

The Usability Evaluation of the Ecological Agriculture Park Website

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Abstract

The food quality and safety condition are the important symbols of the national economic development level and the quality of people's lives. Ecological agricultural park strictly controls seedling, producing, processing, storing and distributing links to provide the market with high-quality traceable food. Websites are important ways of the brand marketing of ecological agriculture park. The usability of the websites is directly linked to the benefit of park. This paper establishes the three levels GAHP (Group-Analytic Hierarchy Process) model that consists of index layer, criterion layer and target layer, and the synthetic weight of each index were determined by the four experts. Taking four ecological agriculture park websites as the evaluation cases and selecting 30 users to rate, the comprehensive score of the four websites was obtained after weighting. GAHP method plays collective intelligence, having a relatively high application value for the optimum selection and optimization of the ecological agriculture park website.

Keywords: Website; Usability; Ecological Agricultural Park; Evaluation

1. Introduction

With the development of Chinese economy and the improvement of people's living standard, the food safety and quality have been paid widespread attention by the society [1]. Healthy food with the retrospective pattern of "from seed to feed" has been favored by the market. China has built many ecological agriculture parks [2]. These parks have provided the market with healthy products and obtained better economic benefits through strictly controlling seedling, producing, processing, storing, selling and establishing traceability system of food. Brand effect can bring relatively high economic interests. Faced with the fierce market competition, the development of brand agriculture has become the inevitable choice in the development of agricultural parks. How to promote the brand effect to seize the development opportunities has become an outstanding problem.

As one of the important intermediaries for brand promotion, the Internet is featured by vast spread and fast speed [3]. Meanwhile, the appearance of mobile Internet brings a new opportunity to the development of agricultural park. Internet has become the convenient channel to strengthen clients' communication, which is beneficial to know the views of consumers and improve the service. Users can get to know the products, technologies, business ideas, culture, images and so on of the parks through the website, thereby building their acceptance and trust to the parks.

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The establishment of website becomes the main content of the construction of Ecological agricultural park, and the key point of the establishment is how to judge the quality of the websites. Usability is an important quality index of interactive IT product/system. The definition in ISO9241/11 is that usability is a multi-factorial concept which includes easiness to learn, easiness to use, availability of system, satisfaction of users and the judgment toward specific target combining all these factors and actual usage environment [4]. Usability is used to measure the quality of the products from the perspective of users, and its application in multimedia is very wide. To apply the usability to the construction of agricultural park website means that the website must have relatively strong usability, that is, the website can truly provide clients with the practicability of functions and information. The core of the construction of the website is "how to find potential clients and effectively turn them into cooperative clients." In this Internet era of high competition, one of the keys to get potential clients is to improve the usability of the website.

The usability evaluation often adopts the method of user rating. But owing to the different importance between different indicators, the method's error is very big. AHP is a kind of multi-criteria decision-making method which carries out quantitative analyses of qualitative problems [5]. It is convenient, flexible and practical, which is widely applied to such fields as energy system analysis, urban planning, economic management and scientific research evaluation. In order to increase the precision of the evaluation, the introduction of group decision method is pretty necessary. The group decision-making is the whole process in which many people undertake jointly the decision-making analyses and formulate decisions with the purpose of giving full play to the collective wisdom [6].

2. Method and Evaluation System

2.1. Methods and Procedures

The basic procedures of GAHP model application are as follows [7-8]:

- (1) Selecting indexes, and constructing hierarchical structure;
- (2) Constructing the judgment matrix of pairwise comparison, and the experts perform pairwise comparison according to the scale 1-9 (Table 1);

Table 1. Scale of Relative Importance Used in the Pairwise Comparison Matrix

Intensity of importance	Linguistic variables
1	Equally important
3	Weakly important
5	Strongly more important
7	Very strongly important
9	Extremely more important

- (3) Confirming the related elements order of importance in this hierarchy versus certain element in last hierarchy, namely the relative weight. Conduct consistency test of single level judgment matrix, which requires $C.R.<0.1$; when $C.R.>0.1$, experts modify judgment matrix;

- (4) Calculating synthetic weights of each layer to the target layer and making total sorting to determine the importance of each element at the lowest layer of hierarchical structure graph among the general goal. Checking the consistency of the total ordering of layers, requiring $C.R.<0.1$;

- (5) Grading the elements at the bottom of the websites awaiting assessment and doing the weighted process, and getting the aggregate score.

