

---

# **Software Requirements Specification**

**for**

## **Reservation system of equipment and rooms management**

**Version 1.0 approved**

**Prepared by**

Garcia Reyes Jose Adan

Gómez Cueva Elías Jair

Martínez Bustamante Daniel

Martínez Pérez Diana

**20/January/2025**

### Document information

Date	Review	Author	Verified by quality control.
20/January/2025	<b>Review 1</b>	Garcia Reyes Jose Adan Gómez Cueva Elías Jair Martinez Bustamante Daniel Martinez Perez Diana	Ray Brunett Parra Galaviz

By the client	By the Supplier Company
Ray Brunett Parra Galaviz	Garcia Reyes Jose Adan Gómez Cueva Elías Jair Martinez Bustamante Daniel Martinez Perez Diana

## **Table of Contents**

<b>1</b>	<b>Introduction</b>	<b>6</b>
1.1	Purpose	6
1.2	Product Scope	6
1.3	Document Conventions	7
1.4	Intended Audience and Suggestion	8
1.5	References	8
<b>2</b>	<b>Overall Description</b>	<b>9</b>
2.1	Product Perspective	9
2.2	Product Functionality	9
2.3	User Classes and Characteristics	10
2.4	Operating Environment	11
2.5	Design and Implementation Constraints	11
2.6	User Documentation	11
2.7	Assumptions and Dependencies	12
	2.7.1 Assumptions	12
	2.7.2 Dependencies	12
<b>3</b>	<b>External Interface Requirements</b>	<b>14</b>
3.1	User Interfaces	14
	3.1.1 General Design	14
	3.1.2 Menu Options	14
3.2	Hardware Interfaces	14
3.3	Software Interfaces	14
	3.3.1 Software Compatibility	14
3.4	Communications Interfaces	14
<b>4</b>	<b>Internal requirements</b>	<b>15</b>
4.1	Functional requirements	18
	4.1.1 Functional requirements 1: Equipment Inventory Module	18
	4.1.2 Functional requirements 2: Room Module	18
	4.1.3 Functional requirements 3: User Management Module	19
	4.1.4 Functional requirements 4: Availability Module	19
	4.1.5 Functional requirements 5: Reservation Module	19
	4.1.6 Functional requirements 6: History Module	20
<b>5</b>	<b>Nonfunctional Requirements</b>	<b>20</b>
	5.1 Security	20
	5.2 Reliability	20

5.3 Availability	20
5.4 Maintainability	20
<b>6 Other Requirements</b>	<b>21</b>
6.1 Appendix A: Glossary	21
6.2 Appendix B: Analysis Models	21

## **1 Introduction**

This program is designed to streamline the booking and management of resources within an organization, ensuring efficient utilization of equipment and spaces. Built using Java for robust backend functionality and React Native for a responsive and user-friendly interface, the system will provide a smooth experience on mobile. Additionally, it will leverage a database connected through APIs to securely store and manage critical information, enabling reliable and efficient system operation.

### **1.1 Purpose**

The aim of this project is to develop software that facilitates the booking and management of business resources by efficiently organising bookings and equipment availability. This system will help companies to keep track of their equipment and resources, optimising their use and availability. It will also provide tools to improve coordination between employees who need resources to carry out activities, facilitating better internal organisation.

The software will include features such as an intuitive interface that allows bookings to be managed in a simple and efficient manner, integrating specific modules for the administration of equipment and rooms.

### **1.2 Product Scope**

We will develop a business resource management and reservation software called (project name). This system will optimize the management of equipment and rooms in companies, ensuring their availability in an efficient manner.

The software will include the following modules and functionalities:

User Management, Availability Module, Resource Management, Reports and Histories:

The main objective of the software is to improve the management of business resources, facilitate their availability and promote more effective communication between employees who require equipment and rooms for their daily activities.

### 1.3 Document Conventions

#### Style and Document Format

- **Titles:** Times New Roman font, size 14, bold, black color.
- **Subtitles:** Times New Roman font, size 12, bold, black color.
- **Text:** Times New Roman font, size 12, black color.

#### Personnel involved

<b>Name</b>	Gómez Elias	Martinez Daniel	Martínez Pérez Diana	Garcia Adan
<b>Role</b>	Member in charge	Member in charge	Member in charge	The leader
<b>Professional Category</b>	Review and elaboration	Review and elaboration	Review and elaboration	Review and elaboration
<b>Responsibilities</b>	Service-oriented web applications	Mobile applications	Internet of Things	Tester
<b>Contact</b>	664 215 9161	664 135 2020	664 309 6515	663 364 3953

#### 1.4 Intended Audience and Suggestion

The target audience is mainly companies and organizations that require efficient management of their shared resources, such as technological equipment, work tools, and physical spaces.

