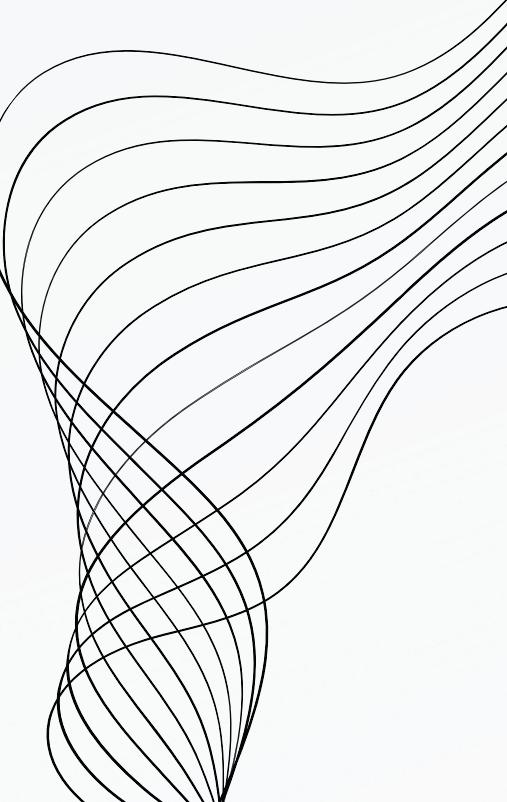


Door Access Control

Project team:
Luca Bernardi
Francesco Ilacqua
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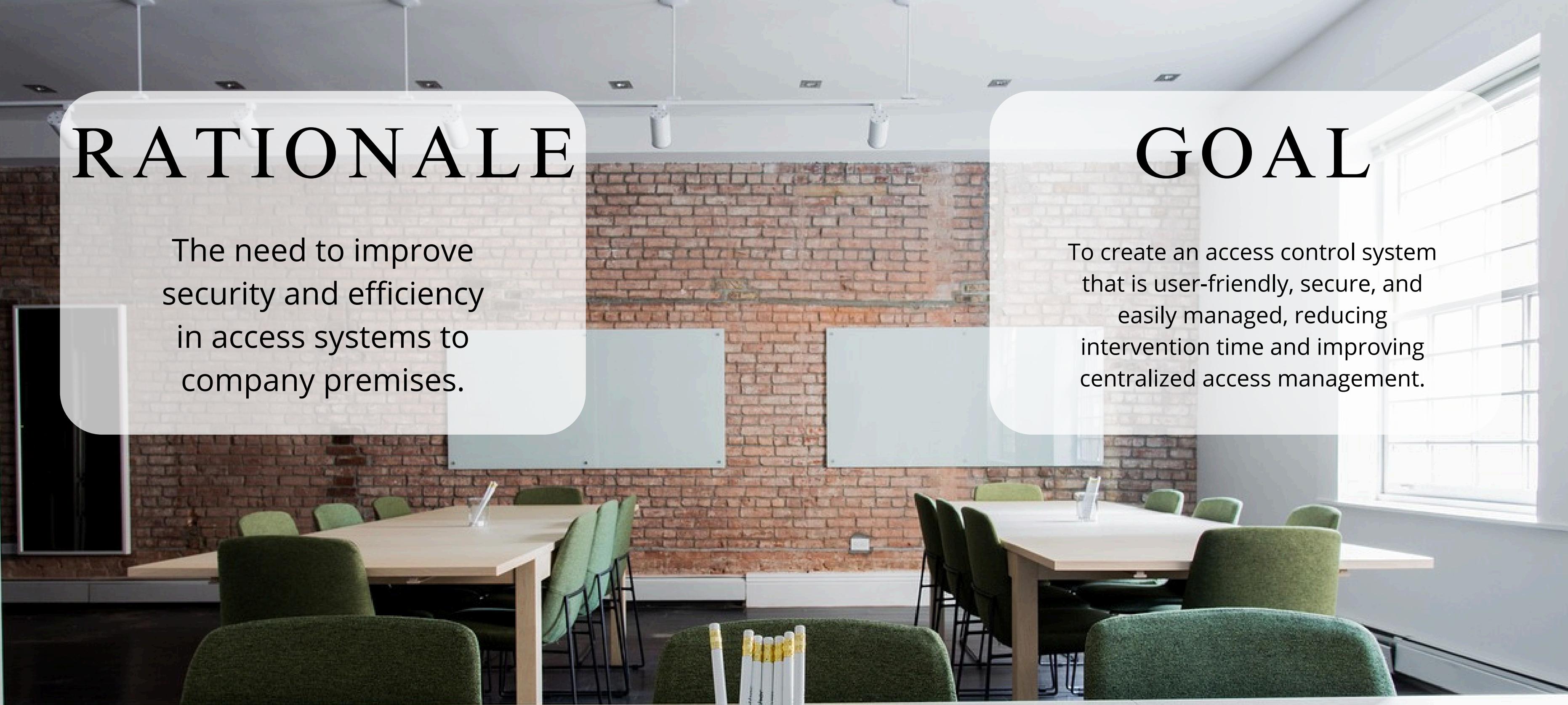


