MICHIGAN STATE UNIVERSITY

Project Plan

Fleet Auction Distribution and Sale Optimizer

The Capstone Experience

Team Chrysler

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From Students…
…to Professionals

Project Overview

- Chrysler sells fleets of vehicles that get returned to auction sites
- Dealers come to bid on cars at auction sites across the country (15 or so nation wide)
- Our task is to optimize where vehicles are sent
- Factors include climate, market saturation, transportation logistics, etc…

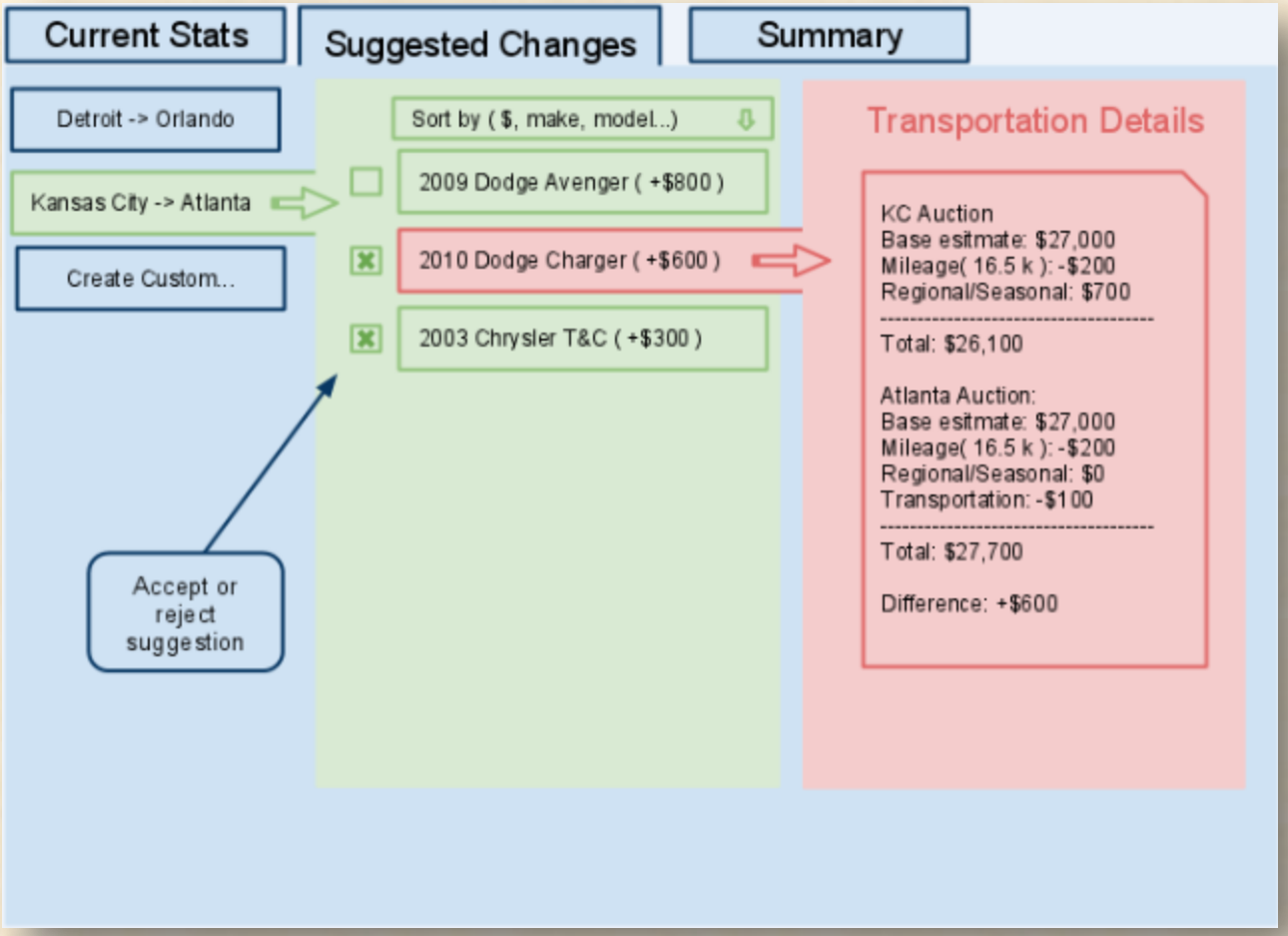
Functional Specifications

- List/Filter/Search Auction sites based on certain criteria
- Suggest optimized distribution of cars to user
- Allow user to adjust factors used for optimization
- Allow user to create and analyze custom transportation packages
- Report summary of accepted transportation plans

