SME alliances with multinationals

The Keosan case: creating value through knowledge networks

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SME alliances with multinational distribution firms can be an effective source of R&D for the former. This article explores models of this new networking relationship between local suppliers and multinational firms to shed new light on the process of value creation through innovation. Using the case of a small Korean firm, Keosan, the author, finds that knowledge networks based on school ties and international networking among scientists and technicians can substantially reduce sunk costs, if not opportunity costs, of innovation. Reduced R&D costs also make it easy for multinational firms to renew their value delivery commitments with local suppliers.

Introduction

The typical “evolution concept” of a firm differs from strategic theories of value addition and creation. The former banks on the wishful thinking that the development of a firm resembles the process of biological evolution — that genetic progress continues, corresponding to mutants found in the overall genetic system.

But firm innovation is not a continuous effort; as the whole process of searching for a more efficient, and thus a more environmentally fit, mechanism of financing, production and marketing is consciously switched on or off by managerial will.1

The tendency of firms innovating and creating value resembles a natural selection process. However, since natural selection is not always congruent with rational decision making at a firm level, value creation studies must be able to provide mechanisms with which firms can move from primitive natural selection to advanced levels of rational decision making.

This article explores ways of changing the innovative behaviour of small and medium firms or enterprises (SMEs) by identifying typical behaviour patterns on the one hand, and providing a new means of maximizing rational decision-making about innovative behaviours on the other. Using a case study of an international company, Keosan, the author finds that small and medium firms can overcome difficulties of value addition and creation through innovation by reducing R&D costs. Knowledge networks based on school ties and international networking...
among scientists and technicians substantially reduce sunk costs, if not opportunity costs, of innovation.

A proper strategy of innovation for firms of any size should enable them to spend resources on innovation while profits roll in, not to turn on the innovation switch at the time of profit reduction. SMEs must realize that they are not in the market to maximize profits, but to maximize innovative activities in order to survive. The end result of survival is the ultimate value creation of SMEs. To engender survival, firms must realize the necessity to economize on unnecessary spending and profit sharing and thus commit ample resources to ongoing innovation. Ongoing innovation is value addition, and ultimately value creation through accumulating intangible assets.2,3

However, all SMEs face a Catch-22 situation. They can always be better off by not spending in R&D but emulate new products through outright imitation and copying. Simultaneously, they also face a new problem of intellectual property rights protection and enforcement, where zero spending in R&D will eventually drive a firm out of the market. Faced with these new conflicting changes in the market environment, SMEs that shifted strategies from emulation to active innovation can fall into the trap of overspending in innovative activities by allocating resources to new knowledge shopping, either through licensing of foreign technologies or through expanding networks of scientists and technicians who might participate in the firm’s innovative activities.

The spending habit resembles that of a compulsive shopper who believes that immediate need satisfaction can be justified by long-term value addition to the overall corporate asset. This is where the economic value of R&D investment and its psychological value clash. Psychologically, one firm can exhaust all its financial resources in R&D investment, in part because the competition pressures make CEOs expedite innovative processes within a firm, especially in an effort to lead the market by introducing new and better products. However, the depletion and exhaustion of resources will only jeopardize the firm’s financial standing in the market, especially in the eyes of key stakeholders, as it requires a relatively long time to harvest profits from R&D investments.

This conflict between rational and psychological value addition can be offset by several mechanisms that may deter overspending in the form of psychological indulgence without causing too much economizing on R&D investments.

One such mechanism in many successful SMEs is a sanguine control of the overspending urge by setting up what bargaining lawyers call “bright lines”.4 The idea that CEOs can always retreat back to a bright line from overspending can make them indulge in extravaganza briefly, while quickly retracting back to the bright line when their overspending does not pay off in short or mid-term returns.

One important requirement for this bright line is the existence of a group that dominates the SME in terms of value creation through marketing.2 This also means that CEOs of SMEs can actively organize marketing (or value delivery) networks outside of their firms, so that these external partners can remind the CEO of the bright line when R&D overspending is noticed. But this is possible only when both parties recognize the value of each other.5,6,7

This article illustrates how a particular SME organizes its value creation activities through R&D investments. Models of knowledge creation through school ties, friendship networks, and more global value creation networks, including multinational distributing firms, will shed new light on corporate value creation through innovation for SMEs. The rest of this article explores the theoretical background of value creation through networks and presents a case study.

