

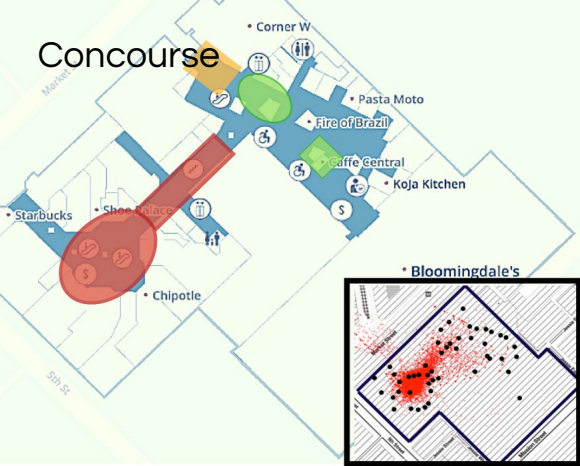
EXL EQ 2018

OUTLIERS, DTU

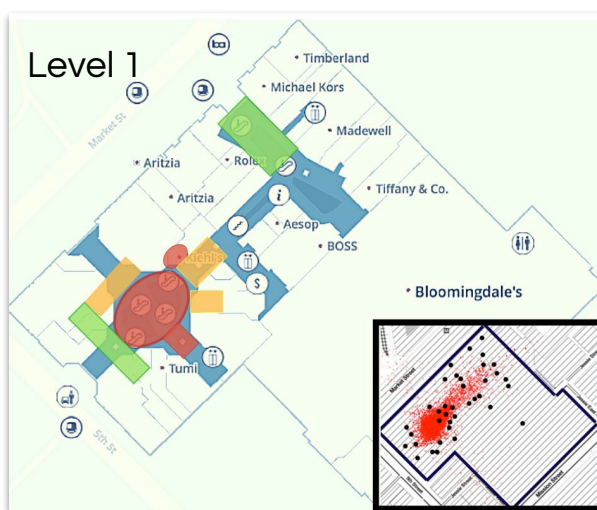
Arnav Saxena
arnavsaxenadt@gmail.com

Mudit Mangal
mmudit96@gmail.com

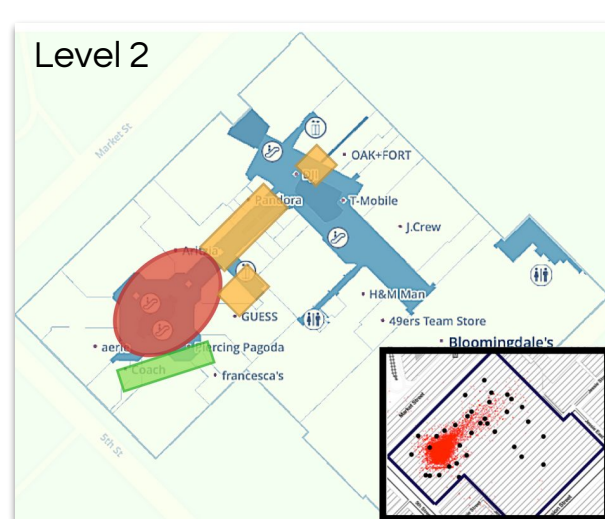
Concourse



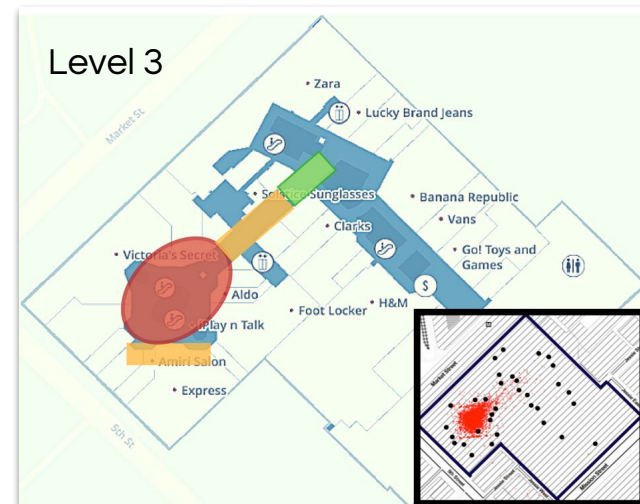
Level 1



Level 2



Level 3



1. Shopper Density Zones

(Floor Wise)