2.2. Evaluation Model

According to the results of literature retrieval and questionnaires of users, selected nine indexes and classified them into three layers respectively. The three layers hierarchy evaluation model is established based on the hierarchical relationship (Table 2).

Table 2. The Usability Evaluation Model of the Ecological Agriculture Park Website

Target layer(A)	Criterion layer(B)	Index layer(C)	Index instruction
Usability	Topicality (B1)	Graphic sense(C11)	The webpage is elaborately organized, and has a unique sense of art.
		Affinity(C12)	The webpage has a feeling of closeness, and users are willing to use
		Experience degree(C13)	Users' experience effect in using the website
	Functionality (B2)	Practicality(C21)	Meeting the practical demand of the extension of the agriculture park
		Easiness to use(C22)	Users feel convenient when using the website
		Completeness(C23)	Meeting the potential usage requirements of users
	Information elements (B3)	Integrity (C31)	High expression of the information of the park
		Accuracy(C32)	The degree of accuracy in the expression of information
		Timeliness(C33)	Timely update, and be valuable for users to make decisions

2.3. Calculating Software

The computing process of GAHP is quite complicated, but it can be accomplished with the aid of professional software. There are many AHP computing software such as Super Decision software [9] and Expert Choice [10]. Yaahp software [11] is simple and easy to operate, and can directly reflect evaluation findings, even non-specialized personnel can quickly understand and operate. Computation uses Yaahp 5.3 version.

3. Results and Discussions

3.1. Weight of Index

The choice of evaluation personnel is very important for improving evaluation accuracy. This study chose four teachers from Henan Institute of Technology who are familiar with the construction of Ecological agricultural park and the development of the industry as evaluation experts (E1-E4). The results are concentrated by the method of weighted arithmetic mean, and the judgment findings are shown in Table 3-Table 6. According to the evaluation results (Figure 1, Table 7), the graphic sense, practicability, completeness and timeliness occupy a higher weight, which states that the graphic sense for a website is an important manifestation of the brand image, and the well-made website is usually easier to gain user's acceptance; the target of the website should be clear and applicable. The flowery and ineffective information should be reduced so that the users find it easy to search; the users demand should be considered to perfect the information, and avoid declining users' degree of recognition of this website; the website information

should be updated timely to make users know about the latest products, price, delivery and other information.

Table 3. The Judgment Matrix from Criterion Layer to Target Layer

A	B1				B2				B3			
	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
B1	1	1	1	1	3	1	1	1/3	1/3	5	2	4
B2	1/3	1	1	3	1	1	1	1	1/5	3	2	5
B3	3	1/5	1/2	1/4	5	1/3	1/2	1/5	1	1	1	1
C.R. of expert E1 - E4 respectively are : 0.0370 , 0.0279 , 0 , 0.0825												

Table 4. The Judgment Matrix from Index Layer to Criterion Layer (Topicality)

B1	C11				C12				C13			
	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
C11	1	1	1	1	3	1	1	1/3	1/3	5	2	4
C12	1/3	1	1	3	1	1	1	1	1/5	3	2	5
C13	3	1/5	1/2	1/4	5	1/3	1/2	1/5	1	1	1	1
C.R. of expert E1 - E4 respectively are : 0.0370 , 0.0279 , 0 , 0.0825												

Table 5. The Judgment Matrix of Index Layer to Criterion Layer (Functionality)

B2	C21				C22				C23			
	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
C21	1	1	1	1	3	1	1	1/3	1/3	5	2	4
C22	1/3	1	1	3	1	1	1	1	1/5	3	2	5
C23	3	1/5	1/2	1/4	5	1/3	1/2	1/5	1	1	1	1
C.R. of expert E1 - E4 respectively are : 0.0370 , 0.0279 , 0 , 0.0825												

