

PROJECT-OPENING A SUPER FOOD SHOP @ BANGALORE

YOU ARE WHAT YOU EAT!!

[Document subtitle]

Overview



1.Problem Definition

Using food as our medicine has become a popular theme for health improvement. The trend is now to focus on healthy food intake as a primary fitness goal. Bangalore could become the fitness capital of our country. It has emerged as the most fitness conscious city in India followed by Delhi and Mumbai as per new findings. People are buying products related to fitness triple the times as compared to 2015 as per latest reports of Snap deal.

2.Business Case

With the population 12 lakh and people and whooping 4350 people per square feet, the fitness centres are flooded everyday with the huge foot fall. Identifying area where there are large fitness centres but not proper health juice and nutrition super food shop would an analysis of immense importance for people trying to identify areas best suited for this business.

3.Data Collection

For doing this analysis we have to use the data for Bangalore neighbourhood segregation from mapsofindia.com using panda's library. Geocoder library would be essential to get the coordinates for the Neighbourhood of Bangalore. Foursquare data is to be used identify nearby venues for all neighbourhood of Bangalore. Geocoder library would be essential to get the coordinates for the neighbourhood of Bangalore. This data is then to combined and wrangling as required for analysis.

Preliminary Research

A preliminary research is done on the type of fitness activity which is popular among the people. This would help to find out the footfall at various venues of the city. Furthermore, a study on the habits of the Indian people is also done. This would tell us the preferred cuisines, percentage contribution of the unorganized sector and organized sector in the food industry and reasons of them eating out. This would help in finding venues preferred by people if they choose to eat outside.

3.1 Fitness Preference

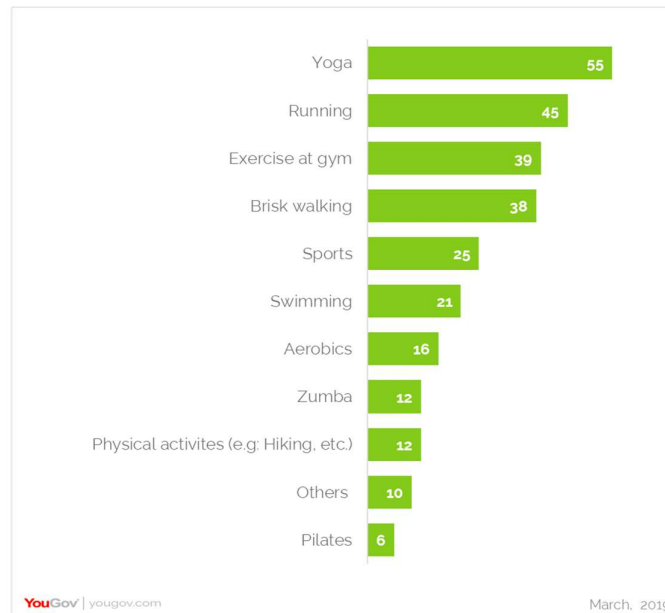


Fig 3.1. Plot for fitness preference

As per yougov.com majority of the fitness oriented population prefers to do Yoga, Running, Gym or Sports. This is directly linked with the food they eat. The study shows that at present, more than 1 in 2 people (53%) say they exercise regularly while 1 in 5 (21%) follow a specific diet in order to stay healthy. However, around 1 in 10 (9%) are likely to start exercising while almost half of these (5%) intend to follow a diet in the future to be in good trim.

Of those who currently exercise, more than half (55%) practice yoga, while under half (45%) run. As compared to males, a higher number of women are currently indulging in Yoga (65% vs 47%) and Zumba (21% vs 5%).

Activities like yoga are either done in peaceful environments like lake side or garden or else modern fitness centers have integrated yoga and meditation centers. Running and outdoor sports require open spaces such as track field and grounds. Gym/Fitness centers are also popular places among youth to perform fitness activities. Therefore venues related to these activities become crucial for analysis.

