

**MICHIGAN STATE**  

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**UNIVERSITY**

# Project Plan Presentation

## Time Cube

The Capstone Experience

Team Vectorform

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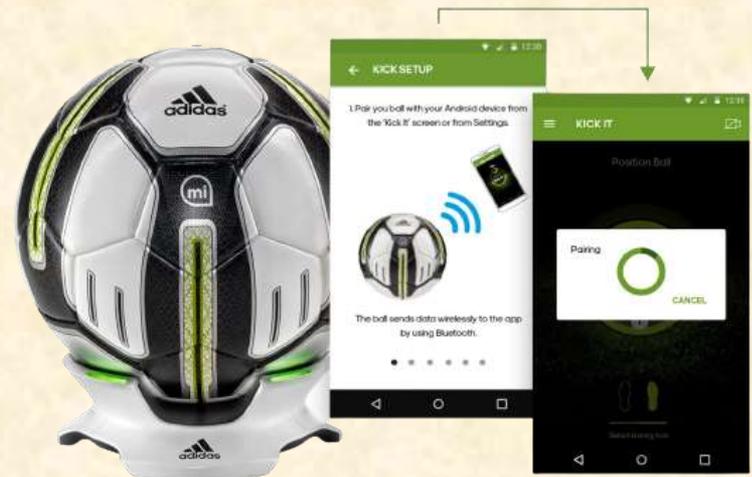
*From Students...  
...to Professionals*

# Project Sponsor Overview

- Invention Company
  - “We Invent the Future”
- Company Values:
  - Invent through Collaboration
  - Invent for Humans
  - Invent to Create Value
  - Invent the Impossible
  - Invent the Future



## Vectorform



# Project Functional Specifications

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- Time Cube
  - Track time spent on billable projects
  - Using a desktop device monitoring system
  - To provide accurate, automatic time tracking
  - Electronically without intruding on employee privacy



