



Research Paper

Investigation and Analysis of College Students' Shopping Information Searching Behavior under the Background of E-commerce

Yuyi Shen, Tingting Liu, Haonan Chen, Xinyu Wang
(School of Management, Tianjin University of Technology, Tianjin, 300384, China)
Corresponding Author: YuYi Shen

ABSTRACT: Since the 1990s, the Internet has developed rapidly, and the role of the Internet in people's lives has become more and more important. With the widespread application of the Internet in people's daily life, the Internet has become an important way for people to obtain information. In turn, a new shopping model of online shopping has emerged, and college students have also become the main force of online shopping. Due to the huge amount of online shopping information, this project will use data mining, questionnaire surveys, and specific website statistics to study the shopping information search behavior of college students.

Received 24 Jan, 2022; Revised 28 Feb, 2022; Accepted 06 Feb, 2022 © The author(s) 2022.

Published with open access at www.questjournals.org

I. INTRODUCTION

1.1 RESEARCH BACKGROUND

1.1.1 CURRENT SITUATION OF E-COMMERCE DEVELOPMENT

According to a research report by UCLA (University of California at Los Angeles), Internet users regard the Internet as the most important source of information, and they rely more on the Internet than TV and radio; the well-known American Jupiter survey company recently announced The report shows that the Internet has surpassed traditional media such as newspapers and magazines in Europe and has become one of the main sources for people to obtain news information. According to the 48th "Statistical Report on China's Internet Development Status" released by the China Internet Network Information Center (CNNIC) in Beijing,

As of June 2021, the number of Internet users in China has reached 1.011 billion[1]; the number of mobile phone Internet users in China has reached 986 million; the proportion of Internet users using mobile phones to access the Internet is as high as 99.7%. The huge scale of netizens provides a strong endogenous motivation to promote the high-quality development of China country's economy and accelerate the construction of my country's new digital infrastructure. With the large screen of mobile terminals and the continuous improvement of mobile application experience, the trend of mobile phones as the main Internet terminals for netizens has become more obvious. Mobile commerce applications have developed rapidly, and Internet applications have moved closer to improving experience and being closer to the economy.

1.1.2 ONLINE SHOPPING INFORMATION SEARCH BEHAVIOR OF COLLEGE STUDENTS

Nowadays, college students pay attention to image, have a high level of education, are curious about new things, and love free choice. With the popularization of the Internet, online shopping occupies a major position on college campuses and has become an inseparable part of college students' lives, impacting students' traditional consumer concepts. College students have become the fastest adopters of online shopping and the main customers of online shopping.

1.1.3 THE APPLICATION STATUS OF DATA MINING

With the advent of the era of big data, the scale and complexity of data have been explosive growth. The emergence of advanced computer technology and ultra-large-scale databases has stimulated the development of data mining technology, prompting data analysts in different application fields to use data mining technology to analyze data. In application fields, such as smart medical care, digital government, etc., a

typical data mining task often requires complex subtask configuration, integration of multiple different types of mining algorithms, and efficient operation in a distributed design environment.

1.2 RESEARCH SIGNIFICANCE

1.2.1 THE INFLUENCE OF COLLEGE STUDENTS' ONLINE SEARCH BEHAVIOR AND PURCHASE DECISION

The consumer's purchase process usually goes through five stages: demand confirmation, information search, plan evaluation, choice plan, and purchase result. We conduct research and analysis on information search in order to better serve the consumer groups of college students and the majority of e-commerce. We conclude that 70% of students spend an hour or more on online shopping every day, and 60% of students have a sudden desire to buy while browsing. This data shows that the consumption of college student consumer groups is indeterminate and vulnerable to external factors. Studies have shown that Internet experience has a significant impact on information search methods and online shopping tendencies. The longer the online time, the more inclined to online shopping. The main reason is that online shopping platforms are diversified and can be tailored to the user's consumption behavior based on the user's historical browsing history, which be called personalized push: The impact of online referral on brand market strategies with consumer search and spillover effect[2]; Incentive contract design for internet referral services: Cost per click vs cost per sale.[3] This project research focuses on college students' online information search behavior, grasps their psychological factors during shopping and their different responses to external influences, understands their concerns, and enables college students to have a more comprehensive understanding of online shopping information and make better decisions when they consume.

