

A Study on the Impact Mechanism of Value Network on the Business Model Innovation of New enterprises

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Abstract. Under the background of “Mass Entrepreneurship, Mass Innovation”, the national innovation and entrepreneurship activities have emerged. As the main body of entrepreneurial activities, compared with existing enterprises, new enterprises lack advantages of technology and capital, and they need to break through the market dilemma through business model innovation. The value network that new enterprises are located in and the learning process of constantly participating in social innovation and entrepreneurship activities greatly affect their business model innovation. Therefore, after explaining the relevant concepts and theoretical basis of value network, innovation and entrepreneurship learning and new enterprises business model innovation, this paper proposes a conceptual model of the relationship among the value network, innovation and entrepreneurship learning and new enterprises business model innovation, and puts forward some theoretical hypotheses, which are verified by the statistical analysis of questionnaires, and finally obtains the research conclusions: the breadth and strength of the connection of the value network can significantly enhance new enterprises business model innovation; innovation and entrepreneurship learning plays a partial mediation role in the relationship between value network and business model innovation of new enterprises, that is to say that the breadth and strength of the connection of the value network, in which the new enterprises are located, can help them acquire more knowledge and experience of innovation and entrepreneurship by strengthening the development of innovation and entrepreneurship learning activities, and further promote the business model innovation of the new enterprises.

1. Introduction

Entrepreneurship is a new entry behavior, which means that individuals or organizations create new products or services, or recognize the commercial value of existing products in the new market, and create feasible and profitable enterprises by integrating various resources ^[1]. Compared with entrepreneurship at the individual level, entrepreneurship of new enterprises plays a more significant role in economic development and transformation. In the research on entrepreneurship, many scholars pay special attention to new enterprises. In competition, new enterprises are often at a disadvantage due to lack of talents and resources, backward technology and low market share, and gradually fail in the process of starting up. A large number of surveys show that the failure of many new enterprises is not only due to the lack of resources and management experience compared with traditional enterprises, but also due to the failure of finding consistent and long-term business models, so it's difficult to form their own competition barriers.

The formation of business model of new enterprises is a process of constant adjustment and innovation ^[2], which involves the overall reconstruction of customers, resources, channels, business processes and suppliers. Some scholars believe that the establishment of business model of new enterprises is not only affected by the objective operation of enterprises, but also related to the innovation and entrepreneurship learning of new enterprises. Especially in the context of innovation and entrepreneurship, when faced with changes in the market environment, innovation and

entrepreneurship learning of new enterprises can help them more effectively identify, recognize, screen and process new market information, so as to seize innovation opportunities^[3] and carry out reasonable and effective business model innovation^[4]. Moreover, the value network reflecting the relationship among different enterprises, customers, partners and competitors also affects the business model innovation of new enterprises. The value network of the new enterprises can help the enterprise to pool the strength of network members, integrate resources and capabilities, so as to promote the business model innovation of new enterprises to a large extent^[5-6].

The research on business model innovation of new enterprises is still in its infancy stage, mainly to analyze the construction and adjustment of business model of new enterprises or to make a summary introduction to foreign researches^[7], and the research is not in-depth enough. Therefore, this study illustrates the theory of business model innovation firstly, and then put forward a conceptual model. With the help of statistical analysis of questionnaire, the conclusion is drawn.

2. Theory and hypothesis

2.1. Business model innovation

Many scholars have conducted in-depth discussions on business model based on their own knowledge structure and research fields, and business model has been defined on the agenda of many scholars, entrepreneurs and managers^[8]. Most scholars believe that business model is a system composed of interdependent value activities, which describes the value provided to customers, its internal and external structural network, relational capital and other elements^[9-10]. In recent years, business model innovation has become a research hotspot. A large number of scholars have done a lot of research and obtained some basic views on business model innovation: (1) Business model innovation can be divided into efficiency-oriented business model innovation and novel business model innovation^[11]. (2) The evolution process of business model innovation can be divided into three stages: closed, semi-open and open business model innovation^[12-13].

The innovation of business model has a great impact on the competitive advantage of enterprises. For new enterprises, their technological and capital capabilities are not as good as those of incumbents. Unique business model innovation can provide them with competitive barriers that are difficult to be imitated by competitors. Under the market environment with high degree of openness and information sharing, new enterprises must be able to rely on its own value creation environment to achieve innovative business model innovation.

