

Executive Summary

The Smart Kiosk is an interactive system designed to modernize how users navigate and interact with campus buildings at UTA. The system consists of standalone kiosks placed in key locations, with functionality tailored to each building's needs.

Core features include an interactive building map, room reservation system, supply request management, and secure card swipe login. A web-based version is also available for remote access, with certain features limited to maintain the kiosk's role as an on-site resource.

By centralizing information and streamlining common tasks, the Smart Kiosk enhances accessibility, efficiency, and overall user experience across campus.

Background

Navigating large campus buildings and accessing essential resources can be inefficient and frustrating for students, faculty, and visitors. UTA is committed to improving accessibility and the overall campus experience for students, faculty, and visitors. However, several challenges exist within key buildings such as ERSA and ERB.

At ERSA, faculty reported issues with missing supplies and the lack of a structured system for reserving conference rooms. In the six-story ERB, students and visitors often struggle to locate rooms and events due to the building's size and complexity.

To address these challenges, we developed the Smart Kiosk system, a centralized platform that provides interactive navigation, room reservations, and supply requests. This solution improves day-to-day efficiency and enhances the overall campus experience, with the potential to scale across additional buildings.

Experimental Setup

The Smart Kiosk system is deployed in a simulated campus environment representing ERSA and ERB use cases. The system integrates a React-based frontend, Django backend, and kiosk hardware components including a touchscreen display and card reader.

Table 1. Smart Kiosk Experimental Setup Components

Index	Components	Description
1	Frontend UI	React-based touchscreen interface
2	Backend System	Django server handling logic & APIs
3	Database	Cloud-hosted storage for users and data
4	Card Reader	Captures MavID swipe input for user login
5	Display Hardware	Multi-touch touchscreen kiosk interface
6	Network	Enables real-time communication

Experimental Test Plan

- To evaluate the effectiveness of the Smart Kiosk, we designed a series of usability and performance tests based on real-world user scenarios.
- Test cases included:
 - User login via card swipe and manual authentication
 - Navigating the interactive building map to locate rooms
 - Reserving a conference room with time conflict validation
 - Submitting supply requests across multiple categories
- Performance metrics measured:
 - Task completion time
 - System response time
 - Error rates during interaction
 - User satisfaction and ease of use
- Participants included students and faculty members who interacted with the kiosk under guided and unguided conditions. Feedback was collected to identify usability improvements and system reliability.

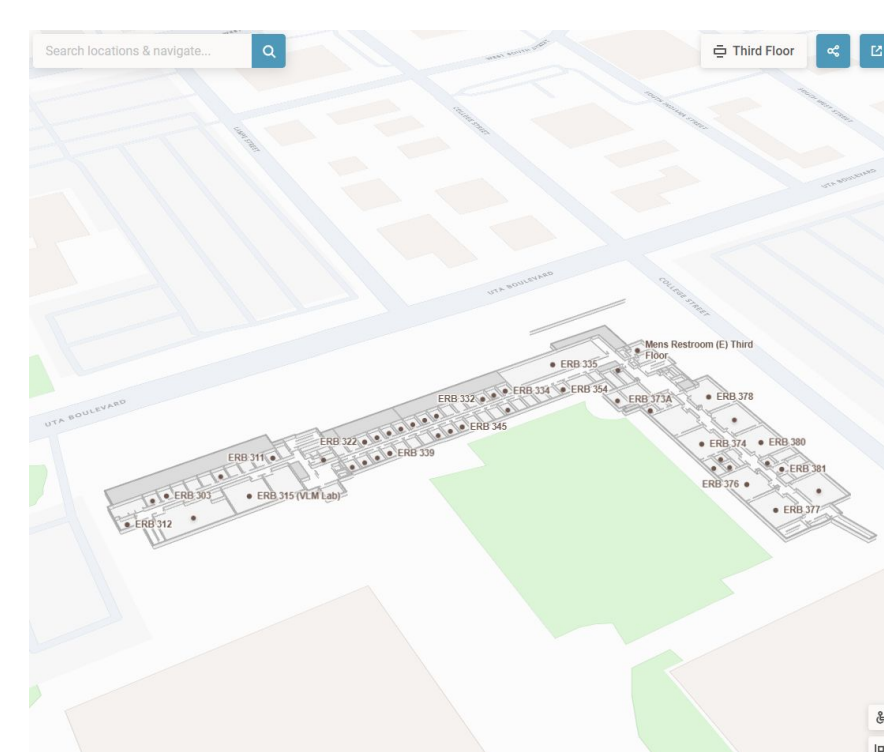


Figure 1. ERB Third Floor using Interactive Map



Figure 2. ERSA Kiosk Dashboard

Experimental Results

- The Smart Kiosk system demonstrated strong performance across all evaluated metrics. Users were able to complete core tasks such as navigation, reservation, and supply requests efficiently, with minimal instruction.
- Results showed:
 - High task completion rates with low error frequency
 - Fast system response times for all major interactions
 - Positive user feedback regarding interface clarity and ease of use
 - Successful handling of edge cases such as scheduling conflicts and invalid inputs
- Additionally, the card swipe authentication feature provided a seamless and secure login experience. The system maintained stability throughout testing and showed readiness for deployment in real campus environments.
- Overall, the results validate the system's effectiveness in improving accessibility, efficiency, and user engagement within campus facilities.

