

Partnerships for Optimizing Organizational Flexibility

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For the purpose of this conference, I was asked to discuss partnerships in general. We will first review the reasons that bring organizations to enter into a collaborative agreement, then provide examples of different types of partnerships, discuss some factors that seem to explain the success of partnerships, and review important points to consider before preparing for a partnership.

A Global Tendency

All the articles I have reviewed on this subject confirm that we are seeing an increasing number of partnerships today. Kumar, in his book on R&D consortia, provides the following reasons (Kumar and Magun, 1995):

Globalization of the world economy

Firms are becoming increasingly international, and to increase their competitiveness they are aggressively pursuing the acquisition of new technologies worldwide. Therefore, we are seeing an increasing number of mergers, joint ventures, consortia and technology acquisitions. Firms also need to overcome technical barriers to access foreign markets. An example of this is the work done on building codes and standards by Canadian research organizations in collaboration with Japanese scientists to increase the access of Canadian lumber to the Japanese market.

Greater role of government in shaping a nation's competitiveness

With the abolition of trade barriers, nations are relying more on technological innovation to increase their global competitiveness and are encouraging consortia. This trend is also explained by nations' perceptions that they are lagging behind other nations in key strategic technology, and it pushes governments to encourage R&D consortia (Potworoski, 1994).

Another trend that we are seeing, particularly in Canada, is that of major efforts toward deficit reduction and sound fiscal policies (Potworoski, 1994). What this means is that less government money is available to conduct research, and that governments are encouraging partnership with industry to leverage funding—all at the same time to increase the relevance of research as well as the dissemination of knowledge.

Technology trends

Products' life cycles are shorter, technologies are more sophisticated, and it is becoming increasingly expensive to undertake innovative R&D. Therefore, companies are seeking partnerships to reduce the cost of development, and the involvement of several research disciplines is often required to keep

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pace and solve sophisticated industrial problems (e.g., artificial vision in the wood industry).

Finally, another tendency that I have personally noticed recently, with the cutbacks in research funding, is the shift of several R&D firms, traditionally active in basic research, toward applied research and technology developments to increase their sources of funding. One example of this is Laval University, which has created a commercialization branch to market discoveries made in the university laboratories. Another example is the Centre de Recherche Industrielle du Quebec (CRIQ), which is now heavily involved in technology development after having revisited all its research priorities. With this trend, we are seeing more new research players in the forest sector. On the one hand, specialists in artificial vision are trying to better understand the needs of the forest industry in an attempt to find new applications for their technologies. On the other hand, the traditional forestry research organizations, more familiar with the forest industry problems, are trying to push their research projects a step further—i.e., into a new technological application. An example is acquiring expertise in other fields, such as artificial vision.

Perceived Disadvantages of Partnerships

Here is an illustration of some of the perceived disadvantages of partnerships, or comments that you often hear before entering into a partnership agreement:

- We may lose control of our project (loss of autonomy)
- We may have to share intellectual property (loss of exclusivity)
- We don't know their real objectives (question of trust)
- It will be time-consuming and costly to deal with another partner (loss of flexibility)
- Would we not be better off doing this ourselves!!!

Benefits of Partnerships

Each organization has its own views regarding R&D partnership. These depend on the culture of the organization, its capacity, the research field in which it is already involved, the field of research aimed at, etc. For example, academe and industry have always had symbiotic motives for collaborating. According to Sounder (1993), academe is a source for industry to keep up on developments, renew its idea-well and recruit new employees. Industry is a natural source of funding for academe's instructional and research programs; a means for academe to maintain its real-world relevance; and a source for faculty consulting work and student employment. Governments also have a natural interest in fostering collaborations that stimulate economic growth and ever-expanding employment opportunities. Firm-to-firm and academe-industry collaborations are perceived as one means for translating science into useful products and services that achieve these policy goals. Some of the reasons why organizations would consider partnership include the following:

- Sharing complementary expertise
- Reducing the duplication of research efforts

- Reducing cost of research
- Reducing cost of developing a new technology
- Sharing risk associated with an R&D project
- Gaining expertise in a new area
- Getting more direct access to a new technology

Type of Partnerships

Research partnerships may take many forms, based on the needs and desired objectives of the different partners. As Potworowski (1994) suggests, the models of partnership seem to be as varied as the partners themselves:

- some partnerships are essentially problem-driven;
- others aim at supporting a specific industry sector (Forintek-Laval agreement);
- others again are geared at developing and commercializing new technologies (CRIQ model); and
- some focus mainly on the advancement of knowledge or dissemination of knowledge (NCE).

One model of partnership aiming at supporting an industry sector is the Forintek-Laval agreement on small stem processing. By creating an official collaborative agreement with the university, Forintek can increase university research efforts in wood-related fields and contribute to the training of students. It also provides Forintek with a pool of researchers specialized in different research fields, who can work in the forest sector. Together, the two organizations can submit university/industry grant applications to granting organizations. So far, this arrangement has generated concrete results such as OPTITEK, which is a sawmill simulation software package.

Another example of partnerships aiming at commercializing technologies and increasing funding is the CRIQ model. Rather than selling a license for a new technology and obtaining royalties in exchange, CRIQ is now fostering joint ventures with equipment suppliers. To commercialize its technology and maximize the benefits, CRIQ creates a new joint venture company in which it becomes a partner. Its investment is limited to the value (patent) of the technology it puts in. As a partner in the new company, CRIQ has a say in the commercialization decisions. For example, it requests that both partners invest part of the profits on the technology back into R&D at the CRIQ to further develop the technology (second generation). By doing this with several technologies, they have been able to raise several million dollars for their laboratories.

A third model of partnership is the Networks of Centres of Excellence (NCE) on sustainable forest management, focusing more on the advancement of knowledge. It involves some 25 universities, 5 federal laboratories, 11 industries, and 7 other organizations. The objective is to develop forest management strategies for sustaining all forest-related values. It is described as a network of researchers and scientists across the country conducting world-class research in areas crucial to Canada's long term competitiveness. Some of the desired outcomes are to stimulate the production of leading-edge fundamental and long-term applied research, accelerate the exchange of research results, and develop strong university-industry partnerships to accelerate the dissemination of advanced technological knowledge to industry.

There are several other types of partnerships that could be illustrated, of which I provide a listing at the end of this paper for the benefit of the reader. These vary from the student project to the more sophisticated consortia.

What Works and What Does Not Work

Opinions vary a lot on what works and what does not, or on what are the key success factors for a successful partnership. On the one hand, some authors are saying that firms prefer to collaborate in basic research, while on the other hand certain authors contend that it is easier to collaborate in applied research. There are several such opinions that contradict one another in this regard. One model that I find interesting and that I would like to share with you is Sinha and Cusumano's (1991) model, which I feel provides good insight into the important factors to consider for successful partnership (figure 1). Their model explaining the probability of success of a partnership is represented by four quadrants. The vertical axis represents the expected benefits from research and the appropriability of technology or the proprietary benefits of technology. The horizontal axis represents complementary skills and resources.

According to Sinha and Cusumano, there is a high level of complementary skills in Quadrant I and resources there are high proprietary benefits, such as in projects relatively close to commercial applications with clear and focused topics. A partnership in this quadrant requires few or no outside incentives because the technology has a higher value. In this quadrant, a vertical type of partnership involving supplier and user of technology has better chances of success (R&D organization, the equipment supplier, and the industry). In contrast, a horizontal model of partnership often fails here because competing companies will be cautious about revealing sensitive company knowledge due to the high value of the technology.

Quadrant II includes projects with high complementarity of skills and resources, but low expected proprietary benefits of research. Here, one finds projects involving basic but relatively focused and well-defined research, such as on the development of a manufacturing process; or one finds applied research, but on subjects for which patents would be difficult or unwise to obtain because the technology involved is difficult to specify precisely or because firms feel little need to protect it. Firms may need little incentive to collaborate, contrary to research in Quadrant I.

