Scientific
Research

Usability Evaluation of Independent-Sales B2C Fashion Website Based on Consumer's Perspective[*]

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ABSTRACT

Based on consumer's perspective, according to Microsoft Usability Guidelines (MUG), evaluation system of independent-sales B2C fashion website usability was established. Six independent-sales B2C fashion websites were selected to be tested. The questionnaire results were analyzed by gray correlation analysis, two-step cluster analysis and hierarchical cluster analysis, leading to a usability classification and characteristic description, which indicated the quality of usability of the selected fashion websites.

Keywords: Consumer's Perspective; Usability Evaluation; B2C Fashion Website; Microsoft Usability Guidelines; Gray Correlation Analysis; Cluster Analysis

1. Introduction

The development of China apparel e-commerce has a history of more than ten years; in particular B2C area of apparel online shopping grows rapidly. Foreign academics have conducted a lot of usability researches of e-commerce website since 1970s; comprehensive evaluation indicators have been developed and used for various websites studying. Hong-In Cheng studied the usability of input way, menu and navigation, drew a conclusion that it is most efficient when there are 50 to 100 menu options [1]. Ivory, Sinha and Hearst evaluated navigation, content, visual design, functionality and experience of the websites from different areas with more than 350 testers [2]. Compared to foreign success, the previous domestic researches of the independent-sales B2C fashion website have mostly discussed the design and implementation. One of the successful studies is that Jinling Chang and Guoping Xia evaluated the B2C e-commerce websites of 5 companies based on Microsoft Usability Guidelines (MUG)[3]. Yan Ge and Ronggang Zhou studied the color preference of college students[4]. So it is lack of the usability research from consumer's perspective for independent-sales B2C fashion website. Therefore, this article established usability evaluation system of independent-sales B2C fashion website from consumer's perspective based on MUG. And then used the system to classify six independent-sales B2C fashion

websites: VANCL, shishangqiyi, m18, xiu, menglu, togj.

2. Evaluation System

2.1. Microsoft Usability Guidelines (MUG)

Microsoft Usability Guidelines (MUG) is comprehensive usability evaluation indexes which proposed by Microsoft Corporation. MUG consists of five main indicators: content, easy of use, promotion, made for the medium, emotion [5].

Content is used to assess the capacity of website and information transfer. It consists of relevance, media use, depth and breadth, current and timely information.

Easy of use refers to the requirement of ability to use websites. It is composed of goals, structure and feedback.

Promotion refers to publicizing ability on internet or other media.

Made for the medium refers to the ability to meet the request of user, which is made up with community, personalization and refinement.

Emotion could be defined as emotional reaction of website. It is comprised of challenge, plot, character strength and pace.

2.2. Evaluation System of Independent-Sales B2C Fashion Website Usability

Based on the five main indicators of MUG, considering the consumer culture, consumption habits and feature of Chinese consumers, evaluation system was established as

shown in **Figure 1**.

System has 40 specific indicators which are shown in **Table 1**.

3. Empirical Research

In order to achieve the complementary analysis result, user testing, in-depth interview and questionnaire method were used during the empirical research together with evaluation system[6].

3.1. In-depth Interview for Indicator Correction

Typically sample size of in-depth interview is five to ten people, in addition sophisticated users can find more problems during the usability research[7].

For this reason 5 consumers whose "online shopping age" was higher than two years were chosen. Through the interview, 40 specific indicators were cut down to 35 which would be used in Likert scale questionnaire later.
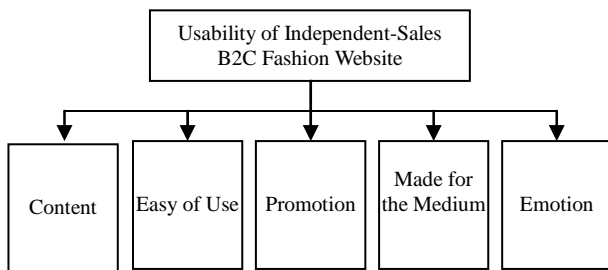
Figure 1. Evaluation system of independent-sales B2C fashion website usability.

Table 1. Specific indicators of evaluation system.

