

A Case Study of How Embedding in Global Industrial Chain Effects on Chinese Enterprises' Radical Innovation

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Abstract. Radical innovation is an important opportunity for the technology backwardness enterprises to catch up with and surpass the leader. Through the exploratory case study, the study discovers the mechanism of how the Chinese wind power manufacturing enterprises realize the radical innovation by embedding in global industrial chain. The study finds that: 1) With the constant improvement of the embedding in global industrial chain level, the ability of integrating global industrial chain resources will be increased gradually; 2) The integration of global industrial chain resources includes integrating resource from suppliers technology and the market worldwide; 3) The ability of integrating global industrial chain resources has a positive effect on radical innovation performance.

Introduction

A large number of cases show that the radical innovation is the important opportunity for the enterprises to obtain Striding-across Way (Christensen, 1997)^[1], and it's also very important for the enterprises to maintain technological superiority leading position and improve the market competitiveness. It has been widely accepted by the scholars that the Radical innovation has greater dependence on the industrial chain (Johnsen, 2000; Tether, 2002; Petersen, Handfield & Ragatz, 2005; Song, 2008; Adner, 2006)^[2-6]. Despite the uncertainties, the researchers have generally agreed that the enterprises' innovation activities with upstream suppliers and downstream users can reduce risk and cost to a certain extent, and it also can get support from external technical, financial, and market (Chesbrough, 2003; West & Gallagher, 2006)^[7-8]. Look from the research trend, the innovation of the ecological environment and the whole industry chain of the study of innovation has become the important content of research in this field.

From the point of the existing literature, what's influence mechanism about embedded in the global industrial chain to radical innovation is not clearly. Some scholars have studied the network embeddedness impact on the performance of the enterprise's innovation, and found that the different embedding strength of the enterprise has different impact on their innovation (Uzzi, 1996; Bengtsson & Solvell, 2004; Wu & Wei, 2005)^[9-11]. Although some scholars have tried to explain this problem from the view of learning ability of the enterprise and industry differences (Rowley, 2000)^[12], but it's not enough to interpret the intrinsic mechanism and to explain the radical innovation from developing countries' enterprises which are in technical disadvantage.

In theory, the existing literature on the global industrial chain embedded research on the influence of Chinese enterprises radical innovation mechanism is not yet mature, so we need to explore the research blank. In reality, China's emerging enterprises have begun to integrate global resources to build core competitive advantages by radical innovation strategy rely on their own advantages. Therefore, through the case study, this article attempts to analyze how China's enterprises embed the global industrial chain to promote their resource integration ability, and then affect their radical innovation. Figure 1 is the default theory of case study.

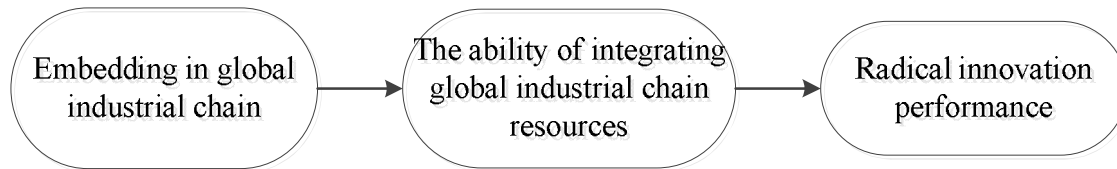


Fig.1 The default theory of case study

Case study method

Choose the right method of case study

Case study is a kind of important research method which is widely used in sociology, economics, political science, psychology, management and other fields. According to different research purposes, case study is generally divided into exploratory case study, descriptive case studies, explanatory case studies and valuation case studies (Eisenhardt, 1989)^[13]. Table 3-1 lists the main research purpose and research focus of different kinds of case studies.

