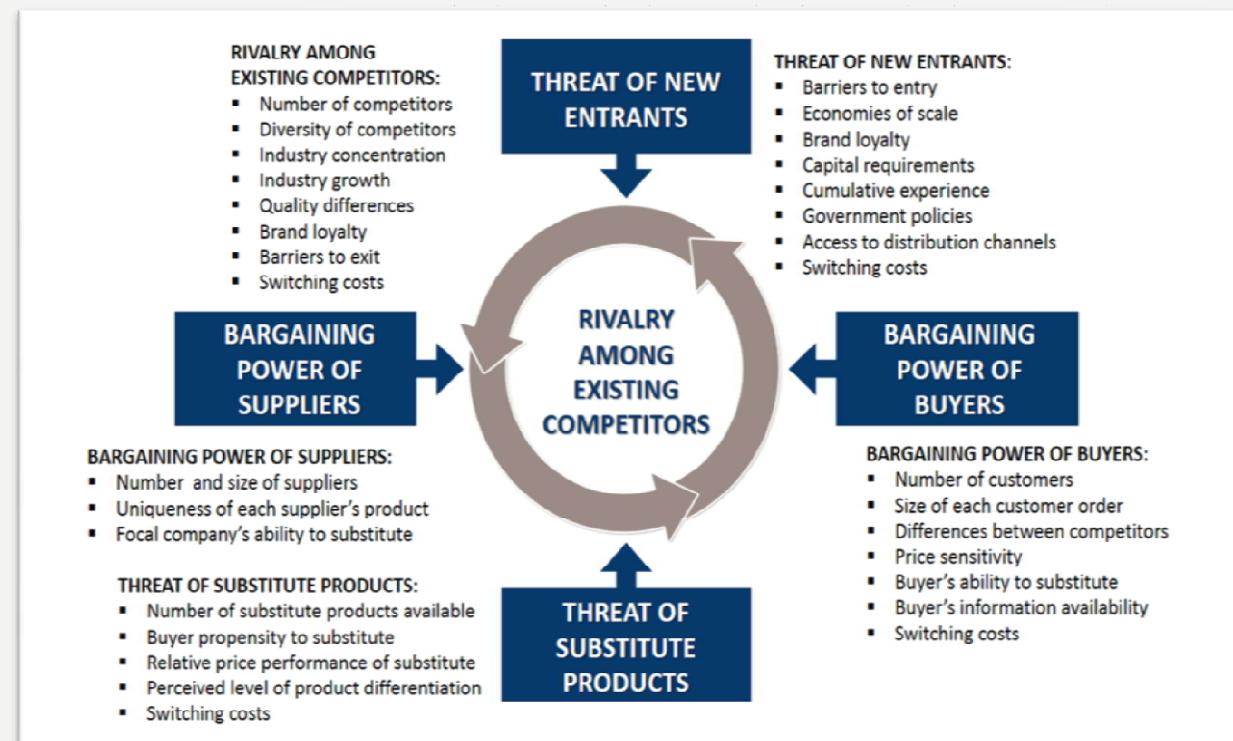


DISTRIBUTION CENTRE LOCATION PLANNING

*-By Pratik Khadse
June 27, 2019*

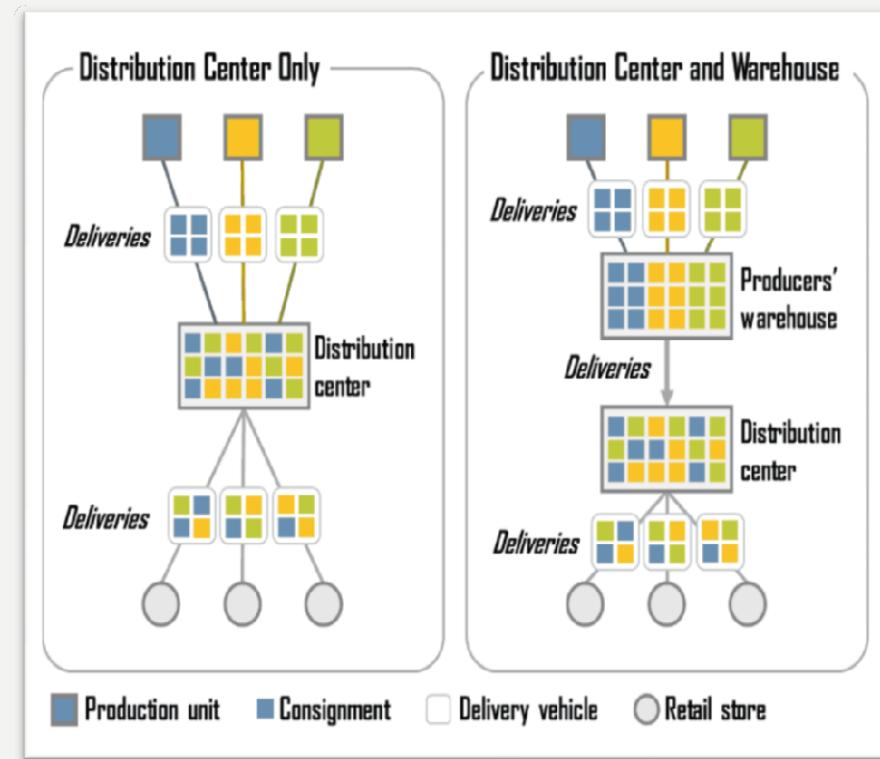
CASE BACKGROUND

- Competition amongst businesses is ever increasing
- Boom in ecommerce and unicorn companies
- Venture Capital investment increasing and number of startups appearing high
- Eg: Lime, Bird, etc.
- Supply chain efficiency and distribution centre location important



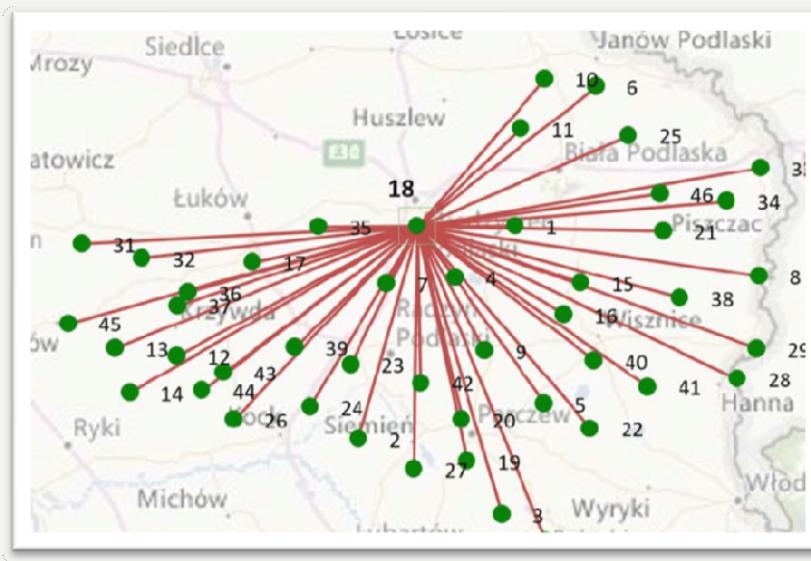
DISTRIBUTION CENTRE

- They are backbone of efficient supply chains.
- Storage and shipping building
- **Accessibility:** biggest advantages of having all of your products in one central location means you have easy access whenever you need it
- **Transportation:** While you might see a slight rise in your inbound transportation costs, the fact that all of your products are in one central location will make shipping your products much more efficient
- **Reporting:** you get to keep a closer eye on stock and inventory changes
- **Costs:** In the long run, increases profitability



DISTRIBUTION CENTRE LOCATION MODELS

- The list shows the factors to consider while selecting distribution centre location.
- In this project, we will be focusing on a subtopic of the last point being customer/client density zone



Physical Location

Build/Lease consideration

Storage requirements

Labour availability

Proximity to linkages

Zoning and desired Customer Base

BUSINESS PROBLEM AND OBJECTIVE

- A retail firm seeks to expand its business in Malaysia.
