Alpha Presentation
Time Cube
The Capstone Experience
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Project Overview

• Time Cube
  ▪ Web application that tracks time spent on billable projects
  ▪ Using a physical device
  ▪ To provide accurate, automatic time tracking
  ▪ Electronically without intruding on employee privacy
  ▪ Ability to add, change, and remove time entries
System Architecture

Bluetooth-Low-Energy (BLE) -> Time Cube

Bluetooth-Low-Energy (BLE) -> Frontend

JavaScript

Backend

Node.js

SQLite

REST API

JIRA

React

Time Cube

Frontend
Web Application
Web Application: During Use

![Web Application Interface](https://vectorform-timecube.com/)

<table>
<thead>
<tr>
<th>Project Code</th>
<th>Start Time</th>
<th>End Time</th>
<th>Time(mins)</th>
<th>Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>28734-Home-Energy</td>
<td>8:00AM</td>
<td>9:00AM</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>41954-HMI-Widget</td>
<td>9:00AM</td>
<td>10:20AM</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>17504-Fleet-Diagnostics</td>
<td>10:20AM</td>
<td>11:15AM</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>87624-HB-Connect</td>
<td>8:00AM</td>
<td>9:00AM</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>41954-HMI-Widget</td>
<td>9:00AM</td>
<td>10:20AM</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>32134-HoloLens-2</td>
<td>10:20AM</td>
<td>11:15AM</td>
<td>55</td>
<td></td>
</tr>
<tr>
<td>92714-Smart-Home</td>
<td>11:15AM</td>
<td>11:30AM</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

Connect Device: Time-Cube-03

Time Cube Display:
- 41954-HMI-Widget
- 32134-HoloLens-2
- 92714-Smart-Home
- 28734-Home-Energy
- 87624-HB-Connect

Swap Codes:
- 17564-Fleet-Diagnostics
- 87546-Augmenting-SmartCity
- 44323-BLE-Sport
Confirming Entries
What’s left to do?

• Battery display
• Cube state machine
• Table toggles
• Date widget
• Edit entries
• Confirm entries
• Calendar API integration
End of slide show, click to exit.
Project System Architecture

- **Frontend**: React
- **Backend**: Node.js
- **SQLite**: REST API
- **Bluetooth-Low-Energy (BLE)**
- **Physical Cube**: C++, Arduino

Diagram shows the integration of frontend, backend, and physical components in the project system architecture.
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
Orientation Mitigation

Threshold: 8.0
Threshold: 9.5
Threshold: 9.0