Software Requirements Specification

for

Human Resource Management System – ‘Jupiter’

Version 1.0

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- Group 9 Project ID 2 -

9th of September 2023

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Revision History

Name	Date	Reason For Changes	Version
Initial Version	09/09/2023	-	1.0

1. Introduction

1.1 Purpose

This document's objective is to provide a comprehensive overview of an HRMS for a clothing firm.

This portal is made to facilitate the management of personal information, managing absences, and generating reports. This document details the system's functions, features, and other software specifications. Also covered are the system's functional and non-functional needs, security features, the limitations that must be met, and the system's response to outside factors. Both system users and system developers should read this text.

This is version 1.0 of the proposed system.

1.2 Document Conventions

This document is the Software Requirement Specification (SRS) of the proposed Human Resource Management System. This SRS has prepared according to the IEEE (the Institute of Electrical and Electronics Engineers) standards.

1.3 Intended Audience and Reading Suggestions

This document is for:

1. Users - Company admin, Employees
2. System Developers
3. System Analyst
4. Responsible Authorities

The SRS includes all the functional and non- functional requirements, relevant use cases

- Section 1 is primarily written for all the intended audience to get a basic understanding of the project.
- Section 2, 3 and 4 can be used by typical users to get a better understanding about the product and its functionality. Section 5 contain further details.

1.4 Product Scope

This Human Resource Management System mainly focuses on replacing existing ERP system with a user friendly and efficient solution. As for the initial phase, the product is expected to support PIM (Personal Information Management) and Absence Management.

The main focus of the PIM module is to store information about the employees including name, birth date, marital status etc. The HR can add, remove, or edit employee details, while employees can view or edit their user information or access absence-related functionalities based on their employment level.

In addition to the Personal Information Management (PIM) component, the system must consist of an Absence module to facilitate leave-related operations. Every employee has a number of leaves based on their employment level and 4 types of leaves can be taken: annual, casual, maternity and no-pay. Each employee can apply for leaves, and after the leave is approved by their supervisor, it will be counted.

Moreover, there is a separate reporting module to provide reports required by the company. Employee by department, total leaves in given period by department and employee reports grouped by job title, department, pay grade is some reports required by Jupiter.

All modules have their own restrictions and require specific permissions. For example, a level 1 employee can view their personal information but cannot edit it or access absence-related functionalities and a managerial employee can edit all PIM information but no access to Absence related functionalities.

1.5 References

IEEE sample SRS template
IEEE sample SRS template

830-1984 - IEEE Guide for Software Requirements Specifications
https://ieeexplore.ieee.org/document/278253

2. Overall Description

2.1 Product Perspective

The Human Resource Management System (HRMS) described in this Software Requirements Specification (SRS) is a self-contained product developed to meet the specific needs of our client, Jupiter Apparels. It is not a member of an existing product family or a replacement for any existing systems. The HRMS serves as the initial phase of a larger plan to streamline HR and management activities within Jupiter Apparels.

The HRMS interacts with Jupiter's existing SAP ERP system to a limited extent, primarily for data integration purposes, such as employee information and organizational structure. It acts as a

standalone system with its own database and user interfaces, but it must be able to share and receive data from SAP.

2.2 Product Functions

The major functions of the HRMS are:

- Personal Information Management (PIM) for employees, including the storage of personal details, dependents' information, and emergency contact details.
- Organization structure management, defining job titles, pay grades, and employment statuses.
- Customizable employee attributes management.
- User management, including admin and HR manager roles.
- Leave management, with support for leave application, approval, and leave type customization.
- Reporting module for generating various HR-related reports.
- Fine-grained authorization control for user roles.

2.3 User Classes and Characteristics

The anticipated user classes and their characteristics include:

1. Admin Users*:* They have full system access, including user and employee management. They are typically IT administrators responsible for system setup and maintenance.

2. HR Managers: HR managers have access to most HR-related functionalities, including PIM, leave management, and reporting. They are responsible for HR-related tasks within the organization.

3. Employees: Employees have limited access to their personal information and leave management. They can apply for leaves, view personal details, and update certain information.

User classes may also be differentiated based on their technical expertise, but the system aims to be user-friendly and accessible to users with varying levels of technical knowledge.

2.4 Operating Environment

The HRMS will operate in the following environment:

- **Hardware Platform**: Standard business-class servers and workstations.

