Evaluating The Joint Chiropractic Inc: Cracking into the Chiropractic Industry

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April 3, 2019

1. Introduction

1.1 Background

Franchising offers aspiring entrepreneurs the opportunity to invest in proven business models with the potential for large returns on your investment. One such franchising opportunity is The Joint Chiropractic, which has been transforming the cost and accessibility of Chiropractic care by situating its locations near retail settings.

The Joint Chiropractic franchise has touted exceptional growth due to its small footprint, low overhead and no inventory business model. The company allows it clients to receive affordable chiropractic care with monthly plans at a cost of $39 per visit. The franchise also advertises that it leverages Global Information Strategies and customer analytics to evaluate the ideal locations for future sites.

1.2 Problem

Entrepreneurs need to independently evaluate franchising opportunities to assess if the Joint Chiropractic is the appropriate investment opportunity. The Data Science approach will be used to evaluate the following:

1. Does a K-means analysis provide insight on what constitutes a "Good" Joint Chiropractic location?
2. What tools can be sued to help gauge customer impressions of the Joint Chiropractic as a brand and assess the overall impression of this franchise in the United States?

1.3 Interest

Although The Joint Chiropractic Inc. provides potential entrepreneurs with data to help decide whether or not to open a Joint franchise, it is a wise idea to hire a Data Scientist to help the entrepreneur independently assess the business opportunity. I have a close friend who is in the process of opening a Joint Franchise locally. This analysis could be used to assist in deciding on whether to move forward.

2. Data

In order to properly assess the Joint Chiropractic Franchise, we will need to aggregate two types of data: nearby venue data and customer satisfaction data. At the time of this analysis, the Joint has over 470 franchises in operation nationally. A critical component of the Data Science analysis was to acquire enough data to adequately characterize the stores near each of the Joint Chiropractic clinics. Based on my initial research, there are currently approximately 35 existing Joint locations in the greater Atlanta area. However, performing an analysis on the Atlanta sites does not provide enough data to properly characterize the Joint Chiropractic brand as a whole.

The Joint's website, https://www.thejoint.com/, was scraped to obtain the address and location description of the existing 470-plus clinics. After that, a mapping and analysis tool called ArcGIS, http://www.arcgis.com/index.html, was used to acquire the geocoding data for each clinic. Data Wrangling was then performed to ensure the data is in the appropriate format to use Foursquare API to obtain information about Venues near each clinic.

In order to obtain customer satisfaction data, initially the Foursquare API was used to obtain customer satisfaction data. Unfortunately, only a small sampling of the local clinics was evaluated on this platform. As a result, as an alternative, the Google Places API has been used to determine the average user rating for 474 of the clinics operating in the U.S. This API was critical in gauging the national perception of the Joint Chiropractic Brand.

Data visualization will then be used to depict the current locations nationwide. The Foursquare location service can then be used to determine common venues near each site within a 500 m radius. After that, the resultant nearby data will then be normalized in preparation for K-means analysis. Since we don't know the optimal cluster value beforehand, we will apply the Elbow method to ensure an appropriate K is used for the current analysis.

3. Methodology

The aim of this project was to determine what constitutes a "good" location and assess how well the Joint Chiropractic franchise is viewed nationally. The Joint website was used initially to obtain clinic addresses throughout the United States, while the Foursquare API provided the nearby venue data needed to benchmark the typical Joint Clinic. After that, the Google Places API was leveraged to determine user ratings for over 80% of the active clinics, and eventually determine an overall average user rating for the Joint Chiropractic chain.

The Data Science Analysis was performed as follows:

1. Used BeautifulSoup4 to scrape the Joint website and obtain address information for the 474 locations.
2. Leveraged ArcGIS API to generate the corresponding longitude and latitude values from the target locations.
3. Visualized the current clinic locations on a map and was able to identify potential sites in the Atlanta area.
4. Employed Foursquare API to obtain Nearby venue data for all current The Joints sites nationwide.
5. Prepped and normalized nearby venue data in preparation for K-means analysis.
6. Used Elbow method to determine the appropriate K-mean cluster value.
7. Recorded observations and conclusions based on nationwide Foursquare analysis.
8. Attempted to obtain on consumer rating data using Foursquare by obtaining the Venue ID for each location and then aggregating the number of Likes and user rating. However, insufficient data was available on Foursquare.
9. Used the Google API to obtain consumer rating data for approximately 95% of the existing Joint locations. Used the Latitude and Longitude coordinates along with a criterion where the Keyword- Chiropractors and radius-100 m.
10. Summarized all analyses and provided recommendations for either moving forward or declining to pursue a Joint Chiropractic franchise.

