

COLLABORATION STRATEGY AS A MANAGEMENT OF TECHNOLOGICAL INNOVATION

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Abstract: Innovation is a beautiful thing. It unleashes a creative spirit, opening minds to hitherto undreamed of possibilities, while simultaneously accelerating economic growth. For industrial organizations, the primary engine is innovation which provides both exceptional opportunities and steep challenges. Technological innovation is the act of introducing a new device, method, or material for application to commercial or practical objectives. Collaboration strategy is one of type of technological innovation management which is approached as a strategic process. Firms are most likely to collaborate with customers, suppliers, competitor, and also with producers of complements. Collaboration used to progress from assessing the competitive dynamics of the situation, to strategy formulations and then strategy implications.

Keywords: Collaboration strategy; technological innovation; strategic management of technological innovation.

1. INTRODUCTION

In many industries technological innovation is now the most important driver of competitive success. Firm in a wide range of industries rely on products developed within the past five years for almost one-third or more of their sales and profits. The increasing importance of innovation is due in part to the globalization of markets and the advent of advanced technologies that enable more rapid product design and allow shorter production runs to be economically feasible. Foreign competition has put pressure on firms to continuously innovate in order to produce differentiated products and services. Introducing new products helps firms protect margins, while investing in process innovation helps firms lower their cost.

Most business companies nowadays are making collaboration with other companies to enhance the development of their business. Collaboration can often enable business to

achieve more, at a faster rate, and with less cost or risk than they can achieve alone. However, collaboration also often relinquishing some degree of control over development and some share of the expected rewards of innovation, plus it can expose the business to risk of malfeasance by its partners.

Collaboration can include partner with suppliers, customers, competitors, complementors, and organization that offer similar products. Each form of collaboration mode poses a different set of trade-offs in terms of speed, cost, control, potential for leveraging existing competencies, potential for developing new competencies, or potential for accessing another firm's competencies. Successful collaboration requires choosing partners that have both a resources fit and a strategic fit. Furthermore, it also requires developing clear and flexible monitoring and governance mechanisms to ensure that partners understand their rights and obligations. A firm should evaluate these trade-offs in formulating a collaboration strategy.

This study will examine collaboration strategies for technological innovation management, which had made a research on a Verizon Wireless Company. It will focus by looking at how the firm, Verizon Company, manages a collaboration strategy with other companies around the world such as Touch Tones, Ericson, Cisco and others.

1.1 PROBLEM STATEMENT

A number of factors will influence whether a firm chooses to collaborate on innovation. Some of the most important include whether the firm or a potential partner has the required capabilities or other resources, the degree to which collaboration would make proprietary technologies vulnerable to expropriation by a potential competitor, the importance the firm places on controlling the development process and any innovation produced, and the role of the development project in building the firm's own capabilities or permitting it to access another firm's capabilities.

1.2 OBJECTIVES OF THE STUDY

- i. To identify what are some advantages and disadvantages of collaborating on a development project.*
- ii. To examine how the mode of collaborating does influence the success of a collaboration strategy.*

2. LITERATURE REVIEW

Innovation is a practical implementation of an idea into a new device or process. Innovation can arise from many different sources. It can originate with individuals, as in the familiar image of the lone inventor or users who design solutions for their own needs. Innovation can

also come from the research efforts of universities, government laboratories and incubators, or private nonprofit organizations. Most innovative ideas do not become successful new product. Many studies suggest that only one out of several thousand ideas results in a successful new product (refer to Figure 1).

