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# Research on the Performance Evaluation and Advancing Path of Henan Agricultural Products E-marketing

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**Abstract** Given that the traditional marketing management of agricultural products has been unable to meet the diversified demands of market, and the network has been applied to the marketing field of agricultural products, the research on the performance evaluation and advancing path of Henan agricultural products E-marketing is more important than before. Based on current problems of Henan agricultural products E-marketing, a system of performance evaluation is established, which covers website building and maintenance and other four first-class indexes as well as profit ratio of sales and other thirteen second-class indexes, and then the system is evaluated by comprehensive evaluation method. Meanwhile, it is explored to discuss how to further advance Henan agricultural products E-marketing.

**Key words** Agricultural products, E-marketing, Performance evaluation, Path, China

Henan is famous for its great agricultural production, and its yield of diverse agro-products, such as grains, cotton, meat, fruits and so on, ranks the front in China. However, the agricultural market in Henan is still at the primary stage of development with a long supply period and poor transmission and sharing efficiency of information. The weak capacities of collecting, processing, and distributing information have greatly constrained the sales of Henan agricultural products<sup>[1]</sup>. With the large, diversified, high and dynamic requirements for agricultural products in recent years, the traditional marketing cannot accommodate to local market changes. As the network and communication techniques develop rapidly, the E-commerce has been adopted in the sales of agricultural products, the E-marketing has been applied in many places and achieved good results, which, however, still has a large gap from that of other developed provinces like Shandong. Thus it is of great necessity to comb our concept about the E-marketing of agricultural products and carry out a reasonable evaluation, so as to find out a more scientific path to advance the marketing.

## 1 E-marketing of agricultural products

E-marketing is a new type of marketing model based on international website to realize the marketing goal by the interaction of digital information and network media<sup>[2]</sup>. Different from traditional marketing in both its concept and channels, the E-marketing is comprehensively upgraded from the speed, width and depth of marketing, which brings considerable benefits to the agricultural companies and has become a powerful tool for competition.

The theoretical definition of E-marketing hasn't been unified till now. For facilitating our study, the E-marketing of agricultural

products in this paper is defined as: a general name of diverse marketing activities, including the collection and distribution of agro-products demands and prices, the circulation of agro-products based on the production bases and logistics system, the upgrading of agricultural brands, the enhancement of relations with customers, the improvement of services, the broadening of marketing channels, *etc.*, which are carried out based on the international website and by introducing the E-commerce system to the sales of agricultural products.

## 2 The evaluation index system for the E-marketing performance of agricultural products in Henan Province

There is still a large gap between the agricultural E-marketing of Henan Province and that of other developed provinces like Zhejiang, Jiangsu and Shandong. To solve the problems about what are the gaps, how to narrow the gap and whether the agricultural E-marketing has achieved the expected results, a scientific method is needed to carry out a comprehensive and objective evaluation of the E-marketing, which, on the one hand, helps understand the agricultural E-marketing achievements; on the other hand, characterizes the gap between the practical and expected achievement. The experiences from agricultural E-marketing activities are summarized for the theoretical basis for local department to formulate related policies. On the basis of present agricultural E-marketing problems in Henan, a performance evaluation system is established.

**2.1 The existing problems in Henan agricultural E-marketing** The present agricultural E-marketing in Henan Province has several problems. Firstly, the rural and agricultural infrastructure in Henan is generally weak and unevenly developed, and the website building and maintenance are still at the primary stage of development, the information is updated slowly and the promotion is weak; secondly, the gross output of E-marketing accounts for only

Received: May 30, 2012 Accepted: December 9, 2012

Supported by the Natural Science Research Program of Henan Education Department "New-type Agricultural Services System of Henan Province from the Perspective of Multi-objective Decision" (Project No. 2011B630016).

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a small proportion of total sales, and the input-output ratio is very low; thirdly, the network laws and regulations are still underdeveloped, which cannot provide a safety assurance for network marketing and lead to some non-standard marketing activities<sup>[3]</sup>; fourthly, the informational team of agricultural products hasn't been formed, and the quality of employees needs to be improved and trained; fifthly, the standards for agricultural production and products are low; sixthly, the backward facilities of logistics distribution make it impossible to rapidly respond to the needs of customers.