- **Operating System**: Compatible with modern operating systems, including Windows Server, Linux, and Windows 10/11.
- **Database**: Utilizes a relational database management system (RDBMS) such as MySQL, PostgreSQL, or Microsoft SQL Server.
- **Web Server**: Requires a web server for web-based access.
- **Browser Compatibility**: Supports major web browsers like Chrome, Firefox, Edge, and Safari.

The HRMS must peacefully coexist with Jupiter's existing SAP ERP system, ensuring data exchange and synchronization.

2.5 Design and Implementation Constraints

- **Regulatory Compliance**: The HRMS must adhere to relevant labor laws and data privacy regulations in the regions where Jupiter operates.
- **Data Security**: Stringent security measures are required to protect sensitive employee data.
- **Technology Stack**: The project must use specified technologies and tools for consistency and compatibility with existing systems.
- **Integration**: The system must integrate with the SAP ERP system, following SAP's integration guidelines.
- **Scalability**: The design must allow for future scalability to accommodate Jupiter's growth.
- **UI/UX**: While this document focuses on the database design, the HRMS must ultimately adhere to UI/UX design standards.

2.6 User Documentation

User documentation components to be delivered along with the software include:

- User Manuals
- Online Help
- Tutorials
- FAQ documents
- Release notes

The documentation will be provided in digital formats and may include both text-based and multimedia resources to aid users in understanding and using the system effectively.

2.7 Assumptions and Dependencies

Assumptions:

- Assumed factors include the availability of necessary hardware and software resources for system deployment.
- Assumption that the initial phase of the project (PIM and Leave Management) will succeed before further modules are developed.
- Assumption that the client, Jupiter, will provide necessary inputs and support during development.

Dependencies:

- Dependency on the SAP ERP system for data integration and synchronization.
- Dependency on third-party libraries and frameworks (e.g., for reporting) as agreed upon in the project plan.
- Dependency on the availability of development and testing environments as per the project schedule.

Any changes to these assumptions or dependencies could affect the project's timeline and success. It is crucial to maintain clear communication with all stakeholders to ensure alignment throughout the development process.

3. External Interface Requirements

3.1 User Interfaces

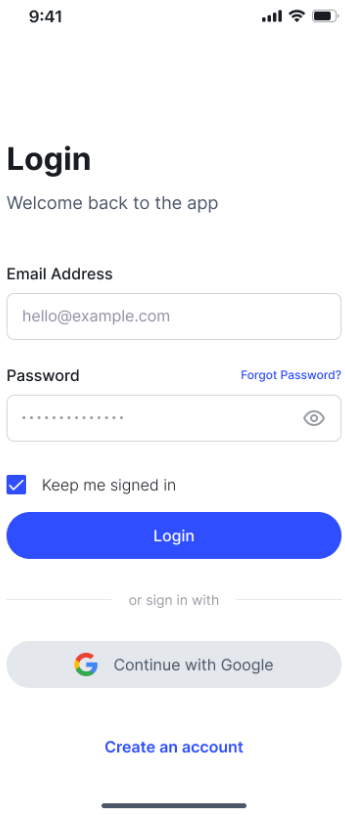
This section outlines the specifications for the user interface within the system.

Software Components Requiring User Interface

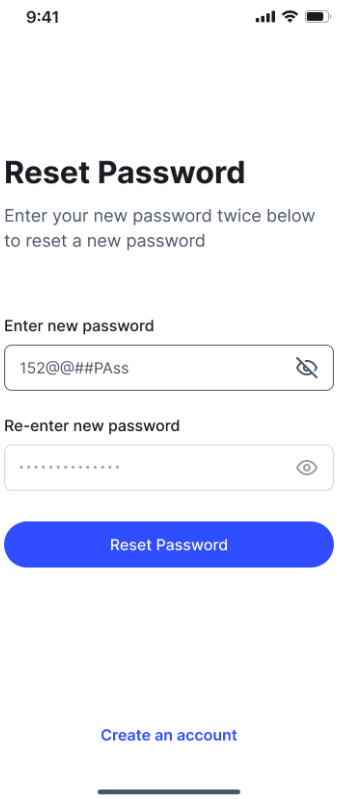
- **User Logging System**
- **Admin User**
  - Have permission to edit all information.
- **Supervisor**
  - Accept leave requests.
- **Level 1 employee**
  - View personal information.
  - Fill out the leave application form to request a leave of absence.
- **HR Manager**
  - Add employees.

