

The Transformation of Consumer Demand and Marketing Methods in the Era of Popularization of Smart Phones

Jujun Feng*

Xi'an Peihua University, Xi'an City, Shaanxi Province, China

691730812@qq.com

Key words: Smart phone, Consumer Demand, Marketing Methods, K - means Algorithm

Abstract: The gradual development of social economy and the progress of science and technology makes the application of smart phones more popular, all of people's consumption demand and has had a profound influence to enterprise's marketing, in order to meet the new era of smartphones under the popularization, promoting good sales of enterprise products, enterprises must strive to change the marketing way, keep the competitiveness of the good, only so can not be eliminated by the social economy. The popularization of mobile phones in the consumer demand performance is mainly personalized consumer demand, in the marketing performance is mainly reflected in the marketing concept and marketing methods. Based on the smart phone consumption characteristics, on the basis of a simple comparison with the traditional consumption, and on the basis of using the K - meansS algorithm, analyses the smartphone to popularize a new era of consumption demand of concrete under a change of direction, and how to promote the development of marketing under the influence of mobile intelligent, puts forward some Suggestions to better promote the change of marketing, promote the wider smartphone rapid economic development of The Times.

1. Introduction

In the era of Internet technology, consumers' consumption concept and consumption habits have undergone tremendous changes, and offline experience and online purchase have become the mainstream. And with the popularity of smart phones, the change of consumer is more obvious, everyone began to shift to the mobile phone, shopping behavior is not only shopping, brush a circle of friends, order a meal, travel, and even office are on the phone, because the arrival of the era of mobile Internet brought smartphones, everybody's shopping behavior is no longer limited to time and space [1]. The convenience of consumption brought by the popularization of mobile phone promotes the change of people's consumption demand. On the one hand, the change of consumption demand and largely promote the change in the way of marketing, on the other hand, intelligent mobile Internet has changed the consumers' access to information and usage patterns, traditional marketing has been unable to meet the development requirements of the market, many enterprises adapt to change, for example, actively use the Internet word of mouth to attract consumers and establish the fan coil, tried to use fans to build marketing channel, the transformation of the mode of marketing [2-3]. Of course, this is only one of the marketing methods, the popularity of smart phones will bring about a profound change in marketing methods.

At present, domestic and foreign scholars have conducted many studies on consumption and marketing under the background of Internet, mainly on consumption types, consumption habits, consumption patterns and marketing strategies, and rarely on the reform of consumption demand and marketing methods [4]. Moreover, the current researches of scholars are mainly aimed at the Internet environment, but not specific to the popularization of smart phones. Therefore, many previous research theories are not fully applicable to the economic development in the era of the popularization of smart phones, and many problems will arise if they are copied [5-6]. In general, there are still some research gaps in this aspect.

To sum up, the popularity of smart phones has greatly changed people's lifestyle and consumption habits, but also brought new opportunities and challenges for the development of all walks of life. Therefore, it is of great significance

for economic development to study the consumer demand in the era of mobile phone popularization and make efforts to change marketing methods [7-8]. To make up for the scholars in the field of intelligent mobile phone consumption existing research gaps, in this paper, on the premise of arranging and analyzing the related basic theory, the use of K - means algorithm, on the basis of in-depth analysis of the smart phone popularity brings the change of consumer demand, and on the basis of the analysis of the current era of marketing methods and existing problems, and puts forward some suitable for smart phones under the popularization era of marketing strategy [9-10]. Therefore, this paper is of great theoretical and practical significance to the economic development of various industries and the overall social development in the future.

2.Method

2.1 K - means Algorithm

K-means algorithm has become the most widely used clustering algorithm in data mining. The algorithm accepts a data training set that has not been classified, and then the data will automatically gather into different groups without supervision. The original K - means clustering algorithm is a random sample in the sample data K samples as the initial cluster centers, so that there may be the initial cluster center concentration or not evenly distributed in the sample data set, the required number of iterations increases, resulting in data convergence into local optimal solution, even affect the accuracy of the clustering results. In order to avoid such results, the selection of the initial cluster center is improved according to the specific situation, so that the cluster center can be evenly distributed in the sample data set, to avoid outlier and noise, and to achieve the highest accuracy of the most intermediate clustering result. At the same time, three Distance measurement methods were put together for analysis, including Euclidean Distance, City Block Distance and Minkowski Distance, to find out the optimal Distance measurement method.