**2.2 The performance evaluation system of Henan agricultural E-marketing** Henan agricultural E-marketing varies from region to region, and it differs greatly from traditional marketing. It is no easy thing to establish a perfect evaluation system for agricultural E-marketing. The goal of evaluation system is to promote the rapid development of agricultural E-marketing and play the functions of evaluation, supervision, forecast, early-warning and feedbacks. On this basis, the evaluation indexes are selected based on the principles of importance, comparability, operability, economy, combined quality and quantity and flexibility. Five first-class indexes, including the construction and maintenance of website, promotion of website, financial conditions of website, competitiveness within the industry and post-effect, as well as fourteen second-class indexes, including the safe transaction, sales increase, registered number and so on, are adopted to construct a performance evaluation system for agricultural E-marketing, which can be seen in Table 1.

(1) Website building and maintenance. The website building and maintenance are the foundation of E-marketing, and the selected indexes should have comprehensive functions and enable safe transactions, easy flow monitoring and management. The comprehensive functions mean that the information on the website should be comprehensive and cover diverse aspects, including online transaction, easy payment and statistics of user access, *etc.* The safe transaction means that some commercial information, including the quantity and quality of agricultural products, electron-

ic contracts, as well as the bank account, password, transaction amount of both parts, will not be illegally intercepted or stolen<sup>[4]</sup>.

(2) Website promotion. Agricultural E-marketing mainly relies on website promotion, which, to some extent, depends on the labors of website marketing staff<sup>[4]</sup>. The website is mainly promoted by the means of search engine registration, key words search, website advertisements, members marketing and even viral marketing, *etc.*, and the promotion effectiveness will be evaluated by the indexes of registered user number and increase rate, among which the number of registered users reflect the value of website and the information value provided to the customers. The registered users generally equal to the potential customers.

(3) Financial conditions of website. The financial conditions of website usually reflect the agricultural circulation costs, profiting capacity and marketing costs<sup>[4]</sup>, and are usually evaluated by the indexes of the profit ratio, asset-liability ratio, and input-output ratio. The profit ratio refers to the ratio of sales profit to sales revenue; the asset-liability ratio refers to the ratio of total liabilities to total assets; and the input-output ratio means the ratio of website input capital to website output.

(4) Industrial competitiveness of websites. The industrial competitiveness of websites characterizes the use efficiency of people, capital, objects and information during website marketing activities<sup>[4]</sup>. The competitiveness will be evaluated by the website visits, market shares and turnover ratio. The market shares are generally measured by the ratio of agricultural sales in total market sales, and the turnover ratio refers to the ratio of effective transactions achieved through the website.

(5) Post-effect index. Post-effect is generally evaluated a period after the stable website operation and by the indexes of customers loyalty, social influence and mean residence time. The customer loyalty refers to the ratio of purchased agro-products from website in the total amount of purchased products; social influence is measured by the third-party, considering its promotive impact on the whole social economy and related industry.

**Table 1 Performance evaluation index system of Henan agro-products E-marketing**

	First-class index	Second-class index
Performance evaluation index system of Henan agro-products E-marketing	Building and maintenance of the website	Comprehensive functions, safe transaction and flow monitoring and management
	Website promotion	Number and increasing rate of registered users
	Financial condition of the website	Profit ratio, asset-liability ratio, input-output ratio
	Website competitiveness	Website visits, market shares and turnover ratio
	Post effect	Customer loyalty, social influence and mean residence time

### 3 Fuzzy comprehensive evaluation of Henan agricultural E-marketing performance

**3.1 Evaluation factor set, grade set and weights of each-class index** According to the established performance evaluation index system of Henan agricultural E-marketing, the E-marketing performance in the cities, counties and districts of Henan Province is comprehensively evaluated. The evaluation factor set is  $U = \{u_1$

$u_2 \ u_3 \ u_4 \ u_5\}$ ,  $u_1 - u_5$  refer respectively to the five first-class indexes of website building and maintenance.

