

臺灣運動用品業者社會網絡互動型態之研究

摘要

臺灣運動用品製造業，在世界各國具有領先的地位，許多產品更是成為全球運動產業鏈中所不可或缺的項目。本研究採取質性研究法，訪談採用社會網絡分析之定名法與定位法，釐清臺灣運動用品者產業網絡中的跨組織互動狀況、要素及資源流通狀態，瞭解產業跨組織行為間的互動行為要素，分析產業中跨組織網絡結構互動的指標。

臺灣運動用品業者應完善消費者及合作廠商的訊息回饋，運用商務平台，蒐集消費者使用習性，形成大數據系統，適時提供給研發部門，進行產品調整或修正、提高合作衛星廠的供應鏈管理整合效能，加強跨組織連結聯繫及節省相關成本、進行品牌形象的建立暢通全球通路體系，輔以電子商務平台，配合客製化策略，即時掌控貨品位置動態。緊密連結中衛體系的連結、政府應降低業者在區域經濟整合下的關稅負擔，建立臺灣品牌的價值供應鏈。

關鍵字: 運動用品、社會網絡、互動型態

A Study of Social Network interaction style among Taiwanese Sporting Goods Companies

Abstract

Taiwan's sporting goods manufacturers also have outstanding manufacturing capabilities. In-depth interviews were conducted with the above three industry players to understand how these industry players integrate the networks of supply chain with strategic partnership and to find out the interaction structure of organizational network. Also, this research tries to understand the interactive elements of cross-organizational behaviors in the industry. It is hoped that this research can provide some indicators for analyzing and understanding the interaction in cross-organization network of an industry for the sporting goods industry and the academic circle.

The recommendations for the industry practice are listed as follows:

Creat a spacial organization to manage interorganization relationship ; Research into and develop innovative material ; Build a self-own brand name and a high-quality product marketing channel ; Strengthen the custom-made strategy ; Build a globalized network system ; Increase the connections in the center-satellite system ; Gain access to the government resources

Keywords: Sporting goods, social network and inter-organizational interaction.

Introduction

Background of the Study

Because of their outstanding manufacturing technologies around the world, many Taiwanese sporting goods manufacturers have been outsourced as OEM (original equipment manufacturer) by various famous international sporting goods companies, such as GIANT manufactures bicycles for Schwinn; POU CHEN GROUP produces shoes for NIKE; Continental Chemical Industries Co., Ltd. makes balls for Wilson (Fan, 2010).

The products manufactured by Taiwanese sporting goods companies are diversified, mainly they are: rackets, golf goods and fitness equipment and their accessories; camping products; general sport ware; balls; sport nets; water sports equipment; scuba gear and diving equipment; skating and skiing goods and winter sport goods (Taiwan Sporting Goods Manufacturers Association, 2016). Among all of these products, the Taiwanese technology to manufacture fitness equipment is world leading. Moreover, in May of 2016, the output value of sport goods manufacturing industries reached USD 500 million, with the share of 5% among total output value in Taiwanese manufacturing sector. Evidently, the sporting goods manufacturing industry is an essential sector both in Taiwanese and overseas sporting goods markets.

The technology that Taiwanese fitness equipment manufacturers utilize is as sophisticated as that in the high-tech industry. For manufacturers, it is vital to swiftly respond to order requests, take up the OEM role and become key players in the global supply chain (Huang, 2011). Organizational links between manufacturers are built due to governmental promotion of center-satellite system and the world-wide trend of regional economic integration. In addition, to respond to the global trend of digitization and personalization, the content of the industry covers a variety of technologies, including materials, electronics, metalworking and plastic processing. The development of its supply chain requires the integration of multiple manufacturers and their co-development and cooperation.

Therefore, in 2012, the “S-Team” alliance was forged by fourteen renowned Taiwanese health equipment manufacturers in the hope of transforming Taiwanese manufacturers into “the research and development center for global high-end household and commercial fitness equipment.” Among the 14 founders, five are center factories and

others key components makers. The “S-Team” alliance is the fourth expert manufacturer team in the traditional industry followed by the A-Team for bicycle, M-Team for mechanical industry, T-Team for hand tool (Industrial Development Bureau, Ministry of Economic Affairs, 2016).

Taiwanese sport goods manufacturers integrated internal and external supply chains in the industry and innovated methods to share resources when transiting from OEM to OBM. They gradually formed a diverse, complicated and interactive structure of industrial network. With manpower and information circulating fast between organizations, the effect of knowledge spillovers had increased. This phenomenon had been beneficial for the upgradation of innovative capabilities in the industry (Baptista & Swann, 1998; Porter, 1998; Baptista, 2001; Cook, Pandit & Swann, 2001; Porter & Stern, 2001; Furman, et al., 2002). However, current studies on Taiwanese sport goods manufacturing industry focus more on technology research and development or consumer behavioral motivation and less on interaction and networking of sector players. The studies on Taiwanese sport good manufacturing industry has been absent.

The World Magazine in Taiwan pointed out in 2015 that Taiwan had played a significant role in the sport and leisure fashion market. International sport goods brands, including Under Armor, procured functional fabrics from Taiwan. This list included Columbia, the North Face, Arc'teryx, and Salomon. They choose Taiwanese suppliers because the high quality, short delivery time, acceptance of small quantity order and the flexibility in manufacture responding to market changes. In addition, they need Taiwanese supplier to develop second and third generation products if sales are good. In addition, the MasterLink Securities in Taiwan carried an industry analysis in 2015 and indicated that functional sports fabrics accounted for 44% of global clothing market whereas outdoor sport clothing for 19%. The fore-mentioned functional clothing accounted for 63% of global clothing market. It showed the great demand of functional fabrics in the global clothing market. However, academic research on sport goods industry and the mutual integration of its supply chain players are absent. As the result, there has been a gap between practices in industry and academic research.

Taiwan enjoys rich nature with 1134-kilometer cost line. This feature promotes the development of water sport and scuba gear and diving equipment industry (Sport Administration, Ministry of Education, 2015). There are around 100 thousand regular

divers while 300 thousand divers had diving license. The annual growth of new divers was around 4000 to 5000 persons (Hsieh, 2013). Taiwanese scuba gear and diving equipment manufacturers have casted off the limitation of OEM. Among them, SHEICO Group which was renowned for producing scuba diving suits launched a self-own brand. It was the largest manufacturer of diving suit and top-ten brand in the world with annual output of 4.5 million pieces. Its orders mainly came from buyers from Europe, America, Australia and Japan. SHEICO Group was a global pointer enterprise with annual revenue 11.27 billion (Pan, 2015).