In this paper, the sample set of mobile phone users is defined as object set S, in which every mobile phone user is an object S. Any cluster represents a set of similar objects, that is, where k represents the total number of clusters. K objects are selected as the initial center of each cluster, such as formula 1, where is the initial clustering center, f is the number of features participating in clustering, Max is the set composed of the maximum value of each feature, and min is the set composed of the minimum value of each feature.

$$m_i = \min_{j=0}^f + \frac{\left(\max_{j=0}^f - \min_{j=0}^f \right) * (i + 1)}{k + 1} \quad (0 \leq i \leq k) \quad (1)$$

For each data in the training set, Euclidean Distance, City Block Distance and Minkowski Distance of the initial clustering center were calculated to associate them with the nearest clustering center, and all points associated with the same clustering center were clustered into a class. The specific formula is as follows, where S_i is the object of class I and m_i is the clustering center of class I. Calculate the average value of each category, and move the original clustering center to the position of the average value, as the next clustering center.

$$d_E = \sqrt{\sum_i^m (s_i - m_i)^2} \quad (2)$$

$$d_C = \sum_{i=1}^n |s_i - m_i| \quad (3)$$

2.2 Transformation of Consumer Demand in the Era of Smart Phones

The era of smart phones has promoted the rise of personalized consumption. With the continuous improvement of

consumption level and the convenience of consumption methods, consumers' consumption demand presents the trend of individuation and differentiation, requiring exquisite, individual and unique products and high-quality, comprehensive and personalized services. If merchants cannot bring new shopping experience and differentiated product demand to consumers, it is difficult to precipitate loyal users. Due to the advantages of smart phones, in product design, pricing, marketing, sales and after sales, and many other links, consumer can participate, with a Internet tools such as weibo, WeChat, businesses can combine consumers' opinions and Suggestions, so as to realize product customization production, marketing, and after-sale service, etc. Consumers are also more willing to pay for such personalized products and services.

3.Experiment

Step1: according to the input K value, select K objects from the training set as the initial center of each cluster. When selecting objects, pay attention to the accuracy of the object information of mobile phone users, so as to guarantee the scientific and accurate results from the beginning of the experiment.

Step2: for each data in the training set, calculate the initial clustering center, and associate the initial clustering center with the nearest clustering center to cluster all the points associated with the same clustering center into a class.

Step3: calculate the average value of each category, and move the original clustering center to the position of the average value, as the next clustering center, and then substitute it into another formula for calculation.

Step4: repeat the above steps 2 and 4 until the obtained clustering center is fixed and no other changes are generated, then the iteration stops. Then the three measures are put together for comparison, so as to find the appropriate clustering results, and the sum of squared errors, iteration times and iteration time are used to evaluate the three measures. Based on the results, we can judge the transformation of consumption in the era of smart phones.

4.Discuss

4.1Analysis and Comparison of Experimental Results

The consumption records of mobile phone users were extracted from the online consumption database of mobile phone users as sample data, and then the data needed for this experiment were obtained through a series of screening, transformation and integration. Finally, for the consideration of the effect of the subsequent data analysis, it is necessary to discretize the relevant data into a limited number of categories, and the obtained classified and labeled data can be used as the input data of the subsequent experiments. Finally, the analysis of the three distance modes is shown in figure 1. The data in the figure is the result of the author's collation.

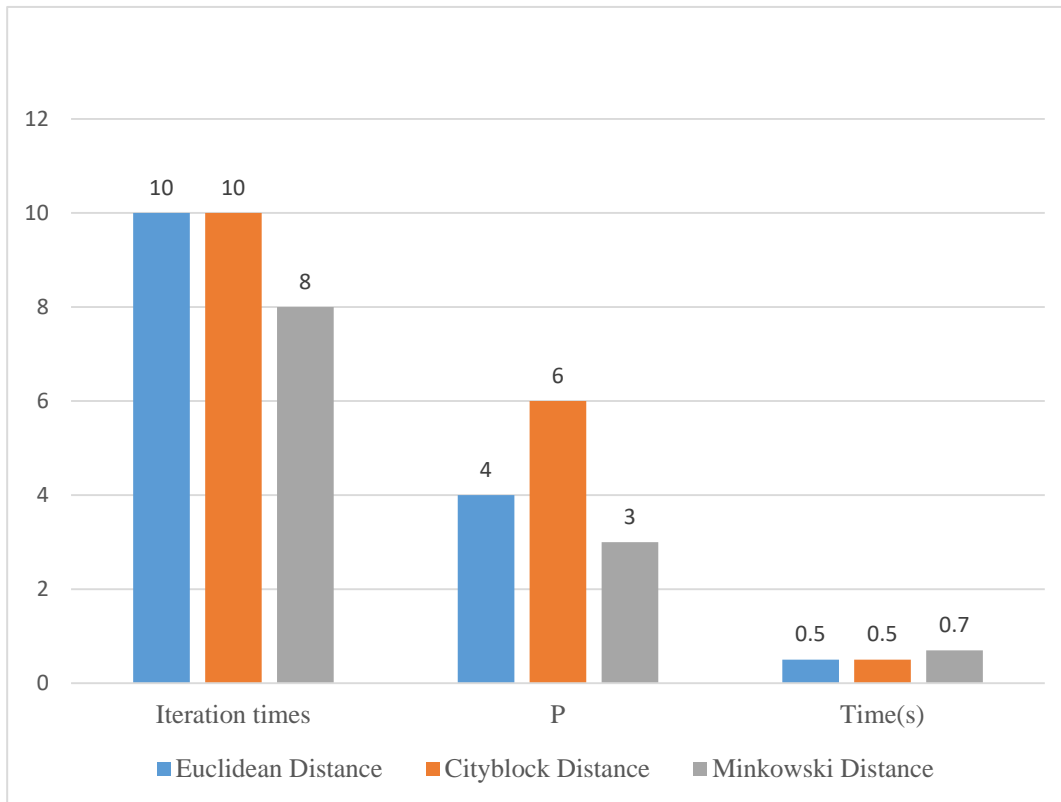


Figure 1. Analysis table of three distance height modes

4.2 Marketing Methods in the Era of Smart Phones

According to the statistics of network consumption from 2014 to 2018, we can see the transformation of consumption in China. In order to adapt to this transformation, we must change marketing strategies. The specific consumption status is shown in table 1. The data is the result of the author's reference and collation

