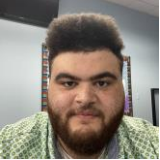


# GATEKEEPER SECURITY SOLUTIONS

Ryan Pierce, Alejandro Martinez, Jon Nguyen,  
Manuel Santos





Ryan  
Pierce

# Problem and Need

## Current Challenges:

- Inefficient manual attendance
- Limited security with traditional methods.
- Isolated systems lacking integration.

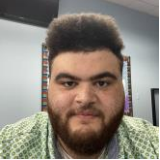
## Need for RFID System:

- Automates and accurately tracks attendance
- Enhances security with dynamic access controls.
- Integrates easily, allowing scalability

## Benefits:

- Saves time and reduces costs.
- Provides robust data for security and decision-making,





Ryan  
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# Team Charter

*Securing Today, Safeguarding Tomorrow*

## Vision:

- Gatekeeper Solutions aims for seamless, intelligent, secure access control to become a standard.

## Mission/Purpose:

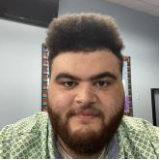
- Facilitate secure access with innovative RFID systems.
- Empower future innovations in security technology
- Ignite collective success through collaboration and innovation

## Ground Rules:

- Meetings: Weekly, on time, with structured agendas
- Decision-Making: Combine consensus with majority rule.

## Tools for Team Self-Assessment:

- Use professional platforms for recording and reflecting on team performance and progress.



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# Vision and Scope: Problem Statement

## Problem Statement:

Utilizing RFID technology to innovate secure attendance and access control systems adaptable for present and future needs.

## Stakeholders:

*Team Lead:* Makes final decisions and keeps the project on track.

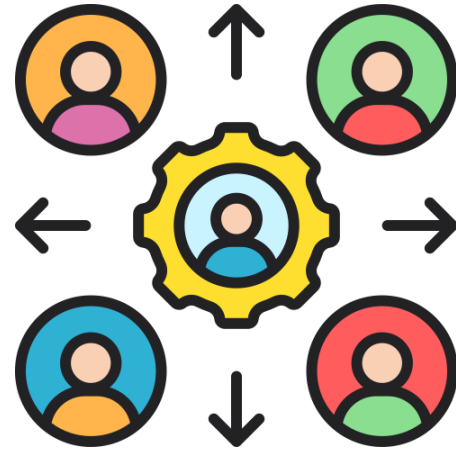
*Project Manager:* Manages project execution and sets weekly goals.

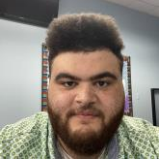
*Programming Coordinator:* Manages programming tasks within the team

*System Programmers:* Develop and maintain software components.

*Hardware Builder:* Designs and assembles hardware components.

*Project Consultant:* Offers expert advice to improve the project.





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# Vision and Scope: Problem Statement

## Users:

### *Low Security Users:*

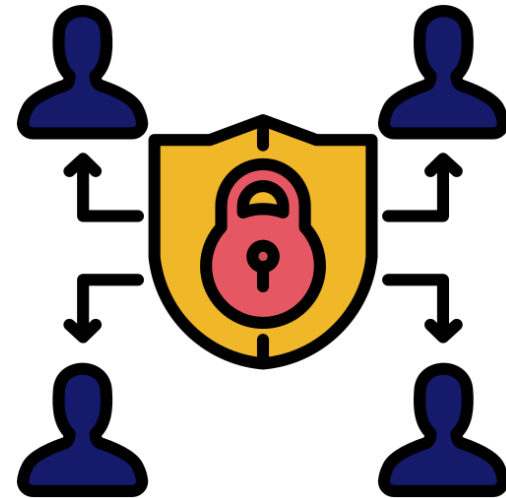
- Use the system for access and attendance
- Student and employees for routine access.