RATIONALE

The need to improve security and efficiency in access systems to company premises.

GOAL

To create an access control system that is user-friendly, secure, and easily managed, reducing intervention time and improving centralized access management.



SOLUTION: DOOR ACCESS CONTROL

- **Simplified Access:** Using RFID cards linked to user accounts for quick and secure access.
- **Alternative Authentication:** In case of RFID card unavailability, access via login with username and password.
- **Centralized Management:** Administrators can manage users, permissions and monitor access from a single platform.



ADVANTAGES

Authentication with JWT Tokens

Enhanced security in user sessions.

Password Hashing

Protection of sensitive data by hashing passwords.

Input Validation

Prevention of attacks through SQL injection and other malicious methods.

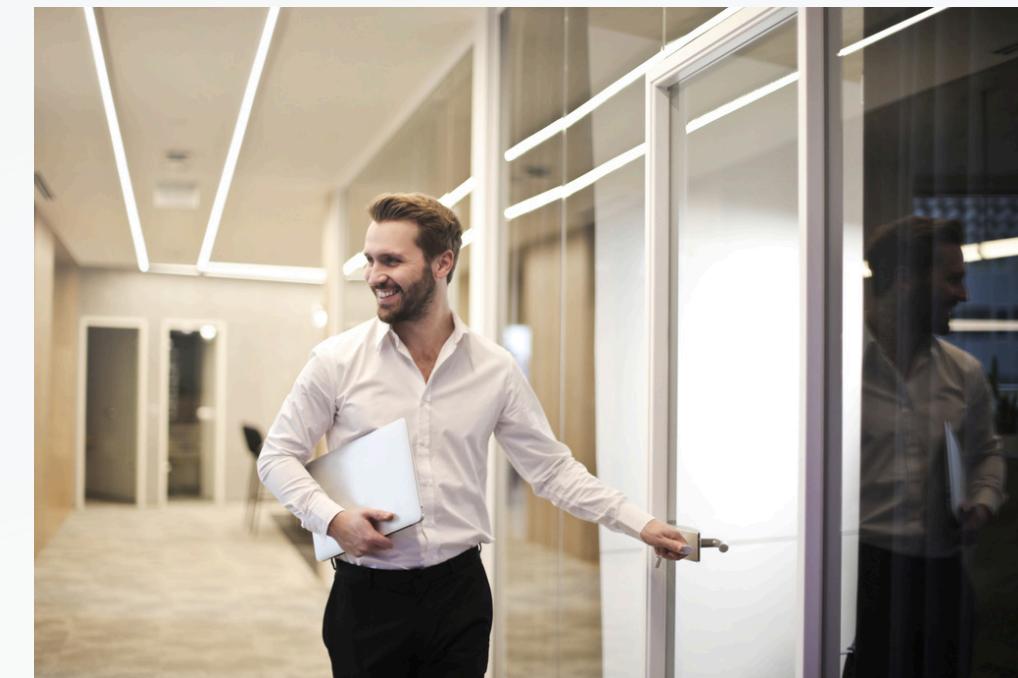


EFFICIENCY & USABILITY



- Intuitive User Interface: Developed with Flutter for a consistent and responsive experience across multiple devices.
- Mobile Access: Mobile app for convenient and secure access even remotely.

- Role Management: Different levels of access that can be configured according to company roles (System Administrator, Costumer Administrator, Customer Operator, User)..