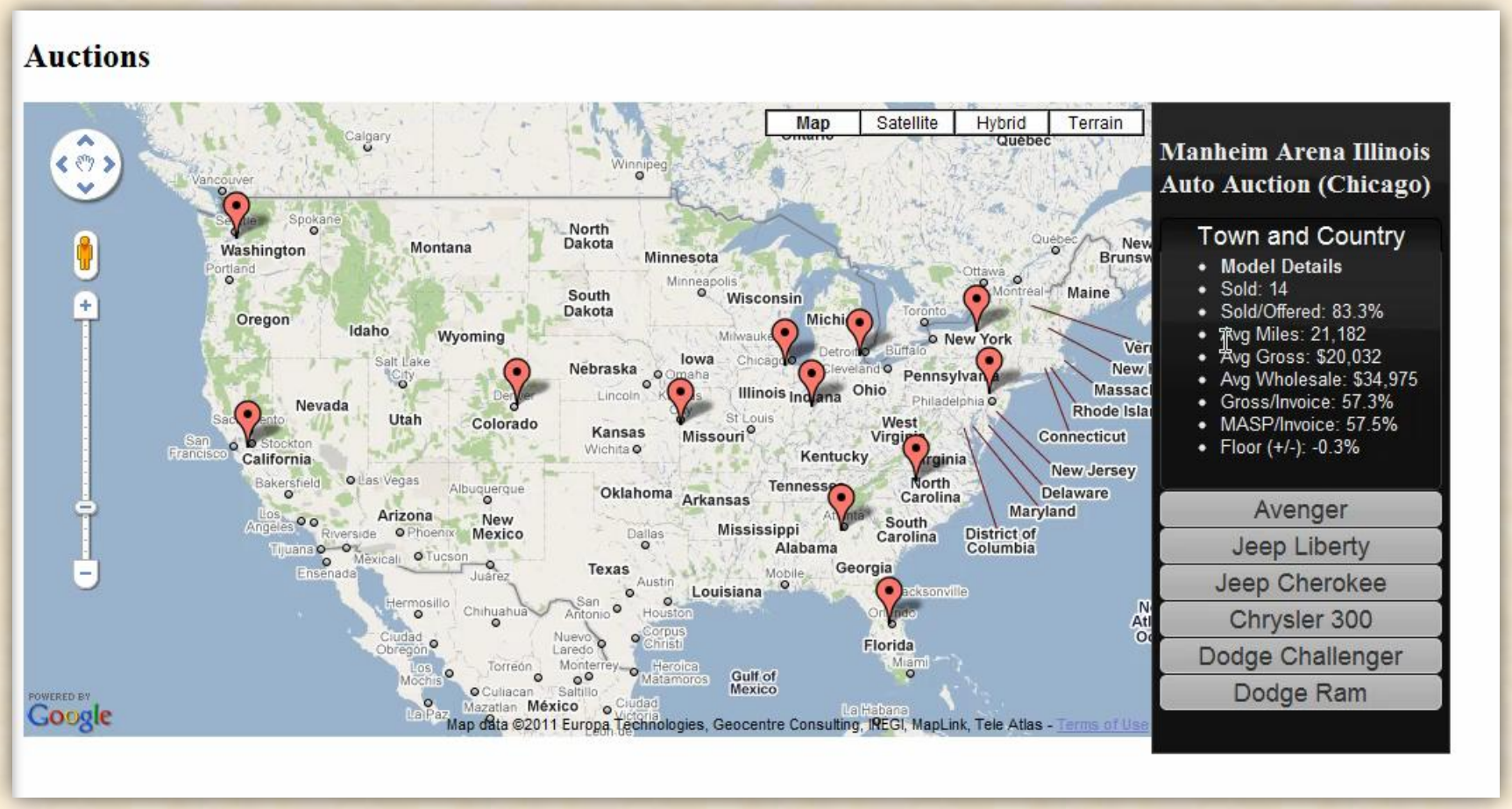
Design Specifications

- Using Google maps interface to display macro information (current market state)
- Incremental depth of detail for information for viewing and editing optimized packages
- Table styled summary of details of session decisions
- Dynamic web form interface for editing system settings

