Project Plan
Fleet Auction Distribution and Sale Optimizer

The Capstone Experience

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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 nationwide)
- 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

Auctions

Manheim Arena Illinois Auto Auction (Chicago)

Town and Country
- Model Details
- Sold: 14
- Sold/Offered: 63.3%
- Avg Miles: 21,182
- Avg Gross: $20,032
- Avg Wholesale: $34,975
- Gross/Invoice: 57.3%
- MASP/Invoice: 57.5%
- Floor (+/-): -0.3%

Avenger
Jeep Liberty
Jeep Cherokee
Chrysler 300
Dodge Challenger
Dodge Ram

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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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Technical Specifications

Entity Relationship Diagram

- Vehicles
  - id
  - make
  - models
  - vin
  - year
  - status
- Locations
  - msap
- Has
  - location
  - id
- Actual Price
  - date
  - ideal price
- Has-sold
  - transit_record
- Auctions
  - phone
  - fax
  - address
  - region
  - name
  - latitude
  - longitude
  - suggested_price
- Estimated
  - updated_at
  - Has
  - adjustments
  - add_date
  - options
  - type
System Architecture
System Components

• Hardware Platforms
  ▪ Production server Solaris
    o We use a Linux staging environment because of WebShpere
    o 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