However, the how the Taiwanese scuba gear and diving equipment manufacturers integrate with each other to produce elf-own channels to promote products has not been studied. Most existing studies on scuba gear and diving equipment industries have focused on risk assessment of diving activities or safety planning of water zone. Few studies have analyzed consumer behavior. No existing studies address on the integration happening in the industrial chain. Therefore, it indicates this study provides great value by choosing diving equipment manufacturers as the research subject.

In the context of multi-national industry link, the industrial organization development of the Taiwanese sport goods industry started to stride toward inter-organizational integration. Modern information transmission technologies drove knowledge to flow across borders, tripped geographical boundaries, and expanded cross-regional cooperation mode (Huber, 2012). When industrial cooperating network was formed, the interaction between industrial organizations started to become research topic because, in the industrial network, organizations built complex network. In the resource-sharing industrial network, network players had enjoyed the decrease of production cost, trade cost, ease of hiring skilled labor, acquiring knowledge and technologies and other interests (Gertler, 2003; Storper, 1997). In addition, the development of regional industries has been the most important and valuable resources. Relevant studies and policies have been consistently presented in academic and in practice. Therefore, in the course of industrial organization interaction, fast changing and highly complicated operating Environment as well as networked trading or resource exchange between organizations had become the foundation of important theories and practices (Bizzi & Langley, 2012; Borgatti & Halgin, 2011; Jones & Hesterly & Borgatti, 1997). In view of the fore-mentioned, this study draws up the following research purposes:

1. Analyze the fundamental relationship between sport goods manufacturers in the inter-organizational network structure
2. Analyze the attributes of sport goods manufacturers in the dynamics of the inter-organizational network structure
3. Analyze the structure scenarios of sport goods manufacturers in the inter-organizational resource exchange
4. Construct the behavior mode of sport goods manufacturers in the inter-organizational network structure

Methodology

1. Research design

This study was a qualitative research using the interview research method by Lin (2015) . In the analysis of interview content, nomenclature method and positioning method of social network analysis by Qu, Bi, Liu &Yang, (2015) was used for preliminary construction of the network of interview subjects. Interview draft was reviewed by experts and scholars of this field and research ethic scholars. Focus group interview was carried out and the analysis result was used to draw up interactive relationship in the inter-organizational network structure.

2. Subjects of study

This study chooses members of Taipei Sporting Goods Association (TSGA) Taiwan, with total number of 15 members, to analyze their interactive relationship in the inter-organizational network structure. The interviewed subjects covered business owners in fitness equipment industry, scuba gear and diving equipment industry, sport functional fabrics industry. Five business owners from each industry were interviewed. Starting from March 2017, interview was done in the office of business owners. The research subjects were encoded in order as follows: A for sport functional clothing; B for fitness equipment; C for scuba gear and diving equipment. Table 1 illustrates the operating background of business owners in different categories.

Table 1 Operating background of business owners in different categories

Category	Code	Operating background
Code A: sport functional clothing	A01	Self-own brand merchant, manufacturer
	A02	Self-owned brand merchant, manufacturer
	A03	Agent
	A04	Agent,distributor
	A05	distributor
Code B: fitness equipment	B01	Agent(trader), manufacturer
	B02	Self-owned brand merchant
	B93	Manufacturer
	B04	Self-owned brand merchant, manufacturer, distributor
	B05	Agent, Manufacturer
Code C: scuba gear and diving equipment	C01	Self-owned brand merchant, distributor
	C02	Self-owned brand merchant, manufacturer
	C03	Self-owned brand merchant, manufacturer
	C04	Self-owned brand merchant, manufacturer
	C05	Self-owned brand merchant, manufacturer

3. Preparation of the interview draft

This study consulted the interview questionnaire on inter-organizational behavior in the yacht industry used in the doctorate dissertation of Prof. Anna Christina from Universite Paris-Sud. The following content was amended with Prof. Christina's authorization: Vignette 1: "fundamental nature of relationship: the inter-organizational behavior of sport goods business owners"; Vignette 2: "network attributes of actors: dynamics of sport goods business owners' inter-organizational relationship"; Vignette 3: "structural position that actors possess: the resource exchange relationship between

sport goods business owners in the inter-organizational network." Each vignette had several sub-vignettes in order to clarify issues raised in this study in an orderly manner.

4. Data process and analysis

4.1. The reliability and validity of this study: the statement of interviewees was repeatedly validated and inspected to reinforce the reliability of this study. Their statement was verified in accordance with their organizational background to promote the internal consistency of this study. The accounts of same-industry interviewees were cross validated to reinforce the external consistency of the research data.

