MAMS SISO (Contd.)

Digitizing attendance at Mass Academy

Erica Dong

(Tarun Eswar, Charles Tang, David Barsoum)

1. How It Started

Problem

- Written sign-ins waste paper and are inconvenient to swap out
- Paper sign-ins consume time (i.e. signing name/recording time)
- No ability to track attendance history
    - If students leave the building and come back, this remains unreported
- Identifying whether students are at school

Minimum Viable Product

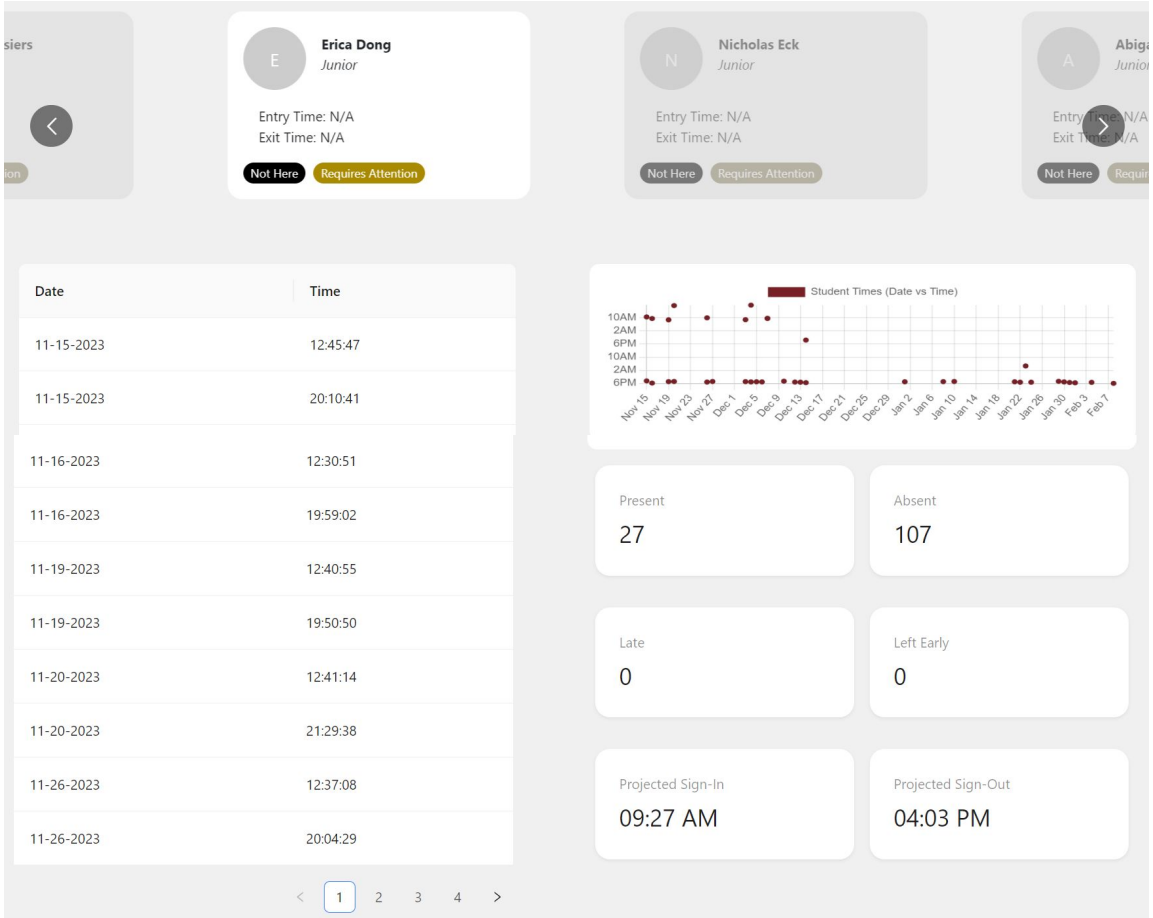
1. Allow the student to sign in and sign out using an easily accessible personal identifier for each student.
2. Collect the sign-in/out data into a database that tracks sign-in and sign-out times, attendance by each date, and the student's unique personal identifier.
3. Provide a user interface web page or application that allows administrators to access daily reports and query attendance data.