The initial challenge was to determine the locations and geo coordinates for all the Joint Clinics in the United States. First, BeautifulSoup4 was used to extract: The Location Name, Address, and City/Zip code. The Joint website allows users to search for all its current listings at once. To parse the site properly, code was then added to handle two cases: when an address included a Suite number and when it did not. All locations were then stored into a single dataframe. Next, ArcGIS was used to determine the longitude and latitude for each clinic. After providing the full address for each location, ArcGIS was used to loop through all 473 locations and obtain the corresponding coordinates.

Next, Folium was used to visualize the Clinic locations as shown in Figure 1.

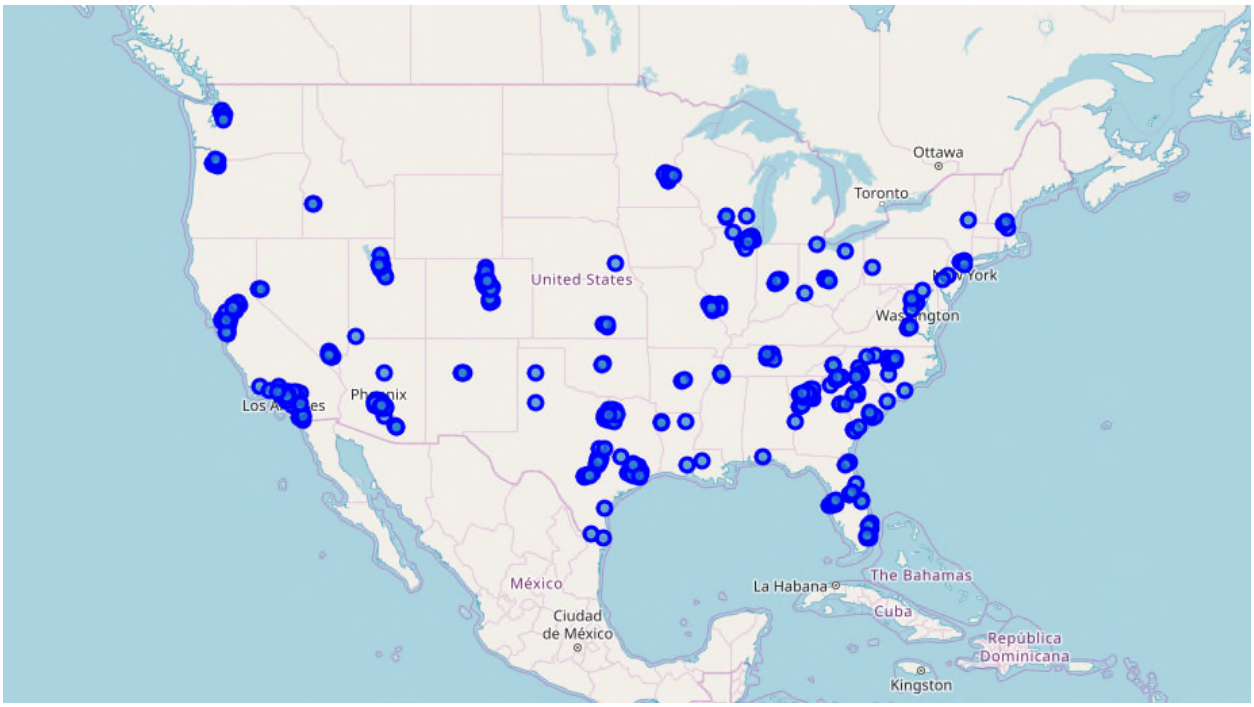

Figure 1: Depiction of The Joint Chiropractic Franchises in the U.S.

With the coordinate information for each location in place, a K-means analysis was then performed to cluster each of the clinics into its associated cluster. The analysis was similar to the one performed in Week 3. The sum of the squared distances was plotted versus the number of items per cluster to graphically estimate the appropriate K value.

