Research on B-C E-commerce Website Information Architecture Level

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Abstract

This paper mainly analyzes the core contents of IA, which contain Organization System, Navigation System, Labeling System, and Search System. on the basis of former researches, the article puts forward a set of evaluation system with observation principles of second index for B-C e-commerce website IA, and endows different power to indexes with analytic hierarchy process, defines three different levels of IA, which are information dissemination, information-improvement and information exchange. According to those, choosing some sample websites to research on their level of IA, and acquires website IA situation in China. Additionally, it points out the strengths and weaknesses of China's website IA, and gives suggestions to the three different levels of IA.

Key words: IA, index system, B-C, Analytic Hierarchy Process, information search system

1. Introduction

Information overload is the main problem facing the information society. The level of website IA can be defined as the extent to which the information organization and design of a website can meet the needs of its users. To a website, the defects of its IA will definitely bring many negative effects, especially to a B-C e-commerce website, whose IA level can directly affect its users' experience of browsing and searching goods, and indirectly make effects on its profits.

To the development of website IA evaluation, the present study mainly focus on websites whose main business is to provide information services, but lacks comprehensive evaluation of the level of e-commerce website IA. Considering all these, this paper intends to put forward a set of improved and objective e-commerce website IA evaluation system, carry out quantitative evaluation study and propose targeted improvement strategies.

2. Analysis on the core contents of website IA

In order to evaluate a website's IA level, we can decompose the evaluation index according to the structure. Then we need know the specific configuration of the evaluation objects as the evaluation foundation. A website's IA means its organization systems, navigation systems, labeling systems, and search systems. This chapter will focus on the four

systems' meaning, contents and evaluation perspective. Moreover, it will make a summary of the four systems' relations.

2.1. Analysis on organization system

2.1.1. Overview on organization system: Organization system is responsible for the classification of information, which determines the organization schemes and organization structures of information, making logical groups and the relationships of each group, so as to make the information orderly and structured. Organization schemes consist of Top-Down, Bottom-Up and hypertext organization schemes. To website IA, organization system is key, the foundation of navigation system and labeling system, also the bottom and the slowest rate of change of information architecture level.

To the surfers, a good organization system will be easy to use and understand, extremely simple, can be quickly learned and mastered its internal logic and method.

2.1.2. Contents of organization system evaluation: (1) Classification. As Steve Toub said, a well-designed classification needs to take the following three aspects into consideration: the smallest gap between the entries following the same classification should, the biggest difference between different classifications, and lower classification can well represent the sub-headings

(2) Hierarchical structure. It includes the reasonableness of width and depth. Too deep and narrow or shallow and wide structure may cause the user to lose confidence and patience to click or browse. Generally, the width should follow the principle of 7 ± 2. Miller, cognitive psychologists pointed out that people's short-term memory can save and effectively deal with the number of symbols or information size is 5-9, usually 7, and considering the depth, it must avoid letting the user click after 4or5 layer, in order to get the target information.

(3) Richness. Rich layers of the organization system help the user make multiply choices, and different ways of expression can be used for the same content items. What is more, users can easily understand and find information

2.2. Analysis on navigation system

2.2.1. Overview on navigation system: The navigation system is responsible for information browsing and movement between information, and by a variety of signs and path, allows users to know the information they have seen, their position and where they can reach and get further information. It consists global navigation, local navigation, contextual navigation, and supplement navigation.

2.2.2. Contents of navigation system evaluation: (1) Integrity. Whether the four navigation elements are complete.

(2) Comprehensive. It refers to the degree to which the navigation can cover the whole site. Users can reach the main content of the site, including global navigation, local navigation, as well as supplementary navigation.

(3) Clarity and consistency. It refers to whether the navigation elements are clear and consistent. Global navigation, local navigation and supplementary navigation on the site need to be named clearly, set in eye-catching position, as well as be consistent with the location

and name on each page, so that users can clearly understand the content and structure of the site.

2.3. Analysis on labeling system

2.3.1. Overview on labeling system: Labeling system is responsible for the representation of the information, and determines the name, label or description. Generally, it includes navigation system label, index label, title label and icon label. Global navigation and particle navigation usually use text or icon to identify a large amount of information. Underscore is often used in context navigation to distinguish words with link from the common words. Index label are usually the key words, metadata, controlled vocabularies, etc its user may used to search, and are generally used to create an index for easy browsing. For example, words will appear between <title> and </title> in the page code to act as an index. The heading label is usually plays the role of distinguishing the title from the text. The icon label provides an intuitive expression, such as a question mark indicates more help and that a magnifying glass more information.

