Future Development Trend of "New Retail" and E-Commerce Based on Big Data

Yanyan Wang¹*, Jiancong Chang¹

¹Business School, Shanghai Jian Qiao University, Shanghai, 201306, China

*Corresponding author email: jiancongchang@gench.edu.cn

Abstract. In recent years, my country's "new retail" and E-Commerce(EC) have developed vigorously and have become the world's largest offline shopping market on the Internet. At the same time, with the development of information technologies such as cloud computing and the Internet of Things, rapidly expanding data has brought mankind into the era of big data(BD). It has become possible to use BD technology to analyze the development of regional "new retail" and future EC and provide corresponding guidance. The purpose of this article is to study the future development trend of "new retail" and EC based on BD technology. Based on the development status of "new retail" and EC in Anhui Province, this paper selects Hefei and Huangshan as the research objects. After referring to numerous theoretical studies, this article has determined the factors affecting the development of regional EC, such as informatization infrastructure, logistics services, etc. At the same time, it uses the range of standardization method and selects representative indicators to construct a regional "new retail" and EC development level evaluation index system. Finally, combining the evaluation results and the development status of various regions, taking Hefei and Huangshan as examples, proposed the concept of building a regional third-party "new retail" and EC trading platform and creating regional product integration services. This article combines BD to deeply analyze the influencing factors that traditional trade and circulation companies face in the process of strategic transformation in the development of "new retail". This article explores the strategic transformation paths and measures for traditional trade and circulation enterprises to develop the "new retail" business model. Investigation and research show that, through the evaluation model, this article concludes that Hefei’s online retail sales are higher than Huangshan’s, with an annual growth rate of more than 3%, which is also high relative to the province’s growth rate.

Keywords: Big Data, New Retail, E-Commerce Development, Development Strategy

1. Introduction
New retail and EC are hot topics nowadays [1-2], and they are also areas with the most potential for development. Countries around the world have listed new retail and EC as strategic industries for development [3-4]. At the same time, due to the rapid development of the network economy, BD will
also become a strategic decision for countries to seize development, and the control and application of data will become the core competitiveness of the future society \[5-6\]. Regional new retail and EC development research based on BD analysis will enhance the development of new retail and EC in the region, and better promote governments, enterprises and other institutions to obtain benefits from BD, thereby laying the cornerstone of the BD industry, improve service capabilities and operational efficiency \[7-8\].

In the research on the “new retail” and the future development of EC based on BD, many scholars have conducted research on it and achieved good results. For example, Delafenestre R used a quantitative method to judge the development level of regional EC. The selection of indicators follows the criteria of determining a unified concept standard, focusing on the objectivity of sampled data, establishing an indicator system, focusing on cross-sectional data, and focusing on reasonable planning and step-by-step implementation \[9\]. Jovevski D takes Velocity as the research object, and uses STP analysis, comparative analysis and other management methods to conduct a comprehensive analysis from different perspectives such as "new retail", business model, operation mechanism, profit model, cash flow, and corporate value \[10\].

This paper selects the evaluation indicators for the development level of regional EC. When constructing the evaluation indicators, not only the traditional rigid indicators are selected, but also the dynamic indicators obtained from the Internet-online retail sales and the proportion of the population are selected to make the selection of indicators More complete. Construct a related linear weighting model, weighted calculation and analysis of all indicators, and get the final scores of the evaluation system of new retail and EC development in Hefei and Huangshan.

2. Development Trend of "New Retail" and EC Based on BD

2.1. Exploration of New Retail and EC Marketing Models Based on BD

Marketing has become more refined, and BD can provide personalized marketing plans for a certain product, a certain activity, or even a specific person. The transformation of the marketing model: from the previous mode of waiting for the job to take the initiative to attack, from "the former people looking for information" to the "information looking for people" marketing model. BD marketing runs through the entire life cycle of users using products.

(1) Personalized marketing services for individuals

In the era of BD, by processing information and data such as user identity, age, location, online behavior, and social relationships, it is possible to locate each person in a very specific and clear user portrait. By collecting information, collecting and forming marketing data such as user preferences, purchasing power, current needs, etc., marketing activities can be carried out in a very targeted manner.

(2) Marketing services throughout the product life cycle

In the marketing process where BD participates, BD can provide full life cycle marketing support for products, group users according to different life cycle stages of products, and provide specific marketing policies for each user.

(3) Anti-grabbing for basic business marketing

1) Traffic management analysis

The user can be segmented according to various characteristics of the user to guide different traffic consumption to different customer groups. Normalized marketing: Establish a customer group model based on user traffic usage habits and frequency, and carry out marketing work for users with the potential to increase traffic. Real-time marketing: Real-time monitoring of the user's in-suite traffic usage, and according to the user's real-time traffic consumption, carry out 7*24-hour accurate sales of traffic packages.

