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COLLABORATION BETWEEN TECHNOLOGY ENTREPRENEURS AND LARGE CORPORATIONS: KEY DESIGN AND MANAGEMENT ISSUES

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ABSTRACT

The 1990's witnessed an explosive growth in strategic alliance activity. Today, strategic alliances are a central element in the growth strategies of technology entrepreneurs and emerging technology companies. In many instances, these alliances involve a large corporate partner. This phenomenon has been accelerated by the explosion in corporate venturing activity in recent years. On a conceptual level, alliances between small entrepreneurial firms and large corporations can provide significant benefits to both parties. A small technology company can leverage the research, manufacturing, marketing and financial resources of the large partner while the latter can tap into the innovative capacity of the smaller partner. On a practical level, however these alliances pose some significant design and management challenges. This article examines these challenges and outlines actions that the technology entrepreneur can take to respond to them.

INTRODUCTION

In all high-technology sectors, small firms are investigating, negotiating and forming alliances in record numbers. Their ability to develop and execute these collaborative strategies has become a key determinant of survival, growth and profitability in an increasingly complex, uncertain and rapidly changing business environment.

In recent years, a growing number of small technology companies have been engaging in alliances with large corporate partners. This trend has been accelerated by the rapid increase in corporate venturing activity (e.g. Intel, Siemens, IBM, Panasonic, etc.). Using one of the most widely recognized definitions, an alliance is:

> *a formal and mutually agreed commercial collaboration between companies. The partners pool, exchange or integrate specific business resources for mutual gain. Yet the partners remain separate businesses (Lewis, 1990).*

Collaboration with large partners ranges from informal cooperative agreements and joint projects to more formal arrangements (e.g. licensing, distribution agreements, joint procurement, new product development, R&D, etc.). When equity investment is involved, it can range from minority shareholding to a full-scale joint venture.

Surveys show that executives of small technology companies are acutely aware of the need to partner:

- Almost 90% of executives from small information technology companies believe that alliances will be critical in their future business strategies (Kelly & Schaan, 1996).
- Among future alternative strategies, biotechnology industry executives assigned top priority to the formation of alliances. (Coopers & Lybrand, 1998).

This paper examines the importance of alliances from the perspective of the small entrepreneurial technology company, typically employing less than 50 employees. It focuses on the unique benefits and managerial challenges inherent in collaborative arrangements with large partners.

WHY SMALL TECHONOLOGY FIRMS & LARGE FIRMS ENTER ALLIANCES?

Alliance Benefits to Small Technology Firms

Small companies face significant hurdles to commercializing their early-stage technology or products. Roadblocks are numerous but significant ones include access to resources or capabilities such as capital, manufacturing and marketing skills, distribution channels, etc. A key challenge is to develop a new product or service while simultaneously generating enough capital to keep a business afloat, either by selling product or accessing other sources of financing. Many fail this challenge. It is estimated that 85 percent of start-up companies fail in their first five years. Highly innovative products never make it to potential customers because of the principals' inability to fill out the needed infrastructure and access marketing, distribution and financial resources (Botkin & Matthews, 1992). A partnership with a large corporation can improve not only the financial position and reputation of the small firm, but can also substantially strengthen its business system in areas of research and development (R&D), manufacturing, marketing and distribution. Table 1 summarizes from the literature about alliances, some the benefits that may accrue to small technology companies when they collaborate with large firms.

A major reason for a smaller high-technology firm to enter into a strategic alliance with a larger firm is to quickly take its technology through commercialization in order to pre-empt the competition and/or avoid obsolescence. Expanding the market coverage is a natural strategy and partnering with a larger organization with resources allows the small firm to see products through to commercialization. According to a manager of a small software company, allying with larger firms is the key to ensuring that her organization has a future (McFarland, 1995).

A good example of the benefits derived from partnerships with larger partners is Juniper Networks; a young U.S.-based company focused on the development and delivery of high performance networking products for the growing Internet market. Juniper's technology is directed at the heart of Cisco in the Internet core. In 1998 it partnered with Ericsson, Nortel, 3Com, the Siemens/Newbridge alliance, UUNET Technologies Inc, Lucent, and ATT

Ventures. For Juniper this represents a partnership with companies that collectively represent more that $75 billion in annual sales to virtually every major networking customer. The relationship provides a foundation for the delivery of Juniper's technology around the world. In return, corporate investors are able to integrate Juniper's leading edge technology with their existing product lines and services worldwide.

