

Innovative Activities of a Logistics Company in the Global Value Chain

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Abstract Business model innovation brings new value and revenue to enterprises. For industries with competitive advantages, strengthening the value chain is an important matter. This study explores the workings of the logistics service providers in the bicycle industry in Taiwan who provide an innovative and integrated value chain to customers with new value propositions to create a win-win situation. The study found that logistics company understand the needs and problems of customers. They integrate upstream and downstream customers in the value chain and provide processing services for bicycle manufacturers. The logistics company play an extended machining service provider of upstream suppliers. The innovative business model shortens the lead time of key components from suppliers to bicycle manufacturers. Innovation has changed the old value chain model and has improved the service capabilities of the logistics company.

Keywords: *innovation, value proposition, global value chain, logistics company*

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1. Introduction

While facing competition and business environment changes, companies need to maintain competitiveness for sustainability. Innovation is one of the sources of competitiveness for business. Different industries use different types of innovation and need to consider both the internal and external environment to make innovation successful [1]. Monitoring external environment changes and customer demands helps companies reduce the uncertainty of decision-making [2]. Innovation depends not only on the enterprise's own capabilities, but also comes from the connection between both the upstream and downstream of the industrial value chain. The Taiwan bicycle industry's value chain, the A team, is an innovation system example by connection [3].

Taiwan's bicycle industry was under pressure from international competition and the manufacturing chain moved out [4]. Some companies introduced the Toyota production system to guide subsequent innovation and transformation of Taiwan's bicycle industry. The transformation comes from the formation of an industry A team [5]. In order to solve the difficulties of the bicycle manufacturers, market leaders invited parts and components manufacturers to join a cooperative organization named the A team [6,7]. The new cooperative helps industry members reduce inventory, shorten delivery time, and produce high value-added

products while building an international, high-quality image of Taiwan's bicycle production [5]. Logistics operators in the value chain also provide innovative and integrated services to customers. According to the integration of the value chain, the team integrates and supports domestic component suppliers to improve product quality and delivery service. Once team members had the ability to produce high value-added products, the organization dissolved in 2016 and converted to an association. Since then, team members that are already international companies have had to rely on their own efforts to compete globally [8]. Logistics companies continue to cooperate with bicycle companies to provide logistics for key components and import and export-related services.

The cooperative relationships between manufacturers are forged to develop future business opportunities [9]. In order to avoid low-cost competition from international competitors, the research and development (R&D) strategy of the team leans towards developing mid- to high-end products. [10] pointed out that: (1) labor quality or infrastructure, (2) domestic industry's demand for products or services provided by the industry, (3) the performance of related industries and supporting industries, and (4) enterprise organization and management systems affect the capability of industry to compete internationally. Since the establishment of the A team in Taiwan's bicycle industry, R&D and production capabilities have improved [6,7]. Except for a part of key components, most of the quality suppliers are located domestically.

The global production system is becoming more and more decentralized, and companies are trading with partners, suppliers, and customers around the world [11]. The integration of the value chain coordinates and organizes the output of manufacturing and service industries [12]. The relationship between enterprise value networks supports enterprises sustainability. Related literature also points to the theoretical development and importance of value chain governance structures [13,14] and network configurations [15].

Value chain integration allows for the internal and external competitive advantages to reorganize by coordinating and integrating service, information and financial streams to reduce operating costs and improve efficiency [16]. The value chain integration connects business processes between various enterprises and help create value for customers. To implement value chain integration, enterprises must consider the learning capabilities both inside and outside the value chain and the interaction between the global value chain and regional innovation systems [17]. Furthermore, how to integrate customer value to improve the effectiveness of a company is a topic worthy of discussion [18]. Previous research has gathered results on value chain integration and corporate performance and the impact of company absorptive capacity on innovation. However, research on actual cases is needed [2].

This study uses a case as an example to discuss how companies use value chain integration to provide innovation services and improve customer value. The research case being discussed is that of a logistics provider serving bicycle manufacturers in Taiwan. The processes and operations of this enterprise, used as an example, enables the integration of the value chain to fabricate an innovative operating model, which in turn induces specific performance and enhances competitiveness. The results of this study can provide a reference direction for enterprise value innovation.