TECNOLOGY INTEGRATION

- Raspberry pi support (the best SBC)
- RFID support
- EASY to install
- Interaction with client-side and hardware-side applications.
- Full touch GUI support
- Security improved
- Room access verification
- Fast reads and responses



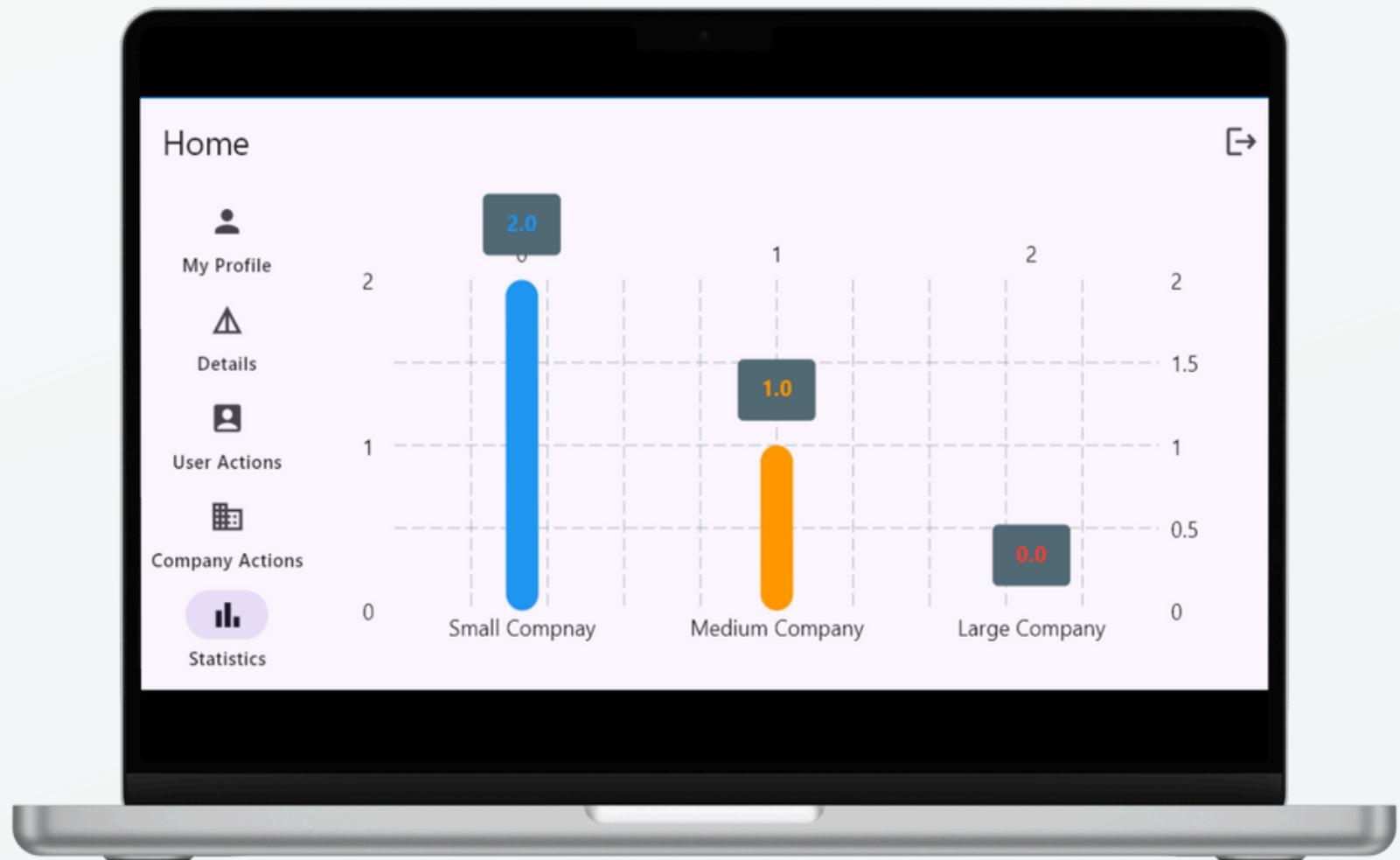
TECHNICAL DETAILS

- Frontend: Developed with Flutter and Dart, it offers efficient role management and a dynamic user interface.
- Backend: Implemented with Flask and MySQL, providing secure and flexible data management.
- Hardware Integration: Interaction with RFID readers via Raspberry Pi, facilitating the implementation of access control.