Table 1: Potential benefits of alliances with large firms

Activity	Benefits
Financing	• Access financial resources-equity, royalties, R&D funding, etc. • Reduce costs
R&D/ New product development	• Utilize market intelligence • Access to extensive publications library • Obtain technological insights • Leverage core competencies • Access complementary technologies • Access to labs and test facilities
Manufacturing	• Receive manufacturing knowledge and capabilities • Capitalize on component purchasing power • Access Quality assurance capabilities
Marketing/ Distribution	• Improve market access (distribution channels, global networks) • Access and established and loyal customer base • Acquire market research and personal insights • Reduce cycle time • Increase credibility • Ties to a partner capable of driving industry standards
Legal/ Regulatory	• Advice on regulatory or patent approvals
Service/ Support	• Establish warranty, service and customer support procedures
Reputation	• Exploit "halo effect" that comes from large company's endorsement

Small technology firms like Juniper Networks, facing time pressures and financial considerations which can often preclude the creation of value chain infrastructure by an individual company, build their strategies around a business model centered on alliances. Many small information technology (IT) companies, for instance, are focused on a key software-based or ingredient technology that the company controls. Using alliances to outsource non-mission critical aspects such as hardware elements, sales and support, they can aim internal efforts at improving their product offerings while creating the infrastructure to be competitive.

In the biotechnology sector emerging companies have realized that their ability to finance and create the infrastructure to be a fully integrated pharmaceutical company is virtually impossible. Instead, many of these companies focus their efforts on basic research and develop alliances with larger firms to handle testing, clinical trials, manufacturing, sales and distribution. This permits them to stay lean while leveraging and complementing their capabilities and reducing their time to market.

A report for BIOTECanada found that the major reasons that Canadian biotech companies enter alliances is for access to money and markets (Coopers & Lybrand, 1998). It has been estimated, for example, that in 1998 over 60 percent of the financing for biotech companies came from collaborations with big pharmaceutical companies (Zegera, 1999). These partnerships allow biotech companies to increase revenues and reduce risks while perfecting their particular areas of expertise. They can also be an important source of credibility. Small companies can point to their collaborations as visible validation of the technology and products making it easier to attract traditional venture capital financing.

A good example of how small companies in the biopharmaceutical industry can use alliances with large partners to fill out needed infrastructure is the relationship between Vancouver-based QuadraLogics Technologies (QLT) and American Cyanamid. In the late 1980s, QLT had patents on a number of promising drugs including Photofrin, a light activated drug that can be used in the treatment of cancers The company had an excellent science base and the ability to develop further products in the area of photodynamic technology. In order to make significant profits from their scientific research, the company's founders recognized that they needed access to a range of complementary resources including clinical research capability, production facilities, management of the regulatory process and marketing and sales capabilities (Callahan, 1990). They also realized that the company had neither the time nor resources to develop these capabilities internally. Through its partnership with American Cyanamid, at the time a $4.6 billion company with a $ 365 million research budget and strong experience in the area of anticancer drugs, QLT was able to access many of the competencies it lacked. Cyanamid also invested $15 million into QLT for a 16% equity position

Alliance Benefits to Large Firms

Clearly, alliances between small and large firms occur because significant benefits can accrue to the larger partner as well. A major reason for partnering with small technology companies is that it can help large firms stay at the forefront of innovation. Competition in all high-technology sectors requires ongoing innovation to stay ahead of rivals. The continuous building and renewing of capabilities is the only path to sustained advantage. In order to improve competitive position, large companies leverage internal developments with initiatives such as the promotion of intrapreneurship, skunk works, spin-offs and acquisitions. They also use alliances with small companies as a means of accessing innovation and innovative capabilities. There is growing evidence that:

- Small technology firms appear to exhibit higher rates of innovation than large firms do (Gilman and Siczek, 1985).
- The products developed by small firms tend to be more innovative than those resulting from efforts of large organizations (Kotabe & Swan, 1995).

In many cases large firms use smaller ones to provide best-of-class integrated solutions. In recent years Canada's BCE Inc has used this strategy for both its outsourcing/ consulting activities and for the emerging e-commerce market. Partners of choice for each endeavour were The CGI Group and MPACT-Immedia, now renamed BCE Emergis.

Partnerships with small entrepreneurial firms can be used to gain early insights into new products, strategies and technologies and hedge bets on industry evolution. In recent years an increasing number of these arrangements have involved equity investments by the larger firm as a number of large technology companies are creating venture capital funds to support their small company alliance strategies (Kelly & Schaan, 1999).

In creating Mustang Ventures, its new venture capital fund, Germany's Siemens AG, a $10-billion company with 10,000 in-house developers, was acknowledging its need for partnerships with small innovative companies because of its inability to cover all of the new technologies critical to its future competitiveness. Not only are top engineers are increasingly attracted to small companies with their stock options and entrepreneurial spirit but many large companies have found their innovation efforts weighed down or crippled by the bureaucracy and internal politics.