3.2 Food Preferences

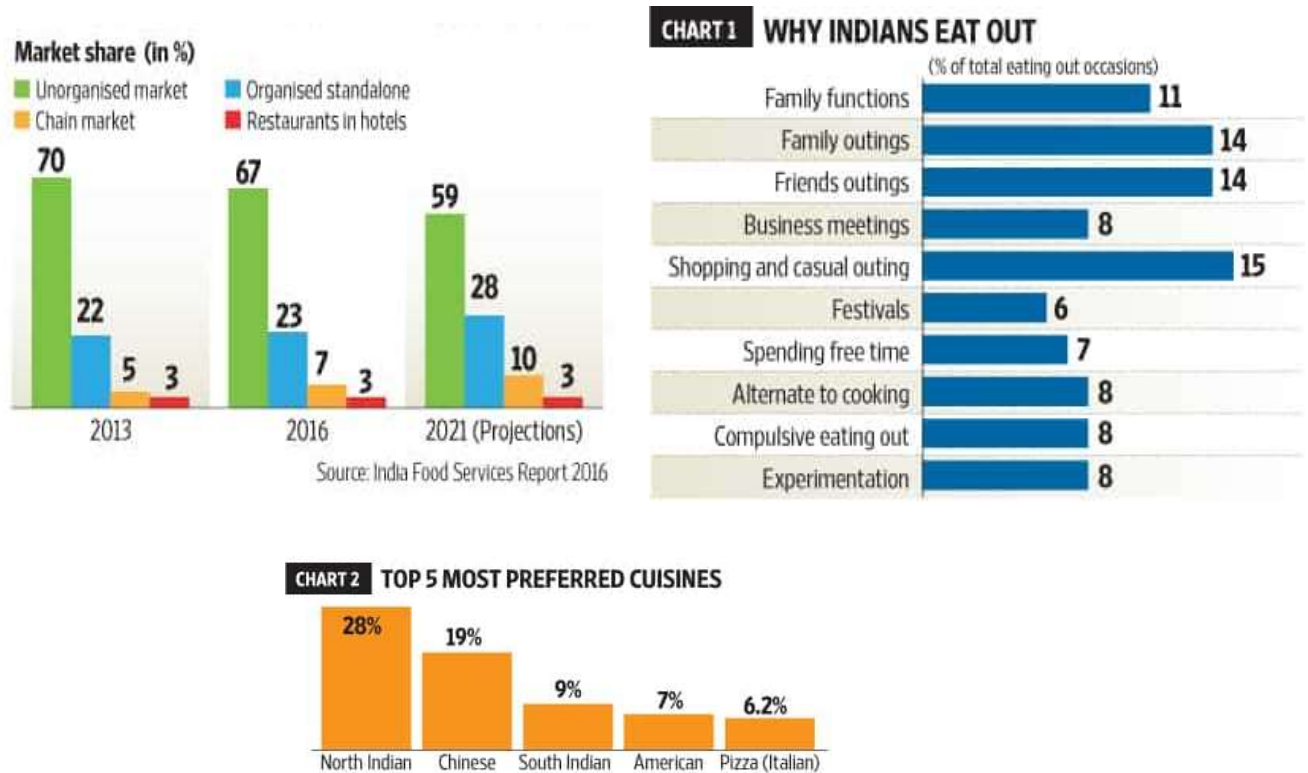


Fig.3.2 Food Preference

As per **livemint.com** group gatherings (with friends and family) and not cooking at home are top reasons for people to go out and eat. Indians—across metro and non-metro cities—eat out simply restaurants (QSRs) are the most preferred destination, followed by casual dining restaurants when it comes to eating out, according to the India Food Services because they want to experiment, love food, or that's how they want to spend their free time. They prefer north Indian food to any other cuisine. Chinese is their second most preferred cuisine. Quick-service report 2016, brought out by the National Restaurants Association of India (NRAI) and consulting firm Technopak Advisors Pvt. Ltd. Group gathering place to be looked for in analysis. Major chunk of food market is unorganized. Food trucks, Dhabas etc. to be watched out while analysing the data.

3.3 Neighbourhood geocoding

The neighborhood data is scraped from a Mapsofindia.com webpage. The latitude and longitude of the neighborhoods are retrieved using Google Maps Geocoding API.

