



# Changes in Marketing Strategy Based on Big Data and Smartphones

Weidong Xi<sup>1a</sup>

<sup>1</sup>Dalian university of science and technology, School of economics and management, 116052 Dalian, Liaoning province

<sup>a</sup>e-mail: 93307717@qq.com

## Abstract

With the spread of smartphones, customers have begun to make purchasing behaviors "anytime" and "anywhere", creating a purchasing process in an omni-channel society. Toward an omni-channel society, production consumers are transforming into production promotion consumers, and marketing continues to transform into channel interactive real marketing in order to respond to that change. Channel interactive real-time marketing, which enables self-fulfillment of customers and enterprises, has reached the realm of marketing 4.0. Channel interactive real-time marketing maximizes the effectiveness of improving marketing ROI. Channel interactive real-time marketing implements seamless inter-channel cooperation, two-way communication, etc., which makes customer response more detailed, further improving the ROI for each channel and maximizing the return on investment of marketing.

**Key words:** Marketing 4.0, Omni-Channel Interactive Real-Time Marketing, Big Data, Smartphones, additional value

## 1 INTRODUCTION

In an omni-channel society, the use of big data is indispensable for providing customers with the best purchasing experience. Big data allows you to get a closer look at what your customers are and share customer information across all channels to anticipate customer needs. Big data is a large amount of digital data that is generated and accumulated as the Internet becomes more widespread due to the development of ICT, the amount of processing of computers increases, and the speed increases. Due to the increase in users of blogs and video sites, or SNS such as Facebook, Twitter, and LINE, not only text but also digital data such as voice, photos, and videos are stored in servers on the Internet from PCs and smartphones, and databases are stored. Big data is huge data that cannot be handled by ordinary databases, but it is not only the amount of data, but also the frequency of occurrence and the diversity of data that are unmatched in the past. Nomura Research Institute explains that the characteristics of big data are composed of three Vs: data volume (Volume), data type (Variety), data generation frequency, and update frequency (Velocity). Big data is considered to have significantly different 5 V elements of accuracy (Veracity) and value (Value) in addition to 3 V of

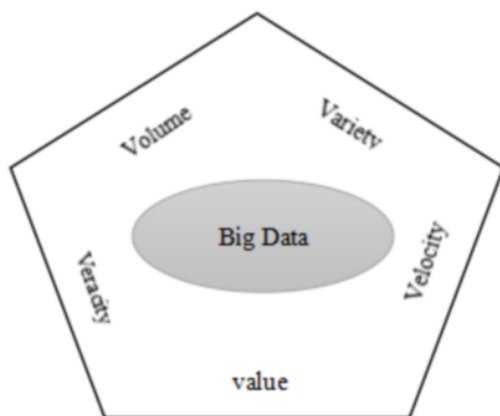
quantity (Volume), frequency (Velocity), and diversity (Variety) (Fig 1).

Volume, as the name implies, means large volumes of big data. With the evolution of ICT technology, it has become easier to collect and store data, and it is said that the amount of data has changed from terabytes to solid bytes. Velocity means that data is generated and accumulated from the Internet at a tremendous frequency and speed, such as server access logs and click streams on websites. In an omni-channel society, it is required to process, analyze, and utilize these data in real time[1].

Diversity refers to various data such as text, voice, images, and videos, in addition to customer attributes and quantified data [2]. Data such as customer attributes is called structured data, and unstructured data such as audio and video is called unstructured data. It is important to structure unstructured data by performing text mining, audio, and image analysis, and utilize it together with conventional structured data. For example, surveillance camera images have been used in supermarkets and convenience store retailers as security measures such as shoplifting prevention and theft. In recent years, there has been a movement to utilize the images of surveillance cameras to monitor the

purchasing behavior of customers. Traditionally, the decision of where to display products has been based on the intuition and experience of the company. However, it is a local exhibition product that is most likely to be a customer, as well as a copy of the current regular sales, an analysis customer service, a medium-sized consumption line, and a customer service.