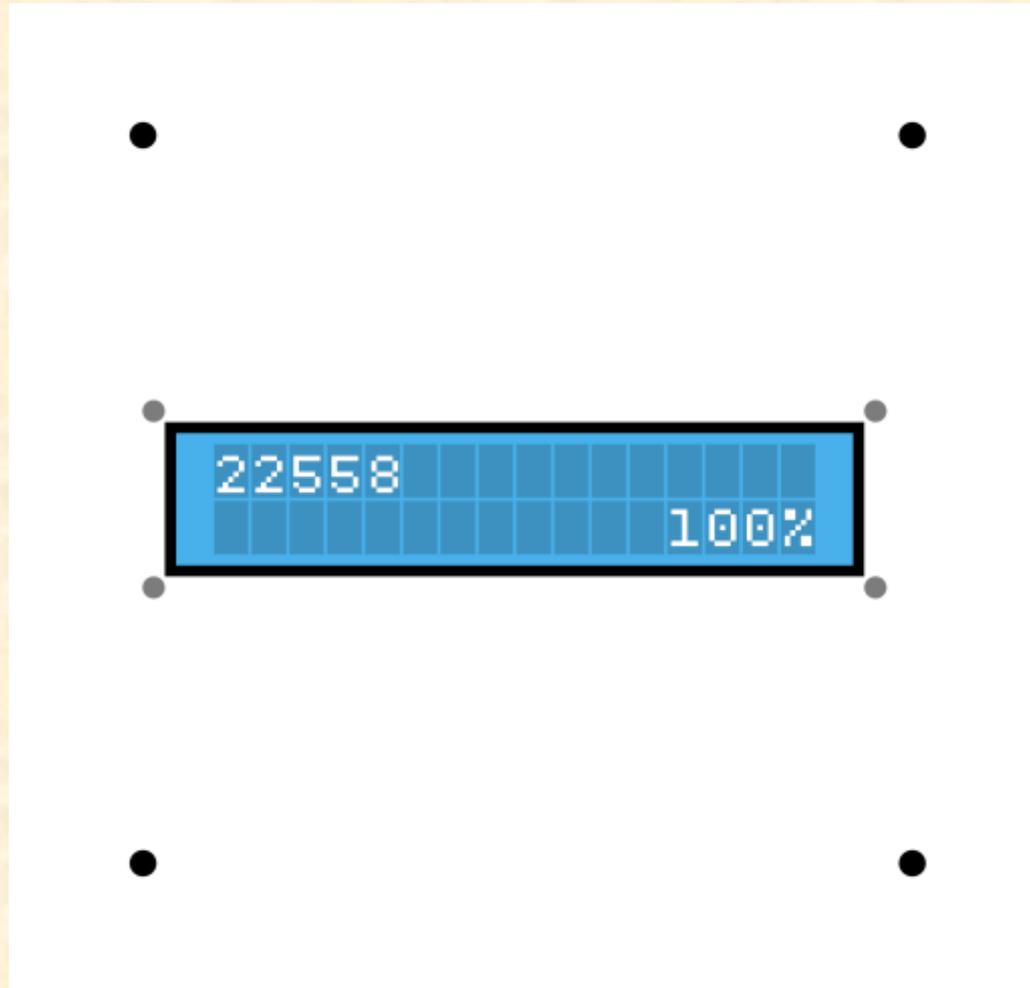
# Project Design Specifications

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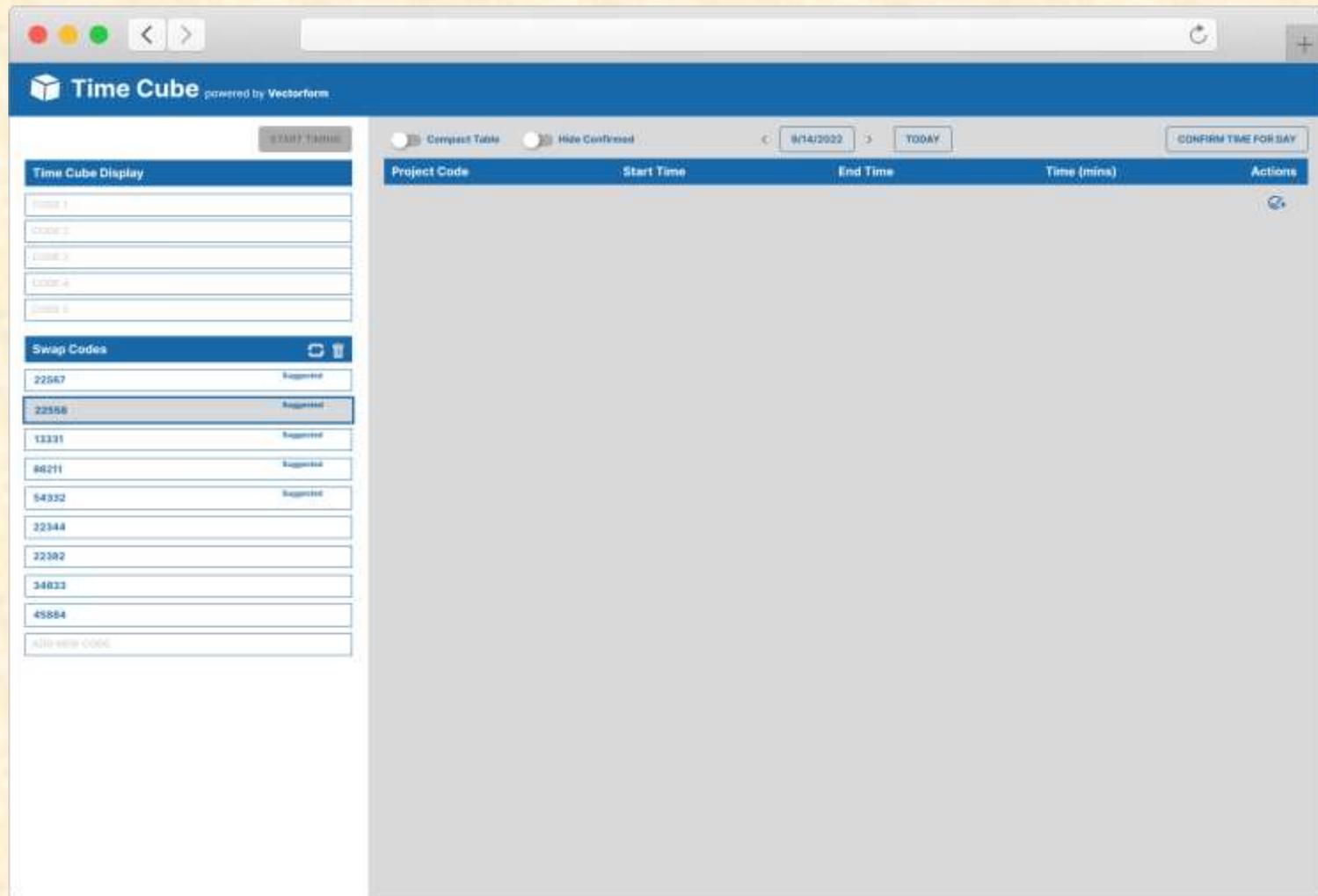
- Time Cube displays Project Codes and battery life
- Web application where users can configure Time Cube display
- Sync suggested Project Codes
- Display generated time entries
- Ability to add, change, and remove time entries



