MICHIGAN STATE UNIVERSITY

Project Plan

"Alexa- what's my work schedule look like?"

The Capstone Experience

Team Union Pacific

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From Students…
…to Professionals

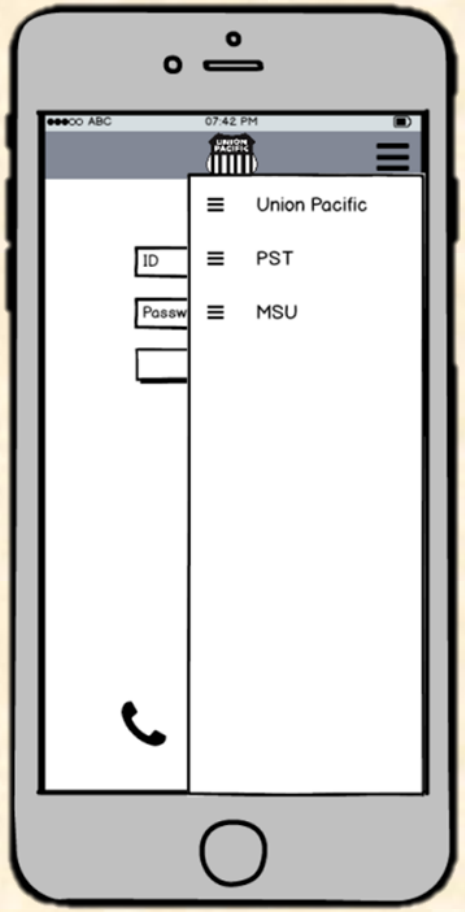
Functional Specifications

- Union Pacific train drivers have crazy schedules that are constantly changing
- Drivers assigned to a train by matching an employee queue to a train lineup
- They want to give the train conductors the ability to check these queues via popular voice assistants
- The primary goal of this project is to create apps for Amazon Echo, Google Home, and Siri that can inform train conductors of their upcoming assignments when requested

