

Statistics and Big Data in Business Marketing

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ABSTRACT

In a society where information speed and development are extremely fast, it needs to make good use of all the available information to reduce uncertainty. As a result, the author intends to discuss statistics and big data in business marketing using existing literature and case studies. Specifically, this paper studies how big data predicts future industry trends in marketing through data collection and analysis, taking the financial statement of YongHui supermarket as an example. The future prospects and difficulties of big data are also discussed. The result shows that big data analysis and utilization has had a good start and development in business marketing. Big data is not only used for the short-term marketing strategy of enterprises, but also for the future innovation and development and long-term planning of enterprises. In the future, the development and technology of big data will become more and more mature, despite some challenges.

Keywords: *Big Data, Marketing, Statistic, Business, Analysis*

1. INTRODUCTION

Today's big data has begun to slowly occupy the market, and big data analysis has become an important analytical and reflective measure for some companies. Because the current big data analysis methods are still immature and have certain uncertainties, how to collect effective data, how to analyze and compare data, and how to encrypt and protect data have become the expectation of the current society for big data. The healthcare industry was one of the first to use big data analytic. They see the importance of this data early on and use the holistic nature of big data to develop treatment plans for patients. For example, the amount of chemotherapy used for cancer is different for each individual, so using big data analysis and calculation to determine the dose for an individual has become an effective and simple algorithm.

The energy industry is also one of the earliest users of big data. In the process of buying and selling energy, big data analysis can give the export volume of energy for the next 2-3 months. This data is used by many energy companies and has become one of the most important tools for energy companies to make decisions. This paper will use the method of data comparison and analysis to discuss several big data analysis examples from the perspectives of marketing prospects, innovations and difficulties. Through the data analysis and research of this paper, it is helpful for the public to more clearly understand the important role of big data and statistical analysis in enterprise influence and management, and it

is also helpful for enterprises to further realize the importance of analyzing customer data and making targeted decisions.

2. DEFINITION OF STATISTICS AND BIG DATA

Statistics, also known as a subject of probability, is an advanced mathematical science that uses data to plan for the future. The basic process of statistics consists of three points. Firstly, obtaining or collecting relevant and reliable data. Secondly, different algorithms are used to analyze the obtained data and compare relevant samples. Thirdly, draw a conclusion and make a plan for the future by analyzing the data[1]. Statistics originated in Europe in the mid-17th century, when people used advanced mathematical operations to make judgments about future uncertainty.

As time goes by, the use of statistics has become more and more extensive and diversified. With the development of history, more and more algorithms and theories have been proposed and confirmed by mathematicians, such as error measurement, normal distribution curve, and the least square method[1]. In today's highly developed computer society, rich big data continues to expand the application and practicability of statistics. Big data is a new definition that emerged in the process of computer development to represent a large amount of, diverse, low-value, high-speed data. There is a huge amount of data generated in the continuous

development of science[2]. Although most of the data is low in information content, if someone integrates it properly, some valuable data will be obtained. People bring big data into statistics, and they hope that statistical algorithms can find valuable data in the vast data and make changes and adjustments to the future plan. Although this definition is abstract, big data is very close to our lives. In our daily shopping, a large number of consumer receipts are a very good representative of big data. These small tickets meet the characteristics of large numbers, diversity, and low value content, and this is very high-quality data for merchants to make future predictions. They will rate the consumption intensity of consumers by analyzing the items purchased on the receipt to facilitate pricing, and they can choose the purchase ratio of future quarters through the category of consumer goods to reduce certain losses[3].

3. BIG DATA RELATED TO MARKETING

Marketing is a way for companies to achieve corporate interests through the flow and communication of goods. It is very important for the company to take control of the overall situation and forecast what will happen in the future in the marketing strategy. Big data and statistics are widely used in marketing companies, because in such companies there will be large data flows and huge data reserves. In big data, the analysis data can evaluate the products in the market and make targeted adjustments to the company's product marketing methods and plans[4]. Take clothing brands as an example.