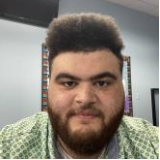
### *Mid-Security Users:*

- Can access attendance logs and higher-risk areas
- Faculty and manager with extra access

### *High-Security Users:*

- Manage and modify access points; access high-risk areas.
- System administrators for critical maintenance.





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# Vision and Scope: Problem Statement

**Hardware Malfunction:** Risk of hardware breakdown or component failure.

**Hardware Delay:** Delays due to missing or incomplete hardware, impacting Arduino software tests.

**Missing Team Member:** Team member absence can disrupt workflow, requiring tasks redistribution.

**Hardware Incompatibility:** Insufficient power for all components, leading to operational issues.

**Engineering Lock Error:** Lock mechanism may fail due to programming or mechanical errors.

**Programming Incompatibility:** Parts of the program may not integrate well, needing rework.

**Database RFID Incompatibility:** Issues with RFID sequence input due to size constraints in the system.



Manuel  
Santos

# Vision and Scope: Assumptions

**RFID Compatibility:** Tokens/cards are compatible with the scanner and system.

**System Connection:** Connected via a USB cord.

**Database Configuration:** Running with default settings.

**RFID Documentation:** Tokens/cards are documented for assignment; no scanning for assignment.

**Administrator Knowledge:** Requires SQL knowledge for efficient database setup; otherwise, manual entry is needed.

**RFID Unique IDs:** Each card has a unique ID.

**Security Access:** Higher security levels inherit lower level clearances.

**Security Assignment:** Security levels are correctly assigned.





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Santos

# Vision of the Solution

**Vision Statement:** Our goal is to create a scalable, robust attendance and access security system using RFID technology that facilitates quick, automated access to doors and tracks attendance automatically. RFID tokens and cards will be used for access and tracking, with additional privileges for administrators and faculty to manage facilities and access attendance lists.

## Features:

- *Admin Control:* Manage users and access points with adjustable security levels.
- *User Access:* Scan at access points for entry and attendance.
- *Attendance Access:* Admins can view and manage attendance lists, including denied entries.
- *Automated Archival:* Automatic archival of attendance data.

## Desired Features:

Transition to wireless systems.

Web interface for remote attendance access.

Additional security options: keypads, biometrics, voice recognition.

Closed door detection feature.





Manuel  
Santos

# Requirements: Definitions

**Arduino:** Open-source electronics platform.

**RFID:** Technology for wireless identification and tracking.

**Use Case:** Scenarios of system interaction by users.

**Administrator:** User role with system-wide access and management responsibilities.





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Santos

# Requirements: Functional

## User Management:

- Add, modify, delete user information
- Manage access permissions

## Attendance Management:

- Automatic recording upon RFID scan
- Generate detailed attendance reports

## Access Control Configuration:

- Define access rules by user groups and areas

## Event Logging:

- Log all access attempts, successful and unsuccessful

## Data Encryption:

- Secure data during transmission with industry-standard encryption





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Santos

# Requirements: Non-Functional

## Performance:

- System response within 1 second for RFID authentication.
- Support for 1000+ users simultaneously

## Security:

- Encrypt user data during transmission
- Secure login for administrators

## Usability:

- User-friendly interface for administrators
- Accessible via web-based platforms

## Reliability:

- 99% uptime
- Regular data backup and recovery mechanisms.

## Scalability:

- Easily integrate with existing infrastructure
- Support for increasing user numbers.

## Maintainability:

- Modular and well-documented code for easy updates.
- Administrative tools for system configuration.