In order to gauge customer perception of the Joint Franchise, Foursquare was the initial choice. A query was constructed to find the Venue ID for each location, and then in turn, attempt to accumulate the user rating and number of Likes for each clinic. However, since most of the clinics did not have customer satisfaction information stored on Foursquare, the Google Places API was used instead. Obtaining the average user rating and total number of votes could be obtained without any charge. In addition, over 450 of the 474 clinics had customer satisfaction data stored via Google Places.

4. Results and Discussion

4.1 Mean number of Nearby Venues

The initial benchmark metric was to determine the average number of nearby venues at each clinic. This statistic is significant, because The Joint franchises advertise that clinics are intentionally situated near retail shopping centers. We wanted to investigate if the claim was true.

From Table 1, we see that the average number of nearby venues is just over 37 venues within a 500-m radius and the median value is 34 venues. Based on these results, it seems that Joint clinics are situated near well populated retail areas.

Table 1: Summary Statistics associated with the Number of Nearby Venues at each U.S. Joint Clinic

	Nearby Venues - Summary
count	473.000000
mean	37.171247
std	17.419374
min	2.000000
25%	25.000000
50%	34.000000
75%	47.000000
max	100.000000

4.2 Appropriate K- Mean Cluster Value

K-means clustering algorithm was performed. The Elbow Method was used to select an appropriate number of k-clusters. Looking at Figure 2, the convergence slows at a cluster size around 40. As a result, the K-means included in the Jupyter Notebook uses 40.

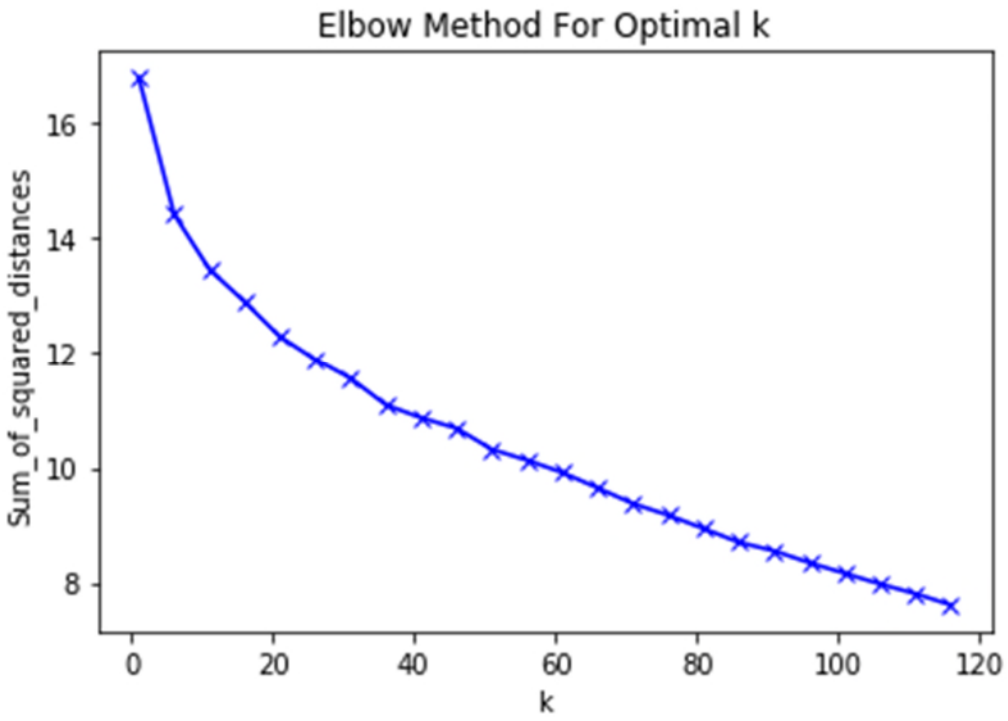

Figure 2: Elbow Method depicting the Sum of the Squared distances as a function of the number of K-clusters

4.2 K- Means Analysis

Once the k-cluster value was confirmed graphically, then the K-means clustering method was applied to all of the clinics nationwide. Figure 3 show the different clusters for each clinic nationwide. The motivation for this project was to look for potential places to open a Joint Franchise in the Atlanta area. Figure 4 shows the clustering for the Atlanta market. It appears Smyrna, Marietta, and Mableton could provide a potential location for a future site.