PROCESSES FOR STRUCTURING AN ALLIANCE

As noted above, the value creation possibilities in alliances between small firms and large companies are significant. To ensure that value is created and that the small firm is capable of appropriating its anticipated share of the benefits, technology entrepreneurs need to proactively manage the process of designing and implementing these ventures. They also need to find ways to manage the co-operative/competitive dynamics inherent in these arrangements.

Table 2 sets out some guidelines for technology entrepreneurs to consider in this respect. These guidelines were derived from a review of the literature on alliances and interviews with executives in technology companies. The remainder of this paper explores the guidelines in detail and identifies some of the major challenges in implementing and managing small/large technology alliances.

Table 2: Guidelines for entering an alliance with a large firm

Process	Key Steps
1. Define Strategic Agenda	• Identify capability gaps and formulate objectives for alliances • Formulate profile of ideal partner(s)
2. Screen Partners	• Clarify large firm's strategic agenda • Assess potential operational compatibility
3. Design & Negotiate Alliance	• Formulate shared vision • Clarify roles and responsibilities • Protect strategic interests • Protect proprietary knowledge • Design interfaces at strategic and operation levels
4. Implement Alliance	• Jointly monitor progress • Address issues as they arise • Implement infrastructure for conflict resolution • Monitor roles and responsibilities • Establish effective communications
5. Maintain Ongoing Operations	• Assign champions • Create teams and task forces • Establish a learning process

Define Strategic Agenda

Identify capability gaps and formulate objectives for the alliance. For the small company, protecting itself against surprises begins with a good understanding of its own strategic interest; the capabilities needed to pursue it and a clear strategy for obtaining them. Small technology companies should have an agenda for partnering and proactively manage the process. The strategic agenda is easy to define when the small firm proactively decides that to meet its future strategic objectives an alliance with a larger partner is the best way to fill specific gaps. It is not as obvious when it is the large firm that initiates the contact with a deal in mind. At that point, it is essential to consider the deal in the context of the current and future strategic imperatives of the small firm.

Formulate profile of ideal partner(s). This strategic agenda should be the basis for both seeking potential corporate partners and identifying their suitability. In seeking a partnership with a large corporate partner, the small company needs to be realistic in its expectations. It is more likely to achieve a limited set of objectives, 2 to 3 primary goals rather than a broad range of diffuse benefits.

Challenge – Being Reactive. Unfortunately, Yoshino and Rangan (1995) observed that small firms often enter alliances on an ad hoc basis, driven largely by immediate or tactical concerns. Harbison and Pekar (1998) found that too many alliances began with one company reacting to overtures from another company rather than undertaking an active, vigorous and thoughtful assessment of its own capability gaps and prioritizing its ideal partners. In many cases, there is too much emphasis on vague synergy and not enough on common strategy and joint value proposition.

Screen Partners

Clarify large firm's strategic agenda. In developing alliances with large firms technology entrepreneurs need to be as clear as possible about the agenda of prospective partners. Understanding the competitive benefits that the other partner seeks to gain from the arrangement can provide useful insights into true strategic intent. With this information, the technology entrepreneur can assess whether the strategic direction of its potential partner complements or conflicts with its own.

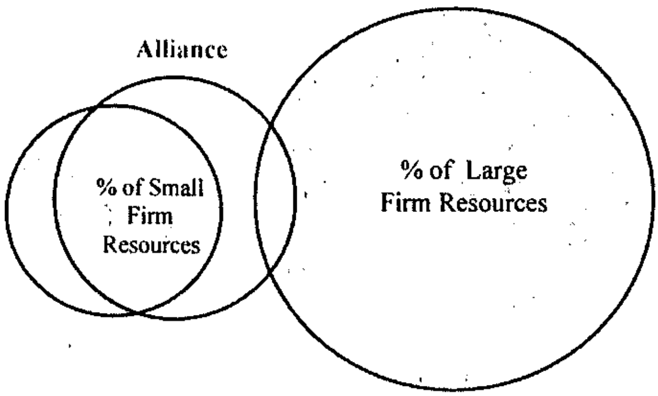
Harbison and Pekar (1998) note that inexperienced firms tend to pay more attention to their own objectives and rationales instead of conducting detailed analyses of potential partners. Experienced firms, they suggest, develop knowledge of potential partners, their management cultures, previous alliance experience, reputation and strategic objectives. They note in particular that a company needs to look closely at the resources and capabilities necessary to achieve its strategic objectives and whether the partner has the motivation and disposition to deliver the required resources. Successful alliance builders, in their view, have learned that an ad hoc or soft evaluation of agenda places an alliance in a precarious position from the start.