Jon  
Nguyen

# Project Plan: Hardware and Software Resources

## RFID Scanner:

- Arduino
- RFID Scanner
- Wires
- Power Source
- RFID Tokens
- Motor

## Security Program:

- Python
- Host Computer

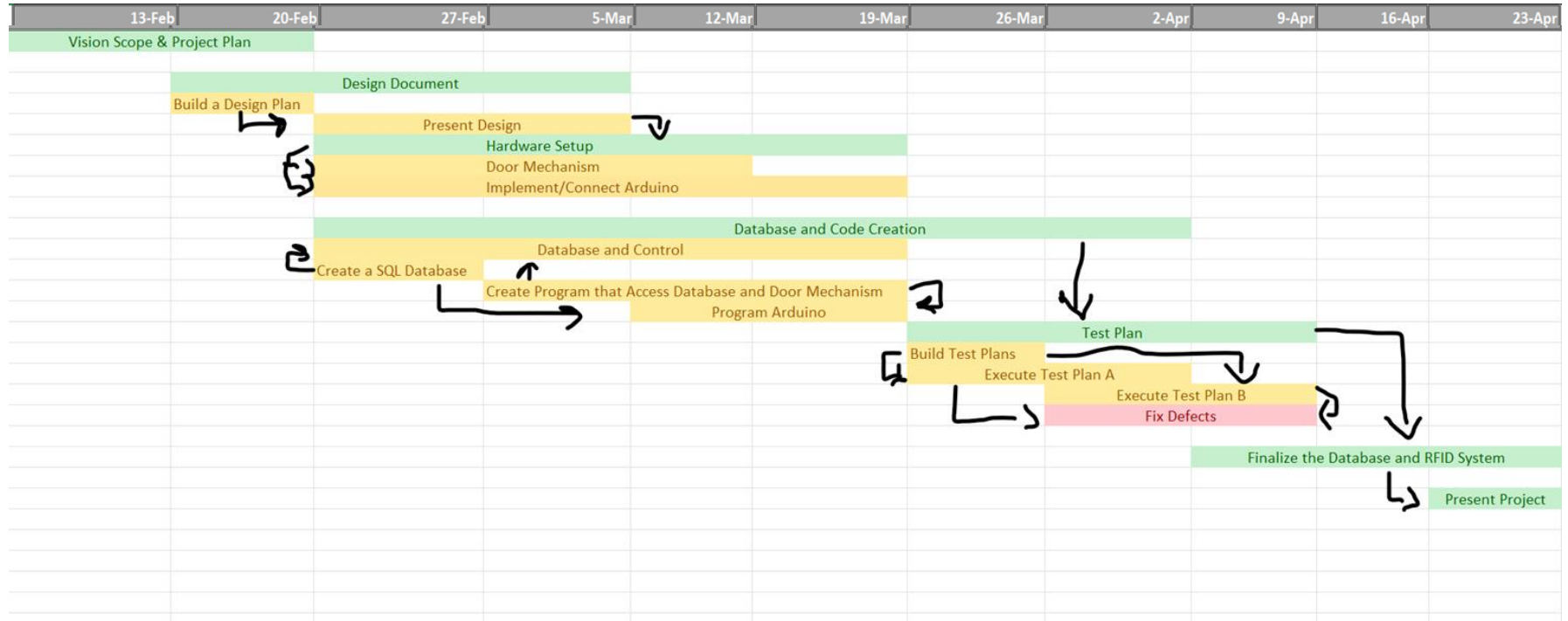
## Database (server program)