The structure of this paper can be summarized as follows: Section 2 presents a literature review that presents prior research on value chain and business model innovation. Section 3 presents the research methodology. Section 4 presents the research results. Finally, a discussion of the results and the implications of the study are presented in Section 5.

2. Literature Review

2.1. Value Chain Integration and Servitization

[19] proposed a value chain that can analyze the competitive advantages of enterprises and find means to maximize business value. The value chain divides the enterprise's value activities into primary activities and supportive activities. Primary activities include inbound logistics, production, outbound logistics, marketing and sales, and services. Supportive activities refer to enterprise infrastructure, human resource management, technology, and procurement [19]. The value chain forms a sequentially linked value system for suppliers, partners,

and customers and shows the value created by the company's processes [20].

Value chain integration connects the internal and external core competitive advantages of enterprises by reorganizing the value chain [21]. The implementation of value chain integration is an enterprise strategy that coordinates and integrates activities in relation to products and service flows, and also integrates information flows and financial flows in order to reduce operating costs, improve efficiency, and generate revenue. The purpose of value chain integration is to connect business processes of the enterprise and create value for customers [18].

Value chain integration is the driving force behind sustainable business competitive advantage [22]. Considering the comparative advantage, manufacturers divide the value chain into several parts. The intermediate raw materials are imported from abroad, and after production, products are exported to other countries [23]. Industry leaders use varied supply chains and manage suppliers to meet their requirements for delivery, quality, and price [24]. Through collaboration and connection with the international value chain, enterprises facilitate knowledge exchange and learning and generate opportunities for innovation [17]. The polity of the value chain changes according to market demand and leads to improving market accessibility, upgrading manufacturing processes, transferring technology, and expanding the supplier market.

When companies want a link to the market, they have to be a part of the value chain and link with the market leader. Upgrading the value chain requires investment, participants, and involvement. The benefit of connecting and collaborating of enterprises is an upgrade to the value chain and an increase to the added value for companies [25]. Both productivity and cost efficiency are essential for companies to improve their value chain. Therefore, the upgrade includes repositioning the value chain, investment that enhances value-added activities such as strengthening the connection between the front-end and back-end of the value chain or diversification into new markets [26].

[27] proposed five elements of the value chain management model, where both speed and agility are important:

- The vision and strategy of value chain management.
- Process management.
- Collaboration and partnership.
- Information technology integration framework.
- Speed and agility.

From the perspective of the industry value chain, transactions are mainly influenced and managed by leading manufacturers. Leading manufacturers control resources and have market power. Therefore, understanding the business strategies and needs of leading companies and often providing services to them for establishing entry barriers and reducing risks, creates benefits for other companies [28].

There are several ways to upgrade value chains [29,30]:

- Process upgrade: Improving production processes such as reorganizing production systems or using new technology.
- Product upgrade: Building a complete production line.

- Supply chain upgrade: Backward linking with suppliers.
- Diversity of end customers: Upgrading in the end market.
- Link to new added value: Joining new value chains and/or upgrading the value chain.

These upgrades depend on the type of lead firm, supplier capabilities, and industry competition [31]. Service outsourcing often provides opportunities for professional suppliers to enter the value chain. This shows that service often increases the added value and contributes to the value chain. For example, financial services, logistics, and after-sales services have increased the importance of the automotive industry value chain. Leading manufacturers also create value from functional upgrades. For example, Taiwanese PC manufacturers conduct product development on behalf of buyers [31].

Manufacturing servitization research indicates that servitization is affected by both internal and external factors [32]. The leading internal factor is that the enterprise expands its scope to generate revenue and increase market share. External factors crop up from technological innovation, ICT utilization, and service modularization [33,34]. Modularization enables the standardization of services [31]. The main reasons for enterprises to adopt outsourcing strategies are cost reduction, economies of scale, and connections with network providers [34].