- **Managerial employee**
  - Give editing access to all PIM information instead of absence related functionalities.

Sample Screen Images

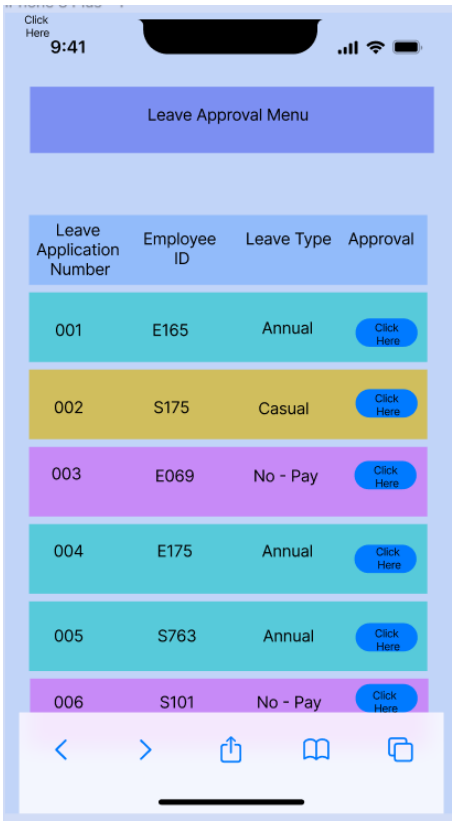


Login Page



Reset Password

HR Manager Interface



Leave Approval Menu

3.2 Hardware Interfaces

1. Supported Device Types

This product will run on desktops, Laptops and mobile devices. It will be compatible with windows, Linux, MacOS and android.

2. Data and Control Interactions

Reading and writing data to and from the database will be part of data interactions between the software product and hardware components. For the purposes of storing, retrieving, and processing data, the software will communicate with the hardware components.

3. Communication Protocols

Standard communication protocols will be used by the software product and the hardware parts when interacting. These may consist of:

- JDBC (Java Database Connectivity) or ODBC (Open Database Connectivity) are two options for database connectivity.
- The http protocol is used to process all server requests. Using HTTP protocols, client devices can ask the system for services.

3.3 Software Interfaces

The Human Resource Management System (HRMS) interfaces with various software components and systems, ensuring seamless communication and data sharing. These interfaces include:

1. **Database Management System (DBMS):**
    - **Name and Version:** MySQL, PostgreSQL, or Microsoft SQL Server (as specified).
    - **Data Items:** Employee records, leave requests, custom attributes, and other HR-related data.
    - **Purpose:** Storing and retrieving HR data, ensuring data integrity and security.
2. **Operating Systems:**
    - **Versions:** Compatible with modern operating systems, including Windows Server, Linux, and Windows 10/11.
    - **Services Needed:** Resource management, file I/O, and security services.
    - **Purpose:** Ensuring the HRMS operates smoothly on different operating platforms.
3. **Web Server:**
    - **Name and Version:** Apache, Nginx, or equivalent (as specified).
    - **Data Items:** HTTP requests and responses.
    - **Purpose:** Handling web-based user interfaces, routing requests to the HRMS application.

4. **Web Browsers:**
    - **Versions:** Compatible with major web browsers such as Chrome, Firefox, Edge, and Safari.
    - **Data Items:** HTTP requests and responses.
    - **Purpose:** Providing user access to the HRMS through web-based interfaces.
5. **SAP ERP System:**
    - **Name and Version:** SAP ERP (specific version as used by Jupiter).
    - **Data Items:** Employee information, organizational data, and other relevant HR data.
    - **Purpose:** Integrating HRMS with SAP for data synchronization and exchange.
6. **Third-party Libraries and Frameworks:**
    - **Components:** Libraries and frameworks for reporting, data visualization, and other functionalities (as specified).
    - **Data Items:** Vary based on the specific library or framework.
    - **Purpose:** Enhancing HRMS capabilities by utilizing third-party resources.
7. **Communication Protocols:**
    - **HTTP/HTTPS:** Used for web-based communication between clients and the HRMS.
    - **JDBC/ODBC:** Used for database connectivity and data retrieval.
    - **SOAP/REST:** Possible for integration with external systems.
    - **Purpose:** Enabling data transfer and communication across different software components.
8. **Data Sharing Mechanism:**
    - **Implementation Constraint:** Data sharing should follow industry-standard protocols and security measures to ensure the confidentiality and integrity of shared data.

