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Research of the Impact of Firm's Network on the Growth of B2B2C E-commerce Firm

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Abstract: This paper does a brief introduction on B2B2C e-commerce, network structure, network relationship and the growth of e-commerce firm. Then it sets a theoretical framework and uses case study to explore the impact of firm's network on the growth of B2B2C e-commerce firms involving retail, travel and shoes industries. The result of case studies indicates that firm's network structure and firm's growth, firm's network relationship and firm's growth, firm's network capabilities and firm's growth all have clear positive correlations. Then this paper puts forward relevant hypotheses and does pretest to ensure the effectiveness of questionnaire. Finally, it discusses the limitations and points out future research direction.

Keywords: Firm's Network, B2B2C, E-commerce, Network Capability, Growth.

1. INTRODUCTION

B2B2C e-commerce comes from the combination of B2B (Business to Business) and B2C (Business to Consumer). Any commodity or service supplier can be the first B. The second B is an intermediary of the suppliers and consumers, and it provides them value through operation management. In this paper, we will focus on the second B's network and its growth.

Firm's network is kind of dynamic and complex network of relationships based on information technology. As a form of inter-organization system, the networks of relationships in which firms are embedded profoundly influence their conduct and performance^[1].

The majority of scholars affirmed the effect of firm's network on firm's growth, but the research approach of network is rarely used in e-commerce fields. Do network structure and network relationship affect e-commerce firm's growth? Do network capabilities have a direct or indirect impact on the growth of e-commerce firm? Should we consider other factors, such as industry, firm's age, firm's size and environmental dynamism in the study? These require us to do some exploratory case studies. And we will use the firm instead of B2B2C e-commerce firm in the latter discussion.

2. THEORETICAL FRAMEWORK OF PROPOSITION

2.1 Network structure and network relationships

Network structure refers to the overall pattern of relationships within which the industry is embedded. It can be measured by various indicators, such as network locations, structural holes, network heterogeneity and network size^[2]. The concept of network centrality reflects the importance of a firm in a network^[3]. Some

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scholars found that resource heterogeneity, such as knowledge heterogeneity, network heterogeneity influences managerial performance and innovativeness^[4]. So this paper selects network centrality and network heterogeneity as measures of firm's network structure. Since Zaheer et.al posit that firms with superior network structures may be better able to exploit their internal capabilities and thus enhance their performance^[5], we propose that firm's network structure have direct relation with firm's growth.

Network relationships discuss conditions among network participants, such as mutual exchanges, cooperation duration and the degree of trust. Past research has consistently shown that companies which have close relationships with customers, suppliers, research institutions and competitors are more likely to have higher product and process innovation success. Following the literature, we use tie intensity and tie duration to express network relationship^[6].

2.2 Network capability

Network capability, which can be called 'network competence', is measured by assessing a company's degree of network management qualifications and execution of network management tasks^[7]. Network competence is a company-specific ability to handle, use, and exploit inter-organizational relationships, it may lead to innovation success^[8]. Ren designs the measure scale of firm's network competence from four levels: network visioning capability, network developing capability, relationship management capability and portfolio management capability^[9]. Because network development and relationship management have important practical significance, firm's network capability refers to network developing capability and relationship management capability in this study. The first may affect firm's network centrality and heterogeneity, the second means the ability that may help to maintain the tie intensity and duration of network partners. So we propose that network capability may have direct and indirect impact on the firm's growth.