Services have contributions in value chain management. However, past research mainly discusses service process outsourcing, and rarely mentions adding value to the global value chain with services. However, this is a new business opportunity that companies invest in to increase productivity and make integrated decisions with suppliers and customers [35].

2.2. Business Model Innovation

When an enterprise improves an existing business model or introduces a new business model, there is an opportunity for business model innovation. Business model innovation is typically based on the change of the intra-value chain, for example, changing the source of revenue stream or channel activities. In addition to the business model innovation of intra-value chain activities, there is also a cross-value transformation [36].

[37] pointed out that in future business model research, the composition of the organizational structure will be an important factor. Therefore, research on business model innovation crosses the business level, and from the perspective of the overall value chain, will be a feasible development opportunity [38].

Internal and external environmental factors affect a company's innovation performance [1], and performance is also affected by industry issues [39]. [40] conducted a research survey on the development of the Hong Kong manufacturing innovation system and identified that the innovation of an enterprise is affected by its technological innovation capabilities. Understanding the needs of the market is essential for successful innovation activities [42]. In addition to this, combining innovations from external companies can help companies develop and improve their products, services, and processes [40].

Business model innovation needs to find feasible development opportunities besides that of its application, such as from the problem-oriented aspect, from the perspective of enterprise problem solving, for future expectations to generate alternative solutions and implement planning [43]. Businesses interact closely with customers, suppliers, and partners to innovate business models and have opportunities to expand [44], which may also affect the interaction of business networks.

Value proposition is at the core of business models and is a part of business strategy [45]. This means that companies give products and/or services to customers, and customers get benefits [46,47,48]. [47] proposed the value proposition canvas, including customer profile and value map, and mentioned that value proposition can differentiate a company from its competitors. Customer profile refers to understanding the jobs to be done by customers and the obstacles for customers to complete a task [47]. The gain is the source of unspoken desire or happiness. The value map is a list of the products and services that meet the task to solve customers' problems. The value concept creates benefits for customers, solves pain points, and helps customers complete tasks [47].

3. Research Methodology

This study uses a case study for empirical analysis. The method explores, describes, and explains the environment in which the case is located [48]. [49] mentioned that the purpose of the case study is to understand the real dynamics in a limited space, time period, and environment. This describes a specific reality [50] or process-tracing [51]. The case study is suitable for answering questions about how and why, mainly presenting a specific context of facts, without the need to control related factors and mainly focuses on current events and gets an insight into the real situation through interviews and direct observations of participants [48]. This research uses a single case that can provide specific insights into specific phenomena rather than provide superficial narratives [52]. The case study provides an exploratory understanding of the operation of and summarize the analysis into context and logic.

This study explores a bicycle logistics company by in-depth interviews on how to construct new value chains through innovative value propositions. The case of this innovative value chain is dominated by a logistics company, and so, this study will be conducted along the lines of a single case study. The interviewees are the person in charge of the logistics company and the managers.

4. Results and Discussion

4.1. Bicycle Industry Development

The Taiwan bicycle industry started after the end of World War II [53]. In the early days, domestic bicycle sales were the major market. To support the bicycle industry, the government encouraged domestic manufacturers to produce their own bicycles instead of imports. Bicycle

imports were regulated in 1951. Domestic bicycle manufacturers OEM were established in 1952 [53]. In the 1980s, the increase in global demand and the improvement of the quality and technology in the industry led to a sharp increase in Taiwan's bicycle exports [53]. As a result, Taiwan's bicycle exports have become substantial in the international market [54]. After 1990, China replaced Taiwan as the largest bicycle exporter by volume and was the major competitor. In the meantime, Taiwan's total export value increased [4]. This shows that the value of bicycles continued to grow. Facing global low-cost competition, bicycle manufacturers understood the importance of cooperation within the industry value chain. For example, companies can move orders to other companies in order to assist them in overcoming operational difficulties. In addition, bicycle manufacturers sponsored international cycling teams and participated in an international exhibition to learn user needs and latest technological development trends [4]. These informal interactions contribute to the cooperation between industrial networks and enterprises [55]. The specialization manufacturing of parts and components of the bicycle industry gains the benefits of economies of scale and is an industry-based competitive advantage in Taiwan [53].