3.4 Communications Interfaces

1. **Web-based User Interface:**
    - **Requirements:** The HRMS provides a web-based user interface accessible via standard web browsers (e.g., Chrome, Firefox, Edge, Safari).
    - **Message Formatting:** HTTP/HTTPS protocols are used for communication with web clients. Data is exchanged in HTML, JSON, or XML formats, depending on the specific use case.
    - **Communication Standards:** Adheres to HTTP/HTTPS standards for web communication.
    - **Security:** Utilizes HTTPS to ensure data encryption and secure user interactions.
    - **Data Transfer Rates:** Data transfer rates should be optimized for efficient user experience.
    - **Synchronization:** Real-time synchronization is required to reflect changes immediately in the user interface.
2. **Database Connectivity:**
    - **Requirements:** The HRMS interacts with the underlying database management system (DBMS) for data storage and retrieval.
    - **Message Formatting:** SQL queries and responses in the form of result sets.

- **Communication Standards:** Utilizes standard DBMS connectivity protocols (e.g., JDBC for Java applications, ODBC for other languages).
- **Security:** Secure database connections with authentication and authorization mechanisms.
- **Data Transfer Rates:** Optimal database query performance is essential to support system responsiveness.
- **Synchronization:** Ensures database transactions adhere to ACID properties for data consistency.

3. **Integration with SAP ERP:**
    - **Requirements:** The HRMS integrates with the SAP ERP system to synchronize employee data and organizational information.
    - **Message Formatting:** Data exchange may involve XML, JSON, or custom data formats compatible with SAP APIs.
    - **Communication Standards:** Adheres to SAP's recommended communication protocols and APIs for integration.
    - **Security:** Secure communication channels and data encryption to protect sensitive HR data.
    - **Data Transfer Rates:** Data transfer rates should meet business requirements and accommodate frequent synchronization.
    - **Synchronization:** Scheduled or event-driven data synchronization to maintain consistency between systems.
4. **External System Integration (if applicable):**
    - **Requirements:** If integrating with third-party systems, communication protocols and message formats will vary based on the specific integration requirements.
    - **Message Formatting:** Depends on the external system's supported data formats and APIs.
    - **Communication Standards:** Adheres to industry-standard protocols (e.g., SOAP, REST) as required by external systems.
    - **Security:** Implements security measures based on the external system's authentication and encryption requirements.
    - **Data Transfer Rates:** Tailored to meet the demands of each external system.
    - **Synchronization:** Follows the integration requirements for data synchronization with external systems.
5. **Email Notifications (if applicable):**
    - **Requirements:** The HRMS may send email notifications for leave approvals, system updates, and other relevant events.
    - **Message Formatting:** HTML or plain text email messages.
    - **Communication Standards:** Utilizes SMTP (Simple Mail Transfer Protocol) for sending email notifications.
    - **Security:** Ensures secure email transmission and may include email encryption for sensitive information.
    - **Data Transfer Rates:** Email notifications are sent promptly upon triggering events.
6. **User Authentication and Authorization:**
    - **Requirements:** User authentication and authorization processes are crucial for secure access to the HRMS.
    - **Message Formatting:** Authentication requests and tokens for authorization.

- **Communication Standards:** May involve industry-standard authentication protocols like OAuth or custom authentication mechanisms.
- **Security:** Strong encryption and secure transmission of authentication data.
- **Data Transfer Rates:** Authentication and authorization processes should be efficient to minimize login delays.

4. System Features

The logical organization of the product's functional requirements is demonstrated in this section. Here is the step-by-step procedure for carrying out this use case.

