

# Research on Brand Performance Evaluation Index System of Local Original Clothing Brand Under E-commerce Environment

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**Abstract:** Digital economy and Internet celebrity economy flood into the clothing market, further leading to the Matthew effect of clothing brands. However, developing local original clothing brands can use the network to achieve brand effect and increase market competitiveness. Therefore, this paper conducts semantic network analysis based on spidering network comment data to complete the construction of brand performance indicator system, providing a method for brands to grasp and measure brand operation effect. The research results of this paper are as follows: 1. Analyze the latest influencing factors of the performance of local original clothing brands in the e-commerce environment through case analysis and literature analysis; 2. Based on the perspective of online public opinion, Bazhuayu software is used to climb the brand network operation semantics of M brand to form the sight words matrix, and analyze the brand effect of local original clothing; 3. Construct FAHP index weights based on social network analysis, and give the application mode of brand performance evaluation index system model established in this paper based on fuzzy comprehensive evaluation method.

## 1. Introduction

According to data from the National Bureau of Statistics, in recent three years, the growth rate of online retail sales of domestic apparel commodities has maintained at about 20% [1], and the participation rate of apparel enterprises on the Internet is as high as 99% [2]. However, currently there are about 400,000 domestic apparel brands, but about 2,000 brands are eliminated in the apparel market every year [3]. And 2019-2020 Chinese clothing electronic commerce development report summary, due to the traditional brand clothing strengthening digital ecological layout, in a variety of new retail formats, driven by offline online market, the supply chain system can assign resources online feedback offline market, drive online channels all strong growth, clothing brand of Matthew effect appeared gradually [4]. Meanwhile, a report shows that among the TOP5 fashion attitudes of the post-90s generation, the main consumer force in contemporary China, 73% are willing to try minority brands or independent designer brands [5]. Online is the mainstream channel of clothing consumption, and a large number of local clothing enterprises into Internet, but every year, thousands of local clothing enterprises fail to grasp brand management, lack of unique competitiveness, resulting in losses or even bankruptcy. So, Based on online public opinion data, this study explores the method of measuring brand operation effect of local original clothing brands in the e-commerce environment, for domestic original clothing brands, especially in the start-up stage and the development of domestic original clothing brand, provide brand performance evaluation index system, help them to establish brand image in the turbulent market competition.

## 2. Literature review

Zhu Mei (2007) once put forward that "brand performance refers to the reality achieved by enterprises in brand cultivation through brand operation in the process of development, and reflects the overall brand operation of enterprises. It can be used to measure the final effect of the

formulation, implementation and control of brand operation strategy [6]. P Iyer (2018) discussed three factors affecting brand performance from the perspective of organization: brand orientation, strategic brand management and internal brand [7]. S Molinillo (2019) [8], Wang Ya and Li Guihua (2021) have summed up two main measurement perspectives of current global brand performance: finance and market. From the perspective of brand equity in the market, brand performance is usually regarded as customers' attitude, cognition and willingness to pay premium to the brand [9]. Because the core of brand performance is brand equity, the discussion of brand equity is inseparable from consumer factors. Based on Du Jiangang and Chen Yurun et al. (2019), this paper summarizes the three dimensions of enterprise, market and consumer as the leading factors of brand equity, and takes out the second-order sub-factors of market and consumer level, including brand communication, brand strength, brand association and brand attitude [10] as indirect performance sub-indicators. This paper constructs the brand performance evaluation index system centering on the people-oriented concept of network brand marketing.

### **3. Construction of index system based on case analysis**

#### **3.1 Case analysis**

In recent years, there has been an obvious phenomenon of aggregation of development stages for local original clothing brands. Based on interviews, questionnaires and literature research, this paper divides the current domestic original clothing brands into three stages: initial stage, development stage and mature stage from the perspective of development stage. The initial stage refers to the original clothing brands, such as the clothing brands of independent designers, which are mainly sold and publicized online by individuals or organizations and are in the attract flow stage. The local original clothing brands in the development stage have experienced brand manufacturing and are in the process of stabilizing the consumers into the brand domain. For the mature local original clothing brands stage, brand manufacturing and brand management have accomplished, and the design and production of the back end as well as the sales and publicity of the front end have also become mature systems. Many brands have made some achievements in brand extension and expansion.