2. What’s New

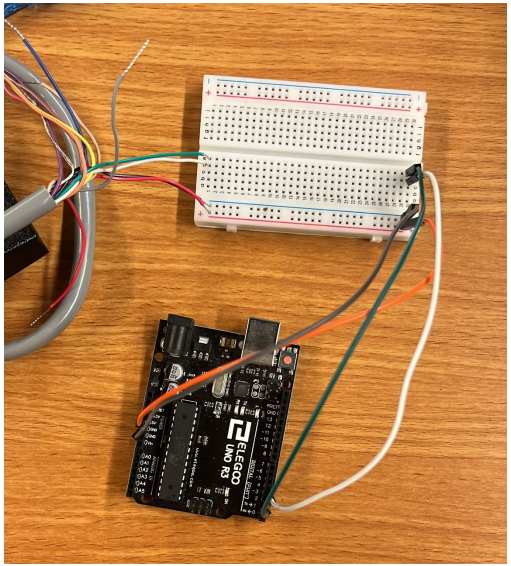
Software

- Conducted code review and debugged
- Redux was integrated (Tarun)
- Helped work with IT department to migrate VMs
- Helped migrate from locker number to student ID
- Created individual student view

Student View



Card Reader

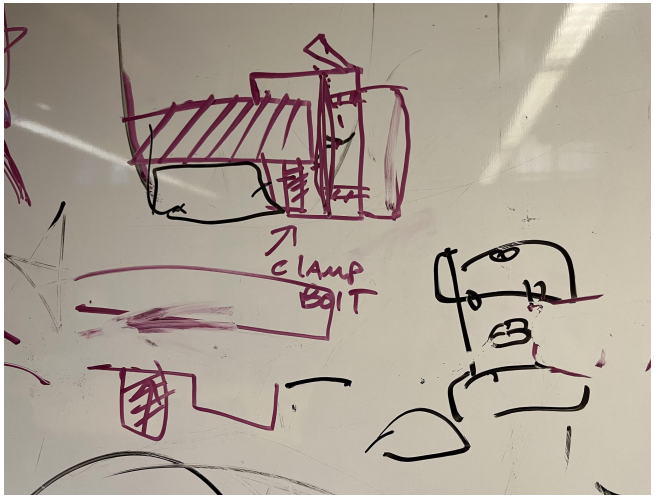


- Prototyped system with Arduino Uno and breadboard
- Tested card reader output with student IDs

Name	Student ID (employee ID) #	5-digit card ID (on back of card)	HID Reader Output (Card Code)
Erica Dong	901022796	69406	Read 35 bits. FC = 1039, CC = 69406 (consistent)
[redacted]	[redacted]	[redacted]	Read 35 bits. FC = 1039, CC = [redacted] (consistent)
[redacted]	[redacted]	[redacted]	Read 35 bits. FC = 1039, CC = [redacted] (consistent)
[redacted]	[redacted]	[redacted]	Read 35 bits. FC = 1039, CC = [redacted] (doesn't read all bits in some cases)
David Barsoum	[redacted]	[redacted]	Read 35 bits. FC = 1039, CC = [redacted] (consistent)

