# Research on Consumer Behaviour Analysis and Marketing Strategy Based on Big Data

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**Abstract.** The aim of this study is to explore the key influences on consumer behaviour analysis and marketing strategies based on big data. By analysing large-scale consumer data, this study demonstrates how big data technologies can play a key role in the modern marketplace. A variety of data collection and analysis methods, including machine learning and data mining, are used to gain insights into consumer behaviour patterns. Key findings include that the application of big data is critical to the success of personalised marketing. Big data analytics provide insights into consumer preferences, enabling organisations to better meet customer needs, improve customer satisfaction, and increase sales and market share. In addition, this study highlights the critical impact of big data on market competition and strategy development. The conclusion highlights the potential value of big data in consumer behaviour analysis and marketing strategy, as well as the need for continuous learning and adaptation to new technologies. These findings have important practical implications for businesses and marketing practitioners.

**Keywords:** Big Data; Consumer Behavioural Analysis; Personalised Marketing

## 1. Introduction

In today's digital age, big data has become one of the main drivers of the business world. From online shopping to social media interactions, consumer activity on the Internet generates an enormous amount of data. Not only does this data represent a huge wealth of information, but it also provides deep insights that reveal patterns and motivations behind consumer behaviour.Traditional market research methods are often limited by the size of the data and are unable to fully capture and understand complex consumer behaviour. However, with the development of big data technologies, we now have the ability to collect, store and analyse data at previously unimaginable scales. This provides organisations with unprecedented opportunities to gain a deeper understanding of their audiences, develop more targeted marketing strategies and achieve greater competitiveness in the marketplace[1].

The aim of this research is to explore how big data-based consumer behavioural analyses are important for modern marketing and how these analyses can be translated into effective marketing strategies. We will study the development and application of big data technologies and explore how to better understand consumer behaviour in the context of big data. In addition,

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we will explore how these insights can be used to personalise marketing to improve customer satisfaction and achieve higher sales growth. With the growing popularity of big data analytics, organisations must adapt to this new business environment to remain competitive. We will look at how big data is transforming market research and marketing strategies and provide key insights for organisations to better meet changing market demands[2].

## 2. Theoretical foundations

(1) Big data technologies

Big data technology is a key tool that has revolutionised the business world. Big data refers to data sets that are huge in size, diverse and generated at high speed. These can include structured data (e.g., sales records) and unstructured data (e.g., social media posts or text comments), as well as data from a variety of sources.

The development of Big Data technologies has been made possible by advances in the following areas[3]:

1) Storage Technology: Traditional relational database systems cannot store big data efficiently. As a result, distributed storage systems, such as Hadoop and NoSQL databases, have come to the forefront, making it feasible to store large-scale data.

2) Data Processing: Big data processing requires distributed computing frameworks, such as Apache Spark, to handle large-scale data sets. These tools can accelerate data analysis and mining.

3) Cloud Computing: Cloud computing provides scalable computing and storage resources that enable organisations to easily scale their data processing capabilities when needed.

4) Data Collection: The popularity of the Internet and the growth of the Internet of Things have led to the generation of large amounts of data, which provides a source of data for big data analysis.
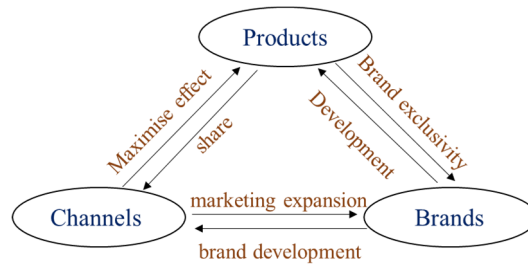
(2) Consumer Behaviour

Consumer behaviour research is an important branch of the marketing field that seeks to understand and predict consumer behaviour and motivations when purchasing products or services. This area of research is important to businesses as it can provide key insights into how to meet customer needs, develop effective marketing strategies and improve products or services[4], as shown in Fig. 1.

Consumer behaviour research covers a number of areas, including:

1)  Needs and desires: Consumer behaviour research explores the needs and desires of consumers and how these needs drive their purchasing decisions.

2)  Purchase Decisions: The study of the decisions consumers make when purchasing a product or service, including information search, evaluation and selection.

3)  Consumer response: Analysing consumer response to a product or service, including satisfaction, loyalty and word-of-mouth communication.

4)    Market Segmentation: Dividing consumers into different market segments to better meet their needs.

5)    Psychological and Sociological Factors: Examining the psychological and sociological factors behind consumer behaviour, such as culture, social influences and personal characteristics.



**Fig.1** Merchandise marketing channels

## 3. Consumer Behaviour Analysis in the Context of Big Data

(1) Big Data in Consumer Behaviour Analysis

Big data has revolutionised our understanding of consumer behaviour. In the past, market research has typically relied on small samples of data, surveys and respondent statements, methods that have been limited by time and cost. However, the rise of big data technologies has opened up entirely new opportunities for market research[5].