Table 6. The Judgment Matrix of Index Layer to Criterion Layer (Information elements)

B3	C31				C32				C33			
	E1	E2	E3	E4	E1	E2	E3	E4	E1	E2	E3	E4
C31	1	1	1	1	2	3	4	1/5	1	1/3	1/3	1/3
C32	1/2	1/3	1/4	5	1	1	1	1	1/4	1/4	1/6	3
C33	1	3	3	3	4	4	6	1/3	1	1	1	1
C.R. of expert E1 - E4 respectively are: 0.0516, 0.0707, 0.0516, 0.0370												

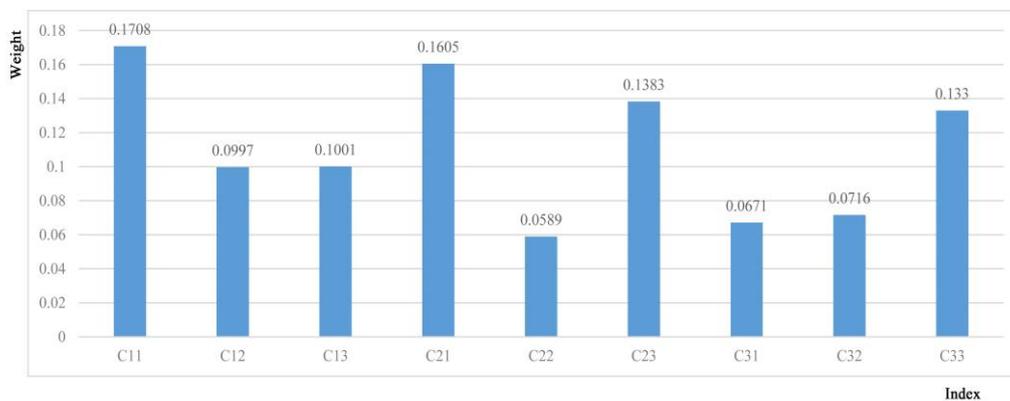


Figure 1. The Total Rating Weight of Index Layer

Table 7. The Comprehensive Evaluation of the Ecological Agriculture Park Website

Index	Weight	Case 1	Case 2	Case 3	Case 4
C11	0.1708	57	79	94	90
C12	0.0997	78	86	95	92
C13	0.1001	75	84	90	93
C21	0.1605	82	87	93	95
C22	0.0589	90	91	92	90
C23	0.1383	74	89	95	93
C31	0.0671	82	90	93	92
C32	0.0716	91	94	96	94
C33	0.1330	90	96	93	95
Combined Scores of Case 1 to Case 4 respectively are 77.7, 87.65, 93.5, 92.8					

Table 8. The Case and Address of the Ecological Agriculture Park Website

Case	Website
Case 1	http://www.82003080.com/Home/WebIndex
Case 2	http://www.oabc.cc/
Case 3	http://www.ifarm365.com/index.html
Case 4	http://www.baiwei.com.cn/

3.2. Case Evaluation

Four ecological agriculture park websites were chosen as evaluation objects (Table 8, Figure 2), then 30 users were chosen to rate hundred percentage point system, and a comprehensive score of 4 websites after weighting can be gained. The score of website case 3 is the highest, while the score of case 1 is the lowest, and the scores of case 4 and case 2 are in the middle. The results have a better partition degree.

4. Conclusion

The website construction of the ecological agriculture park is the important content of brand construction. The usability of the website directly determines the efficiency of transforming potential clients into cooperative clients. Therefore, it is quite important to evaluate the usability of the website. The GAHP model can convert qualitative evaluations to quantitative ones through the mode of group decision, which not only plays the collective wisdom, but also makes it convenient to compare different websites, providing a relatively objective basis for the selection and optimization of the website.



Figure 2. Cases of Ecological Agriculture Park Websites

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