3.4 Venue Data

From the location data obtained after Web Scrapping and Geocoding, the venue data is found out by passing in the required parameters to Foursquare API, and creating another Data Frame to contain all the venue details along with the respective neighbourhoods.

4.METHODOLOGY

4.1 Visualizing the Neighborhood

Folium builds on the data wrangling strengths of the Python ecosystem and the mapping strengths of the leaflet.js library. All cluster visualization are done with help of Folium which in turn generates a Leaflet map made using OpenStreetMap technology.

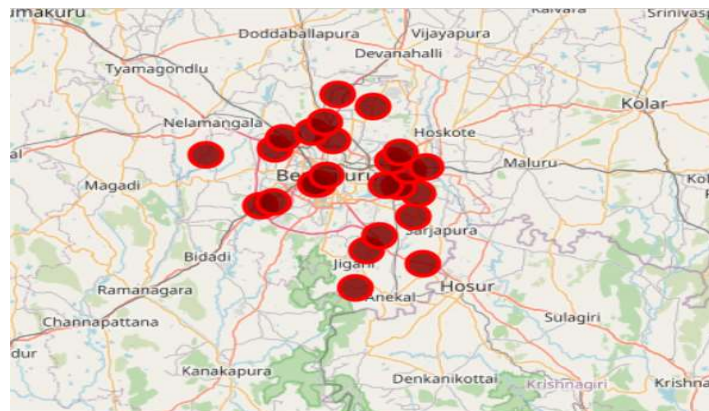



Fig 4.1 Neighborhood marking using folium

4.2 Venue Category filtering

'Afghan Restaurant',	'Australian Restaurant',	'Bookstore',	'Fitness GOTO area max',	'Multiplex',	'Hotel Bar',
'Airport',	'BBQ Joint',	'Botanical Garden',	'Flea Market',	'Music Store',	'Ice Cream Shop',
'Airport Terminal',	'Badminton Court',	'Boutique',	'Flower Shop',	'Music Venue',	'Indian Chinese Restaurant',
'American Restaurant',	'Bagel Shop',	'Bowling Alley',	'Food',	'Nightclub',	'Indian Restaurant',
'Andhra Restaurant',	'Bakery',	'Breakfast Spot',	'Food Court',	'Noodle House',	'Indian Sweet Shop',
'Arcade',	'Bar',	'Brewery',	'Food Truck',	'North Indian Restaurant',	'Italian Restaurant',
'Art Gallery',	'Basketball Court',	'Bubble Tea Shop',	'French Restaurant',	'Office',	'Japanese Restaurant',
'Art Museum',	'Bed & Breakfast',	'Building',	'Fried Chicken Joint',	'Park',	'Juice Bar',
'Asian Restaurant',	'Bike Shop',	'Burger Joint',	'Furniture / Home Store',	'Performing Arts Venue',	'Karnataka Restaurant',
'Athletics & Sports',	'Bistro',	'Burrito Place',	'Garden Center',	'Pizza Place',	'Kerala Restaurant',
'Bus Station',	'Coffee Shop',	'Dessert Shop',	'Gas Station',	'Platform',	'Lake',
'Business Service',	'Concert Hall',	'Dhaba',	'Gastropub',	'Plaza',	'Liquor Store',
'Cafeteria',	'Construction & Landscaping',	'Dim Sum Restaurant',	'General Entertainment',	'Pool',	'Lounge',
'Café',	'Convenience Store',	'Diner',	'Go Kart Track',	'Pub',	'Maharashtrian Restaurant',
'Campground',	'Cosmetics Shop',	'Donut Shop',	'Golf Course',	'Racetrack',	'Market',
'Castle',	'Creperie',	'Eastern European Restaurant',	'Grocery Store',	'Rajasthani Restaurant',	'Mediterranean Restaurant',
'Chaat Place',	'Cricket Ground',	'Electronics Store',	'Henan Restaurant',	'Recreation Center',	'Men's Store',
'Chinese Restaurant',	'Cupcake Shop',	'Falafel Restaurant',	'History Museum',	'Resort',	'Mexican Restaurant',
'Clothing Store',	'Deli / Bodega',	'Farmers Market',	'Hockey Arena',	'Restaurant',	'Motorcycle Shop',
'Cocktail Bar',	'Department Store',	'Fast Food Restaurant',	'Hotel',	'Salad Place',	'Movie Theater',