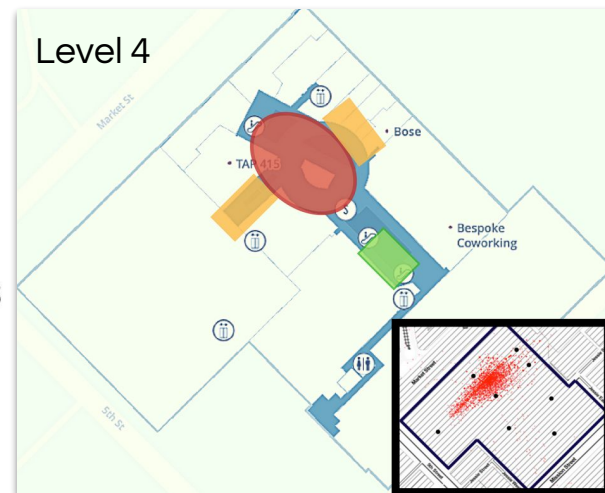
High Density Zones

Moderate Density Zones

Low Density Zones

*No colour signifies negligible shopper density

Level 4



Shopper Ping Density Analysis

Methodology

After removing around 40,000 outlier pings (pings that didn't belong inside the mall premises), we plotted them by floors to study shoppers' preferred location within the mall.

We ultimately classified all the floors into four different zones - High Density, Moderate Density, Low Density & Negligible Density Zones.

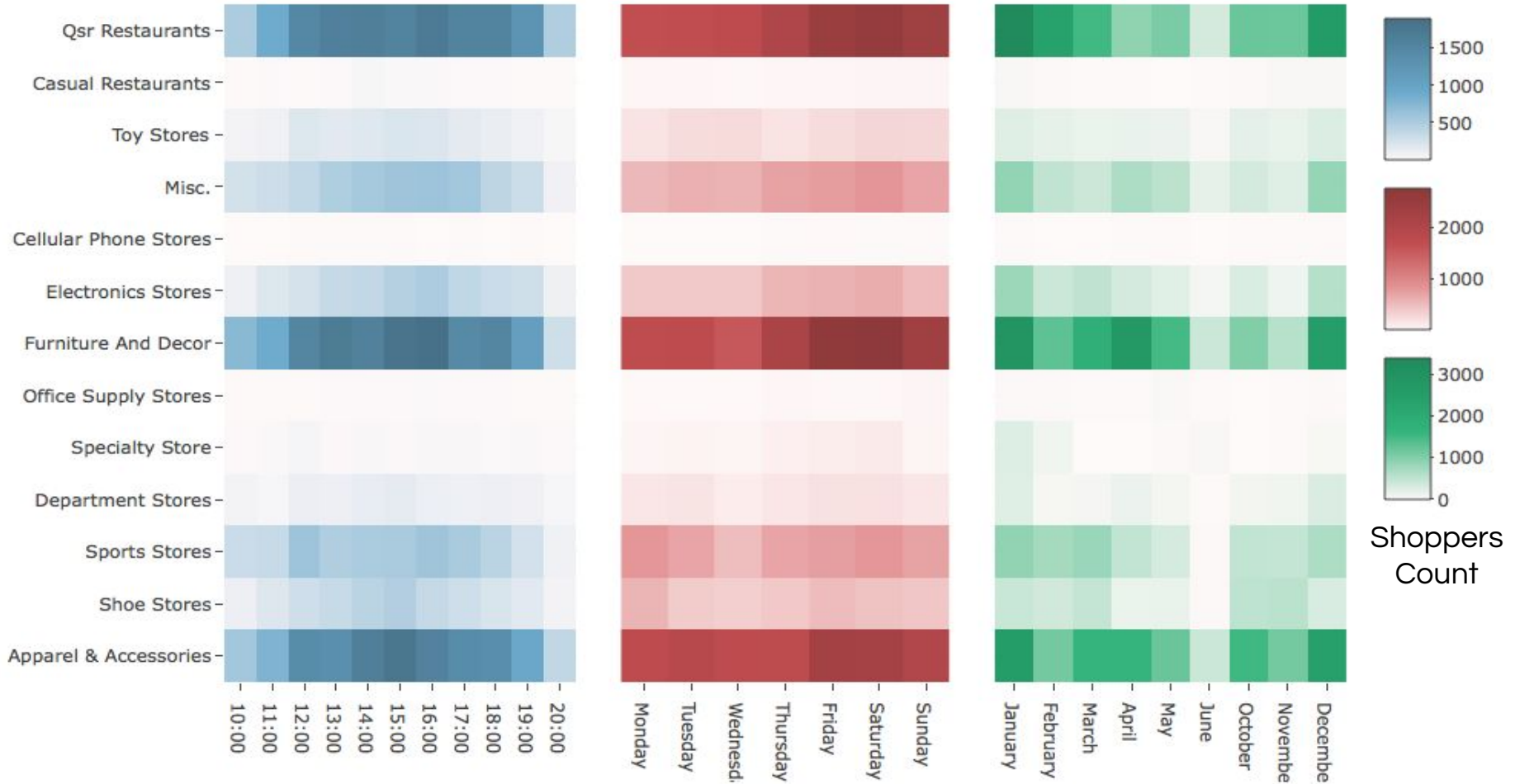
(We were able to find Mall's layout on it's website which further helped us with plotting and analysing. Source :[Westfield San Francisco Center](#))

Recommendations

1. Advertising to be done in the High & Moderate Density Zones.
2. To make the shoppers explore the stores in low density and negligible density zones:
 - a. Gaming events (like a coupons hunt or treasure hunt), exhibitions etc can be organised.
 - b. Anchor stores in high density zones can be shifted to low density regions with a safe assumption that it's sale won't go down.
 - c. These zones can be developed into Recreational Areas, "Coupon Zones" etc.