The label is a symbol of visual graphics or text in the form of transmission of information, which is easier for people to distinguish identify different things, plays the role of a schematic, instructions, identification or warning, has a stronger visual impact than the language, but also has larger amount of information.

2.3.2. Evaluation content of labeling system: (1) Completeness of the label. To a website, some labels are necessary, such as its domain and name, which remind the users that they are logging on the safe website wherever they surf.

(2) Comprehensibility of the label. A well-designed label system needs to take the users' language preference and habits, using words and expressions that are familiar to the users. Relevant notes are needed if there is a specific icon or term

(3) Accuracy and consistency of the label. This is to say that the label must represent the source text accurately. A well-designed labeling system must be clear as well as consistent.

2.4. Analysis on search system

2.4.1. Overview on search system: Search system, or retrieval system is responsible for searching information. According to the users' questions, it provides search engines, retrieves algorithm site and presents search results to the users. Search system is supplementary to navigation system. Except the key words searching function, a well-designed search engine usually provides the user with drop-down menus, tabs, radio checkbox and other elements acting as category search function, and wildcards, Boolean operators, truncation operator to conduct advanced searching. In addition, it can make use of the controlled vocabularies to find words with similar keywords to improve the search. As to the search results, if various search results can be arranged in different orders, or key words are provided to further narrow the search results, or suggestion and assistance are provided in the zero results or disordered results, it will be more useful to the users.

2.4.2. Evaluation content of search system: (1) Diversity of searching ways. Whether it can make searching ways diversity. On the base of diversified demands of different users, it can provide users with primary search, advanced search, category search and so on.

(2) Diversity of searching qualification. Whether the searching engine provides sufficient search entrance to meet users' needs.

(3) Richness of elements in search results. That is to say whether the search results are rich or standard, and whether they can represent the search results flexibly to make further reference for the users, including displaying the original search prerequisite, the number of search results, setting fixed number in each page, and reordering and searching again, etc.

(4) Practical help notes. That is to say whether help notes, including search introduction or examples are displayed in the searching page. What is more, the notes should be easy to understand.

(5) Effective advice. That is to say search advice in the site should be consistent with the users' typing words, and provide relevant search words effectively.

(6) Effective search engine. It refers to the completeness, accuracy and relevance of the search results.

2.5. Relationships between the four systems

Organization system, navigation system, labeling system and search system are the core of a website IA, among which organization system is the most important and it is the base of the other three, on which to establish navigation system and labeling system. Navigation system is essential to website IA, which responsible for routing problems, while search system is supplementary to it. As to labeling system, it is the expression of the other three. Navigation system and labeling system are usually stable, which focus on the organization and static representation of the information, while the other two stress on communication with the users and dynamic representation of information. In a word, the four systems are interrelated and influenced, as the following chart shows:

3. Evaluation index of B-C e-commercial website IA

After analysis of the four systems in website IA and their evaluation aspect, we can establish a related evaluation index to evaluate a website's IA. This chapter intends to put forward a specific website IA index for B-C website, combining the IA heuristic principles.

There are two stages in the evaluation of website's IA. First, design a common framework which is suitable for all commercial websites, including first and second indicator, staying out of second indicators observations. Then design specific specifications for the B-C website, including evaluation of the object, the principles to be followed in the evaluation index system, and concrete introductions to the second level indicator.

3.1. Improved evaluation index of websites' IA

Basing on the above statement of evaluation of a website's IA level, and previous research, this paper is to put forward an improved evaluation index of websites' IA, which includes 4 first level indicators, 13 second indicators, and secondary indicator observations. Moreover, the secondary indicators observations vary according to the different characteristics of the evaluation objects. And the weights of the indicators are determined by analytic hierarchy process.

