Analysis of Sales Status of the X E-commerce Platform in Beijing

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Abstract: In recent years, the development of China electronic commerce is very rapid. More and more people begin to buy necessities and service by internet, which makes online shopping consumption become popular, and different types of e-commerce companies largely arise. This paper focuses on the sales status of a community e-commerce platform, which provides shopping and all kinds of home services. Descriptive analysis and cluster analysis are used to analyze the sale data. The analysis result can be used to modify the strategies of the X platform.

Keywords: E-commerce, Community Service, Cluster Analysis

1. Introduction

E-commerce is a hot word now and appears in our daily lives. The E-commerce has a lot of types, such as ABC, B2C, C2C, B2B, B2M, M2C and O2O. The rapid development of this industry closely impacts our society. The e-commerce industries benefit from the development of information technology, and more and more people access the internet by PC or mobile phones. Online shopping is very popular now, which highly promotes the development of electronic commerce. All kinds of e-commerce platforms emerge in an endless stream. The X e-commerce platform is an Online To Offline (O2O) platform, i.e., put the offline service and products trading online. The special aspects of X e-commerce are that it only runs their business for communities. Now the X e-commerce is new run company, and they only offer services in several communities in Beijing, and only the residents in these communities can buy in their online platform.

The X e-commerce platform now only offer services in 11 communities, and the trade history data are downloaded from company database. The data includes everyday trade history for each community and the time is from June 25th, 2015 to Dec. 9th, 2015. The data contains the number of apartments, the number of register apartments, the number and amount of purchase in the X platform. At present, the platform only offers service for laundry, tourism, and supermarket. This paper is to analyze the sale status in several communities in

Beijing. According to the results of the analysis, it is expected to give some advices on the business direction, sale strategies and future development. Hopefully, the analysis results can help to do precision marketing for every community, and lead more income for the X e-commerce platform.

2. Hierarchical Clustering

Hierarchical clustering essentially consists of progressively organizing all of the candidate objects into clusters comprising mutually similar objects as determined by some measure of inter-object and inter-cluster similarity, proceeding in succession from the formation of small clusters containing just two objects to large clusters containing many objects. It is characteristic of this procedure that the clusters formed in each step can be graphically displayed in tree diagrams referred to as dendrograms. Hierarchical clustering is widely used as it visuality, but it is less efficient for large observations. In this paper, the 11 communities are clustered into several groups and only 7 variables are used. The 7 variables are the total number of apartments, total number and amount of supermarket, laundry and tourism sales. The original dataset has 1815 observations, but are summed to 11 rows and 7 columns, and each row resents a community. The dataset is suitable for hierarchical clustering method. The data are

transformed by z-score standardized before clustering.

By clustering, the 11 communities are grouped into several clusters, and the analysis about these clusters is then performed.

3. Descriptive Study

Figure 1 shows the spatial distribution of 11 communities in Beijing. The name and the apartment number of each community are marked in the map. In the map, the size and color of each community is proportional to its apartment number. It can be seen from the map that communities are mainly in Beijing suburban areas. In terms of prices, TN one and Original Villa are in the most expensive areas; while Mount Hope, M Chantilly, X Chantilly, and S Paridise are in the cheapest areas. The other communities are in the middle scale. Original Villa is the villa community and the others are apartment community.