Based on the long-term attention to the local original clothing brand, this paper selected representative 23 different brand construction stage of native original clothing brands (including fast fashion brands and independent designer brands), observed the coverage of brands on domestic mainstream social platforms and major e-commerce platforms, including Tiktok, BiliBili, Microblog, Xiaohongshu and WeChat Subscription, Taobao, Tmall, Vipshop, jd.com and small routine, and recorded the number of fans about their main publicity platforms, main stores and pricing range. It is found that Tiktok, Microblog and Xiaohongshu have a relatively broad target group positioning, which can quickly arouse consumers' interest and give full play to the role of brand communication and brand association. Secondly, it can be seen from brand pricing that brand positioning has a significant impact on fans conversion. In addition, the strength of individuals, organizations and enterprises will also affect the number of brand publicity and sales platforms and operation strength. Therefore, the unique online brand marketing mode of local original clothing brands in the e-commerce environment is concluded. (As shown in Figure 1)

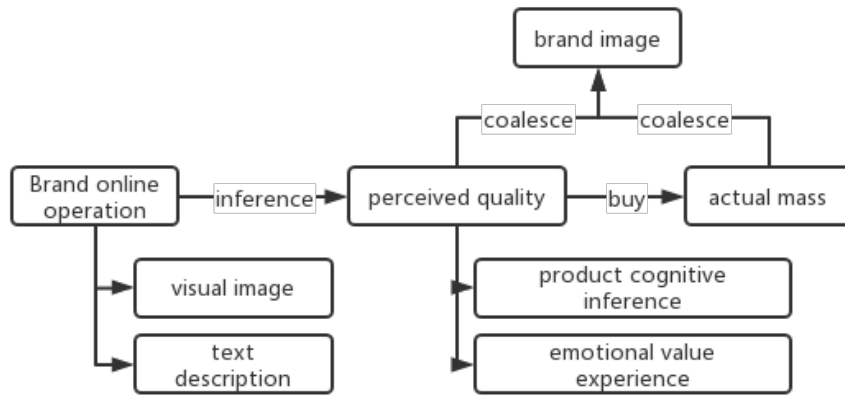


Figure 1 Online brand marketing mode of clothing brands under the e-commerce environment

### 3.2 Selection of evaluation indicators

In accordance with SMART principles, the performance index system of local original clothing brands in the e-commerce environment is summarized (as shown in Table 1)

Table 1 Performance index system of clothing brands in the E-commerce Environment

Evaluation objectives	Level 1 indicators	Level 2 indicators	Level 3 indicators	Assignment method of indicators
Brand performance	Direct performance	Brand premium	Added value	$BC - MAC / MAC$
			Emotional value	$BP - MAP / MAP$
		Brand sales	Online store sales volume	Online store sales
			Offline conversion sales volume	Offline store sales × OSR
	Indirect performance	Brand communication	Network publicity intensity	$BRN / T3RAN$
			Fan interaction activity	$AF / TF$
			Brand cooperation and drainage degree	$IP / TP$
		Brand strength	Network coverage	$CSN / TSN$
			Enterprise competitiveness	$BNMS / T3NMS$
		Brand association	Brand culture acceptance	$AN / TN$
			Product style intensity	$LN / TN$
			Enterprise association degree	$KN / TN$
		Brand attitude	Brand attempt rate	$FBN / TBN$
			Word of mouth communication	$CTN / TTN$
			Brand satisfaction	$(PS + SS + LS) / 3$
			Brand re-purchase rate	$RBN / TBN$

Where, MC represents the brand cost and MAC represents the average market cost; MP represents the brand price and MAP represents the average market price; OSR represents the proportion of online shopping among offline customers. BRN represents the number of brand information released, and T3RAN represents the average number of information released by the top three brands in the garment industry; AF indicates the number of fans who have read, commented, liked and sent private letters, TF indicates the total number of fans displayed by the brand on the platform, IP indicates the increased number of followers of the brand after third-party publicity, and TP indicates the total number of people participating in third-party publicity. CSN represents the number of records related to the brand in the search of brand entries, and TSN represents the total number of records searched; BNMS represents the brand network market share, and T3NMS represents the sum of the top three network market shares in the garment industry. The data of brand association needs to be obtained through questionnaire survey. TN represents the number of effective respondents, AN represents the number of people who accept brand culture, LN represents the number of people who like brand style, and KN represents the number of people who understand brand enterprises. TBN represents the total number of people who buy brand clothing, FBN represents the number of people who buy brand clothing for the first time, and RBN represents the number of people who buy brand clothing repeatedly; CTN represents the number of compliments in brand related topics, and TTN represents the total number of brand related topics; PS is product satisfaction, SS is service satisfaction and LS is logistics satisfaction.

