

DESIGNING KEY PERFORMANCE INDICATORS FOR CAFÉS INTEGRATING WITH MOBILE ORDERING APPLICATIONS

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ABSTRACT

The food and beverage industry has gone through many revolutions. The most recent one is the introduction of food ordering applications. These application help a local restaurant or café increase digital presence with the hopes of higher revenue. However, these apps brought certain challenges as orders volumes increased during peak hours remaining flat during non-peak hours. This paper gives an approach that managers can use to design KPIs as they try to accommodate to this change. The paper is based on a project done by the author with OSU Dining services and focuses on self-service café's offering hot sandwiches. This paper asserts on an approach where managers first find focus areas in their café and then use these as a foundation to build their KPIs.

INTRODUCTION

In the last 5 years, mobile food ordering applications have proliferated in the market. They have enjoyed traction and popularity amongst end users thus many local cafés and restaurants adopted these technologies in hopes of getting more digital presence resulting in a higher business volume. This integration has left managers and owners perplexed over how to implement and design process improvement initiatives in their business.

This paper gives an insight on how can managers design and identify Key Performance Indicators for cafés that have partnered with such a food ordering app and now have two channels of ordering and payments. This paper grows on the study done by the authors team on a Café, Oxley's by the numbers, which falls under the OSU Dining Services.

Dining Services' mission is to provide the best dining experience possible to students while aligning itself with the university's mission of creating the extraordinary student experience. Dining Services collaborated with Tapingo App technology over the summer of 2016. Tapingo is a mobile ordering application that allows students to order food for pick-up or delivery from various restaurants. With this technology, there are a new set of challenges being faced by dining locations. Orders coming through the Tapingo App have increased throughout the Autumn 2016 semester as seen in Figure 1.1. *Oxley's by the Numbers* is one of Dining Service's busiest and most space restricted dining locations. There are opportunities to improve *Oxley's by the Number's* facility layout to handle increasing number of orders on non-traditional POS (point of

sale) systems such as the Tapingo App and ordering kiosks. Our project is aimed at creating a facility layout that incorporates the effects of increased Tapingo app usage and technology.

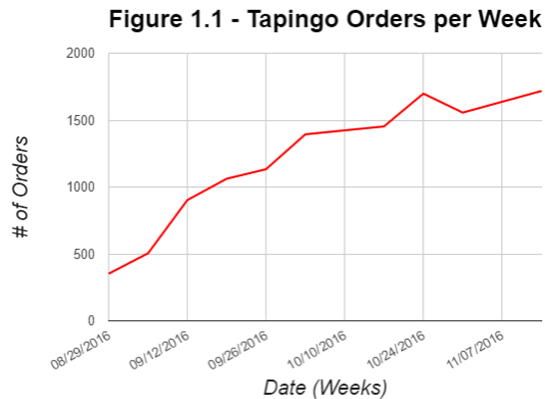


Fig 1.1

METHODOLOGY

Several tools were used to gain insight into the business process and customer satisfaction. Out of the mentioned tools Customers surveys were used to help understand qualitative parameters important for defining KPIs where as collecting sales data from Point of Sales (POS) System and time studies reflected on quantitative parameters. These tools are discussed in detail below.

Customer Surveys

The team developed customer surveys with the help of D'Arcy Oaks, Senior Associate Director with the Center for the Study of Student Life. The surveys were aimed at gaining insight into customers' behavior and preferences for this particular dining location. Topics of the survey included the size of the group the customer came with, ordering style preferences, and feedback on the Tapingo app. Our team surveyed over 300 customers on site, targeting those who were waiting in line or had just placed their order. The results of the survey provided great insights and shaped our recommendations for aspects such as seating and ordering methods.

Sales Data

Data from Sequoia and Tapingo was obtained from our sponsors through Sequoia's QuadPoint Database and the Tapingo Dashboard. Sequoia data was much more granular, as it provided sales breakdowns down to the individual item. It allowed us to see the average total number of sales on a daily and weekly basis, as well as the percentage of orders that were hot sandwiches. The Tapingo data was more general, as it only showed total number of sales, number of registrations, and number of unique customers. However, we were able to estimate the number of hot sandwich orders from Tapingo by using the percentage found from the Sequoia data. With the

combined data, we were able to determine the peak hours for Oxley's by the Numbers and use this time period as the window of observation for the rest of the project.

Time Studies

A time study was conducted to analyze hot sandwich production. More specifically, these time studies measured the average time for each task in hot sandwich production. This was done by setting up a camera in the kitchen of *Oxley's by the Numbers* and recording the sandwich making process during peak hours. The footage was then reviewed and time studies were performed for the process. Each individual task was timed over a period of 2 hours and their resultant distributions were determined for further analyzation.

