International Journal of Hybrid Information Technology
Vol.8, No.3 (2015), pp.97-110
http://dx.doi.org/10.14257/ijhit.2015.8.3.10

Online Marketing Management allows for Customization in Clothing Industry in Retail Market in China

Wei Zhenfeng

Zhejiang Industry & Trade Vocational College
No.717 Fudong Road, Wenzhou, Zhejiang, China, 325003
wzf456@163.com

Abstract

Today's marketing climate raised a significant challenge for the marketers- finding a marketing solution that's both economical and efficient when it comes to responding to the ever-changing customer environment. It is important to address the main factors affecting the demand of customers in order to generate the best response. This paper is an attempt to investigate the main factors affecting the demand of the clothing customization products for the online shoppers in retail market in China. GRA (Grey Relational Analysis) and Fisher's exact test is applied to identify the main affecting factors of online performance of the selected e-commerce clothing customization companies. The results could be the guideline for the online clothing customization companies in terms of improving their online popularity and making further progress in the clothing customization industry.

Keywords: *Customization marketing, Fisher's exact test, Clothing industry*

1. Introduction

As the development of the internet, there are increasingly online shoppers in the world engaging in e-commerce activities. The online shoppers could use the new information technology structure to be more active participants in the economic value creation process [1, 2], which is one of the most interesting opportunities. For instance, the online shoppers can create their own personalized version of a website or services, and they can communicate with other online shoppers about the products they have bought.

As one of the biggest developing countries that experience the highest online population growth, there are increasingly online shoppers engaging in e-commerce activities in China. According to the report of the China Internet Network Information Center, China's e-commerce market racked up a whopping 190 billion USD transactions in 2012, an increase of 66.5 percent over 2011′s, and more than two hundred million online shoppers purchased products through internet [3].

More and more companies have realized the potential benefits of these opportunities; especially the combination of flexible manufacturing and Internet-based information and communication technology has altered the traditional product development process and production process by being able to incorporate consumer tastes or preferences throughout the product development period. This is most prominent in the emerging strategy of mass customization. From the company's point of view, the success of implementing online customization will depend on customers' willingness to purchase the products through the internet. From observations, however, there exist many issues and challenges in the current customization e-commerce companies regarding the actual performance in terms of the effectiveness of their promotional effort. In order to provide practical insight and

ISSN: 1738-9968 IJHIT

guidelines for improving the performance of these online customization companies, an investigative empirical study is needed, which is the primary motivation of this research.

The main objective of the paper is to bring into focus the issue of the main factors affecting online shoppers' willingness to purchase the clothing customization products in retail market in China, which could be the guideline for the improvement of this kind of clothing customization companies. The remainder of this study is organized as follows. Section 2 introduces the related literature about the customization marketing and e-commerce. Following is a brief introduction about the GRA and Fisher's exact test which are employed in this research. Section 4 discusses the main factors that have impact on the online shoppers' willingness to purchase the clothing customization products in China. In the last section, the related managerial implications of this research are discussed.

2. Literature Review

E-commerce is "any form of business transaction in which the parties interact electronically rather than by physical exchanges or direct physical contact" [4], and is generally classified as B2B, B2C, C2C and C2B e-commerce [5]. Jennifer, *et al.,* [6] argue that B2B e-commerce seems to be driven by global forces, whereas B2C seems to be more of a local phenomenon. While along with the advancement of information technology, there are increasingly online shoppers buying products through the e-commerce websites. Many related researches have been done on improving effectiveness of the e-commerce websites [7-10].