Conclusions

The Smart Kiosk successfully meets the core needs of students, faculty, and visitors by improving navigation, accessibility, and day-to-day convenience within campus buildings. Despite early hardware limitations and delays, our team adapted by prioritizing a strong and reliable software system without sacrificing functionality.

The system was built with scalability in mind, allowing it to expand easily to additional campus locations and integrate with future upgrades. Key features include a responsive web interface, interactive wayfinding, secure card swipe login, and streamlined room reservation and supply request workflows.

Through this project, our team gained valuable experience in full system design, problem-solving, and developing solutions that align with real stakeholder needs. We would like to thank our sponsors, Jade Myers and JD Briggs, as well as Dr. Wang, for their continued support and guidance throughout this project.

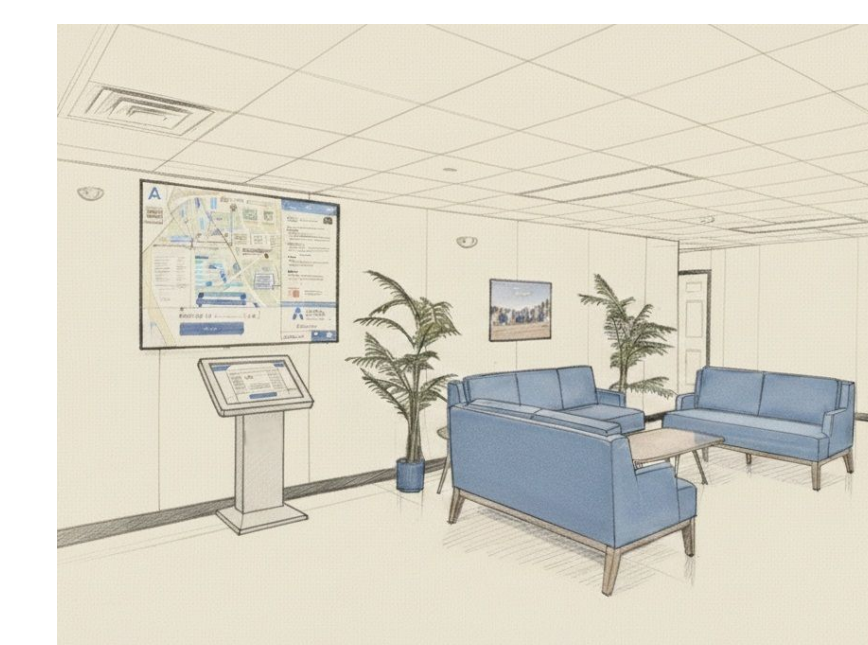


Figure 3. Smart Kiosk in ERSA

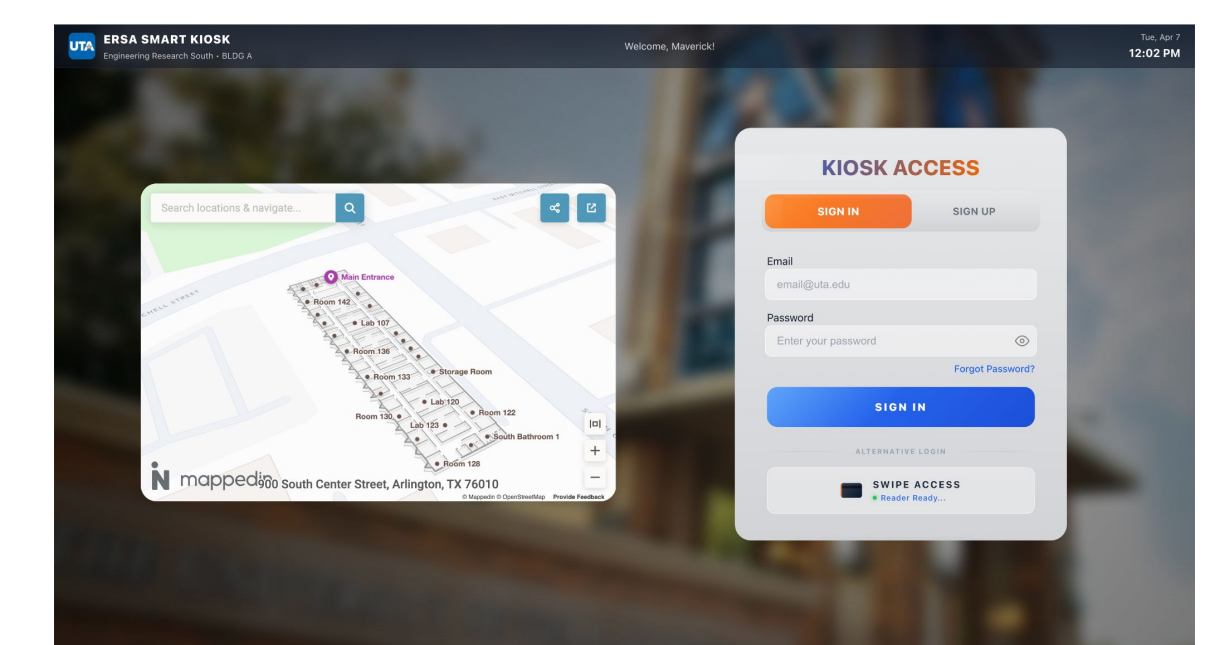


Figure 4. ERSA Kiosk Login Page

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