On the Main Challenges in Managing Innovation Across Supply Chains

Supply Chain Management Assessed Essay Question

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Introduction

In order for a firm to not be out-competed, let alone truly succeed, it must build synergies and innovate across supply chains to synthesise something that is greater than the sum of its parts. There are many ways to manage innovation, each bringing their own challenges. Within this essay, some of these challenges are explored, juxtaposed with established supply chain management theories, compared with practical examples, and critically analysed.

To begin, one must look at the meaning and the different kinds of innovation. In essence, innovation can be viewed as either a process or an outcome. As a process, innovation would entail the individual steps that are required for the generation of a new idea that would ultimately cause a change for the better and increase profits. On the contrary, innovation as an outcome would consider the effects of a new idea or change and how they can be used as a differentiator or sold. The potential outcomes can be categorised into process, product, paradigm, and position innovation; or the four Ps as is explained later.

Furthermore, innovation can come incrementally and have a smaller impact but are long term, or radically and have an immediately large impact. In fact, the nature of an innovation can depend on a firm's core competencies and if they are either largely preserved in the case of incremental innovation, or destroyed or requiring significant rework (Westland, 2008). Ultimately it is a question of how much risk a business is willing to take.

Innovation will almost certainly have an effect on the four Ps as previously mentioned. For the product, the goal is to increase its desirability to the end customer or a buyer on a lower tier in the supply chain. For the process, the innovation may manifest itself as an optimisation in the production of the product. For the position, a product may be targeted differently, and finally, for the paradigm the company may shift what they do completely, such as Tesco becoming a provider of financial services (Pilkington, Paton, Clegg, & Juliana, 2011).

Additionally, innovation may arise in a myriad of ways. Sometimes innovation is driven by planning and careful research (push), other times they are developed as a strong demand for them appears (pull), and sometimes they are completely accidental, such as the discovery of Penicillin. In any case however, innovation across the supply chain must be managed effectively and the challenges in doing so must not be taken lightly.

SCM Challenges and Critical Analysis

General

Depending on the nature of a corporation and the products they sell, it may be more focused on product differentiation than it is on cost leadership or vice versa to achieve competitive advantage. In fact, Porter himself originally claimed that the two are mutually exclusive (Porter, 1980). He mentions that if focus were split between the two, a company would end up having no clear direction at all.

In order to manage innovation across the supply chain however, both strategies have to be applied to a certain extent. Porter later revised his rationalisation after research has shown that not only are hybrid strategies successful, but they can outperform strategies with a single focus (Hambrick, 1983). Cost must be reduced as much as possible through the employment of tactics such as outsourcing, while the company makes sure that their core competencies, skills, differentiating factors, and to a certain degree, knowledge, remain within the company and are sustained.

Regarding outsourcing, the shifting of processes out to third parties who may be able to carry them out at a lower cost, it is clear that more and more companies choose to do so. Overall procurement brings in knowledge and technology that others can do better. While it is an excellent way to reduce costs and potentially increase efficiency, there are some towering issues that come in the way of innovation.

Take for instance the electronics industry; as consumer electronics get smaller and thinner, the manufacturing of microprocessors has become ridiculously difficult. It has reached a point where the designers of microprocessors are forced to contract manufacturing out to specialised fabrication plants where making a profit only becomes feasible if you produce by the millions. As a result of this, unless you are Intel or AMD and can afford the plants, somebody else is essentially producing the core product. This in itself is a huge barrier for entry, let alone competition. The end result is that you are left with an industry where giants reign and small fries are instantly crushed. There is no drive for innovation because there is no competition.

One must not ever make the to prematurely treat supplier as partners. Only if they are completely trusted should they not be held at arms length and dealt with as a separate business. Nowadays, large businesses tend to diversify once they have reached a certain size as specialisation has its limits. As a direct result of this, a business may be directly competing with one branch of a supplier firm, while simultaneously being supplied with a core part by another.

A recent example is Samsung and Apple. The Samsung Galaxy Phones and the Apple iPhone have been in what can only be described as a product war. One of the attacks made by Apple were on the legal front, enforcing patents and

intellectual property and taking Samsung to court over copying their design in countless ways. Samsung, a technology giant, is however also active building mobile processors and literally manufacture the processors that are inside iPhones. So to counter Apple, they have revised their contract such that after 2014 Apple will have to pay 20% more for their processors; clearly no trivial request. Although Apple disapproved it at first, they did not understand the power balance and could not find another supplier, thus forcing them to the blow of a 20% price increase on more than 200 million units in the past year and growing (MarketWatch, 2012).

How does this affect innovation management one might wonder. The answer is that a company like Apple puts a lot of money on research and development and if their supply chain is misanalysed and they put too much trust on what is essentially their enemy giving them more power, they will make less money and have less to retained profit to spend.

