Research on the Application of Correlation Model in Keyword Optimization of e-Commerce Data Operation

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Abstract: Relevance model is the basic model of e-commerce platform commodity search and sorting. It is the basic rule of keyword optimization in the current e-commerce operation field, especially in the data-based e-commerce operation. This paper takes the keyword collection, selection, combination, monitoring and replacement process based on relation model as the main line and focuses on three screening rules: key words competition coefficient, number of single grade competition and key words main price range, and the specific application and implementation process in the process of key words optimization. The monitoring results show that more efficient platform drainage can be achieved by using the title keywords optimized with correlation model.

1. Introduction

1.1 Correlation Model

In the e-commerce platform, we call the data that affects the ranking of commodities as your factors, and the factors play a leading role in the ranking dimension of commodities. We call these factors that affect the ranking dimension of commodities as weight models, the main weight model is shown in Figure 1, Relevance model is one of the weight models, which can be divided into text relevance and category relevance. The relevance model mainly refers to the category of commodity ownership, the relevance degree between commodity keywords and visitor search terms. Relevance is the key to optimize the ranking of goods in e-commerce platform [1], and also the basis of other models. If the foundation is not well done, for example, the selection of high correlation classification is wrong, and the keyword arrangement is wrong, the goods cannot be indexed. No matter how high the scores of other models are, they will not be able to get a good exposure under the comprehensive ranking.

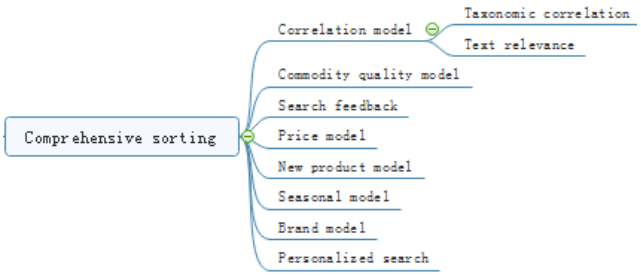

Figure 1 Mposition of Commodity Ordering Model

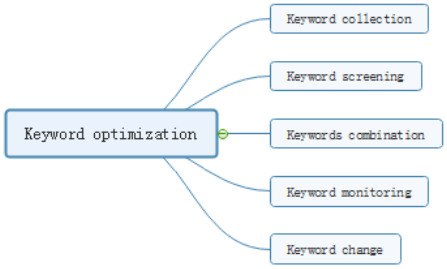

Figure 2 Implementation Steps of Keyword Optimization

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1.2 Keyword Optimization

In the relevance model, text relevance is the concept that SEO (search engine optimization) workers need to be familiar with most [2]. The method of text relevance optimization is called keyword optimization.

2. Keyword Optimization and Implementation

The basic steps of keyword optimization include four steps: keyword collection, keyword screening, keyword combination, keyword monitoring and transformation, as shown in Figure 2.

2.1 Keyword Collection

It is the first step of SEO workers in keyword optimization to collect keywords and make keywords related to the products in the industry (product title or selling point, etc.) into product keywords. There are four ways to collect Keywords:

2.1.1 Front Page Collection of e-Commerce Platform

There will be a search box on the homepage of jd.com or taobao.com. When a buyer enters a keyword in the search box, a recommendation keyword related to the keyword entered by the buyer will appear below the search box. These keywords are all displayed in the form of a list from top to bottom according to the search popularity through big data statistics. We just need to select from these hot search terms according to the specific situation of our products, Collect several highly relevant words. As shown in Figure 3, it is the recommended hot search term when inputting “sweater”[3].

2.1.2 User Feedback Collection

Search results page product title, advertising (buy point) in the text that affects our product conversion rate, called conversion rate keywords. We can find the key words that can be used in the title or advertisement (selling point) to form the conversion rate for the products through the user feedback channel. There are several ways to get user feedback: user evaluation, tag and instant messaging software feedback [4]. In this paper, “sweater” is the core word, which can be collected from user feedback, including: versatile, big V-neck, elegant and low-key, etc.