The applications of big data in consumer behaviour analysis are as follows:

1)    Consumer Trend Analysis: Big data can track consumer purchase history, preferences and behaviour. By analysing this data, companies can better understand consumer trends and cyclical needs.

2)    Target Market Identification: Big data analytics can help companies identify potential target markets and determine which consumers are most likely to be interested in their products or services.

3)    Sentiment Analysis: Big data technologies can be used for sentiment analysis to understand consumers' emotional feedback on social media. This helps businesses understand the reputation of a product or brand and customer satisfaction.

4)    Shopping Path Analysis: Big data can track the consumer's path through the shopping process, from online browsing to final purchase. This helps businesses understand the key factors in shopping decisions.

5)    Real-time personalised marketing: Big data allows businesses to provide real-time personalised suggestions and offers to meet specific consumer needs. This helps in increasing sales and customer loyalty.

(2) Consumer Behaviour Analysis Methodology

Consumer behaviour analytics is a complex and diverse field that requires the use of multiple methods and techniques to gain deep insights. In the age of big data, consumer behaviour analytics methods have become more powerful and diverse.

Data mining techniques are used to discover patterns and correlations in data. Through data mining, companies can identify consumer buying trends and preferences to better meet their needs.Machine learning algorithms can be used to analyse large-scale data sets to predict consumer behaviour. This includes purchase prediction, churn prediction, and product recommendations.

Social media analytics are used to monitor and analyse consumer activity on social media, including sentiment analysis, topic identification and word-of-mouth. Experimentation and A/B testing allows organisations to test different marketing strategies and product variations to see what works best.Behavioural analytics are used to understand consumer behaviour during the shopping process, such as clickstream analysis, shopping basket analysis and shopping path analysis. Geographic Information System (GIS) analytics are used to identify geographically relevant patterns of consumer behaviour that can help locate shops and promotions[6].

(3) Personalised marketing and consumer experience

Personalised marketing and enhancing the consumer experience has become a key focus of modern marketing. Businesses are increasingly realising that by catering to the unique needs of each consumer, they can increase customer loyalty, sales and word-of-mouth communication. Big data technology plays a key role in this area.

Personalised marketing: Big data allows businesses to provide customised marketing content and advice to each consumer. By analysing a consumer's history of purchases, browsing history and preferences, businesses can pinpoint customer needs and suggest products and services accordingly. This personalised approach not only increases sales, but also enhances customer satisfaction[7].

Consumer Experience: Enhancing the consumer experience is another key objective. Big data can be used to monitor and improve the consumer experience, for example by analysing online shopping processes, user interface design and customer support interactions. By understanding consumer feedback and experiences, organisations can make timely improvements to provide a more enjoyable shopping experience.

Personalised recommendations: Big Data technologies are also used to personalise product and service recommendations[8]. By analysing consumers' historical behaviours and buying patterns, businesses can recommend the most relevant products and services to them. This not only increases sales, but also promotes cross-selling and up-selling.

Real-time interactions: Big data makes real-time interactions possible. Businesses can provide real-time recommendations and offers based on real-time consumer behaviour, such as online searches, shopping cart content and social media interactions. This timely interaction helps increase sales conversions[9].

By combining big data with personalised marketing and enhanced consumer experience, businesses can better meet customer needs, improve customer satisfaction, increase sales and build a strong brand reputation.

# 4. Analysis of merchandising strategies in the context of big data

(1) Commodity market analysis

Commodity market analysis is a key part of business success. Understanding market trends, competitive landscape and consumer demand is the basis for formulating effective marketing strategies. In the era of big data, market analysis has become more in-depth and precise[10].

Market Trend Analysis: Big data can be used to analyse market trends, including changes in consumer demand, the rise of emerging markets and the evolution of the competitive landscape. By monitoring large-scale data sets, companies can better understand market dynamics.

Competitive Analysis: Big data analytics can be used for competitor tracking and analysis. Organisations can learn lessons from competitors' pricing strategies, market share and product features.

Target Market Identification: Big data can help companies identify the most promising target markets. By analysing consumer behaviour and buying patterns, companies can determine which market segments are best suited for their products and services.

Demand Forecasting: Big data technology makes demand forecasting more accurate. By analysing historical sales data, consumer reviews and social media interactions, companies can better predict demand for their products and avoid overstock or undersupply.

Pricing Strategies: Big data analytics can be used to develop effective pricing strategies. Companies can determine the most competitive prices based on market pricing trends, consumer response and cost factors.

The application of big data allows for more comprehensive and in-depth market analyses. Companies can extract information from more data sources to support market decisions and better adapt to market changes.

Factors influencing consumer purchasing decisions, as shown in Table 1.

