Leopold Brandl and Mohammad Abuzah

Python for Business Analytics

Professor John Droescher

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Final Project Report

We are confronted with the task of providing suggestions to our CEO who would like to open a successful pizza restaurant. We make it our goal to maximize profit and under no circumstances do we want to take losses. We use the data provided to identify potential risks (losses) and opportunities in this endeavor.

In reviewing the data, it becomes apparent that two specific relationships are particularly important – the first being the revenue at certain times of the day. Particularly slow hours can quickly lead to losses – especially in a small margin business with high competition. Busy hours cannot be missed to quickly generate a profit.

The second crucial relationship is between the pizza topping options and the rate of sale. It is important to always have the best-selling pizzas prepared, while at the same time not running the risk of excess inventory going bad for the less popular pizza choices. Therefore, a smaller menu with fewer options (10-20 toppings) could lead to shortened wait times and a lower operating cost. By looking at the daily pizza orders through a pareto chart, it becomes apparent that the top ten toppings account for 50% of daily pizza sales, and the top 20 account for 80%. We have identified the most and least sought pizza toppings to provide insights toward an optimized menu that cuts down food waste and lost revenue.

We did not identify a possible benefit in differentiating between different pizza sizes since the same ingredients and labor are required to produce any size of pizza, and the size selection is dependent on individual consumer preference. There would be no losses incurred with size selection.

In analyzing the hours of operation and revenue, we can discern that specific times of the day (lunch and dinner) have the highest profit, while off-hours such as after lunch and late into the night have lackluster performance in comparison. Considerations concomitant to this finding would be to designate break times for the pizza restaurant during off-hours, creating special deal offers to incentivize customers, and general hours of operation. This data is also useful when deciding the staff size at certain hours/days of the week.

Additionally, the data set from the pizza topping choices and the rate of demand presents a clear idea of the best allocation of ingredient inventory. The top ten pizza choices make up half of the overall orders. This would eliminate the unpopular topping choices, allowing the restaurant to shift their focus to supplying quality ingredients for the popular options rather than keeping the unpopular toppings in stock. Not only will this prevent unnecessary losses from ingredient food waste, but amplify the restaurant's brand of good quality pizza.

Through these two data set relationships, we were able to target ways to streamline the potential of a pizza restaurant by two important factors: hours of operation and pizza topping selection. The decisions in these two areas have the ability to maximize total revenue and cut unnecessary losses, which satisfies our research in opening up a successful pizza restaurant.