2.1.3 Field Segmentation Collection

Many categories in e-commerce platform have the unified habits of visitors when they search for goods. These habits are not rules, but formed through visitors' understanding of the goods. These words are a powerful supplement to the words of goods, and also the words that businesses must contend for. More accurately, these words belong to market segmentation words, such as: small please new, student dress, mother dress, etc. Different categories have different market segmentation words [5]. Its collection requires the operator to have a clear insight into the market. At the same time, it can refer to the segmentation words in the “relevant recommendation” of the platform during the search.

2.1.4 Big Data Tool Collection

At present, all major e-commerce platforms are basically equipped with their own big data analysis tools, such as the business advisor of Taobao platform, the Dongshangzhi of JD platform.in these big data analysis tools software, there are big data statistical analysis functions of data indicators such as “search heat”, “click heat”, “conversion degree” of industry keywords. In these big data tools, as long as we input the core key words of our products, the system will put the big data statistical information of key words related to the core keywords (with full Data analysis index data) can be displayed to operators, or all statistical data can be downloaded, so that operators can collect their desired product keywords according to these “big data”. As shown in Figure 4, it is a big data keyword statistical information table displayed by inputting “sweater” with the big data tool of a platform. We can collect keywords suitable for our products according to data indicators

such as “search heat”, “click heat”, “conversion degree” from such keyword table.

Figure 3 T Search Words Collection on Front Page

搜索词	搜索人气	搜索热度	点击率
毛衣女宽松外穿	477,660	1,208,155	106.89%
毛衣	475,170	1,098,426	118.59%
毛衣女	434,154	1,136,420	119.81%
毛衣男	337,179	772,115	96.60%
女士毛衣	334,917	795,619	84.49%
毛衣女2019新款	323,545	865,144	106.86%
毛衣女秋冬外穿	265,066	669,325	106.05%

Figure 4 Keyword Collection Table of Big Data Tools

2.2 Keyword Screening

According to the previous keyword collection method, we will make a keyword collection table based on the keywords we collected. Here, take “sweater” as the core keyword as an example to form a keyword collection table, as shown in Figure 5 as a part of the keyword table.

After keyword collection, we need to filter out the keywords of products from this table through a reasonable filtering method. In the process of keyword selection and optimization, the most important standard for search engine workers is to reduce the difficulty of keyword optimization, improve the effective coverage of keywords and increase the exposure of commodities. According to this standard, we need to do the following aspects in keyword selection: the competitive coefficient of keywords is excellent; the number of single grade competitive keywords is excellent; the main price range of keywords and commodity price positioning match well. The following three criteria are used to optimize the keyword selection.

2.2.1 Optimization and Selection of Key Words Competition Coefficient

Keyword competition coefficient = product quantity under keyword / search quantity of keyword (search index).

Keyword competition coefficient, which indicates the difficulty of single commodity competition under specific keywords. The smaller the competition coefficient is, the lower the competition difficulty is; the larger the competition coefficient is, the higher the competition difficulty is. Therefore, operators should find out the key words with better (easy) competitive environment according to the competition coefficient [5]. As shown in Figure 6, the key words with smaller competition coefficient are selected according to the descending order of key words competition coefficient (the first 20 key words competition coefficient fields have been set to display in red).