# Screen Mockup: Time Cube



# Screen Mockup: Web Application



# Screen Mockup: During Timing

The screenshot shows a web browser window displaying the 'Time Cube' application. The interface is divided into several sections:

- Header:** 'Time Cube powered by Vectorform' with a logo on the left and navigation icons on the right.
- Left Panel:**
  - Time Cube Display:** A list of project codes: 22558, 85211, 54322, 22282, 34833.
  - Swap Codes:** A list of codes with 'Suggested' labels: 23567, 19331, 22344, 45884, and a link for 'All 4000 Codes'.
- Right Panel:**
  - Controls:** 'Compact Table' and 'Hide Confirmed' toggle buttons, a date selector for '8/14/2022', a 'TODAY' button, and a 'CONFIRM ENTRIES' button.
  - Table:** A table with columns: Project Code, Start Time, End Time, Time (mins), and Actions. The first row shows '22558' and '7:05 AM'.



# Screen Mockup: After Timing

The screenshot displays the 'Time Cube' application interface, powered by Vectorform. The interface is divided into several sections:

- Header:** 'Time Cube powered by Vectorform' logo and navigation icons.
- Left Panel:**
  - Time Cube Display:** A list of project codes: 22558, 88211, 54332, 22382, 34833.
  - Swap Codes:** A list of swap codes: 23567 (Suggested), 19331 (Suggested), 22344, 45884, and a field for 'Add New Codes'.
- Main Table:** A table showing project timing data for 9/14/2022. The table includes columns for Project Code, Start Time, End Time, Time (mins), and Actions. The data is as follows:

Project Code	Start Time	End Time	Time (mins)	Actions
22558	7:55 AM	9:12 AM	77	/ [trash]
88211	9:12 AM	9:46 AM	34	/ [trash]
54332	9:46 AM	11:04 AM	88	/ [trash]
BREAK	11:04 AM	11:36 AM	12	/ [trash]
22382	11:36 AM	12:10 PM	34	/ [trash]
BREAK	12:10 PM	1:00 PM	55	/ [trash]
22558	12:10 PM	2:20 PM	130	/ [trash]
88211	2:20 PM	3:43 PM	83	/ [trash]
22558	3:43 PM	5:02 PM	79	/ [trash]
- Right Panel:** A 'CONFIRM TIME FOR DAY' button.



# Screen Mockup: Submission Box

The screenshot displays the 'Time Cube' application interface, powered by Vectorform. The main window features a blue header with the application name and a navigation bar. On the left, there are sections for 'Time Cube Display' and 'Swap Codes'. The central area contains a table of time entries for a specific date (9/14/2022). A modal dialog box is overlaid on the table, displaying a summary of recorded minutes.

**Time Cube Display**

22558
88211
54332
22282
34833

**Swap Codes**

23567	Suggested
19331	Suggested
22344	
45884	
All 9/14/2022	

**Time Entries Table**

Project Code	Start Time	End Time	Time (mins)	Actions
22558	7:55 AM	9:12 AM	77	/
88211	9:12 AM	9:46 AM	34	/
54332	9:46 AM	11:24 AM	88	/
BREAK	11:24 AM	11:36 AM	12	/
			34	/
			55	/
			130	/
			83	/
			79	/

**Submission Box Summary**

602 minutes have been recorded

Project Code	Total (mins)
54332	88
88211	117
22282	34
22558	286
BREAK	87

Done



# Screen Mockup: Confirmed Entries

The screenshot displays the 'Time Cube' application interface, powered by Vectorform. The interface is divided into several sections:

- Header:** 'Time Cube powered by Vectorform' logo and navigation icons.
- Left Panel:**
  - Time Cube Display:** A list of project codes: 22558, 85211, 54322, 22382, 34833.
  - Swap Codes:** A list of swap codes with 'Suggested' status: 23567, 19331, 22344, 45884, and a field for 'Add New Codes'.
- Main Content Area:**
  - Controls:** 'START TIMING' button, 'Compact Table' and 'Hide Confirmed' toggle switches, date selector '8/14/2022', 'TODAY' button, and 'CONFIRM ENTRIES' button.
  - Table:** A table with columns: Project Code, Start Time, End Time, Time (mins), and Actions. It contains 10 rows of confirmed entries.

