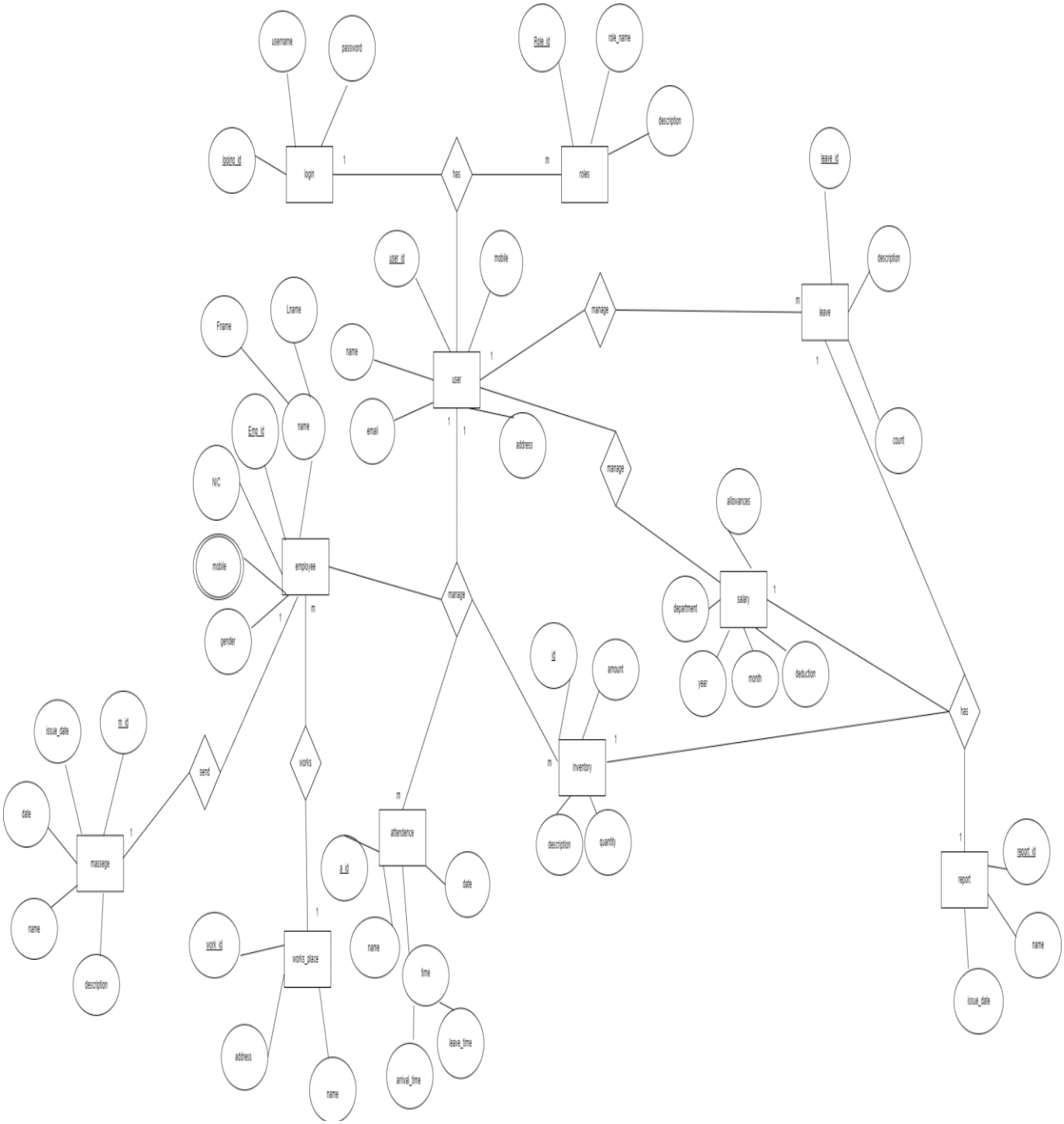

Figure 18- ER Diagram

4.2 Usecase Diagram

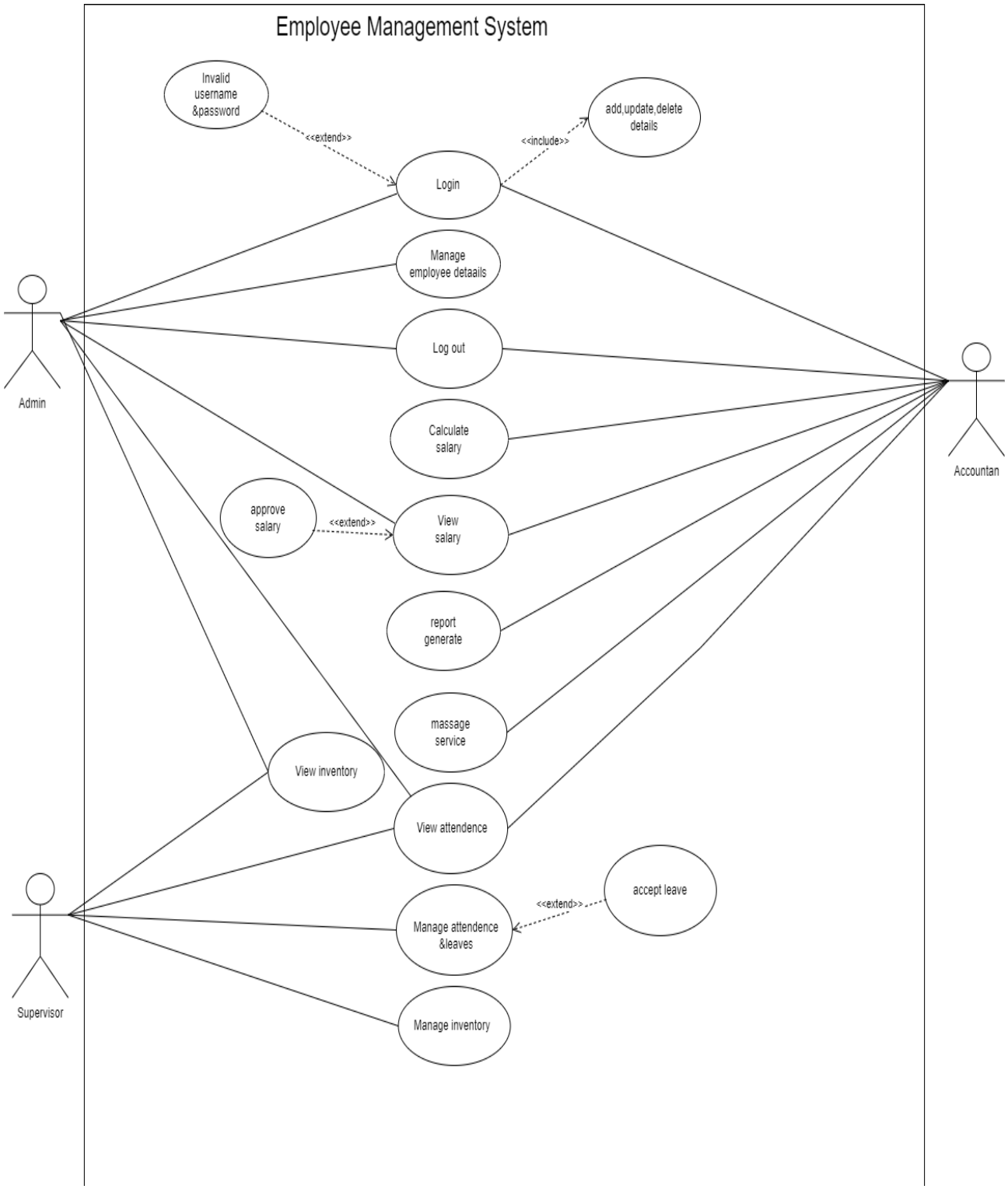

Figure 19- Use case diagram

4.3 Usecase Narrative

Use case ID	01
Use case name	Employee Management
Actors	Admin
Description	Admin Add, Edit, view, and delete employee details.
Preconditions	Admin should be signed in and logged into the system.
Flow of events	1. The admin requests the admin dashboard. 2. Admin requests add form or search employee details to update or delete. 3. System sends the form to add or view the searched employee detail. 4. Admin fill in the add employee form/update form or delete the record. a. Admin filled in the valid details in add form. i. The system displays "Successfully Added" message. b. Admin filled in the valid details in update form. i. The system displays "Successfully Updated" message. c. Admin deleted the record. i. The system displays "Are you sure you want to delete this" message and "Successfully deleted" message.
Extensions	Admin filled in invalid details. a. System displays "Please enter valid data" message.

Figure 20- Employee management Use case narrative

Use case ID	02
Use case name	Manage Inventory
Actors	Admin, Supervisor
Description	Actors Add, Edit, view, and delete employee details.
Preconditions	Actors should be signed in and logged into the system.