OEM factories are the main drivers of developing the bicycle industry's value chain [54]. Furthermore, the standardization of bicycle components forms an embedded coordination that the same parts can be used by all OEM production lines. Standardization and specification of parts saves time in coordination and communication between suppliers and manufacturers [55]. The satellite system of the bicycle industry makes organic combinations of the upstream, middle, and downstream of the value chain activities, and strengthens the understanding between the OEM factories and parts manufacturers [4].

Except for key components, such as derailleurs, which are provided exclusively by Japanese manufacturers, most bicycle components can be developed and produced in Taiwan. The bicycle industry has formed cluster advantages and accounts for 80% of manufacturers located in the heart of Taiwan [5]. In order to maintain the production capacity of Taiwan's high-priced vehicle models, to differentiate from other countries' low price competition, to encourage innovation of parts, and to enhance the overall perceived quality and international competitiveness of Taiwan's bicycles, two leading companies, Giant and Merida, launched the A team to enhance bicycle manufacturing capacity and value [5]. In addition to this, the "Toyota Production System" was introduced in the bicycle supply chain [6]. The A team enhances members' willingness to learn and also forms a special collaborative network [8].

4.2. Industry Value Chain and Problems

The bicycle industry can be bifurcated into two parts: complete vehicles and spare parts. The supply chain includes movement upstream, midstream, and downstream. The upstream includes the frameset, handle, derailleur, and the brake system. The midstream is the assembly depot, and the downstream is the channel and market [56]. The value chain of Taiwan's bicycle industry is dominated by Giant and Merida. Other component

manufacturers, such as suppliers, provide companies manufacturing bicycles much needed parts.

The export price of Taiwan's low-and-mid priced bicycles was affected by low-cost competitors from Southeast Asia and China, and exports declined [57]. However, due to the efforts of the A team to strengthen the image of products, quality, and brand, the average unit price of bicycles exported from Taiwan has gradually increased. The export statistic shows that the demand for middle- and high-level bicycles has grown, and the average unit price has also increased. Using export data from the Taiwan Bicycle Association of 2018 as an example, the total number of bicycles exported increased by 6.72%, the export value increased by 11.36%, and the average unit price was \$ 668.42 [58].

The A team members did not include all suppliers that only work for manufacturers who show a willingness to cooperate [5]. This was different from the traditional supplier association. The A team members share the same goal that coordinate and cooperate to promote mutual knowledge sharing and learning [5]. The production quality and efficiency of leading manufacturers is affected by the quality of parts and components. Therefore, leading manufacturers must upgrade their supply systems. The cooperation of the A team promotes the creation and formation of new knowledge and motivates suppliers to develop standardization products [3]. By 2017, the members of the A team concluded that the tasks it was formed to do were completed, and the organization was dissolved [8]. Since then, leading manufacturers have developed their own products and collaborated with their own value system.

Bicycle manufacturers need to manufacture bicycle according to production plans and design, and deliver them on time to increase value proposition. When the bicycles are exported, the company can schedule and manage the delivery in advance. One of the bicycle manufacturer's problems is that the overseas key component suppliers are not members of the A team. Therefore, required components such as high-end derailleur need to be ordered from foreign manufacturers and paid for in advance. The interviewee pointed out that overseas suppliers supply customers globally and cannot provide services only as a domestic supplier. The upstream suppliers prepare for production after receiving the payment for the order. It takes about 120 days to manufacture and deliver products to Taiwanese manufacturers. The bicycle manufacturers need to respond to customer and market demands immediately and often increase the order amount to reduce the wait time from overseas suppliers. This also increases the inventory cost of bicycle manufacturers. However, the market needs change rapidly. The extra-ordered inventory may not be used for production because of a change in the bicycle production model. Thus inventory becomes sluggish and increases cost for manufacturers. The long lead time of the suppliers affects the financial flexibility of manufacturers and also affects their capability to respond to customer needs. This is painful for manufacturers.