Screen Mockups



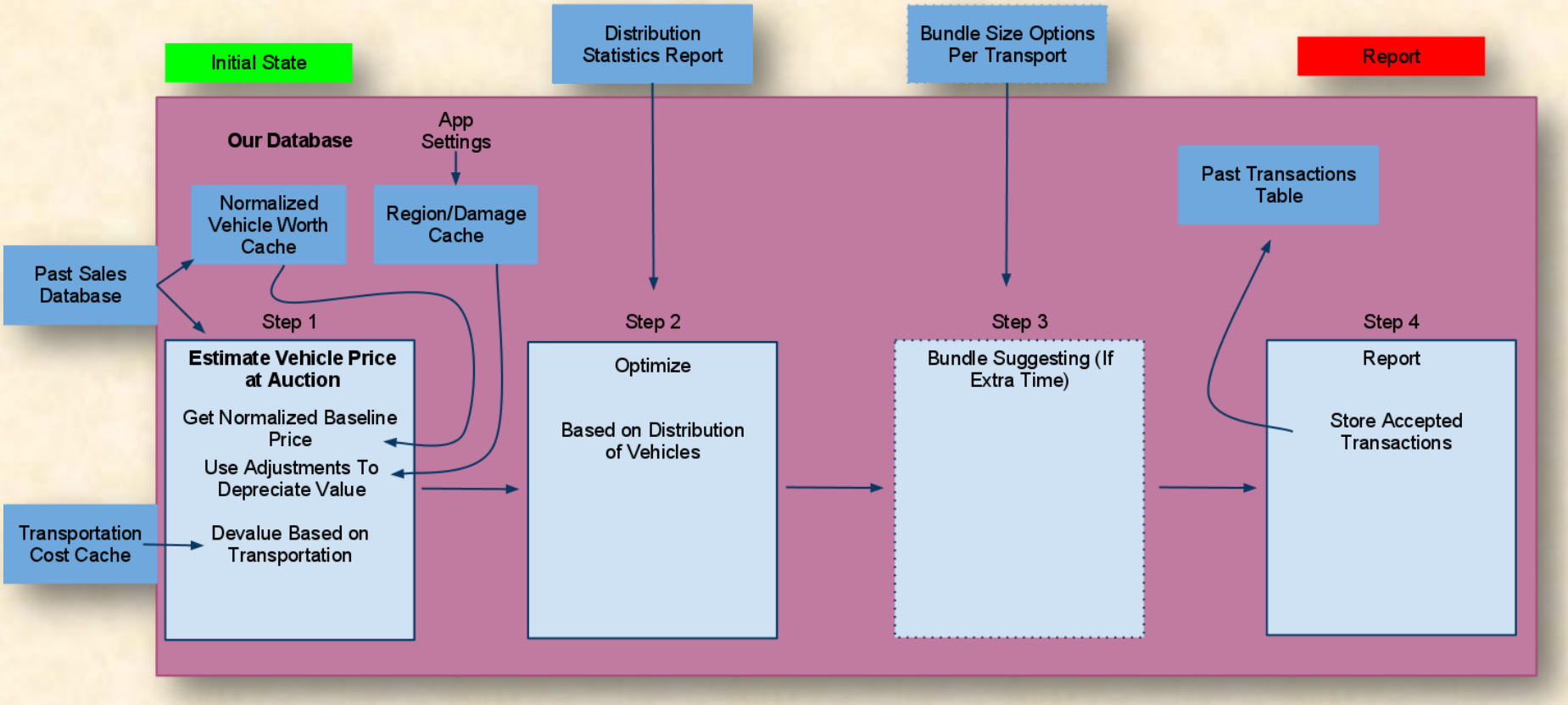
Screen Mockups



Technical Specifications

- Estimate/cache baseline prices for each vehicle model at each auction site
  - Can be aggregated over various amounts of time
- Depreciate vehicle instance from baseline based on user defined statistics
- Depreciate instance based on external distribution information
- Package vehicles into bundles based on transport options for specific source auction site
- Report summary of optimization session in a consumable format