Flow of events	1. Actors request the dashboard. 2. Actors request add form or search inventory details to update or delete. 3. System sends the form to add or view the searched inventory detail. 4. Actors fill in the add inventory form/update form or delete the record. a. Actor filled in the valid details in add form. i. The system displays "Successfully Added" message. a. Actors filled in the valid details in update form. i. The system displays "Successfully Updated" message. a. Actor deleted the record. i. The system displays "Are you sure you want to delete this" message and "Successfully deleted" message.
Extensions	Actors filled in invalid details. b. System displays "Please enter valid data" message.

Figure 21-Manage inventory use case narrative

Use case ID	03
Use case name	Leave and Attendance
Actors	Supervisor
Description	Add, view attendance and Leave count
Preconditions	Supervisor should be signed in and logged into the system.
Flow of events	1 The supervisor requests the supervisor dashboard. 2 Supervisor select the workplace 3 Supervisor add the attendance form. a. Supervisor filled in the valid details in add attendance form. i. The system displays "Successfully Added" message. 4 Supervisor can view attendance 5 Supervisor can count the leave days
Extensions	Supervisor filled in invalid details. a. System displays "Please enter valid data" message.

Figure 22-Leave and Attendance use case narrative

Use case ID	04
Use case name	Salary calculates

Actors	Accountant
Description	Add and manage salary, calculate etf, epf send message
Preconditions	Accountant should be signed in and logged into the system.
Flow of events	1 Actors request the dashboard. 2 Actors request add salary form. 3 System sends the form to add salary. 4 Actor manage the salary a. Actor filled in the valid details in add salary form. b. The system displays "Successfully Added salary" message. 5 Actor request the calculate etf, epf form. 6 The system sends the form to calculate etf, epf c. The system sends "successfully debited salary" message.
Extensions	Actors filled in invalid details. c. System displays "Please enter valid data" message.

Figure 23-Salary Calculate use case narrative

5. Other Nonfunctional Requirements

5.1 Performance Requirements

- Response Time

  - Specify the maximum acceptable response time for the system to respond to user actions or requests.
  - This includes tasks such as loading employee data, generating reports, or scheduling cleaning assignments.

  - Rationale

    - In a fast-paced environment like a cleaning service, quick response times are crucial for efficient operations. Delays in accessing information or executing tasks can hinder productivity and customer satisfaction.

- Throughput

  - Define the number of transactions or operations the system should be able to handle within a specific time period.
  - This could include tasks like processing employee time sheets, updating schedules, or managing inventory.

  - Rationale

    - A high throughput ensures that the system can handle the workload efficiently, even during peak times. It prevents bottlenecks and ensures smooth functioning of daily operations.