4.1 Add Leave

Use Case Name	Add Leave
XRef	Section 2.2
Trigger	Employee requests a leave
Precondition	The employee has access to the page which he will be able to add a leave. The employee should have a supervisor.
Basic Path	1.The user selects the option add leave. 2.The shows leave application form to be filled. 3.The user fills in the form and clicks submit. 4.The system verifies the details and checks whether if employee is able to have a leave. 5.adds the leave to database. 6.Sends the leave request to the supervisor
Alternative Paths	user can check the leave details before step 5
Postcondition	Database will be updated
Exception Paths	If an employee is not eligible to take a leave request will be abandon, otherwise add leave user case update the database
Other	No

4.2 View Personal Information

Use Case Name	View Personal Information
XRef	Section 2.2.
Trigger	Employee requests a personal Information
Precondition	The employee requests his details
Basic Path	User selects the option PIM
Alternative Paths	No
Postcondition	Showing the Employee’s personal information

Exception Paths	No
Other	No

4.3 Add Employee

Use Case Name	Add Employee
XRef	Section 2.3
Trigger	Add a new employee to the system
Precondition	1.manager log into the system and access the add employee page
Basic Path	1.HR manager request to add a new employee 2.System Gives an application form to fill. 3.HR manager Submit the details of the employee. 4. The system checks the information and adds it to the database.
Alternative Paths	No
Postcondition	New employee will be added to the system
Exception Paths	If request has errors show the necessary massages
Other	No

4.4 View leave details

Use Case Name	View employees leave details
XRef	Section 2.2
Trigger	Employee wanted to request his leave details
Precondition	1.manager log into the system
Basic Path	1.employee login to the system select add leave button 2. employee select the employee view leave details option
Alternative Paths	Leave details option in personal information page
Postcondition	Showing leave details of the employee with available leaves.
Exception Paths	No
Other	No

4.5 Approve leave.

Use Case Name	Approve leave
XRef	Section 2.2.

Trigger	Supervisors get a massage with requesting a leave
Precondition	No
Basic Path	1.Supervisor login to the system 2.Check whether if it is possible to accept a leave 3.If it is possible give the leave otherwise reject the leave
Alternative Paths	Supervisor can check leave details and eligibility of a leave
Postcondition	If leave is accepted database must be updated
Exception Paths	If employee didn't eligible send a massage employee with his eligibility
Other	No

4.6 View Employee leave details.

Use Case Name	View employee details
XRef	Section 2.3
Trigger	User Request a leave detail
Precondition	User has access to the view his details
Basic Path	1. User login to the System and select the add leave option 2. User select the option view employee details 3. employee details show in the screen
Alternative Paths	1. User selects the view personal information option. 2. Select the option view leave details option
Postcondition	Leave details will display in the screen.
Exception Paths	No
Other	No

4.7 Remove Employee.

Use Case Name	Remove Employee
XRef	Section 2.3
Trigger	HR manager wants to remove an employee
Precondition	No
Basic Path	1. HR manager login to the system 2. Request the option to remove an employee 3. submit the employee id of the student 4. showing personal details and ask to confirm the removing employee 5. HR manager submit the confirm option
Alternative Paths	No
Postcondition	Database will be updated
Exception Paths	In line 4 in basic path HR manager can choose the cancel option.
Other	No

4.8 Add a new attribute to the employee table.

Use Case Name	Add new attribute to the employee
XRef	Section 2.2.
Trigger	Company needs to add new attribute to the system
Precondition	HR manager must login to the system
Basic Path	1. Request the Option add new employee attribute option. 2. System gives a form to filled with field name data type and submit the form 3. System adds new attribute to the system.
Alternative Paths	No
Postcondition	Database will be updated
Exception Paths	No
Other	No

4.9 Add second management user account.

Use Case Name	Add second management user account
XRef	Section 2.3
Trigger	Admin wants to add the second management user
Precondition	Admin must log in to the system
Basic Path	1. Select the option to add new managerial user 2. System gives a form to filled 3. Admin fill the form and submitted 4. System create new managerial user account.
Alternative Paths	No
Postcondition	A new second management user may be added.
Exception Paths	No
Other	No

4.10 Edit PIM Information

Use Case Name	Edit PIM Information
XRef	Section 2.2
Trigger	Managerial employee wants to edit his personal details
Precondition	Managerial employee must login to the system.
Basic Path	1. Request to edit PIM Details. 2. Enter the ID of the employee 3. Shows details page with edit access 4. Managerial user edit and chose submit option
Alternative Paths	No
Postcondition	Relevant record in the database will be updataed
Exception Paths	No

