Constructing the model of triumphantly laughing curve from the innovative networks: the case of Apple Inc.

Abstract

The innovation in business value-chain networks is critical to the sustainability of a corporation. However, such networks should not be limited or over-emphasized to certain components in business operation, such as R&D and brand marketing. Ignoring other components leads to the results of low margin of revenue and less awareness of customer demand. This study constructs the model of triumphantly laughing curve by adapting the concepts from two previous models (i.e. smiling curve and laughing curve) through the case inquiry and secondary information. The empirical model uses Apple Corporation as an example to verify its strategies by examining the five components within the value-chain and illustrates the values from customers and global partners. The results are directed to the successful integration of the five components. The evidences show the brand and product design of Apple are dedicated to the target customers. The flexibility of its value chain network enables Apple to lower its costs in product manufacturing and acquire advanced technologies. The implication of triumphantly laughing curve is thus introduced and required for further applications.

Keywords: Business model innovation, Triumphantly laughing curve; Innovative networks, Brand assets management

1. Introduction

The information industry in Taiwan is prosperous over the past 20 years for taking orders from famous electronic brands, such as Hewitt Packard (HP), Dell, Apple and Nokia, through different forms of product manufacturing (e.g. OEM, ODM, and OBM). To obtain sustainable competitive advantages, the section of product manufacturing has been shifted to Mainland China in order to lower cost and acquire productivity capacity to compete with business opponents in Korea. For example, Foxconn has acquired Chime Innolux and invested in Sharp panel section to compete with Samsung in terms of revenue, market penetration and technology. Acknowledging such emerging competitions, Stan Shih, the founder of Acer corp., proposed the model of smiling curve to encourage Taiwan's enterprises to strive for innovation design and brand asset management. Two biggest computer companies, Acer and Asus, have applied this concept and divided their companies into two major sections, one is dedicated to manufacturing outsourced to external companies and another is specified for managing brand assets. Such demeanor is believed to create more values to the company and its customers. However, their progress is still far behind the performance of Apple in terms of profit margin.

In recent years, big companies, such as IBM and Apple have invested large stakes in technology innovation and company brand, and developed a complete ecosystem through outsourcing with partners their product manufacturing and purchasing (Linden, Kraemer, & Dedrick, 2009). The products of Apple and 3M, originated from consumers' demand, have led the company to high growth rate in respect to the consumer market share and the number of company revenues (Teece, 1986). Hence, the components of Apple's innovative wheels are worth further exploring and thus become the scope of this research.

2. Literature Review

2.1 The Innovation of Value-Chain Network

Innovation is regarded as a driving force to the economic growth (Linden et al., 2009) and pivotal to the sustainability of a company (Prahalad & Krishnan, 2008). In a recently analysis by Innosight, the lifespans of S&P 500 companies are fading if they fail to hold a sustainable innovation (Foster, 2012). Most successful companies, such as 3M and IBM, continue to evoke innovation in their products and company culture (Zien & Buckler, 2003). The key factors to their success can be drawn to the strategies of value-chain innovation and brand asset management (BAM)(Hart & Milstein, 2003; Knox, 2002).

The key resources that a company can utilize are critical to the delivery of customer value, such as intellectual property, partner relationship and infrastructure, in order to innovate its business model (Lafley & Johnson, 2010). Afuah (2003) posted that the company's value-chain innovation can be gradually revealed by integrating the key elements of production, such as the key resources, information, and technologies, with the flexibility to

handle the dynamic operation. Through the cycle of this process, the company is described to achieve better competitive advantage and distinction from its competitors. The company's CEO is also required to routinely examine the level of customer satisfaction that customers expect from their products and thus grasp the value propositions to warrant for the future innovation (Chesbrough & Rosenbloom, 2002). The company can also expect for profits from long-term relationship with their customers through continuous refinement and high satisfaction towards their products/services. Kim and Mauborgne (2005) believe the construction of value-chain innovation is not only the simple product modification but also the requirement for achieving a long-term business model. The goal of value-chain innovation is not merely aimed for competition. Instead, it is targeted to create a new and competitive-free market through the value generation from both customer's and company's perspectives. Following the similar concept, Lafley and Johnson (2010) use the term "seizing the white space" to describe the unexplored market through innovation. In summary, the paths to value-chain innovation can be mainly illustrated in five different ways:

1. The company can redefine the target market to obtain a first mover advantage.
2. The company can reconstruct customers' recognition to obtain advantages from product innovation.
3. The company can increase its advantages by reconstruction of their value-chain and collaborative activities.
4. The company can create innovation through different combinations of products/services, such as adding more product functions, services, marketing position or transaction methods.
5. The company can achieve value innovation by introducing new technologies or improving service delivery.

2.2 The Value of Brand Assets Management

Brand is one of the key resources which is pivotal to the building of a good business model (Lafley & Johnson, 2010; Osterwalder & Pigneur, 2009). Urde (1994) considers brand as a critical strategic asset for a company. Brand is described to be a useful tool to create value and obtain competitive strategy for a company. Any brand-oriented company is expected to integrate the resources and activities to develop the brand equity (Aaker, 1991). The strategy of brand equity is not only created from creating and maintaining brand value, but also centered by integrating the company's vision, goal, culture, organization, and resource utilization and allocation. Distinctive from the perspectives of customer or market orientation, the company's marketing strategy and associated activities should focus on the brand image and ultimately reinforce the brand attributes and value.

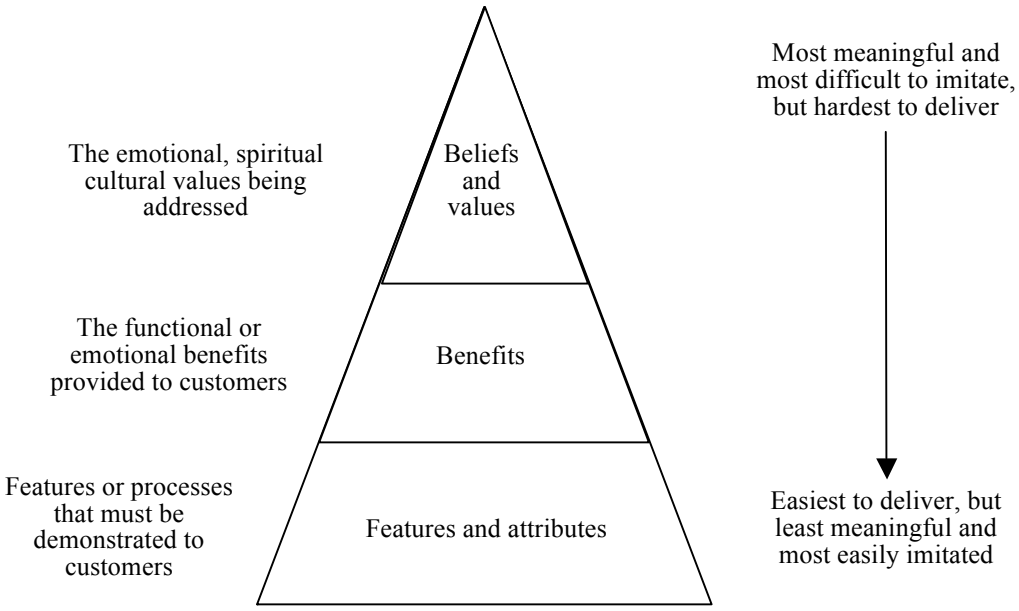

Figure 1. Brand Value Pyramid (source: Davis, 2000)

2.3 The Concept of Laughing Curve

The process of concept operationalization of smiling curve and laughing curve is briefly introduced and explained by its components. A firm's value chain activities are described to divide into three categories: the upstream (input), the downstream (output or market) and the middle (process) (Mudambi, 2008). The founder of Acer, Stan Shih, observed the information industry has transformed from seller market into buyer market during the period of 1990. Hence, he posited the notion that only the companies that hold the technology core and value-added services could survive from the market competition. The smiling curve theory, proposed by Shih in 1992, attempted to identify and analyze the most valuable segment within the process of industrial value-chain, which composed by the segments of research and development (R&D), component manufacturing, assembly, distribution, and customer service (Shih, 1996; Shin, Kraemer, & Dedrick, 2012). The upstream of intellectual property and R&D and the downstream of brand management in the value chain are found to be the most valuable segments within the manufacturing process. The value obtained from the mid-stream of this process is found to bear the lowest value in terms of barrier of market entry and level of substitution by competitors (see Figure 1).

