Reimagining the C-Store:
A Simulation Driven Approach

September 9th, 2025

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Speaker

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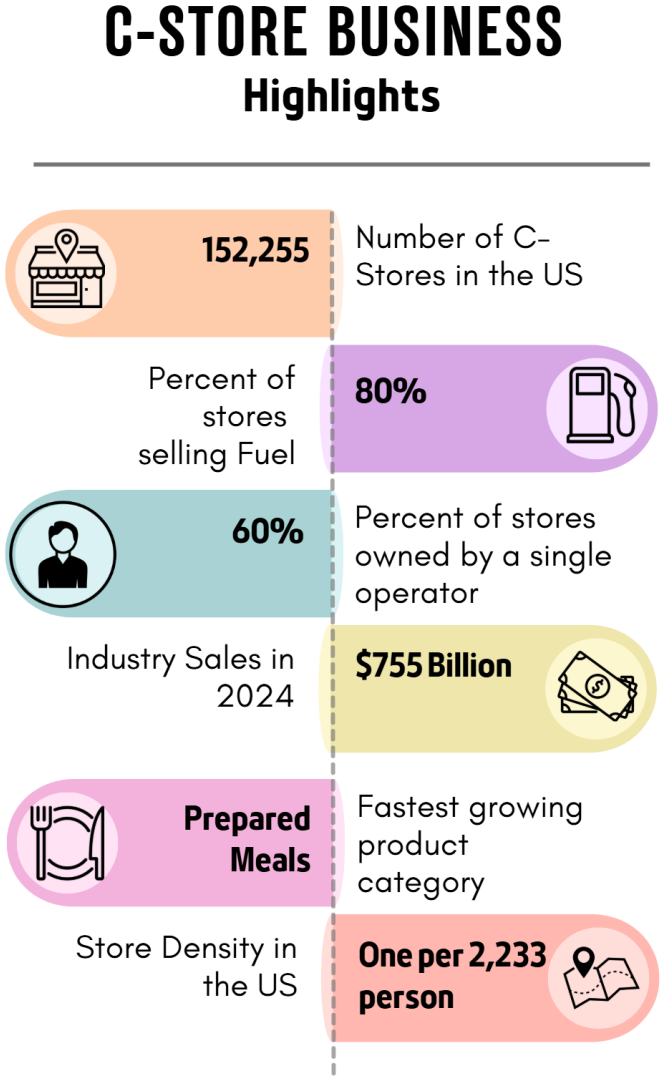
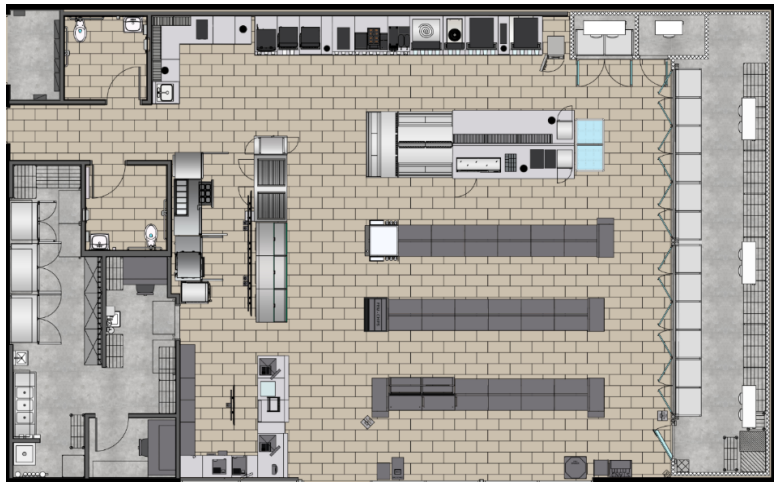
Project Background

- Client was a large convenience store chain
  - Convenience Stores are known as “C-Stores”
- Traditional C-Store products are not providing desired growth
  - Majority of store revenue is low margin fuel sales
  - Millennials and Gen Z want healthy food options
- Pivoting to healthy on-the-go meals
  - Higher gross margin on food helps offset revenue decline in other product categories



Implementation Challenges

- Remodeling thousands of existing store
  - Multiple layouts and configurations
  - New food products and holding equipment
  - New cooking equipment and procedures
- Uncertainty around new app and loyalty program
  - On-demand food delivery
  - Permit customer self-checkout