Value creating networks
The three areas of “value” are (1) value definition, (2) value creation, and (3) value delivery.

Value definition involves vision and insights, which implies that it is not a simple mixture of rational decisions, but rather a chaotic process of intuitive brainstorming, with a psychological commitment to creativity and imagination.

Value creation is the actual execution of innovation, based on the value definition.

Finally, value delivery is an important process of brand positioning, pricing and distribution management.2 The final price of the delivered innovation is the realization of its future value.

However, in these three processes of value addition and creation, as I mentioned earlier, rational decision making models are not achieved in most corporate executive rooms. For example, value definition requires lots of insights that derive from intuition, instead of rational calculation. But imagination and intuition remain an individual capability at best, awaiting members’ support or rejection.8,9 In a similar vein, value creation, as I explained above, requires commitment to bright lines - i.e. a psychologically safe maximum of money that has to be delivered for value creation. However, even before the bright lines are set up, decision makers must have the will to allocate money for value creation to begin with, before they realize that they are spending too much on it. This will - to commit to and withdraw from R&D - is usually challenged by irrational behavioral anomalies.1

Finally, value delivery may involve carefully planned execution strategies of marketing, although no clear connection between value creation and value realization exists, except in rare cases of big business successes.

Most SMEs cannot achieve value creation unless their corporate buyers, often multinational firms, renew alliance commitments by appreciating the value of partner assets. At the same time, these multinational firms provide the supplier firm with an institutional means of formalizing a CEO’s value definition capabilities and the so-called blue lines for the value creation process.

Although this argument remains quite theoretical at best, other studies have found that the role of the differentiated network for multinational firms is becoming more important for value creation than ever before.10,11,12
Special Feature: Value Addition or Creation through Innovation

Figure 1: Value creation for SMEs

Differentiated networks enhance flexibility for local innovation and value creation without jeopardizing hierarchical control of local suppliers and subsidiaries.

A commonsense understanding of a strategic alliance with big firms for the purpose of value realization forces SMEs to limit value definition and creation. Indeed, this is what happens to most OEM contracts, where value definition has already been done by multinational firms, and value creation is closely monitored by the purchasing firm.

However, an alliance with a multinational firm with continuously innovating technologies that can be converted into future value can change the whole situation. As long as SMEs, as local suppliers of multinational corporations, can reduce sunk, if not opportunity, costs of R&D and continuously produce values through innovation, they can delimit the multinational firm’s domination.

Non-interference, however, is not a good sign, especially when aggressive R&D activities have to be warned against. This is particularly so when CEOs of SMEs are themselves scientists and/or engineers; because then no one from the internal hierarchy can provide warnings that they have to slow down. In this case, only a long-term external buyer with multinational firm networks can provide such warnings.

As I said earlier, a long-term commitment to value creation through innovation for SMEs must be subject to a condition that the value added or created must be recognized by the market. The key to this market recognition is value creation through R&D that does not incur dangerously high levels of internal costs of innovation. This is what demarcates SMEs from giant corporations that can spend large amounts of funds for targeted value creation.

The reduction of sunk costs of R&D depends on the availability of social capital that can generate intellectual capital through combining and exchanging activities. The structural dimension of social capital includes, among others, networks of scientists and engineers involved in the R&D activities. The cognitive dimension refers to the sharing of the same vision and language in the exchange of ideas toward innovation. The relational dimension includes social norms, trust, and institutions, all of which contribute to the formation of social capital and the exchange of valuable knowledge within a social capital network.

The presence of social capital in the market provides SMEs with opportunities of innovation, while combining and exchanging mechanisms allow them to realize innovation activities. Since R&D is organized under the principle of science and engineering, it is safe to assume that CEOs with science and technology backgrounds can have a higher chance of getting connected to the social capital network that espouses scientific and technological progress through innovation.