- The objective is therefore, to select the best venue to open up a distribution centre.
- 2016 onwards-significant growth in shopping e-commerce. Brick and Mortar centres declining or becoming obsolete.
- Thus important to enter into retail business with careful appraisal and a clear picture of the market



Kuala Lumpur, Capital City of Malaysia
We will be applying our data analysis to shopping malls in this city.

DATA ACQUISITION

- Wikipedia link-
[https://en.wikipedia.org/wiki/Category:Suburbs in Kuala Lumpur](https://en.wikipedia.org/wiki/Category:Suburbs_in_Kuala_Lumpur)
- Foursquare API was also used.
- Web scraping was performed using Python requests and beautifulsoup packages.
- Coordinates of the desired venues were obtained using geocoder.

Pages in category "Suburbs in Kuala Lumpur"

The following 70 pages are in this category, out of 70 total. This list may not reflect recent changes (learn more).

A

- Alam Damai
- Ampang, Kuala Lumpur

B

- Bandar Menjalara
- Bandar Sri Permaisuri
- Bandar Tasik Selatan
- Bandar Tun Razak
- Bangsar
- Bangsar Park
- Bangsar South
- Batu 11 Cheras
- Batu, Kuala Lumpur
- Brickfields
- Bukit Bintang
- Bukit Jайл
- Bukit Kiara
- Bukit Nanas
- Bukit Petaling
- Bukit Tunku

F

- Federal Hill, Kuala Lumpur

H

- Happy Garden

J

- Jalan Cochrane, Kuala Lumpur
- Jalan Duta
- Jinjang

K

- Kampung Baru, Kuala Lumpur
- Kampung Datuk Keramat
- Kepong
- KL Eco City
- Kuchai Lama

L

- Lembah Pantai

M

- Maluri



METHODOLOGY ADMINISTERED

Web scraping: wikipedia data exercised.