There are many researches focused on the study of marketing strategy framework and find that the strategy is influenced by a series of environmental factors. Political–legal, economic, competitive, infrastructure, cultural, customer and so on are consider as the environmental factors [11, 12]. According to Clark 's report, the impact of different cultural in business transactions is always stronger for service firms than for manufacturing goods operators [13]. Katsikeas, *et al.,* explore manufacturing companies always use a standardized strategy when the environment between the home and host markets is similar [14]. Extant researches have explored several consumer characteristics and perceptions. A lot of researches focus on consumers' choice face customization, such as in extensive-choice contexts, simplifying heuristic strategies are more selective in their use of available information to balance the trade-offs between accuracy and effort [15–17]. 'Satisfies' is always chosen as the method to make the decision when consumers face extensive-choice and find any choice that seems acceptable [18]. Bharadwaj, *et al.*, empirically analyze consumer's responses to customization by taking both buyer and seller characteristics into account [19]. Wang, *et al.*, analyze the interaction effect of customization mode and regulatory and find it significantly influences the number of options retained, and prevention-focused consumers retain more options in the final customized offering than promotion-focused consumers in subtractive customization [20].

Boddewyn [21] and Subramaniam [22] investigate the relative effects of variation in competitive environments across national borders and standardization strategy in the manufacturing sector. And the conclusion is when the environmental difference is high firms lean to build a customization strategy. According to Clark [13] and Lovelock's [23] researches, needs of local customers, level of technology within the local infrastructure, costing of local operations and so on are a series of factors need to be considered when internationalizing their operations. Buckley, *et al.,* explore the relationship between marketing strategy for services and cross-market environment [24].

Samiee and Roth study the impact of customization strategy based on the performance relation between standardization and the business units of US manufacturing firms in the early 1990s [25]. Shoham makes the research on various marketing programmer components in US manufacturing firms [26]. In Cadogan, *et al.,* investigation, compared with goods exporters, good services is more rely on customization strategy in a highly different market environment [27]. Shemwell and Cronin investigate the relationship between customization and market competitive, and find that a higher degree of customization could offer service operators competitive advantages [28]. In Prahalad and Ramaswamy's study, manufacturer should pre-design a customization product to meet the needs of different consumers. Huffman and Kahn investigate e-tailers and e-sellers who use large assortments strategies and customization in order to establish a competitive advantage [29].

In summary, the online customization marketing both in theory and in practice has proven to be very important and quite complex, and there are few studies focusing on the customization marketing in the clothing industry for the e-commerce companies in China, which is the primary motivation of this research.

3. Methodology

3.1 Grey System Theory

Grey system theory which can help evaluate outcomes under the situation with incomplete and indeterminate information is first proposed in 1982 [30]. Considering the incomplete information in this paper, grey approach which has been recognized as an effective tool to solve this kind of the problems is adopted to select the leading industries.

To introduce some fundamental aspects of grey system theory, some basic definitions and notation are shown as follows:

x is denoted as a closed and bounded set of real numbers. A grey number, $\otimes x$, is defined as an interval with known upper and lower bounds but unknown distribution information for x (Deng, 1989), which is,

$$\otimes x = [\underline{\otimes} x, \bar{\otimes} x] = [x' \in x \mid \underline{\otimes} x \le x' \le \bar{\otimes} x]$$

where $\underline{\otimes} x$ and $\bar{\otimes} x$ are the lower and upper bounds of $\otimes x$ respectively.

Expression (2) — (5) demonstrate some basic grey number mathematical operations:

$$\otimes x_1 + \otimes x_2 = [\underline{x_1} + \underline{x_2}, \overline{x_1} + \overline{x_2}]$$

$$\otimes x_1 - \otimes x_2 = [\underline{x_1} - \overline{x_2}, \overline{x_1} - \underline{x_2}]$$

$$\otimes x_1 \times \otimes x_2 = [\min(\underline{x_1}\underline{x_2}, \underline{x_1}\overline{x_2}, \overline{x_1}\underline{x_2}, \overline{x_1}\overline{x_2}), \max(\underline{x_1}\underline{x_2}, \underline{x_1}\overline{x_2}, \overline{x_1}\underline{x_2}, \overline{x_1}\overline{x_2})]$$

$$\otimes x_1 \div \otimes x_2 = [\underline{x_1}, \overline{x_1}] \times [\frac{1}{\underline{x_2}}, \frac{1}{\overline{x_2}}]$$

3.2 GRA (Grey Relational Analysis)

Below is a briefly review of relevant definitions and the calculation procedure for the GRA approach.