- Scalability

  - Specify how the system should scale to accommodate an increasing number of users, employees, or data volume.
  - This includes provisions for adding new features or integrating with additional systems.

  - Rationale

    - As the cleaning service grows, the system must be able to scale seamlessly to meet the evolving needs without compromising performance. Scalability ensures long-term viability and adaptability of the solution.

- Reliability

  - Specify the level of reliability expected from the system in terms of error handling, fault tolerance, and data integrity. This includes measures to prevent data loss or corruption.

  - Rationale

- Reliability ensures that the system consistently performs as expected without unexpected failures or errors. It instills confidence among users and minimizes disruptions to daily operations.

- Security

  - Define the security measures and protocols to safeguard sensitive employee information, such as personal details, payroll data, and performance records.
  - This includes authentication, authorization, and encryption mechanisms.

  - Rationale

    - Security is paramount in protecting confidential employee data from unauthorized access or malicious attacks. Compliance with data protection regulations and industry standards is essential to maintain trust and credibility.

- Usability

  - Specify the ease of use and intuitiveness of the system interface for employees, managers, and administrators.
  - This includes providing clear navigation, informative feedback, and customizable preferences.

  - Rationale

    - Usability ensures that users can efficiently perform their tasks within the system without unnecessary complexity or confusion. A user-friendly interface enhances productivity and user satisfaction.

5.2 Safety Requirements

- Data Security

Requirement
  - The system must implement robust data security measures to protect sensitive employee information from unauthorized access, modification, or disclosure.

Safeguards
  - Employ encryption techniques to secure data transmission and storage. Implement access controls, authentication mechanisms, and role based permissions to restrict unauthorized access to sensitive data.

Rationale
  - Safeguarding employee data is essential to prevent privacy breaches and identity theft, ensuring compliance with data protection regulations such as GDPR, CCPA, or HIPAA.

- System Reliability

Requirement

- The system must maintain high reliability to prevent potential disruptions or errors that could impact business operations or employee safety.

Safeguards

- Conduct regular system maintenance, testing, and monitoring to identify and address any potential issues or vulnerabilities proactively. Implement backup and recovery procedures to minimize data loss in case of system failures.

Rationale

- Ensuring system reliability is essential for uninterrupted access to critical information and functionalities, reducing the risk of downtime or service outages.

5.3 Security Requirements

- User Authentication

Requirement

- The system must implement robust user authentication mechanisms to verify the identity of employees, managers, and administrators accessing the system.

Specification

- Use strong authentication methods such as passwords, biometrics, or multifactor authentication to validate user identities before granting access to the system.

Rationale

- User authentication helps prevent unauthorized access to sensitive data and functionalities within the system, enhancing overall security and privacy.

- Access Control

Requirement

- The system must enforce access control measures to restrict user privileges based on roles and responsibilities.

Specification

- Implement role based access control (RBAC) or attribute based access control (ABAC) mechanisms to define and enforce access permissions for different user roles within the system. Ensure that users can only access the data and functionalities necessary for their job duties.

Rationale

- Access control prevents unauthorized users from viewing or modifying sensitive information, reducing the risk of data breaches and insider threats.

- Data Encryption

Requirement
- The system must utilize encryption techniques to protect data transmission and storage from unauthorized interception or access.

Specification
- Encrypt sensitive data both in transit and at rest using industry standard encryption algorithms (e.g., AES) and protocols (e.g., SSL/TLS). Implement encryption key management practices to securely store and manage encryption keys.

Rationale
- Data encryption ensures that sensitive information remains confidential and secure, even if intercepted or accessed by unauthorized parties during transmission or storage.

5.4 Software Quality Attributes

- Usability

Requirement
- The system must prioritize usability to ensure that employees, managers, and administrators can navigate the interface easily and efficiently.

Specification
- Conduct user testing to achieve a System Usability Scale (SUS) score of at least 70, indicating good usability. Implement intuitive navigation, clear layout, and informative feedback to enhance user experience.