Challenge – Hidden Agendas and Conflicts of Interest. A study by Bain & Co. (Rigby & Buchanan, 1994) found that 90 percent of alliance negotiations do not pan out. A number of the negotiations were not entered with the objective of building an alliance but rather to obtain information and/or knowledge from the other party. Small technology firms may find themselves negotiating with a larger firm that is:

- trying to capture the technology of the small firm and appropriate it;
- wishing to appropriate it or acquire exclusive marketing rights and shelve its product as a means of eliminating a potential competitor;
- regarding the partnership as a kind of insurance policy or a hedging strategy against a technology or market with little real interest in its success; or
- attempting to prevent the small firm from entering into a partnership with a competitor.
- has a competing project group working internally
- looking to use the alliance as a prelude to an acquisition

Assess potential operational compatibility. While evaluating prospective large companies, a small firm should satisfy itself that the two parties would be able to work together. In many cases it is wise to do business with the large corporation before seeking to partner with it. This can benefit the future alliance in three ways. First, the technology entrepreneur would have an opportunity to assess the large firm's strategic intent. Second, it provides a way to assess the compatibility and capabilities of the firms and minimize surprises once a partnership is established. In particular, it can provide important insights into the potential partner's decision making process and its political and personal dynamics. Third, it facilitates negotiations since both partners know each other.

Figure 1: Typical Differences in % of Resources Devoted to Alliance



Challenge – Size Asymmetry. Although the large firm will often provide the resources to address the gaps identified by the small firm, the difference in size can be a barrier to success in collaborative activity (Harrigan, 1986; Jacobini & McCreary, 1994; Doz & Hamel, 1998). Doz and Hamel (1998) suggest that size differences in organizational contexts, often stemming from size differences between partners, do more to undermine alliances than do differences in national culture. Doz (1988) suggests that such partnerships are often a disappointment to the partners and that the tensions in making them work often dwarf their success in the eves of the participants. Figure 1 shows how the small firm devotes nearly all of its resources to the alliance whereas the investment in the alliance for the large firm is not as great. Such inequalities can cause serious conflicts at both the strategic and operational/organizational levels. If these conflicts are not avoided or managed effectively they can derail or undermine the successful operation of the venture.

Challenge – Differences in Corporate Culture. A common challenge in any alliance is how to make people from different organizational cultures work effectively together. This challenge is heightened in small firm/large firm alliances since the size of the partners generally has an important impact on corporate culture. Generally, large firms are inclined to be more hierarchical with entrenched bureaucracies and highly political decision-making structures. The politics involved in committing resources and new projects can result in a lack of consistency and position over time. Small firms, on the other hand, tend to be more flexible and entrepreneurial and are often frustrated when dealing with the slow bureaucracies of their large partners.

In a study of alliances in the Canadian high-technology industry, Kelly and Schaan (1996) found that many small company executives highlighted the cultural challenges that arose in partnerships with large companies. One likened the large company culture to that of government with multiple layers of authority and defined processes, with people rewarded for doing things correctly within the box. This was juxtaposed with the small entrepreneurial firms where "thinking outside the box" and speed were essential. According to one of the executives interviewed in their study:

If you differ with a partner in your approach to doing business, the speed of doing business or your attitude towards business - you have an enduring problem where you are always going to be rubbing each other the wrong way.

For small companies the common component is the time that it takes to get things done, a highly precious resource in small companies. In some cases, the transaction costs can outweigh the benefits that the small partner expects from the relationship.

Design and Negotiate the Alliance

Formulate Shared Vision. Once the partners have a mutual understanding of how the intended project will fit in their respective companies' strategies, they need to jointly formulate a vision statement for the alliance. This is an essential step to facilitate decision-making and to help resolve the differences in views that will develop between the small technology company and its large corporate partner. Once they agree on a shared vision, the partners can make decisions and/or resolve differences by deciding what is in the best interest of the future of the alliance as opposed to their respective self-interest at the time.

Clear Roles and Responsibilities. According one executive experienced in managing alliances "the key to managing an alliance is to understand how the strategy is going to get implemented in their organization and in yours, and ... who is going to be responsible for it in each organization" (Kelly & Schaan, 1996). An understanding of partner roles and a definition of responsibilities are the foundation of a manageable alliance. Partners need to develop a consensus on role assignments. Many studies suggest that these assignments should be clear before launching the operation. Lynch (1993) has referred to this as designing management into the front end. He suggests the development of a responsibility chart defining what tasks need to be performed and what decisions need to be made and by whom. Although such decisions may be sensitive because of the egos involved or because of the fear of loss of control, they are part of a good implementation plan and should be clear to all parties before the venture becomes operational.

Protect Strategic Interests. Small firms also need to ensure that strategic interests are well protected in an agreement or contract between parties. According to (Botkin and Mathews, 1992), particular attention needs to be paid to:

- conditions for renewal and termination,
- clear benchmarks to measure progress and identify deviations from the plan, and agreement as to what happens if a partners does not deliver on its part of the bargain at the deadline.