'Athletics & Sports',	'Juice Bar',
'Badminton Court',	'Lake',
'Basketball Court',	'Lounge',
'Bed & Breakfast',	'Market',
'Breakfast Spot',	'North Indian Restaurant',
'Building',	'Office',
'Bus Station',	'Park',
'Chaat Place',	'Pool',
'Chinese Restaurant',	'Salad Place',
'Construction & Landscaping',	'Sandwich Place',
'Cricket Ground',	'Snack Place',
'Dhaba',	'Soccer Field',
'Fast Food Restaurant',	'Soccer Stadium',
'Fitness GOTO area max',	'South Indian Restaurant',
'Food Court',	'Sporting Goods Shop',
'Food Truck',	'Stadium',
'Fried Chicken Joint',	'Tech Startup',
'Furniture / Home Store',	'Track Stadium',
'Hockey Arena',	'Vegetarian / Vegan Restaurant',
'Hotel',	

Figure 4.2 Reducing Variables

The venue categories are then filtered on the basis of preliminary analysis and narrowed down to **39** instead of initial no. of **150**. The main factors filter considered are- **Gym, Tracks, Sports related places, fast food areas, North Indian, Chinese and south Indian cuisines**

4.3 One hot encoding

One hot encoding is a process by which categorical variables are converted into a form that could be provided to ML algorithms to do a better job in prediction. For the K-means Clustering Algorithm, all unique items under Venue Category are one-hot encoded.

4.4 Top 10 most common venues

All the venues are then grouped by the neighborhood and mean is taken for them. This help is to understand the average occurrence of each venue in the corresponding neighborhood.

	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	A F station yelahanka	Hotel	Lounge	Vegetarian / Vegan Restaurant	Park	Breakfast Spot	Chinese Restaurant	Gym	Bed & Breakfast	Cricket Ground	Fried Chicken Joint
1	Anekal	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
2	Attibele	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
3	Attur	Bus Station	Food Truck	South Indian Restaurant	Vegetarian / Vegan Restaurant	Hotel	Fast Food Restaurant	Athletics & Sports	Soccer Field	Fried Chicken Joint	Badminton Court
4	Avenue Road	Hotel	Lounge	Breakfast Spot	Fast Food Restaurant	Park	Vegetarian / Vegan Restaurant	South Indian Restaurant	Snack Place	Sandwich Place	Bed & Breakfast
5	Bagalgunte	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Dhaba	Cricket Ground
6	Bagalur	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
7	Bettahalsur	South Indian Restaurant	Vegetarian / Vegan Restaurant	Construction & Landscaping	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
8	Bhattarahalli	Hotel	Construction & Landscaping	Badminton Court	Basketball Court	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant
9	Chamrajpet	Hotel	Park	Fast Food Restaurant	Breakfast Spot	Snack Place	Vegetarian / Vegan Restaurant	Sandwich Place	Lounge	Fried Chicken Joint	Track Stadium
10	Chikkabettahalli	Bus Station	Hotel	Fast Food Restaurant	Athletics & Sports	Dhaba	Sandwich Place	Chinese Restaurant	Gym	Building	Chaat Place

Fig. 4.3 Arranging top ten venues

Due to high variety in the venues, only the top 10 common venues are selected and a new Data Frame is made, which is used to train the K-means Clustering Algorithm.