Implementation Challenges

- Customer perception
  - Patrons may not expect high quality fresh food at a convenience store
- Garnering support from franchisees
  - Independent owners across the entire United States
  - Franchisees control store labor and training
  - Effectively have full discretion over menu items

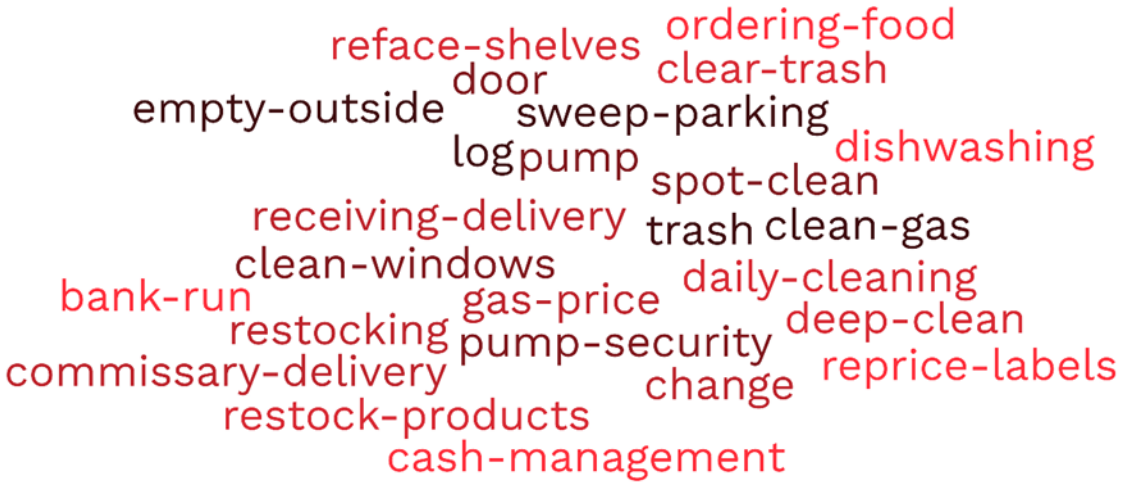
Why Simulation?

- Accurately predict store performance after remodeling
  - Track store revenue, cost, food waste, and total profit
  - Quantify expected benefit of loyalty program
  - Visualize employee and customer movements
- Quantitively alleviate franchisee concerns
  - *"If I invest more labor, will I actually make more money?"*
  - Flexibility to model any store