Protect proprietary knowledge. For technology entrepreneurs one of the key concerns both during the negotiation and implementation stages of an alliance is the potential loss of their proprietary knowledge, which could jeopardize future competitiveness. In alliances with larger partners the small partner is typically a technology provider. The day-to-day operation of the relationship provides substantial opportunities for technology leakage to the corporate partner. The unplanned or unintentional transfer of knowledge can alter the balance of power in an alliance in favour of the large firm and may even make the venture's continuation unnecessary. At the same time, alliances provide an important vehicle for learning and developing new skills and capabilities. Achieving a balance between ensuring that information critical to the partnership flows freely with the need to guard against the unplanned transfer of key competitive assets or critical skills is a never-ending challenge in alliance management.

Knowledge protection is especially difficult in more intensive and interactive partnerships or where the task is more complex and involved. Many types of alliances, such as joint research and product development, require extensive communication and interaction between the partners. Rigid restrictions on information flow or an obsession on skill loss is likely to undermine the ability of the partnership to achieve its objectives.
Baughn et. al (1997) suggest that one way to gauge partner intentions in this area is to look at some of its other activities around or outside of the alliance to determine whether it has parallel activities internally or with other partners. Companies must address this problem as they construct alliance agreements. However, no matter how well crafted the agreement, a substantial potential for unintended skill transfer remains in daily interactions.

Design interface at a strategic and operational level:
Strategic level - Successful alliance implementation is contingent on a well-designed interface between the partners that fosters trust, commitment, communications and the development a shared understanding in support of the venture's strategic objectives. Interface design needs to take into account differences in organizational contexts and cultures. While it may be unrealistic to think that the executives of a small company can establish strong personal relationships with the CEO of a large multinational enterprise, creating of linkages to key senior executives in the partner company are important. Strategic alliances need acceptance from the entire organization, buy-in that usually starts at the top. In their study of executives of Canadian high-technology companies, Kelly and Schaan (1996) found senior management commitment ranked by executives as the most important factor in the successful implementation. One small company executive in this study suggested that top level commitment in the larger partner was what defined the deal as strategic.

Linkages and communication with, and commitment from, the senior/strategic level in the partner is important for several reasons.

- It sets the environment for the alliance and signals its importance to others within the large partner.
- The alliance stakeholders from both firms are in a better position to defend the alliance against resource cuts by the large firm.
- It allows operational managers to push things upstairs when required and keep the venture moving forward.

Operational level - The right chemistry between those involved in the day-to-day operations is key to producing value. In managing the interface with the larger partner, a technology entrepreneur needs to consider the following questions:

1. How will the two companies relate to each other?
2. How will communication take place?
3. What are the initial roles and responsibilities of the partners?
4. How will intellectual property be managed?
5. How will conflict between partners be resolved?
6. How will learning take place?

In co-operation with its counterparts in the large firm, management should institute a communications program among operational managers and staff to justify and clarify the reasons for the alliance and the benefits to be gained by the firms. People should be made aware of the rationale for the alliance, be given background on the partner and understand the particular roles they are expected to play. This should be done by senior management in person and also through such as newsletters and email. Communicating the successes and benefits of the alliance needs to be an ongoing effort if support is to be maintained.

Internal support for the alliance also requires providing incentives to reward alliance-supporting behavior by the people involved. This means ensuring that the goals against which employees are measured and rewarded are consistent with the alliance responsibilities and tasks people are required to perform in support of the alliance. There is no point trying to convince people to behave differently if they are not rewarded for it. A lack of appreciation of this simple fact has derailed numerous alliances, acquisitions and reorganizations.

Challenge - Middle management buy-in. Eighty-four percent of the managers of Canadian high-technology companies indicate that strong linkages at, and commitment from, the middle management in the partner companies was a key factor in the successful implementation of alliances (Kelly & Schaan, 1996). Top management's endorsement does not guarantee that it is openly embraced at the operating level. As Harbison and Pekar (1998) note, if operational managers are uncomfortable with some aspect of the proposed alliance the chances of success will diminish. Executives in the Canadian study mentioned above, (Kelly & Schaan, 1996) referenced alliances with strong senior management commitment in both parties yet they were falling apart at the business level. This lack of commitment at the operational level can stem from either personal or professional sources:

- *Fear loss of power or status, even a loss of job*: Given the wave of downsizing and reengineering that many companies have experienced, senior management should not be surprised that people inside the large partner view alliances with a great deal of suspicion and from a perspective of personal interest.
- *Alliance perceived as more work or trouble with little recognition or reward*: They may be reluctant to spend time on a venture for which they do not see any immediate and tangible results emerging. As a result, the response often ranges from "going through the motions" to "too busy, not a priority" to outright bureaucratic sabotage.
- *The pursuit of personal agendas*: The implementation of successful alliances can often stand in the way of middle managers' career aspirations, empire building, etc.