1.2.2 THE INFLUENCE OF E-COMMERCE PARTICIPANTS' OPERATING MODELS AND MARKETING STRATEGIES

Through the research on the shopping information search of college students, we can understand consumers' individual factors, network environment factors and other factors that affect information search behaviors, help the majority of e-commerce companies to understand consumer information search behaviors, and provide theoretical references and references for the future development of related e-commerce companies. Draw on. In the B2B model, logistics scoring is an important decision factor for consumers to choose merchants. The key factor for companies to provide service guarantees for consumers' purchase behavior is to cooperate with high-quality logistics companies. Most college student consumers choose Taobao shopping platform because of the high quality and low price of products and the Huabei loan model. The survey found that 37.53% of students use Huabei to shop. Therefore, major e-commerce companies can learn from this type of model to make the sales system more perfect. Some brick-and-mortar stores use the characteristics of strong publicity and fast news dissemination in Moments, adopting policies such as collecting likes and forwarding with preferential policies to attract customers. This kind of online-driven offline business model has obviously become a trend, and this model is suitable Goods and services that must be consumed in the store, such as catering, fitness, beauty salons, etc. The research on the shopping information search behavior of college students will help all kinds of enterprises and businesses understand the consumer psychology of college student consumers and various factors that affect their consumption, so that enterprises and businesses can better face the consumer market. Analyzing the impact of different factors on college students' online shopping information search behavior and habits has important practical and theoretical significance for companies to seize opportunities to maintain advantages and retain customers in a fiercely competitive environment [4]. Impact of cost uncertainty on supply chain competition under different confidence levels.[5]

II. BEHAVIOR ANALYSIS BASED ON THE QUESTIONNAIRE SURVEY

A total of 500 questionnaires were collected for this project, covering 21 provinces and cities across the country. The data are mainly concentrated on college students in various universities in North China (the ratio of men and women is basically the same, 20% for freshmen, 25% for sophomores, 40% for juniors, and 15% for seniors). We hope to understand the choices and requirements of the online shopping information search process for college students through the questionnaire.

2.1 ANALYSIS OF BASIC ONLINE SHOPPING BEHAVIOR

Through the survey of the average monthly online shopping expenses of college students and its proportion in the monthly living expenses. It is found that the monthly online shopping expenses of most college students are normally distributed around 100-300 yuan, accounting for less than 40% of the monthly living expenses. Secondly, it can be seen that most consumers are more sane and will not affect their daily expenses due to online shopping.

The results of the questionnaire show that college students spend an average of 1 hour per day browsing shopping websites such as Taobao. And the time spent on products of different values is not the same. When the value of the product increases, the information search time increases significantly, which can prove

that the price obviously affects the information search behavior, and there is a positive correlation with the amount of information search. The purpose is to obtain higher search revenue. Related research shows that people are not sensitive to search costs when searching for high-priced products [6].

2.2 ANALYSIS OF E-COMMERCE PLATFORM SELECTION IN INFORMATION SEARCH

Consumers' buying behavior is a very complicated process. In order to avoid buying risks, consumers will collect more sufficient information through various channels before buying, so as to evaluate, compare and choose products of various brands. Most students use Taobao and Jingdong for shopping. In the B2C market, Tmall and JD.com respectively accounted for the top two market shares. Among them, Tmall ranks first in the industry with a share of 50.2%, and its leading advantage is difficult to surpass [7]. It proves that consumers trust these famous e-commerce brands more. Below we will also analyze specific products for Taobao and Jingdong Mall. The main reasons for college students to choose online shopping are time-saving, low prices and abundant choices. Online e-commerce platforms provide consumers with huge product information, and consumers can make efficient choices through purposeful search behavior and reasonable analysis.