GRA uses several small sub-problems to present the decision problem, and the problem is decomposed into a hierarchy with a goal at the top, criteria and sub-criteria at levels and sub-levels and decision alternatives at the bottom of the hierarchy.

The comparison matrix involves the comparison in pairs of the elements of constructed hierarchy. The aim is to set their relative priorities with respect to each of the elements at the next higher level.

$$D = \begin{array}{c} \\ C_1 \\ C_2 \\ C_3 \\ \vdots \\ C_m \end{array} \begin{array}{c} \begin{array}{ccccc} C_1 & C_2 & C_3 & \cdots & C_n \end{array} \\ \begin{bmatrix} x_{11} & x_{12} & x_{13} & \cdots & x_{1n} \\ x_{21} & x_{22} & x_{23} & \cdots & x_{2n} \\ x_{31} & x_{32} & x_{33} & \cdots & x_{3n} \\ \vdots & & & & \\ x_{m1} & x_{m2} & x_{m3} & \cdots & x_{mn} \end{bmatrix} \end{array}$$

Where x_{ij} is the degree preference of i^{th} year over j^{th} criterion. Before the calculation of vector of priorities, the comparison matrix has to be normalized into the range of [0, 1] by the equation below:

The larger, the better type:

$$y_{ij} = \frac{\left[x_{ij} - \min\left\{x_{ij}\right\}\right]}{\left[\max\left\{x_{ij}\right\} - \min\left\{x_{ij}\right\}\right]}$$

The smaller, the better type:

$$y_{ij} = \frac{\left[\max\left\{x_{ij}\right\} - x_{ij}\right]}{\left[\max\left\{x_{ij}\right\} - \min\left\{x_{ij}\right\}\right]}$$

The normalized decision matrix is denoted by $Y = [y_{ij}]_{m\times n}$.

Assume Y is a factor set of grey correlation. Let $y_0(k)$ and $y_i(k)$ denote the initial criteria values of y_0 and y_i on company k respectively.

As average correlation value $r(y_0, y_i)$ of $\{r(y_0(k), y_i(k)) | k = 1, 2, ..., m\}$ is a real number, the value can be defined by grey correlation.

Let $r(y_0, y_i) = \frac{1}{m}\sum_{k=1}^{m} r(y_0(k), y_i(k)) = r_{0i}$,

where $r(y_0(k), y_i(k)) = \dfrac{\min\limits_i \min\limits_k |y_0(k) - y_i(k)| + \rho \max\limits_i \max\limits_k |y_0(k) - y_i(k)|}{|y_0(k) - y_i(k)| + \rho \max\limits_i \max\limits_k |y_0(k) - y_i(k)|}$, where ρ is the distinguished coefficient ($\rho \in [0,1]$).

Grey correlation matrix $R = (r_{ij})$ is derived by grey correlation analysis, where $i = 1, 2, ..., m, j = 1, 2, ..., n$. The definition of clustering financial ratios based on the entries of the grey correlation matrix is presented as follows.

Definition 3.1 As $r_{ij} \geq r$ and $r_{ji} \geq r$, Y_i and Y_j belong to the same cluster, where r is a threshold value of clustering.

Definition 3.2 When $r_{ij} \geq r$, $r_{ji} \geq r$, $r_{ik} \geq r$ and $r_{ki} \geq r$, but $r_{jk} < r$ or $r_{kj} < r$, if $min\{ r_{ij}, r_{ij} \} \geq min\{ r_{ki}, r_{ik} \}$, then Y_i , Y_j and Y_k belong to the same cluster.

As those indices can be partitioned into several clusters, the finding of representative indices of clusters is stated as follows.

Definition 3.3 As Y_i and Y_j belong to the one cluster, the representative index of the cluster is determined according to the maximum value of r_{ij} and r_{ji}. If $r_{ij} \geq r_{ji}$, the representative index of the cluster is financial ratio *i*.

Definition 3.4 As Y_i, Y_j and Y_k are in the one cluster, the representative index of the cluster is decided according to the maximum value of $r_{ij} + r_{ik}$, $r_{ji} + r_{jk}$ and $r_{ki} + r_{kj}$. If $r_{ij} + r_{jk}$ is the maximum value, then the representative index of the cluster is financial ratio i.