Table 1 the main research purpose and research focus of different kinds of case studies

The type of case study	Research purpose	Research emphasis
Descriptive case study	to make an accurate description of the whole incident	to make a detailed description of events
Explanatory case study	to summarized the special phenomenon, to explore the regularity of change, and explain causal relationship	to give theoretical explanation to the event
Evaluative case study	to express their views and opinions	put forward some views on the evaluation
Exploratory case study	Try to use a new Angle, new ideas, new model to explain some phenomenon	put forward the theoretical assumptions

*Resource: K.M. Eisenhardt: Building theories from case study research, Academy of management review, Vol. 14(1989), p. 532-550

The purpose of this research is to explore how the enterprises integrate various resources through actively embedded in the global industrial chain to enhance the organization's radical innovation performance. In the field of radical innovation research, from the perspective of embedded in global industrial chain is that which from a new Angle to evaluate a phenomenon, so the exploratory case study is suitable for the research.

The research steps

It is generally believed that there should be eight steps for the exploratory case study (Eisenhardt 1989)^[13]. This study follows the eight steps which show in Table 2.

Table 2 The steps of case study

Step		Activity	Reason
Preparation stage	Start the case study	Definition of research question; Possibly a priori constructs; Neither theory nor hypotheses	Focuses efforts; Provides better grounding of construct measures; Retains theoretical flexibility
	Choose to study principle	Specified population; Theoretical, not random, sampling	Constrains extraneous variation and sharpens external validity; Focuses efforts on theoretically useful cases i.e., those that replicate or extend theory by filling conceptual categories
	Crafting Instrument and Protocols	Multiple data collection methods; Qualitative and quantitative data combined Multiple investigators	Strengthens grounding of theory by triangulation of evidence; Synergistic view of evidence; Fosters divergent perspectives and strengthens grounding
Execution phase	Entering the Field	Overlap data collection and analysis, Including field notes; Flexible and opportunistic data collection, methods	Speeds analyses and reveals helpful adjustments to data collection; Allows investigators to take advantage of emergent themes and unique case features
	Analyzing Data	Within-case analysis; Cross-case pattern search using divergent techniques	Gains familiarity with data and preliminary theory generation; Forces investigators to look beyond initial impressions and see evidence through multiple lenses
	Shaping Hypotheses	Iterative tabulation of evidence for each construct; Replication, not sampling, logic across cases; Search evidence for "why" behind relationships	Sharpens construct definition, validity, and measurability; Confirms, extends, and sharpens theory; Builds internal validity
Dialogue phase	Engaging Literature	Comparison with conflicting literature; Compare with similar literature	Builds internal validity, raises theoretical level, and sharpens construct definitions; Sharpens generalizability, improves construct definition, and raises theoretical level
	Reaching Closure	Theoretical saturation when possible	Ends process when marginal improvement becomes small

*Resource: K.M. Eisenhardt: *Building theories from case study research*, Academy of management review, Vol. 14(1989), p. 532-550

Case Selection

Because of the huge difference of characteristics among enterprises, the mode of multiple case study should be more advantages (Yan & Gray, 1994; Yin, 2003)^[14-15]. But it is generally believed to have the following characteristics that can be used in single case study (Eisenhardt, 1989)^[13]: 1) critical cases of the mature theory; 2) the extreme or unique case; 3) exposure type case. This study aims to explore the internal mechanism of Chinese enterprise's radical innovation, build a conceptual framework preliminary, so this study is appropriate for single case model.

On the basis of above analysis, the paper takes several factors into account before choosing the type case: 1) Limiting the case in high-end equipment manufacturing and new energy industry, because the industrial chain of these is longer than other emerging industries', and it also can reduce the extraneous variation to some extent (Yan & Gray, 1994)^[14]; 2) Choosing the representative

enterprise with radical innovation strictly; 3) Selecting case is not random, but taking the availability of data and information and the representative of the enterprise into account.

Research process

Data collection process

The research collects data mainly through interview and public documentation. In the interview, the researchers talked about the radical innovation performance, innovation strategy and the cooperation with upstream and downstream with the prepared interview outline with high-level personnel. On the basis of the consent of the respondents, we recorded the conversation by tape, and made further arrangement within 24 hours after the interview.

The research choose interview respondents follow these standards: 1) Must be over 3 years working experience in the enterprise; 2) Must be familiar with enterprise's R&D and product management; 3) Must be the enterprise's senior supervisor or above; 4) The one who must agree to carry out the research, and accept the follow-up interviews. Three days after the interview, The researchers made a further communication and confirmation about the interview information, and perfected the related information fully. At the same time, the researchers paid attention to the Internet, newspapers, magazines and other channels to collect the enterprise management interviews news, product introduction, the annual reports, enterprise publicity materials such as public information as further supplement of the interview.