This solution is especially useful for companies that value transparency, accountability, and better communication between employees for good team and room management.

#### 1.5 References

Reference	Title	Link	Date	Author
• <i>TSU</i>	Higher university technician TSU	<a href="https://uvp.mx/uvpblog/tecnico-superior-universitario-tsu/">https://uvp.mx/uvpblog/tecnico-superior-universitario-tsu/</a>	2023, 1 July	Universidad del Valle de Puebla

## **2 Overall Description**

### **2.1 Product Perspective**

The Reservation and Resource Management System will be developed as a central platform for efficiently managing the booking and usage of equipment and rooms within an organization.

The system will be designed to cater to companies, educational institutions that need to optimize the use of shared resources. By utilizing React Native for the mobile interface, the software ensures reliability and responsiveness. The product will connect to a database via APIs to securely store and manage data related to user profiles, equipment availability, reservation details, and usage histories. This integration will enable real-time availability tracking and ensure the smooth operation of the system.

### **2.2 Product Functionality**

#### **Equipment Inventory Module:**

- Equipment Registration (serial number, name, type or category, characteristics, brand, model).
- Equipment Status (available, in use, out of service, removed).
- Equipment Categories (laptops, projectors, machines, etc.).

#### **Room Module:**

- Room Registration (number, name, location).
- Room Status (available, in use, out of service).

#### **User Management Module:**

- User Registration and Authentication (login/logout).
- User Roles (administrator, regular users).
- Role-based Permission Management.
- User Profile (personal data, reservation history).



### **Availability Module**

- Display boxes showing available equipment and rooms.

### **Reservation Module**

- Report with.
  - Responsible person's name.
  - Requested date.
  - Date of use.
  - Request time.
  - Reservation time.
  - Time used.
  - Requested.
    - Requested room.
    - Equipment used.
  - Description of use.

### **History Module**

- Equipment and rooms used by the user (for the user) and accessible by the admin for all users.

## **2.3 User Classes and Characteristics**

### **Regular User:**

- Can reserve equipment and rooms as needed.
- Can view the availability of resources and make reservations based on that availability.
- Can manage their own profile and view their own reservation history.

**Administrator:**

- Can register, update, and delete equipment, rooms, and users.
- Can assign roles and manage user permissions.
- Can view the reservation history for all users within the system.
- Can generate reports on resource usage and reservation statistics.

**2.4 Operating Environment**

The web application will be developed using standard technologies such as Java, Spring boot and the mobile application will be developed using React native and Expo Go, integrated with a database API to manage the information. The system will be designed to be accessible from a mobile device.

**2.5 Design and Implementation Constraints**

- The system will only be accessible with a login, which means there will be authentication.
- The permission structure must be strict, making sure only authorized users can access certain functions based on their roles.
- The data storage and management must follow security and data protection rules.

**2.6 User Documentation**

- User Manual: Instructions for using the system, explaining how to manage employees, create tasks, assign roles, and create reports.
- Administrator Guide: Document for system administrators on how to configure the system.

## **2.7 Assumptions and Dependencies**

### **2.7.1 Assumptions**

- **Resource Availability**
  - It is assumed that equipment and rooms are correctly registered in the system with current and accurate information.
- **User Roles and Responsibilities:**
  - Users adhere to assigned permissions and roles, and administrators manage resources according to company policies.
- **Internet Connectivity:**
  - The system requires a stable Internet connection to synchronize reservations and perform real-time queries, especially for the web and mobile version.
- **Device Compatibility:**
  - It is assumed that the devices used (mobiles and computers) meet the minimum requirements to run the application (such as an updated browser or compatible operating system).
- **Data Accuracy:**
  - Users enter correct data when registering reservations, equipment, and users to avoid conflicts or errors in the information.

### **2.7.2 Dependencies**

- **Database System:**
  - The system relies on a database that stores information about equipment, rooms, users, and reservations. The connection to the database is made through an API designed specifically for the system.
- **External Libraries and Frameworks:**
  - For the development of the system, tools such as:
  - Java: Backend of the system.
  - React Native: For the mobile interface.
  - CSS/HTML: For the web interface.

- Firebase: Database of the system.
- Authentication Service:
  - Service dependency to authenticate users.
- Hardware Infrastructure:
  - The availability of servers to host the system and the database is critical for the continued operation of the system.
- Operating Environment:
  - The system must work correctly on computers and mobile devices.

### **3 External Interface Requirements**

#### **3.1 User Interfaces**

##### **3.1.1 General Design**

We seek to appeal to as many people as possible through a simple, beautiful and eye-pleasing interface.

