Honors Capstone Throughput & Demand Analysis Consulting Study for Joe's Pizza Ann Arbor

Winter 2023

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Introduction

Our Honors Capstone was a pro-bono operations consulting project with Joe's Pizza to drive down their wait times at their Ann Arbor location. Joe's Pizza is one of the most popular places on campus, attracting students and families every day. However, because of its popularity, the line for Joe's Pizza on a busy night can be up to 45 minutes, which can deter business and frustrate customers. We used IOE principles from coursework to develop techniques that brought strategy, implementation, and results.

Objectives

The main concern in Joe's Pizza's operations is the long wait on busy nights. Our goal was to conduct a comprehensive analysis of current operations, including suggestions (with quantitative justifications) for future improvements and modifications. Our primary objective was to provide operational excellence best practices for new facility design layouts and continuous improvement across all brick and mortar stores.

Methods

- **Pro-Model Simulations:**
1. Baseline model of Joe's Pizza's current operations
2. A model incorporating a digital ordering kiosk for full pies (including 6 scenarios that mimic customer adoption percentages ranging from 0 to 100% kiosk use)
3. A model utilizing a pick-up window for online, third party, and kiosk orders to pick up (with 6 scenarios for varying online order conversion rates)
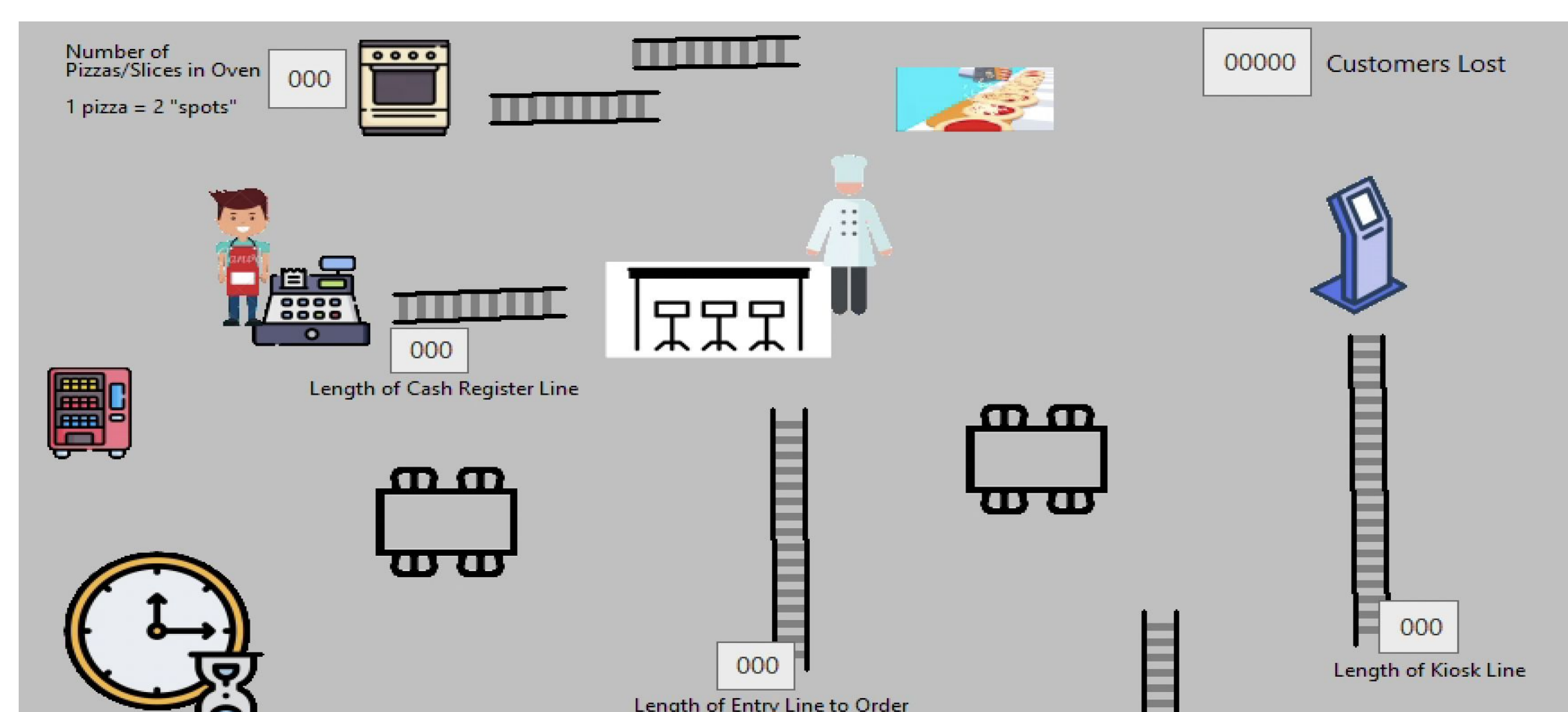

Figure 1. Screenshot of Model 2 with Kiosk Implementation

Each model allowed us to gain insights on operations and understand what improvements will yield positive results for Joe's revenue, customer loss, and line wait time - for both the Ann Arbor location and for future college campus locations.

Methods Continued

- **Literature Review**

  Our team conducted a literature review on studies on human perception of wait times and how to incentivize people to wait in lines longer. Three papers were analyzed, which allowed us to derive our additional recommendation discussed in the conclusion section.

- **Demand Profiling**

  We performed demand profiling on data we received on orders from Joe's Pizza. The orders were analyzed by order method (in-person, phone, etc.), product type (pie, slice, drink,.etc.), etc. This analysis was performed in order to have demand data that could be implemented in ProModel.