Table 1. The first and second level indicators of evaluation indicator system for website's IA level and their weights

First level indicators	Weights of first level indicators λ_i	Second level indicators	Weights of second level indicators λ_{ij}	Weights
Organization Systems	0. 4765	reasonableness of width and depth	0. 9	0. 4288
		Richness	0. 1	0. 0476
Navigation Systems	0. 2879	Integrity	0. 7396	0. 2129
		Comprehensive	0. 1666	0. 0480
		Clarity and consistency	0. 0938	0. 0270
Labeling Systems	0. 0810	Completeness	0. 0660	0. 0053
		Comprehensibility	0. 6153	0. 0498
		Accuracy and consistency	0. 3187	0. 0258
Search Systems	0. 1547	Diversity of search ways and qualification	0. 4598	0. 0711
		Richness of elements in search results	0. 2782	0. 0430

In the process of evaluation, we will use 10-point method, that is to say all the second indicators will score 0- 10, and then according to the following formula to sum the results

$$S = \sum_{i=1}^{m}\sum_{j=1}^{n} \lambda_i \cdot \lambda_{ij} \cdot S_{ij}$$

(S is the total scores of a website' IA level, Sij is the score of second indicator, λi·λij is the combined weights, m is the number of first indicator, n is the number of second incator in a first indicator) Multiply the score of second indicators and their corresponding weights, and then sum the results together; we can get the score of a website' IA.

We classified the websites' IA into the following basing on the evaluation results:

(1) Information release type (less than 6 grades): this type is limited to the release of information, its organization of information needs to be improved. There are more or less incomplete and repeated information, overlapping and confused classification, disordered structure and order, jerky label, and difficult navigation system. What are worse, too limited search methods and results prevent the users to use the system very smoothly

(2) Information completed type (grades between 6 and 8): There are comprehensive information, more reasonable and clear organization programs and structure, easily-understand labels, as well as clear and consistent navigation system. Moreover, the search programs are so rich that users can successfully find the target information and understand the information as long as they have a glimpse of study and remember them.

(3) Information interacted type (grades between 8 and 10) The four systems in this type are more perfect and easy-to-use, and there is high degree of interaction with the user. The organization programs and structures are reasonable and clear, the labels are easy to understood, the navigation systems are clear and consistent. In addition, the search program are so diverse that almost without learning and memory, the users can successfully find the target information and understand them quickly.

3.2. Evaluation system of b-c e-commerce websites' IA level

To a B-C website, its website's IA needs to take its fixed target into consideration, which includes its products' information and to guide consumption. Its IA characteristics are as following:

(1) In organization system, it should refer to the main information of product classification. In specific, it should classify the products according to their type, brands, price, store, or rank. To a B-C website, product information is the most important content which is often huge and various. Therefore it needs to balance the width and depth in the goods information classification

(2) In navigation system, its context navigation differs from the other websites which provides the related information including related products of the same brand or in the same theme, products the user recently viewed, what they browsed who bought the same goods, the product combination and so on. In addition, the users are required to manage their personal information if they purchase online, therefore whether personal pages and cart belonging to the account can be logged should take into consideration.

(3) In labeling system, it is the same with the other websites, except that the users are required to create an account. When the website provides users' identity, it can make the users be aware that whether they have logged the website and manage their personal accounts.

(4) In search system, it does not need to be as so precise and perfect as the digital library, but it also requires a relatively complete search function to help users find product information and tap the potential consumption. In the search results, it normally ranks by price or sales.

Having analyzed its characteristics, considering the scientific, perfect, feasible and generic evaluation system, this paper puts forward the B-C websites' IA evaluation system, as shows in Table-2. The score of second indicators observations is based on the second indicator it belongs to, and although they all different, the full scores are 10 points.

Table 2. The evaluation system of b-c e-commerce websites' IA level

First level indicators	Second level indicators		Secondary indicator observations	Scoring criteria	
Organization Systems	Rational-ity 10points	Classification-ion 5 points	similarity of the same classification	Highly similarity ,2points Moderate similarity ,1points Do not similarity, 0 points	
			the degree of overlap between the different classification	do not overlap, 2 points moderate overlap, 1points highly overlap, 0 points	
			the degree of lower classification represent the sub-headings	well represent, 2points moderate represent, 1points do not represent ,0 points	
		Hierarchic-al structure 5 points	the reasonableness of depth	click less than three times ,2points	click more than three times, 0 points
			the reasonableness of width	width between five to nine items , 2points	width less than five or more than nine items, 0points
	Richness 10points		different ways of classification	Yes,5 points	No,0 points