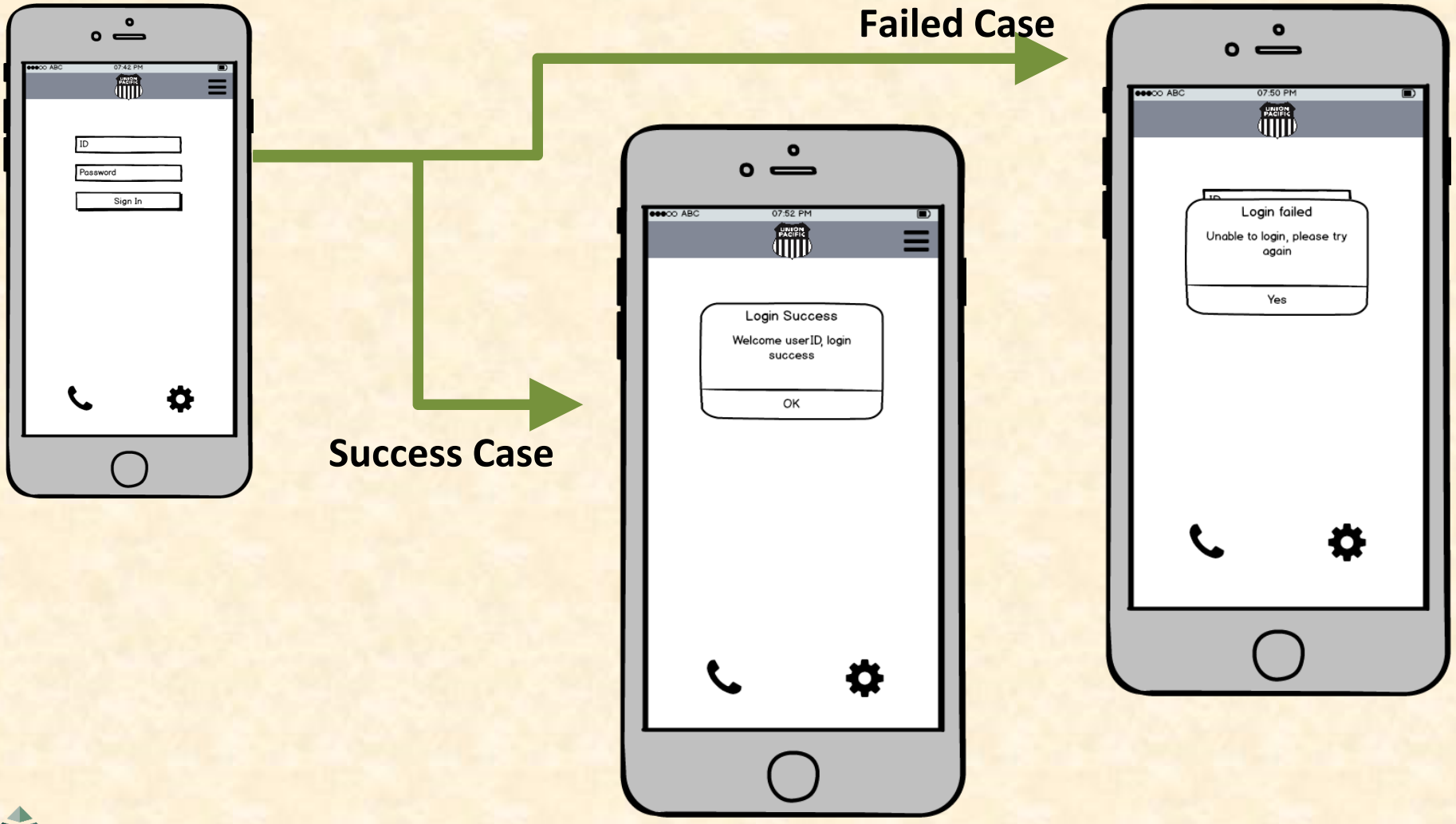
Design Specifications

- Each voice assistant will have application that allows a user to request their “times out” or the current train lineup
  - “Times out” is a company term for an employees place in the queue i.e. 4 times out is 4th in queue
- Requests sent to backend server which handles database calls and responds with information
- Mobile iOS application to easily modify settings and provide Siri implementation

