

MICHIGAN STATE

U N I V E R S I T Y

Project Plan

Dealer Improvement Recommender System

The Capstone Experience

Team Urban Science

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

Project Overview

- Dealer consulting services of Urban Science use a “Logic Tree”
 - A hierarchal web of goals, Key Performance Indicators (KPIs), causes, and suggestions for dealerships
- Our project: provide a complete system to model the logic tree, visualize it, modify it, and pass the updated tree to consultants in the field
- Outlook: Eventually our system may be expanded to track the effectiveness of situational recommendations and facilitate quantitative refinements to the model



Project Overview

- Four main interconnected components:
 - Backend SQL database modeling the Logic Tree
 - Application server facilitating communication between web client, database, and iPad client
 - Web client allowing U.S. to visualize and refine the model
 - Extension to existing iPad app allowing on-site consultants to make use of the updated logic tree



Functional Specifications

- Web client:
 - Display a useful visualization of the model
 - Provide functions to create new and edit existing KPIs, causes, and recommendations
 - Provide the ability to create new and edit existing weighted relationships between KPIs, causes, etc.
 - Users should provide login information
 - Changes to the model should be audited
 - Saved changes must be reflected in database



Functional Specifications

- iPad App:
 - For on-site use at dealerships by consultants
 - “Bolt-on” extension to existing (last semester’s) app
 - Reflect changes to model in the app
 - Reflect weights on relationships in the suggestions provided to the user
 - Take input of KPI data extant in the current app and produce suggestions



Functional Specifications

- Backend SQL Database:
 - Models the Logic Tree and the relational weights between components
 - Maintains a record of changes
- Application Server
 - Provides controlled access (user authentication) to the SQL database