##### **3.1.2 Menu Options**

Users will be able to select an option using by pressing on the corresponding button on the graphical interface. Each option will take the user to a new screen or section where they can perform the specific actions related to that category.

#### **3.2 Hardware Interfaces**

It will be necessary to have a mobile device that is in good condition and fully functional, it will be required for the execution of the program.

#### **3.3 Software Interfaces**

##### **3.3.1 Software Compatibility**

In order for the product to be fully functional, without any error or risk of failure, it is necessary for it to use the Android operating system.

#### **3.4 Communications Interfaces**

Object-oriented programming interface, network communication interface, hardware communication interface.

Describe the requirements for communication interfaces if there are communications with other systems, and explain which communication protocols will be used.

## 4 Internal requirements

Requirement number	FR 1
Name	Equipment inventory management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module you can register, modify or consult the equipment.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optional

Requirement number	FR 2
Name	Room management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module you can register a new one or modify an existing one.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optional

Requirement number	FR 3
Name	Users management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module you can register, modify or consult the users.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optionall

Requirement number	FR 4
Name	Availability of rooms and equipment management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module you can verify which room or equipment is available.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optional

Requirement number	FR 5
Name	Reservations management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module equipment reservations will be managed, a report about the requested equipment will be created, including all the necessary information, like user's name, or reservation date.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optional

Requirement number	FR 6
Name	History management
Type	<input checked="" type="checkbox"/> Requirement <input type="checkbox"/> Constraint
Description	In this module you can check your own history of reservations.
Priority	<input checked="" type="checkbox"/> High/Essential <input type="checkbox"/> Medium/wished <input type="checkbox"/> Low/Optional



#### **4.1 Functional requirements**

1. Equipment Inventory Module
2. Room Module
3. User Management Module
4. Availability Module
5. Reservation Module
6. History Module

##### **4.1.1 Functional requirements 1: Equipment Inventory Module**

In this module is where we will keep information about the equipment in the company. The administrator can register, delete, update the inventory of the equipment that can be reserved, this helps to organize the equipment used in a company and its availability.

The equipment will have a status, which will be: available, in use, out of service, retired.

The equipment will be separated into types or categories such as: laptops, projectors, machines, etc.

##### **4.1.2 Functional requirements 2: Room Module**

This module is where we will store the information of the rooms that are in the company. The administrator will be able to add, delete, and update the inventory of the equipment that can be reserved. This helps to organize the rooms that are used in a company and their availability.

The rooms will have a status, which will be: available, in use, out of service, retired.

### **4.1.3 Functional requirements 3: User Management Module**

There will be only 2 types of users in the system, which will have different permissions in the system. The users will be: administrator and regular user.

This module is where we will keep the records and information of the users who are in the company. The administrator will be able to add, delete, and update users in the system.

Users must be authenticated to log in.

The administrator will have permissions to manage the equipment and rooms in case he requires it, as well as view the reservation history of each one of them.

The regular user will have permissions to make reservations for equipment and rooms, as well as review their reservation history.

### **4.1.4 Functional requirements 4: Availability Module**

In this module the user will be able to:

Check all the registered rooms (number, name, location) and also they will be able to view the availability of it (available, in use or out of service).

Check the information about the registered equipment ( ID, name, category, brand, model) and also they will be able to view the availability of it (available, in use or out of service).

### **4.1.5 Functional requirements 5: Reservation Module**

In this module the user will create the reservation for the required equipment, to do that it needs to fill a report with the name of the user that is making the reservation, the date of the day that is being make the request, the date of the day when it will be used, the requested room and the requested equipment.

Also, when the equipment is returned it will be added to a report the time it was returned, the time of use, and the description of the use.

#### **4.1.6 Functional requirements 6: History Module**

Here the user will be able to view their own reservation history. The administrator will be able to view all the users reservation history. This will help to improve equipment and room safety by keeping track of who is the possible responsible for a damaged equipment or room.

## **5 Nonfunctional Requirements**

### **5.1 Security**

Total security is guaranteed in the use of the software, safeguarding all stored information and only managed by authorized people without the administration affecting the security of our system.

### **5.2 Reliability**

User interfaces will be easy to access, streamlining their understanding, usefulness and functionality.

### **5.3 Availability**

The system will be available 24 hours a day, every day of the week.

### **5.4 Maintainability**

The developed software will have a user manual that offers all the information necessary for its use and will have monthly updates made by our developers.

## **6 Other Requirements**

### **6.1 Appendix A: Glossary**

### **6.2 Appendix B: Analysis Models**