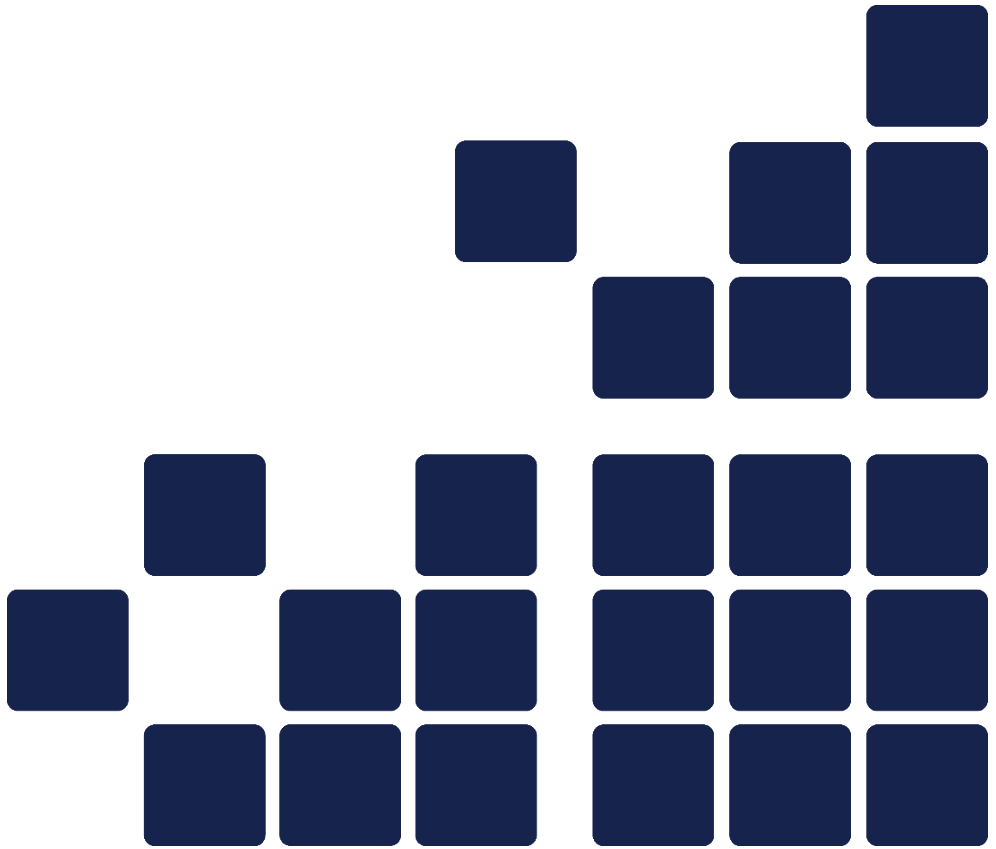
Model Focus Areas

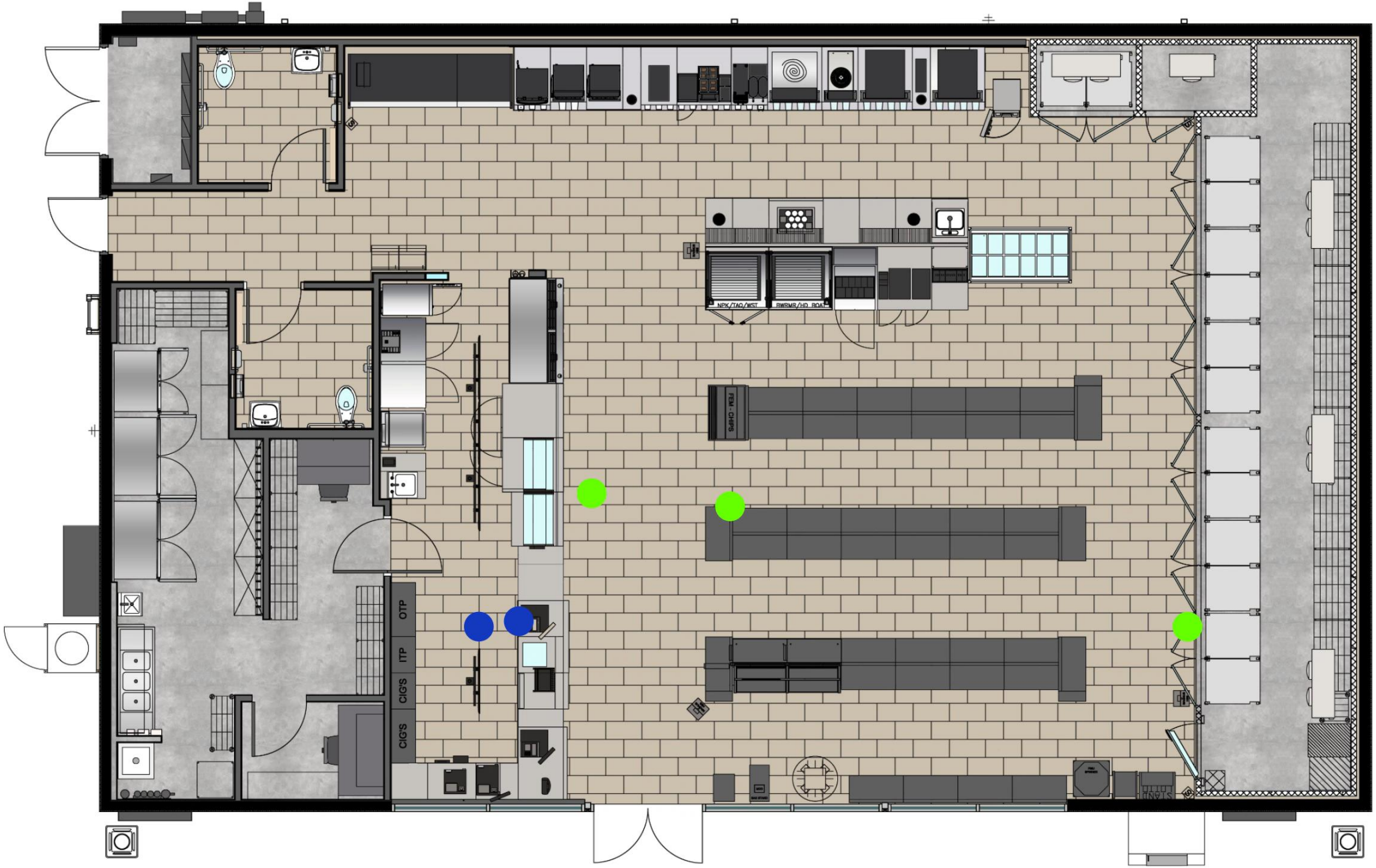
- Store features
  - Dynamic layout generation and product zones
  - Cooking and merchandizing equipment size and behavior
- Customer behavior
  - Size and composition of shopping baskets
  - Customer arrival patterns
- Employee labor
  - Staffing schedule
  - Areas of responsibilities