There are so many brands and categories in the clothing industry, and clothing changes very quickly. When changing seasons, clothing companies need to adjust and optimize their marketing strategies very quickly. At this time, a professional big data analysis and application will become very important. The conclusions drawn through the accumulation of big data in the past few years and the comparative analysis with peers can quickly help the CEO of clothing companies to make correct choices and more profitable decisions. For example, by comparing whether the market is stable and the data of peers, the boss can make a decision to discount the clothes of the previous season and quickly produce and sell the clothes of the next season. In this way, you will always get the most profitable options and always be one step ahead in predicting the future development of the industry. Through this example, it can be proved that the use of big data analysis, statistical analysis, and strategies can make a significant contribution to marketing, and make the company more forward-looking and overall view in the industry[5].

4. MARKET APPLICATIONS OF BIG DATA

4.1. Yonghui supermarket marketing

Big data analytic is fully exploited by large corporations and has become the primary tool for quarterly summaries and future planning. For instance, the big data report of YongHui Superstores in the first quarter of 2021 is as follows:

Financial Data Sheet for YongHui supermarket			
	first quarter financial report	Fourth quarter financial report last year	Contrast percentage
Total assets	80,192,467,612.41	56,157,981,164.81	42.80%
Operating income	26334479484	29256581788	-9.99%
shareholder profit	23318499	1567503383	-98%
Percentage of return on net assets	172909975	1289717724	-86%

Figure 1 Financial data of Yonghui supermarket in the first quarter[6]

Income statement of supermarket chains by region					
region	Marketing	revenue	revenue rate of change	gross profit margin	change in gross profit margin
1	supermarket chain	3981268796	-11%	15.33%	-3.48%
2	supermarket chain	2683561474	-8.20%	14.44%	-3.98%
3	supermarket chain	5572726002	-5.52%	14.04%	-3.74%
4	supermarket chain	5091829199	-18.92%	14.77%	-4.31%
5	supermarket chain	3822121402	-8.55%	14.72%	-4.22%
6	supermarket chain	1183840321	-19.37%	14.53%	-3.95%
7	supermarket chain	2113469919	-6.35%	12.71%	-3.67%
total		24448817116	-11.09%	14.46%	-3.95%

Figure 2 Income statement of regional supermarket[6]

As figure 1 shows, Yonghui Supermarket made a calculation and classification of all the data generated in the first quarter and put forward improvement methods based on the analysis. Yonghui Supermarket's revenue statement for the first quarter of 2021 was compared with the revenue statement for the same period last year. The total revenue decreased by 9.99% compared with last year, the net profit of the company's shareholders decreased by 98%, and the net assets of the company's shareholders decreased by 20%[6].

As the figure 2 shows, among the supermarket chains in China's major regions, Yonghui's total revenue generally decreased by 5%-10% and gross profit margin decreased by 3%-4%[6]. These important data comparisons show that Yonghui Superstores in the first quarter of 2021 did not have very good sales and revenue, and they formed a serious downward trend compared with last year. This data analysis proves that Yonghui Supermarket has very bad form in this quarter, but after conducting a survey of the entire Chinese supermarket market, it is found that most supermarkets had losses of varying scales in the first quarter, which shows that the supermarket itself did not. There must be management and planning problems involved. It is normal for offline supermarkets to reduce their revenue due to the epidemic, but this also poses a challenge to the senior leaders of Yonghui Supermarket: how to formulate plans and directions for the second quarter to change or improve the revenue of the first quarter? Through market research and big data analysis of peers, Yonghui Supermarket's executives have developed an online window and increased the coverage of "home delivery". Through the analysis of big data, Yonghui Supermarket can reduce the opening of offline supermarket chains and increase online coverage and supply in the second quarter. Through these improvements, Yonghui Superstores can improve the first quarter by reducing the cost of stores and labor in the second quarter and increasing the advantages of online services.

4.2. Big data helping companies innovate and develop

Big data is not only suitable for short-term marketing strategies, but also for helping companies innovate, and develop and adjust their general direction. The contribution and innovation made by the analysis to social trends are no longer uncommon in the enterprise. For example, China Mobile Co., Ltd. has completed small-scale innovation tasks with the help of big data. Through the big data analysis of users' clicks on the Internet and travel services completed using the Internet, China Mobile found that in the first quarter of 2021, the social economy is in a state of recovery compared to last year's epidemic. After statistical analysis of data, it is found that mobile phone users are constantly getting younger and some short video apps are also capturing this

era of traffic, such as tiktok, bilibili and Kuaishou. These are apps that use a lot of traffic and time, and the simplest innovation is syndication. Mobile companies can use the data and user feedback from these apps to come up with cooperative solutions based on user needs. For example, take unlimited download packages for those who use high-end video software (tiktok, bilibili). A package with broader coverage and a stronger signal is used for communication software (WeChat, QQ) with numerous basic user needs (access to communication by text, using internet access for getting information, and entertainment).