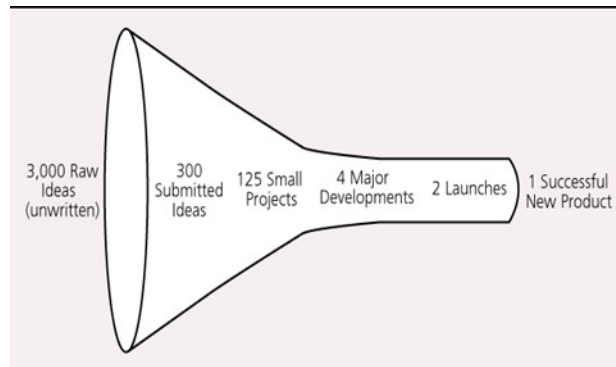


Figure 1. The Innovation Funnel

One primary engine of innovation is firms. Firms are well suited to innovation activities because they typically have greater resources than individuals and a management system to marshal those resources toward a collective purpose. Firms also face strong incentives to develop differentiating new products and services, which may give them an advantage over nonprofit or government-funded entities (Schilling, 2010).

Firms often form alliances with customers, suppliers, complementors, and even competitors to jointly work on an innovation project or to exchange information and other resources in pursuit of innovation. Complementors are organization or individuals that produce complementary goods, such as light bulbs for lamps, or DVD movies for DVD players. In some industries, firms produce a range of goods and the line between competitor and complementor can blur. For instance, Kodak competes with Fuji in both camera and film markets, yet Fuji's film is also a complement for Kodak's cameras and vice versa. This can make the relationships between firms very complex. Collaboration might occur in the form of alliances, participation in research consortia, licensing arrangements, contract research and development, joint ventures, and other arrangements. Firm may also collaborate with competitors and compelmentors.

Such collaborations include (but are not limited to) joint ventures, licensing and second-sourcing agreements, research associations, government-sponsored joint research programs, value-added networks for technical and scientific interchange, and informal networks. Collaborative research is especially important in high-technology sectors, where it is unlikely

that a single individual or organization will possess all of the resources and capabilities necessary to develop and implement a significant innovations (Hagedoorn, 2002).

As firms forge collaborative relationships, they weave a network of paths between them that can act as conduits for information and other resources. By providing member firms access to a wider range of information and other resources than individual firms possess, interfirm networks can enable firms to achieve much more than they could achieve individually. Thus, interfirm networks are an important engine of innovation. Furthermore, the structure of the network is likely to influence the flow of innovation and other resources through the network (Chesbrough, 2003).

3. METHOD OF STUDY

The study is based on a qualitative approach that serves of the following purposes (Leedly, 2005):

1. Description; data can reveal the nature of certain situation, settings, processes, relationship, systems, or people that related to the objectives of these study.
2. Interpretation; data enable to gain new insights about a particular phenomenon on micro-banking system and discover the problems that exist within that phenomenon.
3. Evaluation; data provide a means through which a researcher can judge the effectiveness of particular policies, practices, or innovations regarding the micro-banking system on developing SMEs.

Data collected by exploration that serves purposes of study as well. The exploratory phase search strategy usually comprises of the following (Cooper, 2011):

1. Discovery and analysis of secondary sources, that can be done through:
 - a) Published studies, usually focused on the result of surveys or on case studies featuring one or a few incidents
 - b) Document analysis
 - c) Retrieval of information from organization's databases
2. Group discussion with individuals involved with the problem or its possible solutions, including informal groups, as well as formal techniques such as focus group or brainstorming among student in the class of Strategic Management of Technological Innovation at Faculty of Technology Management and Technopreneuership _ UniversitiTeknikal Malaysia Melaka (UTeM).

The exploratory study begins with a literature search – a review of books as well as articles that relate to the problem statement. This review should include high-quality Web-published

materials. Exploratory study may save time and money. However exploration is sometimes linked to old biases about qualitative research such as subjectiveness, nonrepresentativeness, and nonsystematic design (Cooper, 2011).

4. FINDING AND DISCUSSION

A. *Product of Verizon Wireless Company*

Verizon Wireless is a mobile network operator in the United States. It had 108.7 million subscribers as of the end of 2011, the largest number of any wireless service provider in the United States. Headquartered in Basking Ridge, New Jersey, the company is a joint venture of U.S. telecommunications firm Verizon Communications and UK multinational mobile network operator Vodafone, with 55 and 45 percent ownership respectively. On January 9, 2009, Verizon Wireless acquired Alltel Wireless in a deal valued at \$28.1 billion. The acquisition expanded Verizon's wireless network.