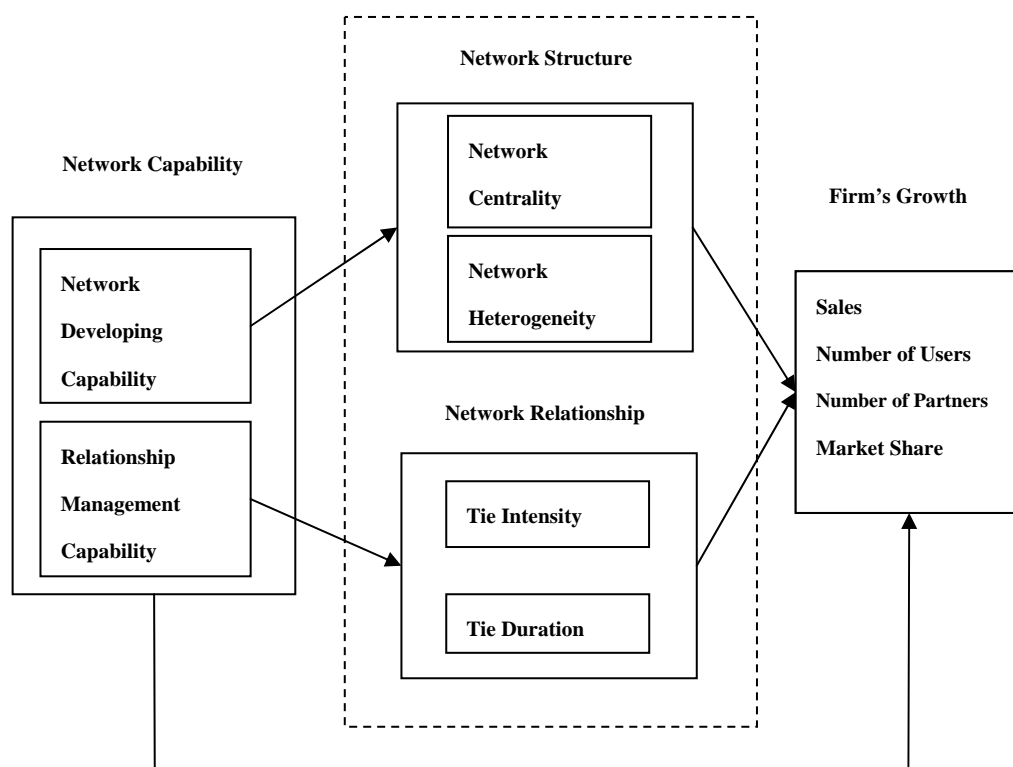


Figure 1. Theoretical framework of propositions

2.3 Growth of e-commerce firm

Growth theory provides a theoretical vantage point to observe and interpret e-commerce development in the global economy^[10]. And firm's network plays important role in the firm's growth procedure. A variety of different variables, increasing sales, market shares, assets and the number of employees are used to evaluate a firm's growth^[11]. This paper studies the growth of B2B2C e-commerce firm, mainly measured by sales, number of users, number of partners and market share. According to above discussion, we proposed a theoretical framework of network capability, network structure, network relationship and growth of B2B2C e-commerce firm (Figure 1).

3. CASE STUDIES

Since the relationships in Figure 1 are lack of empirical research in current e-commerce environment, it is demanded to do exploratory case studies. We took in-depth interviews of five B2B2C e-commerce firms from 2013 to 2014. Cases are evaluated based on the following three criteria:

- (1) The firms should be scattered in multiple industries, such as retail, tourism, shoes and so on.
- (2) The firms should have certain differences in firm's network structure, network relationship, network capabilities, or the firm's growth.
- (3) The firms should have been founded for more than three years, and is well known in the industry. The related materials of case studies include the internal data of the firms, interview records of executives and information from internet.

Firm A (<http://www.anport-e.com>) is the only authorized service platform for Xiamen's government procurement. It has the resources of government procurement, so it has advantage on price and quality. But its business is limited in Fujian Province, especially in Xiamen. And it primarily sells 3C products, office equipment and home furnishing products.

Firm B (<http://www.cncn.com>) is a platform providing integrated e-commerce service for tourism industry. It runs two platforms, one is the largest B2C reservation platform of tourism products in China ([cncn.com](http://www.cncn.com)); the other is B2B platform ([cncn.net](http://www.cncn.net)), which is the No. 1 real name tourism community in China.

Firm C (<http://www.paixie.com>) is the earliest B2C platform dealing with authentic footwear sales in China. Its headquarters is adjacent to China's shoes city Jinjiang. With advantages of region and supply chain, firm C has become one of the most influential sales platforms and more than 20,000 styles are sold on online.

Firm D (<http://www.s.cn>) takes the model of online outlets. It buys out the brands' stocks, and carries the shoes to its own warehouse. Then it sells the shoes at low prices, and meets the consumers' demand for premium goods. More than 60 percent of its sales come from other platforms while not from its own website.

Firm E (<http://www.roomy.cn>) is a leading brand shoes' e-commerce retail supplier in China. It focuses on internet sales of domestic first-line brand sports shoes. It relies on the advanced IT system and integrates the resources of goods, channels and warehouse to realize multi-platform and multi-channels operation.

3.1 Network structure and network relationship

Table 1 help us to indentify the five firms' network centrality and heterogeneity, tie intensity and duration.