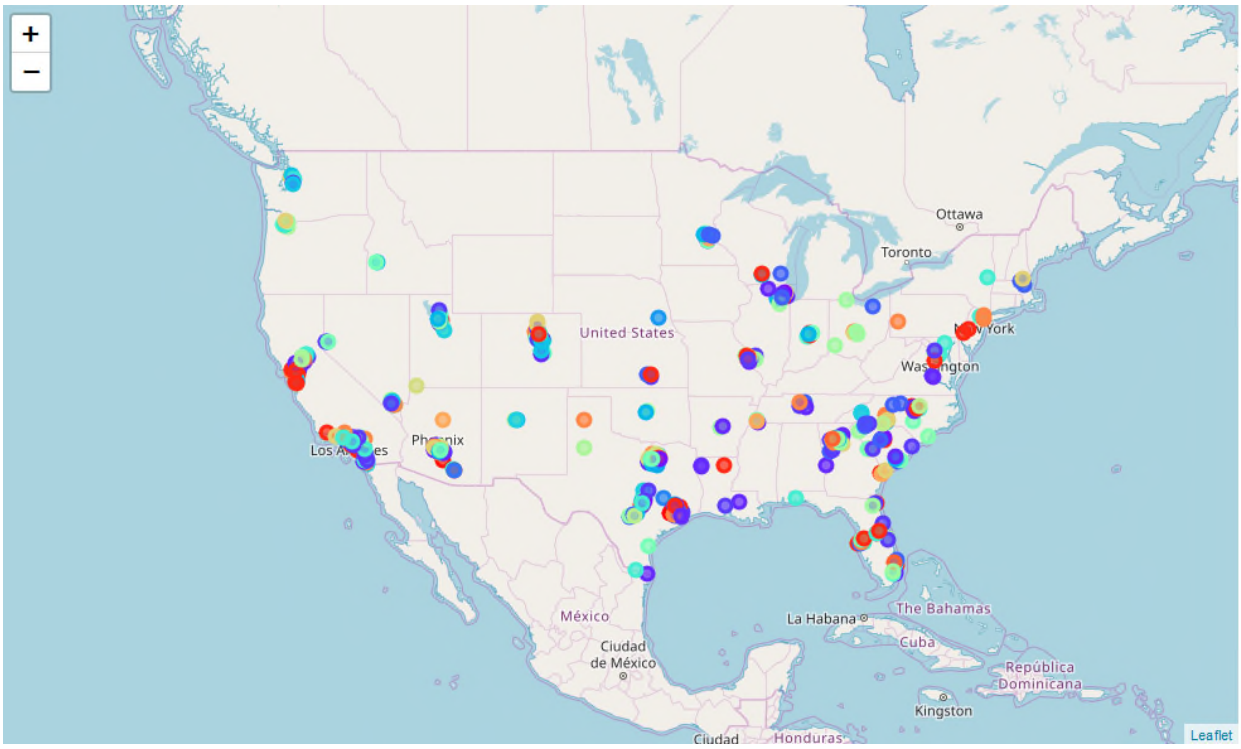

Figure 3: Depiction of K-means National results for the Joint Chiropractic Franchise