Veracity refers to the exclusion of previously speculated incorrect data from all big data, and analysis and utilization of truly reliable data. Value means that it is the essential value of big data to analyze the generated, collected, and accumulated data, derive useful information, and utilize it in business[3]. The true value of big data is not in the size of the data, but it is important to make the most of the five V elements and increase the value obtained from them.



**Figure1** Five V Elements of Big Data

## 2.CLO (CARD LINKED OFFER)

Today's businesses get customer information at every contact point. These include contact points when purchasing products, when a sales representative proposes a service, when contacting a call center, when browsing a website, when answering a questionnaire survey, or when paying with a credit card. For example, major online shops such as Amazon and Rakuten display other recommended products and services when purchasing products and services based on purchase history and access information data on the website. About customer information when browsing websites Companies track clicks on websites and monitor browsing history and behavior on SNS. Get customer information such as conversations on YouTube, Facebook, Twitter, and other social networks. This is so-called unstructured data[4].

CLO (Card Linked Offer) is attracting attention as a new marketing method using credit cards [5]. CLO enables the realization of one-to-one marketing such as discount coupon distribution for each customer based on big data such as customer attribute data of credit card users and purchasing behavior data in payment.

Rather than providing the same preferential services to all customers as in the past, based on highly accurate purchasing behavior data such as credit card payment information, specific coupons and cash are given only to customers who are likely to have high needs. CLO benefits credit card users, card companies and businesses alike.

Credit card users can receive benefits simply by paying with the registered credit card without presenting the delivered coupon on the screen of a smartphone or the like. In addition, according to customer analysis of credit card companies and companies, it is expected that benefits that meet their needs will be delivered, and coupons that match the purchasing behavior of credit card users can be conveniently used.

By analyzing customer attributes and purchasing behavior based on big data, card companies will be able to provide products and services that meet customer needs. By providing benefits that suit the customer, continuous communication can be realized, leading to an improvement in the card usage rate. For companies as well, efficiency can be improved by extracting target customers who distribute coupons based on big data and focusing on customers who are more likely to lead to purchasing behavior[6].

CLO began to be rolled out in the United States around 2008, and in FY2015, the credit card handling amount is expected to reach 11 trillion yen and 500 billion yen, while the CLO-related market size is expected to reach 600 billion yen. CLO has high expectations for the development of a seamless omnichannel society for physical stores and online stores.

AMEX, the world's largest card company, is embarking on the use of big data in tie-ups with various retailers.

It analyzes the transaction history related to AMEX card payments and distributes the deals and coupons of retailers who are tie-ups to customers to customers who have given their consent in advance. When a customer who receives information or a coupon makes a purchase at a retailer, the payment is made with an AMEX card, and the purchase is completed. Customers can make great purchases, retailers can increase sales, and AMEX can increase payments. In addition, a system called a point mall operated by a credit card company is also expanding. A point mall is a virtual shopping center where customers can earn more points when shopping online.

The credit card company uses the purchase history of the products and services of the company that is open in the point mall to deliver the profitable information that points are given to the credit card when the customer purchases the products and services of the company [7].

When a customer purchases a product or service and pays with the credit card, points are awarded. The accumulated points can be exchanged for gift certificates and gifts. By utilizing the affiliate system, customers can receive points from credit card companies in addition to points from mail-order site companies. The use of big data by CLO is becoming more active in the banking industry[8]. Purchasing data analysis makes it possible to provide proposal activities tailored to customers' lifestyles and preferences, as well as financial products and services that accurately capture their needs. By collaborating with a card company and starting a mall in collaboration with a card company that operates an Internet shopping mall, it is possible to accumulate purchasing data via the mall in the bank and utilize it for marketing. Currently, the operation of shopping malls of banks with the sale of goods, which is permitted in the United States, is not permitted under the current domestic banking law, so it will be handled in cooperation with card companies. Use the mechanism of the virtual shopping district of the point mall already implemented by Amazon and Rakuten[9].

At shopping malls mainly operated by card companies, customers can earn more points when shopping online.