Acquisition method	Key word
用户反馈	百搭
用户反馈	大V领
用户反馈	低调优雅
市场细分	妈妈装
市场细分	学生装女
前端热搜词	毛衣外套
前端热搜词	毛衣女
前端热搜词	毛衣女宽松
前端热搜词	毛衣外套女
大数据平台	毛衣
大数据平台	毛衣外套
大数据平台	女童毛衣
大数据平台	开衫毛衣
大数据平台	儿童毛衣
大数据平台	v领毛衣
大数据平台	长款毛衣
大数据平台	宽松毛衣
大数据平台	镂空毛衣

Figure 5 Yword Collection Table

Acquisition method	Key word	Commodity quantity under key words	Keyword search index	Competition coefficient
用户反馈	低调优雅	45	279	0.16
大数据平台	jk毛衣	7360	18454	0.40
大数据平台	露背毛衣	5733	11469	0.50
大数据平台	彩虹毛衣	36282	37842	0.96
大数据平台	毛衣	1903579	1305057	1.46
前端热搜词	毛衣外套	912009	354335	2.57
大数据平台	毛衣外套	912009	354335	2.57
前端热搜词	毛衣女宽松	711020	213094	3.34
市场细分	妈妈装	1062046	224057	4.74
大数据平台	儿童毛衣	347964	70426	4.94
大数据平台	手工毛衣	94084	15022	6.26
前端热搜词	毛衣女	1365254	217780	6.27
大数据平台	粉色毛衣	233591	35270	6.62
大数据平台	婴儿毛衣	444028	60782	7.31
前端热搜词	毛衣外套女	927684	116739	7.95
大数据平台	开衫毛衣	782619	89255	8.77
用户反馈	百搭	1231614	136525	9.02
大数据平台	一字领毛衣	87691	9299	9.43
大数据平台	宽松毛衣	692495	68370	10.13
大数据平台	v领毛衣	886347	70147	12.64

Figure 6 Results of Keyword Selection by Competition Coefficient Optimization

2.2.2 Keywords Single Product Competition Number Optimization Screening

Key words: number of single grade competition = number of products under the key words / number of pits on the first page.

Acquisition method	Key word	Commodity quantity under key words	Keyword search index	Competition coefficient	Number of single grade competition
用户反馈	低调优雅	45	279	0.16	0.94
大数据平台	露背毛衣	5733	11469	0.50	119.44
大数据平台	jk毛衣	7360	18454	0.40	153.33
大数据平台	彩虹毛衣	36282	37842	0.96	755.88
大数据平台	一字领毛衣	87691	9299	9.43	1826.90
大数据平台	手工毛衣	94084	15022	6.26	1960.08
大数据平台	粉色毛衣	233591	35270	6.62	4866.48
大数据平台	儿童毛衣	347964	70426	4.94	7249.25
大数据平台	半高领毛衣	385204	6922	55.65	8025.08
大数据平台	紫色毛衣	400490	28428	14.09	8343.54
大数据平台	条纹毛衣	418528	19412	21.56	8719.33
大数据平台	婴儿毛衣	444028	60782	7.31	9250.58
大数据平台	短款毛衣	645522	45390	14.22	13448.38
用户反馈	大V领	657483	50446	13.03	13697.56
大数据平台	宽松毛衣	692495	68370	10.13	14426.98
大数据平台	大毛衣	702699	13779	51.00	14639.56
前端热搜词	毛衣女宽松	711020	213094	3.34	14812.92
大数据平台	加厚毛衣	772385	3524	219.18	16091.35
大数据平台	镂空毛衣	775126	60902	12.73	16148.46
大数据平台	开衫毛衣	782619	89255	8.77	16304.56

Figure 7 Optimization and Screening Results of the Number of Single Grade Competition

The number of single grade competition of keywords refers to the number of competitors faced by specific products of the platform when entering the homepage under specific keywords

(keyword search results). Through the optimization of the number of single grade competition, we can make a secondary screening on the difficulty of keyword competition and select the commodity keywords with less market competitiveness [5]. The keywords are sorted in ascending order according to the calculation value of the number of single grade competition, and the first 20 of the single grade competition sequence are marked in red, as shown in Figure 7.