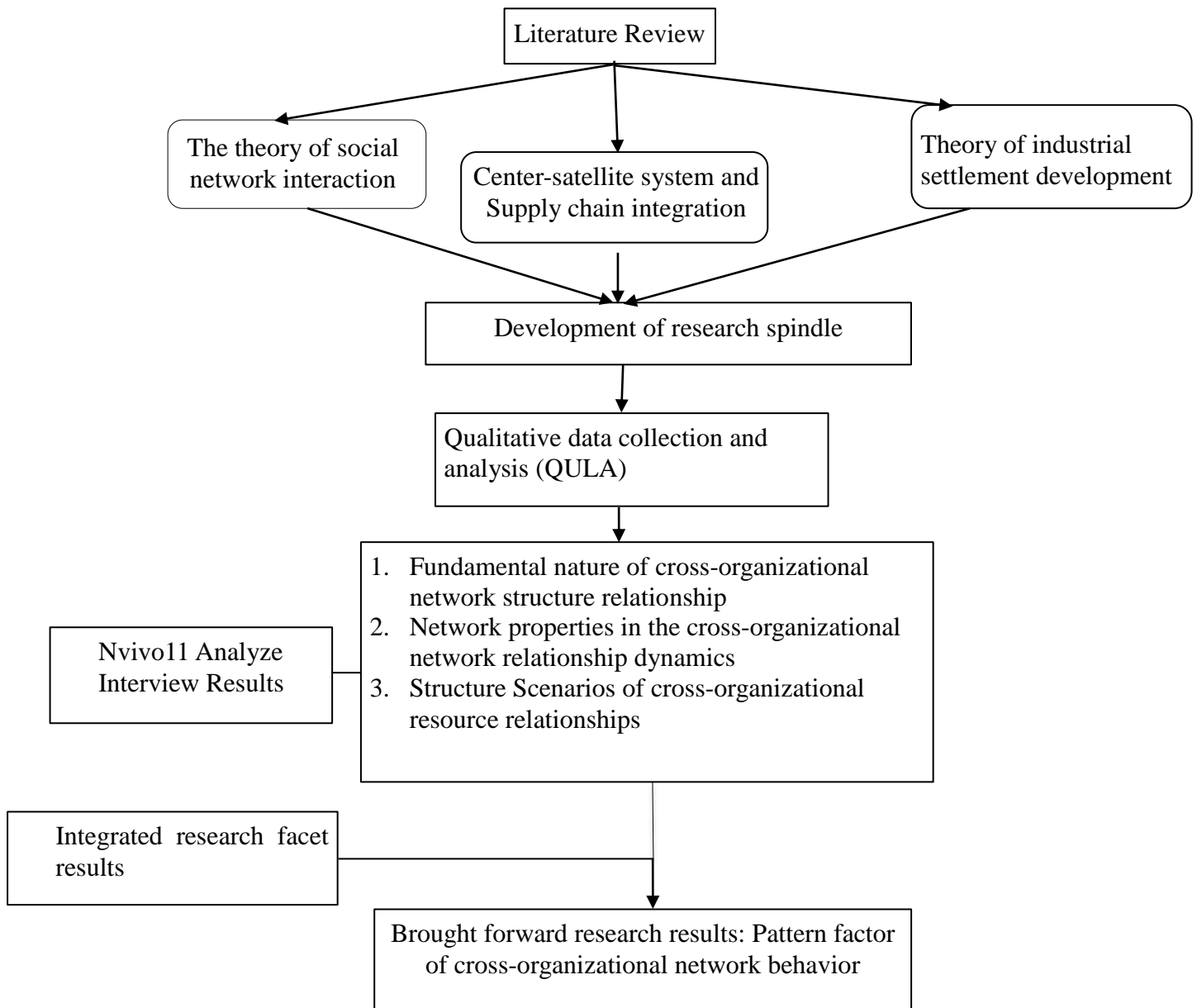
During the interviews, the subjectivity of the interviewee as well as the context and logic of their statement content were taken into consideration. The researcher of this study and interviewee did not have a vital interest. The interview content was confidential and was presented with code.

This study collected paper documents of interviewed subjects to increase the diversity of information source. During the interview, a recording pen, a laptop and other electronic devices were used and supplemented by noting to keep record of interview content while observing facial expressions of interviewee. The triangulation method by Hu, You-Hui (1996) and Wang, Wen-Ke (2015) was utilized to re-verify interview content with the research subjects to correct inappropriate content. Interviewee's statement was repeatedly verified with relevant reference and statement of other interviewed subjects.

4.2. Data encoding: mechanically recorded data, invited experts and scholars to review questionnaire outline and invited research ethics specialists to verify.

5. Research process

This study used the theory of social network interaction to collect and integrate literature on industrial settlement, supply chain integration and center-satellite system to draw up the outline of interview questionnaire. The focus group interview was carried out with members from Taipei Sporting Goods Association (TSGA) Taiwan. The network organizational relationship of relevant industry, the interaction and linkage were analyzed. The research results concluded the network interactive relationship structure of the studied industry.



Table

1

Research

Process

Results

1. Fundamental nature of relationships: inter-organizational network structure of sport goods manufacturers

1.1 Fundamental nature of relationships

1.1.1 The globalized E-commerce has become the trend that led sport goods manufacturers to continue maintaining inter-organizational links. The derivative departments under this circumstance were important logistics supporters.

A03:16 : Internet is the most important part...the E-commerce... ; A04-11 : The development of community relies on the Internet. It's like the marketing of electronic products depends on E-commerce... ; B02-23 : We form an alliance with people in the same business...because our current cooperation products are still produced by domestic factories.

1.1.2 Some Taiwanese sport goods manufacturers were short of social network concepts. Their inter-organizational cooperation was built on trust and relational basis accumulated over the years. Contracts were signed to ensure both parties' rights when trades involved money in their mutual selling activities.

B03-52 : When we decide that someone is trustworthy, we commission that person to do the job. We contribute our original ideas ...amendment are made after discussion ; B04-81 : We are competitors who are in a cooperative relationship. Together, we strive to expand the market and to promote this atmosphere... ; B05-42 : Usually, the cooperation last for years without signing contracts...

1.1.3 The traditional method to build inter-organizational relationship was to join relevant associations, which most organizations adapted.

A05-20 : This is very important in terms of business operation. Association is the community that we must join in.

1.1.4 When industries conducted inter-organizational cooperation, their concerns were to cut the cost by professional division of labor and to lower production-related costs. They conducted inter-organizational cooperation in the supply chain, complemented one another and satisfied each other's needs.

A01-32 : We mainly rely on domestic counterparts. However, we out-source complicated machining processes to suppliers in Southeast Asia ; B03-10 : Our partner manufacturers are from China...in Shanghai ; C04-08 : We develop molds with some factories and manufacturers together. You can say it's kind of supply chain...

1.1.5. Manufacturers of scuba gear and diving equipment had less cooperation with counterparts in the same industry. It was a more conservative industry.

C02-54 : We complete all the manufacturing process all the way when raw materials come in.

1.1.6. Organizations maintained their relationship and foundation for mutual trust by constantly trade with each other.

A05-40 : You can obtain all the information form the annual conference. Thus, you don't need to spend time building relationship. If you are the member of the association, you are familiar with the whole organization... ; B04-97 : I think the comradeship is hard to be superseded because we have long-term relationship in cooperation...

1.2 Analysis on the network properties of the inter-organizational network relationship dynamics that sport goods manufacturers possessed

1.2.1 The inter-organizational linkage of Taiwanese sport goods manufacturers was

direct linkage. Only some of them built linkage with third-party channels in product sales.

A02-41 : We search for suitable factories for production according to clients' needs ... ; B03-45 : We are the middleman or traders. This means that we need to link with many factories.

1.2.2. When sport goods manufacturers conducted organizational cooperation, the needs of their clients were the major driving force for building networking.

A05-70 : It's to reflect the needs of the market. We pass these needs to suppliers to produce and develop the products you want.

