

Business Models In Collaborative Research

By Gene Slowinski, Edward Hummel, Matthew W. Sagal, Scott Mathews and Ernest R. Gilmont

Overview

Collaborative research has taken its place as a mainstream innovation process. Its purpose is to access external sources of technology (or other assets) and integrate them into the firm's products and services. Licensing Executives Society (LES) members take a lead role in planning, structuring and negotiating these relationships with universities, small high-technology firms, mid-market companies, and large firms. The purpose of this article is to explore the impact of business models on two dimensions of collaborative research: collaborations as an alternative to incubators and business models as a tool for assessing the opportunity portfolio and allocation of risk. We conclude with a set of management recommendations.

Business Models

A business model describes the logic and principles that a firm uses to generate revenues. Yet, business models are more than that. The firm's in-place capital assets, intellectual property portfolio, R&D and marketing staff capabilities, decision-making systems, and metrics are optimized for the existing models. The firm's relationships with key suppliers and channel partners are well established. Programs for improvements by suppliers and channel partners are easily planned and implemented because of familiarity and strong motivations on all sides. For example, a food and beverage firm may use a model that maintains a world class skill, an intellectual property portfolio in key ingredients and nurtures close relationships with major ingredient suppliers that are motivated to drive ingredient improvements as requested by the firm. This model does not work if the firm is required to make major departures from its traditional ingredients.

Business models are a mature topic with much available research. However, there has been a limited amount of work that explores how business models impact collaborations or provide vehicles for monetizing assets that do not fit with the firm's current business models (Chesbrough 2006).

To understand how firms factor business model analysis into their collaborative research creation process, the authors held two roundtable discussions. Participants included twelve Fortune 500 firms, selected for their extensive experience in licensing

and using collaborative research to meet technology commercialization goals (most were either LES or Industrial Research Institute members). They represented a diverse set of industries including oil and gas, specialty chemicals, foods, pharmaceuticals, national laboratories, diversified manufacturing, large chemical, aerospace, and telecommunications. Each roundtable member played a central role in supporting early stage technology at his or her firm. In addition, the authors conducted individual interviews and held workshops with R&D executives who represented major firms. Finally, this article is an extension of our work on using collaborations to achieve breakthrough innovation and adjacent space growth (Slowinski and Sagal 2013).

Collaborations as an alternative to incubators

The primary concern of senior management is corporate growth. Some growth is based on modest technical changes to products in existing market spaces, typically using existing internal resources or resources of established suppliers and channel partners. While these incremental growth initiatives are important contributors to business unit objectives, they tend to be low risk and yield modest rewards. To grow at higher rates, firms turn to higher risk breakthrough technology and move into adjacent market spaces (Le-

■ Gene Slowinski,
Rutgers University Business
School/Alliance Management
Group, Director of Strategic
Alliance Research and
Managing Partner
Gladstone, NJ, USA
E-mail: gene@strategicalliance.com

■ Edward Hummel,
Alcatel-Lucent,
Director Business Development,
Murray Hill, NJ, USA
E-mail: ed.hummel@alcatel-lucent.com

■ Matthew W. Sagal,
Alliance Management Group,
Senior Partner,
Gladstone, NJ, USA
E-mail: mwsagal@comcast.net

■ Scott Mathews,
Boeing Research & Development,
Boeing Technical Fellow,
Seattle, WA, USA
E-mail: scott.h.mathews@boeing.com

■ Ernest R. Gilmont,
Univ. of Penn. School of
Engineering & Applied Science,
Professor,
Philadelphia, PA, USA
E-mail: gilmont@wharton.upenn.edu

ifer 2000 and Colarelli O'Connor 2008). The current literature on growth through innovation emphasizes these higher growth opportunities (Meyer 2007, Zook 2004 and Meyer 2008).

As senior management considers a breakthrough technology or adjacent space opportunity, there is a recognition that the characteristics of a traditional business model do not apply. One solution is to create an “internal incubator,” where a group of selected R&D staff, supported by other skills such as marketing and finance, are separated from the firm’s organizational structure in a small internal business initiative.¹ The incubator leader, who may be at a mid-management level, reports outside the normal chain of command to a senior executive. The incubator is tasked with pursuing the new opportunity, with its own budget but with the intent of drawing on the firm’s other resources as needed.

