

# Study on the Assessment Indicator System for the Innovative Capability of Rural E-business Enterprise

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**Abstract**—This assessment indicator system for innovation capacity of rural e-business enterprise is hereby proposed through the review on the theory of enterprise innovation capacity and the current research status of assessment indicator system and aiming at the problems existing in the development of rural e-business enterprise. The study results may help the rural e-business enterprises timely find and solve the problems, improve enterprise innovation capacity and better serve the agriculture, rural areas, and rural residents and gain economic benefits.

**Keywords**—rural e-business enterprise; innovation capacity; assessment indicator system

## I. INTRODUCTION

There is a large population in rural China which not only possesses huge consumption market, but also contains abundant resources and special local products. This lays a solid foundation for the development rural e-business. The development of internet, big data and other technologies promotes the growth of rural e-business enterprises like mushrooms after rain. At the same time, a series of measures have been issued from the state to local governments which can encourage and support the development of rural e-business enterprises on the aspects of policy and fund and greatly promote the level of informatization and internet thinking and consciousness of agricultural products enterprises and rural township enterprises so as to promote the economic development of China.

The main businesses of rural electronic enterprises include the fields of connection with rural resources and expansion of rural information and service through construction of internet platform. The rural electronic enterprises are the information service stations for three rural issues spread over counties, towns and villages. As the platform enterprises directly settled in rural areas and serving the three rural issues, the rural electronic enterprises can promote the implementation of three rural issue services and benefit the farmers.

However, during the development process of rural electronic enterprises, there still exist many problems, especially the problem of blind development of rural electronic enterprises caused by the policy impacts in recent years. It is good for the agricultural product enterprises and rural

township enterprises to integrate with the internet. However, there are significant differences between the operation modes of e-business and traditional production and sales. If the enterprises blindly follow trends because they are not familiar with the characteristics and operation modes, it may cause the situations of poor management and failure in operation. The e-business itself is an innovative enterprise operation mode and the rural e-business must promote the innovation capacity and solve the problems during enterprise operation with innovative thinking. To promote the innovation capability of rural e-business enterprises, it is urgent to build a scientific and standard system for diagnostic assessment to help rural e-business enterprises find and solve problems, promote the flourishing of rural e-business enterprises and facilitate the economic development of China.

## II. SUMMARY OF STUDY ON ASSESSMENT INDICATOR SYSTEM FOR ENTERPRISE INNOVATION CAPACITY

The concept of “innovation” was proposed by Joseph Schumpeter in 1912 in the book of *The Theory of Economic Development*. King (1990) thought that the innovation subject should focus on the fields which need innovation but has not been innovated. Chen et al. (2011) thought that the innovation is set forth from new ideas and new concepts and can promote the implementation and practice of new opinions and new programs and enable them to bring economic interests through solving various problems which, in general, is a relatively complex process. Vibha et al. (2012) thought that the promotion of enterprise innovation capacity depends on the open innovation, because it can help the enterprise absorb the disperse knowledge and provide new innovative thinking. The enterprise innovation capacity refers to the capacity of integration and use of all the resources for creating new resources or promoting their efficiency, including innovation input, output, production, output, marketing and other aspects. Therefore, the capacity of enterprises to use all of their resources to convert certain new concept or new thinking of technology into some kind of new product or new service will be considered as the enterprise innovation capacity. There exists close positive correlativity between innovative openness degree and enterprise innovation capacity. Robert et al. (2015) thought that the successful innovation of enterprises not only depends on the openness of innovation modes, but also can effectively absorb external knowledge. Therefore, it can be

seen that the knowledge flow is what the enterprise innovation relies on (Operti et al. 2014). The more sufficient knowledge flow will better motivate the independent innovation potential of enterprise. Joern et al. (2013) thought that the innovation capacity can reflect the effects motivated by knowledge. The strong the knowledge motivation is, the faster the enterprise innovation and conversion will be.