Role Management Support:

SA User

- **User Management:** Register new users, delete existing users, and edit user details
- **Company Management:** Register new company in the system and enroll users in a specific company
- **Statistic Management:** Full access to statistical data both to monitor room usage by users and to monitor the number of big, medium and companies in the system
- **Role Management:** Assign and edit user roles



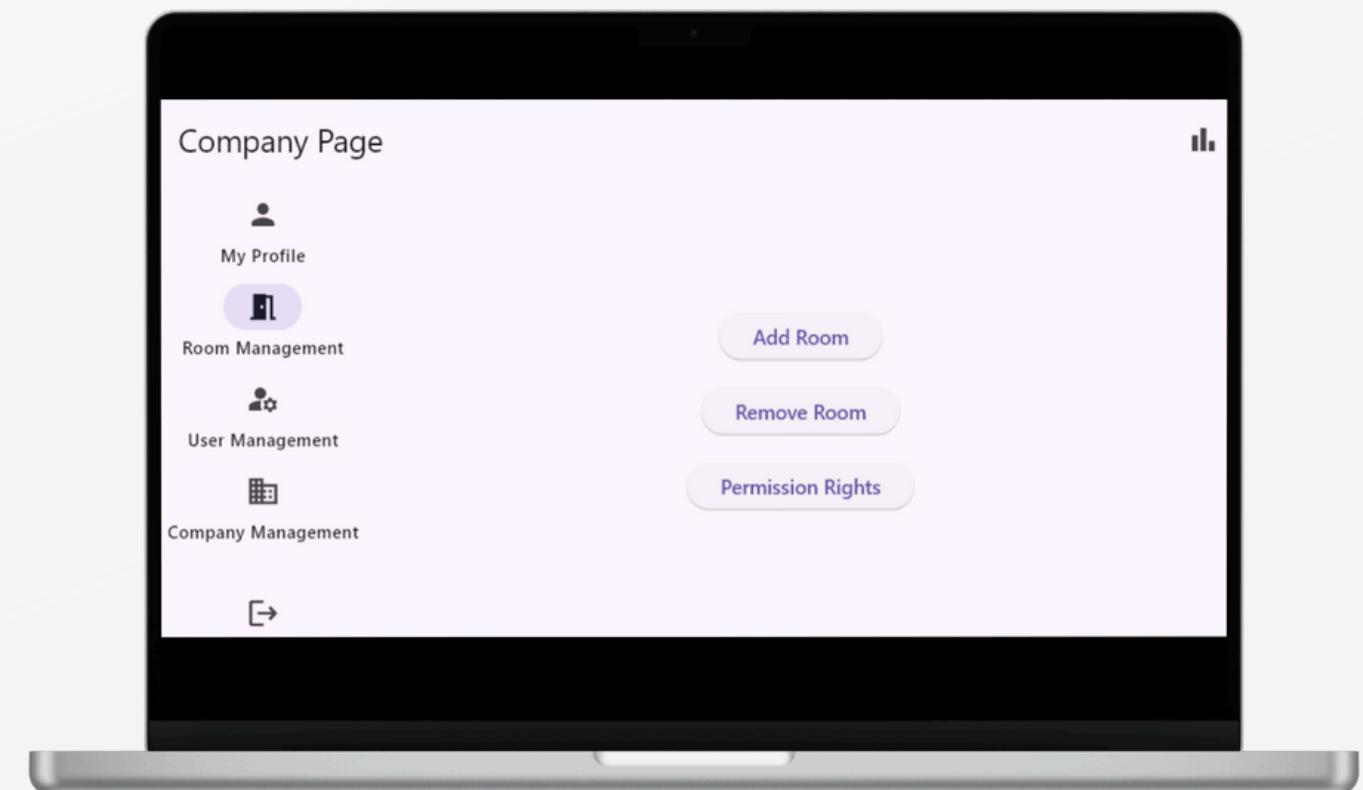
Role Management Support:

CA User

- create, edit, and remove users, as well as add and remove rooms within their company.
- Assign and edit user roles and set access permissions to rooms.