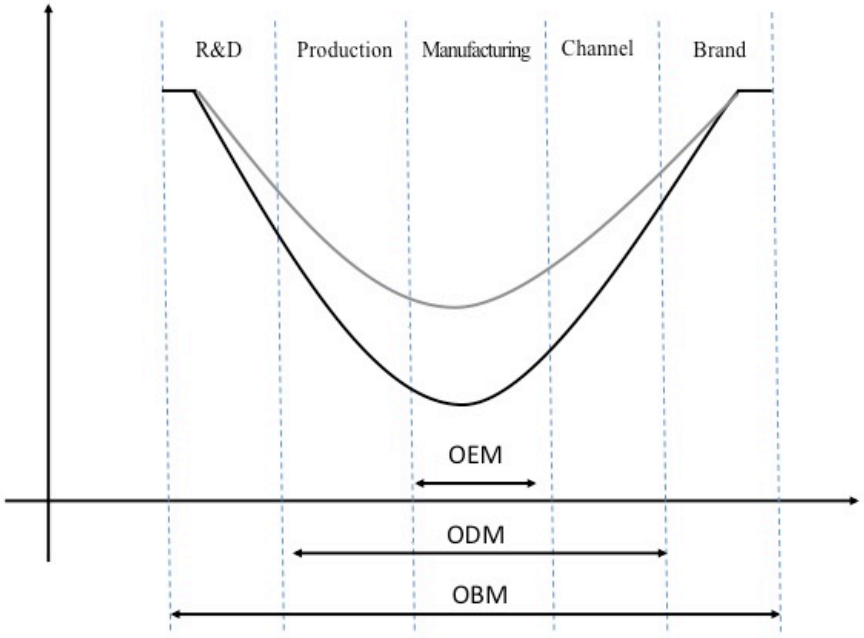

Figure 1. The models of smiling curve and laughing curve

King Liu, the founder of Giant manufacturing, considered the smiling curve should be modified based on facts that the level of manufacturing skills in Taiwan is equivalent to the level of world class. Although R&D and branding are still important, Liu thinks the efforts of manufacturing and production should not be ignored. The assumption of smiling curve should be modified if the efforts from both R&D and branding can be effectively connected with production and manufacturing process. If the relationship between value-chain structure and its components is illustrated as anti-parabolic line, the arc of the curve should be stretched or less bended (see Figure 1). In Giant's case, the contribution from manufacturing is initially less than from R&D and brand marketing respectively. However, after devoting new management process to improve the value of manufacturing, they can promote their products to a more profitable market segment. Hence, the application of Giant manufacturing proves the value chain of this industry is no longer applied to smiling curve and instead it should be more adapted to the theory of laughing curve.

3. Research Method

This research mainly applies qualitative method to construct the empirical framework of triumphantly laughing curve. The approach of inductive enquiry and interpretive reasoning is useful in helping the researchers to observe and explore the insights of research subjects and

gather information for further analyses (Travers, 2001). Case study, among a number of qualitative research methods, is a better option in collecting information and verifying the hypotheses around a single case (Eisenhardt, 1989). The outcome of a case study is expected to produce novel, testable and empirical results.

Apple, noted for its innovative culture and products, has not been thoroughly examined through case study except from innovation process (Teece, 1986). The method of collecting case information is mainly through secondary qualitative study. We collected and analyzes information from books, company reports and newspapers (ex. Digitimes) for the last five year (Isaacson, 2013). Adapting the concepts of smiling curve and laughing curve, we develop the model of triumphantly laughing curve. The model is then verified through inductive process by interviewing Apple's outsourcing partners in Taiwan and tracking the outcomes of its annual financial reports (ex. Apple.com).

