MICHIGAN STATE UNIVERSITY

Project Plan

Navigation Assistance and Accident History App

The Capstone Experience

Team Auto-Owners

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From Students…
…to Professionals

Project Overview

- Assist drivers in avoiding higher risk accident areas by utilizing historically safer routes.
- Give drivers insight to their driving habits by monitoring braking/acceleration levels as well as speeding habits.
- Create a web app for users to view their personal stats and for Auto-Owners Insurance administrators to view overall driving statistics.
- The goal for this application is to be **Quick**, **Simple**, & **Safe**.

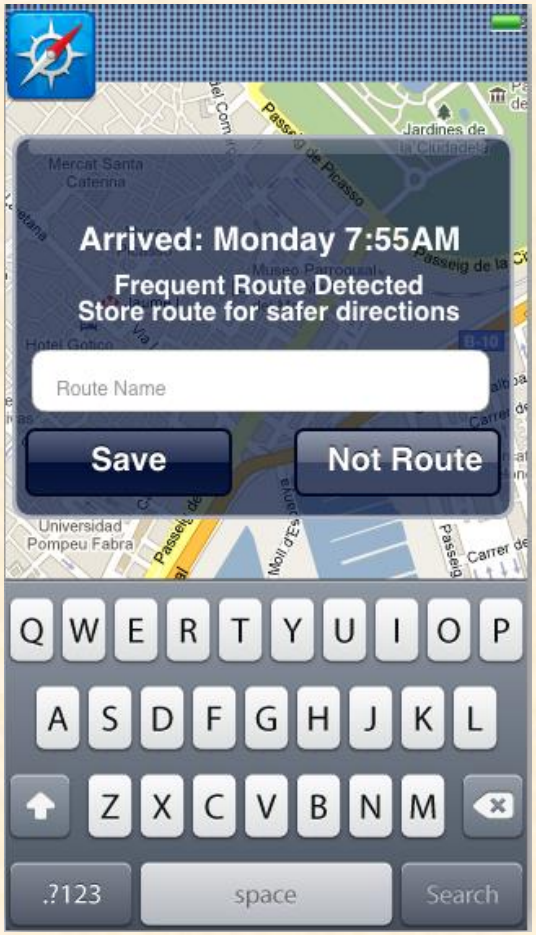
Functional Specifications

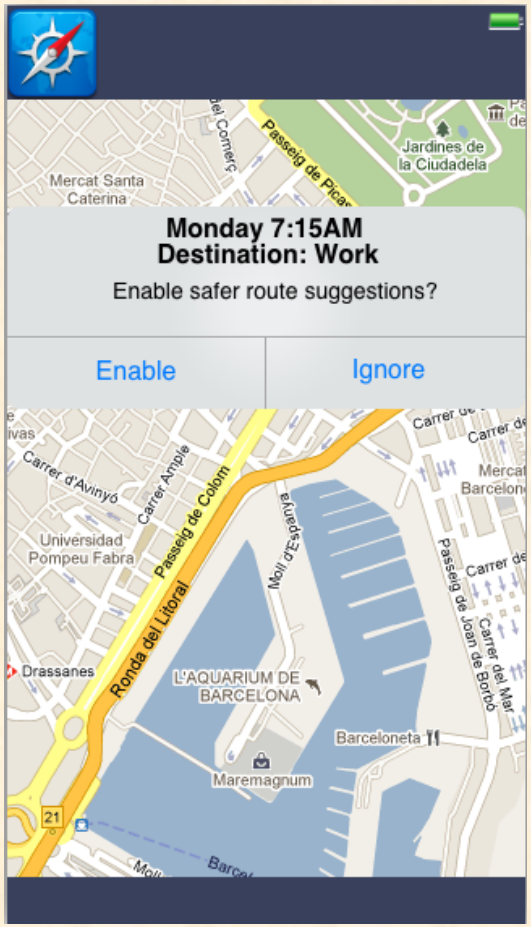
- There will be 2 stages of use for the application.
  - Learning Stage - Where the app learns the users daily routes. This will take 1 week by default, but can be configurable.
  - Safe Nav Stage - Where the app can provide alternate safer routes to the user for their daily routines.
    - The application will show two alternate routes
- The application will take accident data from Michigan's data portal
  - We'll import accident data into our database through a service for application use
  - Jobs will be set up to keep the database updated
- Application will not be responsible for GPS tracking functionality
  - Application will port out selected driving routes to the native phone maps app