For gains, this means that satisfying customer requirements, expectations, and the results may be surprising [47]. As an interviewee mentions, requirements and expectations of bicycle manufacturers primarily are to

obtain the requisite parts for product design and production successfully, to deliver the final product to customers on time, the flexibility of the company's cash flow, and the brand competitiveness.

4.3. Innovative Service Model

Domestic bicycle manufacturers often face difficulties like a long lead time and low financial flexibility. The logistics company in the bicycle industry proposed innovative service models to change the service value chain and the need for creating new value for their customers.

This solution is based on the logistics mechanism and advantages. The case study company is located in the free trade zone (FTZ) area in the heart of Taiwan that has been planned by the government. The area was approved by Executive Yuan and earmarked to facilitate the circulation of people, goods, finance, and technology, and to minimize restrictions on the movement of cross-border goods. [59] pointed out that a free trade port area is a tariff area. In this tariff area, all import and export tariffs and trade barriers can be eliminated.

The FTZ area reduces various obstacles to logistics, business flow, and human resource flow in the trans-national operations of business, enhances national competitiveness, and promotes economic development. The purpose of establishing the free trade port zone is to enhance competitive advantages of domestic manufacturers in the international market [60]. The innovative operation model of the FTZ is "in domestic as outside customs," combined with the "front store and back factory" and "seaport-airport combined transportation" to finish sales, logistics, and specification and collaboration of manufacturing value chain to reduce the company's transnational operating costs [61]. The case study company locates at the FTZ that is free of tax and integrate logistics services with the value chain. The company plays the role of not only a logistics service provider, but also is an extension of overseas suppliers in Taiwan.

The company integrated backward to overseas suppliers and process required products for customers in the FTZ area. In this way, the production, processing procedures, and delivery that the overseas supplier had to complete in the home country were transferred to the logistics company's FTZ in Taiwan for completion. The interviewee mention that the task of outsourcing the processing of parts and components is arranged by the case study company. Therefore, upstream suppliers only provide standard parts, and processing before delivery is done by the logistics company in the FTZ. The supply flow of parts has changed, and the operating procedures of the logistics company have also changed. The results showed that the lead time was shortened to 10 days. This also significantly reduced the inventory of bicycle manufacturers.

The advantage of the innovative service of a logistics company is that bicycle manufacturers can pay according to the number of parts ordered, and because the lead time is shortened, bicycle manufacturers do not need to prepare a large amount of inventory. Even the pressure on cash flow was significantly alleviated.

For upstream overseas suppliers, they only need to provide standard parts for products, saving time to process products. This approach is similar to the overseas supplier who is moving parts for processing and moving the warehouse to the FTZ in Taiwan. When the upstream supplier receives the order, the logistics company will perform processing and assembly in the FTZ, and then deliver the products to the bicycle manufacturers.

In this way, the overseas supplier's production efficiency and effectiveness improved. Overseas suppliers can track the demand of standard parts from the bicycle manufacturers' order and only need to regularly provide standard parts to logistics company. The new service model reduced the cost of overseas suppliers to respond to individual customer needs.

In addition to this, due to significant reduction in lead time, orders have grown steadily. According to previous studies, bicycle manufacturers would purchase the same products from different suppliers. Due to the shortened lead time, customer orders to the upstream suppliers increased. The upstream suppliers' market share increased significantly.

Because the bicycle manufacturers trusts the services of logistics company, the business volume of the bicycle export services has also grown significantly. By integrating the value chain, case study company improve the capability of services and solve the problems of bicycle manufacturers before and after production.

To sum up, the case study company understands that the market is changing rapidly, and bicycle manufacturers need to reduce key components inventory and order them in time, when needed. The innovative services of the case study company solve the problems of domestic bicycle manufacturers requiring more inventory, financial burden, and long lead time. Case study company integrate value chains to provide innovative services and create value for both upstream suppliers and bicycle manufacturers. The innovative services fit the customers need and forms the new value proposition of the case study company.