The name and the apartment number of each community are marked in the map.
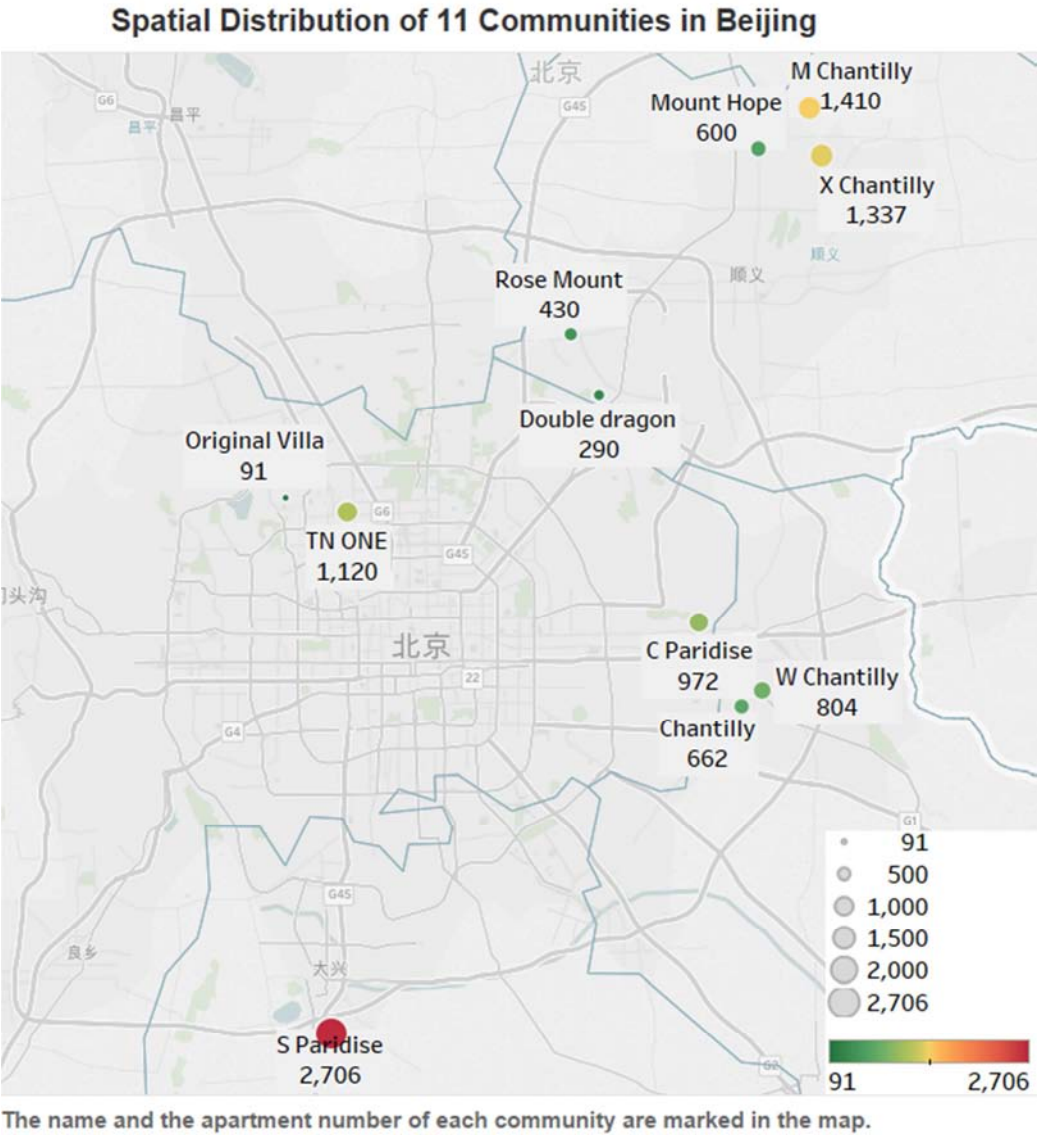
Figure 1. The spatial distribution of 11 communities in Beijing. The name and the apartment number of each community are marked in the map. The size and color of each community is proportional to its apartment number.
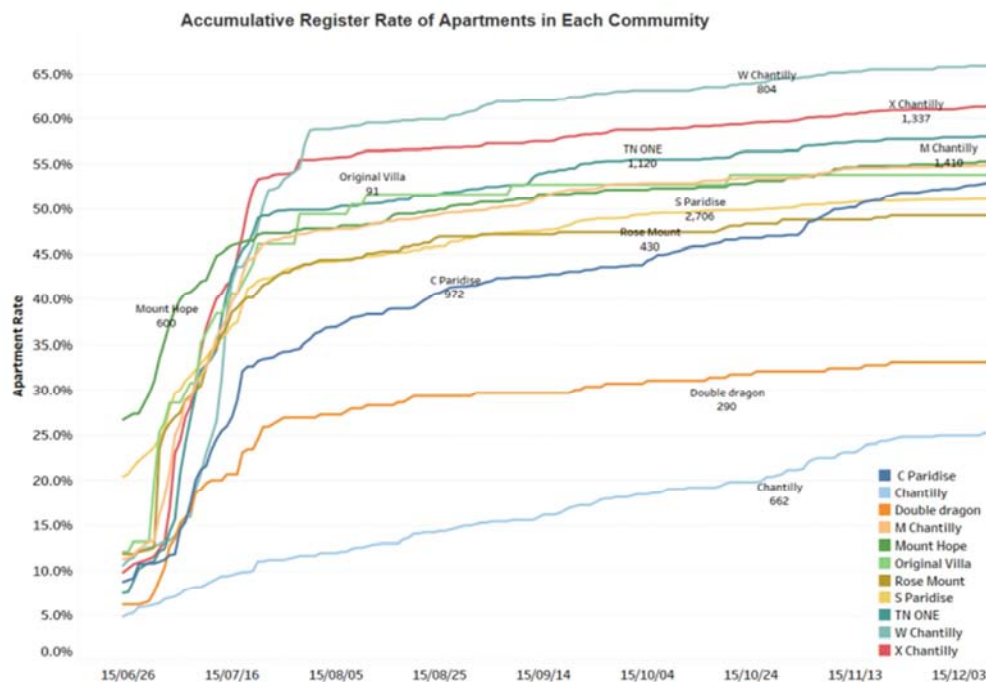
The accumulative register persons in each community are shown in Figure 2. Each color indicates each community. The name and the apartment number of each community are also marked in the figure. Figure 2 displays that the number