Data analysis process

Base on the basis of former presupposes, the researchers discussed and classified the data with related experts. Ultimately, The data was divided into several categories, including enterprise's radical innovation, the process of embedding in global industrial chain and how the enterprise integrated resources from global industrial chain. Then, the researchers summarized the case to further expand and refined the existing theory.

Overview of "Firm A"

Firm A is founded in 1998 with 100 million yuan of the registered capital, and which is the high and new technology enterprises in xinjiang uygur autonomous region. Firm A is also the leading wind power equipment manufacturing enterprises and the overall solution provider of wind power. The company has independent intellectual property rights of direct-drive permanent magnet technology, represents the most growth prospects in the field of global wind power technical route, and it has been honored with the "world's most innovative ability top 50 enterprises" twice by the journal of Technology review of Massachusetts institute of technology. The company is the largest direct-drive permanent magnet fan manufacturing enterprise in the world now. It has united a group of high level of manufacturing, R&D enterprise to formed a team in wind power equipment manufacturing industry which is the important condition for China's wind power equipment to achieve industrialization.

Case analysis

The radical innovation of enterprise

Traditional wind turbines is composed of blades, gear box, generator, inverter, control system, bearing and spindle, base, tire, and so on. All of them, gear box is an important part in wind turbines manufacturing for the most difficulty of R&D, Manufacturing and assembly. Compared with traditional wind turbines, direct-drive permanent magnet wind turbines is a radical innovation. The characteristics of two types of wind turbines are shown in Table 3.

Table3 The difference between direct-drive permanent magnet turbine and the traditional one

	Direct-drive permanent magnet turbine	Traditional gear turbine
Reliability	With the direct-drive technology, it can save the gearbox accessories, simplifies the transmission structure, improve the reliability of the unit. At the same time, the unit runs at low speed, rotating parts is less, and the reliability is higher.	Constantly running 24 hours a day makes the gear box be the most easily to fail in wind turbine.
Maintainability	Can reduce the amount of machine parts of wind power generation group, avoid gear box oil change regularly, reduce the operation maintenance cost.	The structure is complex, and it is difficult to maintain in remote areas.
Efficiency of power generation	Impellers drive permanent magnet generators directly without electro-magnetic, which reduce the power loss; there is no middle part such as gear box, and the transmission chain is short which can reduce the transmission loss with more efficient operation.	Affected by number, quality, speed and other factors of the gear, and also consumes some energy at the same time.
Grid-connection	Adopt ac-dc-ac power flow model, the electricity at turbine side is isolated with the electricity at grid side; Has the ability of low voltage crossing.	Peaks and troughs has impact to the grid to reduce the safety of the power supply

Source: From the interview and corporate's websites

Firm A is the world's largest direct-drive permanent magnet wind turbine at present, and there has more than 10 GW direct-drive permanent magnet generator been completed all over the world. The distribution of the project is in 18 provinces and autonomous regions of China and 17 countries across six continents. It has received 14 projects in United States across 10 states. Up to 2014, Firm A had got more than 300 MW project in America market, and the total capacity had over 500 MW in overseas markets.

Embedding in global industrial chain

Reviewing the development process of Firm A, it carried out the strategy of "promoting internationalization base on localization" to occupy the international market. Firm A has established more than 10 branches and offices abroad which covers North America, South America, Australia, Europe and Africa market. The globalization business layout is becoming mature and perfect increasingly.

In 2003, Firm A started to cooperate with Vensys to introduce direct-drive permanent magnet technology. In 2004, the company began to make direct-drive permanent magnet megawatt fan joint design with Vensys. In 2006, it set up wholly owned subsidiary in Germany. At the same year, it started to cooperate with British GH, Dutch MacI, Germany Vensys and other international academic research institutions and design companies.

In 2008, Firm A completed 70% stake acquisition of Germany Vensys, and built the construction of R&D center in Beijing, xinjiang and Germany which meant that the product internationalization development platform had been established. Firm A combined the China's manufacturing and Germany's design organically, and it also get the concept, style, methodology, etc. of the Germany company. The deal marked Firm A become the China's first enterprise to have completely independent R&D capacity of wind power equipment manufacturers. At the same time, it opened the gate for the company's products to enter the international market space.