The product of Verizon Wireless is 4G LTE. LTE, or Long Term Evolution, is the global standard for the fourth generation of mobile networks (4G) supported by all major players in the industry. The Verizon Wireless 4G LTE Mobile Broadband network, launched in December 2010, is the fastest, most advanced 4G network in the United States, providing speeds up to 10 times faster than Verizon Wireless 3G network. Verizon Wireless 4G LTE Mobile Broadband networks currently reaches one-third of all Americans, with plans to expand the network to the company's entire 3G coverage area over the next three years.

Facts about Verizon Wireless' fourth generation (4G) Long Term Evolution (LTE) network:

- Verizon Wireless was the first tier-one wireless provider in the world to build and operate a 4G LTE network – the most advanced wireless network technology available – and is currently the leader in 4G LTE, covering more people than any other network.
- Their 4G LTE network covers more than 200 million people in 203 markets across the United States.
- By the end of 2012 their 4G LTE network will cover 260 million people in more than 400 markets across the United States.
- They were named the “Fastest 4G Network Yet” by Popular Science’s 2011 Best of What’s New Awards and ranked No. 1 on PC World’s 100 Best Products of 2011.
- Their 4G LTE network supports a wide variety of 4G LTE-enabled devices ranging from Smartphone’s and tablets to netbooks, notebooks, modems and hotspots to machines.

LTE offers the capacity and the speed to handle a rapid increase in data traffic with close to 5 billion mobile broadband subscriptions in 2016. LTE also offers mobile users better coverage

as they travel by providing seamless handover and roaming for true mobility. LTE, the next generation of mobile communication technology, enables the fast transfer of huge amounts of data in an efficient and cost-effective way, optimizing the use of the frequency band.

B. Verizon Wireless Technology and It's Collaboration Strategies

In improving the management of technological innovation, some companies have been implementing various strategies that they wish to conduct to their companies in order to achieve the maximum level of success. In this strategic management, they may build various collaborations with other company to accept some beneficial knowledge and expertise from the other companies. Through these, they can improve their weakness by comparing and sharing various experiences and practicing the skills that they had gained together. Besides, collaboration strategies also help them to have competitive advantages by producing various innovation technologies with collaborative partners.

To explain this collaboration further, we had made a research on Verizon Wireless Company that also uses this collaboration strategy to bring their technological innovation reach each angle around the world. Verizon Wireless drives innovation through collaboration. Verizon created a growing ecosystem of a wide range of participating companies, all collaborating and innovating in an open, exciting environment. Each brings their unique expertise and commitment to creating innovative, market-driving products, services, and applications.

For this research there are several companies who have a part of the ecosystem from founding participant and premier participant in Verizon Wireless. Those companies are:

- **Touchtunes:** Verizon Wireless and TouchTunes Interactive Networks launches new products powered by Verizon Wireless 4G LTE Network, the largest interactive out-of-home entertainment network in North America. TouchTunes provides entertainment and marketing solutions to 50,000 bars and restaurants. Since TouchTunes introduced the world's first digital downloading, pay-per-play jukebox, the network has become the largest of its kind with close to 2 million songs played, on average, across the network every day. TouchTunes has a growing music library of more than three million licensed tracks, and delivered more than 900 million songs in 2011 alone. The company also provides TouchTunesTV, a unique, screen-within-a-screen interactive television experience that provides custom advertising capabilities, venue promotions and social networking opportunities.
- **Alcatel Lucent:** Verizon Wireless and Alcatel-Lucent Show Live 4G LTE Multi-Continent Gaming. Multi-player gaming, voice chat, video calls and real-time video streaming are the sorts of applications we will see more and more of as our 4G LTE network

continues to grow and expand. For the first time, mobile gamers can have a wireless broadband experience similar to what they have with a wired connection through the power of 4G LTE. Now, mobile gamers can experience fast, reliable high-speed broadband even if they are a passenger in a moving car.