2) Operation of stock users

Analyze the user's business usage, analyze and extract users who tend to lose and potential consumers based on usage traces, and carry out targeted retention and maintenance of existing users.
Through data analysis, we can locate customers on different networks, fixed networks, and broadband who are prone to loss, and use them to carry out various maintenance and retention tasks. Through data analysis, we have identified customers with increased consumption, and has carried out various work such as converting single-number cards to contract machines, contract renewals in advance, and high-bandwidth product marketing.

(4) The coordination relationship between user privacy protection and BD marketing

In such an environment, data becomes a resource, and whoever masters the resource has a huge wealth. Although operators have mastered user information, it is the prerequisite for the long-term and healthy development of operators' BD marketing to protect users' personal privacy. Therefore, operators must strictly distinguish between data trust domains and non-trust domains when conducting BD analysis and marketing. The internal system of the operator can be regarded as a trust domain, and user information is shared. For marketing that needs to be implemented jointly with Internet manufacturers, data must be strictly processed. Through the virtualization of user mobile phone numbers, user attributes, location information, behavioral data, etc. do not appear at the same time, and statistical data does not appear to identify users. User information leaked.

2.2. Methods for Regional New Retail and EC Development

(1) Literature research method

The literature research method is mainly to use relevant excellent literature to form a scientific understanding of theories or facts. Research literature can be inspired on the basis of predecessors in order to put forward new ideas and form new understandings. In addition, it is also convenient to prove for yourself and enhance the credibility of the article.

(2) Questionnaire survey method

By issuing questionnaires to the investigators and asking them to truthfully reflect their opinions, we can obtain the original data of the research objects. This article uses questionnaire survey method to determine the weight of evaluation indicators of EC development level, by issuing questionnaires to the government, enterprises, consumers and experts and scholars, and sorting out the results of the questionnaire to obtain the weight value of each evaluation indicator.

(3) Range standardization method

The so-called range method is to eliminate the influence of dimensions between the evaluation indicators. Based on the historical data of each indicator in Hefei and Huangshan, singular data is eliminated, so that the original data value is between [0,1]. Calculated as follows:

\[
X' = \frac{X - X_{\text{min}}}{X_{\text{max}} - X_{\text{min}}}
\]

Among them, \(X'\) is the standardized value of the indicator in a specific year, \(X_{\text{min}}\) represents the minimum value of the indicator's historical data, and \(X_{\text{max}}\) represents the maximum value of the indicator's historical data.

2.3. Three Characteristics of the Era of BD "New Retail"

(1) The era of ever-changing technology

Cloud computing and BD can accurately construct data on user portraits, brand building, social networking, assets, commodities, logistics, supply chain, demand, etc., so as to work scientifically and effectively in these different fields; it can even better integrate these differences. Types of data continue to be superimposed and expanded to produce data that is more valuable to the entire consumer business ecosystem from a strategic level. Therefore, cloud computing, BD, small skills, and overall layout are the core technologies for the development of consumer business ecology.

(2) The community + business circle era

To do a good job in the two major links of "creating new scenes" and "marketing experience", "new retail" + commercial center can have a foundation for development. Nowadays, good commercial centers, such as Joy City, Taikoo Li, Global Center and other successful commercial centers all over the country, have unique and attractive themed scenes. First of all, consumers can get more enjoyable experience, and then Produce consumption.
(3) Mobile social + community era

First look at mobile social. In the era of mobile Internet, everyone is connected through a mobile phone in one hand. People build on WeChat, Weibo, Facebook, Twitter, and even Toutiao and other apps through content publishing, comments, etc. It is very frequent, large-scale, and various types of online communication. First of all, the fundamental difference between mobile social networking and traditional offline social networking lies in the possibility of fission transmission. Let's look at the mobile community again. The so-called people gather by kind and things are divided into groups. People can naturally be divided into different groups according to different hobbies, income, occupation, pursuits, culture and other social elements among people. The marketing effect of merchants spending money or letting big V post online advertisements on Weibo, or letting internet celebrities sell products during live broadcast far exceeds traditional marketing.

3. Experimental Investigation and Research on "New Retail" and EC Development Based on BD

3.1. Raw Data Collection and Standardized Processing

This article tried to use least squares method, grey forecasting method and annual average growth rate to simulate the data. According to the existing data, we find that the relative error of using the average annual growth rate is the smallest, so this article will use the average annual growth rate to calculate the complement of the evaluation index data. The so-called average annual growth rate is a related concept in statistics. In population forecasting, it refers to the average annual growth rate within a certain number of years. The calculation formula for the average annual growth rate is:

\[ m = \left( \frac{B^n - A}{A^{n-1}} - 1 \right) \times 100\% \]  

Among them, \( m \) is the growth rate of data for \( n \) years, \( B \) is the data of the last year, \( A \) is the data of the first year, and \( N \) is the number of years \( n \) minus 1.

3.2. Establishment and Application of Evaluation Model

Based on the unification of the evaluation index data, the evaluation model of this article is established, as shown below:

\[ Z = \sum_{i=1}^{n} w_i x_i \]  

Among them, \( w_i \) is the weight of each index, \( x_i \) is the score of each index, and \( Z \) is the final evaluation index score. According to the calculation formula of the evaluation model and the standardized data processed by the indicators, statistical calculations are performed to obtain the final scores of the evaluation system of the EC development level in Hefei and Huangshan.