1.2.3. Fitness equipment manufacturers conducted specialization division of labor on the parts necessary to the production process. They outsourced to cooperation factories and played a key role in the mid-up stream in the supply chain.

B03-45 : We are the middleman or traders. This means that we need to link with many factories

1.2.4. Scuba gear and diving equipment manufacturers only built networking within their supply chain and owned their patented technologies. They designed and produced products in the self-owned supply chain. Technologies were the foundation for them to lead the trend in the market.

C03-95 : We have patented technologies... ; C02-150 : We control our technologies for research and development... ; C03-23 : Most of the work are done by ourselves... ; C05-20 : The Scuba gear and diving equipment industry is a self-contained community. Your company runs the business in your own way. There is no such thing as inter-organizational ...

1.2.5. The predominance of fitness equipment manufacturers' inter-organizational cooperation was built on the one-stop service before and after customer purchase. They also worked with distributors on a regular basis to develop unclogged sales channels.

B04-08 : We are distributors, too. We have self-own sales channels throughout the island, including the north, middle and south part of Taiwan. We have self-own logistic vehicle teams...We have technicians and maintenance technicians...

1.2.6. Fitness equipment manufacturers and scuba gear and diving equipment manufactures tended to build relationship based on overlapped network to gain cooperation opportunities. This was because they both possessed high quality products.

B05-68 : The products that I represent as the agent need to satisfy two criteria. First, the quality of the products is world-class and top quality. Second, the price is at least 30% lower than products of same quality. I have stores, too. Third, I emphasize on after service because I respond to clients' needs promptly... ; C01-51 : It's the mutual support method. It depends on what kind of demands that need our support, such as sponsoring products... ; B02-54 : I think the best mode is that three parties all share the profits. He uses his networking and we utilize our sequencing resources ; C01-

59 : However, I hope that such a cooperation method is not time-consuming and can be linked by existing networking.

1.2.7. Sport functional clothing manufacturers cooperated with up-stream factories more often. For distributors, they absorb relevant big brand clients in the integration process when refereed by international brand suppliers and media.

A04-07 : In the OME mode, we are still in the up-stream. To produce peripheral parts, we still need to purchase materials from them. A03-72 : If we have self-own brand, we can integrate products of different industries. Our plan in next step is to integrate manufacturers of different sport goods to start a new brand...

1.2.8. Industries were linked up mainly by social events and E-commerce platforms to attain business reciprocity.

A03-27 : Our major social event is playing golf together... ; A05-46 : Usually by platforms, such as PCHOME. For E-commerce, we use online platforms to do business. It is kind of E-commerce and electronic marketing... ; B05-44 : In the past, you needed to visit people in person and to learn...

1.2.9. Taiwanese sport goods manufacturers were technically exclusive. Their marketing behavior was both cooperative and competitive. They also utilize contacts to ensure technical exclusivity of their organizations.

A04-33 : It is impossible for us to provide information that involves our core technologies. It is fine to provide abundant information in business management... B04-77 : Currently, it should be both cooperative and competitive. We cooperate and compete, too. We put efforts to promote this market together. C02-04 : We obtain many patents in technology research and development as well as technological innovation. B04-108 : Things involved with money require contracts.

1.2.10. The most powerful driving force for organizational cooperation was to mutually benefit and decrease cost burden from self-own satellite factories.

A01-36 : If we receive some intractable orders, we need up-stream factories to work with us... B04-35 : When up-stream and down-stream factories are integrated, resources can be shared.

1.2.11. The production and sales of products, government policies and customer feedbacks possessed driving power in the circulation of network relationship.

A05-53: Resources provided by the government...we can follow all the strategies mapped out by the government. B04-156: We focus on our clients because we have direct contact with our end customers. Whether they are household users or commercial users, such as gymnasium, we receive many feedbacks and opinions directly from our clients. Therefore, we would gather these feedbacks and opinions and discuss with our manufacturing factories.

1.3 Analysis on the relationship scenarios of sport goods manufacturers' inter-organizational resources flow

1.3.1. The cooperative relationship of Taiwanese sport good manufacturers lasted for almost over 10 years to 30 years.

A01-52: We have been working with our cooperation factories for 20 to 30 years... B04-96: We have

comradeship which lasts for at least more than ten years or 30 to 40 years.

1.3.2. In the network of sport functional clothing manufacturers and fitness equipment manufacturers, the inter-organizational link was two-way interaction. For scuba gear and diving equipment manufacturers, the inter-organizational linkage relationship was one-way.

A05-81: This is a two-way interaction. It's not possible to one-way. B04-77: Currently, the relationship should be both cooperative and competitive. We compete with each other but also cooperate. We put efforts to promote this market together. C02-10: Our factories are self-owned...we have the whole building and manufacture by ourselves. C03-23: We do not have many suppliers. We finish our tasks most by ourselves.

1.3.3. One of the methods of inter-organizational cooperation between sport functional clothing manufacturers is fulfilling production orders. The method of inter-organizational cooperation between agents and distributor is sponsorship.

A02-48: We can be viewed as a key functional player. Only when we receiver orders, the followed-by clothing production process can be initiated.

1.3.4. Manufacturers of scuba gear and diving equipment only cooperated with physical stores. Throughout their supply chain, they completed product development and manufacturer in self-owned factories.

C04-05: We have self-won factories to produce our products... CO5-21: We have two approaches. One is more inclined to traditional industry and sales channels. The exporters and importers...

1.3.5. Among sport functional clothing manufacturers and manufacturers of scuba gear and diving equipment, cross-industry cooperation was the trend. Brand marketing was the adapted mode to develop new consumer market.

A03-72: When we have self-own brand, we can integrate products of various industries. This is our plan in the next stage. We plan to integrate with manufacturers of sport products to create a brand to reach this goal... C01-49: Cross-strait alliance mode of operation needs a travel agent and equipment manufacturers. The management of travel industry is also required to form such an alliance...

1.3.6. Fitness Equipment manufacturers cooperated with satellite factories technically. They used E-commerce platforms to conduct inter-organizational linkage and to sell their products to markets of different target age groups.

B02-86: Take one company as an example. They have their E-Commerce Department for fitness equipment products to incorporate with relevant domestic business owners... B03-45: We are the intermediate trader and trader. It means we need to cooperate with many factories.

2. Analysis on the factors resulted in the inter-organizational networking behavior of sporting goods manufacturers. This study consolidated data to clarify the structure of Taiwanese sporting good manufacturers' relationship and resource flow in their inter-organizational dynamics.