On the opposite side of the spectrum are companies that are not as involved in the technical side of products that suppliers provide. Either they are new to the industry and simply lack the knowledge, or are not required to have the knowledge in order to do what they do. This can be cured with time and research and a company can reach a point where they have a lot of connections and do not need to waste time on RFIs and can simply announce their specifications and hopefully have their requirements met as much as possible by a another company on the supply chain.

This is mirrored by the subsequent REQs which are characteristically 50 page documents that include all sorts of analysis, present exact, accurate details, specific time frames, and often consume months due to their complexity. Ideally in an industry where PLCs are short and innovation is rapid, constant and ongoing, the process of issuing REQs must be optimised especially if contracts only last for a short time.

It is essential that companies place more emphasis on procurement, as they already do, in order to ultimately increase their profits. Effective procurement can arm a business with very strong leverage. Profits, what is left when costs are subtracted from revenues, only slightly increase if production is increased. Alternatively, if costs are reduced, revenue increases proportionally. This was the case with Rolls Royce, where a 1% decrease in cost caused a 9% increase in profits.

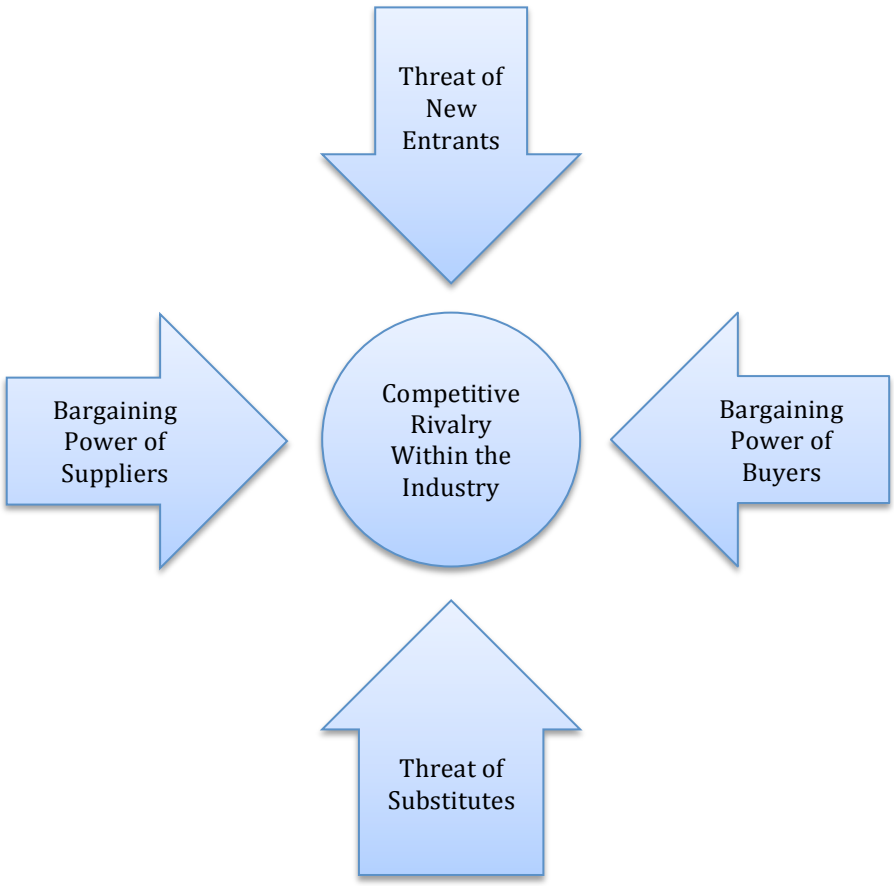
Another factor to take into consideration is that internal demand management directly affects innovation management. Different departments, such as Marketing and R&D, and even different individuals, such as the CEO, may have different needs when it comes to procurement. Each party can potentially damage the company through for example maverick buying (i.e. buying on impulse), fragmentation of spend (buying from many suppliers as opposed to focusing on a few), or not planning for potential changes in the specifications, over-specification, or early specification. It is beyond essential to reach the golden mean in those regards.

A prevalent model in operations management is that of the 4 Vs: Volume, Variety, Variation, and Visibility where each V is depicted as a continuum that can be anywhere between high and low.

The 4 Vs

The idea is that the more a company generally tends to the right, the more they strategies under a cost leadership framework, and in contrast, left corresponds to differentiation. Arguably, this model makes more sense than Porters earlier, traditional view as it recognises that the two strategies are not black and white and that companies are usually in the grey area between while at the same time distinguishing the two as opposite ends of the spectrum. It is however important to note that although different, they are both strong strategic driving forces behind innovation albeit with different motivations and goals and will most definitely affect a company's power profile.