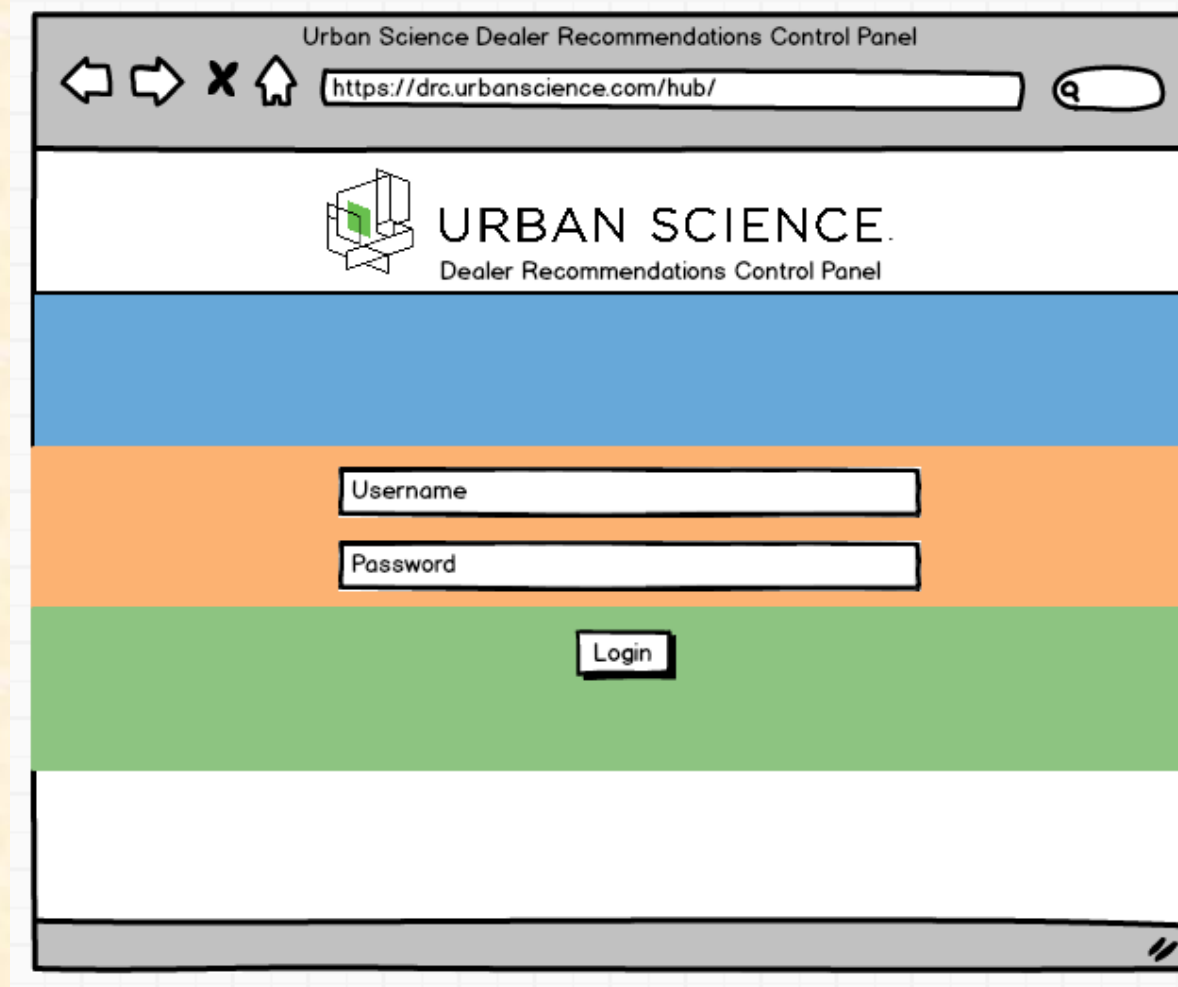


Design Specifications

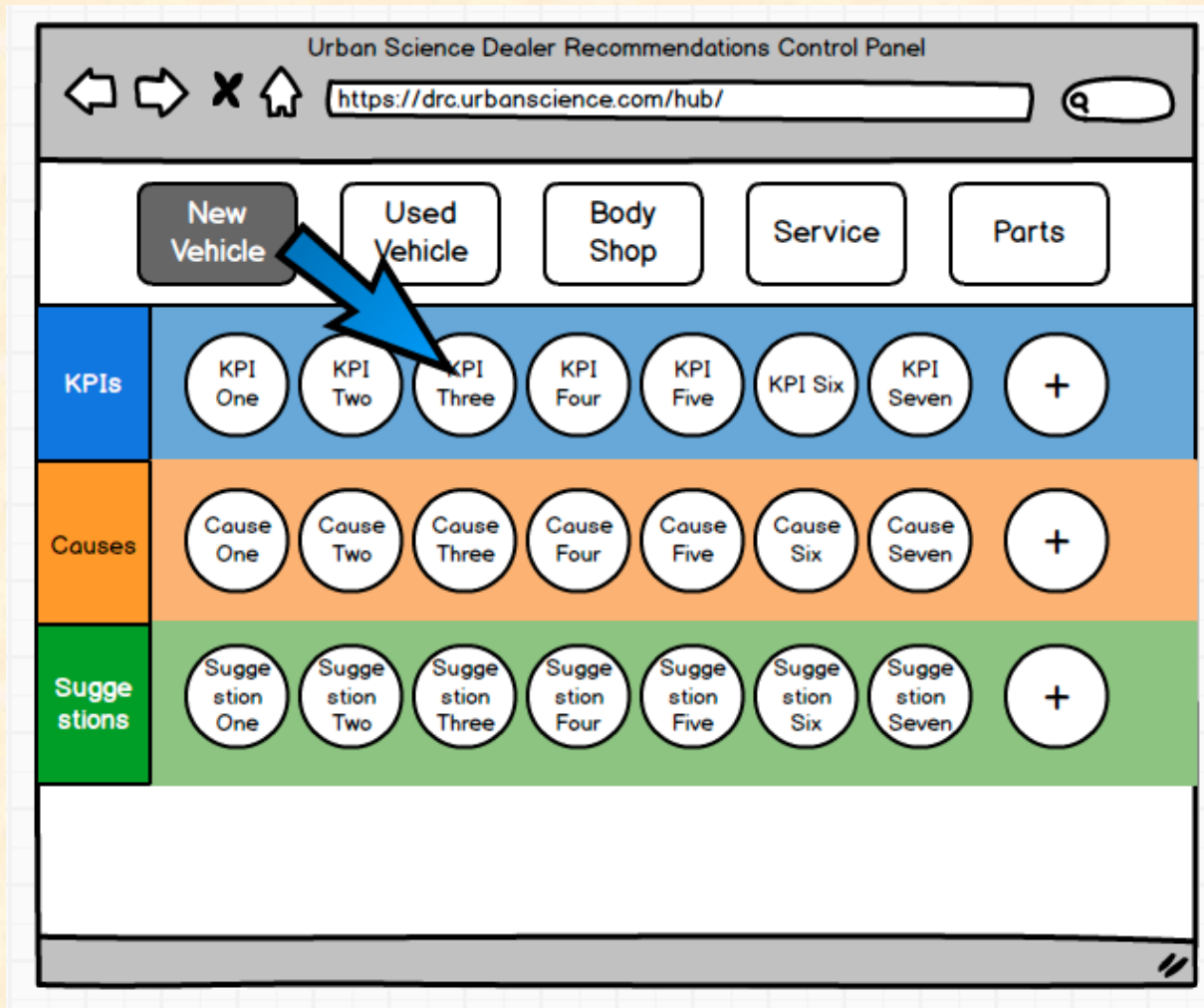
- Web Client
 - Visualization of the Logic Tree
 - Allow for editing
 - User Authentication
 - Editing history
- iPad App
 - Extend the current Dealer Assistant App to provide access to the Logic Tree for suggestions
 - Use KPI as an input