2.2. Value network and business model innovation

Domestic scholars put forward that the essence of value network is the integration of value chain or value system among multiple industries. In the process of integration, the competitive strategy of enterprises must be transferred from the personal level to the network level, and the competitive advantage of enterprises should be built by sharing resources and information with network members. A large amount of literature shows that in the process of business model innovation, value network plays a facilitating role by means of value creation activities, and this helps enterprises exchange external resources and information with other network stakeholders to promote their business model innovation^[14-15].

In the value network, the larger the number of directly or indirectly related partner enterprises the enterprise has, the bigger the enterprise's connection breadth can be, and the more external

complementary assets the enterprise can obtain, thus helping the enterprise to cross the threshold of innovation activities ^[16]. The bigger the connection breadth is, the more diversified the channels of resource, knowledge and information exchange in the value network will be. Such extensive connection can bring the broader and comprehensive external strategic resources to the new enterprises ^[17] and promote its business model innovation. Therefore, the following hypothesis is proposed:

H1a: The connection breadth of value network has a positive impact on business model innovation of new enterprises.

The connection strength characteristics of value network will also affect business model innovation of new enterprises. In the process of value creation, enterprises naturally form a certain connection relationship with various stakeholders in value network through the network. In the value network, stakeholders mainly rely on the connection relationship as a channel to realize the flow of resources and knowledge. It can be said that the degree of connection directly affects the exchange rate and scope of materials and information in value network ^[18], so as to further act on the practical activities of business model innovation of new enterprises. Strong connection makes it easier for new enterprises to obtain low-cost, detailed and reliable network information when communicating with partner enterprises ^[19]. Therefore, the following hypothesis is proposed in this study:

H1b: The connection strength of value network has a positive impact on business model innovation of new enterprises.

2.3. Innovation and entrepreneurship learning and business model innovation

As the main channel for new enterprises to learn from governments, universities, investment enterprises and other subjects, innovation and entrepreneurship activities are particularly important for new enterprises ^[20-21]. In essence, the participation of new enterprises in innovation and entrepreneurship activities can be seen as a kind of learning activity ^[22]. The desire of new enterprises pursuing innovation drives these learning activities, expect to achieve the ultimate success of entrepreneurship through these learning activities ^[23]. This research think new enterprises' innovation and entrepreneurship learning is the process of obtaining knowledge, information, technology and resources from different external bodies (such as government, universities, scientific research institutions, investment enterprises, etc.) by actively participating in innovation and entrepreneurship activities, and it's based on the external drive of innovation environment and the internal appeal of entrepreneurship orientation ^[24-25].

It is one of the main ways for new enterprises to obtain external information to participate in innovation and entrepreneurship activities, and the information exposed to new enterprises is more forward-looking and innovative, which can, to a certain extent, trigger the thinking and adjustment of new enterprises for their own businesses, and even directly provide new business perspectives for enterprises to identify and seize entrepreneurial opportunities; In addition, new enterprises can also promote technological innovation and model innovation by exchanging technologies and complementing resources with different external enterprises through innovation and entrepreneurship learning, so as to gradually build the core competence and achieve the success of entrepreneurship. Therefore, the following hypothesis is proposed in this study:

H2: Innovation and entrepreneurship learning has a positive impact on business model innovation of new enterprises.

2.4. Value network and innovation and entrepreneurship learning

In the value network, the larger the number of directly or indirectly related partner enterprises the enterprise has, the bigger the enterprise's connection breadth can be, and enterprises can acquire more external heterogeneous knowledge. The wider connection provides more knowledge input and benchmarking for new enterprises to participate in innovation and entrepreneurship learning, so as to clarify the learning direction and expand the scope of learning. Moreover, the magnitude of connection strength directly affects the exchange rate and range of material and information in value network, so as to help new entrepreneurs participate in practical activities of innovation and entrepreneurship better, and improve the frequency and efficiency of innovation and entrepreneurship learning of new enterprises ^[26]. Therefore, the following hypothesis is proposed in this study:

H3a: The connection breadth of value network has a positive impact on innovation and entrepreneurship learning of new enterprises.

H3b: The connection strength of value network has a positive impact on innovation and entrepreneurship learning of new enterprises.