The results are demonstrated with Table 10:

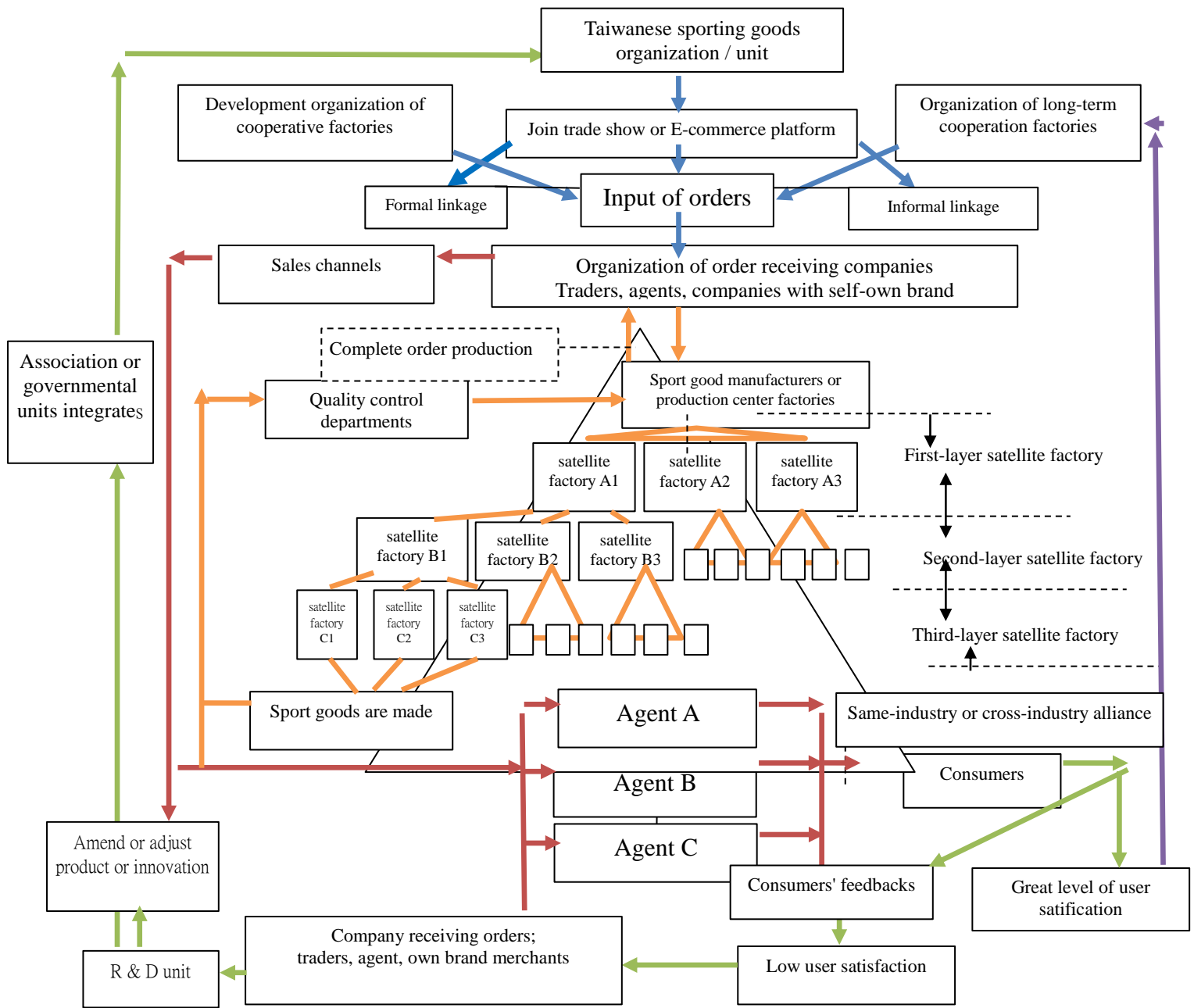


Chart 7: Inter-organizational interaction types of Taiwanese sport goods manufacturers

The types of inter-organizational dynamics between Taiwanese sport goods manufacturers are diversified. Different industries and business operation modes bring different linking and interacting dynamics. Based on the research results of this study, it can be inducted that inter-organizational interaction in the industry is a cycling and mutual interaction that solves issues of sporting goods production, fabrication, research and development and revision in the center-satellite system built

by governmental agencies. The top layer of Chart 7 represents Taiwanese sport goods manufacturers. They join association and/or guilds or build self-won E-commerce platforms to reach target markets and consumer groups. Their relationship can be divided as newly-developed organizational relationship or long-term organizational relationship. In addition, the formal linkage between organizations or informal linkage based on long-term comradeship serves as the decision-making background to decide if orders should be placed. Order-placing decisions are the form of conducting inter-organizational interaction. This is the first inter-organizational interactive cycling in the industry, which is illustrated by blue lines in the chart. Based on the business models, the order-accepting organizations are divided as own brand merchants, manufacturers and agents. Order-accepting firms outsourced the production process to players in the center-satellite system supply chain to manufacture products. The whole production process is divided into layers of labor division. The products are sent to quality control departments for inspection. Products that met standards are sent to center factory. The fore-mentioned procedures are the first stage of completing orders. In the chart, the dotted line box indicates the completion of such a supply chain cycle. Later, the center factory sends products to downstream manufacturers. Order-accepting organizations place orders. When the sporting products are produced as final products, they return to the company and are ready for sale. In the chart, orange lines demonstrate this cycle. When the final products are ready for sale, order-placing firms sell them to consumers via various sale channels. Consumers fulfill their needs of purchasing merchandises via distributors. In the product-selling process, distributors promote products to the market via cross-industry alliance. The above-mentioned is one cycle in the sales-end inter-organizational linkage and interaction. In the chart, red lines are used to illustrate.