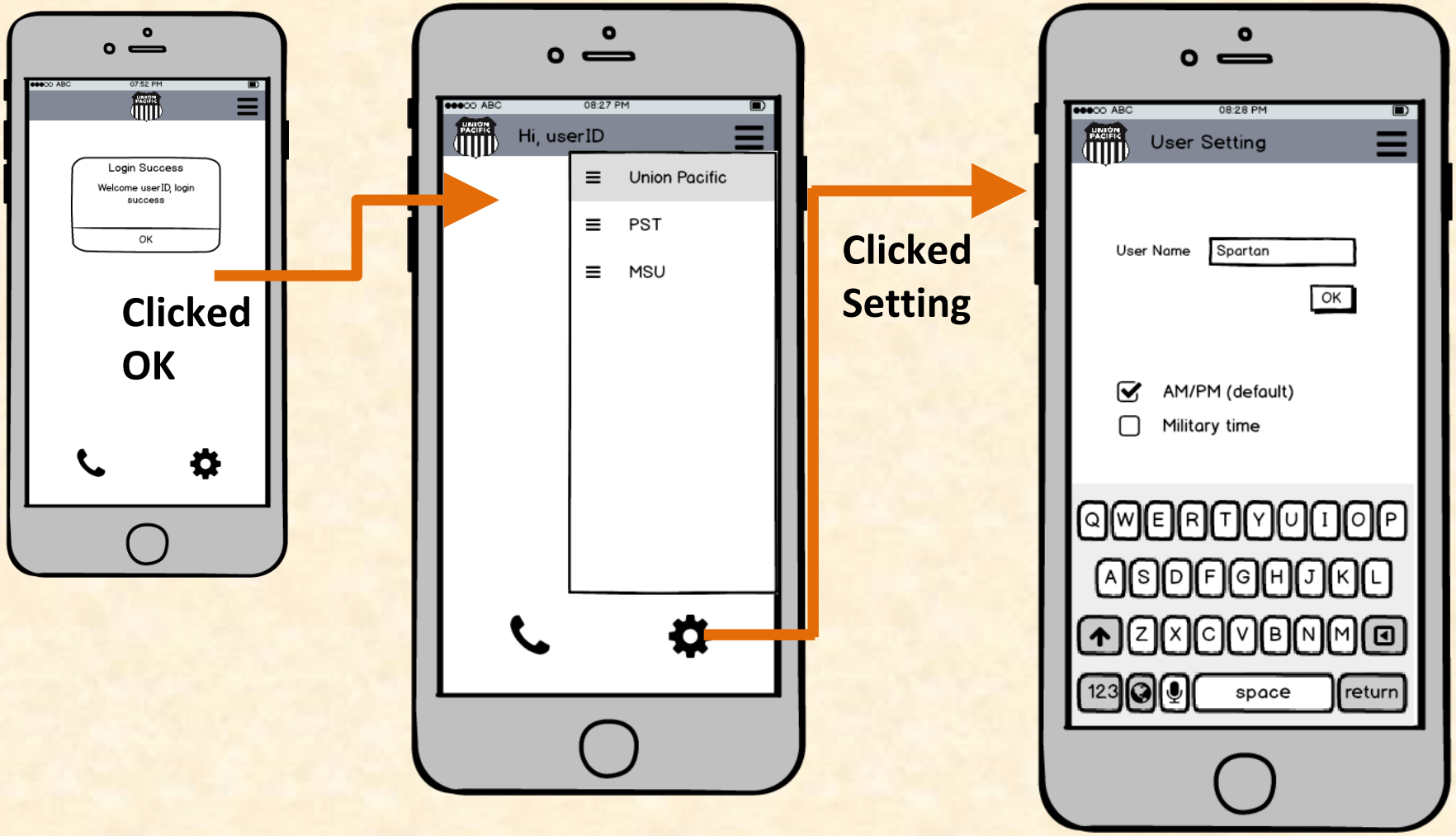
Screen Mockup: Mobile Application



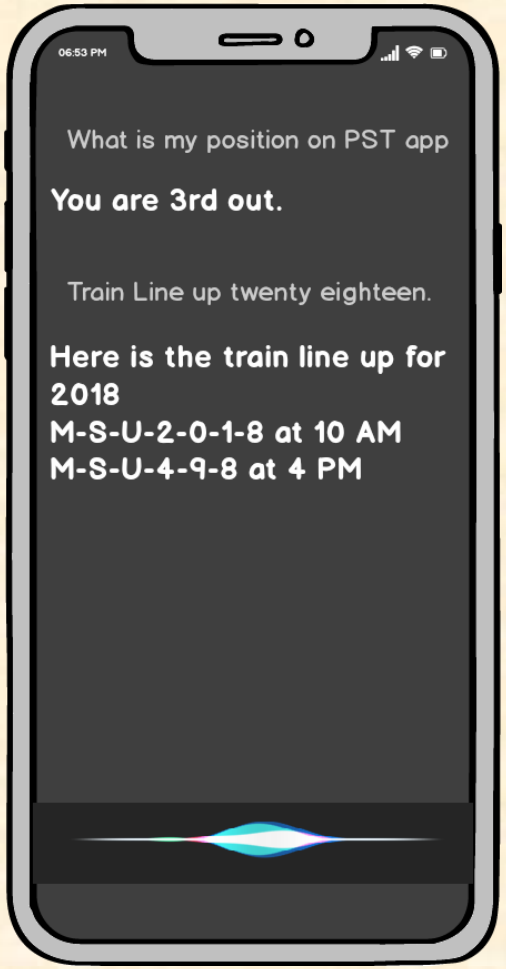
Screen Mockup: Mobile Application



Screen Mockup: Mobile Application



Screen Mockup: Assistant Conversation



Alexa, open the PST app.

Hello Sparty, what can I help for you today?

What's my times out?