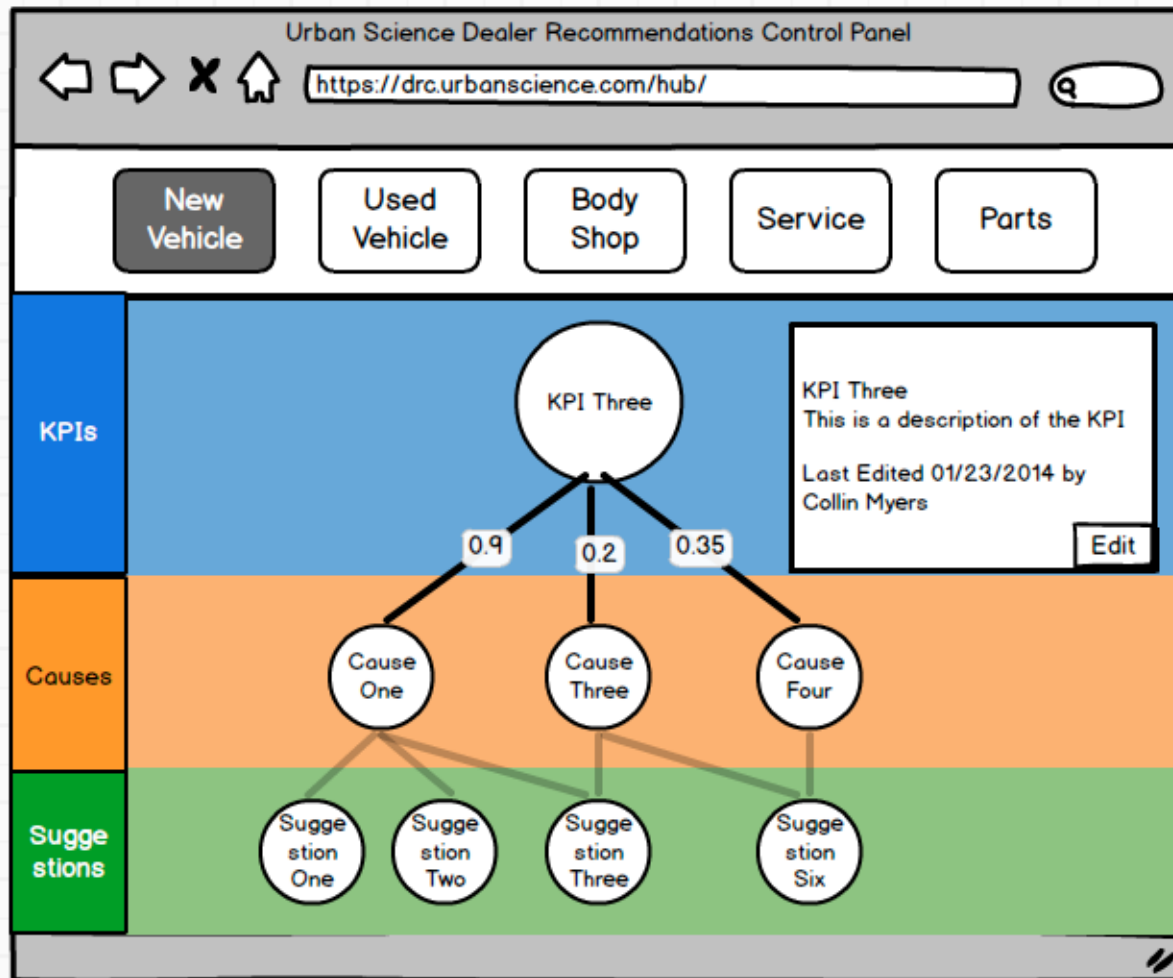
Screen Mockup: Login



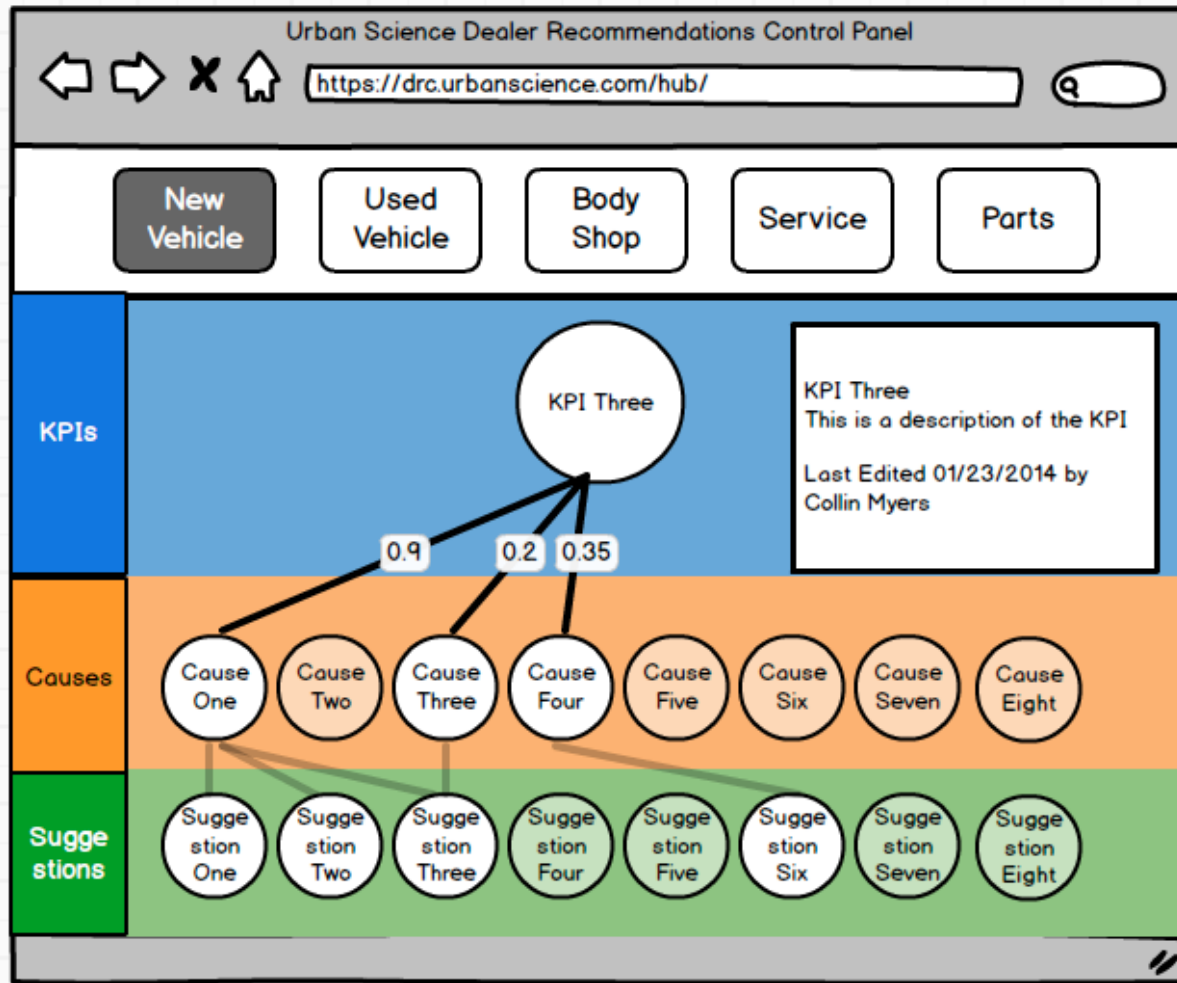
Screen Mockup: Control Panel



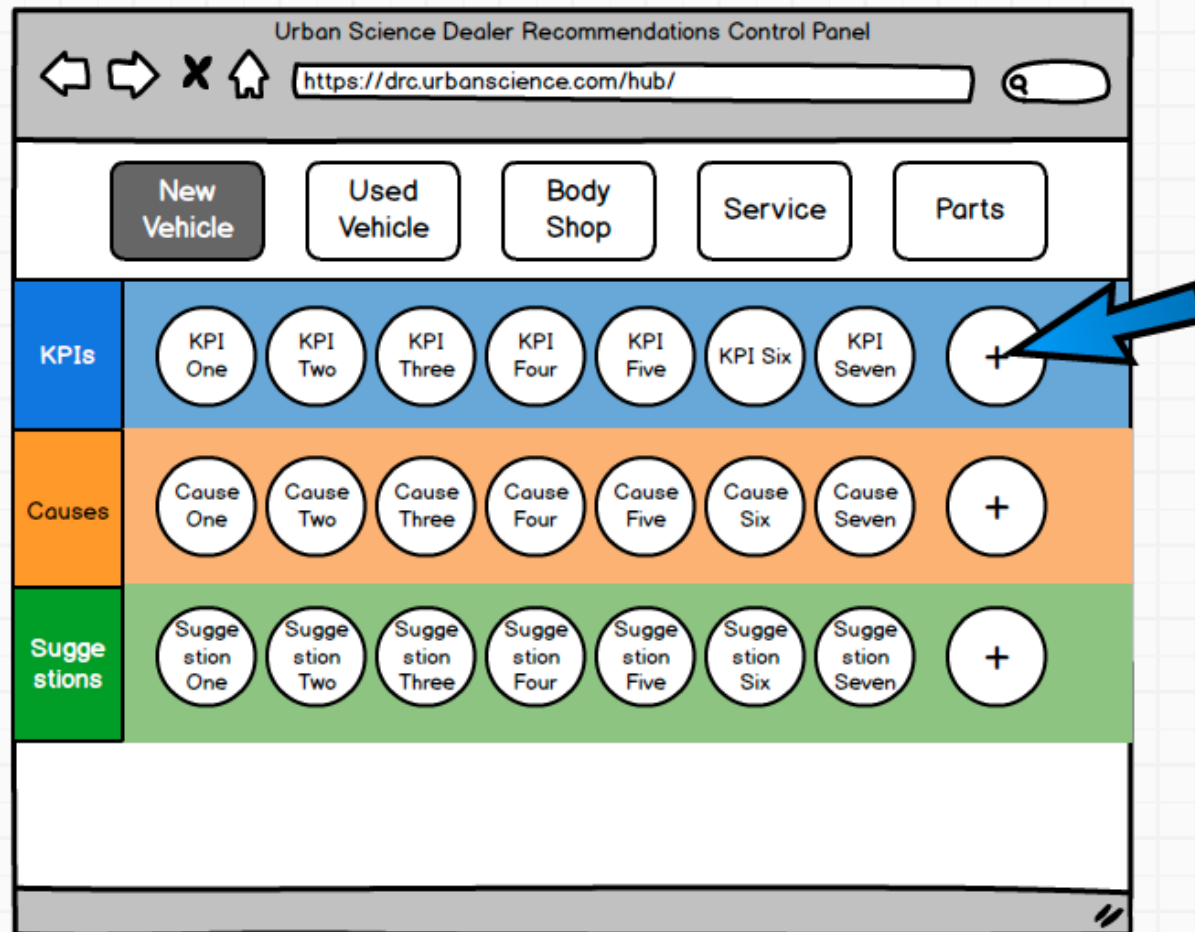
Screen Mockup: Node Details



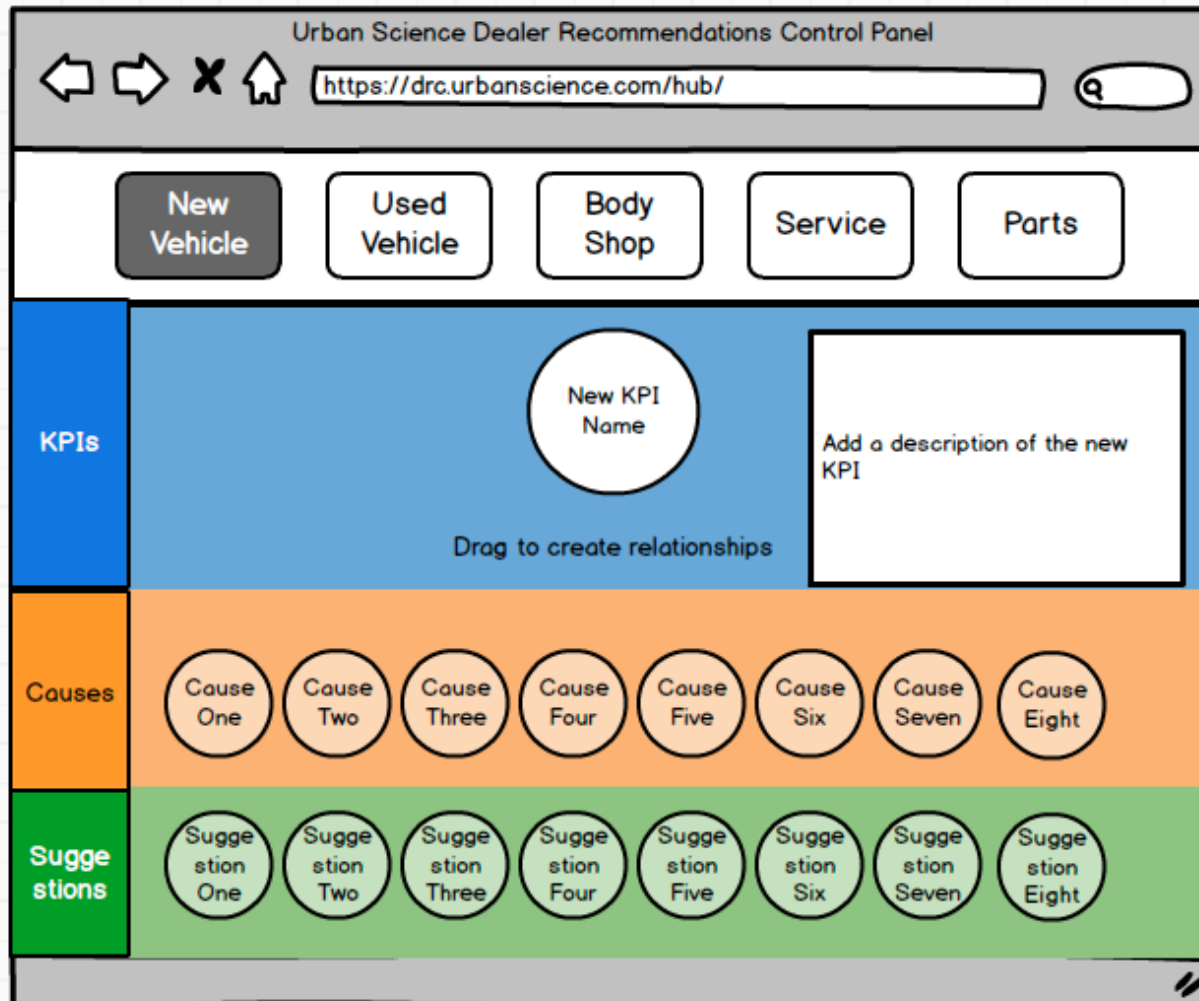
Screen Mockup: Edit Node



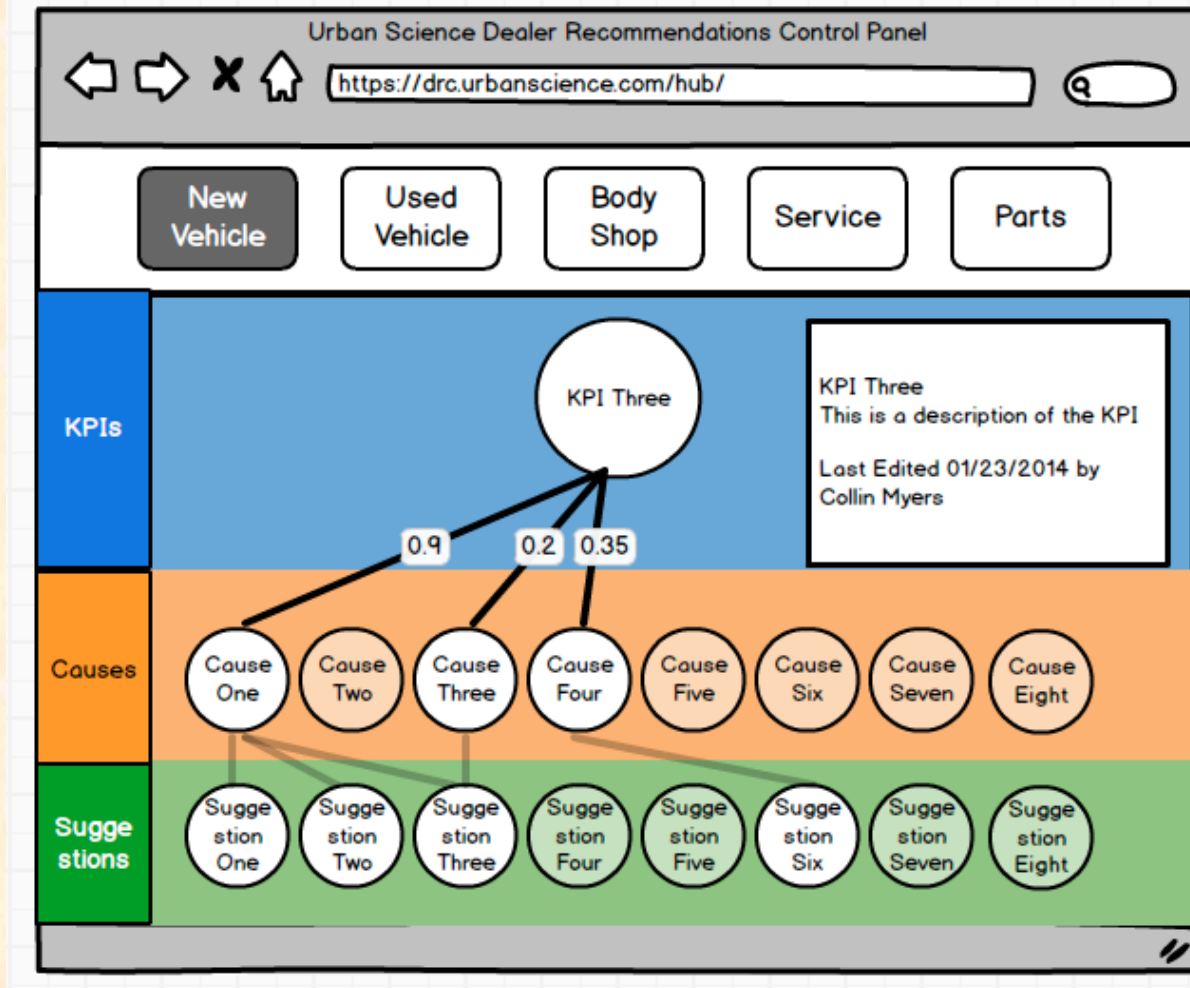
Screen Mockup: Add New Node