3.3 Fisher's Exact Test

Fisher's exact test was first proposed in 1992[31]. It is a statistical significance test in the analysis of contingency tables, and is suitable for the analysis when some of the frequencies are low and use of the chi-squared test is ruled out (*i.e.*, some expected values are 0 or less than twenty percents are less than 5). Fisher's exact test is one of a class of exact tests because the significance of the deviation from a null hypothesis can be calculated exactly, rather than relying on an approximation that becomes exact in the limit as the sample size grows to infinity, as with many statistical tests.

The following is an example to illustrate the theory of the fisher's exact test: a sample of teenagers might be divided into male and female on the one hand, and those that are and are not currently dieting on the other. The hypothesis is that the proportion of dieting individuals is higher among the women than the men, and whether any difference of proportions is significant is tested, and the data is shown as follows:

Table 1. The 2*2 Contingency Table for the Sample

	Men	Women	*Row total*
Dieting	*1*	*9*	*10*
Non-dieting	*11*	*3*	*14*
Column total	*12*	*12*	*24*

These data would not be suitable for analysis by Pearson's chi-squared test, because the expected values in the Table are all below 10, and in a 2 * 2 contingency table, the number of degrees of freedom is always 1.

Before we proceed with the Fisher's exact test, we first introduce some notation. We represent the cells by the letters a, b, c and d, call the totals across rows and columns marginal totals, and represent the grand total by n:

Table 2. The 2*2 Contingency Table for the Sample with the Representative Letters

	Men	Women	*Row total*
Dieting	*a*	*b*	*a+b*
Non-dieting	*c*	*d*	*c+d*
Column total	*a+c*	*b+d*	*a+b+c+d=n*

The probability of obtaining any such set of values was given by the hypergeometric distribution:

$$p = \frac{\binom{a+b}{a}\binom{c+d}{c}}{\binom{n}{a+c}} = \frac{(a+b)!(c+d)!(a+c)!(b+d)!}{a!b!c!d!n!}$$

Where $\binom{n}{k}$ is the binomial coefficient and the symbol indicates the factorial operator.

$$p = \frac{\binom{10}{1}\binom{14}{11}}{\binom{24}{12}} = \frac{10!14!12!12!}{1!9!11!3!24!} \approx 0.001346076$$

The formula above gives the exact hypergeometric probability of observing this particular arrangement of the data, assuming the given marginal totals, on the null hypothesis that men and women are equally likely to be dieters. To put it another way, if we assume that the probability that a man is a dieter is p, the probability that a woman is a dieter is p, and it is assumed that both men and women enter our sample independently of whether or not they are dieters, then this hypergeometric formula gives the conditional probability of observing the values a, b, c, d in the four cells, conditionally on the observed marginals. This remains true even if men enter our sample with different probabilities than women. The requirement is merely that the two classification characteristics: gender and dieter are not associated.

For example, suppose we knew probabilities P, Q, p, q with $P+Q=p+q=1$ such that (male dieter, male non-dieter, female dieter, female non-dieter) had respective probabilities (Pp, Pq, Qp, Qq) for each individual encountered under our sampling procedure. The next step is to calculate the exact probability of any arrangement of these teenagers into the four cells of the table, but Fisher's exact test showed that to generate a significance level, we need consider only the cases where the marginal totals are the same as in the observed table, and among those, only the cases where the arrangement is as extreme as the observed arrangement, or more so. In this example, there are 11 such cases. Of these only one is more extreme in the same direction as our data:

Table 3. The 2*2 Contingency Table for the Sample Considering the Marginal Totals

	Men	Women	*Row total*
Dieting	*0*	*10*	*10*
Non-dieting	*12*	*2*	*14*
Column total	*12*	*12*	*24*

So the probability is $p = \frac{\binom{10}{0}\binom{14}{12}}{\binom{24}{12}} \approx 0.000033652$

In order to calculate the significance of the observed data, *i.e.,* the total probability of observing data as extreme or more extreme if the null hypothesis is true, we have to calculate the values of p for both these tables, and add them together. This gives a one-tailed test, with p approximately 0.001346076 + 0.000033652 = 0.001379728. This value can be interpreted as the sum of evidence provided by the observed data for the null hypothesis (that there is no difference in the proportions of dieters between men and women). The smaller the value of p, the greater the evidence for rejecting the null hypothesis; so here the evidence is strong that men and women are not equally likely to be dieters.