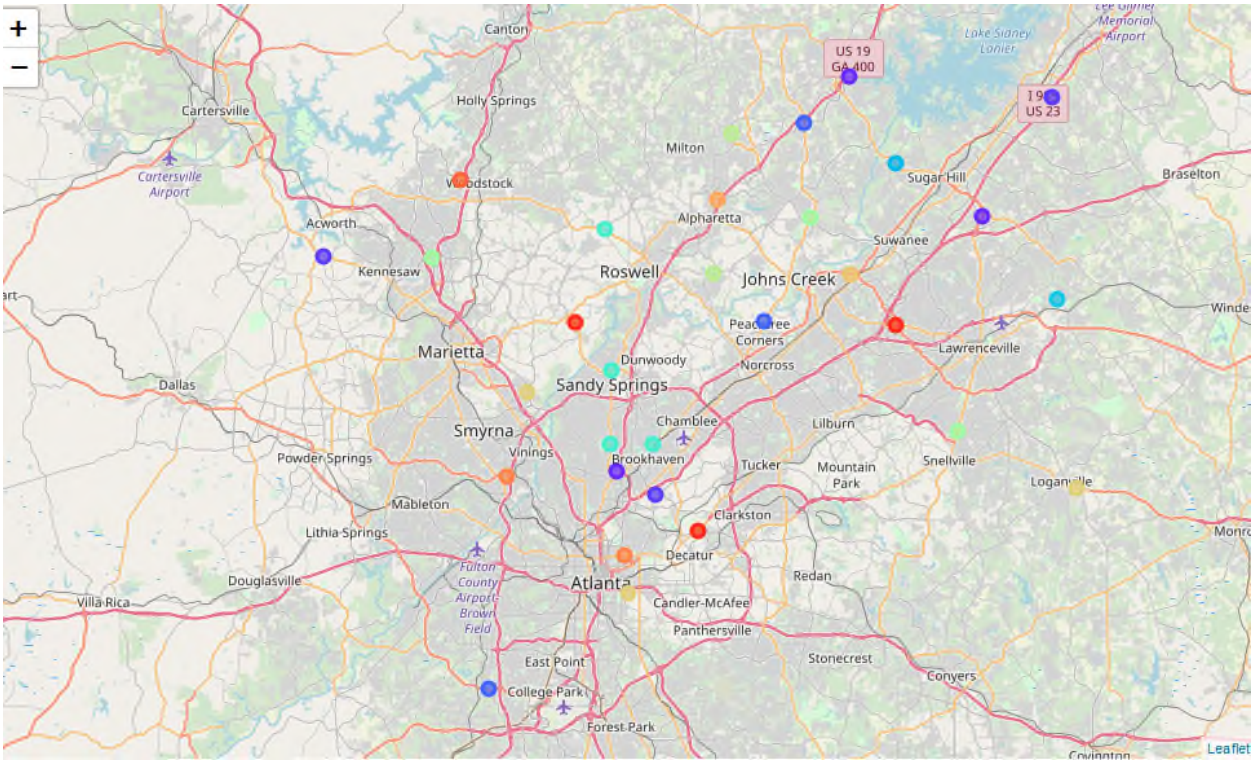

Figure 4: Depiction of K-Means Results for the Atlanta-Area Joint Chiropractic Franchises

4.3 Customer Satisfaction Analysis

In order to determine how customers view the Joint Franchise, the Google Places API was used to determine each location's average user rating and number of ratings provided. The name of the returned Chiropractor was also saved to ensure that only The Joint Clinics were returned. All non-Joint Chiropractor ratings were excluded. In addition, the Ratings total must have at least five (5) ratings to be included. As a result, 417 of the 474 clinics were included in the Customer Satisfaction Analysis.

Table 2: Customer Satisfaction Results for The Joint Chiropractic

	Average_Rating	Ratings_Total
count	417.000000	417.000000
mean	4.540528	44.438849
std	0.379287	36.757348
min	2.900000	5.000000
25%	4.400000	20.000000
50%	4.600000	32.000000
75%	4.800000	59.000000
max	5.000000	236.000000

Based on the results included in Table 2, nationally the Joint has a respectable Average rating of 4.54 out of 5. Moreover, the minimum rating was a modest 2.9. Looking at the Histogram and respective Box plot depicted in Figure 5 and Figure 6, we see that the underperforming outlier locations have user ratings from 3.74 and below. However, the vast majority of the Joint Chiropractic clinics have average user ratings of 4 or greater.