Up to 2014, Firm A had set up more than a dozen overseas subsidiaries, covering North America, South America, Australia, Africa, Europe and other key overseas markets. A total of more than 200 units had been or would be installed in the United States, Cuba, Australia, Ethiopia, Pakistan as well as Cyprus and many other overseas markets. The cooperative enterprise from global industrial chain are showed in Table 4.

Table 4 The cooperative enterprise from global industrial of Firm A

Date	Cooperative enterprise	Position	Content	Meanings
February 2007	LM Glasfiber	Upstream	Supply the blade	Gets LM's strong support in product R&D, quality control and risk prevention.
2008	VENSYS	Upstream	Acquisition	Gets direct-drive permanent magnet motor technology
May 2012	Timken Company	Upstream	Components and parts	One of the steps to continue to expand the market share of USA
October 2012	PTC USA	Technical service	Access technology	Enables enterprises to optimize the management and evolution in the life of the product within a single environment
December 2012	The Three Gorges Corporation	Downstream	Joint development	The first project in Pakistan and South Asia market, and is also the first business cooperation with the three gorges group in overseas.
January 2013	Volkswind USA	Downstream	Acquisitions	Expands market share in North America
February 2013	Mainstream	Downstream	Develop wind field	Enters Chile market
September 2013	EGCO	Downstream	Provide the fan	Enters the southeast Asia market
September 2013	China South Locomotive	Upstream	Turbine	CSR gets direct-drive permanent magnet motor technology
September 2013	German Fleur Group	Midstream	Personnel training	Personnel training, technology platform building, the new product project development process and service solutions

Source: From the interview and the corporate's websites

Integrating the resources from global industrial chain for innovation

Integrating global technology resources

In 2005, Firm A introduced the first 1.2 MW permanent magnet unit, and achieved the acquisition of Vensys' 70 % stake in 2008, and then became the first company with R&D ability of China's wind power manufacturers. It established the greater R&D system which broke through the limit of the area through making joint R&D in xinjiang, Beijing and Germany in 2010. The design from Germany's R&D center faced to international market, and that from beijing R&D center provided the product for China's market, and the xinjiang R&D center provide platform for all of the R&D center.

In R&D management, Firm A made German R&D team still has a 30% stake to maintain Vensys independence and whole R&D ability to retain excellent technical personnel though it had the ability to buy all. Firm A had hold the point that the technology must be in the hands of the Chinese, then it has changed the option and argues that the people is more valuable than the capital, it's a good choice for the foreign employees to stay to work hard when they fell fully be respected. Through the acquisition, Firm A has changed the innovation idea, it don't care where the company registration is and whether the technology foreigners master.

Firm A continues to strengthen the talent localization strategy to strive to realize the internationalization of human resources. It even encourages the doctors and masters to join in after they graduated through various channels. The company has only one Chinese in the United States, others are local talents. Up to 2014, Firm A had more than 4000 employees around the world, including the talents from famous companies such as GE, Siemens, Huawei, SKF management talent and so on.

Integrating global market resources

As one of the earliest China's enterprises go abroad, Firm A not only has made remarkable achievements in the United States, Australia in wind power mature market, but also has made efforts to enter South America, Africa and other emerging markets actively, and has got lots of orders in Asia except China. Firm A made a deal with Electricity Generating Public Company Limited to develop the Southeast Asia market, joined Mainstream to develop the first phase of the wind farm project of Ckani in northern Chile. The Shady Oaks project in the United States Illinois, the Adama projects in Africa and the Mortons Lane project in Australia are also in smooth progress.

Firm A absorbed the internationalization management experience in exploiting the overseas markets. It was difficult to enter India market directly because of the high barriers. But Firm A obtained the stability market through selling technology only, and let the people who were familiar with the local market do the market. As the same pattern, the market share was the fourth of Argentina. In the United States market, there was a special job of market analysis to feedback the local market information under the stress of orders and performance. It was conducive to the transmission of information for hiring the local workers. The downstream partners of Firm A in international market in 2010-2013 is in Table5.