4. The Case Analysis of Apple

Apple has emerged the concept of consumer center into their strategy of product life cycle. Apple initially designed their products derived from user experience and fully integrated with its own platform and application to create a complete mobile multimedia solution. This solution can be observed from the use of different mobile devices, such as smartphone (iPhone) and tablet (iPad). Apple's success has been devoted to the innovative business model derived from the vertical integration between brand marketing and product manufacturing.

The foundation of Apple brand is supported by large scale of consumer demand, which is further complemented by user-friendly interface, and anesthetics of design. The former reduces the information load and fear of new technology from consumers by means of a series of deduction principles. The applications of deduction principles are applied to simplify user interface and use of touch screen instead of using keyboard and mouse. The emphasis of design and aesthetic experiences further improve consumers' brand images with Apple and make consumers identify themselves to be a fashion savvy by using the products. Also, through the integration of value chain, different products (e.g. iPod, iPhone, iPad and recently iTV) and application platforms (e.g. iTune, App store and iBook) are interconnected and thus create a solid innovative business model.

Apple's strategy as a consumer device provider develops an innovative design by providing a touch screen to simplify user interface and fully integrate with its applications. Although the concept of using touch screen as user interface was not a new technology in mobile market, the scope of using a mobile phone had been redefined through such integration. From the perspective of hardware, Apple also outsourced the product manufacturing completely through the collaboration with different partners, which also create an innovative business model for original engineering manufacturing (OEM).

Apple extended its business from hardware to software by combining services from iTune with iPod devices to create a new service model of content aggregation. This integration of hardware and software can be duplicated to other multimedia products such as iPhone, iPad and their latest creation, the iTV. By doing so, it creates a common platform that delivers applications to personal and enterprise users and supports a payment mechanism (70% to app owners and 30% to Apple) that share revenues with authors or content providers in the global market. The advantage of being a global brand also gives Apple the upper hand to collaborate with marketers and telecommunication providers in various countries. The gap between Apple and other competitors can widen if more providers from different industries join the platform and further reduce the cost in global operation. For example, advertisers can take advantage of Apple's platform to increase the scale of market reach and customer segment. For individual users, the platform provides a good variety of apps to download to their own devices. Each user can have a highly customized device based on the functions and services derived from apps. The integration between apps download and device usage also generate another innovative pattern designed by Apple. Consumers are thrilled by the transformation of value chain and innovative business model from Apple. Media companies are able to take a free ride by joining Apple's platform because Apple has reconstructed the value chain from different industries, such as digital music, smartphone, and tablet.

4. 1 Using the indices of smiling curve to examine Apple's innovative business model

Apple propagates its core value to global consumers by emphasizing its personal style, innovative design, and brand image. The company's culture and customer communication is also illustrated from the use of its products and user experience. Apple's strategy to cultivate customer loyalty and to build global brand has brought a rapid growth to company's revenue. Hence, this research aims to use the components of smiling curve to illustrate the phenomenon of Apple's success by examining the components, such as R&D, production, manufacturing, channel and brand, as follows.

4.1. 1 R&D: continuous integration of product features

The success of Apple's product series can be attributed to Apple's fulfillment of user demand. Apple's engineers devote themselves to work on the integration of hardware and software to create an ideal user experience with their products. In 2007, Apple's mobile operation system (iOS) began to support multi-touch user interface, which allows users to interact with their devices by using fingers to slide, select, or control the system (or applications). Meanwhile, the connections between different applications allow users to navigate in an intuitive way. For example, if you receive a short message or a phone call, you can choose to save the information to your contact list or use the same information to return the call. In the design of hardware, Apple observed user experience from R&D laboratory and applied the key technology to match with consumer applications. For example, Apple's new

product, iPhone 4, has utilized several key technologies to adapt consumer demand to the use of mobile phones (Table 1).