Kindly follow this link for an exhaustive list of our innovative ideas and recommendations relating to this case study [Outliers_DTU Recommendations](#)

2. Category Specific Visiting Pattern



Category Specific Visiting Pattern

Methodology

We allotted each ping a store and it's '*Fine Category*' on the basis of Haversine distance of that ping from the store centroid.

The time - date stamp was splitted into date and time. The dates further helped us to find the weekday and month associated with every individual ping.

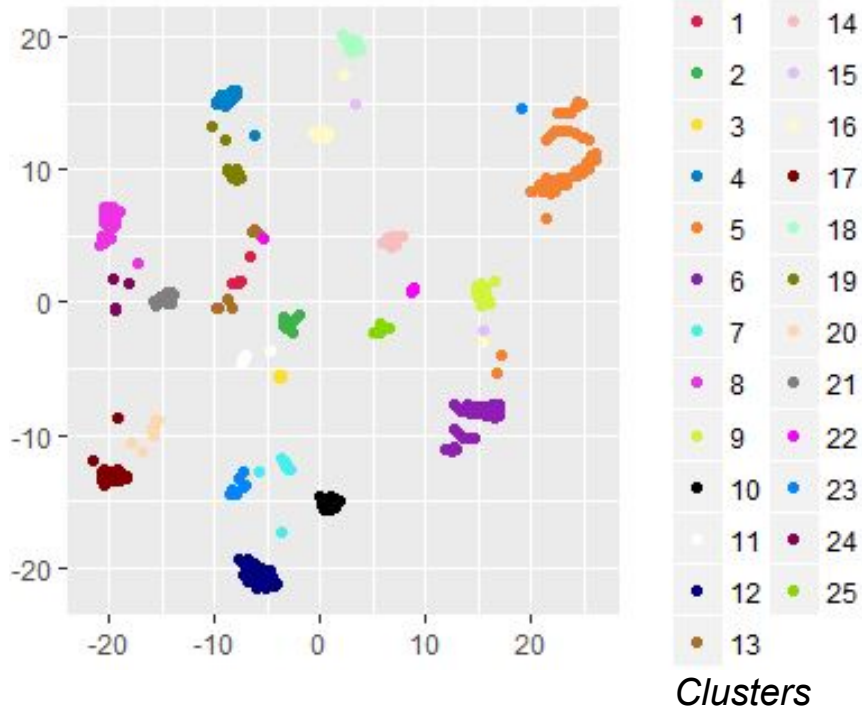
Using the counts of pings registered against a Category for a specific Time/Weekday/Month, appropriate heatmaps were generated.

Recommendations

1. We suggest advertising and promotion for stores pertaining to a specific '*Fine Category*' to be done on the basis of the most popular Time (as can be easily studied from the heatmap) for that category. For instance promoting **Dining Category** would be the most effective from **12:00 p.m to 15:00 p.m**
2. The visit patterns also help us visualise the popularity of different categories in general. Clearly **Apparel & Accessories, Qsr Restaurant, Furniture & Decor** form the anchor categories. Special attention must be paid in enhancing customer experience for these categories.

Kindly follow this link for an exhaustive list of our innovative ideas and recommendations relating to this case study [Outliers_DTU Recommendations](#)

3. Demographic Specific Visiting Pattern



Apparel and Accessories

Clusters Allocated

1,2,4,5,8,12,14,17,18,23



Furniture & Decor

Clusters Allocated

3,7,9,15,22,24



Qsr Restaurants

Clusters Allocated

6,10,11,13,16,19,21,25

Demographic Specific Visiting Pattern

Methodology

1. Gower distance(which incorporates standardization of variables) was used to form the distance matrix for the clustering procedure involving the demographic variables (Age,Gender,Marital Status,Home Ownership and No of Children below 18 years) as input variables.
2. PAM(Partitioning around Medoids) clustering was then used to group customers, according to similar '*Fine_Category*' visits.
3. 25 clusters are obtained along with their demographic characteristics

Recommendations

New customers can be classified into one of these obtained clusters and then be personally targeted for promotion of appropriate categories.

For instance, customers who are most likely to visit 'Furniture and Decor' Stores can be broadly segmented into :

- 40+ males who own a house and have no children
- 30+ married females with children

Any customer who falls under these two categories can be targeted for marketing 'Furniture & Decor'.

Kindly follow this link for an exhaustive list of our innovative ideas and recommendations relating to this case study [Outliers_DTU Recommendations](#)