Table5 The downstream partners of A companies in the international market in 2010-2013

Year	Nation	Partners	Amount of the turbine	Specifications of the turbine	The total capacity
2010	Brazil	IMPISA wind	16	1.5 MW	24.0 MW
	India	ReGen	66	1.5 MW	99.0 MW
	German	VENSYS	1	2.5 MW	2.5 MW
	German	VENSYS	1	1.5 MW	1.5 MW
	Poland	VENSYS	1	1.5 MW	1.5 MW
2011	Brazil	IMPISA Wind	148	1.5 MW	222.0 MW
	India	ReGen	198	1.5 MW	297.0 MW
	Sri Lanka	ReGen	7	1.5 MW	10.5 MW
	German	VENSYS	9	1.5 MW	13.5 MW
	Cyprus	VENSYS	21	1.5 MW	31.5 MW
	The USA	VENSYS	4	1.5 MW	6.0 MW
	Poland	VENSYS	5	1.5 MW	7.5 MW
	Canada	VENSYS	1	1.5 MW	1.5 MW
2012	Brazil	IMPISA Wind	25	1.5 MW	37.5 MW
	The USA	GE	96	1.5 MW	144.0 MW
	The USA	GE	7	2.5 MW	17.5 MW
	Ecuador	GE	11	1.5 MW	16.5 MW
	Australia	OneWind	13	1.5 MW	19.5 MW
2013	German	VENSYS	13	1.5 MW	19.5 MW
	Poland	VENSYS	6	1.5 MW	9.0 MW
	Egypt	VENSYS	2	1.5 MW	3.0 MW
	German	VENSYS	4	2.5 MW	10.0 MW
	India	ReGen	227	1.5 MW	340.5 MW
	Sri Lanka	ReGen	8	1.5 MW	12.0 MW

Source: Sorting the data from the corporate's websites

Integrating supplier resources at home and abroad

At the beginning of the company, there was very few parts suppliers, it not only had to design the accessories themselves, but also had to develop suppliers. Later, Firm A chose the direct-drive permanent magnet technology route which meant the scope of the supplier was more narrow. For one hand, Firm A needed to take more effort to support suppliers. On the other hand, it had to seek reliable supplier resources from abroad. Because the wind power industry was emerging industry,

the development of the industry chain was not complete in early stage. It was a necessary condition for firm A to develop and integrate the upstream suppliers.

First, fostering the suppliers. When the suppliers were in trouble, Firm A provided technical or financing support to let them be on track as soon as possible. For example, Firm A took the advantage of capital to help the key parts suppliers to improve productivity by increasing proportion of advance payment, building and renting blade factory building, etc. Firm A also established long-term strategic partnership through the opportunity of a large number of purchasing with the suppliers to guarantee the supply of them. Firm A even took more attention to the technology of motor, electric control system of key parts, and participated in parts production on the premise of improving quality and reducing cost.

Second, creating conditions to attract the suppliers to join. At the start-up period, Firm A required very high quality suppliers, but the well-known international companies were reluctant to take risks to build factory in local. In order to attract the world's largest blade manufacturers - LM company, Firm A built the factory for LM in xinjiang for free. The high quality blade from LM played an important role in the development of enterprises.

Third, establishing high quality cooperation through emotional links. With the key technology of wind power and the supplier's support, Firm A has kept a rapid development for many years. By 2014, Firm A had established cooperative relations with 88 well-known suppliers in the world, including ABB, Siemens and Infiniti. (Table 6).

Table 6 The main supplier list of Firm A

The main supplier	Nation	Main business areas
TIMKEN	American	high precision bearing
ABB	Switzerland	High-power inverter, the control system
Siemens	Germany	The machine parts
Infineon Technologies	Germany	Semiconductor chips
CSR	China	The generator
SKF	Sweden	Bearing
Dupont	American	High temperature resistant, oil filled transformer
LM	Denmark	The glass fiber blades
The Switch	Finland	Electrical transmission equipment
INA, FAG and LUK	Germany	Bearing
BONFIGLIOLI	Italy	Reducer

Source: From the interview and corporate's websites

Causal relationship about the variables

In order to reveal the possible causal relationship among embedding in global industrial chain, the resource integration ability and radical innovation, the paper takes the following strategies to analyze the case.

