

Department of Information and Communication Technology

Faculty of Technology

University of Ruhuna

**Employee Management System**

**Software Requirement Specification**

Group Project (ICT3183)

Project ID: 07

Submitted by:

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Submitted to:

(Supervisor’s signature)

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Date of submission

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Revision History

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| **Name** | **Date** | **Reason For Changes** | **Version** |
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# Introduction

## 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.

Version 1.1

## 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.

## Intended Audience and Reading Suggestions

### 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.

### 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.

### 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.

## Product Scope

### 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.

### 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.

### 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.

### 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.

## 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).

# Overall Description

## Product Perspective

<Describe the context and origin of the product being specified in this SRS. For example, state whether this product is a follow-on member of a product family, a replacement for certain existing systems, or a new, self-contained product. If the SRS defines a component of a larger system, relate the requirements of the larger system to the functionality of this software and identify interfaces between the two. A simple diagram that shows the major components of the overall system, subsystem interconnections, and external interfaces can be helpful.>

## Product Functions

<Summarize the major functions the product must perform or must let the user perform. Details will be provided in Section 4, so only a high level summary (such as a bullet list) is needed here. Organize the functions to make them understandable to any reader of the SRS. A picture of the major groups of related requirements and how they relate, such as a top level data flow diagram or object class diagram, is often effective.>

## User Classes and Characteristics

<Identify the various user classes that you anticipate will use this product. User classes may be differentiated based on frequency of use, subset of product functions used, technical expertise, security or privilege levels, educational level, or experience. Describe the pertinent characteristics of each user class. Certain requirements may pertain only to certain user classes. Distinguish the most important user classes for this product from those who are less important to satisfy.>

## Operating Environment

<Describe the environment in which the software will operate, including the hardware platform, operating system and versions, and any other software components or applications with which it must peacefully coexist.>

## Design and Implementation Constraints

<Describe any items or issues that will limit the options available to the developers. These might include: corporate or regulatory policies; hardware limitations (timing requirements, memory requirements); interfaces to other applications; specific technologies, tools, and databases to be used; parallel operations; language requirements; communications protocols; security considerations; design conventions or programming standards (for example, if the customer’s organization will be responsible for maintaining the delivered software).>

## Project Documentation

<Write the project documentation components (such as Introduction) that will be delivered along with the software. Identify any known project documentation delivery formats or standards.>

## User Documentation

<List the user documentation components (such as user manuals, on-line help, and tutorials) that will be delivered along with the software. Identify any known user documentation delivery formats or standards.>

## Assumptions and Dependencies

<List any assumed factors (as opposed to known facts) that could affect the requirements stated in the SRS. These could include third-party or commercial components that you plan to use issues around the development or operating environment, or constraints. The project could be affected if these assumptions are incorrect, are not shared, or change. Also identify any dependencies the project has on external factors, such as software components that you intend to reuse from another project, unless they are already documented elsewhere (for example, in the vision and scope document or the project plan).>

# External Interface Requirements

## User Interfaces

## A screenshot of a computer

Figure -Add Employee Interface

## A screenshot of a computer Description automatically generated

Figure - View Employee Details Interface

## Hardware Interfaces

<Describe the logical and physical characteristics of each interface between the software product and the hardware components of the system. This may include the supported device types, the nature of the data and control interactions between the software and the hardware, and communication protocols to be used.>

## Software Interfaces

<Describe the connections between this product and other specific software components (name and version), including databases, operating systems, tools, libraries, and integrated commercial components. Identify the data items or messages coming into the system and going out and describe the purpose of each. Describe the services needed and the nature of communications. Refer to documents that describe detailed application programming interface protocols. Identify data that will be shared across software components. If the data sharing mechanism must be implemented in a specific way (for example, use of a global data area in a multitasking operating system), specify this as an implementation constraint.>

## Communications Interfaces

<Describe the requirements associated with any communications functions required by this product, including e-mail, web browser, network server communications protocols, electronic forms, and so on. Define any pertinent message formatting. Identify any communication standards that will be used, such as FTP or HTTP. Specify any communication security or encryption issues, data transfer rates, and synchronization mechanisms.>

# System Features

<This template illustrates organizing the functional requirements for the product by system features, the major services provided by the product. You may prefer to organize this section by use case, mode of operation, user class, object class, functional hierarchy, or combinations of these, whatever makes the most logical sense for your product.>

## System Feature 1

## System Feature 2

## System Feature 3 (and so on)

**In your case you can write this whole section (Chapter 4 and its sub sections) based on a Use Case Diagrams, Use Case Scenarios, Initial Class Diagram, and Activity Diagram. (Initial Class Diagram and Activity Diagrams are optional) If you have a fairly large number of use cases you can make use of packages to group the use cases into multiple diagrams. Then for each package draw a separate use case diagram**

**Use Alistair Cockburn’s template from the unit Software Engineering II to document your use cases**.

# Other Nonfunctional Requirements

## Performance Requirements

1. 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.

1. 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.

1. 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.

1. 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.

1. 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.

1. 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.

## Safety Requirements

1. 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.

1. 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.

## Security Requirements

1. 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.

1. 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.

1. 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.

## Software Quality Attributes

1. 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.

1. 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.

1. 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.

1. 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.

1. 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.

## Business Rules

1. 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.

1. 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.

1. Equipment Maintenance Requirements

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

1. 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.

1. 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.

1. Reporting of Incidents

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

1. 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.

1. 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.

# Other Requirements

1. 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.

1. 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.

Appendix A: Glossary

<Define all the terms necessary to properly interpret the SRS, including acronyms and abbreviations. You may wish to build a separate glossary that spans multiple projects or the entire organization, and just include terms specific to a single project in each SRS.>

Appendix B: Analysis Models

<Optionally, include any pertinent analysis models, such as data flow diagrams, class diagrams, state-transition diagrams, or entity-relationship diagrams.>

Appendix C: To Be Determined List

<Collect a numbered list of the TBD (to be determined) references that remain in the SRS so they can be tracked to closure.>