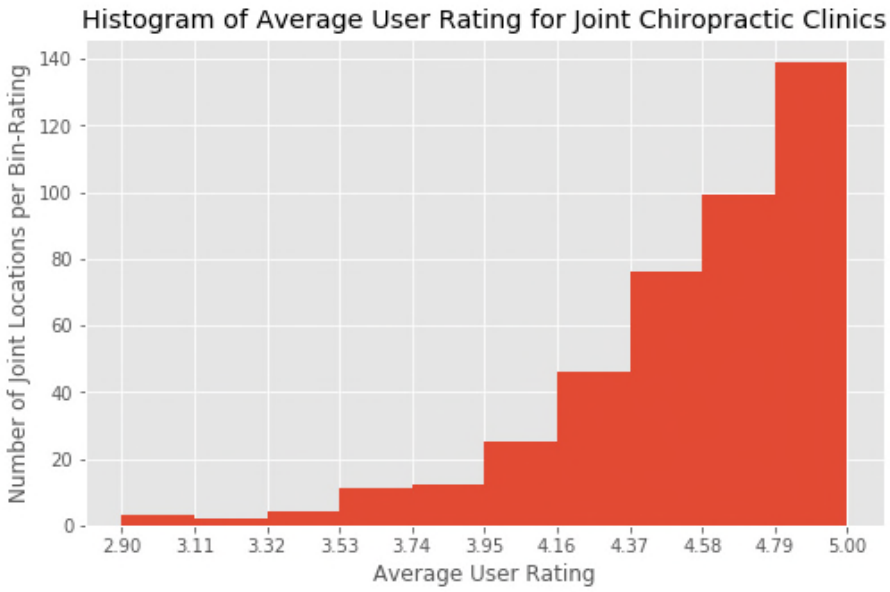

Figure 5: Histogram of Average User Rating for Local The Joint Clinics

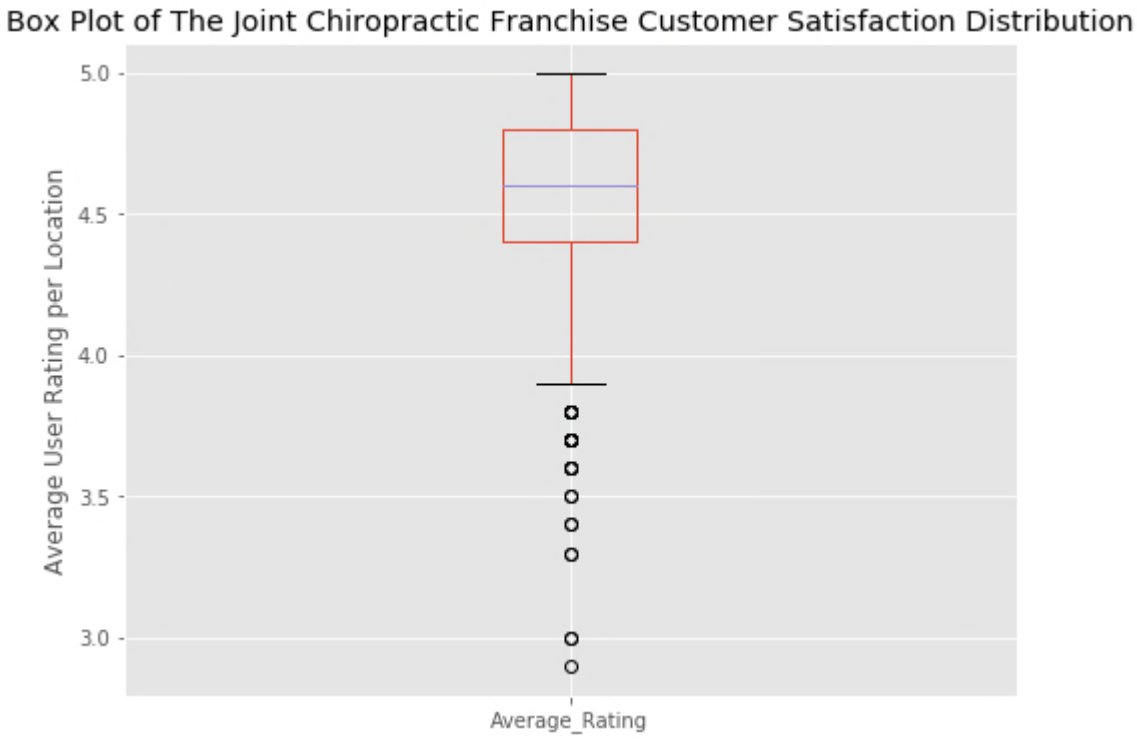

Figure 6: Box Plot of User Ratings for the Joint

5. Conclusion

The Joint Chiropractic Franchise was evaluated using a Data Science Approach to benchmark and classify its current Franchises, determine the typical number of nearby venues at a Joint Chiropractic Clinic and assess the average user rating nationally. Nearby Venue data via Foursquare suggests that on average Clinics have nearly 37 venues near it within a 500 m radius. The K-means analysis featured a k-cluster of 40 for acceptable results. Based on the average user ratings derived from Google Places, the Joint Chiropractic is well received with an average user rating of 4.54 out of 5.00. Given the low overhead and propensity for growth along with the aforementioned results, The Joint Franchise seems to be an excellent franchising opportunity.