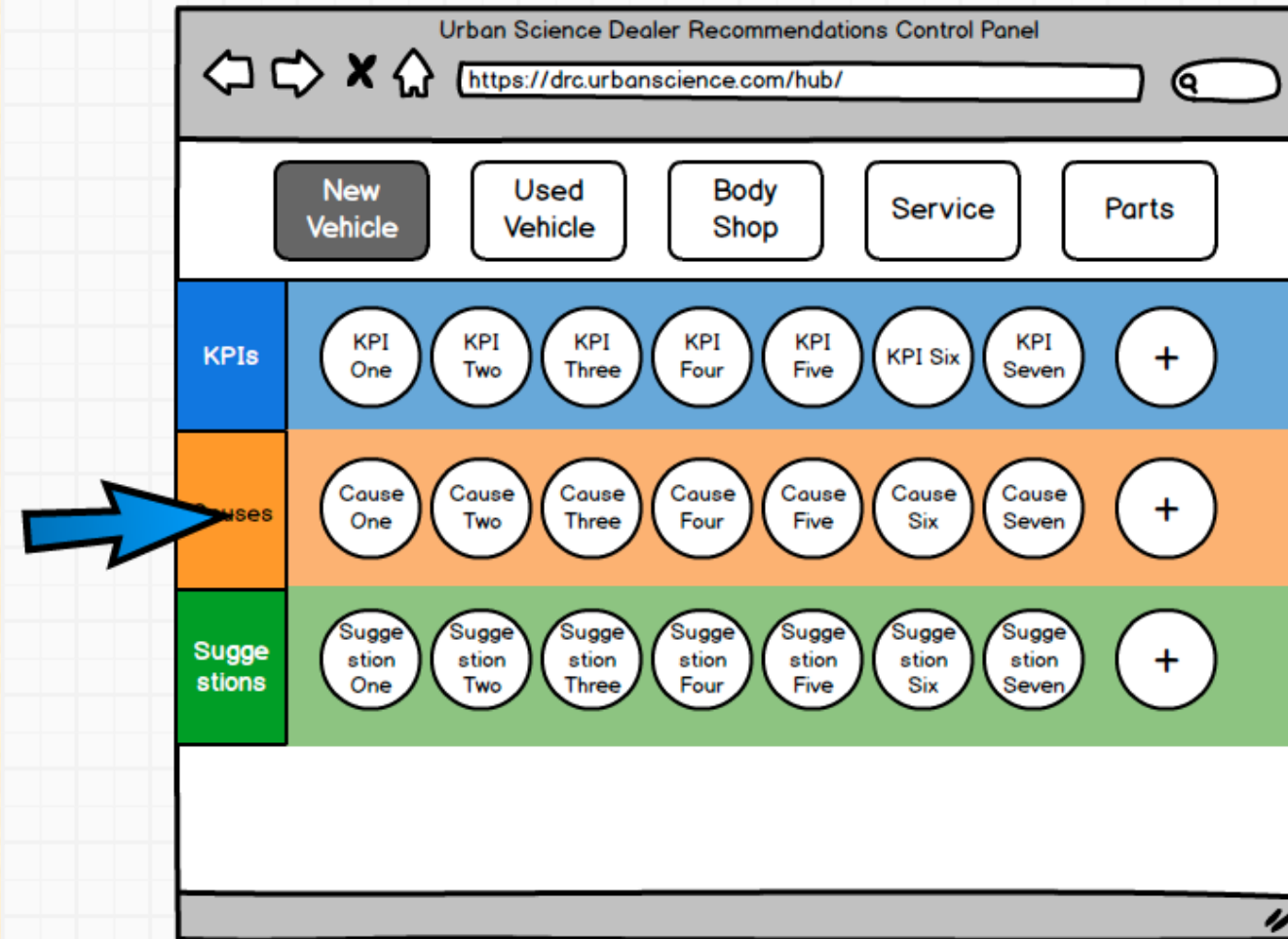
Screen Mockup: Add New Node



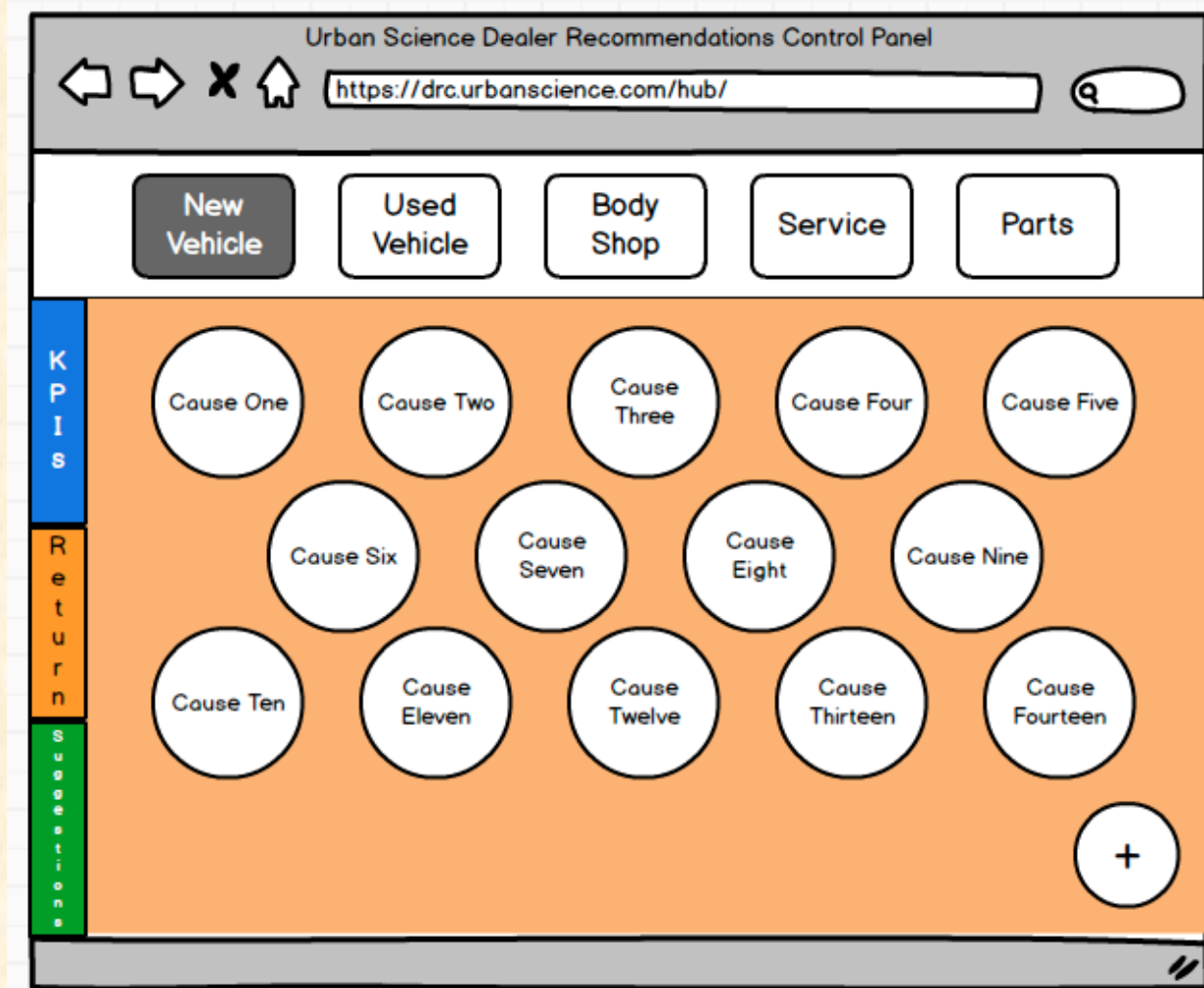
Screen Mockup: Add New Node



Screen Mockup: Category View



Screen Mockup: Category View

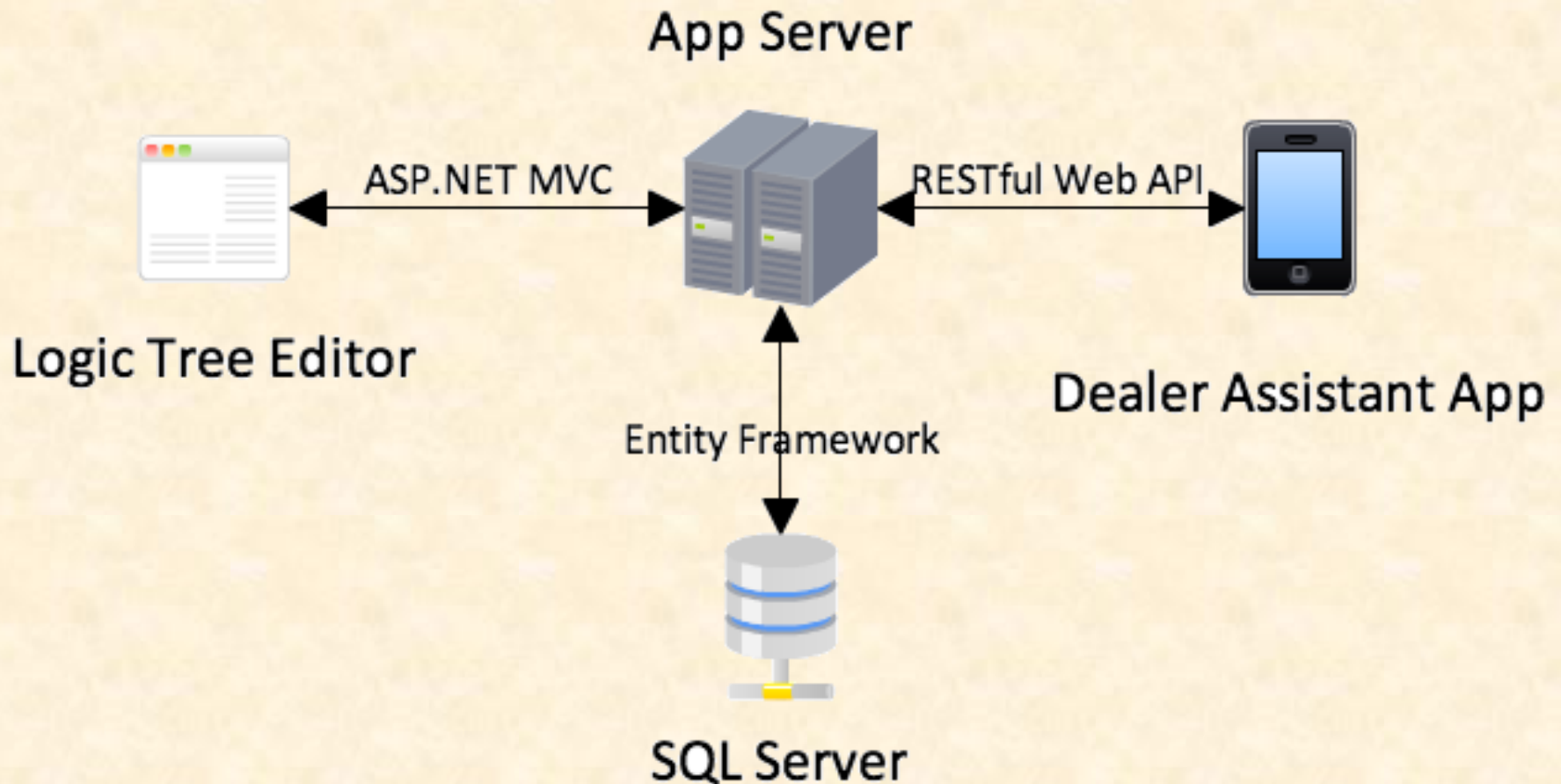


Technical Specifications

- Web Client – “Logic Tree Editor”
 - Written in C#.NET using ASP.NET MVC