First, identifying the position of Firm A in global industrial chain and the relationship between Firm A and its cooperative enterprises in different development period. Second, analyzing whether the resource integration ability and radical innovation performance has changed dramatically or not before and after the degree internationalization of Firm A has changed significantly. If so, the result can explain the causal relationship that the embedding in global industrial chain affects the ability of resource integration and radical innovation. The enterprise's development stage and representative events are showed in table 7.

Table 7 The analysis of enterprise's development stage and representative events

Phase	Year	Representative event	Embedding in global industrial chain	Resource integration ability	Radical innovation performance
Phase one	Before 2001	Start the transformation from scientific research to market	Lower degree	Lower level	Lower level
Phase two	2001~2006	Set up branches in Germany, and list on the shenzhen stock exchange.	General degree	General level	Lower level
Phase three	2007~2008	Acquisit VENSES , get the direct-drive permanent magnet technology, wind turbines exports for the first time	Higher degree	Higher level	General level
Phase four	after 2009	Expand the leading technology advantage, lead the industry development	Higher degree	Higher level	Higher level

Source: From the interview and corporate's websites

In phase one, transferring from a research institute, Firm A mastered the 600 KW blower manufacturing techniques through its own technology accumulation, whole machine import and technology import. At this stage, the link of Firm A to the global industrial chain was limited to the primary stage such as importing technology and buying the whole turbine for the power plant construction. The domestic market was in the initial stage, and the foreign market was blank, so both of the degree of embedding in global industrial chain and the level of resources integration ability of global supply chain were low. Its technology derives from its own accumulation and

technology import which is in the period of chasing and imitating the mature technology, so the radical innovation performance was low.

In phase two, Firm A set up a subsidiary in Germany which worked on large wind turbine R&D, technical consulting, technical services, import and export agent about all the law allows. At this stage, Firm A continued to strengthen the international strategy, set up subsidiary abroad to deepen international cooperation and get in touch with more advanced technology, so the degree of embedding in global industrial chain and the resources integration ability of global supply chain were improved. Because Firm A had not grasped direct-drive permanent magnet technology truly at this stage, its radical innovation performance level was still in low.

In phase three, Firm A acquired VENSYS, and obtained direct-drive permanent magnet technology, and then completed the construction of R&D center of Beijing, xinjiang, Germany, Hong Kong. It had become the first domestic wind power machine manufacturers with completely independent R&D capacity and intellectual property rights, and it had developed the international market with the downstream partners successly at the same time. At this stage, Firm A continued to deepen the international strategy, strengthened the connection with the enterprises in global industrial chain, and it also could expand its influence through integrating the technology, market and suppliers resources of global industrial chain. Because Firm A mastered the new generation technology of wind power turbine, the radical innovation performance was also increased.

In stage four, Firm A continues to improve and strengthen its technology advantage. On one hand, Firm A continues to develop direct-drive permanent magnet motor. On the other hand, it makes effort to expand its market share, deepen the cooperation with the industrial chain upstream and downstream enterprises, strengthen the resources integration ability and the industry leading position. Before 2007, the number of the companies which apply direct-drive technology was only two include Firm A. But with the gradually mature of direct-drive permanent magnet technology, wind energy giants such as Siemens, GE and other companies have also dabble in the field of permanent magnet direct-drive, and the technology advantage has began to appeared especially on the offshore wind. With the technology advantage of its frist into, Firm A has become the leader in wind power industry. Therefore, the embedding in global industrial chain, resources integration ability of industrial chain and the radical innovation has reached the high leavel.

The case shows that, from the process of introducing foreign technology to produce the first wind turbine to grow up to be the leader of the industry, the sucess of Firm A depends on its integration into the global industrial chain based on its own advantages and the integration of the global industrial chain resources.

It is propitious to promote the radical innovation for enterprise to gain complementary, diversity and heterogeneity knowledge from outside the area (Freeman, 1998)^[16]. Firm A strengthened its technical strength through mergers and acquisitions, technology transfer, cooperative development on global scale, and also laies the foundation for its radical innovation.