2.5. Mediating role of innovation and entrepreneurship learning

The wider the connection is, the more knowledge new enterprises can acquire by conducting innovation and entrepreneurship learning in value network, and the wider the scope of innovation and entrepreneurship learning will be. Then, by carrying out innovation and entrepreneurship learning, newly enterprises constantly get more knowledge and information from the outside world, so as to promote business model innovation of newly established enterprises. Furthermore, Large connection strength makes innovation and entrepreneurship learning faster and costs lower, so as to help enterprises constantly seek the possibility of technological innovation or model innovation, and finally influence the innovation of business model of new enterprises ^[27]. Therefore, the following hypothesis is proposed in this study:

H4a: Innovation and entrepreneurship learning plays a mediation role between the connection breadth of value network and business model innovation of new enterprises.

H4b: Innovation and entrepreneurship learning plays a mediation role between the connection strength of value network and business model innovation of new enterprises.

In conclusion, the research and hypothesis model of this study are shown in figure 1:

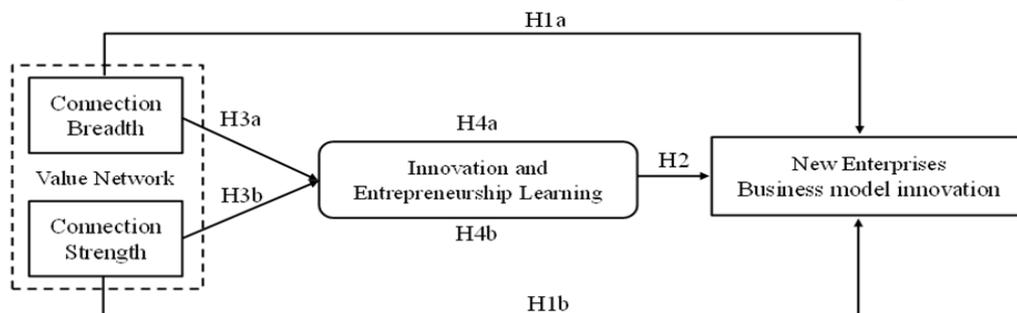


Figure 1 Theoretical model.

3. Methodology

3.1. Sample and data

There are different criteria for distinguishing new enterprises. Many scholars believe that enterprises with an establishment period of less than 8 years are new enterprises ^[28]. This study selects enterprises with less than 8 years of establishment as new enterprises, and collect relevant data of new enterprises through questionnaire. Since the research time of this study is from November to December, 2018, the sample is defined as new enterprises established after January 1, 2010.

This study designed a questionnaire, which was divided into four parts: (1) The basic information of enterprises, including age, sales revenue and industry. (2) Using a 5 point Likert scale extracted by Zott (2007) ^[10] measures business model innovation. (3) Using the “value network scale” developed by MeEvily (1999) ^[29] and Laursen (2006) ^[30] measures value network. (4) Combined with the relevant scales of innovation-driven strategy, entrepreneurship orientation and organizational learning ^[31-32], the measurement scale of innovation and entrepreneurship learning was developed under the guidance of professors and experts.

3.2. Reliability and validity

In this study, the Cronbach coefficient alpha values are all above 0.700, so the questionnaire passes the reliability test. The KMO values of the variables exceed 0.788 and the significant probability of Bartlett ball type test were all significantly higher than that of the other variables. Bartlett’s spherical Sig values less than 0.01. In addition, the cumulative variance contribution rate of each variable is more than 70%, indicating the construct and validity of scales well. This study uses the enterprise age, sales revenue and industry categories as the control variables.

4. Data analysis and results

4.1. Descriptive statistical analysis

Table 1 Basic features of the sample.

Characteristics		Number of samples	Percentage
Enterprise Age	Less than 1 year	15	10.42%
	1 - 3 years	34	23.61%
	3 - 8 years	95	65.97%
Sales Revenue	Less than 0.1 million	1	0.69%
	0.1 - 1 million	12	8.33%
	1 - 5 million	26	18.06%
	More than 5 million	105	72.92%
Industry Category	Manufacturing	36	25.00%
	Services	66	45.83%
	Others	42	29.17%

This study mainly distributed questionnaires to business executives of EDP and MBA schools and their related employees. A total of 230 questionnaires were collected, and 198 questionnaires were recovered. 144 valid questionnaires were obtained after eliminating invalid and repeated

questionnaires, with an effective recovery rate of 72.7%. Through the preliminary statistics analysis of the questionnaire, the basic information of the sample including age, sales revenue and industry categories of new enterprises can be known. The basic features of the sample are shown in Table 1.