Geocoder to obtain geographical coordinates

Foursquare API to obtain venue data

Control structures (looping) used extensively to create and append dataframes

K means clustering (a machine learning technique that classifies data) applied. Number of clusters set to 3

```
#GET request
data = requests.get("https://en.wikipedia.org/wiki/Category:Suburbs_in_Kuala_Lumpur").text

# parse data from the html into a beautifulsoup object
soup = BeautifulSoup(data, 'html.parser')

# create a list to store neighborhood data
neighborhood_list = []

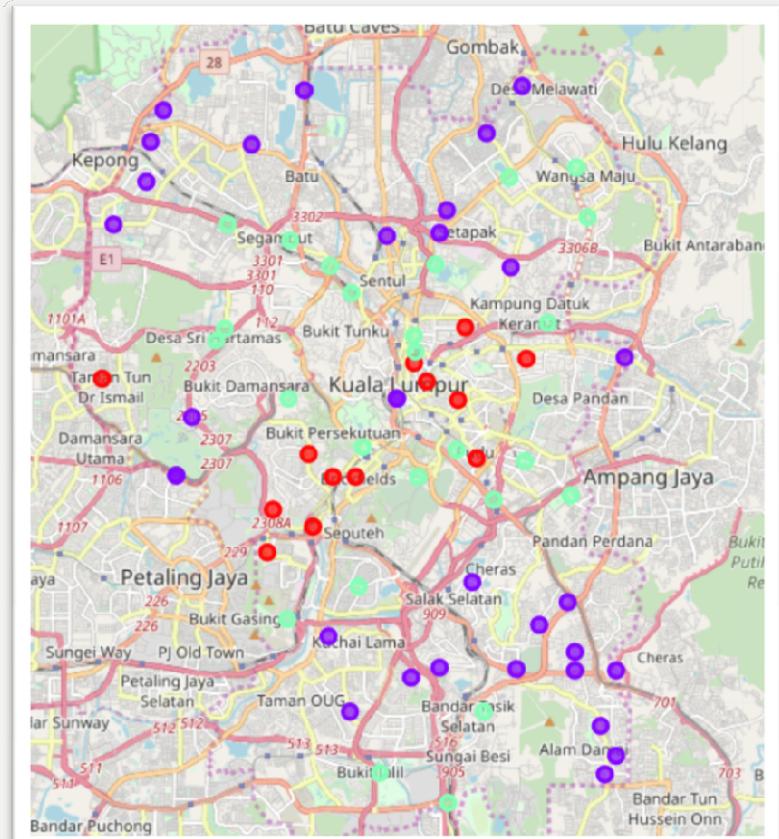
# append the data into the list
for row in soup.find_all("div", class_="mw-category")[0].findAll("li"):
    neighborhood_list.append(row.text)
```

```
# define a function to get coordinates
def get_latlng(neighborhood):
    # initialize your variable to None
    lat_lng_coords = None
    # Loop until you get the coordinates
    while(lat_lng_coords is None):
        x = geocoder.arcgis('{}, Kuala Lumpur, Malaysia'.format(neighborhood))
        lat_lng_coords = x.latlng
    return lat_lng_coords
```

```
# create the API request URL
url = "https://api.foursquare.com/v2/venues/explore?client_id={}&client_secret={}&v={}&ll={},{}&radius={}&limit={}".format(
    CLIENT_ID,
    CLIENT_SECRET,
    VERSION,
    lat,
    long,
    radius,
    LIMIT)
```

RESULTS

- Cluster 0 (red) has the lowest number of malls.
- Cluster 1 (purple) displays moderate number of malls.
- Cluster 2 (green) displays the majority in number of malls.



DISCUSSION

- the density is highest in the central area.
- This might make it a preference for the distribution centre location if proximity were only to be considered.
- Cluster 0 has the lowest number of observation-not suitable
- cluster 1 has moderate number of observation; the spacing are far apart-not optimal
- Malls belonging to cluster 2 seem dense as well as high in number-target clients to be registered.
- Other perspective:
 - cluster 2: malls are located close enough, there will be other businesses too that will be competing for sales-retail firm may have to lower its rates
 - On the other hand, the cluster 1 malls are far apart; lesser concentration of competition. Increased freight costs, but exclusivity and subsidy grants possibly advocated.
 - This leads to the question of brand importance, how well established brand the firm in question is to get preference over other dealers, although, this discussion is out of the projects scope.

CONCLUSION

- Report suggests cluster 2 shopping malls as target clients.
- Questions not considered (not part of scope on this project):
 - Freight allotments and government subsidies
 - Population density (for this project, can be considered synonymous with cluster densities)
 - Employment levels
 - Proximity to main locomotive lines.

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- **Thankyou**