MICHIGAN STATE UNIVERSITY

Project Plan

Optimizing Car Dealership Inventory

The Capstone Experience

Team Urban Science

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From Students…
…to Professionals

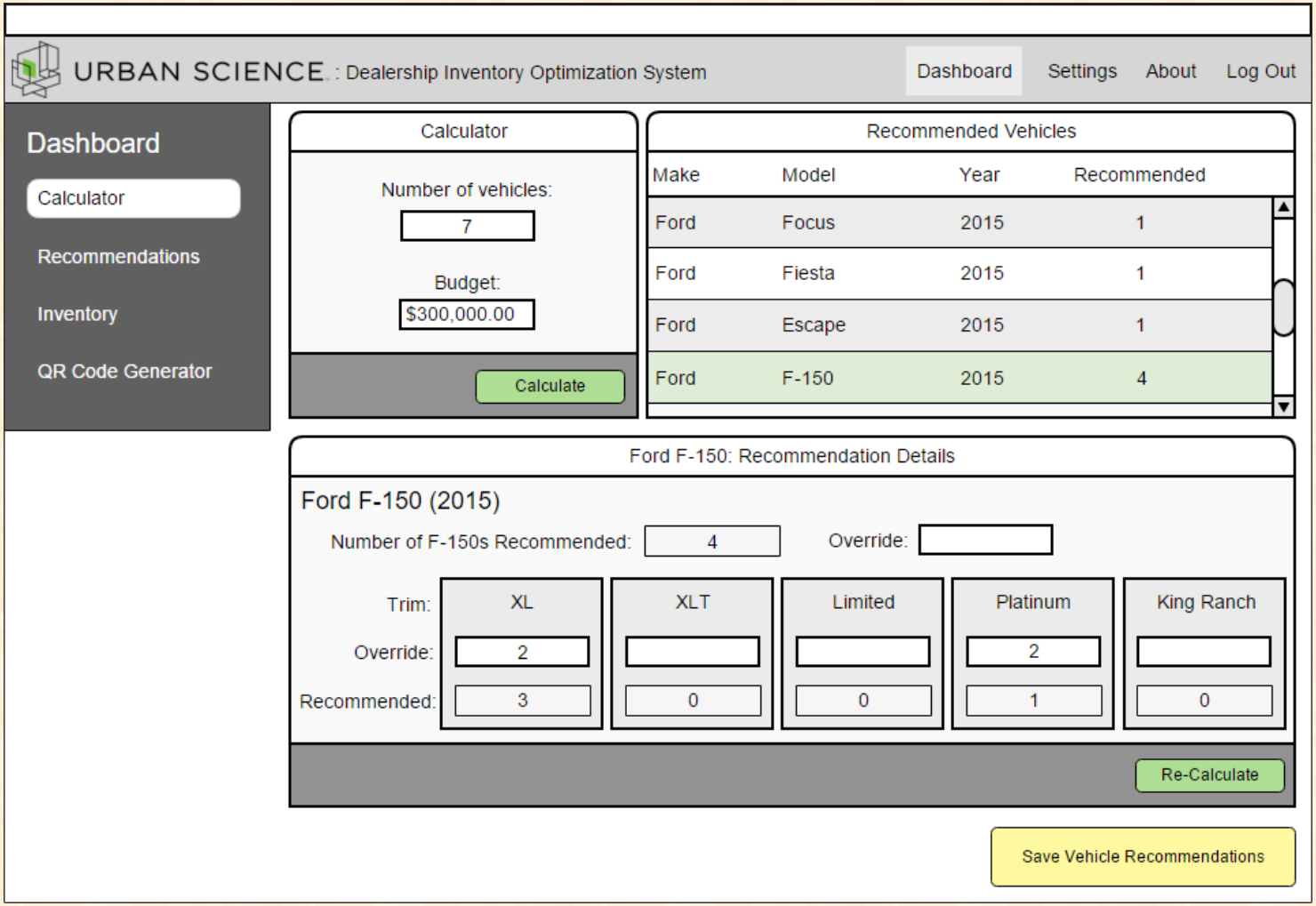
Functional Specifications

- Web Application (Dealers)
  - Assist dealerships in determining the amount and type of vehicles to purchase for their lot
  - Create QR codes to assist with vehicle tracking
- Mobile Application (Customers and Dealers)
  - Allow users to view the inventory of a dealership
  - Aid a user in finding for a vehicle on the lot
  - Remove a vehicle or update a vehicle's position