For a two-tailed test we must also consider tables that are equally extreme, but in the opposite direction. An approach used by the Fisher' exact test is to compute the p-value by summing the probabilities for all tables with probabilities less than or equal to that of the observed Table. In the example here, the 2-sided p-value is twice the 1-sided value—but in general these can differ substantially for tables with small counts, unlike the case with test statistics that have a symmetric sampling distribution.

4. Data Collection and Results Analysis

4.1 Data Collection

A pre-designed observation sheet is used to collect all necessary data from these e-commerce websites. In this paper, price, color available, size available, novelty, detailed introduction, quality (positive feedback), printing process, T-shirt brand, processing time and delivery time are considered as the main factors affect the willingness to buy the customization clothing products online. Three raters are participated to make an appropriate rating, and the selected items from all websites are rated with the widely used Little Scale, *i.e.*, from a scale of 1 (being the worst) to 5 (meaning excellent) accordingly.

4.2 GRA

GRA is employed for the representative selection. Grey Correlation matrix is derived from the DPS 9.5 (software which can determine the grey correlation matrix) as below:

$$R_4 = \begin{bmatrix} 1.0000 & 0.3314 & 0.3823 & 0.3849 & 0.3519 & 0.4058 & 0.3674 & 0.4372 & 0.3581 & 0.3888 \\ 0.2752 & 1.0000 & 0.5470 & 0.5290 & 0.5151 & 0.4394 & 0.3065 & 0.3672 & 0.4422 & 0.3599 \\ 0.3242 & 0.4952 & 1.0000 & 0.5103 & 0.4160 & 0.6594 & 0.3386 & 0.3376 & 0.4659 & 0.4048 \\ 0.3090 & 0.5102 & 0.5225 & 1.000 & 0.7109 & 0.3751 & 0.2816 & 0.3786 & 0.4162 & 0.3538 \\ 0.3436 & 0.5847 & 0.4539 & 0.6988 & 1.0000 & 0.4634 & 0.3675 & 0.3532 & 0.5915 & 0.4096 \\ 0.3469 & 0.4648 & 0.7013 & 0.3862 & 0.4399 & 1.0000 & 0.4114 & 0.3080 & 0.4689 & 0.5210 \\ 0.3373 & 0.2927 & 0.3480 & 0.3218 & 0.3375 & 0.4197 & 1.0000 & 0.2531 & 0.3097 & 0.3300 \\ 0.3427 & 0.3459 & 0.3350 & 0.3381 & 0.3191 & 0.2664 & 0.2416 & 1.000 & 0.3188 & 0.3793 \\ 0.3818 & 0.5018 & 0.5534 & 0.4652 & 0.6218 & 0.5466 & 0.3386 & 0.3847 & 1.0000 & 0.5117 \\ 0.3470 & 0.3882 & 0.4360 & 0.3619 & 0.3946 & 0.5507 & 0.3487 & 0.4128 & 0.4575 & 1.0000 \end{bmatrix}$$

According to the above matrices and the definitions described earlier, the measures can be grouped into several clusters by threshold value r = 0.7, which means that the factor of size available is excluded. Then the following nine factors of price, color available, novelty, detailed introduction, quality (positive feedback), printing process, T-shirt brand, processing time and delivery time are considered as the main factors affect the willingness to buy the customization clothing products online and tested by Fisher's exact test.