- Hosting application
- MYSQL



Jon  
Nguyen

# Project Plan: Schedule





Jon  
Nguyen

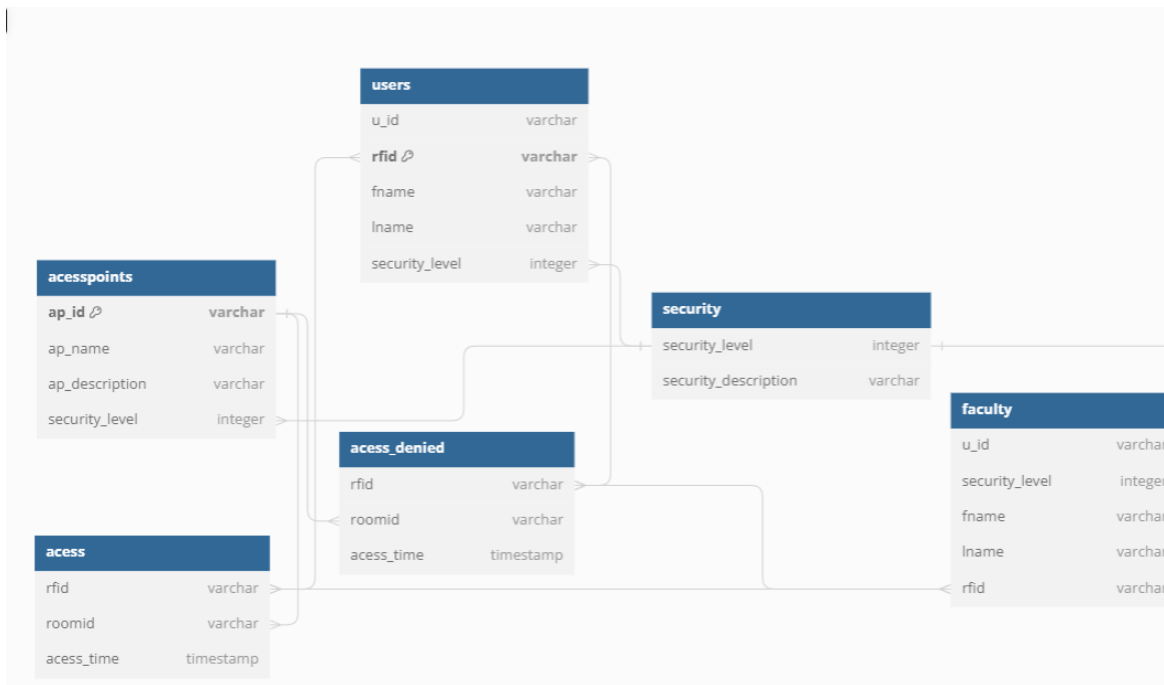
# Project Plan: Risk Plan

Risk plan for project RFID Attendance/Entrance Control System					
Assessment team members Alejandro Martinez, Jon Nguyen, Ryan Pierce, Manuel Santos					
Risk	Probability 1-10	Impact 1-5	Priority	Actions	
Hardware delay	4	4	16	Ryan will get an ETA from Professor as to when we can expect the hardware.	
Jon becomes very sick for 2 weeks	5	5	25	Ryan will ask Manuel and Alejandro to pick up the extra slack until Jon returns.	
Programming Incompatibility	3	5	15	Ryan and Jon will move into a different direction in terms of programming.	
Hardware Malfunction	4	5	20	Manuel will ensure we have extra backup to replace unusable hardware.	
Database RFID incompatibility	3	5	15	Alejandro will trouble shoot any and all problems with our database.	