The success of radical innovation need to across the stage of leading users to mass users (Von Hippel, 2009)^[17]. because there is not enough maktet conditions to support the new product in China, Firm A opens up the international market with the downstream parteners, finds the lead users of the raidcal innovation product. As Firm A improveing product performance constantly, it expands the share of market of the new product gradually and carry through the "innovation cliff" successfully, and the it leads the technology development of wind power industry.

Radical innovation needs more support from the industry chain than that of incremental innovation (Adner, 2006)^[6]. Firm A builds a perfect ecological supply chain through choosing suppliers worldwide, fosters and grows up with the supplier to establish cooperation relationship with high quality, all of these are helped to promote the radical innovation performance. Base on the case analysis, this paper proposes the following proposition.

Proposition1: Embedding in global industrial chain has a positive effect on the ability of integrating global industrial chain resources.

Proposition2: The integration of global industrial chain resources includes integrating resource from suppliers technology and the market worldwide;

Proposition3: The ability of integrating global industrial chain resources has a positive effect on radical innovation performance.

Conclusions

Although some studies have showed that radical innovation need more support of the whole industry chain from upstream to downstream, but they don't make clearly the challenges from the industry chain when the technical backwardness enterprises making radical innovation will face. At the same time, the impact of network embeddedness on innovation is also controversy. Based on the theory of presupposition in this paper, through a case of china's wind power enterprise, we find it is likely that the embedding in global industry chain affect the radical innovation through the resources integration ability of global industrial chain. The conceptual model of this study shows in Figure 2.

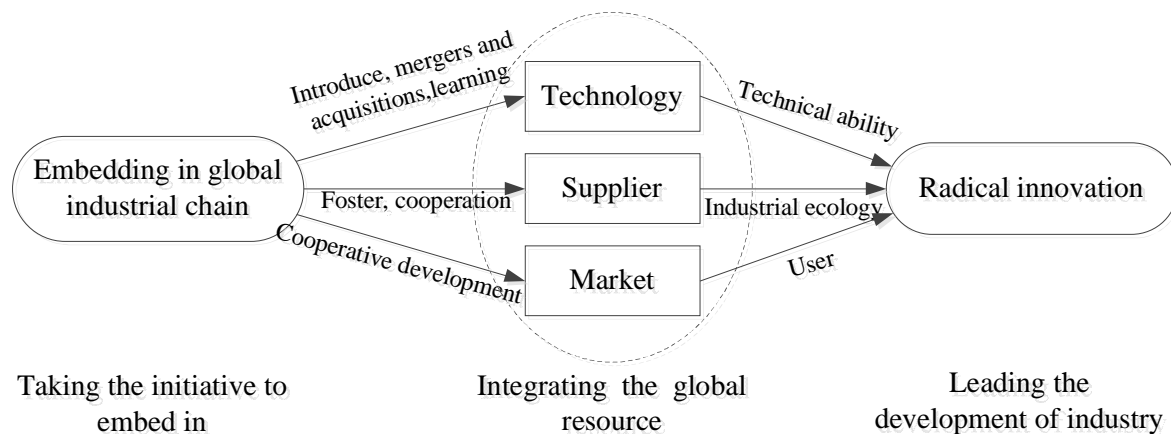


Fig.2 The conceptual model of the study

Firm A can contact and cooperat with the company which holds the forefront technology through embedding in global industrial chain actively, obtains permanent magnet direct-drive technology by means of mergers and acquisitions ultimately, boosts its technical ability and laies the foundation for radical innovation. Radical innovation is the subversion to original technical route, so it can't be successful without the support of new spare and accessory parts. Firm A cultivates its supply chain through direct investment, technology support, strategic cooperation and other modes to build the new industrial ecology which paves the way for its radical innovation. Finally, Firm A exploits the new market through the cooperation with many downstream enterprises to gain the good radical innovation performance.

Of course, due to the special nature of the case study, the conclusion has great limitations to some extent and affects the external validity of the conclusion. It only can preliminary determine the relationship among the variables with the case study, further confirmation on the conceptual model not only need to expound theoretically, but also need to get a more convincing support throug the empirical study of large sample size.

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