#### 4. Weight selection based on fuzzy hierarchy analysis (FAHP)

According to the index system in the previous chapter, the brand performance hierarchy model is established, including 2 level-1 indicators, 6 level-2 indicators and 16 level-3 indicators. Then invite experts to score the importance of elements. (Details of experts are shown in Table 2) Due to the unpredictability of brand operation in the e-commerce environment, this paper analyzes the content of comments related to M Brand obtained from Microblog and Tmall by using ROST CM6 software, and establishes the brand operation effect category of M brand [11] as the reference text of scoring experts (as shown in Figure 2). Determine the set of brand performance factors and construct the judgment matrix  $R = (r_{ij})_{n \times n}$  of evaluation objectives.

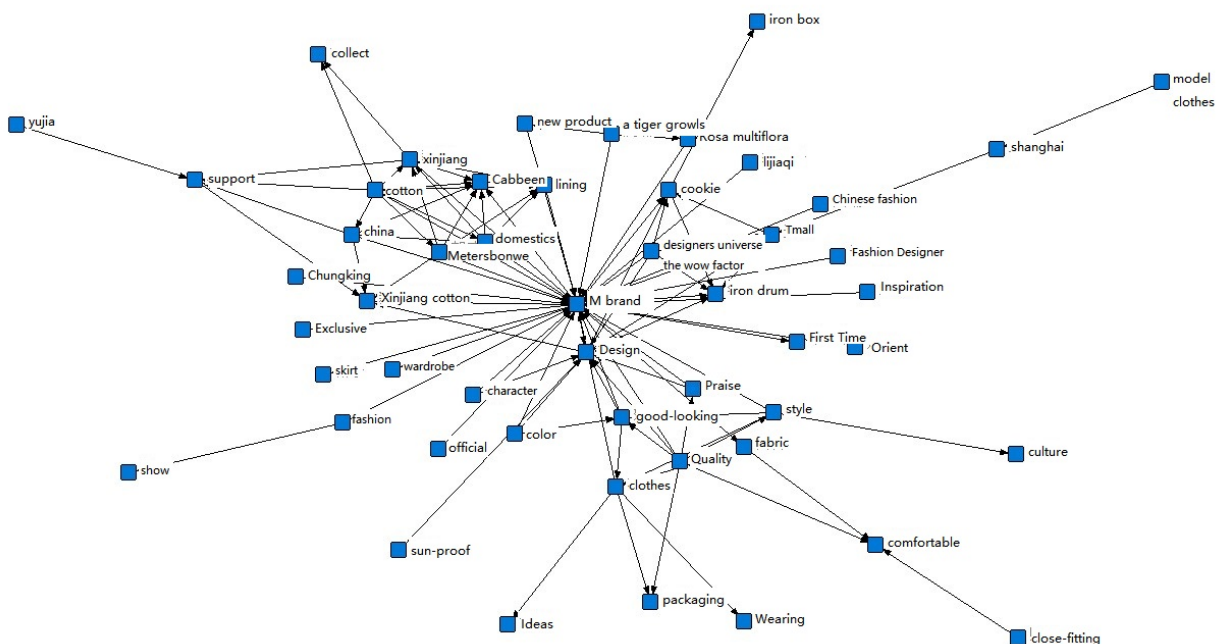


Figure 2 Semantic Network of M Brand

Table 2 Type and quantity of experts

Classify	Subject	Number
Specialist and Scholar	Clothing Design and Engineering	2
Graduate Student	Clothing Design and Engineering	1
	Management Science and Engineering	1
Garment Industry Practitioners	Costume Designing	1
Summation		5

$$R = \begin{bmatrix} r_{11} & \cdots & r_{1n} \\ \vdots & \ddots & \vdots \\ r_{n1} & \cdots & r_{nn} \end{bmatrix}$$

$$0 < r_{ij} < 1, r_{ij} + r_{ji} = 1, r_{ii} = 0.5 (i, j = 1, 2, \dots, n)$$

At this time, the judgment matrix  $R = (r_{ij})_{n \times n}$  is only a fuzzy complementary matrix. According to the sufficient and necessary conditions of the fuzzy consistent matrix, the judgment matrix is transformed into a fuzzy consistent judgment matrix  $F = (f_{ij})_{n \times n}$  by using equations (1) and (2).