- Ericsson: Verizon Wireless and Ericsson will demonstrate the future of wireless including:
 - a. Healthcare – a home-located patient with a medical emergency, a travelling nurse, a doctor at a clinic and a dispatch health-care coordinator using the capabilities of LTE as the wireless infrastructure to perform video and file collaboration in real time and live assistance from a doctor to help the home patient.
 - b. Field Service Technician - remote installation/support for resolving a parts failure by collaboration among a field technician using LTE connectivity, an expert at the headquarters and a dispatch coordinator, all using video and file collaboration to ensure rapid repairs are made on site.
 - c. Security - in-building security surveillance systems are interlinked via LTE to on-site and off-site security personnel using multiple devices with real time interaction with the building owner.
 - d. Remote Training/Education - a doctor is looking to setup an LTE enabled video training session with several remote supporting teams for a clinical trial.
 - e. Newscaster - a news wire service provides coverage through collaboration with the assignment editor, showing how LTE will allow camera crews sent to the news site to uplink stream HD video real time to the Show Producer.

Ericsson not only understands the technology to deliver LTE, but we also understand how consumers and businesses can utilize the technology. Their goal is to demonstrate true innovative solutions for the end user, not just applications.

- Cisco: Cisco and Verizon Wireless are working together to market new solutions for use on the Verizon Wireless 4G Long Term Evolution (LTE) network to facilitate a multidisciplinary, collaborative community with a goal of developing tomorrow's nontraditional products and services using the advanced broadband capabilities of the Verizon Wireless next-generation network. Cisco has developed several demonstrations of how LTE is changing the mobile Internet.
- Samsung: Samsung Mobile is collaborating with Verizon Wireless to help accelerate and revolutionize consumer electronics to deliver richer, more powerful user experiences

through LTE technology. As part of Verizon Wireless' LTE Innovation Center demonstrations, Samsung Mobile is showcasing new and emerging products, including digital picture frames, Mobile Internet Devices (MID) and digital cameras, which utilize practical applications through a connected multimedia ecosystem.

- **LiveEdge:** LiveEdge is the only wireless newsgathering solution approved for use on the Verizon Wireless 4G LTE network. The LiveEdge single stream solution over 4G LTE offers a combination of low latency and high quality that exceeds bonded solutions. Most importantly, bonding inherently results in degradation and delay as transmissions are disassembled into data packets, sent over whatever networks' paths are available and then reassembled. The LiveEdge design avoids these problems.

C. Advantages and Disadvantages of Collaborating on Project Development

Collaborating on development projects can offer a firm a number of advantages. *Firstly*, collaborating can enable a firm to obtain necessary skills or resources more quickly than developing them in-house (Su Han Chan, 1997). It is not unusual for a company to lack some of the complementary assets required to transform a body of technological knowledge into a commercial product. Given time, the company can develop such complementary assets internally. However, doing so extends cycle time. Instead, a company may be able to gain rapid access to important complementary assets by entering into strategic alliances or licensing arrangements.

Secondly, obtaining some of the necessary capabilities or resources from partner rather than building them in-house can help a firm reduce its assets commitment and enhance its flexibility. This can be particularly important in markets characterized by rapid technological change. High-speed technological change causes product markets to rapidly transform. Product life cycles shorten, and innovation becomes the primary driver of competition.

Thirdly, collaboration with partners can be important sources of learning for the firm. Close contact with other firms can facilitate both the transfer of knowledge between firms and the creation of new knowledge that individual firms could not have created alone. By pooling their technological resources and capabilities, firms may be able to expand their knowledge bases and do so more quickly than they could without collaboration.

Fourthly, one primary reason firms collaborate on a development project is to share the cost and risk of the project. This can be particularly important when a project is very expensive or its outcome highly uncertain. For example, utilizing Verizon Wireless' 4G LTE network, LiveEdge can significantly reduce broadcasters' operating expenses when compared to their

current use of microwave and satellite technology. It also creates new revenue-generating services by allowing broadcasters to remotely use their in-house production facilities to complement existing mobile production trucks.