4.5 Optimization using elbow method

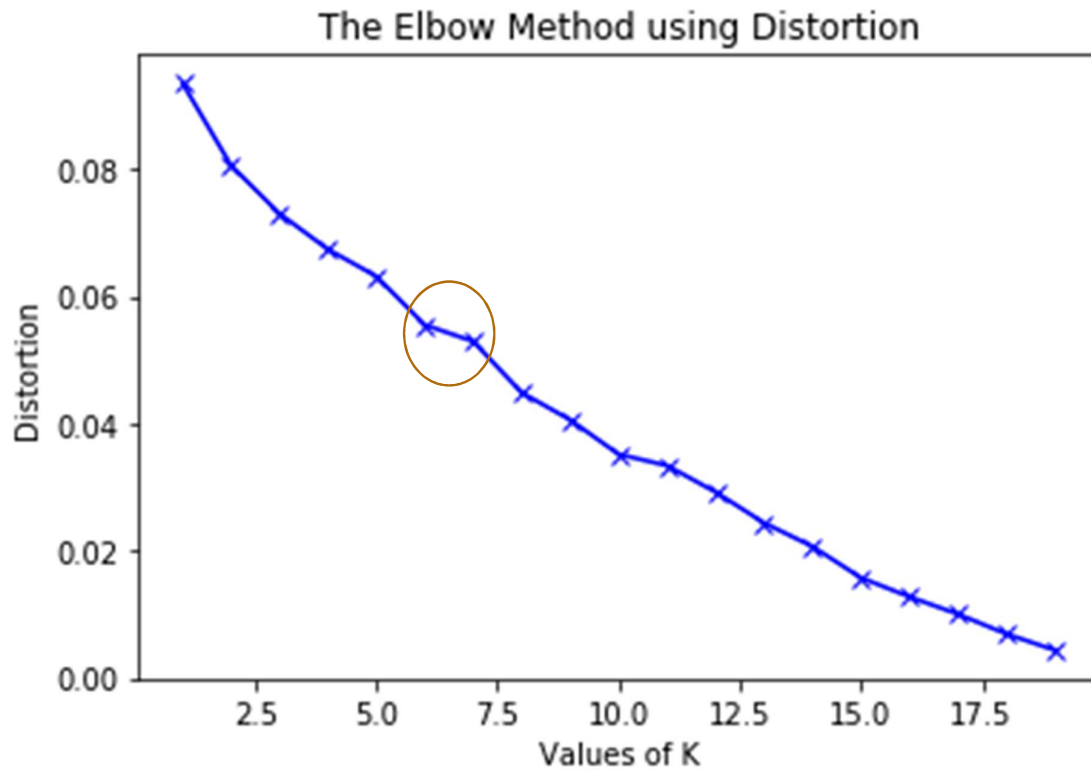


Fig.4.4 Elbow method to find optimum K

Elbow method used to find out the optimal value of and the corresponding distortion. The first change point i.e. 6 is taken as the optimal value for K. When K increases, the centroids are closer to the clusters centroids. The improvements will decline, at some point rapidly, creating the elbow shape

4.6 K-means clustering

The venue data is then trained using K-means Clustering Algorithm to get the desired clusters to base the analysis on. K-means was chosen as the variables (Venue Categories) are huge, and in such situations K-means will be computationally faster than other clustering algorithms.

Out[36]:

	Cluster Labels	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue
0	1	A F station yelahanka	Hotel	Lounge	Vegetarian / Vegan Restaurant	Park	Breakfast Spot	Chinese Restaurant	Gym	Bed & Breakfast	Cricket Ground	Fried Chicken Joint
1	0	Anekal	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
2	0	Attibele	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
3	2	Attur	Bus Station	Food Truck	South Indian Restaurant	Vegetarian / Vegan Restaurant	Hotel	Fast Food Restaurant	Athletics & Sports	Soccer Field	Fried Chicken Joint	Badminton Court
4	1	Avenue Road	Hotel	Lounge	Breakfast Spot	Fast Food Restaurant	Park	Vegetarian / Vegan Restaurant	South Indian Restaurant	Snack Place	Sandwich Place	Bed & Breakfast