Implement Alliance

The dynamic nature of alliances makes them particularly difficult to implement and manage successfully. One of the first things that partners must realize as they begin to execute their alliance is that negotiation does not stop with the deal's close. Alliance implementation is a process of ongoing negotiation with one's partner. As Lei and Slocum (1992) note, the ability to smoothly accommodate managers and practices from different partners is directly related to how well managers can negotiate the uncertainties and complexities of day-to-day activities that can not be specified in legal documents. Moreover, there is a tendency to underestimate the amount of management time required and the skills required might be new to many managers. Nevertheless, alliance success will only be achieved through careful, attentive and active management of the venture since the process of real strategic convergence and value creation occurs over time.

Jointly monitor progress. Start-up is the time when partners have the opportunity to test their assumptions and plans and the period where they can have the most influence on its proper direction and tone. During the negotiation phase it is important to have identified key implementation milestones against which one can monitor developments. The start-up period is where most surprises are likely to occur and where relationships may be put under significant stress. Thus there's a need to pay very close attention to the alliance until it demonstrates that it is able to fly on its own.

It is imperative that small firms invest the time and resources needed to actively manage their relationships. In particular, it is their responsibility to ensure that its strategic objectives are met and its strategic interest and assets are not compromised by the relationship.

Address issues as they arise. Not everything can be foreseen in the alliance agreement and assumptions and expectations may change dramatically as the alliance is implemented. Some of these issues may be quite difficult. Partners must be able to resolve outstanding issues and effect changes together in a constructive and mutually beneficial way. This involves the kind of good will and trust that comes from the existence of close personal ties between key players and managers in both companies.

Implement infrastructure for conflict resolution. Conflict is inevitable in all strategic alliances. It results from both sins of commission and omission. Managing conflicts is the role of the alliance managers who should implement good conflict resolution techniques. Conflict can be productive and a good learning experience. It should be dealt with up-front, not suppressed. Ideally conflicts should be resolved where and when they surface in order to maintain a healthy performing alliance. Senior management should only be called upon to resolve difficult issues including those involving the broader relationship.

Monitor roles and responsibilities. Task definition is not something cast in stone. Rather, it is something likely to evolve over time as partners learn to work together and get a true understanding of each other's capabilities. Doz (1988) found that partners in the most successful alliances engaged in a series of iterative and interactive learning cycles over time. Doz and Hamel (1998) suggest that companies should look at the early phase of an alliance as an opportunity to improve, learn, refine and build trust. These actions are likely more important than rushing to implement specific joint tasks. By working together on a small project at the outset partners are better able to understand and work out their differences, refine expectations and to test assumptions about their ability to contribute the value-creation logic of the partnership. After this period, they may be better able to document clearly how roles and responsibilities are best allocated.

Establish effective communications. Effective communications mechanisms between partners are a key factor in partnership success. Open communications and information sharing between the partners is critical to build a shared understanding of venture goals and objectives and in creating the trust needed for the day-to-day operations of the alliance. Good communication is a key to overcoming alliance problems and preventing them from becoming destabilizing.

The small firm should guarantee that liaison points and communications channels are in place at the engineering, project and executive levels in the large partner. The methods for doing this vary. The partners should consider fixed electronic linkages by establishing an email, newsgroup or phone mail system. If a large partner already has these facilities, the small partner should seek access — even if limited. A regular schedule for telephone calls or teleconferences for status reporting might also be useful.

Technical means of communication, however, are no substitute for the face-to-face interaction from which trust and mutual respect are built (Hollowel, 1999). The parties can also benefit from intelligence gained from important non-verbal communication. Information in electronic communication can be misinterpreted or distorted leading to problems in the relationship and are void of the intuitive, often subtle, non-verbal signals exchanged during face-to-face encounters. Canadian high-technology executives often pointed to the importance of frequent face-to-face meetings between partners. Others pointed to weekly progress reports via teleconference with live meetings on the occasion of significant milestones (Kelly & Schaan, 1996). Regular meetings between the managers involved in the venture can be a key vehicle in developing strategic and operational convergence.