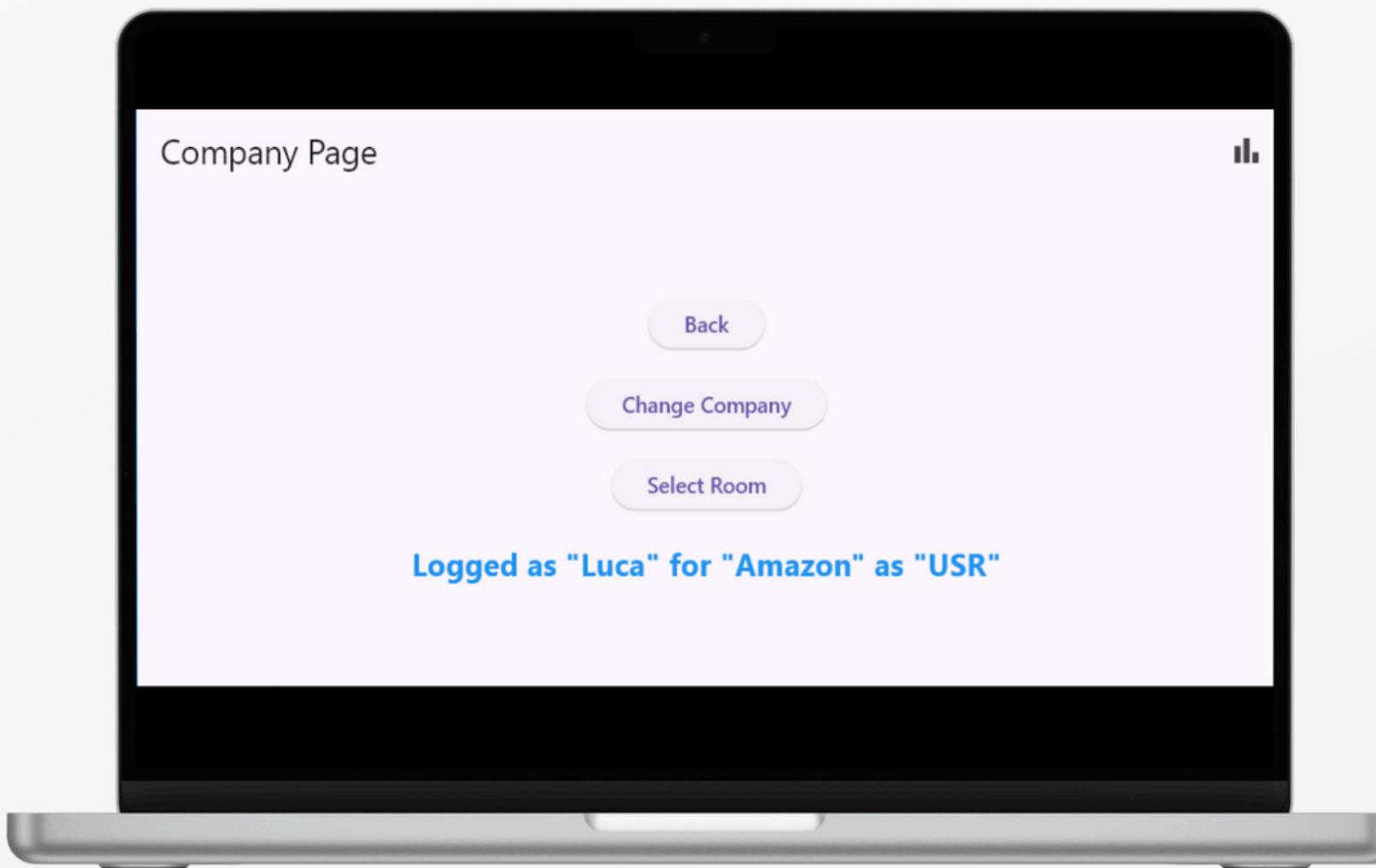
CO User

- Limited company management
- Assign and edit user roles and set access permissions to rooms for users with lower role