Jon  
Nguyen

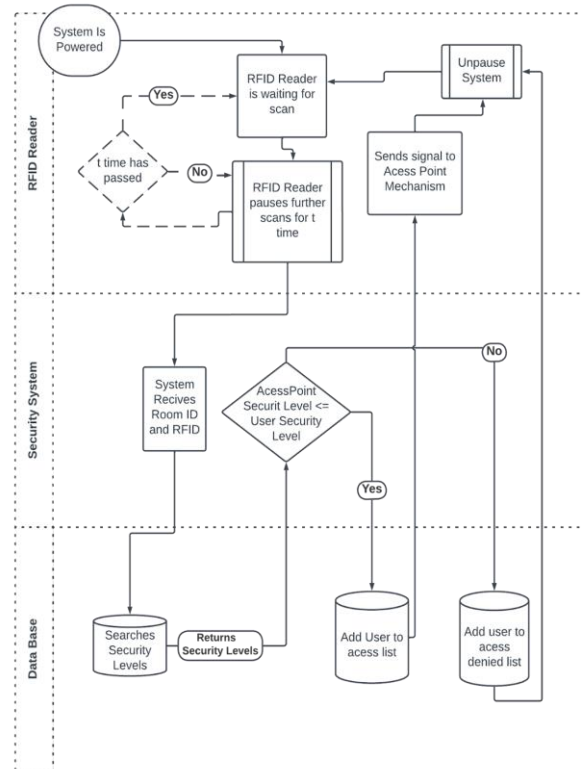
# Design: Entity Relationship Diagram





Alejandro  
Martinez

# Design: Component Diagram

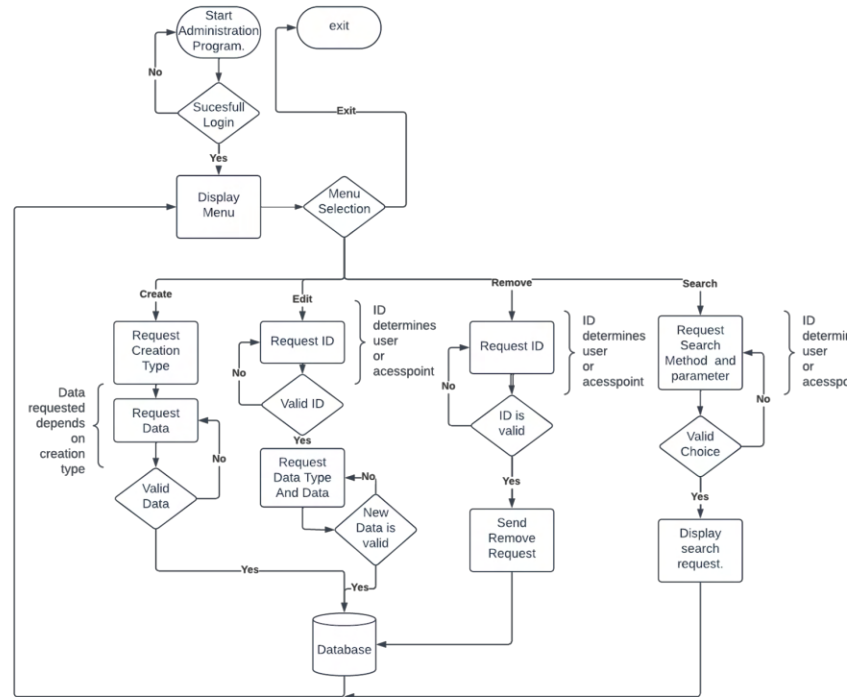






Alejandro  
Martinez

# Design: Administrative Software Activity Diagram





Alejandro  
Martinez

# Test Plan: Test Cases

## Test Case 1: RFID Security Monitoring

**Expected Results:** The RFID system will display a live feed on scanned cards since the software was started.

## Test Case 2: User Registration

**Expected Results:** The RFID card is successfully registered in the system, and the user information is associated with it.

## Test Case 3: User Removal

**Expected Results:** The user and their information is removed from the database.

## Test Case 4: Error Handling - Invalid RFID Card

**Expected Results:** The system identifies the card as invalid and adds it to the correct database.

## Test Case 5: Software-Hardware Integration

**Expected Results:** Hardware and software components interact smoothly without any noticeable delays or errors.

## Test Case 6: Access

**Expected Results:** The access point is opened if not already. Scanned card is added to the database.

## Test Case 7: Access Database Display

**Expected Results:** The system retrieves and displays access records from the database accurately, including entry times, user information, and access status.

## Test Case 8: Access Denied Database Display

**Expected Results:** The system retrieves and displays access denied events from the database accurately, including timestamps and associated RFID card information.

## Test Case 9: User Database Display

**Expected Results:** The system retrieves and displays user information from the database accurately, including user names, IDs, and associated RFID card details.