On the aspect of assessment indicator system for enterprise innovation capacity, the scholars have done a lot of researches and built multiple assessment indicator systems (Xu et al. 2015). In the previous studies, the scholars thought that the enterprise innovation capacity depends on the innovative decision-making capacity, R&D capacity, production capacity, marketing capacity and organization capacity. But the indicator system is relatively simple. Later, the scholars enriched the indicator system and built the assessment system with seven grade-1 indicators and 40 grade-2 indicators, where the grade-1 indicators include R&D capacity, production capacity, organization and management capacity, input capacity, marketing capacity and output capacity. After the methods have been improved, the scholars developed the indicator system into grade 3 with 4 grade-1 indicators on the basis of above researches with 4 grade-1 indicators including potential technological innovation resource, technical innovation input, technological innovation organization and technological innovation output; 9 grade-2 indicators and 23 grade-3 indicators. There are also scholars proposing the more advanced assessment system for enterprise innovation capacity and building 7 grade-1 indicators, including innovation input capacity, R&D capacity, innovative production capacity, innovative output capacity, innovative marketing capacity, system innovation capacity and management innovation capacity and 20 grade-2 indicators and 36 grade-3 indicators.

### III. PROBLEMS EXISTING IN THE DEVELOPMENT OF RURAL E-BUSINESS ENTERPRISES

The rapid development of rural e-business of China plays an important role in promotion of agricultural industry transformation and upgrading, promotion of local economic development, solving three rural issues and implementation of targeted poverty alleviation and other aspects. However, the problems of rural e-business enterprises on aspects including lack of logistics and talents, "standardized" production of agricultural products and blind development, etc are relatively outstanding.

#### A. Problem of Logistics

The quantity of Chinese rural netizen is continuously increasing and the scale of rural e-business is also continuously expanding. However, there are still relatively large rural areas possessing slow construction progress of infrastructure of telecommunication and defective network infrastructures; in addition, there are relatively less high-type highways in rural areas and it is hard to form the logistics distribution network; because the Chinese rural e-business development starts relatively late, the problem of logistics and distribution for rural e-business market has always been an important factor bothering the rural consumers. Because the rural e-business consumption frequency is not that concentrated like that in

urban area and cannot achieve certain scale, many logistics enterprises of private brand are not willing to set the distribution network over intensively and therefore the condition of late service is relatively common which causes the buying and selling in rural e-business to be greatly impacted.

#### B. Insufficient Special Talents

To better develop the rural e-business, it not only requires large quantity of talents who can understand agricultural production and are familiar with knowledge and skills related to e-business, but also requires the special talents with certain financial management knowledge. With the rapid development of rural e-business, many schools and training institutions set up majors related to e-business and strive to cultivate different types and levels of talents for e-business. However, in the field of rural e-business, there temporarily are not special schools or training institutions developing targeted discipline learning. Due to the particularity of rural logistics, the students of e-business major still need plenty of practice for applying knowledge actually learned to the practice. While on the aspect of rural e-business, the overall Chinese practical progress is relatively slow and there lacks the talents in rural logistics major. The shortage of talents directly restricts the development of Chinese rural e-business industry. In addition, most of agriculture industry in rural areas possesses relatively low individualization level and low theoretical attainment of rural populations. And they generally possess no knowledge related to financial management and cannot apply scientific methods. And they cannot increase income and reduce expenditure and be very careful in reckoning in development process. Also, they are not capable of reasonably integrating rural resources to promote increase of economic benefits. To give play to the core function of fund management in the financial management, we should comprehensively carry out the funding budget management system, strictly control the fund flow before production and during production process of enterprise products and strictly carry out the requirements on budget. While, to promote such practices, it requires professional financial management personnel to implement and supervise to guarantee the orderly fund flow and enable the limited fund of enterprises to give play to the maximum value. But such professional financial management personnel are exactly the kind of talents in short in rural e-business which limits the development of rural e-business to certain extent.