			different ways to find the same goods	Yes,5 points	No,0 points
Navigation Systems	Integrity10 points	Global Navigation2.5 points	have the Global Navigation	Yes,2.5 points	No,0 points
		Local Navigation2.5 points	have the Local Navigation	Yes,2.5 points	No,0 points
		Contextual Navigation2.5 points	Prompt user the information of recently browsed goods	Yes,0.5 points	No,0 points
			prompt user the information of other users who browing and buying the same goods	Yes,0.5 points	No,0 points
			prompt user the information of good sales and recommended goods	Yes,0.5 points	No,0 points
			prompt user relevant information of the goods	Yes,0.5 points	No,0 points
			prompt the best combination of goods	Yes,0.5 points	No,0 points
		Supplement Navigation2.5 points	have catalogue	Yes,0.5 points	No,0 points
			have index	Yes,0.5 points	No,0 points
			have site map	Yes,0.5 points	No,0 points
			have position indicator	Yes,0.5 points	No,0 points
			Hierarchy catalog link provided about Goods' category in detail information page	Yes,0.5 points	No,0 points

Continued from Table2

First level indicators	Second level indicators		Secondary indicator observations	Scoring criteria	
Navigatio-n Systems	Comprehensive 10points		users can enter the main content area of the website through global navigation.	Yes,2 points	No,0 points
			Users can open the personal management page at any time	Yes,2 points	No,0 points
			Users can return to the home page at any time	Yes,2 points	No,0 points
			Users can momentarily enter the shopping cart	Yes,2 points	No,0 points
			There is not any wrong, null or death link.	Yes,2 points	No,0 points
	Clarity and consistency 10 points		Global navigation bar keeps the same name in each page.	Yes,2 points	No,0 points
			Local navigation bar keeps the same name in each page.	Yes,2 points	No,0 points
			The Position prompt keeps the same name in each page.	Yes,2 points	No,0 points
			When a page belongs to the content of a navigational element, the navigation element is highlighted	Yes,2 points	No,0 points
			Whether content under Supply navigational is correlated with all levels factors and labels of global and local navigation or not.	Yes,2 points	No,0 points
Labeling Systems	Complete-ness 10points	Label of website information	Have the website name, domain name and logo.	Yes,4 points	No,0 points
			Have a copyright statement and signature.	Yes,4 points	No,0 points

	Label of user	After landing website, it will automatically display the welcome messages which carry the user name.	Yes,2 points	No,0 points
	Comprehensibility 10 points	When the information for the title cannot show completely owing to the limitation of space, whether it can display the complete title in the mouse hover state.	Yes,2 points	No,0 points
		The website has not a unique none, or it has been explained.	Yes,2 points	No,0 points
		Whether the color of the clicked link changed or not.	Yes,2 points	No,0 points
		Whether there is a corresponding text description when mouse moves to the icon or not.	Yes,2 points	No,0 points
		Whether the icon design can represent the labeled content or not.	Yes,2 points	No,0 points
	Accuracy and consistency 10points	The label that is used to express the same meaning should keep consistent.	Yes,2 points	No,0 points
		Whether use the unified form of the website title or not.	Yes,2 points	No,0 points
		The website title can indicate the content of a page.	Yes,2 points	No,0 points
		The URL can indicate the content of a page.	Yes,2 points	No,0 points
		Keep the font, size, color of the label consistent.	Yes,2 points	No,0 points
Search Systems	Diversity of search ways 10 points	Provide the classification search function.	Yes,5 points	No,0 points
		Provide the advanced search function.	Yes,5 points	No,0 points

Continued from Table2

First level indicators	Second level indicators	Secondary indicator observations	Scoring criteria	
Search Systems	Diversity of search qualification , 10points	Provide kinds of search condition.	Yes,5 points	No,0 points
		Can use various search operators.	Yes,5 points	No,0 points
	Richness of elements in search results ,10points	Search results show the original search condition.	Yes,1 point	No,0 points
		Search results show the summation.	Yes,1 point	No,0 points
		The number displayed in per page can be specified.	Yes,1 point	No,0 points
		Search results can be showed by different display modes	Yes,1 point	No,0 points
		Search results can be sorted by price, sales etc.	Yes,1 point	No,0 points
		Search results provide the page up and down function.	Yes,1 point	No,0 points
		Search results provide jumping function to the specified page.	Yes,1 point	No,0 points
		Provide the keyword search function in the results.	Yes,1 point	No,0 points
		Search results provide narrowing the scope functions	yes,2 points	No,0 points