4.3 Fisher's Exact Test

The hypotheses and the Fisher's exact test process are as follows:

Hypothesis-1(a): Price (C1) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-1(b): Price (C1) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 4. Demand* Price (C1) Impact Analysis

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	5.700E2a	442	.000	.000	
Likelihood Ratio	244.098	442	1.000	.000	
Fisher's Exact Test	.000			.000	
Linear-by-Linear Association	4.812b	1	.028	.000	.000
N of Valid Cases	50				

b. The standardized statistic is .000.

As shown in Table 4, the value of Fisher's Exact Test is 0.000, Exact Sig. (2-sided) is 0.000,which is lower than 0.05, therefore Hypothesis-1(a)is accepted with significant level of 5%,which means that price has a significant influence on the online shoppers' willingness to purchase the clothing customization products.

Hypothesis-2(a): Color available (C2) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-2(b): Color available (C2) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 5. Demand * Color Available (C2) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	3.733E2a	325	.033	.b	
Likelihood Ratio	135.749	325	1.000	.003	
Fisher's Exact Test	540.470			.003	
Linear-by-Linear Association	.466	1	.495	.b	.b
N of Valid Cases	30				

a. 364 cells (100.0%) have expected count less than 5. The minimum expected count is .03.

b. Cannot be computed because there is insufficient memory.

As shown in Table 5, the value of Fisher's Exact Test is 540.470, Exact Sig. (2-sided) is 0.003,which is lower than 0.05, therefore Hypothesis-1(a)is accepted with significant level of 5%,which means that color available has a significant influence on the online shoppers' willingness to purchase the clothing customization products.

Hypothesis-3(a): Novelty (C3) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-3(b): Novelty (C3) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 6. Demand * Novelty (C3) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	1.200E2a	100	.084	.003	
Likelihood Ratio	86.416	100	.832	.003	
Fisher's Exact Test	125.513			.003	
Linear-by-Linear Association	11.036	1	.001	.b	.b
N of Valid Cases	30				

a. 130 cells (100.0%) have expected count less than 5. The minimum expected count is .03.

b. Cannot be computed because there is insufficient memory.

As shown in Table 6, the value of Fisher's Exact Test is 125.513, Exact Sig. (2-sided) is 0.003,lower than 0.05, therefore Hypothesis-3(a) is accepted with significant level of 5%.

Hypothesis-4(a): Detailed Introduction (C4) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-4(b): Detailed Introduction (C4) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 7. Demand * Detailed Introduction (C4) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	65.199a	75	.783	.912	
Likelihood Ratio	54.278	75	.966	.535	
Fisher's Exact Test	106.383			.535	
Linear-by-Linear Association	.393	1	.531	.b	.b
N of Valid Cases	30				

a. 104 cells (100.0%) have expected count less than 5. The minimum expected count is .03.

b. Cannot be computed because there is insufficient memory.

As shown in Table 7, the value of Fisher's Exact Test is 106.383, Exact Sig. (2-sided) is 0.535, greater than 0.05, therefore Hypothesis-4(a)is rejected with significant level of 5%,which means that detailed information has a lower influence on the online shoppers' willingness to purchase the clothing customization products.

Hypothesis-5(a): Quality (C5) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-5(b): Quality (C5) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 8. Demand * Quality (C5) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	60.000a	50	.157	.011	
Likelihood Ratio	64.562	50	.081	.011	
Fisher's Exact Test	50.812			.011	
Linear-by-Linear Association	.917	1	.338	.b	.b
N of Valid Cases	30				

a. 78 cells (100.0%) have expected count less than 5. The minimum expected count is .27.

b. Cannot be computed because there is insufficient memory.

As shown in Table 8,the value of Fisher's Exact Test is 50.812,Exact Sig.(2-sided) is 0.011,greater than 0.05,therefore Hypothesis-5(a) is rejected with significant level of 5%.

Hypothesis-6(a): Printing Process (C6) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-6(b): Printing Process (C6) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 9. Demand * Printing Process (C6) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	2.100E2a	175	.036	.b	
Likelihood Ratio	116.512	175	1.000	.000	
Fisher's Exact Test	228.207			.000	
Linear-by-Linear Association	11.392	1	.001	.b	.b
N of Valid Cases	30				

a. 208 cells (100.0%) have expected count less than 5. The minimum expected count is .03.

b. Cannot be computed because there is insufficient memory.