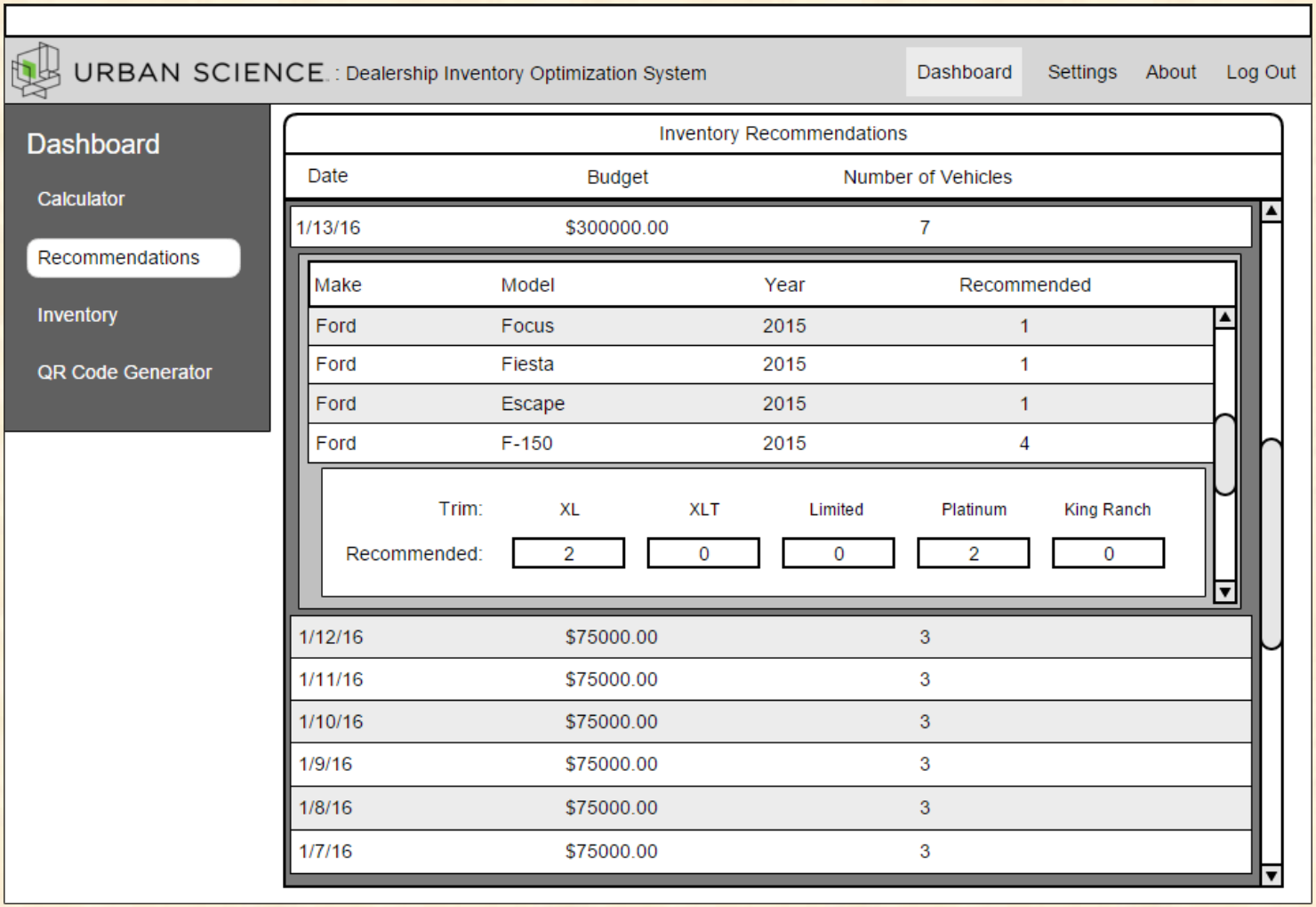
Design Specifications

- Web Application
  - Calculate and edit purchase recommendations
  - View previous purchase recommendations
  - View dealer's inventory
  - Input vehicle VINs to generate QR codes
- Mobile Application
  - Display dealer's inventory and filter vehicles
  - Direct user to a vehicle's location via a map
  - Controls for the dealer to manage vehicles