Technical Specifications



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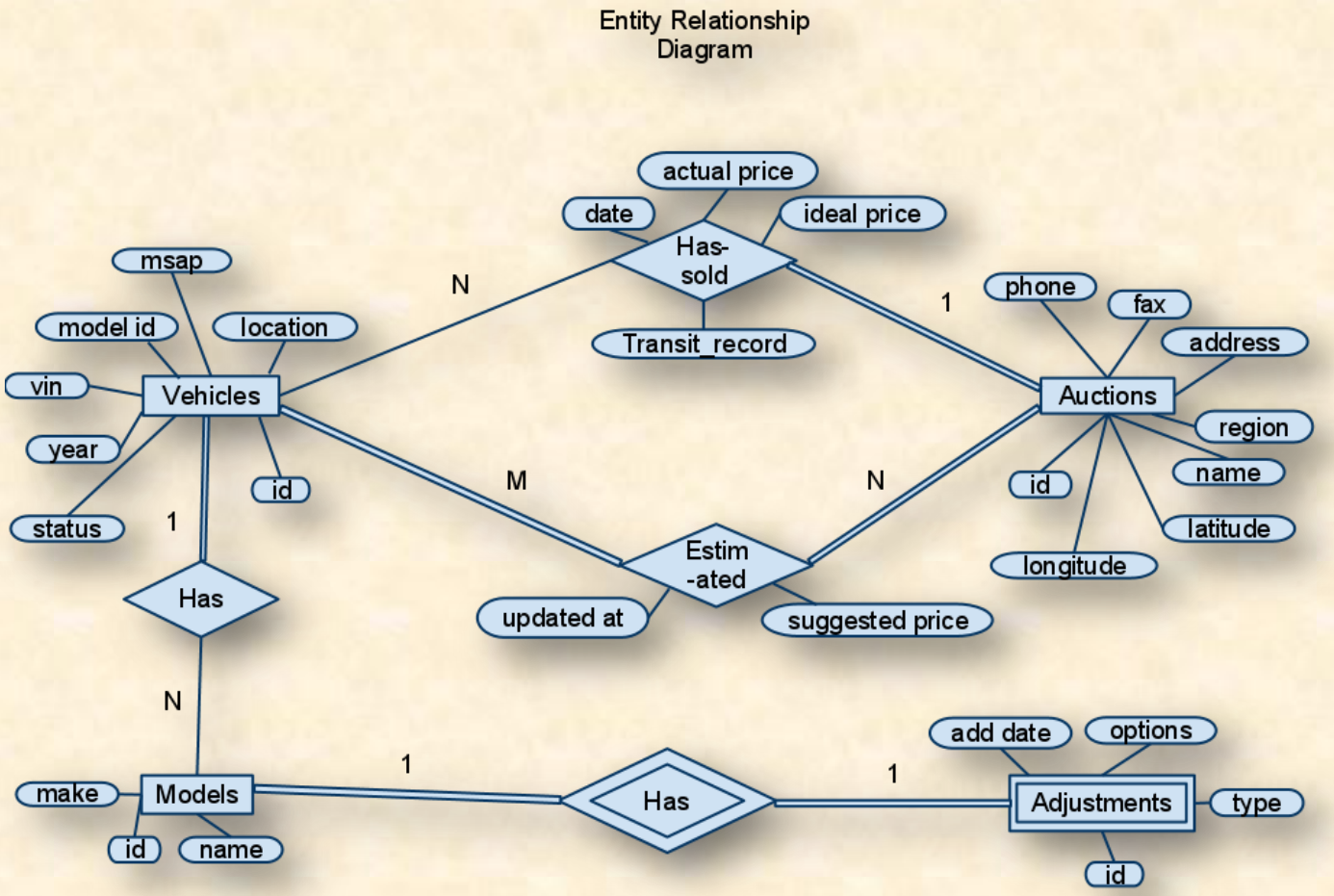
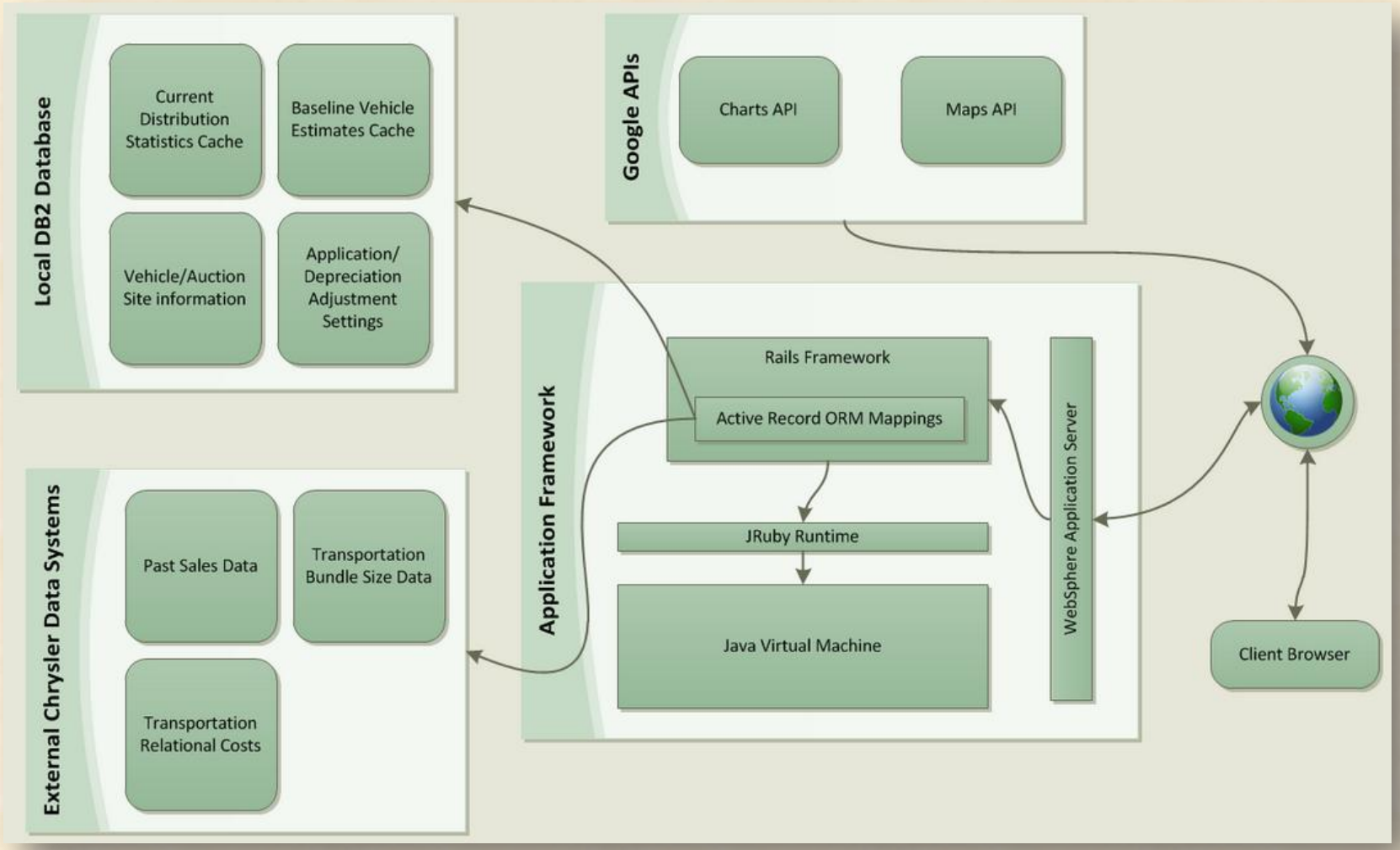


System Architecture



System Components

- Hardware Platforms
  - Production server Solaris
    - We use a Linux staging environment because of WebShpere
    - Using DB2 and WebSphere for hosting data and application
- Software Platforms / Technologies
  - Ruby/Rails web application framework
  - Mixture of JavaScript and HTML for client code
  - Google maps/charts APIs

Testing

- Unit Testing
  - Rails Test Unit framework
- Algorithm Accuracy Testing
  - Given historical sales data, establish different scenarios
  - Run our optimization on the data and compare against actual sales
- Integration Testing
  - Verify application works cross browser

Risks

- Getting aggregated/preprocessed sales reports from Chrysler
  - Time frame
  - Method of adding data to the system
- Efficiency of system
  - We assume because there are a discrete number of auction sites and limited number of cars per session
- Internal deployment
  - Chrysler network is relatively locked down, need to be careful what APIs we use