Design Specifications

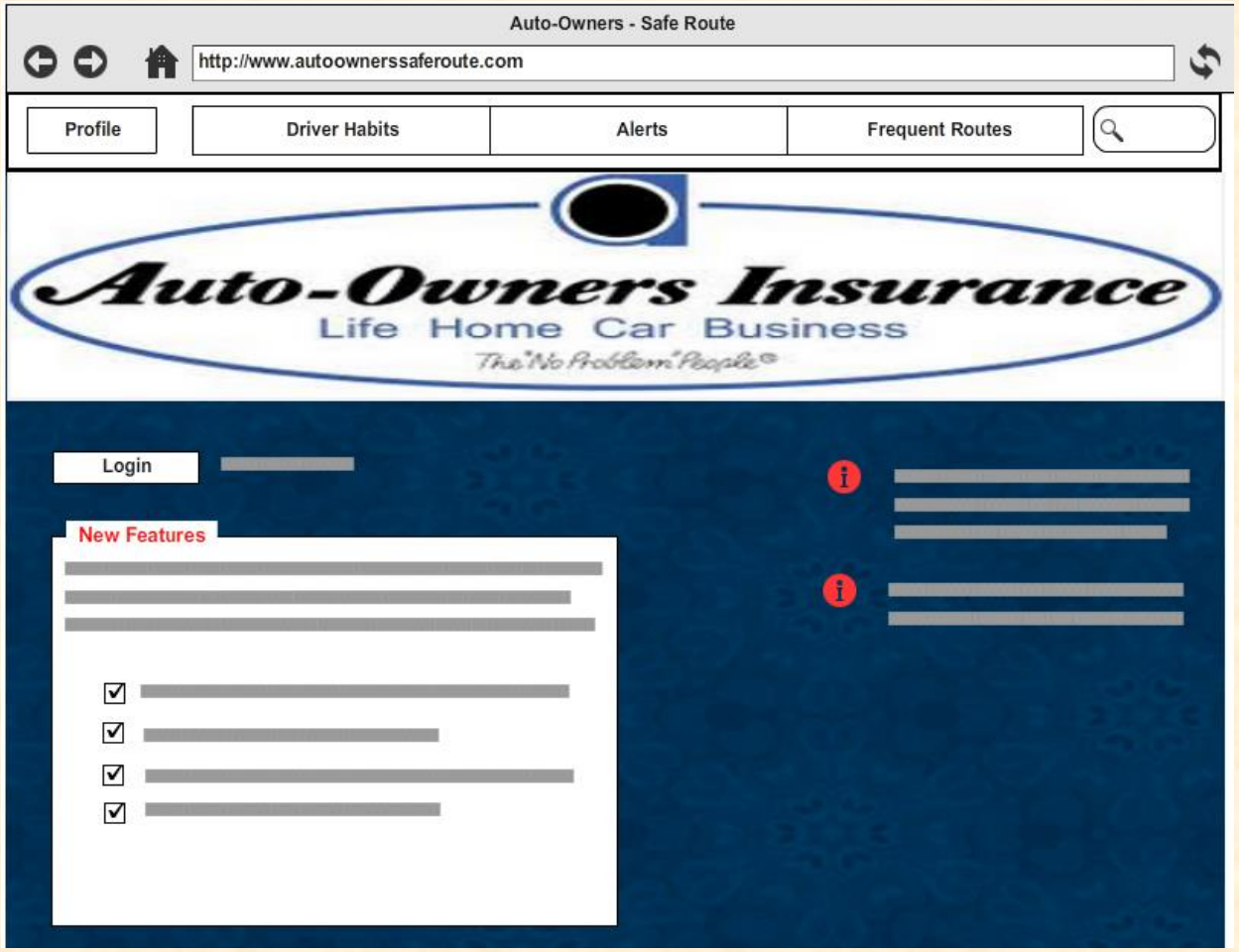
- Hands free interaction with mobile application
  - Goal of the app is to make driving safer
  - App needs to function in the background with minimal user input
  - We need to communicate messages and alerts in a way that is minimally distracting
    - Audio alerts and the ability to disable push alerts will help mitigate this issue
    - Even with alerts disabled, the application will still record incidents such as speeding, breaking, acceleration habits to the users profile
- Multiple case use
  - A list of frequently visited places and an address bar will allow the user to calculate a route from their current location
    - This will make sure users are not limited to driving specific routes at specific times