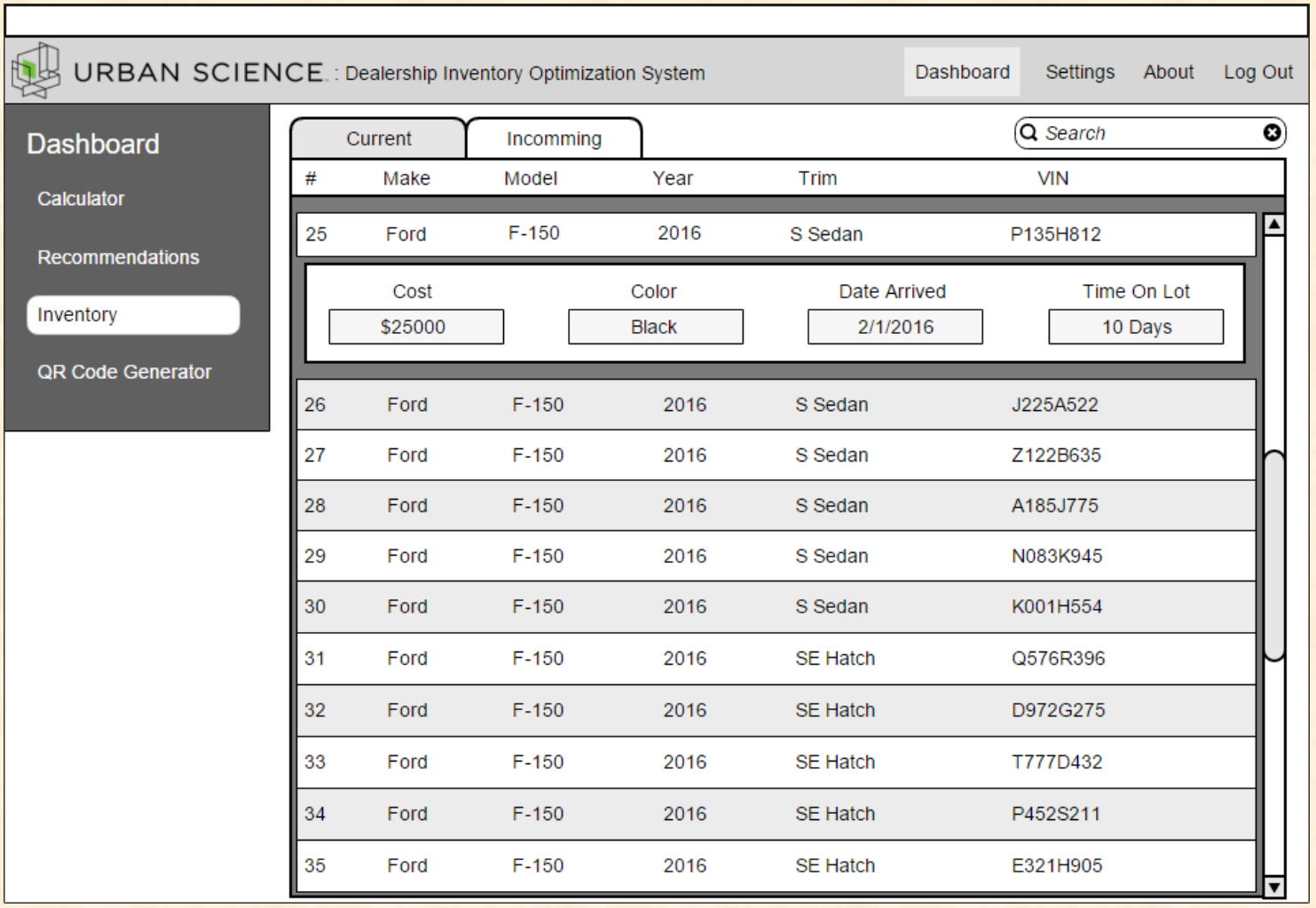
Screen Mockup: Calculator



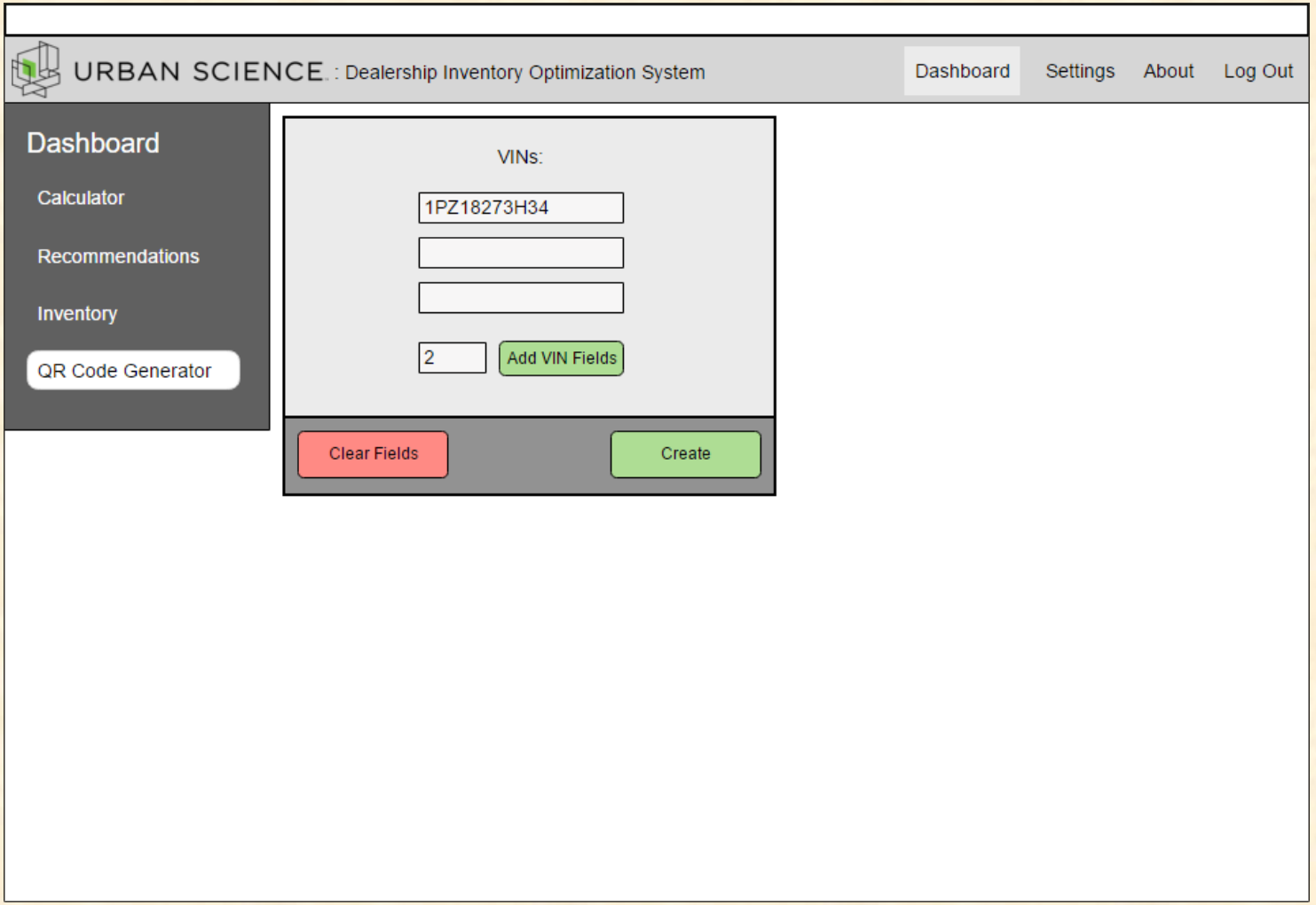
Screen Mockup: Recommendations