On a related note, Porter did create one of the most widely known models in business used in strategic analysis as a more informative tool compared to mere SWOT analysis: "Porter's 5 Forces".



Porter's 5 Forces

Note that in it, buyers and suppliers are depicted as external forces that act inwards rather than an extension of employees and customers respectively. Similarly, it is essential to retain dominance over a supplier no matter how competent (although one should select the suppliers that are most competent of course).

As for the products themselves in a resource-based view, to innovate, one must make sure that they are valuable (to customers), rare (unique positioning), inimitable or imperfectly imitable (through intellectual property or simply making it hard to reverse engineer or copy), and finally, non-substitutable (Barney, 1991).

An example of a product that has successfully hit all characteristics is the diamond. Diamonds are made valuable and rare by controlling sales, they cannot be imitated without incurring more costs than revenue, and people don't want substitutes thanks to effective marketing that convinced them that any other gem is inferior. Difficulty of imitation alone is important enough to be considered a core competence (Prahalad & Hamel, 1990).

It is important to note however that intellectual property does not always act in favour of a business. Elon Musk, founder of SpaceX, said in an interview "We have essentially no patents in SpaceX. Our primary long-term competition is

in China" and "If we published patents, it would be farcical, because the Chinese would just use them as a recipe book" (Bhasin, 2012). In this case, the strategy is simply to keep all important information hidden.

Finally, a substantial method of promoting innovation internally is allowing and facilitating staff to innovate. This can be done by through allowing them to work in an environment that promotes experimentation and allows employees to present new ideas. Employees must feel empowered and valued and that their ideas can grow into something much larger. An example of this being done successfully comes from within Google, the corporation with probably the worlds best employer brand. Larry Page and Sergey Brin insist that their employees get one day a week to work on their own pet projects and a mailing list is available to anyone who wants to post a proposal. It is cultures like these that truly drive innovation.

Goods vs. Service Supply Chains

It is no coincidence that the tertiary sector has increase in size over the years and is often larger as a country is more developed. A concept worth reiterating when discussing the difference between goods and services is how the process of outsourcing differs between the two. When producing a physical product, one usually focuses on the production of parts and other physical products and less on services that are "supplied" such as logistics, distribution, and even areas such as customer support, which more and more companies contract out to specialist third parties.

Within the service sector though, outsourcing can be quite difficult with regard to the core service (i.e. not the procurement of office equipment and the like). The main issue is that the service sector needs to pay more attention to keeping their skills and differentiating factors within the company and not have them diffuse across the supply chain. As a matter of fact, research suggests that the concepts of innovation in manufacturing that are so historically prevalent are very difficult to apply to the service sector, and consequently, the quaternary sector spurred by the internet (Hipp & Grupp, 2005).

The most obvious disadvantage is the less effective utilisation of intellectual property as, within the service sector, imitation can happen almost instantly after launch. Furthermore there is, by definition, more emphasis on human capital and the skills, knowledge, and experience of employees which is not only easily lost, but lost to competitors if they have better employer branding or if proper precautions, such as making employees sign NDAs and confidentiality agreements, are not taken. Outsourcing can definitely make the problem worse and additionally damage a firm's reputation. They cannot take responsibility for employees of other companies, who will often have direct contact with their customers, such as when outsourcing customer service. Humans are inherently imperfect and cannot be simply fixed or replaced, as products can, without HR breathing down your neck and PR trying to convince everyone that you are not a slave driver.

As such, the service sector must ensure that core knowledge is kept and that no confidential information is leaked as the competition will then be able to very easily imitate the company and the company loses incentive to innovate. Additionally, an increase in efficiency and a lead-time advantage is equally effective and an increasingly prevalent strategy in managing intellectual property within the service sector (Päällysaho & Kuusisto, 2008).

Another characteristic that distinguishes the service sector from goods and manufacturing is that production and consumption are simultaneous. There is no storage as such and availability depends entirely on other factors such as the number of employees or even the capacity of a web server. There is no real manifestation of "Just In Time", unless physical goods are involved, as that simply is not how procurement works in the service sector. The ideals of Japanese car manufactures are very difficult to implement when it comes to services.

In services, customer orientation is key. It is imperative to understand, communicate with, empathise with, and show consideration for the customer, whilst de-risking their business (Van Looy, Gemmel, & Dierdonck, 2003). Nowadays customers often give feedback too and can be used as a source for new ideas.