After using products, consumers provide feedbacks to distributors or own brand merchants. Research and development units in the organizations execute product adjustment and amendment based on these feedbacks. They also draw out collaboration programs with associations or guilds for product marketing or technology advancement. In addition, they increase order volume by taking advantage of E-commerce platforms or by utilizing foreign markets developed with governmental assistance. This is the inter-organizational linkage and interaction cycle for product adjustment as well as research and development. In the chart, this cycle is

illustrated with green lines. If consumers enjoy the products, the flow process in the chart enters the organizational linkage cycle of order increasing, which is illustrated by purple lines. Every flow process or segment produces different types of inter-organizational linkage and interaction cycle. In the whole inter-organizational interaction in the sport goods industry, different and yet individual cycling patterns emerge in the interaction process. In this study, fitness equipment manufacturers and sport functional clothing manufacturers tally with this table of inter-organizational interaction. This table can be applied to scuba gear and diving equipment manufacturers who are different from others and more self-contained. The internal structures of the supply chain they integrate are all labor-division factories affiliated to the same cooperating organization. In the sales end, they conduct inter-organizational cooperation with distributors of various countries.

Discussion

The volume of Taiwanese E-commerce reaches 20 billion US dollars and is ranked top ten globally. It keeps growing promptly up to 15% to 20% per year and accounts for 17% of total retail sales volume. The development process is world leading. The successful operation experience in E-commerce in Taiwan had brought great competitive niche for Taiwanese business persons on the international stage (Tang, 2017). In the sport goods industry, sport functional clothing firms started out the popularization of E-commerce and developed B2B, B2C, and C2C platforms to sell products to consumers. The E-commerce platforms provided assistance in logistics, E-payment and other business transaction behaviors. They even combined O2O from online to offline sales mode that allowed consumers place orders online and receive products at convenient stores. This mode influenced the industry's linkage relationship with external players. The platform economy or platform mode referred to business operators who acted as sales channels by utilizing great volume of data, showcasing products online and gaining profits from collecting service charge or advertisement fee (Choudary & Van Alstyne et al., 2016; Kenney & Zysman, 2016). In this study, the inter-organizational linkage methods of Taiwanese sporting good firms included traditional approaches which were regular meetings, membership of relevant association and guilds and telephone communications. The new approach of E-commerce platform became the linkage method they strived to develop. With the O2O

mode, they expanded the global sales market via E-commerce. The platforms provided functions of order-placement, organizational contacts and even the collection of consumer feedbacks. However, the organizational networking of Taiwanese sporting goods firms heavily relied on informal relationship maintenance. The study of Lin (2010) also indicated that, when enterprises possessed excellent reputation and public praise, it was beneficial for them to earn more cooperative opportunities with well-known corporations. What was highly valued was to gain the effect of publicity and endorsement. In the nearly 30-year development process, Taiwanese sport goods firms had built a culture of mutual trust. Business reputation was an important factor in the inter-organizational business transaction and linkage. The feature of mutual-trust culture played a vital role especially in the acceptance part in the whole interaction diagram. This feature also tallied with the basis of social exchange which allowed business behavior to be built on the foundation of trust. Dominated by the rational behavior of self-interest, business players provided mutually beneficial rewards to be conducive to the development of Social communication relations (Xu, Zhang, Xi & Wei, 2016).

In the manufacturing end, Liao & Wang (2004) thought the center-satellite production system had made significant contribution for Taiwanese economy between 1970s and 1980s and created high efficiency in production. In this study, the external inter-organizational relationship of fitness Equipment firms was built on the foundation of their excellent business reputation and hence to promote their popularity among same industry counterparts and to encourage customer purchase behavior. The other foundation of their external inter-organizational relationship was to build strategic alliance with domestic same-industry firms in the manufacturing end for the domestic and foreign sales market. In the current trend of global economic regional consolidation and internationalization of the industrial chain, Taiwanese economy possessed limited resources and shall develop towards software-based and artificial intelligence industries. In particular, Taiwanese economy was an island economy heavily relied on international trade and should focus more on innovation. Developing brands was the advantageous strategy in the technology and marketing aspects (Zhang, 2017). In the process of developing self-owned brand, R&D and design talents were especially important. The three manufacturer categories in this study all possessed cooperating units and internal staff for R&D and design. Therefore, they were able to focus on providing prompt respond to customers' needs

and to overcome product deficiency based on their feedbacks so as to create product niche and advantage. Many firms had started out engaging in or developing self-owned brands. When they strived to construct brand status, the Mathew effect emerged, and the status symbol was formed. If industrial organizations accumulated reputation in the business developing process, they would make the organization to come near to the core status of social network. Their power of exerting influence becomes stronger, too.

In the Taiwanese fitness Equipment industry, the foundation of labor division in the center-satellite system was constructed in the manufacturing chain. This allowed many firms save a great amount of time and efforts in conducting inter-organizational network. The concept of specialization between center factories and Satellite factories promoted the competitiveness of the whole industry (Wang, 2009). The development of external relationship of scuba gear and diving equipment manufacturers was more self-contained because of the nature of the organizations. Most firms had self-owned brands and were also manufacturers themselves. Therefore, their focus was still on product manufacturing in the production line or supply chain. Sport functional clothing firms planned their self-owned brand production, cooperating agents and distributors according to consumers' needs. Same-industry firms constantly conducted strategic and sales cooperation and created linkage of same-industry alliance and cross-industry cooperation. This encouraged partnership in the same- and cross-industry strategic alliance and casted off the concept of same-industry competition. Therefore, the central strategy was to develop market jointly and to create target sales market with more advantages. In contract, Cheng, Lin, Chen, Lin, Lin (2012) indicated that, under OEM circumstances, the ability to answer clients' needs was the driving force of developing products with more elasticity and saving a lot of unnecessary costs on development and manpower. In view of this opinion, it can be inferred that clients' needs are the strongest driving force for business players in the sport functional clothing industry to build inter-organizational linkage.

In the inter-organizational management behavior, manufacturers with self-owned brands coordinated production, channels and distribution to create excellent inter-organizational relationship. They integrated the supply chain and completed business transaction by using information technology and the Internet. They brought upstream and downstream manufacturers together to establish connection, to form a closely interactive network and to build highly efficient organizational network in the supply

chain. The driving force of inter-organizational linkage was to develop the source of procurement orders.