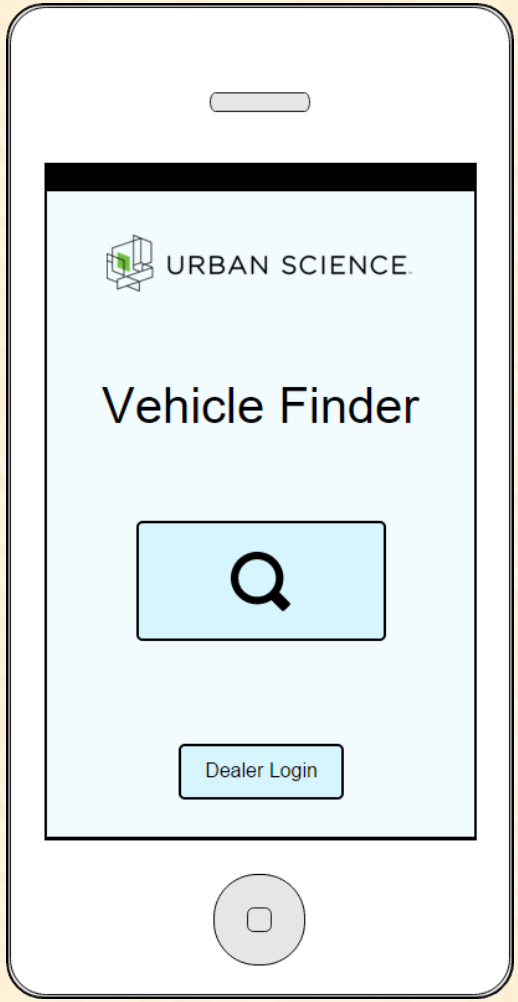
Screen Mockup: Inventory



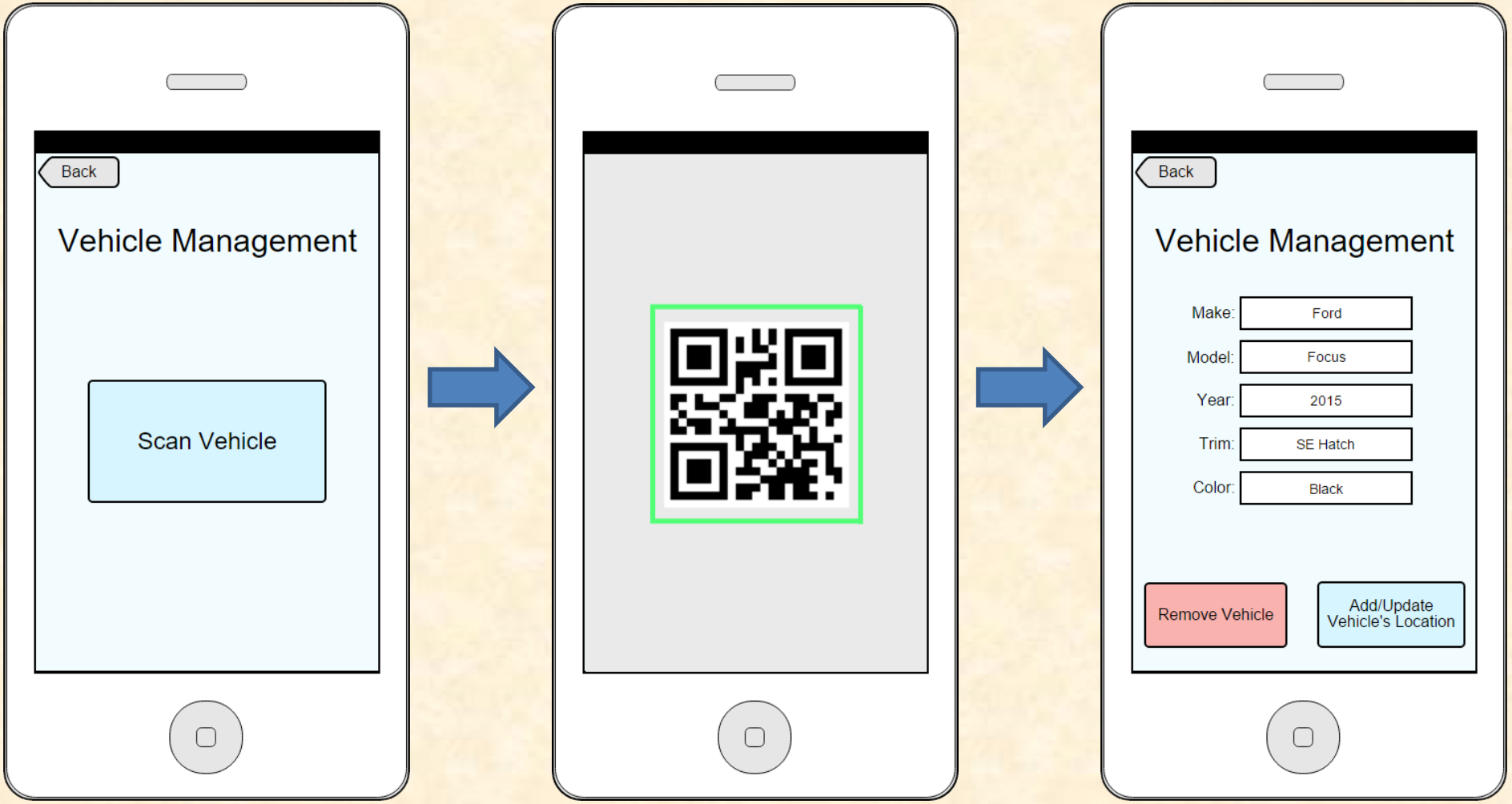
Screen Mockup: QR Generator



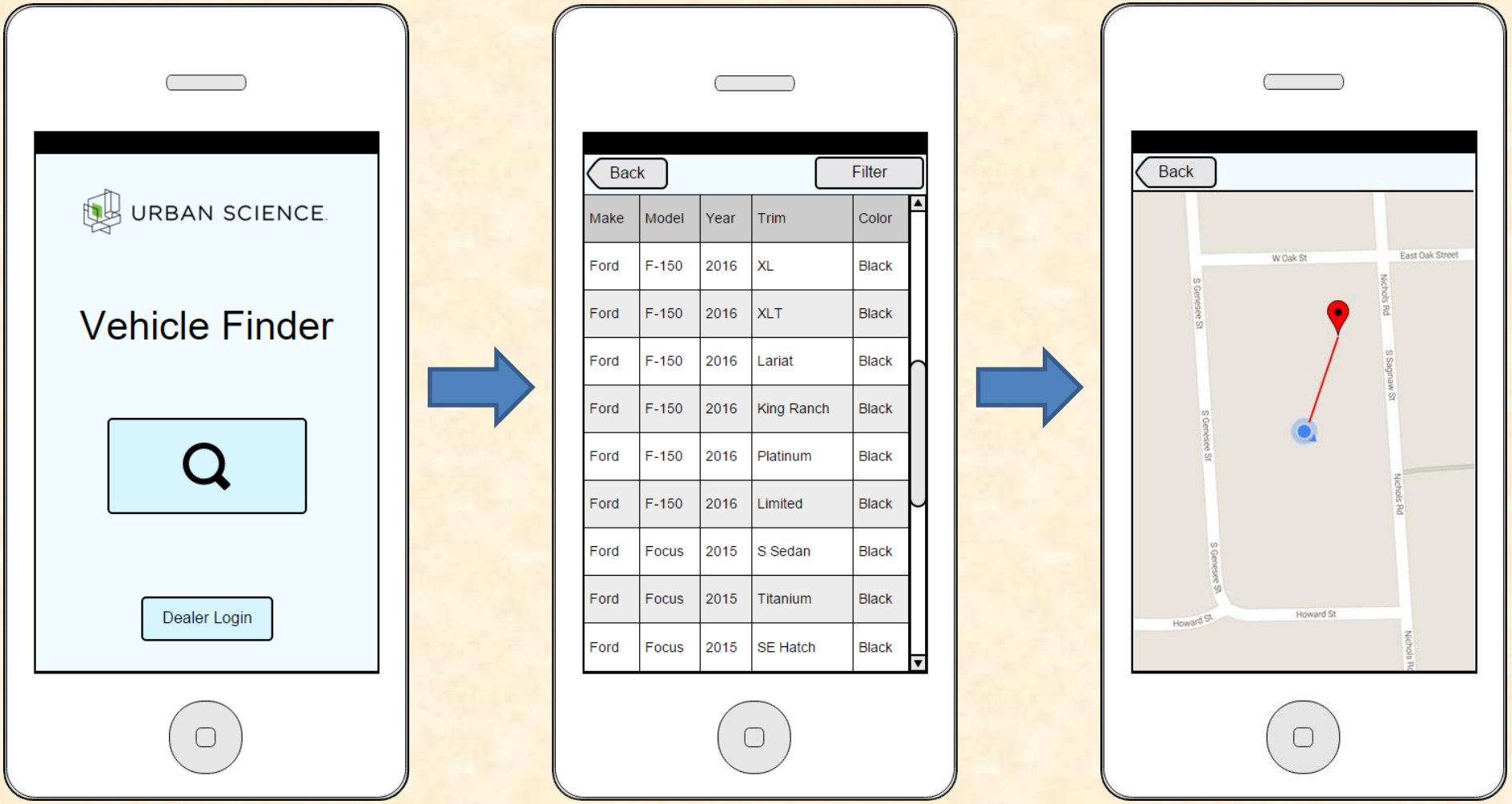