Finally there is the juxtaposition of the lean and the agile supply chains. The lean supply chain focuses on predictions in demand (e.g. weather for coffee or wool hats) and will set their capacity to the mean demand (level capacity), adjust it accordingly (chase demand) or manage demand to match their capacity by means of marketing. It focuses on exactly what the customer wants at an optimised time, place, price, amount and quality, like the Toyota production system, JIT, etc. It focuses on pulling on requirement, and avoiding push to prevent waste, such as accumulation of goods (the bullwhip effect), which is discussed further down.

The agile supply chain is extremely responsive, timing critical, with reduced lead times, can efficiently scale operations, and customise products. In aggressiveness strategy, a company with an agile supply chain would most likely match the "Reactor" position as opposed to the lean "Analyser" position. The trick is avoiding uncertainty, which can be done in four ways that are pretty self-explanatory: Elimination, Compression, Integration, and Concurrency (Mason-Jones & Towill, 1999).

The first type tries to maximise efficiencies and forecast while the latter tries to maximise effectiveness and is demand driven. They can however overlap and the innovation process across the supply chain can be different depending on the "flavour" of the supply chain if you will. These lines up perfectly with the Push and Pull driven models of innovation and it is important for a company to recognise how they innovate as it will indicate to them how they should manage said innovation. At this point it is no longer surprising that companies in the industries of electronics or jet engine manufacturing make more money in after-sales services, or even just break even, than from the actual products they sell.

Mature vs. Emerging Industries

The main differences between mature and emerging industries include the rate of innovation, the number and nature of players, and a certain degree of volatility. The longer an industry exists, the more time companies have to grow eventually forming a select number of giants, like bubbles at the top of a shaken bottle. They either stop new competition form entering completely or remove them through mergers, acquisitions, or through out-matching them in hostility. Their reputations are well rooted and not on the line like in that of an emerging industry.

This begs the question that is competition is so essential for innovation, are the environments so commonly found in mature industries not countering the process? That may be true and government often have to intervene to prevent monopolies from forming as they bring other problems too, yet market leaders tend to pave the way for others to innovate too. An example of this is HP's stringent quality requirements for any that intends to enter its supply chain and its ISO 9000 accreditation being externally recognised. The argument can be made that the existence of market leaders is more likely to facilitate innovation as they naturally create industry standards that allow others to hit the ground running, without having to reinvent the wheel, while at the same time the market leader benefits from the power and benefits it reaps.

Buyer-Supplier Power Relations

When considering the significance of reputation, a company largely depends on being able to maintain dominance in the supply chain or at least reach a level of trust with which the advantages outweigh the risks. One such risk is the risk of lock in. As has previously been portrayed with the Apple-Samsung case, when a relationship exists that would clearly be classified as adversarial (Cox, 2001), leverage must be found through other means such as searching for substitutes. Doing so directly affects a company's share of the surplus value, for the better, which eventually translates into more cash to invest in innovation.

Similarly, relationships are not always business to businesses, but can also be business to consumer (and vice versa), and consumer to consumer (or "peer to peer") (Slack, Brandon-Jones, & Johnston, 2011). This is where effective use of technology as well as e-procurement plays an influential role. E-procurement inherently reduces search and transaction costs, but at the same time, phenomena such as maverick buying are reduced, for the same reasons explained earlier within this essay, and by allowing more competition in the supply market, innovation is irrepressible.

Furthermore, if scarcity, information (prevention of spying as a supplier but transparency towards customers), and utility are maintained, the power balance can be considered solidly favourable. This is also assuming a company analyses its competition and relative power prior to signing the contract since people might not keep promises even with a contract. One can take them to court

but the customers still need service and if they do not get it, the company's reputation may be irreversibly damaged. Another potential issue is that the market leader often indirectly sets prices yet collusion and price fixing (like with oil or electricity tariffs) are a definite possibility and can counteract a company's own drive to innovate.

Provided switching costs are low enough, if functional requirements are met by substitutes, power definitely increases. However, new entrants through low entry barriers jeopardise both supplier and buyer power for a firm especially if they do not respond in a hostile fashion buy acquiring them, merging with them, setting up a strong alliance, or economically destroying them. Barriers can be set up using intellectual property, branding/reputation in conjunction with customer loyalty, industrial connections, existing prolific distribution networks, skills, technology, high starting capital requirements, raw material requirements, capital limits, and the list goes on and on.

Conclusion

Ultimately, all these anti-competition strategies can be highlighted as dangerous for the reasons argued above. It is said that one needs approximately five competitors to achieve excellence in the marketplace. Usain Bolt, world's fastest person, stated that he would not be where he is if it were not for having the world's second fastest person as a training partner who also stated likewise. Thus, one can safely conclude that in order to manage innovation across supply chains, not only must the supply chains themselves be managed properly, but also a careful balance must be found both internally and externally.

End.

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