4.2. Correlation analysis

To study the relationship among the three variables of value network, innovation and entrepreneurship learning and business model innovation of new enterprises, the correlation analysis was carried out for each variable, and the results are shown in Table 2. From the data in the Table, it can be seen that business model innovation is positively correlated with value network and innovation and entrepreneurship learning, and the connection breadth and strength of value network and innovation and entrepreneurship learning are positively correlated as a whole.

Table 2 The correlation matrix between variables (N=144).

	1	2	3	4
1. Business model innovation	1			
2 connection span	0.568**	1		
3. Connection strength	0.456**	0.551**	1	
4. Innovation and entrepreneurship learning	0.464**	0.256**	0.261**	1

Note: N = 144; *p < 0.1; **p < 0.05; ***p < 0.01

4.3. Regression analysis

Regression is used in this study, and the analysis results are shown in Table 3. In the Model 1, it can be seen that the standard regression coefficients are 0.506 and 0.278 respectively, and SIG < 0.05, indicating that the connection breadth and strength of value network are significantly correlated with business model innovation. H1a and H1b have been confirmed. Then, it can be found from Model 2 that the standard regression coefficients are 0.366, and SIG < 0.01, indicating that innovation and entrepreneurship learning is significantly correlated with business model innovation, and H2 has been confirmed. From Model 3, it can be found that the standard regression coefficients are 0.228 and 0.294 respectively, and SIG < 0.1, explaining the connection breadth and strength of value network are significantly associated with innovation and entrepreneurship learning, so H3a and H3b are confirmed.

According to the mediating effect test procedure, Model 1 and Model 3 verify equation (1) and equation (2) respectively:

$$Y = c_1X_1 + c_2X_2 + e_1 \quad (1)$$

$$M = a_1X_1 + a_2X_2 + e_2 \quad (2)$$

Where Y stands for business model innovation, X_1 is the connection breadth, X_2 is the connection strength, M stands for innovation and entrepreneurship learning. According to the next step of the test procedure, equation (3) should be verified:

$$Y = c'_1X_1 + c'_2X_2 + bM + e_3 \quad (3)$$

After add the mediating variable innovation and entrepreneurship learning, Model 4 is obtained. It can be seen that the impact of the connection breadth and strength on business model innovation has reduced ($b=0.254$, $c'_1=0.448 < c_1$, and $c'_2=0.203 < c_2$), indicating that innovation and entrepreneurship learning plays a partly mediating role in the relationship between the connection breadth and strength of value network and business model innovation. Hypothesis H4a and H4b are partially verified.

Table 3 Results from Regression analysis.

Variable	Model 1	Model 2	Model 3	Model 4
	Business model innovation	Business model innovation	Innovation and entrepreneurship learning	Business model innovation
Control variables	--	--	--	--
Connection breadth	0.506***		0.228*	0.448***
Connection strength	0.278**		0.294*	0.203*
Innovation and entrepreneurship learning		0.366***		0.254***
R ²	0.593	0.464	0.293	0.668
F	38.232***	39.002***	10.339***	37.629***

Note: N = 144; *p < 0.1; **p < 0.05; ***p < 0.01

5. Conclusion

This study empirically tested the impact of value network on business model innovation of new enterprises and the mediating role of innovation and entrepreneurship learning. The results show that:

(1) This study found a deep reason why some new enterprises can achieve business model innovation while others cannot, that is the heterogeneity of value network on which value creation depends. The study breaks through the previous limitation of only studying the influence of social network on business model innovation of new enterprises, and discusses the relationship between value network and business model innovation of new enterprises from the enterprise level. Then, based on the differences between new enterprises and incumbents in entrepreneurial orientation, it is found that the innovation and entrepreneurship learning of new enterprises is conducive to absorbing and digesting new knowledge and technical resources, so as to promote their business model innovation.

(2) This study verified that innovation and entrepreneurship learning plays a mediation role between the connection breadth and strength of value network and business model innovation of new enterprises, suggesting that value network is not just to promote business model innovation by influencing entrepreneurship learning of new enterprises. Innovation and entrepreneurship learning is just a means of learning, and other organizational communication and learning can also help new enterprises make better use of the knowledge, information, technology and resources endowed by the value network, an economic relationship network. Although the role of innovation and entrepreneurship learning is limited, the focus on innovation and entrepreneurship learning can make new enterprises more likely to avoid falling into the trap of failure. At the same time, it can also provide relevant theoretical basis for the government to actively promote the construction of innovation and entrepreneurship platforms such as incubators or creative space, as well as the rational formulation of innovation and entrepreneurship service system and relevant policies.

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