Practical help notes, 10points	In the search page, there is assistant link which provides explanation or point to a help page.	Yes,5 points	No,0 points
	Provide a search paradigm	Yes,5 points	No,0 points
Effective advice, 10points	The search box provides hot search keywords.	yes,2 points	No,0 points
	Search results suggest relevant search keywords	yes,2 points	No,0 points
	When there is a spelling mistake, it can provide probable correct spelling.	yes,2 points	No,0 points
	When there are too much search results, whether it is possible to provide search suggestions for improvement.	yes,2 points	No,0 points
	When there is no search result, whether it is possible to provide search suggestions for improvement.	yes,2 points	No,0 points

4. Case analysis of B-C e-commerce Websites' IA

4.1. Evaluation samples

This paper randomly selected 30 B-C websites as research objects. Remove 2 many-to-many B-C website, 9 failures to log-in website and cannot open for a long time of the home page, and 4 delete the data after the failure of the review visit, there are the remaining 15 useful websites' data.

4.2. Analysis on evaluation results

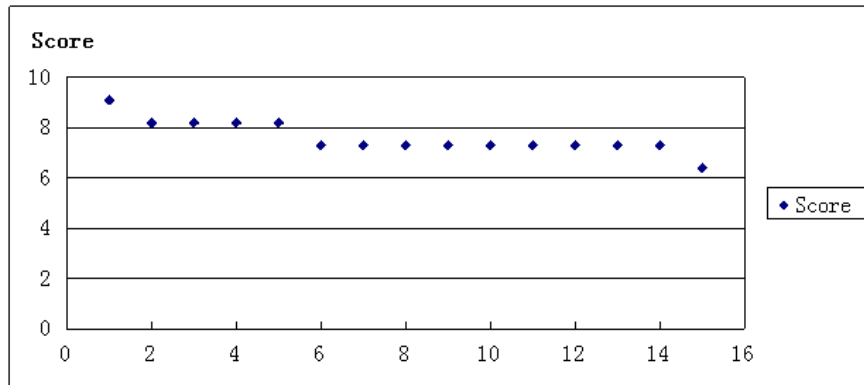(1) the scores of organization system

Figure 1. Distribution of scores on websites' Organization Systems

We can see from the graph that in organization system, the highest score of B-C websites is 9.1 while the lowest is 6.4, and the average is 7.6. That is to say the score is relatively balanced. There are 2 comprehensive websites and 3 vertical line products websites among the 5 websites that score high than the average. Due to a narrower product line, the vertical websites may be easier in terms of the organization of information
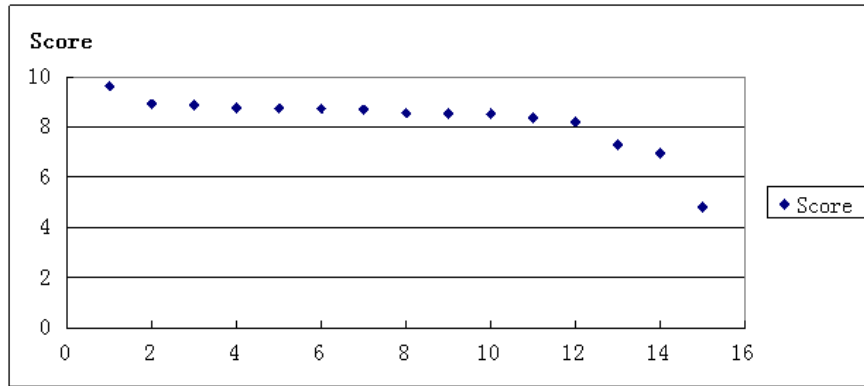
(2) scores of navigation system

Figure 2. Distribution of scores on websites' Navigation Systems

We can see from the graph that in navigation system, the highest score of B-C websites is 9.6, while the lowest is 4.8, and the average is 8.2. Websites that score high than 8 occupy 80 percent. That is to say, navigation system in B-C websites are, in a whole, more perfect, only very few have serious problems and score low
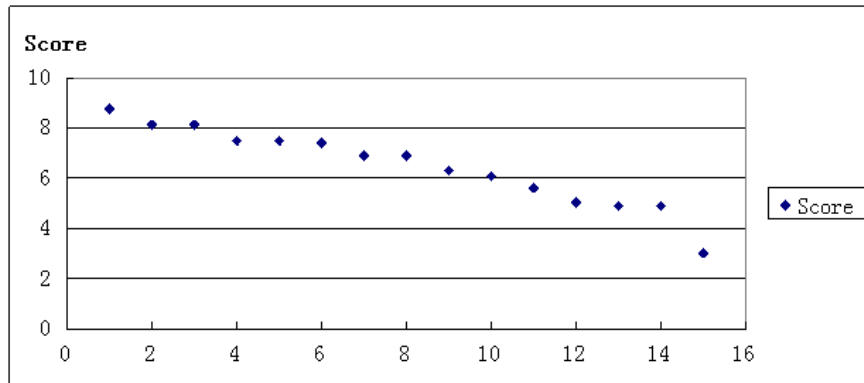
(3) scores of labeling system