Fig.4.5 Cluster after analysis

5.RESULTS

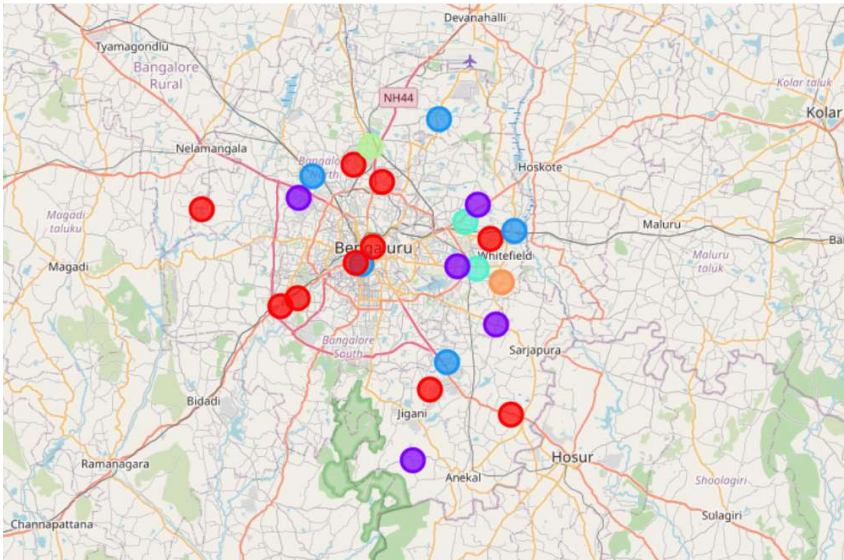


Fig. Labels plot with help of folium

6. DISCUSSION

The neighborhoods are divided into 6 clusters where n is the number of clusters found using the optimal approach. The clustered neighborhoods are visualized using different colors so as to make them distinguishable.

Cluster Labels	Neighborhood	1st Most Common Venue	2nd Most Common Venue	3rd Most Common Venue	4th Most Common Venue	5th Most Common Venue	6th Most Common Venue	7th Most Common Venue	8th Most Common Venue	9th Most Common Venue	10th Most Common Venue	
1	0	Anekal	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
2	0	Attibele	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
5	0	Bagalgunte	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Dhaba	Cricket Ground
6	0	Bagalur	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Fast Food Restaurant	Dhaba	Cricket Ground
11	0	Devanagundi	Fast Food Restaurant	Hotel	Sandwich Place	Vegetarian / Vegan Restaurant	Snack Place	North Indian Restaurant	Chinese Restaurant	Salad Place	Chaat Place	Fried Chicken Joint
12	0	Devasandra	Fast Food Restaurant	Hotel	Sporting Goods Shop	Lounge	Chinese Restaurant	Bus Station	Office	Sandwich Place	Gym	Breakfast Spot
13	0	Doddanekkundi	Fast Food Restaurant	Hotel	Vegetarian / Vegan Restaurant	Chinese Restaurant	Fried Chicken Joint	Gym	Sandwich Place	Lounge	Breakfast Spot	Food Court
16	0	Gunjur	Food Court	Badminton Court	Hotel	Lake	Market	Sandwich Place	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Cricket Ground	Fried Chicken Joint
19	0	Jalahalli West	Fast Food Restaurant	Vegetarian / Vegan Restaurant	Track Stadium	Gym	Furniture / Home Store	Fried Chicken Joint	Food Truck	Food Court	Dhaba	Cricket Ground
21	0	Magadi Road	Fast Food Restaurant	Chinese Restaurant	South Indian Restaurant	Sandwich Place	Building	Hotel	Lake	Vegetarian / Vegan Restaurant	Badminton Court	Bus Station

Fig.6. Cluster Zero with favourable conditions

The 10 places namely Anekal, Attibele, Baglaur, Devansundra, Doddanekuddi, Gunjur, Jalahli West, Magdi Road fall in the criteria for abundant amount of fitness places and fast food places. This would give an ample opportunity to take business there.

The food services market in India is projected to grow to ₹ 4.98 trillion by 2021, expanding at an annual average rate of 10%, from ₹ 3.09 trillion in 2016, according to the NRAI-Technopak report.

7.CONCLUSION

- As people get more and more aware about the relation between the food and fitness. There is an expected shift from people eating habits from unhealthy food to healthy food.
- More data on demographics like age, area wise population density, income can be integrated to get narrow down to less options

THANK YOU