**Table 1** Factors influencing consumer purchasing decisions

| Categorisation | Influencing Factors |
|---|---|
| Marketing incentives | Product prices |
| | Promotional discounts |
| Situational factors | Time and money at the disposal of consumers |
| | Marketing atmosphere |
| | Touch |
| | Service interaction |
| individual characteristic | Impulsive traits |
| | Self-control |
| | Shopping hedonism |
| | Fashion involvement |

(2) Personalised product recommendation and customisation

Personalised goods recommendation and customisation is one of the key strategies of modern marketing. Big data technologies provide companies with the tools to personalise products and services based on consumer needs and preferences.

Personalised Merchandise Recommendations: Big data analytics can be used in recommendation engines to suggest the most relevant products to consumers based on their purchase history, browsing history and preferences. This not only increases sales, but also improves customer satisfaction.

Customised services: Big data makes customised services easier to achieve. Businesses can offer customised products and services based on the specific needs of consumers. This personalised approach can be implemented across a wide range of industries, from customised clothing to customised food and beverage menus.

Real-time personalised recommendations: Big data also makes real-time personalised recommendations possible. By analysing consumer behaviour in real time, businesses can immediately provide personalised recommendations and offers, thereby increasing sales conversion rates.

Shopping experience customisation: Big data technologies are also used to customise the shopping experience. By analysing consumer behaviour during the shopping process, companies can adapt online shopping interfaces, product recommendations and shopping processes to provide a more enjoyable shopping experience.

Personalised product recommendations and customisation not only increase sales, but also promote customer loyalty and word-of-mouth. These strategies, based on deep insights from big data, enable companies to better meet customer needs, increase customer satisfaction, and maintain a competitive edge.

Consumer behaviour is influenced by a variety of factors, including social, family, economic, cultural, attitudinal and personality. Social factors cover social circles and cultural influences, and family factors include family structure and members' purchasing decisions. Economic factors include personal economic status and price. Cultural factors consider religion, values and cultural background. Attitudes and beliefs also influence buying decisions, and individual personality traits play an important role. A deep understanding of these factors is crucial for businesses, as they help to develop more precise marketing strategies that meet the needs and expectations of different consumers. The factors that influence consumer behaviour are shown in Figure 2.
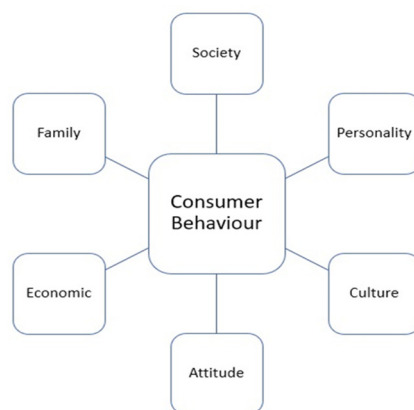


**Fig.2** Consumer Behaviour

(3) Marketing strategy development and optimisation

Developing and optimising marketing strategies is key to business success. Big Data technologies provide businesses with powerful tools to more accurately develop and continually optimise marketing strategies.

Data-driven decision-making: Big Data enables organisations to make data-driven decisions. By analysing large-scale data sets, businesses can understand consumer behaviour, market trends and competition to make more informed decisions.

Precision targeting: Big data analytics can be used to more accurately target markets. Organisations can identify the most appropriate target market segments based on consumer characteristics, purchase history and geographic location.

Multi-channel marketing: Big data also supports multi-channel marketing strategies. By analysing the effectiveness of different channels, companies can optimise the allocation of resources to ensure the best marketing results.

Real-time feedback and optimisation: Big Data allows companies to monitor the effectiveness of marketing campaigns and optimise them in real-time. This includes real-time A/B testing, ad click analysis and social media feedback.

Customer Segmentation: Big data can be used for more granular customer segmentation. Companies can divide customers into different segments based on consumer behaviour and needs, and develop marketing strategies specifically for each segment.

Maximise ROI: Big data analytics can also help businesses maximise their return on investment (ROI). By monitoring and analysing the effectiveness of each marketing campaign, businesses can determine which tactics have the most potential to yield the greatest return.

By combining big data with marketing strategy development and optimisation, businesses can achieve higher sales, customer loyalty and market share. It also enables organisations to adapt more quickly to changes in the marketplace in order to maintain a competitive edge, as shown in Fig. 3.



**Fig.3** Merchandising Strategy

## 5. Summary

In the context of big data, consumer behaviour analysis and merchandising strategy research have become the key to market competition. Big data technologies provide companies with deep insights that help them better understand consumer needs, market trends and competition. Through personalised recommendations, real-time interactions and data-driven decision-making, businesses are able to increase sales, customer loyalty and brand reputation. The use of big data not only improves marketing strategies, but also promotes innovation in the marketplace. As technology continues to evolve, big data will continue to play a key role in the marketing arena, providing organisations with success and a competitive advantage.

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