$u_1 = \{u_{11} \ u_{12} \ u_{13}\}$ ,  $u_2 = \{u_{21} \ u_{22}\}$ ,  $u_3 = \{u_{31} \ u_{32} \ u_{33}\}$

$u_4 = \{u_{41} \ u_{42} \ u_{43}\}$ ,  $u_5 = \{u_{51} \ u_{52} \ u_{53}\}$

$u_{ij}$  represents the second-class index under each first-class index ( $i = 1, 2, 3, 4, 5; j = 1, 2, 3$ ). The evaluation grade set is  $V$ , and classified into four levels, good, fine, average and substand-

ard, that is to say,  $V = \{\text{good, fine, average, subs tan dard}\}$ . The weight of each weight will be achieved by the Delphi method.

**3.2 First-class fuzzy comprehensive evaluation** The fourteen second-class indexes are evaluated by fuzzy method to establish their fuzzy matrix belonging to five first-class indexes. An expert group is built to give the evaluation results, which is expressed by the membership degree. The total index membership should be 1.

With an example of the financial state of website, the fuzzy matrix is calculated to be  $R_3$ ,

$$R_3 = \begin{pmatrix} r_{11} & r_{12} & r_{13} & r_{14} \\ r_{21} & r_{22} & r_{23} & r_{24} \\ r_{31} & r_{32} & r_{33} & r_{34} \end{pmatrix}, r_{ij} \text{ refers to the percentage of eval-}$$

uation results of the three second-class indexes under the financial states of website, the weight matrix of three second-class indexes is  $A_3 = (a_1 \ a_2 \ a_3)$ , thus the comprehensive evaluation matrix for the website finance is

$$H_3 = A_3 \cdot R_3 = (a_1 \ a_2 \ a_3) \begin{pmatrix} r_{11} & r_{12} & r_{13} & r_{14} \\ r_{21} & r_{22} & r_{23} & r_{24} \\ r_{31} & r_{32} & r_{33} & r_{34} \end{pmatrix}.$$

Finally the comprehensive evaluation matrix of the first-class indexes can be concluded in the similar way:  $H_1, H_2, H_3, H_4, H_5$ .

**3.3 Second-class fuzzy evaluation index** The comprehensive evaluation matrix of the first-class indexes is  $H_1, H_2, H_3, H_4, H_5$ , and that of the second-class indexes is  $H = (H_1, H_2, H_3, H_4, H_5)^T$ .

If the weight matrix of the first-class index is  $A = (A_1 \ A_2 \ A_3 \ A_4 \ A_5)$ , the final comprehensive matrix will be  $E = A \cdot H = (A_1 \ A_2 \ A_3 \ A_4 \ A_5)(H_1, H_2, H_3, H_4, H_5)^T$ . Generally, the matrix cannot be normalized, but should be, and the normalized matrix is  $E'$ . The grade set is given a grade matrix of  $V = (v_1 \ v_2 \ v_3 \ v_4 \ v_5)^T$ , and finally the evaluation score of agricultural E-marketing can be calculated to be  $SCORE = E' \cdot V$ .

The grade can be judged from the comparison of the concluded results with the evaluation grade score, and the inferior indexes can be traced and improved.

## 4 Advancing paths to Henan agricultural E-marketing

**4.1 Enhancing the construction of network marketing platform and services team** The website platform is the precondition and material foundation of website marketing<sup>[2]</sup>, and the marketing services team is the assurance of human resources for E-marketing. Given the practical conditions of Henan Province, the possible advancing paths are: firstly, to improve the infrastructure construction and reduce the marketing costs. As a great agricultural province, Henan Province is obliged and also has the conditions to develop the network products into public products; The farmers, as a main body in agricultural E-marketing, should be equipped with the basic facilities for E-marketing within their own capacities. Secondly, the government should actively guide the flow of private capital, establish and improve the agricultural

products information base and actively exploit information resources, so as to satisfy the demands of different levels<sup>[5]</sup>. Thirdly, a professional E-marketing team should be cultivated and professional trainings should be provided to related personnels.

**4.2 Expanding the agricultural E-marketing channels** The scale of Henan agricultural E-marketing is still small. In order to save the costs, it can be chosen to publicize information on related agricultural websites, such as Henan agricultural information net, Henan on-line agriculture, Yibiduo and so on.