4. Experimental Investigation and Analysis of "New Retail" and EC Development Based on BD

4.1. Score Analysis of EC Online Retail Sales in Hefei and Huangshan

The accurate data values of Hefei and Huangshan for three consecutive years from 2017 to 2019 are collected from the Internet. The range standardization method is used to obtain the standardized data, and then the average value is used as the calculation data, and the corresponding weight is used. The final scores of online retail sales in Hefei and Huangshan are calculated, and the results are shown in Table 1.

| Years | Hefei City | Huangshan City |
|-------|------------|----------------|
| 2017  | 652        | 462            |
| 2018  | 972        | 693            |
| 2019  | 1283       | 815            |
Figure 1. Online retail sales data processing and final score

As shown in Figure 1, it can be seen that Hefei’s online retail sales are higher than those of Huangshan, with an annual growth rate of more than 3%, which is also high relative to the province’s growth rate. Hefei's online retail sales in 2019 is second only to some cities such as Hangzhou, Beijing and Shenzhen, becoming a national EC entrepreneurship model city.

### 4.2. Community + Business Circle Era

In today's society, in addition to going to work and school for urban residents, communities and business districts have become the main daily life scenes for urban residents, and therefore the main offline consumption scenes for urban residents. According to statistics from the "China Chain Store & Franchise Association", the development of several types of offline commercial consumption in recent years has been very different. The relevant data of the offline commercial forms from 2017 to 2019 are shown in Table 2.

| Affiliation         | Hefei City (%) | Huangshan City (%) |
|---------------------|----------------|--------------------|
| Business center     | 10.3           | 9.3                |
| Convenience store   | 7.6            | 8.1                |
| Hypermarket         | 15.2           | 9.7                |
| Department store    | 9.3            | 5.2                |
Figure 2. Average growth rate of offline consumer commercial sales in 2018

The data in Figure 2 shows that the growth rate of commercial centers and community convenience stores is considerable. Large supermarkets and traditional department stores fully prove that it also fully shows that the offline consumption of urban residents mainly occurs in commercial centers and community convenience stores.

5. Conclusions
This article uses elasticity index as one of the evaluation indexes, and there may be some imprecision and incompleteness in collecting and collating data. With the huge expansion of data, how to use network data to reasonably reflect the actual industrial development is still in the research stage, so the research in this article is also a preliminary exploration. This paper constructs an evaluation index system for regional EC development research, introduces the analytic hierarchy process, etc. to determine the weight of each index in the evaluation process, and establishes an evaluation model through weighted summation, which is the best value for EC in various urban areas in the region. Evaluation of actual development status provides ideas.

Acknowledgments
The Project of 2017 Humanities and Social Science Research Planning Fund of the Ministry of Education "Research on the global localization strategies of China's Retail Industry Integrating into the 'Belt and Road' Market" (Project No. 17YJA790007).

References
[1] Ziwei, Hui-Zhen, Yuh-Shan. Global development and trend of wind tunnel research from 1991 to 2014: a bibliometric analysis.[J]. Environmental ence and pollution research international, 2018, 25(30):30257-30270.
[2] Manwaring K , Clarke R . Surfing the third wave of computing: A framework for research into eObjects[J]. Computer Law & Security Review the International Journal of Technology Law & Practice, 2015, 31(5):586-603.
[3] Yi C , Jiang Z J , Benbasat I . Enticing and Engaging Consumers via Online Product Presentations: The Effects of Restricted Interaction Design[J]. Journal of Management Information Systems, 2015, 31(4):213-242.
[4] Tang M , Wu Z . Research on the mechanisms of BD on consumer behavior using the models of C2C EC and countermeasures[J]. African journal of business management, 2015, 9(1):18-34.
[5] Wang O , Somogyi S , Charlebois S . Food choice in the EC era: A comparison between Business-To-Consumer (B2C), Online-To-Offline (O2O) and New Retail[J]. British Food
Journal, 2020, 122(4):1215-1237.

[6] Akter S, Wamba S F. BD analytics in EC: a systematic review and agenda for future research[J]. Electronic Markets, 2016, 26(2):173-194.

[7] Tobias, Humpert. BD für den EC 2020[J]. Business Dossier, 2015, 10(2a):25-27.

[8] Yin Y, Zhang R, Gao H, et al. New Retail Business Analysis and Modeling: A Taobao Case Study[J]. Computational Social Systems, IEEE Transactions on, 2019, 6(5):1126-1137.

[9] Delafenestre R. New business models in supply chains: a bibliometric study[J]. International Journal of Retail & Distribution Management, 2019, 47(12):1283-1299.

[10] Jovevski D, Mijoska M, Blagoeva K T. BD ADOPTION IN SELECTED COMPANIES OF THE RETAIL SECTOR IN THE REPUBLIC OF MACEDONIA[J]. Knowledge International Journal, 2018, 28(1):195-200.