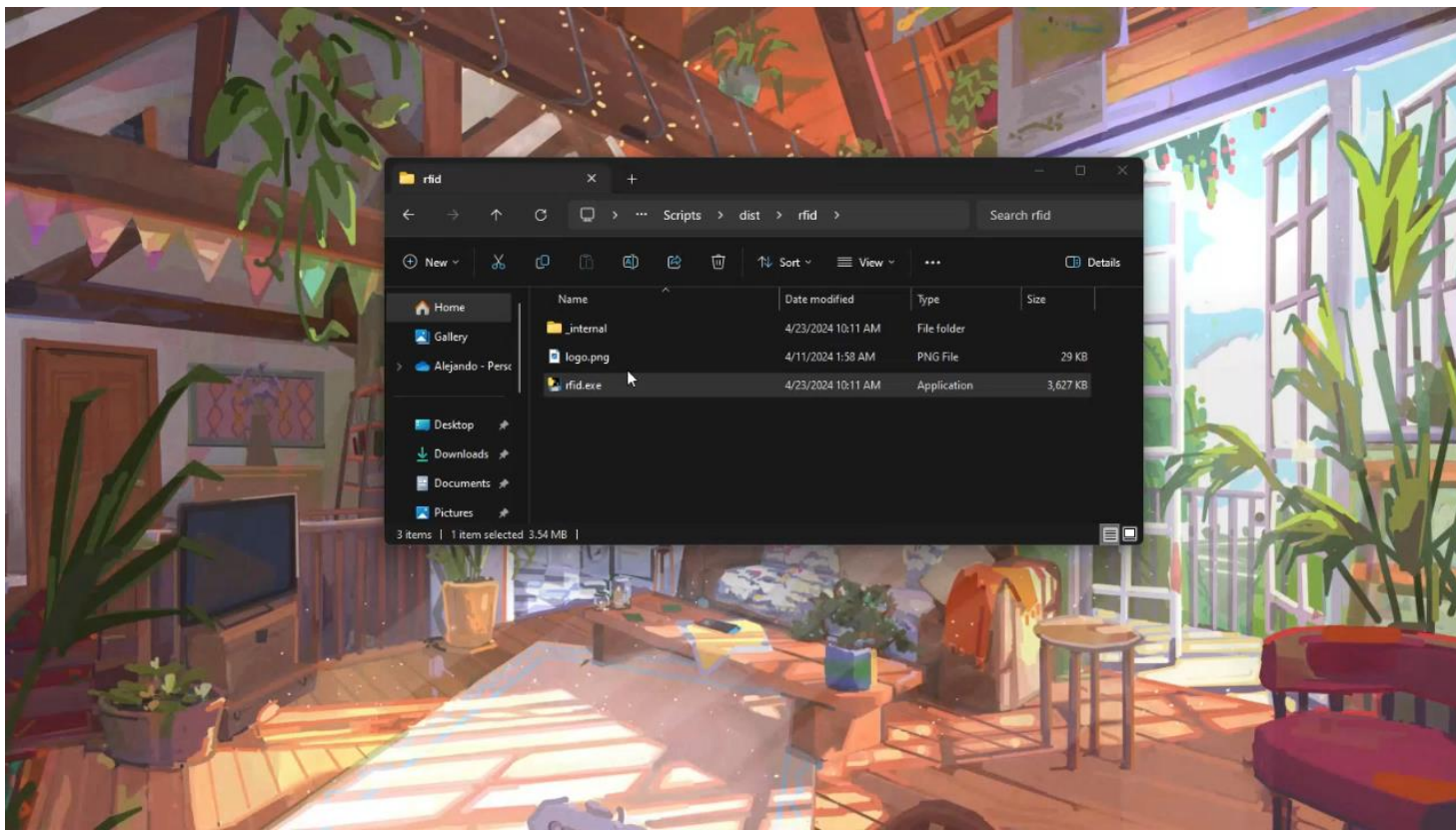
## Test Case 9: Login

**Expected Results:** The system allows correct logins only.



Alejandro  
Martinez

# Demonstration



**Questions?**