$$P_i = \sum_{j=1}^n r_{ij} (i, j = 1, 2, \dots, n) \tag{1}$$

$$f_{ij} = \frac{P_i - P_j}{2n} + 0.5, n \text{ is the order of the matrix} \tag{2}$$

$$F = \begin{bmatrix} f_{11} & \cdots & f_{1n} \\ \vdots & \ddots & \vdots \\ f_{n1} & \cdots & f_{nn} \end{bmatrix}$$

$$\forall i, j, k (i, j, k = 1, 2, \dots, n), f_{ij} - f_{ik} - f_{jk} + 0.5$$

According to the definition, if the fuzzy matrix satisfies  $\forall i, j, k (i, j, k = 1, 2, \dots, n), r_{ij} = r_{ik} - r_{jk} + 0.5$ , the fuzzy matrix is a fuzzy consistent matrix. Therefore, it can be seen that the matrix meets the consistency requirements.

After the construction of fuzzy consistent judgment at the grass-roots level, the row sum normalization method will be used to obtain the relative weight values of elements at each level. Use equation (3) to calculate that each row of fuzzy consistent matrix  $F$  does not contain diagonal elements  $S_{Fi}$  which represents the importance of elements relative to the elements of the previous layer. Use equation (4) to calculate the sum without diagonal elements  $S_F$ . Then, use formula (5) to normalize the element  $S_{Fi}$ , that is, obtain the relative weight  $A_i$  of the element  $a_i$ . On the basis of relative weight value, the absolute weight value  $W_i$  of each level element to the total target can be obtained by multiplying layer by layer from top to bottom according to the subordinate relationship between the sub criteria layer elements and the criteria layer.

$$S_{Fi} = \sum_{j=1}^n f_{ij} - 0.5 (i, j = 1, 2, \dots, n) \tag{3}$$

$$S_F = \sum_{i=1}^n S_{Fi} = \frac{n(n-1)}{2} (i = 1, 2, \dots, n) \tag{4}$$

$$A_i = \frac{S_{Fi}}{S_F} = \frac{2S_{Fi}}{n(n-1)} (i = 1, 2, \dots, n) \tag{5}$$

Through the calculation of the above steps, the relative weight and absolute weight of the index factors of the evaluation system are obtained. The front value is the relative weight value, and the rear value is the absolute weight value of factors at all levels to the overall goal. (as shown in Table 3)

Table 3 Codes and relative/absolute weight values of factors at all levels of brand performance evaluation system

Evaluation objectives	Level 1 indicators	Level 2 indicators	Level 3 indicators
Brand performance(X)	Direct performance (X1(0.25))	Brand premium (X11(0.62;0.16))	Added value (X111(0.42;0.07))
			Emotional value (X112(0.58/0.09))
		Brand sales (X12 (0.38;0.10) )	Online store sales volume (X121(0.65;0.06))
			Offline conversion sales volume (X122(0.35;0.03))
	Indirect performance (X2(0.75))	Brand communication (X21(0.24;0.18))	Network publicity intensity (X211(0.32;0.06))
			Fan interaction activity (X212(0.34;0.06))
			Brand cooperation and drainage degree (X213(0.34;0.06))
		Brand strength (X22(0.28;0.21))	Network coverage (X221(0.6;0.13))
			Enterprise competitiveness (X222(0.4;0.08))
		Brand association (X23(0.21;0.16))	Brand culture acceptance (X231(0.29;0.05))
			Product style intensity (X232(0.43;0.07))
			Enterprise association degree (X233(0.28;0.04))
		Brand attitude (X24(0.27;0.20))	Brand attempt rate (X241(0.21;0.04))
			Word of mouth communication (X242(0.29;0.06))
			Brand satisfaction (X243(0.27;0.05))
			Brand re-purchase rate (X244(0.23;0.05))