#### C. Problem of "Standardized" Production of Agricultural Products

The production of agricultural products is impacted by natural conditions and is unpredictable. At the same time, the instability of market demands of agricultural products brings great impacts on the production and supply. In addition, the regional characteristics of agricultural products, unfixed and decentralized producers, relatively low value added of production of agricultural products, short production and marketing cycle, vulnerability to loss, variety of types and subjective factor impacts on persons evaluating product quality and great difficulty in standardized production all obstruct the industrialization and modernization of agricultural product production.

#### *D. Problem of Blind Development*

Under the background of "Internet +", China's rural e-business scale is expanding rapidly, and the rural e-business website platforms are diversified. Some e-business enterprises, such as Alibaba and JD, are gradually improving the supporting services of rural logistics and promoting the development of rural e-business in China. With the rapid development of e-business, people's online shopping and consumption patterns are becoming more mature. And all kinds of enterprises have seen that e-business is the main direction for the future development of enterprises. Agricultural products companies and farmers have also begun to accept online shopping and consumption, and set their sights on e-business. However, the characteristics and operation modes of e-business are very different from those of traditional production and sales. If we continue to use traditional business operation mode, it is very difficult to successfully develop e-business business. However, most agricultural products merchants do not have enough knowledge and understanding of e-business, blindly follow suit with poor management and sales. The blind development of rural e-business enterprises is a big problem.

#### *E. Financing Problem*

Rural e-business enterprises are mostly private small and medium-sized enterprises, in which there are great difficulties in capital. And banks have always had little support for them, and venture capital has higher requirements for related enterprises. Therefore, village enterprises and township enterprises will also face the pressure of increasing more investment in their own.

#### *F. Problem of Featured Product Marketing and Brand Management*

Most of rural electric business products are mainly local specialties or scarce resources. The advantage of highlighting specialties and scarce resources is that it can easily avoid counterfeiting and reduce competition pressure. Therefore, all the local e-business enterprises with agricultural products as main have adopted the characteristics of regional brands, highlighting the products. At the same time, with the strong support of local government propaganda department, every place has established the core brand of local agricultural products. This practice has an outstanding effect, but it is only suitable for some widely accepted and recognized agricultural products. For many rural characteristic products, because of the influence of history, culture, geography, climate, humanities and other factors, they are not necessarily known to most of netizens. Therefore, while expanding the brand influence, we should also consider how to expand the consumer group, so to make more people not knowing know it and then accept. Therefore, on the basis of developing and protecting their own brand, there are still many problems on how to strengthen their marketing ability and popularize their specialties.

#### IV. CONSTRUCTION OF EVALUATION INDEX SYSTEM FOR INNOVATION ABILITY OF RURAL E-BUSINESS ENTERPRISES

This paper compares the existing evaluation index system of enterprise innovation ability and evaluation method. Combined with the analysis of problems existing in the development of rural electric business enterprises, the evaluation index system of innovation ability of rural electric business enterprises is constructed as shown in "Table I".

According to the current mainstream evaluation index system of enterprise innovation ability, in Table I, the evaluation index system of rural electric business enterprises' innovation capability includes three levels. The first-level indicators include innovative input capability, innovative production capacity, innovative management capability and innovative marketing capability. Among them, the innovative production capacity is aimed at the production-oriented rural e-business enterprises, and the pure-service rural e-business enterprises have no production links, so this index can be eliminated. Generally speaking, the internal and external environment of agricultural product enterprises and rural township enterprises is relatively single and small, which is not suitable for more complex evaluation index system. Therefore, the index system that we constructed contains only four aspects, but these four aspects are aimed at the problems existing in the development of rural e-business enterprises, which help to find and solve problems.