Customers have the privilege of receiving bank points in addition to card company points. If cross-marketing of financial transaction data held by banks and purchasing data held by card companies progresses, it will be possible to realize proposal activities according to the attributes and preferences of customers. It is possible to propose student insurance to customers who have purchased children's products in a timely manner, and to propose consumer loans to customers who spend a lot of money on cards. Furthermore, the benefits of giving points to banks can be expected to expand the base of bank customers and increase the number of cardholders in the banking group. By increasing the number of contact points with customers, it is possible to realize one-to-one marketing by getting to know and approach customers, and by linking corporate POS data and card company payment data from the customer's credit card usage history[10]. The sophistication of CLO will bring evolution to one-to-one marketing.

### 3.INVENTORY VISUALIZATION SOLUTION USING BIG DATA

The proposition of the supply chain in an omni-channelized society is to replenish what is needed, when it is needed, and in the amount needed. In other words, it is to eliminate the stagnation due to excess inventory and eliminate the shortage due to insufficient inventory. In recent years, due to the diversification of customer needs, it has become difficult to make sales forecasts,

and companies have been forced to make adjustments such as fluctuations in order quantity and changes in delivery dates. In addition, in high-mix low-volume production, the number of goods and services has increased to thousands and tens of thousands of units, and it is difficult to keep an eye on all inventories.

Furthermore, omni-channel is increasing the number of channels, increasing the number of inventory bases, and it is not possible to grasp the inventory status of all bases in real time. It will be possible to establish a system that can detect and adjust problematic inventories from the analysis of big data. With the progress of cloud computing, it is possible to grasp the inventory status of various types and multiple bases in real time in seconds. Until now, it was not possible to grasp the problem of inventory of each product only by monthly inventory management. By managing the inventory on a daily basis, it is possible to discover problematic inventory that could not be seen.

In monthly inventory management, even if the behavior seems to be similar, by grasping the inventory on a daily basis, excess inventory, stagnant inventory, and under inventory can be seen (Fig 2).

If there is excess inventory, purchasing can be reduced or production can be suppressed, and if it is stagnant inventory, sales can be stopped and efficiency can be improved by disposing of inventory. On the other hand, if the inventory is low, it means that there is a shortage, and it is possible to secure sales opportunities by increasing production.

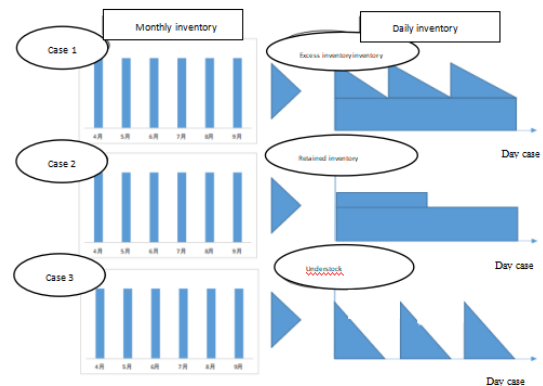


Figure 2 Monthly and daily warehouse management

By utilizing big data, it is possible to realize zero shortages, avoid loss of sales opportunities, and avoid loss due to defective inventory due to reduction of excess inventory. In other words, it is possible to provide products and services that customers want in real time on the channels they want, when they want them.

### 4.BIG DATA USE CASES

Komatsu Construction Equipment Sales Co., Ltd.

manages vehicles using the latest ICT system "KOMTRAX" that utilizes big data. KOMTRAX is a system developed by Komatsu Construction Equipment Sales Co., Ltd. for remotely checking information on construction machinery. Komatsu Construction Machinery Sales Co., Ltd., which is equipped with GPS, is currently operating about 300,000 construction machines worldwide. Japan accounts for only 16% of the total, and globalization is progressing. KOMTRAX centrally manages all data such as which machine is in which place, whether the engine is running or stopped, how much fuel is left, how many hours it has been operating today, etc. anywhere in the world. By introducing KOMTRAX, it is possible to estimate the location of construction machinery and the cause of failure, and speed up repairs.