As shown in Table 9, the value of Fisher's Exact Test is 228.207, Exact Sig.(2-sided) is 0.000, lower than 0.05, therefore Hypothesis-6(a)is accepted with significant level of 5%.

Hypothesis-7(a): T-shirt brand (C7) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-7(b): T-shirt brand (C7) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 10. Demand * T-shirt brand (C7) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	21.346a	25	.673	.974	
Likelihood Ratio	18.015	25	.842	.974	
Fisher's Exact Test	26.296			.974	
Linear-by-Linear Association	.422b	1	.516	.561	.237
N of Valid Cases	30				

a. 52 cells (100.0%) have expected count less than 5. The minimum expected count is .13.

b. The standardized statistic is .649.

As shown in Table 10, the value of Fisher's Exact Test is 26.296, Exact Sig. (2-sided) is 0.974, greater than 0.05, therefore Hypothesis-7(a) is rejected with significant level of 5%.

Hypothesis-8(a): Processing time (C8) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-8(b): Processing time (C8) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 11. Demand *Processing time (C8) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	90.000a	75	.114	.006	
Likelihood Ratio	75.652	75	.457	.006	
Fisher's Exact Test	81.692			.006	
Linear-by-Linear Association	1.736	1	.188	.b	.b
N of Valid Cases	30				

a. 104 cells (100.0%) have expected count less than 5. The minimum expected count is .13.

b. Cannot be computed because there is insufficient memory.

As shown in Table 11, the value of Fisher's Exact Test is 81.692, Exact Sig. (2-sided) is 0.006,greater than 0.05, therefore Hypothesis-8(a) is rejected with significant level of 5%.

Hypothesis-9(a): Delivery time (C9) has a significant influence on the online shoppers' willingness to purchase the clothing customization products

Hypothesis-9(b): Delivery time (C9) has a lower influence on the online shoppers' willingness to purchase the clothing customization products

Table 12. Demand *Delivery time (C8) Impact Analysis

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
Pearson Chi-Square	86.000a	75	.181	.068	
Likelihood Ratio	67.920	75	.706	.102	
Fisher's Exact Test	86.874			.102	
Linear-by-Linear Association	.001	1	.970	.b	.b
N of Valid Cases	30				

a. 104 cells (100.0%) have expected count less than 5. The minimum expected count is .07.

b. Cannot be computed because there is insufficient memory.

As shown in Table 12, the value of Fisher's Exact Test is 86.874, Exact Sig. (2-sided) is 0.102,greater than 0.05, therefore Hypothesis-9(a) is rejected with significant level of 5%.

5. Conclusions

This paper is an attempt to bring into focus the issue of the main factors affecting online shoppers' willingness to purchase the clothing customization products in retail market in China, which could be the guideline for the improvement of this kind of clothing customization companies. The primary data for this research are collected through a observation sheet, and GRA and Fisher's exact test are applied to identify the criteria of demand impact analysis. The results could be the guideline for the online clothing customization companies in terms of improving their online popularity and making further progress in the clothing customization industry. According to the results of the analysis, the main factors affecting the online shoppers' willingness to purchase the clothing customization products are shown in Table 13:

Table 13. The Analysis Result of the Main Factors Affecting the Demand

Criteria	Exact Sig.(2-sided)
C_1 Price	*0.000*
C_2 Color available	*0.003*
C_3 Novelty	*0.003*
C_6 Printing Process	*0.000*

Based on the results of this research, our recommendations for improving the demand of the online customization clothing products are: (1) improving the novelty and update the online products periodically; (2) supply the T-shirt with more available colors; (3) enriching the printing technology for the online customers and (4) reduce their price and still make a positive feedback from the online shopper.

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Authors

Wei Zhenfeng, he received his Master of Computer Engineering in 2010 from Tongji University. Now he is a lecturer of Zhejiang Industry & Trade Polytechnic. His current research interests include Electronic Commerce, Online Marketing and Mobile Electronic Commerce.