C Store Everyday Tasks



Demo

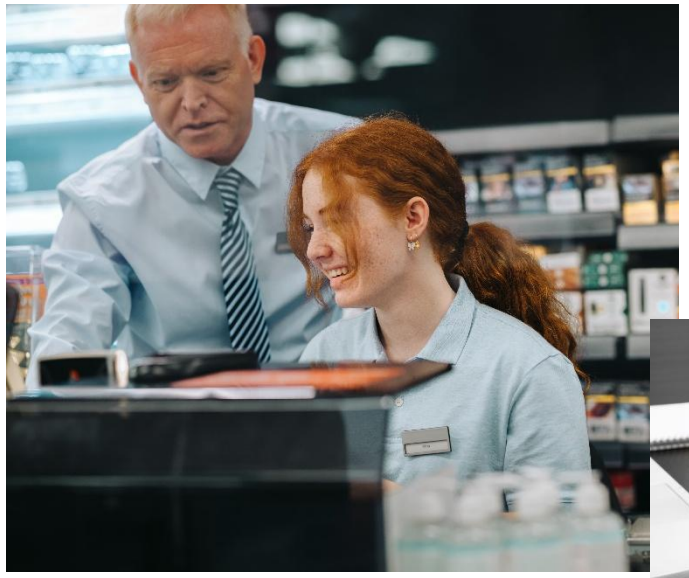




Model Demo

Identifying Meaningful Outputs

- Franchisees
  - Labor hours
  - Checkout queue size
  - Customer wait times
- Franchisor (Client)
  - Food revenue and cost
  - Food stockouts
  - Outstanding tasks at shift end
- Equipment & Architecture Team
  - Cooking equipment throughput
  - Holding equipment utilization
  - Store congestion points



Example Summary Dashboard

Food Forward Simulation

Summary | Sales | Customers | Baseline Foo... | Delta Food... | Baseline CO... | Delta COS... | Task... | Equipment | Roller Grills