Table 1. Statistical table of online consumption from 2014 to 2018

Style	2014(Billion)	2018(Billion)	CAGR(2014-2018)
Phone and PC	28145.1	73000.0	26.9%
Phone	9297.1	45039.7	48.4%
PC	18848.0	27960.7	10.4%
*Data came from the Internet Database			

(1) Strive to expand the sociability of product communication network channels and build a professional marketing social platform

The most important thing of traditional marketing channels is to provide convenient services for consumers to buy goods, maybe corresponding products and services. In this process, there is little communication between enterprises and consumers. In the era of popularization of smart phones, the connection between enterprises and consumers is greatly enhanced by using product marketing promotion platform, so that product marketing is not limited by time and space, and the cost of product marketing is minimized. The group purchase platform is the most representative. With the help of mobile platform, group purchase puts consumers with the same interests and consumption needs in the same area, forming a multi-win pattern for consumers, merchants and third-party platforms. Under the establishment of the marketing platform, the products sold by the enterprise can be publicized in the form of advertisements. In this process, not only the publicity effect of the products is greatly improved, but also the cost is greatly reduced, so that consumers

can timely obtain information about the products they need. At the same time, by using the social marketing platform, consumers can purchase the products they need in time, promote the circulation speed of products, and greatly increase the profits of enterprises.

(2) To realize the diversification of product marketing means

In the fierce market competition environment, enterprises want to use mobile Internet platform to promote the development of marketing, it is necessary to achieve the diversification of product marketing means. In order to achieve this development goal, enterprises need to actively collect all kinds of market information, and from the perspective of buyer's market, comprehensively and deeply collect information related to consumers, so that the products they produce can better meet the consumer demand. In the era of the popularization of smart phones, enterprise product marketing must put consumer demand in the first place. In order to understand consumer demand to the greatest extent, enterprises need to establish a fast manufacturing system and realize the unity and coordination of enterprise production and product design under the role of this system. On the other hand, enterprises need to guide consumers to actively participate in product design, and actively communicate with consumers in product design, so that the products produced can meet the needs of consumers.

5.Conclusion

In the era of the popularization of smart phones, people's consumption needs have undergone tremendous changes. Consumption has gradually become more convenient. Consumers increasingly pursue personalized consumption, and their consumption mode has shifted from passive acceptance to active participation. The rapid development of mobile Internet and the change of people's consumption demand have promoted the reform of marketing methods. In the era of the popularization of smart phones, Internet marketing should pay attention to the changes in consumer consumption patterns and demand for consumer products, constantly innovate marketing concepts, methods and means, so as to continuously improve the marketing effectiveness of enterprises and better promote the development of enterprises.

References

- [1] Elhai J D, Dvorak R D, Levine J C, Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology[J]. *Journal of Affective Disorders*, 2017, 207:251-259.
- [2] Lu Y, Wei Y, Liu L, Towards unsupervised physical activity recognition using smartphone accelerometers[J]. *Multimedia Tools Applications*, 2017, 76(8):10701-10719.
- [3] Chen Y, Chao S. Performance Analysis of Smartphone-Sensor Behavior for Human Activity Recognition[J]. *IEEE Access*, 2017, 5(99):3095-3110.
- [4] Firth J, Torous J, Nicholas J, The efficacy of smartphone - based mental health interventions for depressive symptoms: a meta - analysis of randomized controlled trials[J]. *World Psychiatry Official Journal of the World Psychiatric Association*, 2017, 16(3):287.
- [5] Chong J W, Esa N, Mcmanus D D, Arrhythmia discrimination using a smart phone[J]. *IEEE Journal of Biomedical & Health Informatics*, 2017, 19(3):815-824.
- [6] Morgan N A, Whitley K A, Hui F, Research in marketing strategy[J]. *Journal of the Academy of Marketing Science*, 2018, 47(1):4-29.
- [7] Song R, Moon S, Chen H, When marketing strategy meets culture: the role of culture in product evaluations[J]. *Journal of the Academy of Marketing Science*, 2017, 46(4):384-402.

- [8] Key T M, Czaplewski A J. Upstream social marketing strategy: An integrated marketing communications approach[J]. *Business Horizons*, 2017, 60(3):325-333.
- [9] Finoti L, Didonet S R, Toaldo A M, The role of the marketing strategy process in the innovativeness-performance relationship of SME[J]. *Marketing Intelligence Planning*, 2017, 35(3):298-315.
- [10] Micu A, Micu A E, Geru M, Analyzing user sentiment in social media: Implications for online marketing strategy[J]. *Psychology & Marketing*, 2017, 34(12):1094–1100.