Table 1. The value innovation of an iPhone

Feature	Solution	User experience
Redesign of antenna	Improve the signal reception	The natural position of holding a handset
Battery efficiency	Increase the standby time of a device	Mobile usage can be extended
Camera resolution	Increase the resolution to 8 million pixels	Better photo quality and video recording
Video sync (AirPlay)	Share images or video on different devices	Sharing and viewing with family or friends
Voice assistant (Siri)	Intelligent voice on demand	Control the device and information search by voice
Cloud service (iCloud)	Share or subscribe content from different platforms and deliver them to different devices	Enjoy content anytime and anywhere

4.1.2 Production: Introducing new technology into product and service platform

Apple has acquired numerous patents on the construction of its platforms, such as iTunes, Apple store and iBook store. Content providers can send their products and applications to the platform for users to download selected products and applications to their devices after payment. Apple then keeps 30% of the payment, while the rest is given to content providers. This service model also allows Apple to create a business that has no inventory and restocking costs; it provides a good implementation of the "long tail" theory (Anderson, 2006). Moreover, it provides a wide range of customer segments which not only service mass market but also fulfill the demand from a variety of consumer segment.

4.1.3 Manufacturing: Outsource manufacturing and supply-chain procurement to control the cost

Apple is a corporation that specializes in the integration of internal and external resources exclusive from its strategy of brand-oriented development. Unlike its competitors, Apple designs its core hardware component, including its A-series central processor unit (CPU) and operation system (OS), instead of paying licensing fees and buying from companies, such as Intel and Google. Apple has a complete value chain in manufacturing with big global suppliers, such as Samsung (i.e. chip OEM and display panel), Foxcom (i.e. assembly OEM). In a recent news, Apple was reported to sign a three-year deal with Taiwan

Semiconductor Manufacturing (TSMC) for its A-series chips (Wong, 2013). Apple's action is considered a strategy to lower cost. The large scale of market demand and production volume give Apple advantages in terms of shipment speeds and price negotiation with its suppliers. The cost advantage also gives Apple approximately 40% of profit margin, which is much higher than its competitors.

Marketing channel: the effective suppliers and global marketing system

Apple owns many retailers in major cities around the world, such as New York, Hong Kong, Taipei, Shanghai and Tokyo. It also implements cloud database technology to support electronic transactions in iTunes store, Apple store and iBooks store, and deploys an offline to online (O_2O) marketing system.

4.1.4. Channel: The delivery of customer experience

Apple recently unveiled two new iPhones, iPhone 5s and iPhone 5c. The launch of iPhone 5c in China aims to acquire large demand from China customers (Wakabayashi, Luk, Sherr, & Mozur, 2013). This strategy could be viewed as the demand shift from global customers to customers in certain regions, such as Asia market.

The competitive advantage of Apple is derived from using the right technology for consumer applications rather than from pursuing the leading technology for its products. The launch of Apple's iPad creates a new consumer segment external to the existing market segments for personal computer, laptop and sub-notebook. The introduction of iPad allows consumers to use more than 500,000 applications, browse the web, receive e-mail, read e-books, watch video, and play games all through a single mobile device. This market was initially engaged by Apple, who poses a high entry barrier for other following products and competitors.

4.1.5 Brand value: bridging a positive brand image to consumers

Davis (2002) constructed a framework of brand value pyramid to evaluate the brand image. Based on his assumption, the highest level of brand value is the belief and value that consumers derived from the certain brand. Hence, companies need to acquire the key position in consumers' mind by repositioning their brand towards existing or potential consumers. The value of brand image is evaluated by the acceptance of brand spirit by consumers as well as by the congruence between consumers' perception and needs. Apple designs its products through envisioning usage contexts and using this knowledge to engage consumers' emotions and experience. The products from Apple are not more advanced than other products in terms of technology and time to the market, yet Apple is the first company that successfully connects consumer usage contexts with its brand image. The combination of strong product beliefs and brand recognition allows Apple to introduce its products to global users and play a key role in promoting the value of innovation.