Figure 3. Distribution of scores on websites' Labeling Systems

It is obvious that in labeling system, the B-C websites' scores are imbalanced, and vary greatly. The highest score is 8.7, the lowest is 3.03, and the average is 6.47. Only 20% of the site score more than 8. However, 33% of the sites score less than 6, which implies there is a large room to improve for B-C site in the labeling system, and more need to be improved in the comprehensibility and accuracy and consistency.
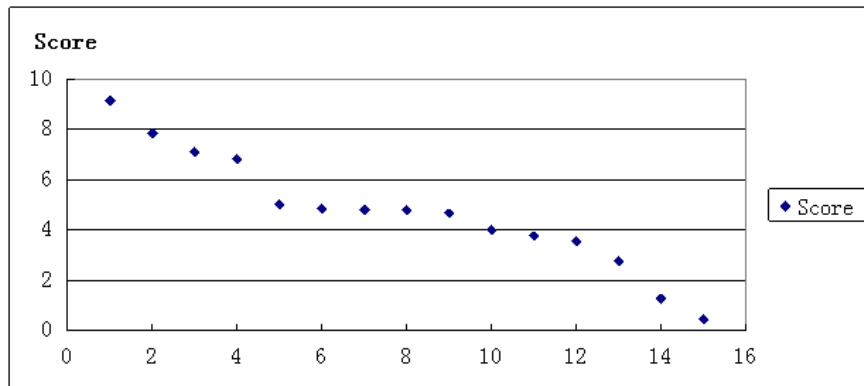
(4) scores of search system

Figure 4. Distribution of scores on websites' Searching Systems

Clearly, the gap in search system is the most obvious and the scores are lower. The highest is 9.1455, while the lowest is less than 1, and the averge is only 4.72. Only 6.7 percent websites that score more than 8, and 73.3 percent score less than 6. The richness in search ways and search qualification need to be improved for the most sites. This conclusion is in consistent with the previous studies on effects of IA, that many users have not yet to find the desired information abandon the site. If B-C websites provide a richer search tool, more powerful in narrowing down search range more flexible in search results, and more practical, effective help, they will help the users to explore more product information so as to bring potential consumption.

(5) the integrated scores

Among the 15 samples of the website, the highest level of IA is 8.6; while the lowest is 5.3 and the average is 7.24. As shows in chart 4-6, the information release type, occupies 13 percent, the information completed type accounts for 80 percent and the information interacted type occupies 7 percent. These show that B-C websites' IA in China is as a whole in the upper level. That is to say the information organization is more reasonable and rich, navigation system is clear and consistent, and the label is easy to understand. Moreover, in terms of content, text size, font, color, style, it is consistent. However, there is still much room for improvement. And the search system needs to strengthen the richness of search means and the degree of control to the search results.
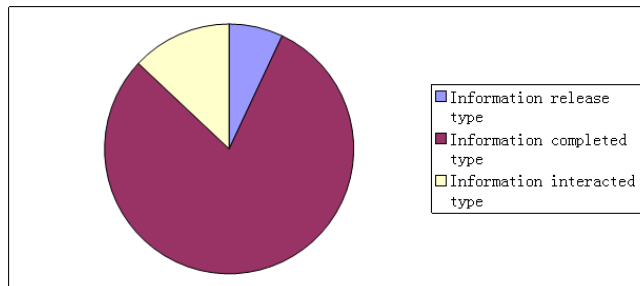

Figure 5. Distribution of scores on websites' IA level

5. Strengths and weaknesses of b-c e-commerce websites' IA

5.1. Strengths of b-c e-commerce websites' IA

Judging from the overall of the industry, the main advantages of BC websites' IA are as the following:

(1) Organization scheme of product content is rich: in the indicators of organizational systems, all the 15 samples score 10, which shows that all sites offer a variety of commodity classification schemes. And according to the research, generally, except for classification by types, there are by brand and sales rank, in order to provide the users with a variety of ways to find product information

(2) The navigation elements are complete: All websites under investigated offer global navigation, partial navigation, as well as rich context navigation and supplementary navigation. Among the 15 samples, there are 12 sites provide the user with his or her recently browsed information, 10 sites provide other consumers' browsing and buying information, 12 sites provide hot-sale and recommended product information, and 12 sites provide product information associated with the products.