Other	No

4.11 Update the existing user.

4.12 Generating Reports.

Use Case Name	Generating Reports
XRef	Section 2.2.
Trigger	User Request a report
Precondition	User able to access to view the requested reports
Basic Path	1. User selects the view leave details button 2. Select the option which detail report must be able to prompt 3. selected report will be displayed
Alternative Paths	No
Postcondition	Requested report will be displayed
Exception Paths	No
Other	No

5. Other Nonfunctional Requirements

5.1 Performance Requirements

Generally, the performance metric specifies how much time a user must wait before the target operation is completed in the context of execution environment such as

- Hardware resources (processors, processor cores, memory, storage, special hardware, etc.)
- System resources (OS type, libraries, and system parameters defining resource availability and limitations)
- Run-time environment (for example, the number of users simultaneously active at the moment, background tasks in execution, etc.)

Performance requirements are essential in the context of the HRM system to guarantee that it functions effectively and satisfies the organization's needs. Here are some timing relationships for the HRM system.

- Critical procedures like user login, leave application submission, and approval processes should have a responsive user interface with a maximum response time of 1 second.
- The system ought to promptly retrieve data on employee and absence records.

- Batch processing procedures such as creating reports, should be finished in a reasonable amount of time.
- The system should react to failures quickly and give users clear error messages. Operations for handling errors shouldn't be longer than five seconds.

5.2 Safety Requirements

Security requirements for the HRM system focus on making sure that the system runs in a way that reduces the possibility of potential danger, loss, or damage. For the HRM system, the following specific safety criteria apply:

- The system must have safeguards in place to guarantee the security and integrity of data. This includes safeguards against unauthorized entry, data corruption, or tampering.
- The system should have a well-defined disaster recovery plan in place to handle catastrophic events, ensuring that the system can be quickly restored to a stable state.
- The system must have reliable backup and recovery procedures in place to protect against data loss due to accidental deletion, corruption, or hardware failure.
- Regulations pertaining to data protection and privacy, such as GDPR, or other regional data privacy laws, must be complied with by the system.

These safety requirements are crucial for ensuring the secure and reliable operation of the HRM system. They address key aspects such as data integrity, disaster recovery, and compliance with data privacy regulations to minimize risks and protect sensitive information.

5.3 Security Requirements

To safeguard private employee data and keep the system's integrity, it is crucial to ensure system security. The HRM system must meet the following specific security requirements:

To confirm users' identities before giving access, the system must include strong user authentication procedures, such as username and password combinations or multi-factor authentication.
RBAC should be used by the system to define and enforce specific roles and permissions for various user categories, ensuring that each user has access to only the capabilities necessary for their role.
Sensitive data, such as personal information and login credentials, should be encrypted both at rest in the database and while in transit using secure protocols (such as HTTPS).
The system must keep thorough audit logs that document important events including user logins, data changes, and adjustments to the system configuration. Only authorized administrators should have access to these logs, which should be securely stored.

5.4 Software Quality Attributes

For Jupiter Apparels' HRM system to be reliable and functional, it must adhere to strict requirements of quality. The HRM system's distinctive software quality characteristics are as follows:

- **Maintainability**:

To make future changes and maintenance simple, the system should be created with clean, modular code and a well-documented architecture. To facilitate effective bug fixes and troubleshooting, code organization is essential.

- **Robustness**:

If the system is shut down due to power outages or other problems, the system will automatically save the leave request data and resume the procedure where the user left off.

- **Scalability**:

The system should be designed to scale gracefully to accommodate a growing number of employees and user accounts, with a minimum capacity to handle a 20% annual growth rate for the next five years.

- **Usability**:

The user interface needs to be simple to use, intuitive, and created with the end-users' requirements in mind. Users only need a minimal amount of training to efficiently navigate and carry out tasks.

- **Flexibility and Customizability**:

In the future, the system should be able to define new custom employee attributes as well as other organizational parameters. The ability to add, modify, or remove fields as needed.