 - Access database using Entity Framework
 - Data visualization using D3.js JavaScript library
 - Source code managed by Visual Studio Online
- iPad App Extension
 - RESTful Web API to access app server
 - Written in Objective-C
 - Source code managed by git
- App Server
 - Microsoft Azure Windows Server
- Database
 - Microsoft SQL 2012 database



System Architecture



System Components

- Hardware Platforms
 - Apple iPad
- Software Platforms / Technologies
 - ASP.NET MVC
 - Azure Windows Server
 - Microsoft SQL Database
 - Entity Framework
 - RESTful Web API



Testing

- Web client
 - Unit testing C#/JavaScript code
- iPad Extension
 - Suggestion comparison to the Logic Tree
- Usability testing
 - Allow client to use the web client to assess its use and workflow



Risks

- Databases
 - Little to no experience with databases
 - Mitigation through C# framework to manage database interaction (Entity Framework)
- ASP.NET MVC
 - No experience with this technology
 - Mitigation through tutorials and client knowledge
- RESTful Web Services
 - What exactly IS RESTful? How is it implemented?
 - Researching RESTful, tutorials, and using client knowledge



Risks

- Translation of Logic Tree
 - Need to translate the Logic Tree into a database model
 - Working with client to solidify a schema that accurately captures and represents the Logic Tree