2.2.3 Matching Optimization of Key Words' Main Price Range and Commodity Price Positioning

According to the price model, when users search for keywords, the platform will give priority to displaying the products whose price matches the subject price range of keywords searched by users (the product price is within the main price range of keywords). When the subject price range of keywords matches the location of product price, first, find out the main price range of all keywords in the corresponding platform. After that, according to the price positioning of the goods, the key words that the main price range of the key words cannot contain the price positioning of the goods are removed [5]. In this paper, the price positioning of the goods whose core word is “sweater” is 80 yuan. After optimization according to the optimization rules, the final keyword optimization results are as shown in Figure 8. In the figure, “competition coefficient”, “number of single grade competition” and “keyword price range” the three fields are marked with red keywords, which are the last selected keywords, and have been marked with red characters and bold.

Key word	Commodity quantity under key words	Keyword search index	Competition coefficient	Number of single grade competition	Key words price range
低调优雅	45	279	0.16	0.94	89-209
露背毛衣	5733	11469	0.50	119.44	44-91
jk毛衣	7360	18454	0.40	153.33	68-138
彩虹毛衣	36282	37842	0.96	755.88	59-168
一字领毛衣	87691	9299	9.43	1826.90	58-188
手工毛衣	94084	15022	6.26	1960.08	169-433
粉色毛衣	233591	35270	6.62	4866.48	69-191
儿童毛衣	347964	70426	4.94	7249.25	40-80
半高领毛衣	385204	6922	55.65	8025.08	49-208
紫色毛衣	400490	28428	14.09	8343.54	60-184
条纹毛衣	418528	19412	21.56	8719.33	50-162
婴儿毛衣	444028	60782	7.31	9250.58	38-76
短款毛衣	645522	45390	14.22	13448.38	40-139
大V领	657483	50446	13.03	13697.56	59-164
宽松毛衣	692495	68370	10.13	14426.98	50-168
大毛衣	702699	13779	51.00	14639.56	80-215
毛衣女宽松	711020	213094	3.34	14812.92	66-159
加厚毛衣	772385	3524	219.18	16091.35	54-136
镂空毛衣	775126	60902	12.73	16148.46	46-172

Figure 8 Matching Optimization Results of Main Price Range and Commodity Price Positioning of Key Words

2.3 Combination of Key Words

After selecting the key words according to the relationship model, at least a more scientific alternative thesaurus is found. At last, whether and how the seller uses it should be determined finally according to the specific characteristics of the goods sold. Among them, how to sort the selected words is also an important work. Major e-commerce platforms also have specific rules to follow for keyword group sorting. Specific combination sorting rules [6].

Reference formula for key words combination and ranking: Chinese brand (English brand) + product name (core words, hot search words) + product features (attributes, functions) + category words + promotion words.

Key words combination sorting reference rule:

Key words word distance: the distance between keywords / words, which matches the visitors' search words accurately and the smaller the word distance is, the better;

Key word order: the order of keywords / words, which is the same as the order of visitors' search words, is higher, and the reverse order is lower;

Keywords length: the length between keywords (number of words or characters), the more

accurate the shorter the better.

2.4 Key Words Monitoring and Replacement

Key words are optimized. In the process of using, operators need to monitor the use effect of key words in real time. They can use the “key words analysis” function of the platform to analyze and monitor the data of key words, such as the flow to the store, click and transaction conversion. If these monitoring indicators are not ideal in the monitoring cycle, they need to consider re screening the key words and replace them.

3. Conclusion

The application of data-based operation of major e-commerce platforms is more and more in-depth and extensive. It can be said that the application has extended to all aspects of e-commerce operation, and the big data analysis tools launched by major e-commerce platforms also provide strong support for e-commerce data-based operation. The “keyword optimization” that this paper focuses on is one of the core skills in e-commerce operation, and it has now been analyzed with big data. The integration of software has become “keyword optimization based on big data analysis”. This paper discusses the process of “keyword optimization based on big data analysis” in detail based on relationship model to provide valuable learning reference for people engaged in data-based operation of e-commerce.

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