The second-hand trading website is an online trading model that has recently emerged on campuses. By selling idle items, it realizes the concept of green recycling consumption. The results of the questionnaire showed that only nearly 40% of the students would use second-hand websites. The possible reasons are that there is no guarantee of online information, mixed items, and high risk of purchase.

2.3 ANALYSIS OF THE PURCHASE DEMAND GENERATED IN THE INFORMATION SEARCH

This project is based on the second type of information search behavior (ie: divide information search into purposeful (active) and purposeless (passive), and research and define as a whole [8]) to analyze the information search behavior process of college students. The results of the questionnaire survey showed that most of the students mainly searched for real-need items such as clothing, footwear, daily necessities, books, or food. Nearly half of the students will suddenly have a desire to buy due to long browsing. In the following article, we will analysis detailedly the relationaship of information search gradually clarify and the final decision through the sales data of Taobao footwear products[9].Optimal incentive contracts under loss aversion and inequity aversion, Fuzzy Optimization and Decision Making.[10]

2.4 ANALYSIS OF REQUIREMENTS FOR SHOPS AND THE PRODUCTS THEY SELL IN INFORMATION SEARCH

According to the results of the questionnaire, it can be known that college students make purchase decisions mainly due to actual needs. Secondly, website activities and price drops will also prompt college students to purchase desires. Price, quality, free shipping, evaluation, and after-sales are the major indicators for college students to consider stores. Among them, praise is the main concern of half of the students, and the importance of price, sales volume, and number of comments are close.

According to psychologists' behavioral research and domestic and foreign scholars' analysis of the characteristics of information searching behavior, the function of traditional information searching behavior can generally be expressed as: searching behavior=f (subject factor, environmental factor). In this project, the main factor is the demand factor generated by college students' preference for e-commerce platform and online product information based on experience; and external factors mainly include web page layout, advertising, living environment, and external influences [11]. Based on the results of the questionnaire survey, we analyzed that in the process of college students searching for information and making the final decision, the influence of the main factor exceeds the environmental factor. Among the main factors, consumer mood largely affects consumer behavior. According to individual differences, nearly 30% of students will choose to purchase when they are happy or unhappy; among external factors, the balance of university student funds also affects for their behavior. Most students will choose to make purchases at the beginning of the month when the living expenses are issued.

2.5 MAKE SUGGESTIONS BASED ON THE ANALYSIS OF THE QUESTIONNAIRE SURVEY

2.5.1 FOR E-COMMERCE COMPANIES

(i). Enterprises should improve the level of information disclosure, strengthen publicity on campus, and use advertisements to help consumers form better expectations.

(ii). Second-hand trading websites strengthen and improve the credit system and assume corresponding supervisory responsibilities, such as providing corresponding appraisal reports, adding after-sales services, etc., to reduce transaction risks.

(iii). Make full use of the characteristics of consumers' information search behaviors, correctly grasp the consumer information search behavior patterns, and communicate with consumers in a more targeted manner.

(iv). Launch advertisements or promotional activities according to the time when college students intensively shop, and also launch different series of products for consumers with different moods to increase sales.

2.5.2. FOR COLLEGE STUDENT CONSUMERS

- (i). Fully grasp the timing of website activities to increase search revenue.
- (ii). Try to use Taobao and other large-scale e-commerce platforms with high reputation and guarantee to reduce search costs.

III. DATA ANALYSIS BASED ON DATA MINING

Nowadays, e-commerce is developing rapidly, and major shopping platform websites have basically met the various purchase needs of consumers. Taking into account the actual purchase needs of college students, the author takes computer products as an example for data collection and analysis. This section mainly analyzes the impact of prices and brands between different brand products and products of the same brand on sales and purchases.

(I). COMPARISON BETWEEN THE PRICE AND SALES VOLUME OF NON-LEVEL ELECTRONIC PRODUCTS

Based on the shopping website information collected by the questionnaire survey and combined with the word-of-mouth in real life, the electronic product data in the project are all from 1071 different brand stores on Jingdong Mall, and the computer models of different brands are grouped and compared.