Table 1. Comparison of five firms' network structure and network relationship

	Network Centrality	Network Heterogeneity	Tie Intensity	Tie Duration
Firm A	Its B2C business is just started and limited in Fujian.	Commodity types and suppliers are limited.	The partners are relatively fixed.	The tie duration is usually as long as contract period.
Firm B	More than 50 thousand travel agencies use the platform, and it has lots of other kind of partners.	Its partners include kinds of travel agency, search engine, advertizer, colleges, ect.	It helps travel agencies establish stores on B2C platform and keep close relationships.	It will not stop any partnerships in general.
Firm C	It integrates the whole footwear supply chains.	It provides customers with the most abundant selections and links to different kind of supplychain partner.	They tie inseparably, and they would not cancel cooperation because of accidental events.	Once cooperative relationships were established, they will not easily be damaged.
Firm D	The top sport open platform, and it connects with most famous brands, enterprises and platforms.	The heterogeneity of shoes suppliers' network is not very obvious. But it also links to kinds of partners.	It keeps close communication with partners and solves problems as soon as possible.	It always maintains cooperation with partners over 3 years.
Firm E	It connects with most famous brands, enterprises, platforms and logistics, finance and software company.	It links to different kind of partners, such as suppliers, logistics and banks.	It keeps close and frequent communication with partners.	It always maintains long-term and stable cooperation with partners.

3.2 Network capabilities

We will use Table 2 to compare five firms' network developing and management capabilities.

Table 2. Comparison of five firms' network capabilities

	Network Developing Capabilities	Relationship Management Capabilities
Firm A	Initially, it built up its network by the help of governments. It gains the trust of partners by improved customer service and price advantage.	It manages partners through contractual agreements and gives IT system permissions to partners for online inquiry and related financial queries.
Firm B	It helps traditional tourism enterprises realize e-commerce by providing complete e-commerce solution, the platform has attracted more than 50,000 travel agencies.	With proficiency of tourism information service and SEO(search engine optimization), it can enhance customer loyalty, and help travel agencies to improve e-commerce system.
Firm C	It provides promotion, sales and after-sale service for shoes company. Plenty of firms join this platform, and its network expanded.	With powerful supply chain management skills, it is able to achieve zero stock. And it can choose proper partners by sophisticated supplier evaluation system.
Firm D	It engages in all channels operation, and connects with tens of e-commerce platforms and shoes suppliers.	Using its intelligent multi-platform synchronization information system, it can manage goods, orders and finance in all platforms freely.
Firm E	Through deep cooperation with brands and e-commerce platforms, it engages in all channels operation, and built up multi-warehouse sales system.	It can carry out real time monitoring and data analysis of inventory management, then realizes data communication with its partners.

3.3 Growth of e-commerce firms

In recent years, Firm A's number of subscribers was triple, but it is less than 1 million. As profit for B2C platform, it was not over 10 million. Because the services of this platform was limited in Fujian province, and

the commodity type is hard to compete with other e-commerce platforms (tmall.com or jd.com). Thus its B2C business developed relatively slowly in the past 3 years.

From 2009 to 2013, over 51000 stores were open on firm B's platform, including 500 stores in mall and 4000 paying subscribers. The whole platform operated more than one billion RMB. According to Iresearch.com statistics in Jan 2013, firm B has become the top 5 popular reservation website for domestic travel (based on monthly page views) and the No.1 e-commerce platform in travel industry.

So far, firm C has get network distribution permission of more than 1000 well-known shoes brands. The number of users has been over 10 million and average page views per day had been over 3 million. It had become one of the leading vertical shoes websites and the first shoes POP platform in China.

Firm D keeps steady growth after founded. In the recent three years, its average annual sales growth is over 50%. In 2013, the sales of Firm D is up to 580 million and it became the only shoes vertical B2C firm in the list of top 100 e-commerce companies in China.

Firm E is a fast growing company. In 2012, its sales is near to 100 million, and the sales is 300 million in 2013. It is expected to grow at a rate of 300% in 2014. The number of users is over 10 million, and the company has been profitable.

4. DISCUSSION AND HYPOTHESES

4.1 Discussion of case studies

Based on the interview, this paper evaluated each case on the dimensions of firm's network structure , network relationship, network capability and the firm's growth , with very high (strong , large, long, fast) , high (strong , large, long, fast) , in general, low (weak , small, short , slow) , very low (weak , small, short , slow) five levels to represent each indicator.

Table 3. Discussion of case studies

	Network Centrality	Network Heterogeneity	Tie Intensity	Tie Duration	Network Developing Capability	Relationship Management Capability	Firm's Growth
Firm A	in general	in general	Strong	in general	in general	Strong	in general
Firm B	Very high	High	Strong	Long	Strong	Very strong	Very fast
Firm C	High	High	Strong	Long	Very strong	Very strong	Fast
Firm D	High	High	Strong	Long	Strong	Very strong	Fast
Firm E	High	High	Strong	Long	Very strong	Very strong	Very fast

4.2 Network capability and firm's growth

The case studies show that it has a clear positive correlation between network capabilities and firm's growth. Firm B, C, D and E have strong network capability, and they have relatively outstanding performance on increasing sales and the number of users. For example, firm C established extremely rapid response mechanisms, as well as the effective management of the supply chain by IT systems. It is more competitive and

profitable in the industry. This leads to our first and second hypotheses.