Role Management Support: USR User

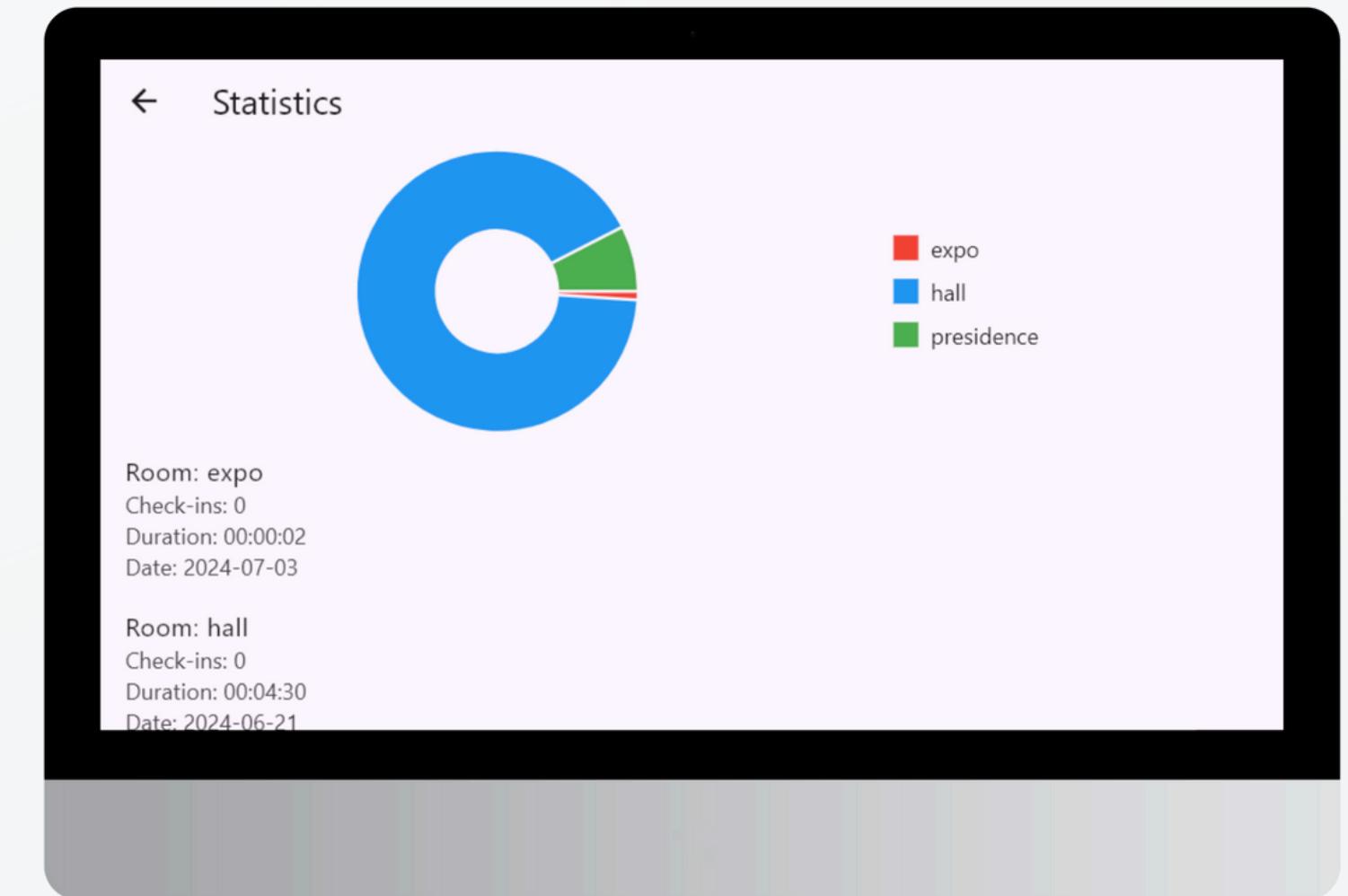
- **Personal profile management:**
Modify personal data
- **Accessing Rooms:** Users can use the system to access authorized rooms via RFID cards or login with username and password