Screen Mockup: iOS Application





Screen Mockup: Web Application - User

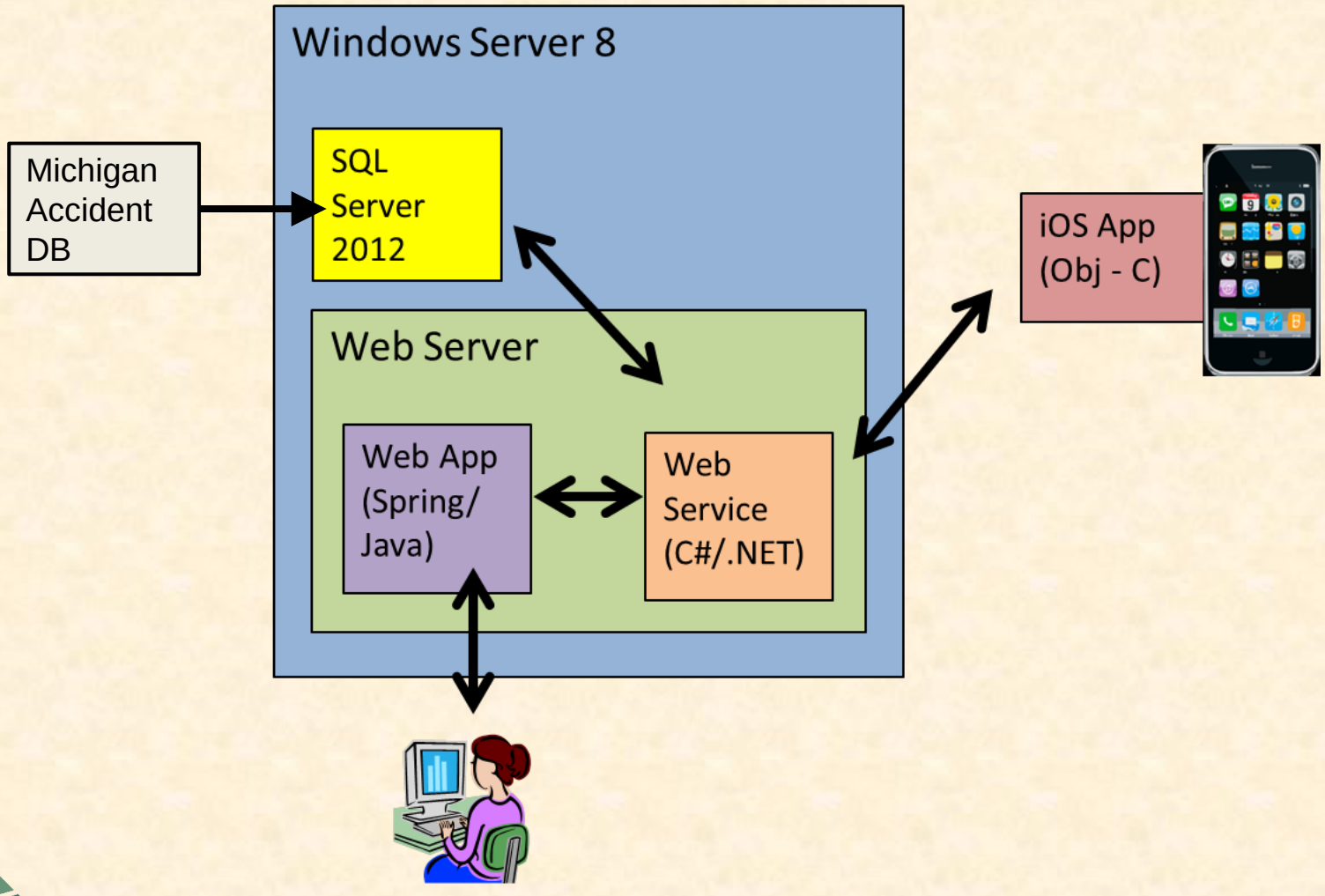


Screen Mockup: Web Application - Admin

Technical Specifications

- SQL Server 2012
  - For holding various driving information, login information, and statistics.
- Web Service
  - For pulling the information from the database to push to client applications.
- iOS Application
  - For calculating and tracking users statistics and driving history. This will push/pull all information to the web service.
- Web Application
  - For users to view their personal statistics and for admins to view general statistics of app users. This will only pull information from the web service.

System Architecture



System Components

- Hardware Platforms
  - iPhone (iOS App) & Android (Possibly)
  - Personal computer (Web App)
  - Dell rack mount server (SQL Server 2012, Web Server, Windows server 8)
- Software Platforms / Technologies
  - Web App
    - Program Coding - Java, the Spring Framework
    - Web Coding - HTML, CSS, Bootstrap Framework
    - IDE - Eclipse
  - iOS app
    - Program Coding - Objective-C
    - IDE - Xcode
  - Web Service
    - Program Coding - C#, ASP, .NET Framework, Entity Framework
    - IDE - Visual Studios 2012

Testing

- Field Testing
  - We plan on putting the application on everyone's phone and using it for 2 weeks.
- Simulation Testing
  - Xcode provides a simulator we can feed data to on the computers.
- Unit Testing
  - Visual Studios offers great unit testing for our code. We will also use JUnit for the Java code.
- Load Test
  - Get as many users as we can to use the application at the same time to ensure it works under stress. (Friends, Auto-Owners staff)

Risks

- Determining common user locations without any user input.
  - Determine general areas that the user travels to rather than specific locations.
- Pushing safe routes in real time
  - Saving historical data to the app so that it doesn't have to pull this information every time the user is going to a specific location. This way the app only needs to check for traffic/accident updates
- Web architecture
  - Research still being done. Possibly have to use another server box.
  - We will follow best practices published by W3.org
- Time constraints due to testing and learning phase
  - While testing we can configure the learning phase to a shorter time period.