Traditionally, the integration of supply chain is the single-form integration achieved within organization or the supply chain. It faces the challenges of competition between organizations and cost reduction. Sport functional clothing firms and fitness Equipment firms conducted technically innovative cooperation via other organizations, such as suppliers, competitors or purchasers. In the cooperating process, they matched and allocated resources released from both parties to activate their networks to achieve the goal of supply chain integration. This tallied with the opinions of Philip and Felicia (2013). Organizations reduced potentially consumed costs because of the complementary benefits from cost and resources. In addition, the internal integration of organizations evolved to be inter-organizational integration and linkage. The advantages of business development can be induced from the above statement. Apparently, the global resource integration ability of firms plays a key role in their long-term competitive advantages. In today's business world, currently, most enterprises are not capable of completing all business process solely. Channels and logistics are the invisible hand that connects relevant firms in the upstream and downstream industries. Therefore, supply chain management integrates work in various business processes conducted by suppliers. Mutual linkage increased values added and resources shared. (Lambert et al., 2011) Important findings can be found by comparing interview content of sport functional clothing manufacturers and fitness equipment manufacturers. However, the interview content of scuba gear and diving equipment manufacturers show no significant differences. The reason may lie in the feature of being self-contained in this industry. Therefore, they do not have the need to carry out excessive inter-organizational linkage or supply chain integration.

When using Theory of Structural Holes to analyze the network and interaction of Taiwanese Sporting goods firms, the findings may include that business owners build inter-organizational relationship in the hope of creating empty spaces between groups of actors or finding brokers to bridge nodes. They hope to gain relevant technologies, to circulate information or to obtain first-hand information and acquire information or benefits from it by using bridging brokers described in the Theory of Structural Holes. This study found that the inter-organizational interaction between sport functional clothing firms and fitness equipment firms were mutual and cycling. The inter-organizational linkage of scuba gear and diving equipment firms were one-way

relationships. Seggie, Griffith, Jap (2013) thought industries should take the initiative to reverse the status of information asymmetry or one-way information. The opinion failed to meet with the emotional bonding orientated mode in Taiwanese sport goods industries. Sport functional clothing firms kept seeking opportunities to create alliance with raw material suppliers and different-industry counterparts to develop and produce new products. When their products possessed the status of technical monopoly, patents could be obtained to create more profits. Similar to the recombinant search theory, it reorganized the previously known knowledge, questions or answers completely, or reconnected or constructed the existing knowledge elements to create new knowledge and promoted the generation of better patents or new products (Henderson & Clark, 1990). In the self-own supply chain of manufacturers and own-brand merchants, every manufacturing procedure from obtaining raw material to production was completed by manufacturers and own-brand firms. In line with the principles of retaining key technologies, outside the organization research and development unit to jointly develop research was a very common linkage type. Overall, scuba gear and diving equipment manufacturing industry was a highly closed industry. In its supply chain, manufacturing and research and development were done by self-own factories. Inter-organizational cooperation linkage only existed to its distributors or agents.

Based on the above discussion and results, it is suggested that Taiwanese sport goods industry shall establish dedicated units within organization to improve the supply chain integration and inter-organizational linkage, to perfect the consumer and cooperation manufacturers' feedback pipeline, to use of E-commerce platforms, to collect consumers' usage habits, to collect and form big data and provide it to the R&D department in order to adjust or amend their products. In the manufacturing process, they should improve the supply chain management efficiency in the satellite factories, to enhance the inter-organizational cooperation and save costs, to establish brand image, to unclog self-own channel system, to use of E-commerce platforms and deploy global network. The government needs to respond to the global economy in the regional economic integration trend, to lower the burden of tariffs for industrial organizations and to take the initiative to set up product brand value of supply chain in Taiwan.

This study summarized the results of the survey and drew a basic relationship map of the inter-organizational interaction model of Taiwan sportswear industry. It is

suggested that in the future, based on this diagram, researchers can deeply analyze the microcosmic relationship between organizational links and resource flows through individual organizations or manufacturers with different business types and business modes, so as to develop the corresponding detailed positions of actors in the network structure (egocentric network, paired network, triangular network). After understanding the corresponding positions of different actors, we can find out the weak connection of their structural holes and provide them to the operators, so that they can more easily enter the key positions in the industrial environment, effectively and quickly integrate into the industry, and improve the competitiveness of the organization. In addition, the interview subjects of this study were members of Taipei Sporting Goods Association (TSGA) Taiwan. Their business operation background and modes were different. It is suggested that future studies could select same-industry or similar-background manufacturers as subjects to carry out in-depth analysis and compare their relationship of inter-organizational linkage. Then, the understanding of differences of the sporting goods industry across organizational linkage could be realized. Furthermore, one limitation of this study is that interviewees may reserve more detailed trade secrets.

Reference

[MasterLink Securities Stock Analysis (12 Aug 2015). Global Sport Clothing Market Analysis: In-depth Stock analysis on Functional Fabrics Manufacturers. Weblink:<http://newjust.masterlink.com.tw/HotProduct/HTML/Detail.xdjhtm?A=PA164-2.html>]

[Wang, Wen-Ke (2015). *Research Method in Education*. Taipei:Wunan Publishing.]

[Wang, Tai-Lee (2009). *The Analysis of Collaborative Platform for Central-Satellite Systems by using UML*. Unpublished Master Thesis, National Kaohsiung University of Science and Technology.]

[Lu, Guo-Zhen, Huang, Yi-Jun (14 Apr 2015). Taiwan Support Half of the Global Sport Fashion Market. *Industry and Manufacturing Section, World Magazine*. Weblink: <http://www.cw.com.tw/article/article.action?id=5066759>]

[Lin, Zheng-Chang (2015). *Research Design: Qualitative, Quantitative, and Mixed Method Approaches*. Taipei: Pro-Ed Publishing.]

[Lin, H.F. (2010). Take a Different Approach to Enter Global Market: Potix Corporation. *Management Review*, 29(2), 121-134.]

[Hu, You-Hui (1996). *Qualitative Research: Theory, Method, and Local Female Research Examples*. Taipei:Chuliu Publishing]

[Fan, C. H. (2010). An Analysis of the Importance of Self-Owned Brands in the Sporting Goods Manufacturing Industries. *Sports & Exercise Research*, 110, 23-29.]

[Tang, H.J.(2017). Developing Unaddressed Marketing under New Southbound Policy: Use E-Commerce as the Example. *Taiwan Economic Research Monthly*, 40(2), 50-56.]

[Zhang, B.Q. (2017). Taiwan's Economic Breakthrough: Impact and Response of the Red Supply Chain. *Taiwan Economic Research Monthly*, 1 (40), 31-41.]

[Sport Administration, Ministry of Education (12 Apr, 2015). Embrace Water Activities on the Sea; Water Safety as Top Priority. News Section of Sport Administration. Weblink:<http://www.sa.gov.tw/wSite/ct?xItem=14838&ctNode=300&mp=11>]

[Cheng, S.H., Lin, C.P., Chen, M. X., Lin, Z.C., Lin, M.Q. (2012). The Synchronous Design Method Applied to the Product Conception Development under ODM Development Mode. *Industrial Design*, 136, 44-50.]