Under the index of innovation input capability, there are two second-level indicators: infrastructure input and manpower input. The input index of infrastructure is mainly aimed at the problems existing in the current logistics distribution of rural e-business enterprises. The main crux of rural e-business logistics distribution is the timeliness of distribution, whether "buy" or "sell" is greatly limited. In terms of improving the timeliness of distribution, the key lies in the construction of rural e-business enterprises' warehouses and networks. So that the distribution center and intermediate storehouse can cover a more comprehensive area and improve the timeliness of distribution. Therefore, rural e-business enterprises should invest more in infrastructure investment. And this paper uses the ratio of infrastructure investment to main business income as the third-level index to measure the intensity of infrastructure investment. In view of lack of professionals and financial management talents in rural electric business enterprises, this paper sets up the second-level indicator of human input and three third-level indicators—the proportion of technical personnel to total staff, financial personnel to total staff and the average educational background of employees. Investing more money in highly educated technicians and financial personnel helps to train high-quality staff teams. And then we can make better use of information technology and e-business skills to serve the Three Rural Issues, and make use of the knowledge of accounting and financial management to increase revenue and reduce expenditure for enterprises. All will promote the integration and optimization of rural resources and promote the economic efficiency.

TABLE I. EVALUATION INDEX SYSTEM OF INNOVATION ABILITY OF RURAL E-BUSINESS ENTERPRISES

First-Level Indicator		Second-Level Indicator	Third-Level Indicator	
Enterprise innovation ability	Innovation input capability	Infrastructure investment	The proportion that infrastructure investment accounts for main business income (%) The proportion of technical personnel in the total staff (%) The proportion of financial staff in total staff (%)	
		Human input	Creative platform	Average education background of employees (below junior college = 1, junior college = 2, bachelor = 3, master = 4, doctor= 5, weighted average by employee's academic qualifications and number)
			Standardization level	Number of industry-university-research cooperation platforms
	Innovative production capacity	Innovation efficiency	Whether it passes the relevant quality certification (yes=1, no=0)	Overall labour productivity (ten thousand yuan/person)
			Enterprise system	The proportion that new product sales revenue accounts for main business revenue (%)
	Innovation management ability	Capital operation	Soundness of enterprise system	Capital structure
			Enterprise culture	Financing structure
			Market research ability	Whether the financing channels are diversified
	Innovative marketing capability	Marketing capacity	Perfect degree of incentive system	Number of market researchers
			Brand building	The proportion that marketing cost input accounts for main business income (%)
Brand building			Degree of networked sales Is there a separate brand department? The proportion that investment in brand construction accounts for main business income. (%)	

The innovative production capacity indicators aimed at the productive rural e-business enterprises, consist of three second indicators, namely, innovation platform, standardization level and innovation efficiency, and four third indicators including the number of production-university-research cooperation platforms and so on. It mainly solves the problem of standardized production of rural e-business enterprises. Through the cooperation of production, teaching and research, quality certification and innovation efficiency, it can improve the status of rural e-business enterprise production and improve the standardization of product quality.

Innovative management capability is mainly aimed at solving the problem of blind development and financing difficulties of rural e-business enterprises. The three second indicators of constructed enterprise system, capital operation and enterprise culture are helpful to improve the management system of rural e-business enterprises. We should enhance the credit level of enterprises, broaden the financing channels, improve the capital structure, and establish and improve an incentive mechanism for enterprises.

The innovative marketing capability includes two secondary levels of sales capacity and brand building, which mainly solve the problem of marketing and brand management of featured products of rural e-business enterprises. The sales revenue of an enterprise can increased by increasing investment in marketing expenses and building up a marketing network to improve the reputation of enterprise. At the same time, we should establish brand awareness and build an independent brand management department to improve the added value of marketing product. Above of all, innovative marketing capabilities can help enhance the competitiveness of rural e-business enterprises.

## V. CONCLUSION

Based on the theory of innovation, this paper systematically and thoroughly analyzes the present situation of rural e-business enterprises. Four multi-level evaluation indexes of enterprise's innovation ability are constructed, which consist of innovation input ability, innovation production capacity, innovation management ability and innovation marketing ability. A comprehensive analysis of the application of each index in rural e-business enterprises can make enterprises fully and correctly understand them, timely discovery problems and solve them, enhance innovation ability, serve Three Rural Issues and create economic benefits.

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