## 5. Empirical analysis based on fuzzy comprehensive evaluation method

### 5.1 Brand introduction

Brand L is an original clothing brand of local independent designers in its infancy, mainly engaged in casual women's clothing. The target group is women aged 20-30 who have a certain pursuit of design. The product price is generally lower than the middle grade, mostly about 200 yuan. The founder of the brand is the designer herself. She graduated from fashion design and studied in Hong Kong for more than two years. Taking into account her main business, she founded the local original brand. The clothing brand has been established for two or three years and is in the drainage stage.

### 5.2 Evaluation results and analysis

The specific evaluation process is as follows :(1) establish the actual value and industry standard value of each evaluation index; (2) establish the fuzzy evaluation matrix; (3) establish the evaluation table of brand operation performance of garment enterprises; (4) multi-level fuzzy comprehensive evaluation; (5) calculate the comprehensive evaluation score. (As shown in Table 4)

Table 4 Brand performance evaluation results of L Brand

Evaluation objectives	Score	Grade	Level 1 indicators	Score	Grade	Level 2 indicators	Score	Grade		
Brand performance	0.485	C	Direct performance	0.358	D	Brand premium	0.374	D		
						Brand sales	0.331	D		
			Indirect performance			0.527	C	brand communication	0.477	C
								Brand strength	0.232	D
								Brand association	0.736	B
								brand attitude	0.713	B

Among them, A is excellent, B is good, C is average, D is bad and E is very bad.

Due to the limited economic and energy investment of the brand founder and the relative lack of professional knowledge of brand operation, it found C. For brands in the early stage of entrepreneurship, it is not allowed to raise the brand price prematurely, and consumers generally have curiosity hunting psychology, so this period has a high potential to attract customers. Brands should focus on the publicity and promotion of online brand operation, such as expanding the publicity platform, improving the frequency of information release, and actively and effectively interacting with fans, by carefully studying the preferences of fans, we can find the concerns of fans about the brand and their potential needs through behavior analysis. In addition, brand can select appropriate third-party public resources on the settled publicity platform, contact and cooperate and achieve mutual benefit and win-win results.

## 6. Conclusion

To sum up, based on the literature analysis and case analysis, this study integrates the three perspectives of enterprises, markets and consumers, and uses the fuzzy analytic hierarchy process and fuzzy comprehensive evaluation method to establish an evaluation system suitable for the performance of local original clothing brands in the e-commerce environment. The main work and research results are summarized as follows:

(1) Brand performance includes direct and indirect parts. Direct performance refers to visible economic benefits, including brand premium and brand sales. Brand premium is affected by product added value and emotional value, while brand sales refers to online and offline sales generated by online brand marketing. Indirect performance refers to intangible social benefits, including brand communication from the macro perspective of the market, brand strength and brand association and attitude from the micro perspective of consumers. Among them, brand communication is affected by the intensity of network publicity, the activity of fan interaction and the drainage of brand cooperation; Brand strength is affected by network coverage and enterprise competitiveness; Brand association is affected by brand culture acceptance, product style intensity and Enterprise Association, while brand attitude mainly refers to brand attempt rate, word-of-mouth communication, brand satisfaction and brand repurchase rate. (2) Using Bazhuayu software to crawl the network data of M brand, and its semantic content analysis, explore the network brand effect. According to the relative weight value of each index obtained by FAHP, the main influencing factor in direct performance is brand premium, and improving brand premium requires brands to grasp product added value and emotional value, such as writing brand stories. The main influencing factors in indirect performance are brand strength and brand attitude. For brand strength, brands need to strengthen their network operation coverage, such as SEO, multiple mainstream platforms, etc.; for brand attitude, that is, the attitude of consumers, the brand needs to focus on brand satisfaction and word-of-mouth marketing, including returning to the product itself, paying attention to the operation of online stores and CRM. In the clothing market with the influx of digital economy and internet celebrity economy, local original clothing brands in the early stage of entrepreneurship and development need to maintain brand uniqueness and ingenuity, it is possible to occupy a place in the highly competitive market.

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