Simulations

The team used a stochastic simulation software called, Arena, by Rockwell Automation. The software simulates systems with statistical properties of random probability distributions. Arena was used to simulate hot sandwich production and provide insights into the bottleneck of the process.

FOCUS AREAS

Data collected from the tools pointed to four focus areas in which the processes at the café can be divided. These focus areas are not mutually exclusive but do show a fair deal of independence from other processes. These focus areas serve as a foundation in designing KPIs targeting process improvement and customer satisfaction. The discussion of these focus areas is limited to the study done at 'Oxley's by the Numbers'. However, these focus areas are very general and can be easily validated in any other café which has been operating on two modes of payments.

1. Queue Line/Ordering Methods

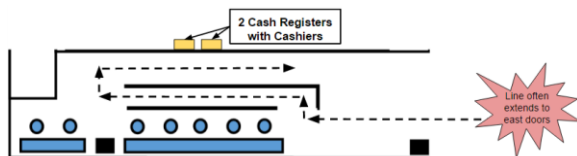


Fig 3.1

In the current system, customers have two options to place their orders. They can either walk in, stand in a queue and then place their order at the cash register. The queue is directed by steel bars fixed in the floor near the cash register. The facility layout in Figure 3.1 shows its exact shape and position. Customers also have an option to place their order using Tapingo mobile app from their smartphones. The Tapingo options restrict customers from using cash as a payment option, but at the same time gives an estimate of time to complete the order. The team observed that walking in and placing the order is still the most popular method handling around 70% of the

orders. During peak times it is pretty normal for the queue to extend to the east doors. This restricts the flow of customers, restricts the usage of the condiments table and causes an inconvenience to customers.

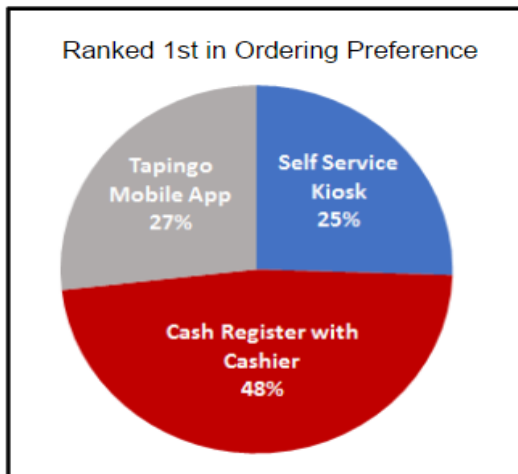


Fig 3.2

Fig 3.2 shows the breakdown of customer's ordering style preference from the surveys. Cash Register ordering was ranked first almost 50 percent of the time, while Tapingo and kiosk ordering were each ranked first by nearly a quarter of the customers. These numbers suggest that cash register ordering is still a desired option by most the customer base for this operation, but there is significant interest in the other two methods.

2. Kitchen Operations

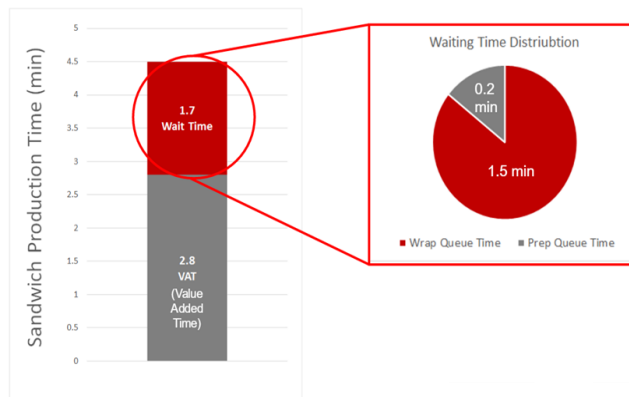
This focus area is on the operations in the kitchen after a customer has placed their order. From interviews with the kitchen manager the team learned that hot sandwiches are the most popular items on the menu and the production line often experiences stress during peak times. Lack of kitchen efficiency affects other areas of the location as well, therefore the team focused to improve sandwich throughput. Figure 3.2 represents the flow of material in the assembly line. There are two separate printers, each dedicated to orders incoming from the POS system and Tapingo. These order slips are read and the sandwich prep starts. One employee puts the meat and cheese on the bread. This is then put into the oven where it takes 75 seconds to heat up. The materials are then transferred to a finishing station where sauces and toppings, such as lettuce and tomatoes, are added. Finally, it moves to a wrapping station where it is wrapped and taped with an order ticket and placed on the pick-up window. The flowchart above also gives the distribution of the process times.

