Overview

At the Nittany Lion Inn, the order processing time of the kitchen can be potentially decreased to improve customers’ satisfaction. The ideal serving time for people eating at the bar is 15 minutes, whereas in the dining room it is between 35-40 minutes. However, when the hotel is very busy, these times are not achieved and take about 10 minutes longer than usual.

Objectives

The team aims to improve efficiency in the kitchen, especially during busy times so that the hotel can deliver 95% of meals to their customers within the desired time frame. To achieve this goal, the team worked closely with the chefs and kitchen employees tracking the tickets and follow them throughout their entire path in the kitchen. The team plans to make recommendations on changes of layout in the kitchen to save time on order processing.

Approach

The methodology we used in this project is DMAIC six-sigma methodology from IE 434. DMAIC stands for define, measure, analyse, improve and control. The main techniques we could use in this project include layout maps, time study forms, T-test statistical analysis and Gantt chart. The team went through the steps of data collection, data analysis and improvement proposal.

After conducting the hotline layout, the team observed that several problems might affect the processing efficiency. First, the food bars and grills are not straight across each other. The cooks have to move to the right across the food bar and turn around to reach the grills. Second, the cooks must carry food (i.e. cheese) across the aisle and leave trash on the floor. The team then conducted time studies that mainly focused on five processes for time studies: sauté ingredients, pans, grill meat, cheese and fish. Data of original layout and the proposed layout is collected. Each path is repeated to collect 30 replicates.

An analysis of the average time of five processes was recorded and conducted a t-test for these results. The result shows that we are 95% confident that there are significant differences for all five processes regarding the improved plan. The averages show that the improved plan can save 40% of average time transporting ingredient, pans, grill meat, cheese and fish, which are the most common components in cooking.

Outcomes

The team proposed 5 recommendations:
1. Move the sauté ingredient station right across the stove; switch the plating location and the ingredient location
2. Put the grill meat at the fridge unit underneath the grill
3. Move the pans above the stove
4. Put the cheese into the fridge unit underneath the flat-top grill
5. Move the fish to the fridge right next to the fryer.

The proposed hotline layout would resolve the issues mentioned in the original layout. With the new grill and new fridge, the overall layout of the hotline was shifted towards the entrance. The new grill is longer than the original one and the new fridge is shorter than the old one. Thus, the positions of the flat grill and the fryer are pushed down. In the new layout, the grill, flat grill and fryer are directly across the corresponding food bars where the cooks mainly work at. The new grill has an underneath fridge unit under the grill, which makes it possible to store some food under the grill. The cook doesn’t need to turn around to the food bar to fetch food, and the food bar would also have extra space to place other things. The positions of plating station and the ingredient station can be switched. As the cooks take the ingredient to the stove, placing the ingredient station right across the stove will make it easier for the cooks to grab food.