Management expects that the incubator will operate in an entrepreneurial manner, effectively pursuing the new opportunity while free from the normal patterns of behavior characteristic of the established business model. For example, a typical expectation is that the incubator will make decisions faster than an established business unit. Overall, senior management hopes that the internal incubator will exhibit the drive and fast results of a start-up firm, while supported by the resources of the parent company.

The track record of incubators has been disappointing for predictable reasons. The technology in a breakthrough technology opportunity, or the marketplace in an adjacent space growth opportunity, is new to the firm, but not new to the world. Incubator staff often play catch-up as they learn about (or invent) knowledge that is known to outside firms. While catch-up is underway, the rest of the world progresses and presents a moving target for the incubator. The technical expertise in the firm’s traditional business models is often not closely tied to the needs of incubator projects. The parent company’s patent portfolio may not provide the incubator project with freedom to operate or zones of protection. These shortcomings make it difficult for the incubator to establish the expected new business in a commercially relevant time frame.

There are internal obstacles as well. Incubators often have loose ties to the firm’s core businesses. This

leads to a shortage of advocates when the incubator needs protection. Similarly, the support needed from other groups within the firm is hard to garner during times of limited staffing and budget reductions.

In addition, most firm’s staff reward systems are inconsistent with the tasks and organizational realities of an incubator. As the incubator staff works hard to move its projects to the next level of commercial readiness, there is little observed pay-off particularly when the firm uses its standard commercial metrics. Non-incubator staff, working on core projects, appear to make greater contributions. Over time, incubator staff can be punished in the compensation and promotion system, making the incubator a potential career dead-end.

Finally, management decision making may be tentative because senior leaders are unfamiliar with the technology or market spaces relevant to the incubator. This uncertainty results in decision making delays and ongoing requests for “more information” even for seemingly straightforward decisions.

This leads to a key question: Can collaborations be used as an alternative to incubators? In many cases they can, particularly if the partner brings business model competencies into the relationship. As the firm assesses a potential partner, part of due diligence is to ensure that the models of the potential partners complement one another and form a complete go-to-market model. Another component of diligence is to ensure the partner’s intellectual property portfolio supports the product, its experts are expert in the relevant technology, and their management team understands the commercialization supply chain. An example of this approach is Unilever’s collaboration with Cynosure on light based skin care (for an in-depth discussion of this relationship see Slowinski, 2013). Cynosure is a technology-based firm with expertise in providing light based skin care in a dermatologist’s office. The goal of the alliance is to apply Cynosure’s light-based skin care technology to Unilever’s consumer skin care business.² From Unilever’s perspective, projects based on light based skin care (not a core competency) have inherently larger levels of uncertainty than projects based on topically applied active ingredients (a Unilever core competency).

One Unilever strategy could have been to place

1. Note that we are using “incubator” to refer to a group within the firm’s structure and 100% controlled by the firm. “Incubators” where selected separate start-up firms are supported by larger firms or institutions are fundamentally different.

2. The July 1, 2009 press release can be found at; <http://www.bloomberg.com/apps/news?pid=conewsstory&tkr=UL%3AUS&sid=arGaNVRktbJs>.

the light-based beauty project into an incubator and develop the expertise/product organically. Instead, they chose the collaboration strategy to access the partner's expertise, IP, and other relevant assets. In summary, as senior management considers establishment of an incubator, it is valuable to see if a collaboration is a more efficient structure.

How about establishing an incubator and then asking the incubator to form collaborations to overcome the shortfalls inherent in an incubator? While this appears to be an attractive pathway, there is a practical pitfall. A potential collaborator, when considering an alliance with the firm, will evaluate the dedication of the firm to the opportunity. The incubator's separation from the mainstream organization creates a "sandbox" perception. The leaders of the core R&D unit and relevant business units may be difficult to engage during collaboration discussions. This casts doubt on the depth of the parent firm's interest. While this can be overcome with senior management recognition of this pitfall, this is a complex organizational and political task that is a logical result of the incubator's isolation.