H1: Network developing capabilities have positive impact on firm's growth.

H2: Relationship management capabilities have positive impact on firm's growth.

4.3 Network developing capability and network structure

Case study results also show that the firm's network developing capabilities have positive relationships with the firm's network centrality. For example, firm B provides its partners complete e-commerce solutions and it has become the No.1 e-commerce platform in travel industry of China. And the firm's network developing capabilities also have positive relationships with the firm's network heterogeneity. We can see firm A's developing capability is in general, so its commodity types and suppliers are limited. While the developing capability of firm B, C, D and E is high, their network heterogeneity is high as well. This leads to the following hypotheses:

H3: Network developing capabilities have positive impact on firm's network centrality.

H4: Network developing capabilities have positive impact on firm's network heterogeneity.

4.4 Relationship management capability and network relationship

The relationship management capabilities of firm B mainly include the tourist information service capabilities and SEO (search engine optimization) capabilities. In addition, it also provides total solutions of microblog marketing, tourism destination promotion marketing, in order to establish a close relationship with the tourism bureaus, travel agencies, hotels, etc. Firm C, D, E and most partners achieve integration via information systems. That makes them tie more intensively, and they would not cancel cooperation because of accidental events. This results in the fifth and sixth hypotheses.

H5: Relationship management capabilities have positive impact on firm's tie intensity.

H6: Relationship management capabilities have positive impact on firm's tie duration.

4.5 Firm's network structure and firm's growth

Firm B, C, D and E are generally in a relatively central location in firm's network, and they establish long-term relationships with suppliers, customers, and other third-party logistics service companies. Firm B tells us that network heterogeneity may meet different customers' demand, thus attract more users and achieve more sales. In shoes industry, we can also see that firm C, D and E grow fast and their network heterogeneity is high. These arguments can be summarized in the following hypotheses:

H7: Firm's network centrality has positive impact on firm's growth.

H8: Firm's network heterogeneity has positive impact on firm's growth.

4.6 Firm's network relationship and firm's growth

Firm B, C, D and E would not destroy cooperation unless the supplier could not pass their evaluation. Long-term stable cooperative relationships help them maintain rapid growth. Conversely, the cooperation period of firm A and its partners is shorter, when a contract expires, firm A will re-select suppliers. The loyalty of suppliers is weaker than the other firms, and its growth is in general. Therefore, we propose a direct relationship between network relationship (tie intensity and tie duration) and the growth of B2B2C e-commerce firms in the following hypotheses:

H9: Firm's tie intensity has positive impact on firm's growth.

H10: Firm's tie duration has positive impact on firm's growth.

5. THE PRETEST RESULT

This article pretested the effectiveness of the questionnaire. We received 38 respondents through direct interview, some e-commerce seminar and some involved e-commerce firms. Among them, 35 are valid. The data was collected between November 2014 and January 2015. Most of the interviewed companies have established their website for more than 3 years (59.5%). That can help us to see the growth of its online business.

Half of our respondents were middle-level or senior corporate staff (56.76%), they can distinguish the relationships among its network. We believe that this approach results in a very high quality of answers given.

Because e-commerce is an emerging industry, our pretest consists mainly of small and medium-sized companies: 27.03% have less than 30 employees, 37.84% have between 30 and 200 employees, 18.92% between 200 and 500 employees and only 16.22% have greater than 500 employees. More than half of the companies in the pretest are in retail, shoes or clothes (63.07%).

After descriptive statistics analysis, we find that the 35 samples follow normal distribution, and the value of Cronbach's α for each latent variable is greater than 0.7. But two reverse questions' CITC (Corrected Item-Total Correlation) is less than 0.5. It seems that most items are fit for the construct. And we will delete the two items in the new questionnaire or make some change.

6. CONCLUSIONS AND LIMITATIONS

This article selected five B2B2C e-commerce firms which are in different industry, different size and different growth step to do exploratory case studies. It did detailed analysis about network capabilities, network structure, network relationship and firm's growth. Then it puts forward to relevant hypotheses. Finally, we distributed questionnaires to pretest the effectiveness of the measures.

Since we promise to use the data in academic research, some interviewers are still reluctant to finish the questionnaire because they are afraid to disclose trade secret. On the other hand, the relationship among firm's network has to be distinguished by corporate executives, but a lot of respondents are common employees. That may affect the result of research.

We will collect at least 300 questionnaires in the future to complete the empirical study. It demands painstaking efforts to ensure the reliability and validity of the data. Furthermore, we will consider of some control and intermediary variables to make clear the impact of firm's network on the growth of B2B2C e-commerce firm.

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