The methods for establishing effective communication in alliances vary and, in many cases, need to be tailored the unique characteristics of the partnership. They can entail intranets, e-mail connections and other electronic linkages, groupware, teleconferencing, memos, bulletin boards, newsletters, etc. Technical means of communication, however, are no substitute for face-to-face interaction (Hollowel, 1999). More and McGrath (1996), for example, found that face-to-face communications played a critical role in successful alliances. Kelly and Schaan (1996) identified it as an important means of developing strategic and operational convergence. The establishment of the trust and mutual respect essential to making alliances work necessitates a level of face-to-face interaction. Without trust, electronic communication can be misinterpreted or distorted. Moreover, while electronic communication is a useful supplement, it can miss the often subtle, non-verbal signals exchanged in face-to-face encounters. De Meyer (1992) found that while electronic communication was widely used, managers still preferred personal contacts to build mutual trust and confidence. Persaud (1999) suggests that face-to-face communications is an important prerequisite for the effective use of electronic communications media.

The quality of communications is also a critical factor. It is often good bell weather for the alliance. Canadian executives felt that it was extremely important to be up-front with problems and to deal with them as soon as they occurred. One of them expressed the view that a breakdown or deterioration of communications such as when people don't return phone calls was typically one of the first indications of a serious problem (Kelly & Schaan, 1996).

Implementation Challenge – Devoting the Time and Resources to Ensure Success. The major challenge involved in implementing the previous points is ensuring that the necessary time and resources are allocated to the alliance, once it has been agreed upon. A study conducted by Coopers and Lybrand (1998) found that senior management involvement in alliances declines precipitously with time (Parkhe, 1998). It determined that 46% of management time allocated to alliances goes into the conceptual phase of developing an alliance, 23% to the development of the business plan and to just 9% to implementation. Other research has found that executives tend to rank themselves poorly with respect to alliance implementation abilities (Kelly & Schaan 1996; Pekar, 1989,). Doz and Hamel (1998) suggest that few executives understand how to move from "the deal" and structural aspects of alliance making to actually managing alliances for strategic value. In many cases, the dealmakers may not even have a specific game plan for the venture. Andersen Consulting (Frerichs, 1999) found that most of the companies participating in their study had launched into alliances with high hopes, but no real plan to realize these hopes. Finally, Kanter (1994) comment that "too often top executives devote more time to screening potential partners in financial terms than to managing the partnership in human terms" and tend to be more worried about controlling the relationship rather than nurturing it.

No matter how much attention has been paid to the strategic and structural design aspects of the alliance, the actual "take-off" stage is likely to be a challenging experience for most companies. Sherman (1992) notes that learning to work together is hard. Nevertheless, the initial stage of an alliance is a critical shakeout period where the foundation is laid for a good working relationship (Anderson & Weitz, 1989). Doz and Hamel (1998) note that the initial context of an alliance seldom encourages co-operation. The managers and staff involved will most likely find themselves in unfamiliar territory in which they have no clear frame of reference. They may have different assumptions, attitudes and expectations about the alliance, as well as private fears about their role in it. This situation is likely to be further complicated by cultural differences, communications barriers, lingering suspicions about partner motives and latent opposition within the partner companies. This is never a situation conducive to a fast and full-blown implementation. Moreover, if these early uncertainties, conflicts and tensions are not handled carefully and deliberately they can cause mistrust and reinforce the separateness of the partners thereby undermining the foundation of the venture.

Neglecting implementation — "what happens the morning after" — has proven to be the Achilles' heel of many promising ventures. In fact, evidence is mounting that many alliances flounder badly during implementation. Bleeke and Ernst (1993) found that 66 percent of the cross-border alliances they examined ran into serious managerial problems in their first two years. Typically, the root cause of these problems is:

- inadequate planning,
- the inability of the managers involved to successfully execute an otherwise well-thought out plan, or
- An organization trying to manages the alliance as if there is only one company involved.

Implementation is a high risk, difficult and time-consuming period. But new ventures can be further hampered by the partners' desire to get joint activities up and moving quickly and to start demonstrating results. The dilemma is that on one hand, market pressures require rapid action by the partners whereas human factors such as trust and relationship building are gradual and time-consuming activities (Wildeman, 1996). Raphael (1993) and others caution that demanding the fast start-up of an alliance can be extremely risky unless the partners have substantial experience in managing them or have worked together before.

Challenge - Communications. It is often said that the management of an alliance takes place through its communications processes. Communication between partners can be seriously hampered by significant structural or organizational differences, such as size and culture, and can increase the co-ordination or transaction costs involved.

Botkin and Mathews (1992) have suggested that the leading cause of death in small-large alliances is not non-performance or missed deadlines but rather poor communication between the partners. Harrigan (1994) found that good communications between corporate counterparts overcame the *a priori* barriers to success suggested by the partner's differences in size, organizational complexity, unequal venturing experience and different perspectives on the details of a venture's activities. Kelly and Schaan (1996) found that 73 percent of respondents cited poor communication as the major cause of alliance failure. Communications problems have also been sited as the major operational problem in the first year of an alliance's existence (Kelly, Schaan & Joncas, 2000).