In addition, it is possible to show the difference between the operating time of the engine and the actual working time, and to propose the replacement time of parts, etc., and to improve the efficiency of work. It is also possible to analyze the distribution of operating conditions by region and make market demand forecasts. Furthermore, if the engine is operating in a place not intended by the customer, the engine can be stopped remotely, which is useful for preventing theft. In addition to this, if the customer violates the contract and does not pay the loan, the engine can be stopped by remote control to prompt the payment. With the progress of IT and the utilization of big data, it has become possible to respond directly to customers easily and at low cost. By following up on individual construction machinery according to the needs and usage of each customer, we are able to better understand customer needs and communicate with them in a two-way manner.

We are creating new added value through the active use of IOT. Differentiation of products and services themselves can quickly catch up with other companies. It is important to always stay ahead of other companies by adding value to products and services. Komatsu Construction Machinery Sales Co., Ltd. creates great added value by fusing the consumption of things with the products of goods, and is constantly growing continuously with the aim of creating new value of goods + things.

## 5. VALUE CREATION FROM BIG DATA

It is no exaggeration to say that the time has come when all events can be acquired as data. By acquiring data with fine granularity, such as customer inquiries over the phone and opinions on products and services scattered on his SNS, in addition to customer feedback received at the store, customer needs that could not be seen can be seen. It is possible to analyze the current situation of newly seen results and create added value for products and services from a new perspective.

Furthermore, in addition to analysis of the current situation, real-time data acquisition technology makes future prediction of customer needs more realistic. In addition to customer attributes such as age, occupation, and family structure of structured data that have been held in the past, by fusing unstructured data such as web browsing status of unstructured data and recorded data of conversations at call centers. It has become possible to realize proposals that are one step ahead of customer needs. There are more opportunities to see coupons received at the time of payment at supermarkets and other cashiers. The cash register coupon does not issue the same benefits, discount services, etc. to all customers, but issues coupons with different contents according to the customer's purchase history.

After accumulating purchase history such as purchased products, purchase amount, purchase frequency, etc., converting it into data and analyzing it, we issue products, service deals, and benefits that are likely to meet customer needs as cash register coupons to encourage purchases. Some customers do not issue it. By digitizing the purchase history, if the customer regularly purchases consumables such as shampoo and laundry detergent, a discount coupon can be issued according to the purchase frequency. In addition, he can issue a 2% discount coupon for customers who purchase over 20,000 yen a month, and a 5% discount coupon for customers who purchase over 50,000 yen a month. Cross-sales that correlate with diaper purchases and beer purchases. There is a law of. The reason why there is a correlation between these two products is based on the hypothesis that a husband who is asked to buy diapers often buys beer as well because it is not interesting to buy only diapers and go home. By introducing a POS system, it is often taken up as a case where a correlation was found in the purchasing behavior of two products that seemed to have nothing to do with each other.

Customers who buy omelets and don't buy beer don't know if they're buying beer at another store or not, but if they buy beer by issuing a beer discount coupon, they'll be new. It may lead to the retention of customers. It is possible to track the purchase behavior within the customer's website, such as the search history of products and services in online stores, analyze the flow line to purchase, and guess what was the reason behind the purchase. In addition, even in a physical store, customer purchase data can be collected from monitor camera images and IC tag data, and analyzed together with sales data such as POS systems. In addition to this, through SNS, it is possible to search for the motivation for becoming interested in products and services, and the factors that create added value from the impressions and opinions after using the products and services.

Big data can create new added value by deriving correlations from vast amounts of data and discovering

relationships that were previously unnoticed. Companies must aim to improve customer loyalty by utilizing big data and creating added value other than the value of products and services themselves.

### 6.CONCLUSION

It is important to create contact points according to the customer's purchasing process in order to realize the best products and services, the best timing, and the right contacts on the best channels.

First, let all customers who are not interested in products and services be recognized by conducting TV commercials and newspaper advertisements. When customers contact us by keyword search, we will narrow down the customers who are likely to be interested based on their interests and behaviors according to their behavior history, and carry out promotions to encourage contact such as directing them to websites and visiting actual stores. Take measures to encourage purchases for customers who contact the

website. We will create repeat customers by promoting re-contacts and re-purchases for customers whose needs have become apparent. There is data stored in the browser used on PCs and smartphones and used for customer identification. You can record the history such as the number of contacts on the website, the length of stay, and the date and time of the last access. Appropriate targeting can be achieved by using this data.