Lenovo: The price and sales volume of the same brand are normally distributed. As the price rises, sales volume rises, and sales volume reaches the critical value and decreases accordingly. The overall curve approaches a normal curve.

Samsung: The price and sales volume of the same brand tend to be close to a normal distribution. As the price rises, the sales volume increases, and the sales volume reaches the critical value. Due to the lack of sales data, the trend of the curve is not obvious.

Apple: There are few special brand models, only two computer models are collected, and there is a simple linear relationship between price and sales. As the price rises, sales volume decreases.

Dell: The price and sales volume of the same brand tend to be in a normal distribution. As the price rises, the sales volume rises, and the sales volume reaches the critical value and decreases. The overall curve approaches a normal curve.

ASUS: As the price rises, within the price range of 4832-6339, the sales volume rises and declines, similar to a normal distribution.

Acer: The price and sales volume of the same brand are normally distributed. As the price rises, sales volume rises, and sales volume reaches the critical value. The overall curve approaches a normal curve.

Summary: Through the vertical comparison of prices and sales between different brands, it can be concluded that the curve of price influence on sales is roughly close to the normal curve. If each brand wants to maximize profits, both computer performance and the relationship of sales volume and market prices must be considered to make reasonable pricing. Consumers must comprehensively compare each brand's vertical comparison when choosing to buy electronic products and computers. They must choose a reasonable price range but also have an excellent value for money. Two-period discount pricing strategies for an e-commerce platform with strategic consumers. [12]

(II). COMPARISON BETWEEN BRANDS AND SALES AT THE SAME LEVEL

In the research on sales of different brands at the same level, the controlled variable method and the keyword-locked method are adopted: gaming notebook i5 processor, 8G memory, 4G video memory, 15.6-inch screen, and 1T hard drive capacity. At the same level of hardware conditions, information was collected from all computer brand stores on JD.com. A total of 173 computer stores of this type of game were collected and analyzed using SPSS software.

After analysis, it is found that there is no linear relationship between sales and prices of different brands. Considering only the brand and sales volume, the sales of the two major brands of Thor and Asus in the same level of gaming computers are much higher than other brands. Thor and ASUS gaming notebooks are well recognized by the industry, and consumers are more inclined to choose this brand on the premise of the same configuration. Consumers will consider the influence of the brand in the market when they make purchases. For the purchase of computer products at the same level, the brand occupies a big factor. A horizontal comparison of the sales of the same type of products of each brand shows that the brand is a factor that affects consumers' buying behavior.

IV. ANALYSIS BASED ON TAOBAO DATA

For this project, three types of shoes of different prices that are popular on campus are selected on Taobao.com, and the impact on sales is obtained by comparing the number of shop followers, prices, services, product descriptions, logistics, and evaluations. The analysis shows that for relatively low-priced shoes, the number of shop followers determines the sales volume, and the price difference is not large. Consumers mainly focus on the reputation of the shop itself. When the price of shoes rises, consumers are mainly concerned about the evaluation of the product itself and the price difference. In store description, logistics, and services, logistics mainly affects consumers' decision-making, which is also an important reason for the rise and rapid development of my country's logistics industry in recent years. In terms of price, more expensive products tend to be sold more closely at stores that are priced closer to the original price. This shows that even most consumers are very sensible in their consumption behavior and will not be too greedy for cheap. Secondly, the evaluation of commodities also influences consumer decision-making to a large extent, especially in higher-priced commodities.

V. SEARCH REVENUE AND SEARCH COST

The existence of discrete prices in the cost market partly stems from the heterogeneity of sellers, and it is also a manifestation of lack of consumer information. Sellers' prices tend to show a right-biased situation due to production costs and profitability, while the marginal rewards that consumers get from searching for information are diminishing. The main conclusions include:

(i). The more discrete the price, the higher the search revenue. Consumers believe that the greater the market price difference, the more they believe in the possibility of obtaining high benefits through information search; in empirical research, Avery also found in the research on consumer information search behavior for daily necessities, if consumers feel that the greater the difference between the price and quality of the product in the market, the greater the pre-purchase information search behavior; but the actual degree of dispersion and the perceived degree of dispersion are different, and the price is too discrete, which will cause the difficulty and cost of price information collection so it is difficult to verify the relationship between actual price dispersion and search returns in empirical research [13].