Main Indicators	Specific Indicators
Content	commodity classification, website updates speed, accurate commodity information, media information expression, enrichment of commodity, image orientation, detail shown from pictures, text credibility, user evaluation, correct statistical and accounting, fashion trend, commodity recommendation
Easy of Use	site layout ,interface design, website information organization, rapidly commodity query, accurate links, information speed, navigation system, convenient return, convenient payment and evaluation, feedback timely, obvious exit path, succinct process
Promotion	website promotion, sales promotion, membership
Made of the Medium	instant communication tool, message system, BBS, personal space, privacy protection, personalized service, payment platform, customer self-management, after-sale service
Emotion	control of the amount of information, cost performance, website attraction, website credibility

3.2. Selected Websites for Research

2009-2010 China Apparel B2C Online Shopping Research Report indicated that the independent-sales B2C fashion websites which ranked high of market share are shown in **Figure 2**: VANCL, m18, menglu, Maso Maso, shishangqiyi, togj, Xiu, HANY[8]. But Maso Maso and HANY only sale men's clothing, they are not suitable for female consumer to do the test. Hence other six websites were identified as test objects except these two.

r_1: VANCL-- www.vancl.com
r_2: m18-- www.m18.com
r_3: menglu-- www.menglu.com
r_4: shishangqiyi-- www.shishangqiyi.com
r_5: togj-- www.togj.com
r_6: xiu-- www.xiu.com

3.3. User Testing

Nilsen and Landauer had pointed out that 85% of the problems fro most of the usability tests could be found by 5 users[9].

To do usability testing, 30 consumers who were veterans of B2C fashion website were chosen, and all 30 samples were proved to be effective. Among them student/office worker ratio is 2:1, male/female ratio is 2:3, 19-24/25-30 years old ratio is 3:4, basically conform with the distribution of Chinese online shopper in *2009 Chinese Clothing Brand and Apparel Online Shopping Research Report* reported by China Intelli Consulting Corp[10].

Test time and place are up to testers in order to avoid the influence from surrounding. Test is carried out as following steps.

1) Step 1: Finish 4 tasks as follows during the test.

a) Task 1: Knowing the ranking of the independent-sales B2C fashion websites for reference.

b) Task 2: Female tester need to purchase a suitable summer chiffon dress. Male tester need to purchase a cotton business shirt.
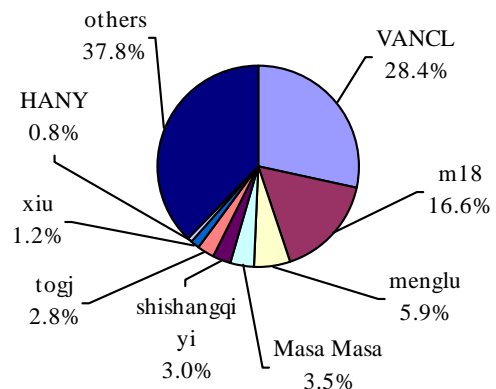
Figure 2. Market share of independent-sales B2C fashion website.

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c) Task 3: Female tester need to purchase a striped sweater which is on promotion. Male tester need to purchase a pair of jeans which is on promotion.

d) Task 4: Consult with customer service about size.

2) Step 2: Fill the form of indicator weight.

3) Step 3: Fill in the score of each indicator for each website.

4. Data Analysis

4.1. Gray Correlation Analysis

Subjective assessment for indicators of website are influenced by knowledge, experience, culture and many other known or unknown factors, as a result, grey correlation analysis can be used for evaluation[11].

Based on grey correlation analysis, the higher the correlation coefficient is, the better the usability will be. After analyzing scores given by testers with SPSS17.0, here are correlation coefficients of websites: r1=0.902, r2=0.821, r3=0.684, r4=0.827, r5=0.670, r6=0.72. It is leading to the classification of usability: VANCL, shishangqiyi, m18, xiu, menglu, togj.

Table 2 is the correlation coefficient of main indicators, it is shown that shishangqiyi, m18 and VANCL rank high of content, which accords with their feature of fast fashion.

VANCL performs well in easy of use, and testers also have pointed out the download time is very important during the shopping.

It seems to make sense that the ranking of promotion matches that of market share in the main.

VANLE get high praise of made of medium, from logistics to packing it does very well. On the contrary, after-sale service of menglu has been complained a lot.

At last it is not surprising that VANCL ranks high of emotion, owe to the good reputation.

4.2. Cluster Analysis

Cluster analysis of SPSS is composed by K-means cluster, hierarchical cluster and two-step cluster, the latter two have been used in this article.

Table 2. Correlation coefficient of main indicators.

correlation coefficient	Content	Easy of Use	Promotion	Made of the Medium	Emotion
r_1	0.299	0.218	0.118	0.137	0.129
r_2	0.295	0.193	0.098	0.123	0.111
r_3	0.246	0.163	0.072	0.100	0.103
r_4	0.325	0.205	0.073	0.106	0.118
r_5	0.235	0.160	0.066	0.112	0.096
r_6	0.239	0.187	0.064	0.132	0.102

Log-likelihood and Bayesian Information Criterion (BIC) have been selected to do two-step cluster analysis, as shown in **Table 3**, it comes to higher distance ratio in step 2 and step 4.