Opportunity Portfolio, New Business Models and Risk Allocation

Innovation portfolio managers face another common challenge. New concepts are often assessed as low value opportunities because they are a poor fit to the firm's predominant business model. When an idea for a new project is introduced, the response may be; "We don't (or can't) do that here... ." However, the right collaborating relationship can supply a new business model that provides the needed assets. Given the right collaboration, the answer may be; "Now we can do that here." Let's look at this process from the point of view of a portfolio of opportunities within Company A.

In Fig. 1a there is a range of investment opportunities arrayed along an efficient frontier for which there is lowest risk for a given level of expected return. A new opportunity, let's call it Concept A₁, emerges from an ideation event or as the result of the merger of disparate concepts within the processes of an opportunity portfolio. Unfortunately, too often the business analysts assess Concept A₁ to be relatively high risk and low value because Company A doesn't have skilled technical resources to commercialize the product at a price point acceptable in its home market space.

Rather than relegate it to the repository of rejected concepts, one of the other business analysts suggests that perhaps Concept A₁ could be a candidate in an exploratory incubator for high margin product. Concept

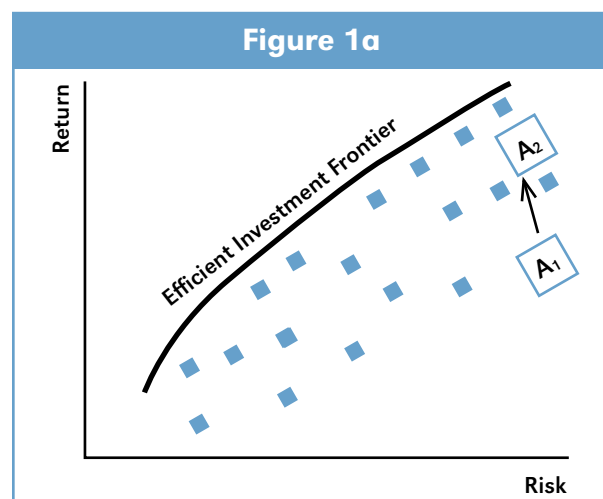
A₂ is then revalued in the context of this new business model. Profitability has improved considerably, sufficient now to cover the cost a skilled technology resources. But the risk remains unacceptably high owing to the unknowns of developing a new high-end market for the high margin, but expensive product.

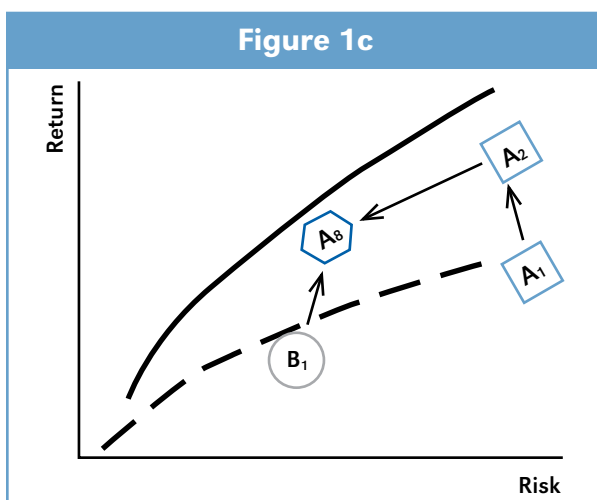
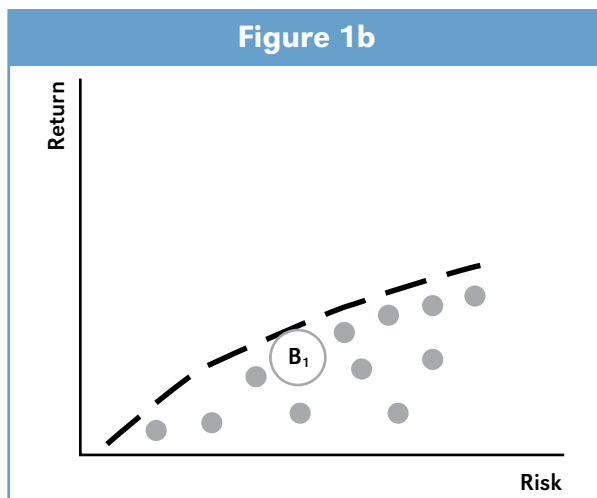
A Company A manager becomes aware that Company B has the skilled technical expertise that would engineer a low-cost solution appropriate for the dilemma facing Concept A₂. Company B has applied this capability for sometime in a related, but non-competing technology. Discussions between the companies ensue eventually leading to the prospects of a collaborative effort.