(ii). The more searches consumers make, the lower the average price they pay, and the smaller the price difference they consider.

(iii). Experience knowledge means that information has a delayed effect. The amount of information will increase through information search, and will also decrease due to the passage of time. Therefore, information search is a flow concept. In this case, the optimal amount of product information acquisition depends not only on the search revenue of the current decision, but also on the impact on future decisions. Therefore, the acquisition of empirical information can be regarded as a consumer's investment in information. Consumers will acquire more information in the early stage and require more information inventory.

(iv). The opportunity cost of time is related to the cost of the lack of the product during the search.

(v). The convenience and low cost of the Internet have reduced the cost of online information search, so the intuitive expectation is that the amount of information search by consumers in the online environment will increase, but relevant empirical research does not support this view [14,15].

VI. SATISFACTION OF INFORMATION SEARCH RESULTS

The ultimate function of information collection is to help consumers make decisions or prepare for future decision-making technicians. Therefore, consumers will price their satisfaction with the results of information search after making a decision. Li Dongjin believes in the "Empirical Research on the Influencing Factors of Consumers' Information Searching Efforts and Their Results and Satisfaction": There are roughly two views on the definition of consumer satisfaction: one is the view that emphasizes results, and the other is the view that emphasizes the process. [15]. Therefore, consumer satisfaction is not only satisfaction with the product caused by past experience, but satisfaction with a certain behavior or decision-making process. The results of the effort to collect information can be understood as a process of acquiring knowledge, this process can be a process of acquiring knowledge, this process can be pleasant or other feelings. From the results of the questionnaire and the case study of the three types of shoes on Taobao, it can be seen that consumers' evaluation of satisfaction with information search mainly considers whether the product matches the description of the store, cost performance, and future use. Secondly, when consumers are dissatisfied with goods, they have different choices of goods at different prices. The higher the price of goods, the more people choose to return and exchange goods. This proves that consumers' tolerance for goods is inversely proportional to price. Finally, we can see that only nearly 30% of consumers leave a detailed description on the e-commerce platform after completing a purchase, which makes a large part of the search resources missing.

VII. CONCLUSION

This project analyzes the results of the questionnaire and uses data mining to verify the detailed sales of a single category of goods on Taobao and Jingdong, and comprehensively consider the factors that affect college students' shopping information search behavior and final decision-making in the context of e-commerce:

The development of e-commerce has triggered people's online shopping climax and also affected the development of physical commerce. Nowadays, the O2O business model has become a trend, which not only facilitates consumers but also increases the income of e-commerce platforms, allowing e-commerce platforms to develop better and more steadily.

(i). The information search behavior of college students is affected by the recommendation of peers and the difference of products. The evaluation of peers and the recommendation of friends have a greater impact on college students' herd mentality, and the more discrete the product, the greater the impact on college students' search behavior.

(ii). The information search behavior of college students is affected by e-commerce platform store advertisements and site recommendations. The search behavior is largely due to the recommendations, advertisements, discounts, and anniversaries of the information on the site. Respondents indicated that they would increase their desire to buy at discounts, anniversaries, and advertising recommendations, thereby generating search behavior for product information.

(iii). The final purchase decision behavior of college students is affected by price and brand. The data shows that the price positioning interval and sales volume form a normal distribution curve, and the brand also plays a key factor in the final decision.

(iv). The final purchase decision behavior of college students is affected by the number of good reviews and sales of the store. The questionnaire shows that the decision to purchase behavior is related to the number of good reviews and sales of the store. College students' consumption concepts are not yet fully mature, and they have a certain herd mentality. They think that the store that everyone buys must be worth buying.