This is particularly the case when SMEs have no other resources of soliciting input from the social capital network. A scientist CEO has information on the most up-to-date knowledge and its exact location. In addition, once connected to holders of new knowledge, scientists can communicate with no major difficulty. Both strong (school friendships, for instance) and weak (friends’ friends, for instance) ties in countries like Japan and Korea, where relationships are taken very seriously in society, have proved very effective in bonding scientist CEOs and researchers together.

As shown in Figure 1, social capital is nurtured by the national innovation system, which actively organizes scientists and allocates funding for accepted projects. R&D facilities investments also come from the NIS resources. What is notable, however, is how an SME can benefit from the NIS by taking a “free ride” strategy, without any substantial investment in the NIS on the one hand or in their own private R&D institutions on the other. The systemic oversight of free riding is to allow the trickling down of innovative technologies to SMEs, as long as small firm CEOs can organize his or her own value creation network using his or her strong and weak ties with scientists and engineers in the NIS network. Here a special note that school ties and social ties are reciprocal and obligatory in Korea and Japan is warranted, because even weak ties are reinforced by the influence of strong ties.

Finally, the exploitation of foreign NIS networks is also possible, depend-
ing on a particular CEO’s networking capability. In this case, the value delivery network plays a role in bridging the gap between foreign NIS networks and a small firm CEO. The opposite is also possible, where a CEO’s exposure to foreign NIS networks leads to an international value delivery network.

The consequence of this network is ongoing value creation through innovation and value delivery through domestic and international alliances. Overspending in R&D is deterred by the bright line emanating from the value delivery network, whereas R&D idling is also discouraged by the same bright line that demands continuous value creation through innovation.

The value definition and creation networks continually grow as new sets of scientific knowledge are sought after for the innovation that is continuously promoted. Maintenance of the knowledge network requires material resources and further opportunities of organizing scientists in the NIS networks, although the total cost is not burdensome, because most scientists are hoping to gain ultimate material benefits only when a long-term value realization is achieved.

This non-myopic attitude is typical of scientist networks based on mutual trust and friendship. Offering participatory opportunities to the scientists drawn from existing NIS networks on the basis of strong and weak ties gives them enough motivation to be non-myopic and committed, especially when the value delivery network also renews commitment to the local value creation process.

All in all, value creation though innovation for SMEs is not possible without a comprehensive networking that involves knowledge network and value delivery network. These are necessary, on the one hand, to motivate small firm CEOs to commit to R&D activities for innovation and, on the other, to provide warnings of R&D overspending if a CEO over-commits to innovation activities.

Having explained the theoretical backgrounds of value addition and creation through innovation for SMEs, I now turn to an actual case study that bears close resemblance to the above theoretical model.

**The Keosan case**

Keosan Corporation is a leading knowledge-oriented firm in Korea in the areas of water purification and air filtering (Figure 2). Its focal fields being highly technology-intensive, the incorporation of the company itself required a CEO or at least a CTO to be highly knowledgeable in water and air technologies. Although Keosan was originally incorporated in the early 1980s, the lack of financing for R&D and the primitive knowledge basis made the company go under several times, until a proper knowledge network was established.

The installation of the current CEO of Keosan, Walter Kim, in 2003 enabled a new knowledge network that incorporated scientists and engineers from Korea, the USA and Japan, and the value delivery networks in the USA and Korea. This was possible, in part, because Walter Kim had a Ph.D. in science and had been active in developing water purification technology. In 2005, Keosan’s exports aggregated to $20 million.

Being a graduate of the Korea Institute of Science and Technology (KIST), a government institution for scientific research in Korea since the 1970s, Walter Kim had received ample training in the field of water treatment technologies. This meant that he could call upon a wide network of scientists in the field of chemistry and other engineering subjects through his mentor networks. Indeed, most of his mentoring professors at KIST came from US universities.

Those with a science Ph.D. in Korea usually have four career options: university professor and researcher; private firm researcher; government researcher; and venture firm founder. If any of these Ph.D. graduates create venture firms, it automatically means that he or she is connected to the other three groups of Ph.D.s. Walter Kim’s case was no exception, and he could exploit the social capital and facilities of the NIS network in Korea.

Also, his lifetime involvement in water research enabled him to build an international network of water scientists and engineers. The assistance he secured from the social capital and NIS facilities from the USA and Japan was colossal in developing new technologies for his firm.