5.5 Business Rules

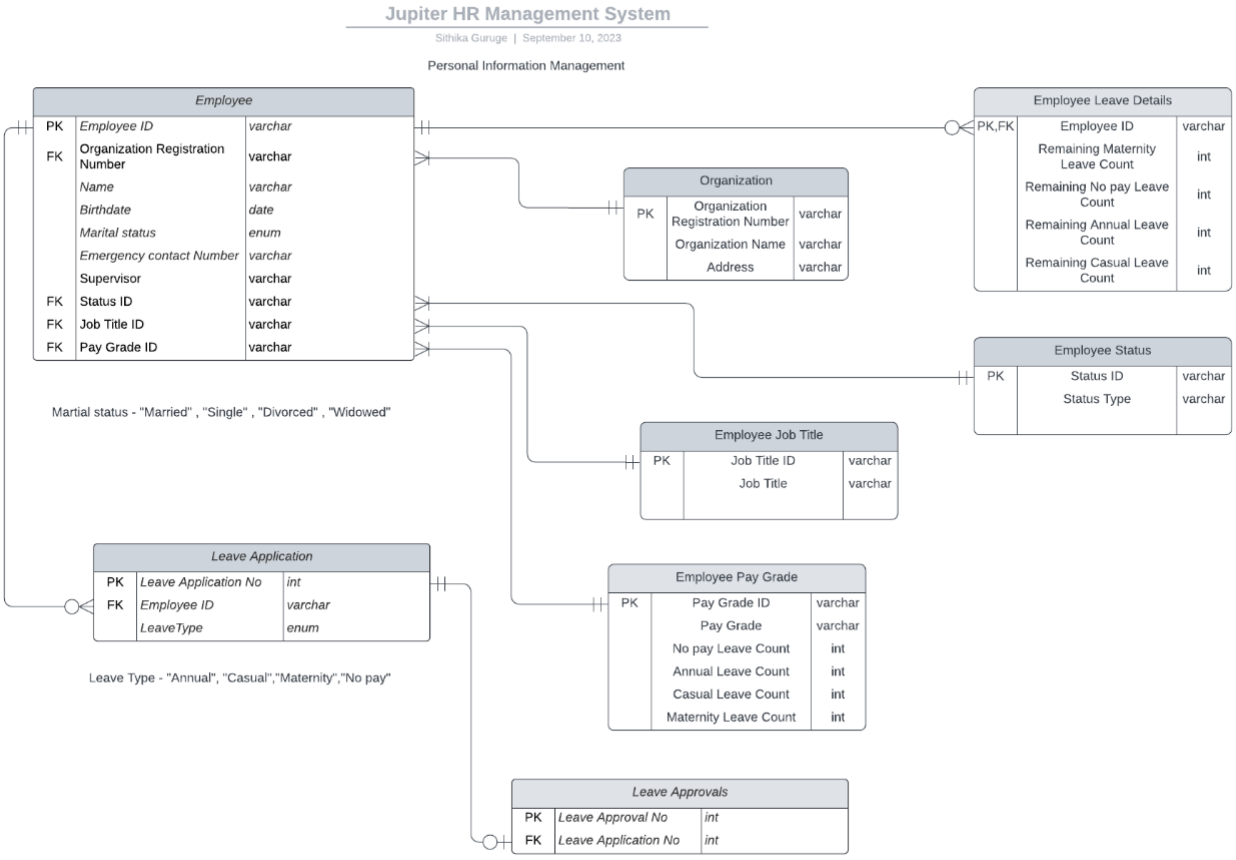
Business rules are essential concepts that guide how the HRM system behaves and functions. They specify the constraints and guiding principles that the system must operate under. The HRM system's specific business rules are as follows:

- Only the admin user can create the second management user, the HR manager. The HR manager is then responsible for adding all other employees to the system.
- Every user of the system must be linked to an employee record. However, it is possible to have employee records without an associated user.
- Fine-grained authorization is required for every module and sub-module of the system. Access privileges should be determined by the user's role, limiting access to specific functionalities.
- A level 1 employee is only allowed to view their personal information and cannot edit it. Managerial employees, on the other hand, can edit their own information but have no access to absence-related functionalities.
- Each employee must have one supervisor to whom they report, and they may have multiple subordinates reporting to them.

Appendix A: Glossary

Term	Definition
PIM	Personal Information Management
Admin	The person who has the access to the main system
HR Manager	Second Admin User of the system
Supervisor	The person who is responsible for confirming leaves, for every employee there is and supervisor.
Managerial Employee	Person who has access to edit the personal information of the user
GDPR	Geographic-Based Disaster Recovery
RBAC	Role-Based Access Control
HTTPS	Hypertext Transfer Protocol Secure

Appendix B: Analysis Models



Lucid Chart link :- Click Here To Lucid Chart