Card Reader Case

- Worked with David to design and CAD case, which was then 3D printed

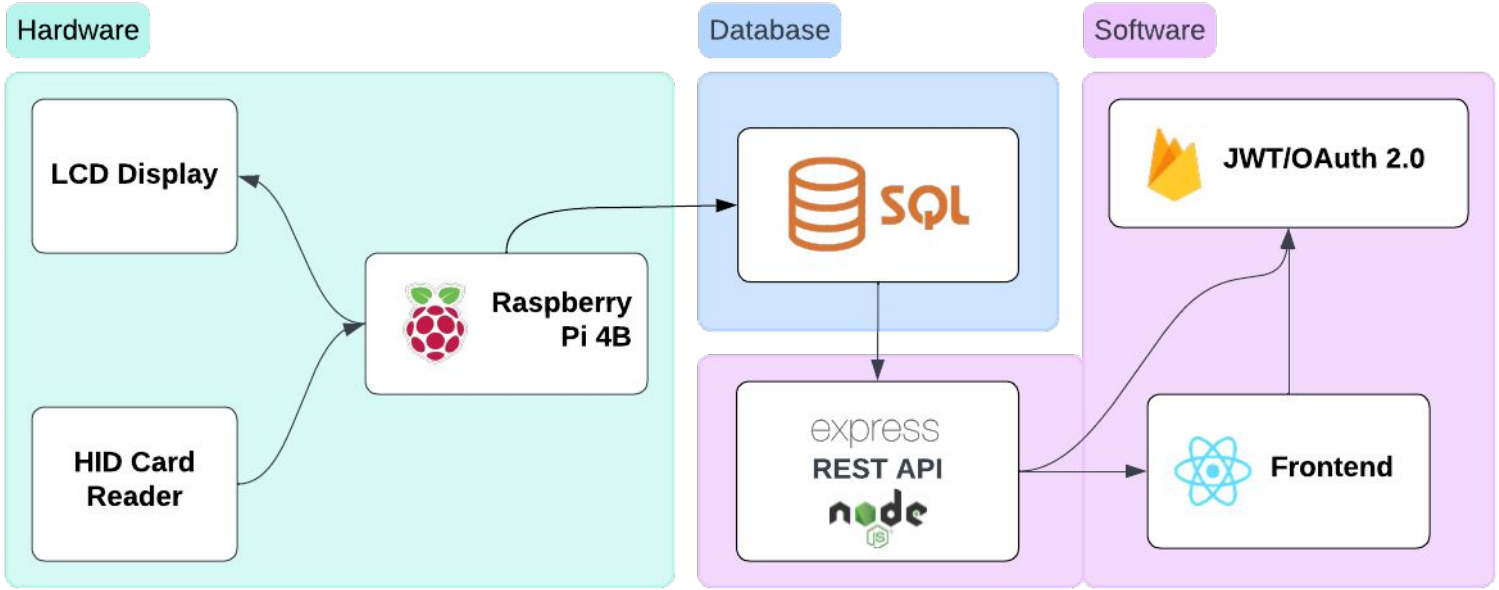


Integration

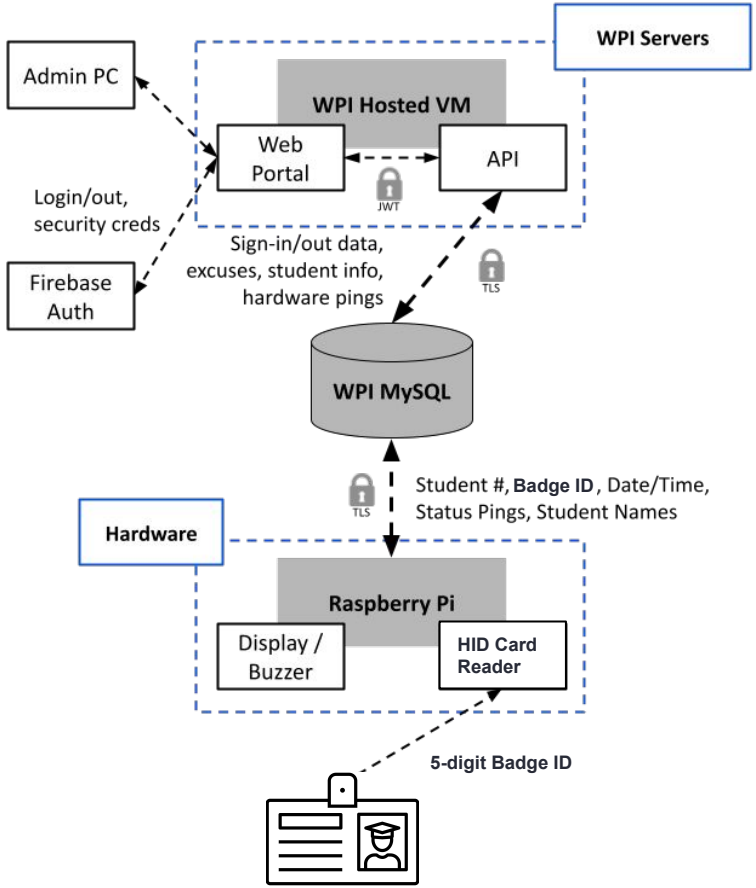
- Ported Arduino code (C++) to RasPi (Python)
- Met with IT to get badge ID to student ID mapping for DB integration

3. Architecture and Tools

High-Level Flow Chart



Stack and Data Flow



Summary

Software

- Pages for daily logs, historical logs, metrics, recent entries, calendar view, individual student attendance, and settings
  - Tags to identify students and special day handling
- Admin has full control over logs, setting student information, etc.
- RESTful API backend

Hardware

- Transitioning from key fob to student ID card
- Custom case with HID card reader, Raspberry Pi, and LCD display
- RasPi communicated with frontend through MySQL database

3. Demo

4. Reflection

Learning and Challenges

- React!
  - Wrangling components
- Git merges
- Working with a full-stack system
- Arduino + RasPi + other hardware
- Communicating effectively with IT

Next Steps

- Assemble case with RasPi, card reader, and display
- Test reader code and integrate with DB
- More metrics
- Set up regular batch queries for student info
- **Deploy at MAMS!**
- Gather user feedback

Thanks! Questions?

Admin Only

Front end: mams-siso.wpi.edu
API: mams-siso.wpi.edu/api

Public View Next.js Application

mass-academy-sign-in-system.web.app

Organization Git Repo

github.com/DigitalSignInMams

- Contains documentation
- Diagrams
- Log of work

Acknowledgements

Tarun, Charles, David - Making a great project and being great mentors

Mrs. Taricco – Primary Advisor

WPI ARC + IT Team – IT Support & DevOps

Mass Academy Admin + Students – Testing

Amy Chen – Artwork

Mingle Li, undergrad @ NEU – Provided advice for faster queries

William Chen, student @ Quarry Lane School, CA - Linux service script bug fix help