Walter Kim’s science background made it easy to locate the social capital and the NIS that possessed the most advanced piece of knowledge in particular fields of his interests. His knowledge network motivated him to engage in R&D activities, although he sometimes overly committed to innovation and the exhaustion of his cash-based assets.

However, one clear benefit of this kind of knowledge network was the ability of the CEO to utilize his science
As a scientist himself, Walter Kim widely searched for advanced knowledge in science and found out that electrolysis methods can safely generate oxygen from normal water without causing high electric bills or emitting noise. Oxygen created through electrolysis was found to have much higher density and more purity (99.99 per cent) than those generated using both membrane (Japanese products) and PSA (US products) methods.

However, making oxygen melt in water first sounded like an impossible task, because oxygen refused to be dissolved in water at all. The insolvability of water is said to be so low that only 0.001 per cent of any amount of infused oxygen in water gets melted. Existing oxygenated water systems have less than 70 ppm of dissolved oxygen in water. Keosan’s Welxy aimed at generating 100 to 200 ppm of oxygen dissolution rates at much lower costs (Figure 3).

The secret of dissolving oxygen in water came from Keosan’s own laboratory. Lab director Kim Gil Jae and lab engineer Bae Gum Joo continuously pursued dissolving technology at the instruction of the CEO, who obtained basic nanotechnologies through his own research and from his network of scientists.

The key to the whole new innovation is the patented discovery that reducing the size of oxygen molecules to nanometres will generate enough force of oxygen molecules infused in water to cancel out the water surface tension. The Keosan R&D team found out that this method will increase the solubility of oxygen in water, and discovered that Welxy, with the combination of these two new pieces of technology in generating and dissolving oxygen, can produce oxygenated water of up to 200 ppm.

Keosan is now actively seeking ways to promote Welxy in the global market, as its capacity has proved to be superior to that of its competitors and it is cheaper in price. This time the value delivery network comprises Korean (for domestic markets) and Japanese (for international markets) distributing channels. This also implies that Keosan is now trying to diversify the value delivery system in order to match its product and technology diversification efforts.

**Conclusion**

Value addition and creation through innovation has rarely been discussed using case studies, because most studies on value creation dealt with financial matters of mergers and acquisition on the one hand, and market positioning in marketing strategies on the other. This study provided some theoretical insights on value creation, defined as the future value of a firm that can be realized only through committing, but within limits, to innovation. This article focused on possible organizational options for SMEs in creating value through innovation without overly committing to R&D spending and running the danger of exhausting their cash based assets.

In developing a model, I used a case study that clearly showed ways of reducing sunk, if not opportunity, costs of R&D and innovation for small and medium firms, where knowledge is scarce and resources for technological and production innovation are few and far between.

The core of the innovative strategy for SMEs is to exploit opportunities of knowledge sharing through networking with domestic and international R&D centres. Social capital within NIS networks that was based on norms of reciprocity and social obligation proved to be beneficial for SMEs that had access to such social capital through their CEO’s or CFO’s strong and weak ties. The initial commitment to value definition, creation, and delivery came from the CEO’s or CFO’s own visionary attachment to innovation.

However, organizing value delivery networks with multinational giant firms helped SMEs get involved in innovation to begin with, and yet control their impulse to get overly committed to R&D spending. The bright line with...
which both value delivery and value creation networks were satisfied was provided by the multinational firms themselves.

It was also noted that diversifying the value delivery networks with other multinational firms also proved to be effective in further reducing sunk costs of innovation and promoting corporate values through innovation.

In the case of Keosan, relatively small investments in R&D were possible through value definition and value delivery networks, although the frequency of product diversification and differentiation through technology innovation increased (Table 1). The corporate value measured in terms of total annual exports in 2005 amounted to $20 million, against total R&D, design, and tooling costs over the last five years of less than $2 million.

This supports the idea that value addition and creation can be achieved by SMEs, if they know how to exploit social capital in value definition, creation and delivery networks.

Future studies on this subject can build formal models of value creation through innovation, using samples of conservative corporations, where innovation is not actively pursued, and highly adventurous firms, where innovation is overly committed, so that the impact of social networks on innovation and value creation can be empirically observed.

References