of register persons increase as time increase. The communities with larger apartments often have larger register persons. In the beginning time of June and July, most communities have the fastest increase rate, and the growth rates gradually decrease. In the end of September, the increase rate of most communities is very low and the lines in the Figure 2 keep even then.
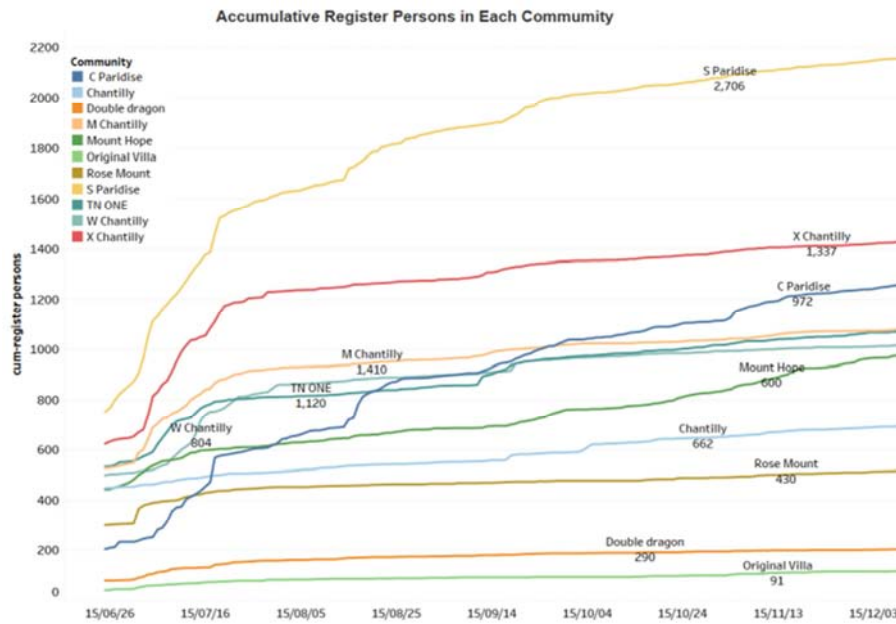
Figure 2. The accumulative register persons in each community. Each color indicates each community. The name and the apartment number of each community are also marked in the figure.