China Mobile can invite more of these short video apps to establish cooperation and provide more data packages in a joint way, set reasonable pricing after determining the consumption level and intensity of young people, and use the strategy of small profits but quick turnover. Not only in the field of short videos, but also some large-scale video software that pays a lot of money can also become partners, such as Baidu's iQiyi and Baidu Video, and Tencent's Tencent Video. The feature of these videos is the membership system and through data analysis, the proportion of membership systems is increasing year by year and more young people are willing to become members[7]. If China Mobile can achieve cooperation and win-win with these companies, it will be a success and be a great step forward. The entry of mobile services into the video market is an innovation that has achieved very fast results. With the development of the times and the update of big data, mobile phones will play a bigger role in business and commercial cooperation.

5. ADVANTAGES AND DISADVANTAGES IN BIG DATA

Big data has many advantages that can be used in business analysis, such as effectively using the resources brought to the company by a large and fast database, making it easier to integrate and analyze past data, and planning for the future. Make targeted changes. These important data will bring security to the company's future planning and maximize the benefits. But there are many disadvantages and disadvantages to big data. The collection of the first big data may require a long process and for some more valuable information, it will involve the privacy of citizens. Driven by technology, the flow of data in life is faster and more productive. In this environment, it is difficult for companies to collect effective information without violating the privacy of individuals. Secondly, in the development of the network, the security performance of data has also been tested to a certain extent. Although most data is now encrypted, once someone obtains the key, the company's data security will be difficult to guarantee and will ultimately harm the interests of the entire company. Thirdly, the variability of big data. The analysis of big data can only

predict the situation after a period of time and is not permanent, so after a period of time, big data needs to be artificially re-collected, re-calculated and analyzed. If the company does not collect and analyze big data in a timely manner, it will also have a certain impact and harm on the company's planning[8].

6. THE FUTURE PROSPECT AND DIFFICULTIES OF BIG DATA

There are still some challenges and uncertainties in the development of big data. First of all, the storage of big data is a big problem. With the development of technology more and more information will be saved and some automated machines will have more data. Although most data has low value density, companies still choose to store this data. Therefore, as the data increases, the container being stored must be able to withstand these bursts of data, and this container, which requires a huge capacity, has become a problem for all companies. Secondly, the omission and accuracy of data, how to accurately store and obtain the correct large amounts of data in such a massive database, and how to ensure the data storage process's security have all become major issues. Although some security problems in information exchange can be reduced through keys, there is still no complete and robust system for storage and preservation. Third, the problem of a talent shortage. Because big data is an emerging technology and position, more professionals are lacking in this position. Although training for big data and statistics is developing, the shortage of talent due to the complexity of big data systems has not been effectively solved[9].

7. DISCUSSION

The author thinks that the future development and technology of big data will become more and more mature. First of all, through the continuous analysis and use of big data, the huge database will build a more complete system than it is now. Secondly, in the future development of information technology, the transmission and storage of information will be more secure, just like the current computer firewall, and similar systems will appear in the future to specifically encrypt and protect information. Thirdly, the use of big data will be more common and popular. The world of the future will implement a national big data scheme, and all people will use this method to compare and predict selective decisions in life. Big data is not only used in companies. But it will be easier for us to obtain and become a major resource for people's convenience[10].

8. CONCLUSION

Through the reports and analysis of Yonghui Superstores, it is found that big data can help managers analyze the market situation and make suggestions for

future development. In China Mobile's survey, it was found that big data can also reflect the needs and preferences of consumers. Companies can use this data to make changes and innovate to meet the needs of consumers. All in all, the application and development of big data analysis and statistics in marketing will gradually increase and become more mature and precise. In the future, people will also commonly use big data as a forecasting tool. The paper may be slightly under informed, and more evidence is needed to support the argument. The future research center will focus on how to make big data more and more mature and how to make people use valuable Big data correctly.

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