Besides, each cluster should extremely represent the characteristics of the website, consequently hierarchical cluster analysis has been down under the premise of 4 clusters based on Between-groups Linkage and Squared Euclidean. **Figure 3** Dendrogram shows that 4 clusters are: VANCL and m18, menglu and togj, shishangqiyi, xiu.

According to **Table 4**, Cluster 1 performs the best for promotion, Cluster 3 is the best of content, and Cluster 4 does better than others in made of the medium.

As a result of the Cluster Analysis, the characteristics of each cluster could be summarized and described as blow in **Table 5**. It is observed that the clustering result is basically conducted in accordance with the sorting of the usability: $r_1>r_4>r_2>r_6>r_3>r_5$.
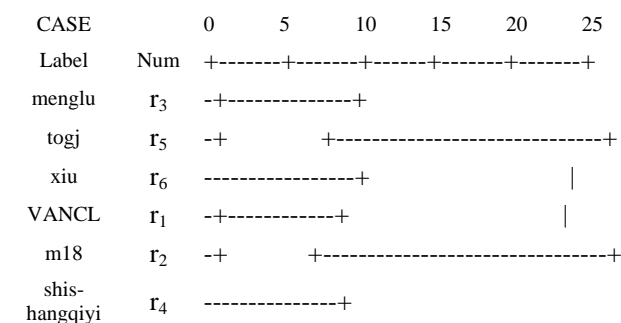
5. Conclusions

1) The evaluation system of this article is based on consumer's perspective, and Microsoft Usability Guidelines (MUG), combined with the uniqueness of independent-sales B2C fashion website.

2) On the basis of evaluation system, the usability classification of selected websites is given by gray correlation analysis: VANCL, shishangqiyi, m18, xiu, menglu, togj.

Table 3. SPSS auto-clustering.

Clusters	BIC	BIC Variance	Variance Ratio	Distance Ratio
1	36.102			
2	43.602	7.501	1.000	3.832
3	58.802	15.199	2.026	1.093
4	74.231	15.429	2.057	1.821
5	90.783	16.552	2.207	1.144
6	107.506	16.723	2.230	0.000

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CASE              0      5      10     15     20     25
Label     Num   +-------+-------+------+-------+-------+
menglu     r3   -+--------------+
togj       r5   -+             +----------------------------+
xiu        r6   ----------------+                          |
VANCL      r1   -+------------+                            |
m18        r2   -+            +----------------------------+
shis-      r4   --------------+
hangqiyi
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Figure 3. Dendrogram.

Table 4. OLAP cubes for Hierarchical Cluster Analysis.

Clusters		Content	Easy of Use	Promotion	Made of the Medium	Emotion
1	SUM	7.670	8.160	**7.980**	7.760	7.690
	N	2	2	2	2	
	Mean	3.837	4.080	3.992	3.882	3.844
	Std	0.051	0.161	0.294	0.069	0.191
2	SUM	6.710	7.210	5.620	6.880	6.940
	N	2	2	2	2	2
	Mean	3.355	3.604	2.810	3.440	3.471
	Std	0.092	0.007	0.127	0.311	0.086
3	SUM	**4.110**	4.030	3.020	3.490	3.830
	N	1	1	1	1	1
	Mean	4.110	4.030	3.020	3.490	3.830
	Std	0.000	0.000	0.000	0.000	0.000
4	SUM	3.390	3.930	2.630	3.960	3.530
	N	1	1	1	1	1
	Mean	3.390	3.930	2.630	**3.960**	3.530
	Std	0.000	0.000	0.000	0.000	0.000
Total	SUM	21.880	23.330	19.250	22.090	21.990
	N	6	6	6	6	6
	Mean	3.647	3.888	3.209	3.682	3.665
	Std	0.327	0.238	0.635	0.287	0.214

Table 5. Character description of independent-sales B2C fashion website.

Clusters	Websites	Characteristics
1 Sales-promotion type	VANCL m18	Attach great importance to both commodity-promotion and self-promotion, create good impression and usability.
2 Balanced-development type	menglu togj	Homogenized websites, lack of own characteristic, usability has to be improved.
3 Fashion-taste type	shishang-qiyi	Gorgeous interface, good at capture the fashion trend, attract the consumer with précised fashion nous and featured products.
4 Terminal-friendly type	xiu	Provide convenient communication platform with highly regarded human-computer interaction

3) Then the six websites are clustered to 4 categories by two-step cluster analysis. Through hierarchical cluster analysis, the usability characteristic of each cluster is respectively defined as sales-promotion type, balanced-development type fashion-taste type, and terminal-friendly type. As basis the development of the websites can be professionally bring into force.

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