(3) The label is perfect: All websites offer site name, domain name and copyright information. From the aspects of IA, these labels are telling the users that they are visiting the safe and right site. Among the 15 samples, there are 10 sites provide the users' account label after they logged, so as to allow the users to know clearly whether their personal pages and the shopping cart page can be used immediately

(4) The organizational systems are more reasonable in classification and rank: To B-C websites, the reasonableness of the content and structure organization are the basic requirements for successful operations. It is safe to say that chaotic categories and unreasonable depth and breadth shopping sites will disappoint the users. The 15 sites in the research all score more than 6, which can meet the basic requirements, providing premise for the successful operation.

(5)The navigation covers comprehensively: Of all the 15 samples, 13 sites score more than 6 in the navigation comprehensive indicators, showing that the majority of sites can provide access to the main sections, back to the home page and open a personal page and cart whenever the users want through the global navigation links.

5.2. Weakness of b-c e-commerce websites' IA

We can immediately see the main deficiencies of the B-C websites' IA by analyzing the o scores.

(1) The effectiveness of search suggestions and practical help is far from sufficient: Of all the 15 samples, 11 sites do not provide relevant search terms. And only 2 sites provide spelling advice in the search keywords when spelling mistakes appear. As to the countless search results, no website provide help to improve search efficiency. Only 2 sites provide links to help notes or search help.

(2) Not high enough in the control of search results: Only 3 sites can specify the number of entries displayed on per page, 5 can provide the control function of the number of entries on per page, and only 1can provide keywords search function among results.

(3) The search qualification is not rich enough: Only 1 site can use a variety of operators in the advanced search.

(4) Users' identities are in place: Only 4 sites reddened the links that the users have clicked. In IA, this reminds the users where they have logged in.

(5) The context navigation should be more diversified: Of all the samples, only 1 site provides information of production combination.

6. Conclusion and Recommendation

Of all the B-C websites in China, they all belong to the information perfect type, whose organization system and navigation system are reasonable while labeling system and search system have great potential to improve.

Information architects should cooperate with experts of various fields such as site administrators、 web designers, usability engineers, user experience analyst IA——to make the information understandable. It should pay more attention to make the users be aware of their routine, location and whereabouts in the design and rebuilding of information release type B-C websites. Moreover, it should make it a core to maintain the website to detect a link error or an empty chain, dead chain or other issues that annoy the users, avoiding their own loss of customers. As to the information perfect B-C websites, they need to keep their advantages in information organization and navigation, to make up for the other disadvantages. On the basis of reasonable classification and hierarchy in organizational systems, they should exploit diversified and intuitive information presentation engine, maintain the consistence of navigation system and labeling system, and explore the potential consumers. As to the information interacted B-C websites, they should improve in details. For example, pay more attention to the appearance of the page and the degree to which they interact with the users. In this way they can make good user experience, and further improve customer loyalty and satisfaction.

Acknowledgements

References

[1] A. Dillon, "I think, Therefore IA", Bulletin of the American Society for Information Science and Technology, vol. 27, no. 12-1, **(2001).**
[2] A. Dillon, "Information Architecture in JASIST: Just Where Did We Come From?", Journal of the American society for information science and technology, no. 8, **(2002)**, pp. 821~823.
[3] J. Kalbach, "IA, therefore I am", Bulletin of the American Society for Information Science and Technology, no. 2/3, **(2003)**, pp. 23~26.
[4] M. Hurst, Exercise in Customer Experience [DB/OL].
[5] http://www.goodexperience.com/blog/archives/000015.php, **(2004-06-03)**
[6] S. Toub, Evaluating Information Architecture A Practical Guide to Assessing Web Site Organization [DB/OL].
[7] T. Jiang and W. Lu, "Information Architecture within the www information ecology", Journal of the china society for scientific and technical information, vol. 23, no. 3, **(2004)**, pp. 340-346.

[8] L. Gan, X. Zheng and Q. Shu, "IA evaluation for the domestic four database websites", Library and information service, vol. 48, no. 8, **(2004)**, pp. 26-29.