Screen Mockup: Home Screen



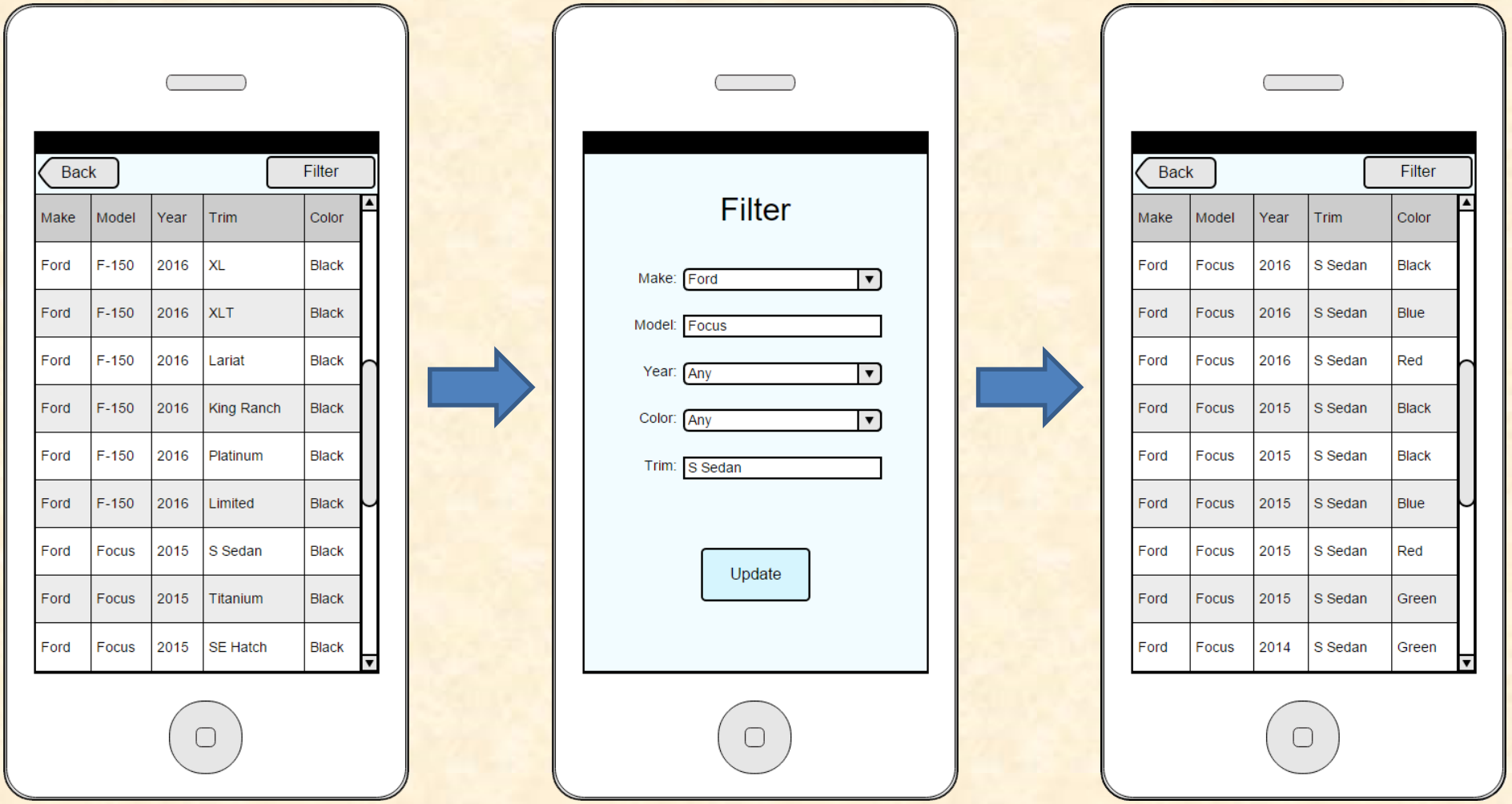
Screen Mockup: Vehicle Management



Screen Mockup: Vehicle Finder



Screen Mockup: Filter



Technical Specifications

- Server
  - Windows Server 2008 R2 Datacenter
  - IIS Web Server
  - Microsoft SQL Server 2012
- Web Application
  - Bootstrap, AngularJS, jQuery, HTML, CSS, JS
  - PHP and SQL
  - jquery.qrcode.js QR code plugin
- Mobile Application
  - Ionic Framework: HTML, CSS, and JS
  - Barcode Scanner plugin