Accumulative register rate of apartments in each community is the ratio between registered apartment number and total apartment number in the community. Every person can register in X platform, but only the apartment owners can register their apartments. The owners can get more extra service if they register their apartments. Figure 3 shows the accumulative register rate of apartments in each community. Each color indicates each community. The name and the apartment number of each community are also marked in the figure. The increase trend in the Figure 3 is very similar to the

trend in the Figure 2, but the gaps among the lines in Figure 2 are far less than those in Figure 3. The order of each community in apartment register rate is different from that in Figure 2 of register persons. For example, Community Chantilly has lowest apartment register rate but have median register persons. Community S Paridise have largest register persons in Figure 2 but have median apartment register rate. The order difference between Figure 2 and Figure 3 is because of the different measurements


Figure 3. The accumulative register rate of apartments in each community. Each color indicates each community. The name and the apartment number of each community are also marked in the figure.

The sale amounts of supermarket, laundry and tourism for each community are shown in Figure 4, Figure 5 and Figure 6 respectively. In the Figure 4, Rose Mount has the highest supermarket consumption, and the original villa has the least amount. In the figure 1, the number of apartments in each community is shown, and the order of sale amount in Figure 4 is a little different from that in Figure 1. In general, communities with high apartments often have high consumption on supermarket, as more people have more daily necessities. However, S Pardise has most apartments but has fewer sale amount. The communities of M Paridise and C Paridise also have similar problem. The X platform should put much resource in these communities to get more customers and sale amounts. The orders of laundry sales in Figure 5 are similar with the order in Figure 4. The interesting things are found that no laundry sales in the communities of Double dragon, Original Villa and S paradise. For the Original Villa, it may because the residents are all rich people and they often have expensive clothing. They prefer to do laundry in their familiar shops. But for the other no laundry communities, the X platform should invest much resource on advertising and service. Figure 6 shows the sale amount of tourism in each community. The new things are found that Original Villa has the highest consumption on tourism. This is because that tourism is a little bit of luxury leisure and rich residents in that community often have mood and money to enjoy the tourism.
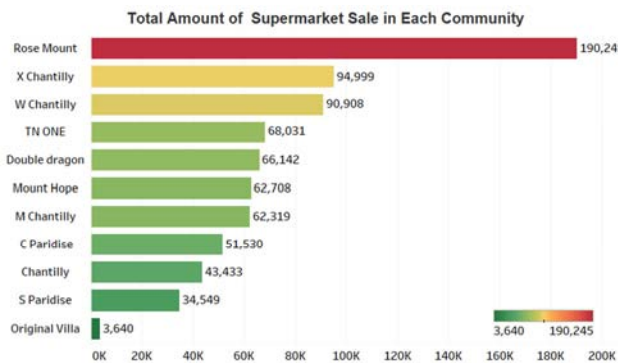
Figure 4. *Total amount of supermarket sale in each community, and the sale amount is marked in plot. The length and color of each bar is proportional to its supermarket sale amount.*
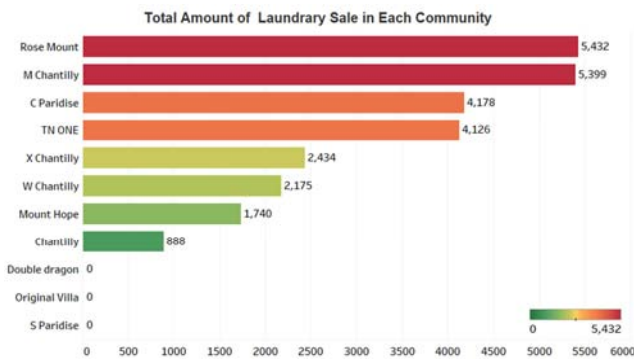