[Xu, S.W., Zhang, H. Y., Xi, Z.J., Wei, X.Y. (2016). Does Knowledge Sharing Matter? Study of Organizational Support Moderating Effect on Organizational Trust, Employees' Citizenship Behavior and Knowledge Sharing. *Journal of Human Resource Management*, 16(3), 29-59.]

[Huang, Yi-Jun (2011). Fitness Hero, Steady Rise. *World Magazine* No. 330. Weblink: <http://www.cw.com.tw/article/article.action?id=5010478>.]

[Huang, Y.K. (2015). The Effect of Integrated Supply Chain Management on Magazine Dealer Satisfaction. *Journal of Chinese Institute of Transportation*, 7(2), 191-220.]

[Huang, Y.K. (2015). The Effect of Integrated Supply Chain Management on Magazine Dealer Satisfaction. *Journal of Chinese Institute of Transportation*, 7(2), 191-220.]

[Liao, R.J., Wang, W. H. (2004). The Improvement of the Quality of Human Resources through the Teaching Mode of Industry-University Cooperation. *Quality Monthly*, 40-42.]

[Taiwan Sporting Goods Manufacturers Association (TSMA) (2016). Categories of Taiwan Sports Goods. Data extracted from:
http://www.sports.org.tw/c/ass.asp?a_table=1]

[Pan, Zi-Yin (23 Aug 2015). The King of Diving Suits Started by Selling Raincoats. *Apple Daily*.
Weblink:<http://www.appledaily.com.tw/appledaily/article/finance/20150823/36737040/>]

[Hsieh, Chia-Ju (2013). *The Study of Market Positioning For Scuba Diving at Taiwan*. Unpublished Master Dissertation, Chaoyang University of Technology.]

[Qu, Hai-Yuan, Bi, Heng-Da, Liu, Zhang-Xuan, Yang, Guo-Shu (2015). Research Methods of Social and Behavioral Sciences: General and Quantitative Research Methods. Taipei: Tunghua Publishing.]

Ahuja, G., Soda, G., & Zaheer, A. (2012). Introduction to the special issue: The genesis and dynamics of organizational networks. *Organization Science*, 23(2), 434-448.

Baptista, R. (2001). Geographical clusters and innovation diffusion. *Technological Forecasting and Social Change*, 66, 31-46.

Baptista, R., & Swann, P. (1998). Do firms in clusters innovate more? *Research Policy*, 27(5), 525-540.

Bizzi, L., & Langley, A. (2012). Studying processes in and around networks. *Industrial Marketing Management*, 41(2), 224-234.

Borgatti, S. P., & Halgin, D. S. (2011). On network theory. *Organization Science*, 22(5), 1168-1181.

Burt, R. S. (2005). *Brokerage and Closure: An Introduction to Social Capital*. New York, NY: Oxford University Press.

Choudary, S.P., Van Alstyne, M.W. (2016). *Platform Revolution: How Networked Markets Are Transforming the Economy and How to Make Them Work for You*: Norton and Company: New York City.

Cook, G., Pandit, N. R. & Swann, P. (2001). The dynamics of industrial clustering in British broadcasting. *Information Economics and Policy*, 13(2), 351-375.

Fiore, A., Grisorio, M. J. & Prota, F. (2011). Regional innovation systems: which role for public policies and innovation agencies? Some insights from the experience of an Italian region. *European Planning Studies*, 19(8), 1399-1422.

- Fritsch, M. & Slavtchev, V. (2011). Determinants of the efficiency of regional innovation systems. *Regional Studies*, 45(7), 905-918.
- Furman, J. L., Porter, M. E., & Stern, S. (2002). The determinants of national innovative capacity. *Research Policy*, 31, 899-933.
- Gertler, M. S. (2003). Tacit knowledge and the economic geography of context, or The undefinable tacitness of being. *Journal of Economic Geography*, 3(1), 75-99.
- Henderson R., Clark B., (1990) Architectural innovation: The reconfiguration of existing product technologies and the failure of established firms. *Administrative Science Quarterly*, 35, 74-85.
- Huber, F. (2012). Do clusters really matter for innovation practices in information technology? Questioning the significance of technological knowledge spillovers, *Journal of Economic Geography*, 12(1), 107-126.
- Jones, C., Hesterly, W. S., & Borgatti S. P. (1997). A general theory of network governance: Exchange conditions and social mechanisms. *Academy of Management Review*, 22 (4), 911-945.
- Kauffeld-Monz, M. & Fritsch, M. (2013). Who are the knowledge brokers in regional systems of innovation? A multi-actor network analysis. *Regional Studies*, 47(5), 669-685.
- Kenney, M., and Zysman, J. (2016). The Rise of the Platform Economy, *Issues in Science and Technology*, 32(3): 61-69.
- Lambert, D. M., Garcia S. J. and Croxton, K. L. (2011), An Evaluation of Process-oriented supply Chain Management Framework, *Journal of Business Logistics*, 26(1). 25-51.
- Philp, R. T. and Felicia, M. F. (2013). The nature of SME co-operation and innovation: A multi-scalar and multi-dimensional analysis, *International Journal of Production Economics*, 141, 316-326.
- Porter, M. E. (1998). Clusters and the New Economics of Competition. *Harvard Business Review*, 77-90.
- Porter, M. E., & Stern, S. (2001). Innovation: Location matters. *Sloan Management Review*, 42(4), 28-36.
- Seggie, Steven H., David A. Griffith & Sandy D. Jap (2013). Passive and Active Opportunism in Interorganizational Exchange, *Journal of Marketing*, 77(6), 73-90
- Simatupang, T. M. & Sridharan, R. (2002). The collaborative supply chain. *International Journal of Logistics Management*, 13(1), 15-30.
- Storper M. (1997). *The Regional World: Territorial Development in a Global Economy*, NY: Guilford Press.
- Uyarra, E. (2010). What is evolutionary about 'regional systems of innovation? Implications for regional policy. *Journal of Evolutionary Economics*, 20(1), 115-137.
- Zaheer, A., Gözübüyük, R., & Milanov, H. (2010). It's the connections: The network perspective in interorganizational research. *Academy of Management Perspectives*, 24 (1): 62-77.