Project Code	Start Time	End Time	Time (mins)	Actions
22558	7:00 AM	8:12 AM	77	
85211	8:12 AM	9:48 AM	94	
54322	9:48 AM	11:24 AM	96	
BREAK	11:24 AM	11:30 AM	12	
22382	11:30 AM	12:10 PM	34	
BREAK	12:10 PM	1:00 PM	50	
22558	12:10 PM	2:30 PM	138	
85211	2:30 PM	3:42 PM	83	
22558	3:42 PM	5:02 PM	79	



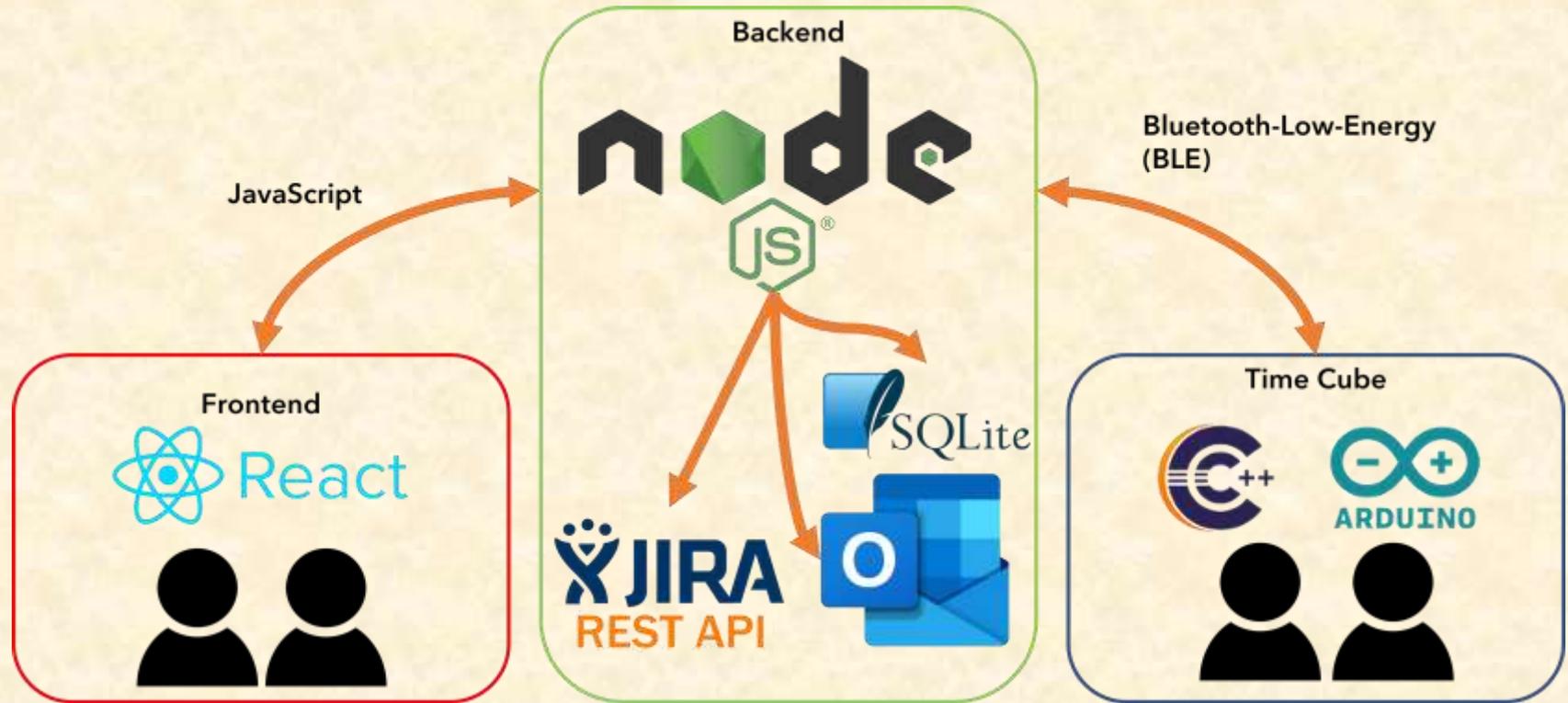
# Project Technical Specifications

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- Time Cube comprised of multiple low-level components
- Desktop middleware and backend application
- Frontend web application



# Project System Architecture



# Project System Components

- Hardware Platforms
  - Arduino MKR 1010 Wi-Fi - Time Cube
- Software Platforms / Technologies
  - Bluetooth Low Energy (BLE)
  - React
  - Node.js
  - SQLite
  - Jira API
  - Outlook Calendar API



# Project Risks

- Bluetooth Communication
  - The web application needs to communicate with the Arduino via Bluetooth. The data needs to be accurately sent in a timely manner
  - Research BLE and get the web application and Arduino communicating as soon as possible
- Tracking Accelerometer and Time Data
  - The orientation needs to be accurately tracked so the Time Cube does not record wrong entries
  - Test multiple time implementations to determine the most stable and efficient method for transitioning between project codes
- Deriving Project Code from API Data
  - The web Application needs to derive and suggest project code from the user's calendar and project management board
  - Research and determine received from APIs. Build mock data for determining the best data point to concentrate on



# Questions?

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