Centrally manage internal and external data, contact websites, analyze data such as customers and customer attributes, and clarify targets. It can be verified by comparing it with e-mail delivery data and POS data of physical stores. His POS data at the physical store includes TSUTAYA's T point card. For example, the target can be clarified by analyzing data such as female gender, annual income of 10 million yen or more for college graduates, yoga as a hobby, and viewing the website of health-related goods for behavior history ( Figure 3).One-to-one marketing can be realized by utilizing and targeting all kinds of data.

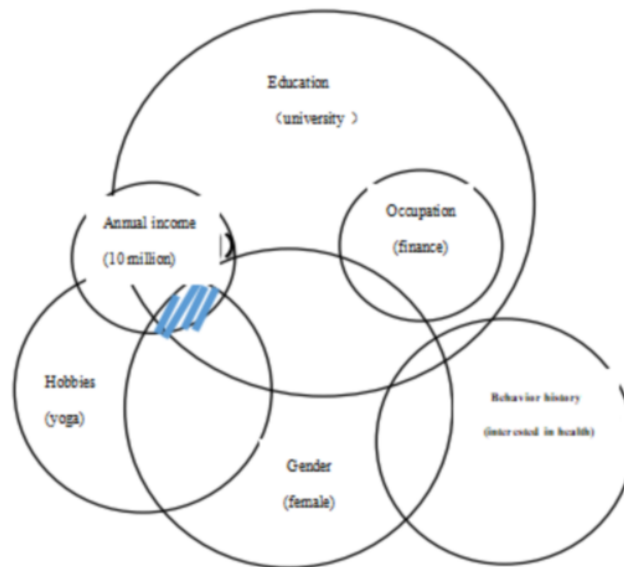


Figure 3 Specific example of targeting using big data

New discoveries can be made by utilizing data that has been discarded or could not be obtained. From the analysis of big data with these five elements of quantity, frequency, diversity, accuracy, and value, it is possible to realize proposals that are one step ahead of the potential needs of customers in real time through all channels. In other words, a company can provide customers with optimal products and services at optimal timing and on optimal channels. Big data creates new added value and innovates the point of contact with corporate customers in an omni-channel society.

### Reference

[1] Wang Mimi. (2020) Research on Marketing Model Integration and Innovation Mechanism from the

Channel Perspective, Business Economic Research, vol. 20: 67–70.

[2] Kong Yanfen. (2020) Innovation of retail marketing model based on omni-channel marketing theory, Modern marketing, vol.12:74–75.

[3] Zhou Yawen. (2019) On the Innovation of Commercial Models of Retail Enterprises under the Omni-channel Marketing Model”, Marketing, vol. 33: 139.

[4] Dong Changliang. (2020) New retail business value appreciation and innovation strategies under the omni-channel marketing model, Coastal Enterprise and Technology, vol. 8: 11–15.

- [5] Wang Yong, Li Wenjing. (2016) The influence of consumers' offline purchases on online purchases in omni-channel marketing, *business research*, vol.4: 118–124.
- [6] Zhou Fang. (2021) Analysis of Marketing Channels of Special Products Based on E-commerce Platform, *Journal of Tropical Crops*, vol. 42: 3481–3482.
- [7] Liu Xiangdong. (2019) Omni-channel business model selection under mobile retail, *Journal of Beijing Technology and Business University*, vol. 3:13–17.
- [8] Du Xiaofeng, Wang Ying. (2020) Analysis of Marketing Channels of Fast Moving Consumer Goods Based on E-commerce Platform, *Market Modernization*, vol. 42: 57–58.
- [9] Ma Rounan. (2019) Research on integration of enterprise marketing channel based on e-commerce environment, *The Yangtze river periodicals*, vol. 33: 81–82.
- [10] Zhu Hai. (2020) The influence of network marketing on marketing channels”, *The wealth of life*, vol.24:16–17.

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution-NonCommercial 4.0 International License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits any noncommercial use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