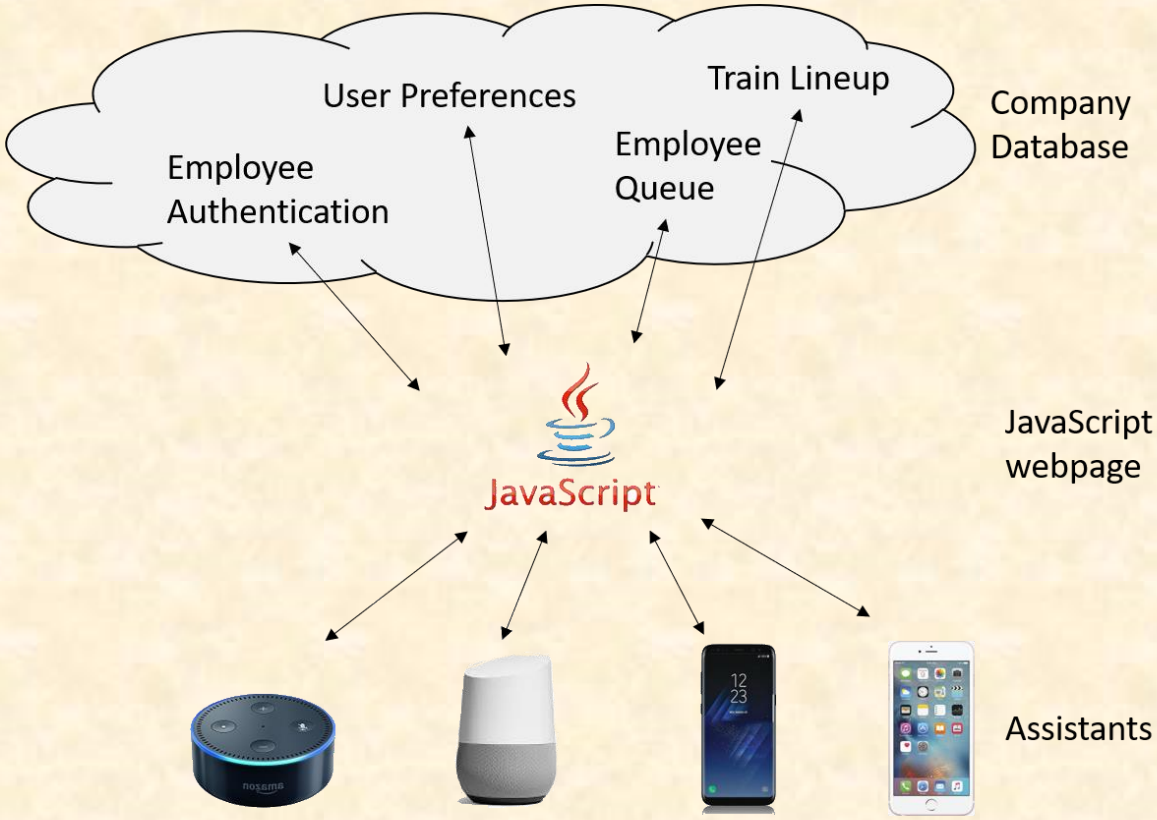
You are currently 4th out right now.

Thanks, that's all.

Technical Specifications

- Assistants (**Google Assistant**, **Apple Siri**, **Amazon Alexa**) interact with backend
- **Ubuntu Server** hosts our MySQL database, OAuth 2.0 server, and backend webpages
- **OAuth 2.0 server** used for authentication
- **MySQL database** stores user information
  - Also have 2 mock databases to hold testing info
- **JavaScript webpages** used to respond to assistant request with database information

System Architecture



System Components

- Hardware Platforms
  - Assistants
  - Ubuntu Server
- Software Platforms / Technologies
  - PHPStorm (Javascript, HTML, ajax, PHP)
  - OAuth 2.0 Server (installed on Ubuntu Server)
  - Xcode (Swift)
  - Google Developers and Amazon Developer Console
  - MySQL

Risks

- Risk 1: Authentication
  - Users will enter a username and password which are sensitive information. We will be utilizing OAuth2.0 for secure authentication but we have no experience with this.
- Risk 2: Project Scope
  - Concerns arose about the scope of our project and our clients have agreed to add on additional features. Adding new features after we have planned development will require us to change our plans and adjust quickly.
- Risk 3: Schedule Scalability
  - With over 8,500 locomotives Union Pacific deals with lots of train drivers and has constantly updating schedules. Our database will need to be quick and flexible to meet these demands.
- Risk 4: Server and Database Interaction
  - Clients want us to use JavaScript as much as possible and we are unsure about the interaction between JavaScript and a database. Will be exploring options using JQuery.

Questions?