Risley Dining Hall Flow Improvement

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Problem Background

The dining hall customers at Risley Dining Hall face increased wait times during peak hours. The goal of this project was to analyze the operational processes, identify bottlenecks, and redesign service flow to minimize wait times and increase customer throughput.

Project Scope

Reconfigure the physical layout and station arrangement.

Increase total capacity and table turnover rate.

Redistribute foot traffic from high congestion area.

Data Collection & Analysis

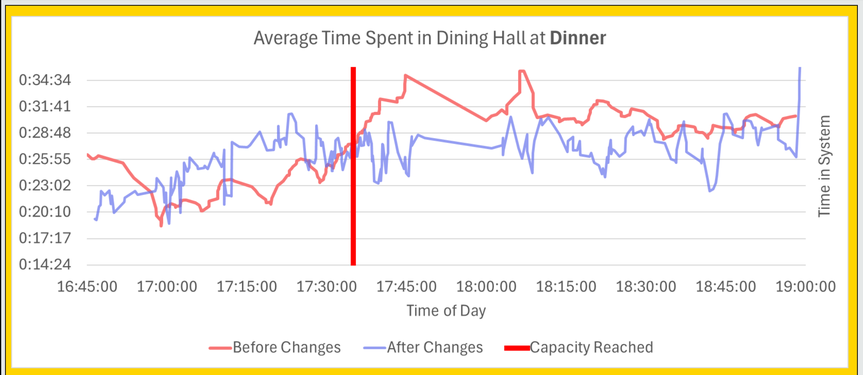

Figure 1: Average Length of Visit By Entry Time During Dinner

Period	Begins at Time	Capacity Reached After at Time	Average Time in System Peak Hours (minutes)	Average Time to get Food (seconds)
Lunch	11:30	12:15	29:33	200
Dinner	16:30	17:35	30:35	216

Table 1: Data for Lunch and Dinner

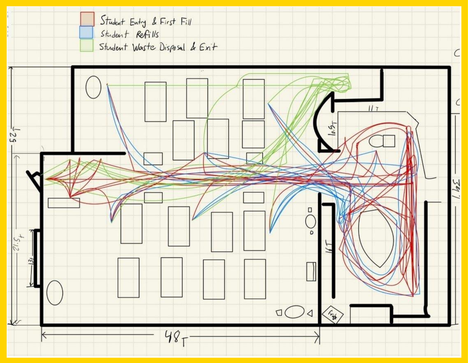

Figure 2: Student flow Spaghetti diagram B***efore*** Changes

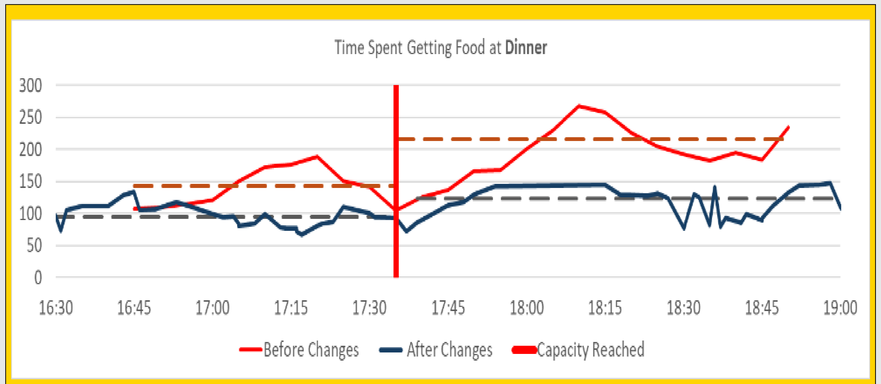

Figure 3: Average Time Spent Getting food by Entry Time During Dinner

Tools Utilized

- Time-Motion Study: Timed the students getting their food (Time in Servery, TIF) and the total time spent in the food hall (Time in System, TIS) using digital stopwatches.
- Spaghetti diagrams: Student movements were tracked during peak hours to capture flow and foot traffic data via spaghetti diagrams.
- Excel: Data collected was used to calculate the average, median, and moving average to establish the state of the system and identify bottlenecks.
- Aramark Database: Existing database information for student entry times was used to establish the total number of students that are expected to be in the system.

Solutions

Layout Re-design

1. Optimized the capacity usage for the dining area.

- Increased maximum capacity by **16%**, from 120 to 140 (Fire Safety Limit is 176 which includes employees).
- New layout encourages more natural social interactions

2. Modified the servery area.

- Designated a separate area for special dietary needs items (Lactose intolerant & Gluten Free) to prevent cross-contamination.
- Consolidated all self-serve breakfast items (milk stations & cereal dispensers) into one section to reduce customer TIF by **13%** at Lunch and **43%** at Dinner.
- TIS during peaks times decreased by **3 Minutes.**

Time in Servery (seconds)		
	Before	After
Lunch	200	174
Dinner	216	124

Table 2: Comparison of Time Spent Getting Food

Time in System (minutes)		
	Before Changes	After Changes
Lunch	29:33	27:06
Dinner	30:35	27:33

Table 3: Comparison of Time Spent in Food Hall

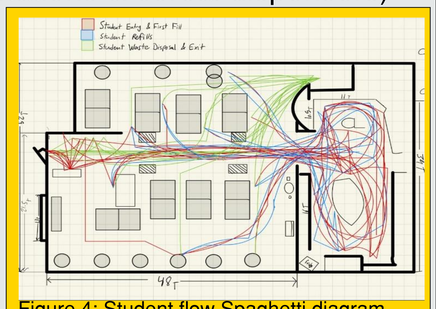

Figure 4: Student flow Spaghetti diagram ***After*** Changes

Simulation

A scale model was created in Simio through which a simulation of students moving within the dining hall was created. The simulation enabled the ability to test changes that were not feasible given the projects timeline.

The changes included

1. Combining the two salad bars into one
2. Moving the Soft drink fountain out of the servery and into the dining area

Figure 5: Simio Model of Risley Dining Hall

Results (seconds)		
	TIF Before	TIF After
Salad Bar	113	120
Soft Drinks	113	102

Table 4: Simulation Results

Conclusion & Recommendations

- Post-implementation data showed a reduction in average wait times, indicating an improvement in customer throughput. We recommend conducting periodic reviews and adjustments based on student feedback and continuous monitoring of dining hall usage patterns.
- For future work, we suggest the exploration of more dynamic layout changes based on seasonal and hourly fluctuations in student population.

Acknowledgements

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