Rationale
- Usability is critical for user satisfaction and productivity, reducing the learning curve and minimizing errors during system usage.

- Maintainability

Requirement
- The system must be designed for ease of maintenance and updates to facilitate future enhancements and bug fixes.

Specification
- Implement modular design principles and clear documentation to enable developers to understand and modify the system components easily.

Rationale
- Maintainability reduces the time and effort required for ongoing system maintenance, ensuring long-term viability and cost-effectiveness.

- Reliability

Requirement

- The system must exhibit high reliability to minimize the occurrence of system failures or errors during operation.

Specification

- Conduct reliability testing to achieve a Mean Time between Failures (MTBF) of at least 10,000 hours. Implement error handling mechanisms and redundancy where necessary to enhance system resilience.

Rationale

- Reliability ensures consistent performance and availability of the system, fostering user trust and confidence in its capabilities.

- Flexibility

Requirement

- The system must be flexible enough to accommodate changes in business requirements or regulatory compliance without significant disruptions.

Specification

- Employ agile development methodologies and modular architecture to facilitate iterative development and easy adaptation to changing needs. Aim for a change impact analysis efficiency of at least 80% to assess the impact of proposed changes.

Rationale

- Flexibility enables the system to evolve and scale according to the organization's evolving needs, ensuring its relevance and value over time.

- Testability

Requirement

- The system must be designed for ease of testing to facilitate comprehensive testing and quality assurance practices.

Specification

- Implement unit testing, integration testing, and system testing frameworks to cover different levels of testing. Aim for a test coverage of at least 80% to ensure thorough testing of system functionalities.

Rationale

- Testability improves the accuracy and reliability of testing outcomes, enabling early detection and resolution of defects.

5.5 Business Rules

- Employee Role Based Access

Only authorized employees with specific roles (e.g., managers, supervisors) can perform certain functions within the system, such as approving time sheets, assigning cleaning tasks, or accessing payroll information.

- Time Sheet Submission Deadlines

Employees must submit their time sheets by a specified deadline (e.g., end of the pay period) to ensure timely processing of payroll and accurate tracking of work hours.

- Equipment Maintenance Requirements

Cleaning equipment must undergo regular maintenance and inspection according to predefined schedules to ensure optimal performance and safety.

- Compliance with Safety Regulations

Employees must adhere to safety protocols and regulations (e.g., wearing personal protective equipment, following proper cleaning procedures) to maintain a safe working environment.

- Confidentiality of Employee Information

Access to sensitive employee information (e.g., personal details, performance evaluations) must be restricted to authorized personnel to protect employee privacy and comply with data protection laws.

- Reporting of Incidents

Employees are required to report any safety incidents, accidents, or equipment malfunctions promptly to management for investigation and resolution.

- Compliance with Labor Laws

All scheduling, time tracking, and payroll processes must comply with relevant labor laws and regulations regarding working hours, breaks, overtime pay, and minimum wage requirements.

- Record Retention Policies

The system must adhere to record retention policies regarding the storage and disposal of employee related data in compliance with legal requirements and organizational policies.

6. Other Requirements

- Database Requirements

  - Define the database management system (DBMS) to be used for storing and managing employee data, scheduling information, payroll records, and other relevant data.
  - Specify database design considerations, such as data normalization, indexing, and backup procedures, to ensure data integrity, performance, and availability.
  - Document any database constraints, such as data retention policies, data archiving requirements, and data encryption standards, to comply with legal and security regulations.

- Legal Requirements
  - Document any legal requirements, regulations, or industry standards that the system must comply with, such as labor laws, data protection regulations (e.g., GDPR, CCPA), and industry specific regulations (e.g., healthcare compliance, environmental regulations).
  - Specify any disclaimers, terms of service, privacy policies, or user agreements that must be displayed or agreed upon by users when accessing or using the system.