- **Observational Methods**

  We conducted several interviews with the Joe's Pizza manager and employees. We observed customer behavior on 2 busy nights throughout the semester to develop educated assumptions to enter as inputs to the ProModel simulations.

Results

Total Best Case Revenue Interval Plot

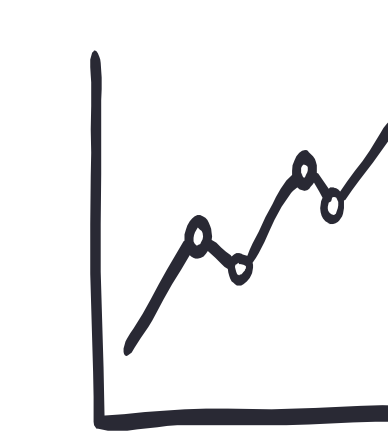**Total Best Case Customer Loss Interval Plot**

Results Continued

- Revenue Projections:
  - **10.35% ($1,345)** increase with 100% kiosk usage
  - **13.85% ($1,799)** increase with window implementation
- Average Wait Time:
  - **22 min.** decrease in pizza wait time with 100% kiosk usage
- Max Customers Lost:
  - **71.14% (67 cust.)** decrease with 100% kiosk usage
  - **97.87% (92 cust.)** decrease with window implementation

Conclusions

Utilize ordering kiosk outside the storefront and aim for high adoption rate

Focus marketing efforts on increasing online ordering to reduce wait time

Aim to incorporate an online order pickup window in future storefronts

Additional Recommendations for Joe's Pizza:

- **Ticketed Queuing System** – a ticketed queuing system would allow customers to wait by heaters, go grab a jacket, or sit down during their queuing period
- **Expected Waiting Time** – posting an expected wait time on the door of Joe's will alter customers perception of actual waited time
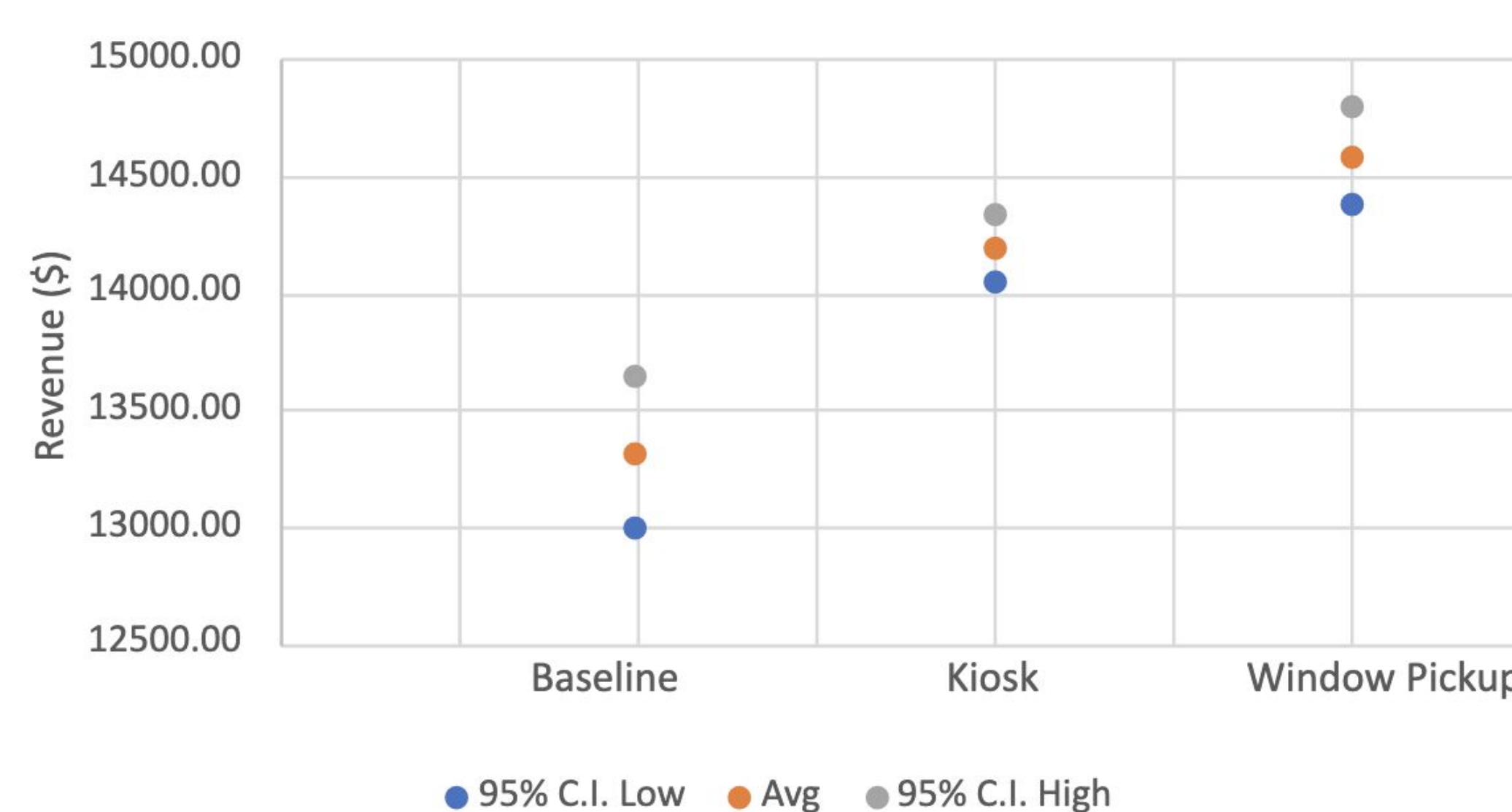
Acknowledgement

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