However, not all such collaborations are successful. The firms may perceive no need to collaborate with other organizations –it may possess all the necessary capabilities and resources for a particular development project in-house. A firm might also choose to avoid collaboration when they already possess the necessary capabilities and other resources in-house, they are worried about protecting proprietary technologies at risk and controlling the development process, or they prefer to build capabilities in-house rather than access a partner firm's capabilities.

D. Mode of Collaboration Strategy

Collaboration arrangements can also take many forms, from very informal alliances to highly structured joint ventures or technology exchange agreements as licensing. The most common forms of collaboration arrangements used in technological innovation including:

- **Strategic alliances:** refers to a broad class of collaboration activities that may range from highly structure, such as joint ventures to informal. Strategic alliances can enable simple pooling of complementary resources for a particular project, or they may enable the transfer of capabilities between partners. The transfer of capabilities often requires extensive coordination and cooperation.
- **Joint venture:** is a partnership between firms that entails a significant equity investment and often results in the creation of a new separate entity. Joint ventures are usually designed to enable partners to share the costs and risks of a project, and they have great potential for pooling or transferring capabilities between firms.
- **Licensing:** involves the selling of rights to use a particular technology or other resources from a licensor to licensee. Licensing is a fast way of accessing (for the licensee) or leveraging (for the licensor) a technology, but offers little opportunity for the development of new capabilities.
- **Outsourcing:** enables a firm to rapidly access another firm's expertise, scale, or other advantages. Firm might outsource particular activities so that they can avoid the fixed asset commitment of performing those activities in-house. Outsourcing can give a firm more flexibility and enable it to focus on its core competencies.

Each form of collaboration mode poses a different set of trade-offs in terms of speed, cost, control, potential for accessing another firm's competencies. An organization should evaluate these trade-offs in formulating a collaboration strategy.

Verizon Wireless Company and his partner's joint venture, they are forming a strategic alliance aimed at accelerating the adoption of global machine-to-machine (M2M) deployments by simplifying the remote management and monitoring of devices spread across both European and United State networks. The alliance is designed to deliver a simple and effective international management solution for growing number of companies looking to use M2M wireless communications to enhance their customer service and create new service offerings in sector including energy, healthcare, automotive telematics, and consumer and commercial products.

At the same time, the initiative will make it easier for Verizon Wireless to centrally manage and control the process of rolling out M2M devices across many countries. This will increase implementation speeds and reduce the cost, complexity and risk traditionally associated with deploying such a projects. The alliances members will also work toward providing customers with a single invoice and a single point of contract for the technical and other support.

5. CONCLUSSION

Collaborative practice is now central to the way we work, deliver services and produce innovations. Collaboration generally refers to individuals or organizations 'working together' to address problems and deliver outcomes that are not easily or effectively achieved by working alone. Collaboration is not about making adjustments at the periphery; it is about systems change and as such participants are involved in a high-risk, high-stakes and volatile environment that can produce results significantly different from those originally intended. This requires a high level of trust and extensive dialogue between participants, however it can be highly rewarding for those willing to take the risks. For a collaboration to work there can no longer be 'business as usual'. Collaboration demands participants forge new relationships and learn new ways of dealing with each other. Participants realize that to achieve outcomes they have to agree to radically alter the way that they think, behave and operate.

Collaboration is characterized by strong and highly interdependent relationships. Collaborative relationships are attractive to organizations because the synergies realized by combining effort and expertise produce benefits greater than those achieved through individual effort. Each of these relationships has merit and usefulness. They should be viewed as complementary ways of achieving integration and joint working modes. The

challenge for practitioners is to match the type of joint working relationship with the identified purpose or required outcome of their project or program. If the goal is sharing information or expertise and adjusting actions, cooperative effort should be sufficient.

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