Clear Filters

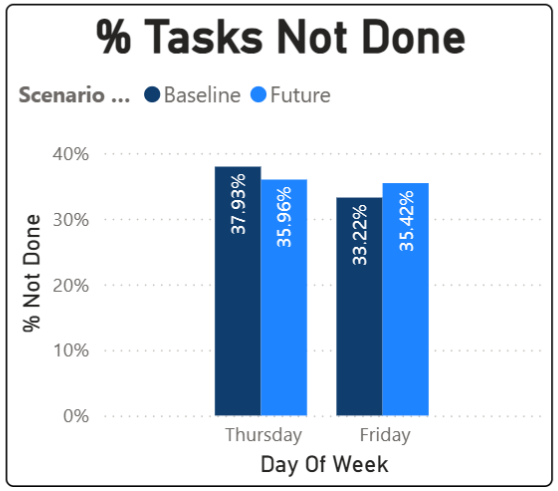
Day(s) Of Week

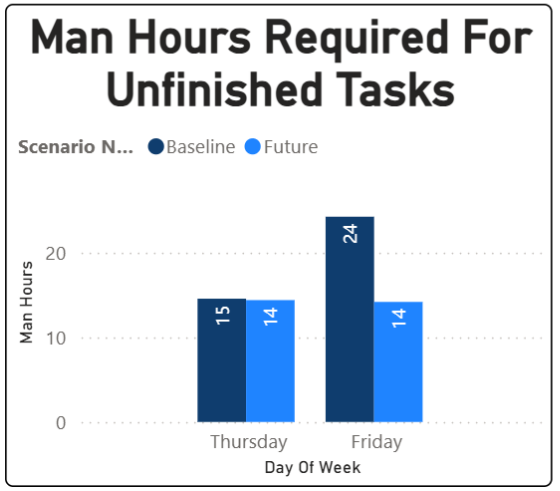
All

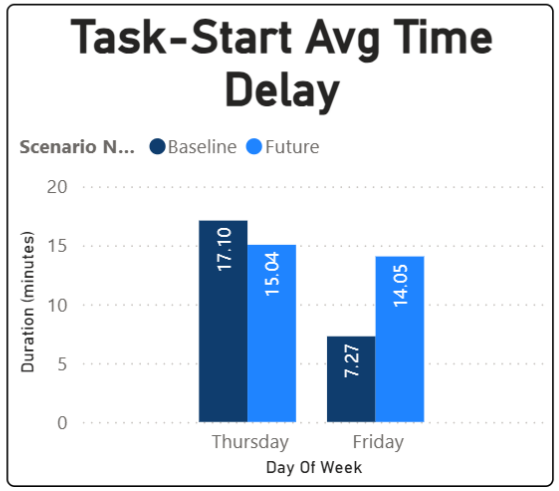
Daypart(s)

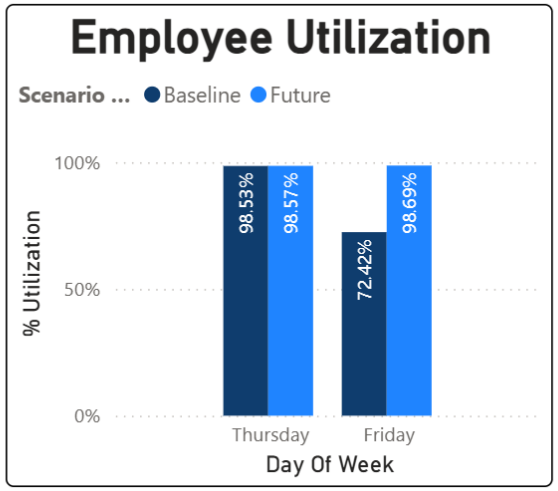
Lunch

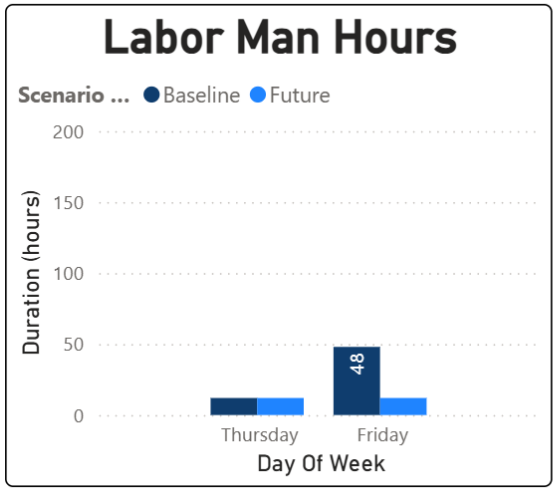
Filters:

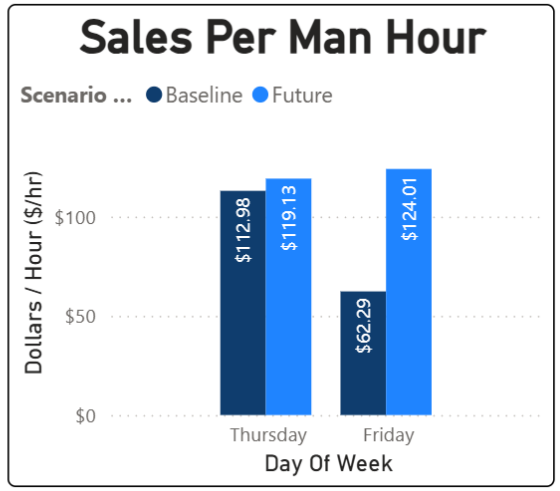












Learnings From the Journey

- Built trust with Franchisees by communicating clear understanding of pain points
  - Most concerns alleviated after trust is established
  - Embraced simulation as tool for experimentation
- Project forced conversation around tradeoffs
  - How much food to cook?
  - Which cooking equipment is necessary?
  - How should tasks be prioritized?

Findings

- Fresh food initiative can be successful
  - Requires more labor than initially expected
  - Fresh food has higher margin than non-perishables
- Food delivery can be disruptive if unprepared
  - Staffing a restaurant is different than a store
- Self-checkout has biggest impact in the morning
  - Alcohol/tobacco sales in evenings are ineligible for self-checkout

Questions

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