System Architecture

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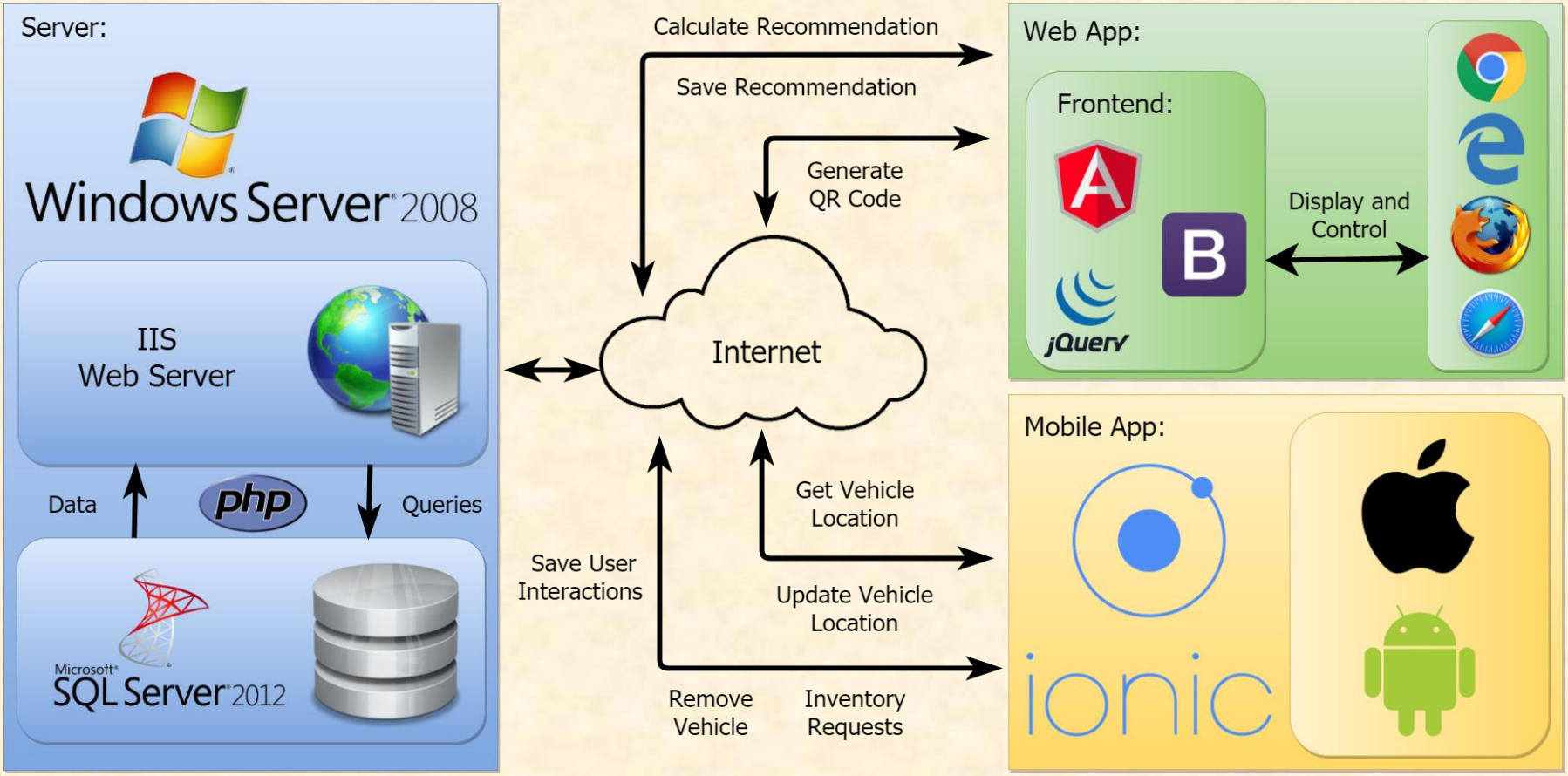

System Components

- Hardware Platforms
  - Windows Server 2008 R2 Datacenter
  - iOS and Android Devices
- Software Platforms / Technologies
  - Microsoft SQL Server 2012 Management Studio
  - Internet Information Services (IIS) 7.5
  - PhpStorm 10.0.3, Xcode 7
  - Version Control: Team Foundation Server (TFS) + Git
  - Desktop Browsers: Chrome, Firefox, Safari, etc.

Testing

- Unit-test both the web and mobile applications to ensure crucial functionality and stability
- Use mock instantiations and assertions as provided by Jasmine and Karma frameworks
- Use Karma to test web application against multiple browsers for compatibility checks
- Manual testing and exploration to check for bugs and performance reliability

Risks

- Algorithm for recommendations is in the works
  - Simulate until available and design for easy implementation
- Little experience with Ionic framework and libraries (Bootstrap, AngularJS, etc.)
  - Utilize online documentation and tutorials, as well as utilize basic templates/demos for quick prototyping and understanding
- Interface design has to be intuitive and simple
  - Frequent internal testing and reviews from our client
- Uncertainty of how to use SQL Server 2012
  - Utilize online documentation and tutorials for self-learning (along with asking our client for data-specific questions)