5. Conclusion

The goal of business model innovation is to create economic value. Therefore, identifying problems and co-creating value with stakeholders is the core of developing value propositions [46]. Customer-oriented innovation is a way of business innovation that solves customer problems and generates new value and creates business opportunities for enterprises [31,62]. This study found that innovative services from logistics company provide new value to the manufacturers in the Taiwan bicycle industry. This study uses the value proposition canvas as the blueprint to analyze the innovative services of customers and logistics company. This study provides a reference case of integrated strategies for manufacturers or logistics providers. By integrating and innovation strategies, companies could develop new value propositions for their customers. By addressing this topic, this study contributes to theory and practice.

Firstly, this study provides an example of the practical application of business model innovation in the bicycle industry. Business model innovation creates value for

enterprises and customers [37]. The study case integrates upstream suppliers and customers by extending logistics services. The new services create value for logistics company, upstream suppliers, and bicycle manufacturers. The logistics company not only provides logistics services but also extends the processing from upstream suppliers. The logistics company also integrates internally to provide innovative services. Because of the public infrastructure, case study company provide processing on behalf of upstream component suppliers to complete orders in the FTZ area. This approach is similar to the functional upgrade of the value chain mentioned by [31] and improve efficiency [16].

Secondly, the value proposition analysis helps to present the content of innovative services, including assisting customers to achieve their goals, reducing pain points, and increasing gains [43,46]. The bicycle industry is profitable in Taiwan. Although there are low-price competitions in the countries, mid- to high-end bicycles manufacturing in Taiwan still provide good value-added. Because the products have high value-added, bicycle manufacturers are willing to invest in new product development. Therefore, the demand for the key components is more-or-less stable. In this way, case study company also proposes new services from the point-of-view of customer needs to meet the needs of Taiwan's bicycle industry. In addition to this, logistics company have increased the flexibility of bicycle manufacturers in financial management through innovative services, and significantly shortened the delivery time of key components.

Thirdly, the logistics company has now developed as a solution provider to satisfy the needs of its upstream and downstream customers. When faced with international competition, the A team integrates the manufacturers' capabilities in R&D. This enhances the industry to differentiate itself from competitors and develop high-end products. The market value of the bicycle industry continues to grow. The case study company responds quickly to bicycle manufacturers' R&D and production needs. The manufacturers successfully complete their production schedule and export the products to the international market. The results are similar to [10] mentions about the global competitiveness that domestic company supports the demand for products or services of the industry.

Fourth, to form a stable demand for upstream customers. The upstream supplier sells products worldwide. In order to make upstream suppliers supply of parts stable, case study company has become their extended service warehouses. Upstream suppliers regularly provide standardized parts, and the processing is handed over to Taiwanese case study company. As such, upstream suppliers only need to manage special specification orders. Therefore, it shortens the delivery time, increases management effectiveness, and reduces costs by integrated the value chain [21]. The innovative services of the logistics industry help upstream suppliers save on the management cost of delivery. Further because the supply is stable and the delivery time is short, the manufacturers' orders are more concentrated on specific suppliers.

This study shows that the case study company provides new value propositions that integrate upstream suppliers

and customers and create immense value for the company. The company also solves the problems of long lead time, wait for key components, and financial liquidity. The integrated services build up the competitive advantages of case study company the result is similar to [22].

This study focuses on the manager's experience and practical practices. The following suggestions are made for future research:

1. This study does not mention the suppliers' perspective in the value chain. The decision-making process and considerations of supplier participation in the innovation value chain are worthy of future research and discussion.

2. This study uses qualitative methodology. The customer experience and viewpoints and the performance created after the integration of the value chain, if there is a quantitative research results, it will be more able to show the benefits of innovative value chain.

3. The A team is an important aspect to the bicycle industry value chain. Inter-personal relationships had an influence on the formation of A team. In the future, the impact of inter-personal relationships on integration and innovation of the value chain can be discussed.

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