5. The construction of triumphantly laughing curve

Comparing the smiling curve proposed by Acer founder with the laughing curve mentioned by Giant, we found the two theories share the same interest in discussing the evaluation of value chain ranging from upstream (e.g. intellectual property and R&D) to middle stream (e.g. manufacturing) and downstream (customer service and brand marketing). The creation of value-added products and services is pivotal to the sustainable operation of a company. It is also a goal that every company needs to achieve in response to its resource allocation and strategic development.

The assumption of smiling curve and laughing curve considered the middle stage of manufacturing has the lowest value in the contribution to the company competitive advantage. On the other hand, the contributions from both ends of a spectrum, R&D and brand marketing, which are based on intensive competition, are regarded to have higher value to the company. Hence, it is necessary to have a thorough evaluation on the perspectives of manufacturing, brand marketing and R&D.

It is worth noting that manufacturing is cost-oriented and the performance of manufacturing mostly depends on the efficiency of production and high yield rate. The development manufacturing initially enjoys a rapid growth but eventually encounters a bottleneck in its phase of lifecycle. In contrast, the evaluation of brand marketing is price-oriented and the performance of brand is to evaluate the contribution of a brand to the company's marketing capability in revenue generation and pricing power. The success of a brand is depends on whether it is acknoledged by consumers in terms of product differentiation and brand recognition. The performance of R&D is market and technical-oriented and R&D is evaluated by its quality and technological innovation. Companies invest a large stake in R&D and professional workers. Doing so may increase the operational cost initially, but it may also give company's advantage to achieve sustainable growth in the long run. Hence, the theory of the laughing curve should not underestimate the potential growth of manufacturing. The section of low value derived from manufacturing can be improved by means of management methods and incrementally contributes to the consequences of R&D capabilities and brand cognition. This approach also helps companies to consolidate its core value in competition.

Instead of relying solely on consumer insight, the secret of Apple's product design is to acknowledge what consumers want in product usage. In addition, by simplifying the product categories, Apple helps consumers to connect the corporate's brand with their usage contexts. Apple launched a number of mobile devices (e.g. iPod, iPhone, iPad), desktop (e.g. iMac) and laptop (e.g. MacBook pro) to replace its original product lines (e.g. Power Book, iBook and PowerBook). The launch not only simplifies the efforts in brand marketing in terms of consumers' brand recognition and advocacy, but also brings a new lifestyle of technology consumption.

Apple does not manufacture their products themselves; instead, it powers its production lines by selecting OEM suppliers. The selection of suppliers is based on price and suppliers' skill capabilities. According to the supplier responsibility progress report, released by Apple, the 156 suppliers selected by Apple occupied 97% of its total expenses in global purchasing. Apple's global partners, including Intel, Broadcom, Samsung, Sony and Sanyo, are all international companies. The list of manufacturers for Apple consists of leading companies in respective industries (Table 2).

Table 2. The list of manufacturers for Apple products

Manufacturing for Apple	Suppliers
System assembly	Foxcom, Quanta, Pegatron, Inventec & Foxlink
Power supply	AcBel & Delta
Battery	DynaPack, Simplo & Amperex
Passive component	Darfon & Yageo
Peripheral component	USI, SDI & TXC
Touch panel	TPK, Wintek, AUO, Chimei & Panel
Magnesium die casting	Catcher & RiTeng
Printed circuit board (PCB)	Career Technology, Compeq, FLEXium, Nan-Ya, Tripod & Unimicron
LED	LiteOn
Packaging	CLC, CymMetrik, TaiYi

Although Apple did not manufacture their own products, they highly rely on the partnerships with suppliers, as they own the manufacturing capabilities and meet with the requirement of Apple. Apple has established a system to control and manage its global logistics and supply chain to ensure all configure to order (CTO), regardless of volume and location, will be delivered to their clients from participated suppliers. Hence, the warrant of on-time delivery means the order cycle time (OCT) in global logistics can be shorter, which also allows Apple to achieve a high penetration rate rapidly. Therefore, this study claims that by means of brand design, vertical integration and multidimensional innovations, Apple can add the value from IP and R&D (upstream) to manufacturing (middle stream), and service integration and brand marketing (downstream). This result shows that the effects of laughing curve, proposed by Giant, should be modified by promoting the capabilities of global logistics and supply chain management to support the assumptions of triumphantly laughing curve. The approach of the triumphantly laughing curve assumes that Apple controls the outsourcing costs of manufacturing, which produces more added value with respect to the

evaluations across different phases of design, production, manufacturing, marketing and brand proposed by smiling curve. Hence, the effects of the triumphantly laughing curve should add more value to the process than the smiling and the laughing curve (Figure 2).