Figure 5. *Total amount of laundry sale in each community, and the sale amount is marked in plot. The length and color of each bar is proportional to its laundry sale amount.*
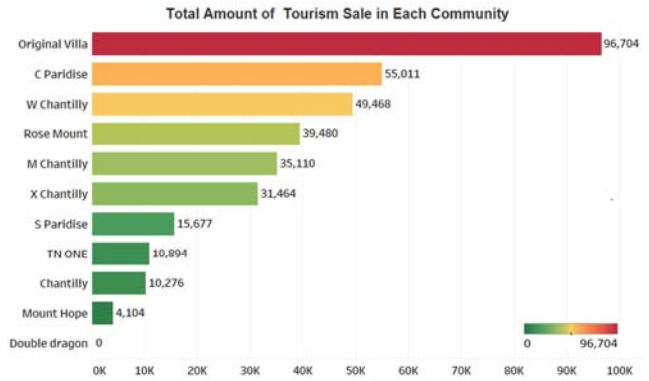
Figure 6. *Total amount of tourism sale in each community, and the sale amount is marked in plot. The length and color of each bar is proportional to its tourism sale amount.*

4. Clustering Result

After the Hierarchical Clustering, the tree-diagram are shown in Figure 7, and it demonstrate how the communities are grouped into small groups in detail.
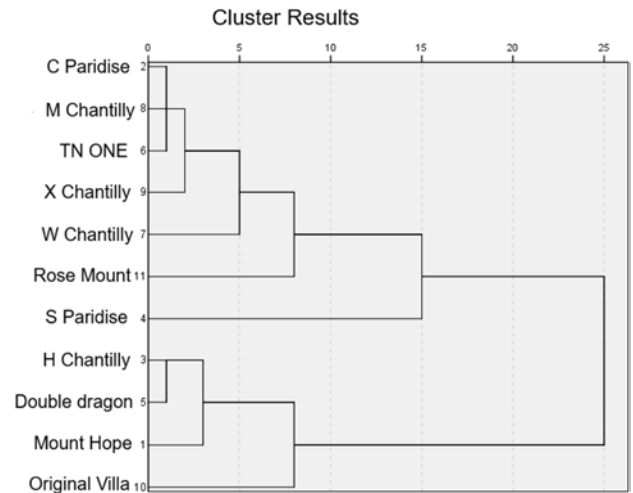
Figure 7. *The process of the segmentation.*

From the figure 7 and based on the analysis on last section, the 11 communities are grouped into 4 sub-groups. Cluster 1 are the communities of C Paridise, M Chantilly, TN One, X Chantily, W Chantilly and Rose Mount; Cluster 2 includes S Paridise only; Cluster 3 contains H Chantilly, Double dragon, Mount Hope; Cluster 4 has Original Villa only.

From the results in Figure 1-6, the communities in Cluster 1 often have large register persons and apartments. The residential incomes in these communities are median and they pay much on their daily necessities. For these communities, the X platform should advertise much on practical products to these communities.

For Cluster 2, it has S Paridise community only. This community is a very community but have fewer register persons and apartments. The further check with S Paridise shows that this community is a new community and Many residents have not lived in their apartments. The residential

incomes in this communities are also not high, and the X platform should also advertise much on practical products to them.

For Cluster 3, the residential incomes in these communities are relative high, and the X platform should offer good products and services to the residents. For the Cluster 4, it has Original Villa only, and residential incomes in this community are relative high. Residents have high quality lifestyle, and the X platform should advertise much on luxury products and services.

5. Conclusions

This paper analyses the sale status of the X e-commerce platform. This platform runs their business in 11 communities in Beijing, and the total number of apartments, total number and amount of supermarket, laundry and tourism sales are described. The accumulate number of register persons and apartment register rates in most communities increase as time, and have fast increase in the beginning time, but gradually keep even. Based on the total number of apartments, total number and amount of supermarket, laundry and tourism sales, 11 communities are grouped into 4 cluster by Hierarchical Clustering. Based on the features of communities in each cluster, the profile of each cluster is analyzed and some suggestions for the X platform are given. The X platform should advertise much on practical products and services to communities in cluster 1 and cluster 2, and offer good products and services to the residents in cluster 3, while advertise much on luxury products and services for the residents in cluster 4. This paper does a simple description and analysis on the data from X platform, and the results in this paper can be a reference to X platform. Hopefully, the results can be used to modify the strategies of the X platform for future development.

Acknowledgements

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