Company A now is able to consider a third approach; a collaboration with Company B. The resulting product could be sold into Company A's traditional market. However, the collaborative effort will require a new business model that sacrifices the predominant corporate business model margin owing to external technology development and a profit sharing arrangement with Company B.

From Company B's perspective, it already has a portfolio of capabilities and products that are optimized for its particular business model. (Fig. 1b) It has developed a technology behind a current product, B₁ that could be leverage to respond to the challenges of A₂. It sees the collaboration with Company A as an opportunity to venture outside the constraints of its current business model. Company B's challenge will also be a new business model for this concept, a shift away from its traditional high-margin low volume technical products to participation in a low-margin product.

The collaboration enables the revision of the concept, Concept A_B in Fig. 1c is now arrayed along the





efficient frontier of the portfolios of both Company A and B. In this context Concept A_B can now be evaluated along with other promising concepts within the portfolio. For Company A, we see that A_B has lower risk than the original concept, but the value is now in line with other promising concepts. For Company B, A_B promises higher returns that its existing set of opportunities accompanied by a small increment in risk. The end result is a possible win-win concept evaluated among the portfolio of opportunities for both companies.

However many unknowns remain. Though the collaboration may resolve technical, design and marketing uncertainties, the collaboration itself poses its own set of risks. These risks can affect the valuation of the concept, but often they are overlooked or buried in the assumptions of the business case. Because not all risks or their severity can be predicted, the best course is to hedge the commitment to the collaboration by investing in the concept incrementally. These incremental investments need to be made in

proportion to the likelihood of a favorable outcome, but significant enough to measure a successful initiative following real option practices (Mathews, 2009). Further, the investment stake should not risk the fiscal health of either partner in the event the concept collaboration does not succeed. Boeing's real-option value algorithm, the Datar-Mathews Method, is an example of valuing these risky project using real options.

Finally, the original investments of both firms are premised on assumptions about the collaboration. Each company needs to establish metrics to account for development progress and investment success. Representative metrics may be attainment of maturity stages of technical or product development, as well as financial ones such as market demand (sales volume) and rates of return. The phasing of the investments need to be tied to the achievement of the pre-established metric markers providing a baseline that justified the original commitment to the concept and the collaboration.

Management Recommendations: Assessing the Impact of Business Models on Your Collaboration

In this section, we will outline a four-step program that helps managers assess the impact of business models on their collaborations.

Step 1—Understand that every collaborative agreement requires the partners to integrate three business models into a functioning whole: Company A's model, Company B's model and the collaboration's business model. This insight is non-trivial. It is possible that the collaboration's go-to-market model will not mirror either of the parents' current models.

Step 2—Compare both companies' model. The goal is to identify leverage points, barriers, areas of overlap and areas where neither firm has required skills. The list in Table 1 is a starting point. Every business model has these components. Managers may add components based on the firm's industry, customer set, geography or other corporate needs.

A cross-functional team that represents the functional groups that will provide resources to the collaboration's go-to-market model best carries out the assessment. Assessing your firm's model is straightforward. Assessing the potential partner's requires the use of publicly available information, discussions with the potential partner and a good bit of judgment. However, there is value in the exercise. A detailed analysis of the potential partner's assets in terms of value and value drivers (Balsano *et al.* 2008) identifies areas of uncertainty, and describes the value and risk that the partner brings.