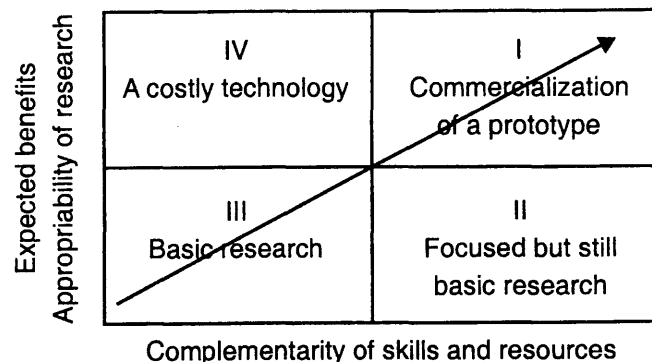


Figure 1—Probability of success of a partnership.

In Quadrant III, one finds projects with low complementarity of skills and resources and low proprietary benefits. Most of the basic research or research focusing on the advancement of knowledge would fall into this category. However, the authors do not suggest that collaboration is less successful here. On the contrary, this is where most organizations will prefer to collaborate, since competition is smaller. However, projects in this quadrant will need more incentive and stronger coordination efforts to succeed. The formation of successful alliances depends more on the attitudes and commitment of the individuals participating, and it is easier to lose track of objectives, considering the type of research involved. Collaboration here is more qualified as horizontal, where organizations with similar expertise will be less reluctant to collaborate. Based upon the results, the authors concluded that strong commitments, strong decision controls, a strong charter, and systematic management processes were very closely associated with R&D consortia effectiveness.

Quadrant IV includes large expected benefits from R&D but low complementarity of skills and resources. It is suggested here that firms cooperate for monetary reasons, i.e., combining financial resources to fund the development of a costly but promising new product or process. High-tech research consortia encouraged by government probably fall into this quadrant, where you have competing firms collaborating to develop a new technology.

There is much more that could be said about partnership. There were several authors that also had good suggestions about key success factors for successful collaboration. Here are some recommendations on how to prepare for partnership:

- Conduct an internal study of your own strengths and weaknesses relative to the long-range business targets.
- Be clear about why you are joining, because you may lose sight of your objectives when other partners with different culture, priorities, and approval processes get involved.
- Undertake a search for the suitable partner after defining your objectives, rather than the reverse.
- Take the time to explore all possibilities before committing to any joint partner.
- Look for complementarity of skills and resources; otherwise be ready to spend more efforts on coordination.
- Do not get into a partnership if you are not totally sure of what you are expecting from it.
- Do not discard a partnership too fast because it may increase probability of success of a project beyond that of you doing it alone.

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Appendix 1: Types of Collaborative Agreements (Sunder 1993)

Informal types of collaborations

Student projects
Interest groups
Study committees
Ad hoc forums
Advisory boards
Discussion groups
Consultation between parties
Information sharing networks

Examples of semi-formal types of collaborations

Equipment sharing
Fellowships
Consulting agreements
Field site agreements
Patron saint arrangements
Industry committees
Standards committees
Seminars and training courses
Release-time sabbaticals
Gentlemen's agreements
Joint bidding agreements
Co-production agreements
Cooperative grants

Examples of formal types of collaborations

Industry adjunct professorships
Cooperative educational programs
Direct sponsorships
Patent pools
Sharing of intellectual property
Joint R&D arrangements
Incubator facilities
Technology licensing programs
Industrial affiliates programs
Endowed research centres
Endowed chairs and professorships
Cooperative instructional programs
Industrial fellowships
University extension services
Science parks and centres
NSF Engineering Research Centres
NSF Science and Technology Centres
Industry-University Collaborative Research Centres

Popular multi-firm types of consortia

Trade or industry association
Industrial R&D institute
University research centre
R&D limited partnership
Industrial development cooperative
The basic research consortium