Maintain Ongoing Operations

The characteristics of small/large partnerships lend themselves well to a few strategies the small firm can implement to ensure on-going success. These strategies involve mitigating the differences between the partners and leveraging the large firm's strengths.

Assign champions. The high level of management turnover common in large firms complicates building effective operational linkages with large partners. This results in an ongoing requirement to bring new managers up-to-speed and to constantly resell the value of the venture at the operational level. According to Yoshino and Rangan (1995), a lack of continuity in management teams is perhaps one of the greatest impediments to building organizational trust and setting the right tone for the alliance. Each change in management adds unneeded uncertainty to the alliance. The small company can mitigate the impact by building numerous and reinforcing ties across the organization. The greater the number of organizational ties, the more secure and the greater the commitment of the personnel of both firms and the better information the small firm has about what is actually going on in its larger partner (Bodkin & Mathews, 1992).

Small companies can also benefit enormously from having a champion or champions in the large firm. A champion is someone who believes in the venture and strives to get it accepted and implemented across the organization. Ninety percent of Canadian technology executives rated champions as important to the successful implementation of alliances (Kelly & Schaan, 1996).

Small companies looking to form alliances with large corporations need champions who can steer the venture through the bureaucracy of the corporation and who will be credible in defending it. Kanter (1985) has suggested that projects in large organizations require enthusiastic championing to stand any chance of success. Champions can also give the small company a way to get the big picture of the business. What they are being told at the project level and what is actually going on within the company may be two different things. A champion outside the particular division involved in the partnership can help provide broader insights into the company's priorities. A champion can also fight for the alliance in the never-ending competition for resources in big companies.

Create special teams and task forces. At times partnerships between companies of substantially different sizes frequently require the fostering of a special environment and the creation of special arrangements. Although the partnership may be between a small company and a particular business unit or division of a large company, as opposed to the company as a large whole, the differences in bureaucratic cultures and operational practices may still stifle the venture. The way around this is to create task forces or horizontal teams with some decision-making capability to relate to the smaller partner.

One approach is to form a team of talented and committed people drawn from both organizations. These teams are referred to as tiger teams, action teams, project teams, etc and are created when managers realize that an alliance cannot be managed along traditional *modus operandi*. The purpose of the team is to promote the active development of the alliance and, in that respect, it is empowered to do what is irrespective of established processes. The team usually contains individual champions who represent key functions or activities relevant to the success of the alliance. In many cases, individuals from both companies are matched together and held responsible for one or more of these function or activities. These teams are designed to fully capture the capabilities that both companies bring to the co-operation and to overcome some of the bureaucratic barriers in large companies (Callahan, 1990).

Establish a learning process. In a competitive environment the ability to develop and apply new sources of knowledge is a key to sustaining competitive advantage. Hamel (1991) has described strategic alliances as a "race to learn". Alliances with large companies offer the small technology company a unique opportunity to learn in a variety of areas including product development, R&D management, process technology, marketing and distribution, supplier management, etc. For a small company learning and extracting value from the partnership should be one of the key objectives of an alliance with a large partner to better ensure long-term success. To achieve this:

- Design into the partner interface a window on the skills being sought.
- Ensure senior level commitment to procedures and attitudes which foster the requisite learning environment.

Learning from a partner will only take place if there is an effort to institutionalize it. Lei and Slocum (1992) suggest that reward and incentive systems need to be designed in ways that encourage learning-oriented behaviour and innovation.

Many of the skills and knowledge that the large partner possesses, and which the small companies seek, may have significant learning barriers. Large technology firms are typically more organizationally mature and have matching processes. Manufacturing and marketing experience, the knowledge of customer requirements and distribution systems, etc are often embedded in the firm's specific and culture-specific organizational practices. Thus, they can be extremely difficult to disentangle and absorb.

CONCLUSION

Alliances between small and large technology partners can be extremely beneficial due to the complementary fit of resources versus needs. Although alliances are important to both parties, large companies generally have more options available to it should joint ventures fail than its small partner. The small firm is more vulnerable given the percentage of resources small firms invest as well as the importance an alliance can have to its strategic direction. Consequently, the onus is on the small firm technology manager to take the greatest amount of care in the management of the venture to ensure its success.

Finally, as the alliance moves towards its initial goals, technology managers need to start thinking about "phase two" of the alliance. The experience of small technology firms suggests that failure to review and adapt the alliance's strategy over time can lead to lost opportunities or conflicts between the partners (Kelly & Schaan, 1996). Alliances are dynamic and need to be adjusted to reflect the exponentially changing environment. Considering this, the evolution of a partnership could lead to the termination of an alliance but could include creating a new co-operative arrangement with the same large partner and thereby the continuation of an experienced, profitable relationship.

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