Table 1. Typical Business Model Components

Resources	Knowledge
<ul style="list-style-type: none"> • Capital Assets • IP Portfolio • Markets/Channels • Supplier Base • Brand • Manufacturing • Geographic Strength • Encumbrances 	<ul style="list-style-type: none"> • Domain Expertise • Ability to Access Risk and Minimize Uncertainty • Understanding of Role Requirements • Strength in Required Tech/Management Capabilities • Deep Customer Knowledge • Advantages/Disadvantages of Key Metrics

Conclusion

A company's business model pervades the corporate infrastructure. A company maximizes its profits by being very efficient at working within its established business model. Aspects of the model find their way into the systems, processes, policies, and procedures of the firm. Examples include key metrics used in decision processes, the legal forms

Step 3—Once both firms have assessed the parent firms' models, they jointly develop the collaboration's model. The firms determine which company will provide specific resources and which company will carry out particular tasks. These issues impact the financial model and how the partners allocate costs and benefits. A clear understanding of the collaboration's model also helps the partners determine what background intellectual property rights are needed and how foreground rights can be allocated. All of this allows the partners to assess each firm for its ability to provide the quality and quantity of resources that are required for commercial success.

Step 4—Prepare each parent firm for the need to provide resources in the steady state. The assessments above allow the partners to predict which resources the collaboration will need from each parent in the steady state. Most collaborations do not have dedicated resources. The relationship's leadership team must reach back into each parent company on a continual basis for funding, personnel and wide range of assets that support the alliances business model. The alliance benefits when the parent firm's management teams understand the relationship's business model and how it links back into the parent firms. This understanding includes a projection of the ongoing support with respect to the assets identified in Table 1. Finally, establish metrics that measure the expectations behind the motivation that secured the investment.

This short discussion is not a substitute for more complete collaborative planning processes (Slowinski 2003). Rather, this four-step process augments those tools by ensuring that a critical component of the process is adequately covered.

used in contracting, the organizational structure, and the culture of the company. While this optimization helps the firm compete, it also institutionalizes the model and hinders the firm from using new models.

One approach companies use to generate new businesses with different models is to isolate them from the core business in an incubator. However, we have argued above that collaboration is an alternative to incubators.

In the final analysis, collaboration with a carefully chosen partner (with a compatible business model) is a synergistic way to enter a clearly defined market. ■

References:

- Balsano, T. J., Goodrich, N. E., Lee, R., Miley, J. W., Morse, T. F., and Roberts, D. A., "Identify Your Innovation Enablers and Inhibitors," 2008, *Research-Technology Management*, Vol. 52, No. 5.
- Colarelli O'Connor, G., Leifer, R., Paulson, A. S., Peters, L., 2008, *Grabbing Lightning: Building a Capability for Breakthrough Technology Innovation*, New York, NY: Jossey-Bass.
- Leifer, R., McDermott, C., Colarelli O'Connor, G., Peters, L., Rice, M., and Veryzer, R., 2000, *Radical Innovation: How mature companies can outsmart upstarts*, Boston, MA: Harvard Business School Press.
- Mathews, S., 2009, "Valuing Risky Projects with Real Options," *Research-Technology Management*, Vol. 51, No. 6.
- Meyer, M. H., 2007, *The Fast Path to Corporate Growth: Leveraging Knowledge and Technologies to New Market Applications*, New York, NY: Oxford University Press .
- Meyer, M. H., Boushell, R., Willcocks, N, 2008, Corporate Venturing; An expanded role for R&D. *Research Technology Management*, Jan-Feb, pp. 34-42.

Slowinski, G. and Sagal, M. W., 2003, *The Strongest Link: Forging Profitable and Enduring Strategic Alliances*, New York, NY, AMACOM Press.

Slowinski, G. and Sagal, M. W., 2013, "Achieving Breakthrough Innovation and Adjacent Space Growth Through Collaborative Innovation," *les Nouvelles*, March 2013.

Zook, C., 2004, *Beyond the Core: Expanding*

Your Market Without Abandoning Your Roots, Boston, MA: Harvard Business School Press.

Acknowledgements

The authors would like to acknowledge the Industrial Research Institute, The EDA University Center Program and each of our respective firms for their support of this project.