**4.3 Enhancing the reasonable distribution of Henan agricultural E-marketing** The distribution of agricultural products is always the bottleneck restricting the rapid development of agricultural E-marketing, and its efficiency is directly related to the success of agricultural E-marketing. The distribution of agricultural products involve the packaging, storage, loading, circulation, processing and stocking of products<sup>[5]</sup>. Given that the agricultural products are perishable and characterized by regional and seasonal characteristics, and the antinomy phenomenon in logistics<sup>[5]</sup>, the reasonableness of each link should be pursued to reduce the distribution costs. Meanwhile, the third-party logistics such as China post can be introduced to integrate the whole products supply chain in Henan. In addition, the agricultural products E-marketing should be standardized, and a strict standard system involving the planting, growth, packaging, processing and varieties of agricultural products should be constructed, and the standardization should be included into the whole process of production and sales<sup>[6]</sup>.

**4.4 Enhancing the CRM construction** The customers should be placed at the first place in both traditional and network marketing, the minimum costs and maximum profits should be always pursued in the premise of guaranteeing quality. Given that the customers of E-marketing are often potential and emotional, we can choose to monitor the network flow and change the network communication into real business; the potential customers can be exploited through exhibitions, and a customer database and on-line complaint center can be built<sup>[6]</sup>, new customers can be searched by solving the problems in finding agricultural products, payment method and providing after-sales services.

## 4.5 Cultivating the agricultural brands of Henan Province

The statistics showed that there were more than fifty types of products which had gained the GI protection and protection of places of origin. Based on the regional distribution of characteristic agricultural products in Henan, starting from the existing advantageous industries and products, a high-quality, safe and green road can be taken to cultivate the brands of Henan agricultural products. Driven by the market demands and led by the leading enterprises, the agricultural products can finally take a path of standard production.

**4.6 Giving full play to the role of peasants' economic cooperatives and rural brokers** One difficulty of website marketing lies in the correct collection, distribution and processing of network information. The peasants' economic cooperatives and rural

brokers, as the spontaneous mutual organizations, are closer to the origin of agricultural sales and belong to the same part of interest. Thus, their roles should be fully used to change the scattered management into centralized management, and the customized services can be provided<sup>[1]</sup>.

## 5 Conclusion

The performance evaluation index system of agricultural E-marketing should be further improved, and it should be studied in-depth how to take into account the difference of agricultural E-marketing in different places. Moreover, the key of E-marketing lies not in the size of management, but in whether the E-marketing can satisfy the diversified demands of customers. With the rapid development of information technique and the improvement of network transaction, to further study the characteristics of agricultural E-marketing, give full play to the advantages of Henan agricultural products, and improve its competitiveness will greatly improve the role of network marketing in the sales of agricultural products.

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geological investigation and tourism development. According to the concept and target of geo-park construction, the activities of the managers and tourists in the geo-parks should be legally governed, so as to guarantee the rational use of diverse resources including the minerals.

## 4 Conclusion

Tourism is a highly connective and comprehensive industry. To meet the challenge of "infinite tourism" theory and the continuous exploiting of tourism products, Henan tourism industry should adopt a positive attitude to welcome the rise of Geoparks. The development of Henan tourism industry can be comprehensively promoted by reorganizing the tourism resources in Henan Province from the perspectives of the origin of central plains culture, the transitional ecological community between north subtropical and warm temperate zone, the central orogenic belt geological heritage and step zones of China's landforms<sup>[9]</sup>, relying on the key tourism destinations, tourism gathering areas and tourist resort areas, promoting the integration of funds and resources, building the leading tourism and strengthening its leading role, and driving the regional cooperation<sup>[10]</sup>.

With high aesthetics ornamental value, complex scientific connotation and profound central plains culture, Henan geo-tourism resources lay a solid foundation for a new tourism cultural system. In a word, the Geopark tourism cultural products have met people's psychological requirements at the new era. The competent authorities of Geoparks should operate the Geopark as a cultural industry and try best to blend Geopark project into regional tourism development plan during the protection of geolog-

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ical heritage, the integration of regional resources, the establishment of policies and regulations, so as to let the science be the theme of Henan tourism products<sup>[9]</sup> and finally achieve a win-win situation among geological heritage, natural cultural heritage, ecological protection and development of tourism economy.

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