Statistics Page: Time Spent in each Room

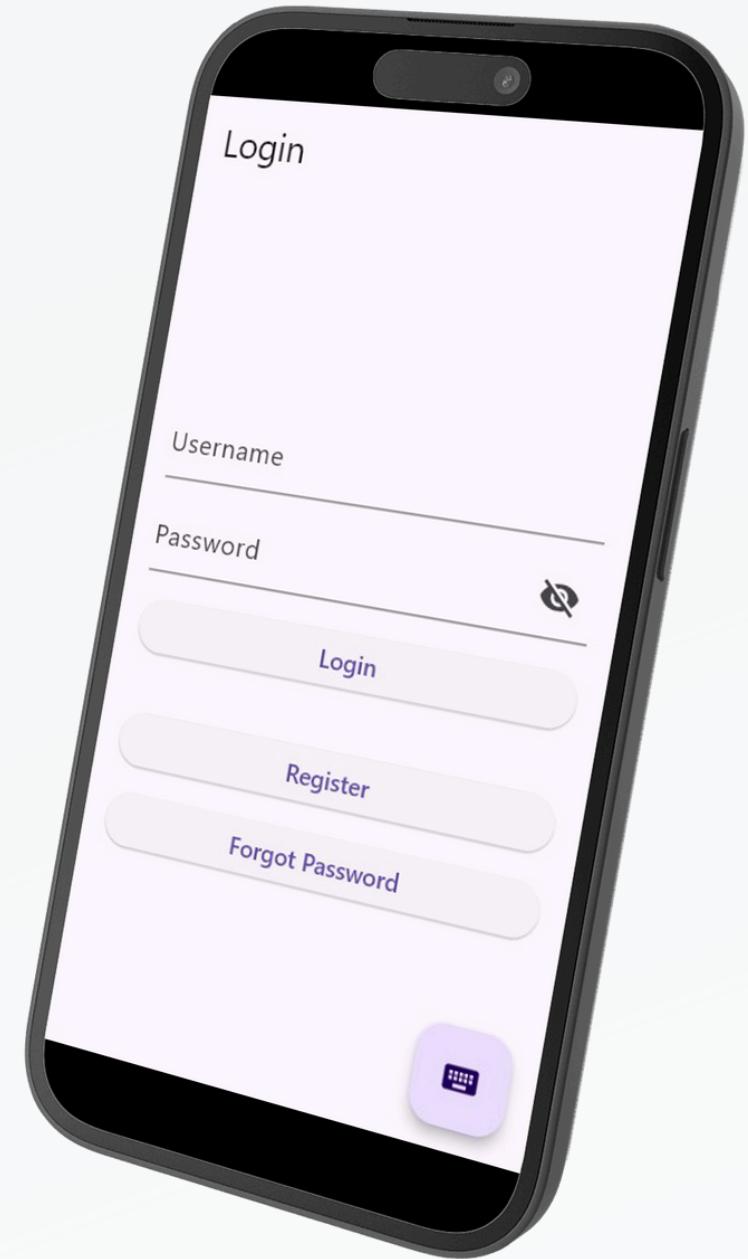
Designed to provide users an intuitive interface where they can monitor the time spent in various rooms within the company

- Precise Recording of Check-ins and Check-outs:
Detailed list of movements, showing rooms visited and time spent in each.
- Interactive Pie Chart:
Displays the distribution of time spent in different rooms, updated in real-time.



SMARTPHONE APPLICATION

- Development with Flutter to support Android, iOS, web applications, Linux, and Windows.
- Simplified process for editing and distributing applications.
- Reduced HTTP server workload.



NEXT PROJECT



CLOUD INTEGRATION

Scalability: Migrate backend services to the cloud for better scalability and performance.

Push Notifications:
Implement real-time push notifications for important events such as unauthorized access or system alerts.

MOBILE AND WEB
APPLICATION
ENHANCEMENTS

Adding cameras to the DACs to access the doors with a QR displayed on the phone, and face recognition

ENHANCED SECURITY FEATURES

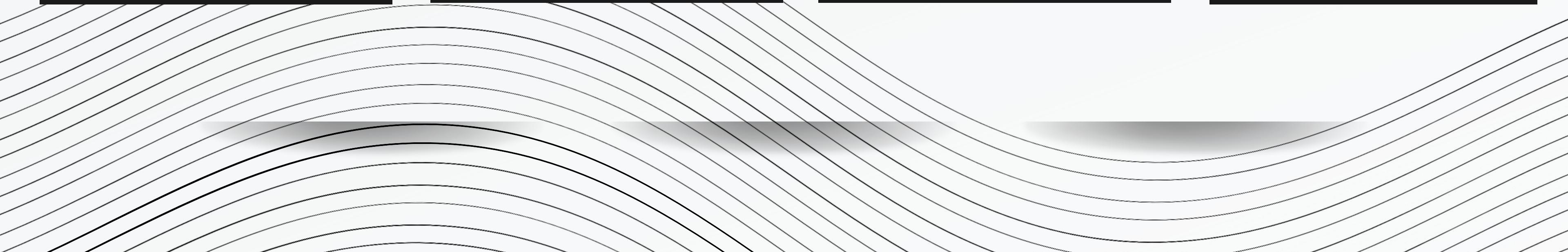
CONCLUSION AND BENEFITS

Robust and scalable system for access control management.

Security ensured through token-based authentication and password hashing.

Flexibility through hardware integration and multi-platform support.

Complete solution for modern access management needs



THANK'S FOR
WATCHING