The team ran simulation runs for the busy period with the obtained data on various elements. The results obtained are shown in the tables in the appendix. On average, one sandwich takes a total time of 4.5 minutes on the production line. Out of this 4.5 minutes, 1.7 minutes were spent in queues. A further breakdown of these 1.7 minutes shows that around 1.5 minutes are spent in the queue to get wrapped. Thus the wrapping station emerged out as a bottleneck.

3. Waiting Area

Currently *Oxley's by the Numbers* has a pick-up window in their east wall. All orders are picked up from here, irrespective of the ordering method. The pickup window is incapable of handling the current order volume. It is a very common sight to see the window filled with packages as seen in Figure 3.3 and a student employee calling for people to pick-up their orders. Also, the team observed large amounts of overcrowding happening during peak hours. Customers waiting for their food tended to form a semicircular periphery, disturbing regular customer flow and seated customers.

Figure 3.3



By analyzing the data provided by Tapingo, the team could identify a clear upward trend in Tapingo orders throughout the semester. The data suggests that the number of orders made via Tapingo will continue to increase, while slowing down over time. The presence of Tapingo allows users to completely bypass the queue line to place an order and then fill the waiting area. This, along with long processing times for sandwiches, leads to overcrowding. In turn, the waiting area overflows into customer seating leading to an unpleasant environment for all.

4. Seating Area

Oxley's by the Numbers currently has a mix of seating options with 19 bar stools and 25 regular chairs which are distributed on 11 small tables. Bar stools are popular among customers and are mostly occupied. However, one can see a substantial amount of chairs left empty. Chairs are

placed very close to each other and if one customer takes a table others are hesitant to share it with him or her due to a possible intrusion in someone else's personal space.

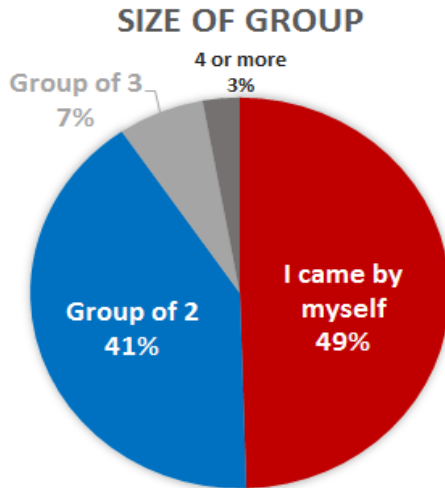


Fig 3.4

From customer surveys, the team found out that 49 percent of dine-in customers come alone, while 41 percent come in groups of 2. Overall, 90 percent of the dine-in customers come in groups of 2 or less, suggesting that there is not a high demand for seating that accommodates 3 or more people.

IDENTIFYING KPI'S

From analysis of the above mentioned four focus areas the following four KPI emerge. These will help managers to quantify health of their businesses.

1. *Time to Order*

A measure of the time taken by customer to place his order will help assess the efficiency of the cash counter. It should be measured as the time taken from when a customer walks into the store till the time his order is received and the payment is collected. It can be collected by taking random samples spread across the day to get a better insight on how to tweak staffing and queue placement to inhibit undesired queue lengths.

2. *Lead time for hot items on production line*

Managers need to keep an eye on the lead time of various products being offered through the Sandwich production line. It is necessary to mitigate variance in the lead time for items if it exists. A measure of the lead time will help processes owners assess the production levels that

they can achieve during high demand hours of lunch and dinner. This will also be essential in conveying accurate wait times to customers. It is recommended that sampling should be done at random times.

3. Number of orders from different sources

Keeping a weekly track of number of orders being placed will help process owners to assess customer sentiment. This will help them to tweak facility layout according to the needs of the customers. There is high correlation in the number of orders coming from mobile ordering app and accumulation of people near the windows.

4. Seating Utilization

Real estate is expensive and businesses want to maximize the use of it. A monitoring of the seating utilization will give process owner a clear understanding of their customer segment. They can help tweak the facility to best fit the customer requirement increasing the overall customer satisfaction reaping long term benefits.

CONCLUSION

It is important for managers and owners to determine KPIs necessary to gain insight into the business. Technological disruptions often make existing KPIs defunct and managers perplexed. It is important to redesign KPIs which suit the current needs of the business. Mobile food ordering apps provide a secondary channel of sales for cafés and restaurants. Although restaurants have benefited by adopting the technology they now face different challenges due to inconsistent demand which peaks during certain time and then fades away. A careful analysis of the key focus areas, Ordering queue, Kitchen, Waiting Area, and Seating area of the café will help managers to rethink KPIs which are suited for the changed business model. KPIs suggested in this paper: Time to order, Lead time for hot items on production line, number of orders from different sources and seating utilization should provide a holistic Business insight for the owner. With these insights it will be easier to initiate targeted improvement projects which reap the benefit of increased customer satisfaction.