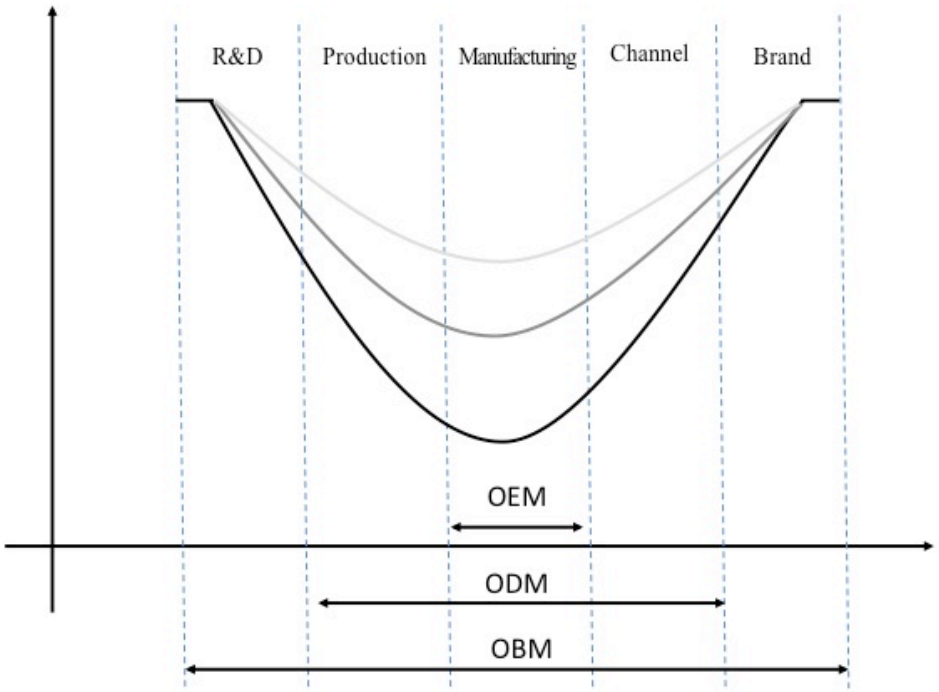

Figure 2. The model of triumphantly laughing curve

6. Conclusion

This study develops an empirical model of triumphantly laughing curve by adapting the models of the smiling curve and laughing curve. The model is further supported by using the Apple company as a prominent example to compare with the theories of the laughing curve. We found the performance of Apple company to exceed the expectations of the smiling and laughing curve in terms of innovative value and business model. Apple extracted their innovative value from different dimensions, such as technology, design, manufacturing, marketing, distribution channel, and brand marketing. As a result,, it generates more revenues from each dimension. Hence, we acknowledged this phenomenon and propose this concept as "triumphantly laughing curve" from the case of Apple.

Confronting with the dynamic challenges of digital convergence, Apple's strategy of integrating hardware, content and delivery platform, provides a good guideline for communication providers to create their own integration through strategic alliance. The

former CEO of Apple, Steve Jobs, anticipated the need to create innovative models in different dimensions, which forced Nokia to loose the dominant mobile market and made Hewitt Packard (HP) exit the computer market in what he called a post-PC arena. Apple rapidly acquired a high market share and accumulated brilliant financial revenues, putting pressure on leading companies such as Intel, Microsoft, Acer and Asus, to re-design their products and make the ground from a losing market.

Apple has created a multidimensional value system derived through innovative product design from consumer-centric, manufacturing from outsourcing, and brand marketing from owned channel, which are reflected to the core concept of triumphantly laughing curve. The empirical model of triumphantly laughing curve can provide valuable guidelines for managers to design their operational strategy and business models.

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