(v). The final purchase decision behavior of college students is affected by the cost of living and time. The questionnaire shows that the time to purchase is at the beginning of the month, indicating that the beginning of the month is when the living expenses are the most abundant, and there is enough money to buy. The time for placing an order at night is much higher than during the day, indicating that there is time to browse the shopping platform at night and busy with courses during the day, resulting in reduced search behavior.

(vi). The final purchase decision behavior of college students is affected by after-sales service and free shipping. The average scores of these two items were higher among the students interviewed. Good after-sales service (return and exchange) is the guarantee for returning customers and recommending to others. When purchasing behavior occurs, in the spirit of less can be less, many college students choose shops with free shipping.

(vii). The final purchase decision behavior of college students is affected by the types of e-commerce platforms. Analyzing the frequency data of the use of e-commerce platforms, it is concluded that the platforms used by college students for consumption will change with the changes in the purchases (for example, buying more electronic products on JD.com, buying more daily necessities on Taobao, etc.).

There are many uncertain factors in shopping methods in the context of e-commerce. Whether for college students or consumers in the whole society, this new shopping method is something the public needs to learn and practice before they can master it. Many factors affect the purchase. In the era of big data and cloud computing, the e-commerce operation platform should analyze consumer buying behavior and influencing factors step by step, draw out the best marketing methods for companies and stores, and guide the future development direction and prospects of the company and the industry!

REFERENCES

- [1]. China Internet Network Information Center (CNNIC). Statistical Report on the Development of China's Internet.[2021-08-027] <http://www.199it.com/archives/1302411.html>
- [2]. Chi Zhou, N. Ma, X. Cui, Z. Liu. The impact of online referral on brand market strategies with consumer search and spillover effect. *Soft Computing*, 2020, 24(4): 2551-2565.
- [3]. Chi Zhou, G. Xu, Z. Liu. Incentive contract design for internet referral services: Cost per click vs cost per sale. *Kybernetes*, 2020, 49(2): 601-626.
- [4]. Li Yulu 2015. Research on the Shopping Information Search Behavior of College Students' Vipshop Website
- [5]. Z. Liu, Chi Zhou*, H. Chen, R. Zhao. Impact of cost uncertainty on supply chain competition under different confidence levels. *International Transactions in Operational Research*, 2021, 28(3): 1465-1504.
- [6]. Bai Haiyan, Zhao Lihui. Analysis of User Information Behavior in the Network Environment.[J] .*Journal of Yanshan University*, 2002.3(1) : 88-92.
- [7]. 2017 B2C online retail market share. www.100ec.cn
- [8]. Cole.C.and.Spink.New Directions in Human Information behavior[J].*Information Science and knowledge Management*.2006(8):3-10
- [9]. Loeber.S.and A.Cristea.A WWW Information-Seeking Process Model[J].*Educational Technology & Society*.2002.6(3):43-52
- [10]. Chi Zhou, J. Peng, Z. Liu, et al. Optimal incentive contracts under loss aversion and inequity aversion, *Fuzzy Optimization and Decision Making*, 2019, 18(1): 85-102.

- [11]. Ford.N.et.Information seeking ang mediated Searching.Part 4.Cognitive Styles in Information Seeking[J].Journal of the American Society for Information Science and Technology.2002,53(9):728-735
- [12]. C. Li, M. Chu, Chi Zhou*, L. Zhao. Two-period discount pricing strategies for an e-commerce platform with strategic consumers. Computers & Industrial Engineering, 2020, 147: 1-13.
- [13]. Avery.R.J.Determinants of search for nondurable goods:Anempirical assessment of the economics of information Theory[J] .Journal of Consumer Affairs.1996,30(2):390-419.
- [14]. Johnson.E.J.etal.On the Depth and Dynamics of Online Search Behavior[J] .Management Science.2004,50(3):299-308.
- [15]. Zhang.J.J.X.Fang and O.L.Sheng.Online Consumer Search Depth:Theories and New Findings[J] .Journal of Management Information Systems.2007,23(3):71-95.
- [16]. Li Dongjin. An Empirical Study on the Efforts of Chinese Consumers to Search for Information[J] . Nankai Journal, 2001, (2): 30-35