Reinventing Corporate Research

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Research organizations in established enterprises need to understand how to take advantage and optimally leverage venture funded companies and management practices

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OVERVIEW:

Research and development organizations in established enterprises can become more effective by leveraging products and learnings from venture funded companies, and from adopting some of the management practices of venture fund managers and start-ups managed by a venture capitalist. Corporate research continues to play an important value creation role, a role that is different from the set of companies funded by a venture fund.

INTRODUCTION:

Venture capital funding for new companies has increased dramatically during the last 5 years and has returned on average about 40%/year during the last 5 years (1). (Venture capital returns were negative during the period June 2000 through June 2001). The large number of new start-ups provides a new set of options for established enterprises to grow. Therefore, acquisitions and minority equity investments in start-ups have become important elements in the strategies for some companies, diverting some resources that were previously spent on internal R&D. Cisco reports that up to 30% of its new products come from external investments rather than internal product development (2). Some observers might conclude that the future of corporate research in innovation and new business creation is threatened by these trends.

In this paper, I will examine how research and development organizations in established enterprises can become more effective by leveraging products and learning's from venture funded companies, and from adopting some of the management practices of venture fund managers and start-ups (referred to as the "venture community" throughout this paper.) I will argue that corporate research continues to play an important role, a role that is different from the portfolio of start-ups managed by a venture capitalist.

This paper does not directly address the broader question of how an established enterprise should expand into new businesses. Options would include the creation of new ventures internally, externally, by acquisition, by investment, or by some combination. This topic has been thoroughly covered in the literature (3,4,5,6).

This paper specifically addresses possible interactions that established companies could have with venture-funded companies and venture fund managers. There are a number of well-known interactions that established companies have with other established companies, such as technology licensing, partnerships, and joint ventures. These management practices have also been well described in the literature and are not the primary focus of this paper.

This paper begins with an overview of a number of ways in which the research and innovation process in existing corporations needs to leverage ideas, technologies, and products from venture funded companies. A simple model is proposed as a framework for describing these interactions. The paper ends by describing a set of management practices used by venture capitalists that can also be successfully applied to corporate technology development and new business creation activities within a large corporation. More details on these techniques is available in the references.

Investor value proposition for start-ups vs. established corporations

For an investor or shareowner, the value proposition provided by an established company is different from a start-up. An established company has an ongoing business with a set of strengths and competencies that can be leveraged to make the company grow. Important factors influencing market capitalization for an ongoing business are earnings and the anticipated future growth in revenue and earnings. The goal of the management team of an established company is to leverage the strengths and competencies of the current businesses to increase revenues, earnings, and thus increase shareowner value. If an established company consists of component businesses with little synergy, then a divestiture may create more shareowner value.

An investor in a start-up is looking to achieve a high rate of return on his investment with a higher level of risk compared to an equity investment in an established firm. The venture fund manager identifies industries with rapid growth potential and funds business plans to address these opportunities (7). The management team of the start-up is responsible for migrating to the most attractive business model for the proposed innovative technologies and concepts; there is no on-going business to worry about and no existing synergies to exploit. Investors in a start-up are interested in obtaining a (large) liquid return from their investments within a specified time frame, possibly through an Initial Public Offering (IPO) or by the purchase of shares by another company.

To simplify, existing companies invest to create new products and services that have leverage and synergy with existing capabilities to increase future revenues and profits. Start-up companies consume cash to pursue a new business opportunity that will allow stock in the company to be converted into cash within a limited period of time.

Each of these models has been optimized around the expectation of investors and the public equity marketplace determines the relative value of these two approaches. There are several examples of large companies that have been successful in "spinning out" new ventures (e.g. Xerox) or placing minority equity investments in successful start-ups (e.g. Intel). The anecdotal data suggests that the market capitalization of these companies has not fully reflected their success with venture investments. Many professional investors do not believe that the performance of the external investments of an ongoing enterprise reflects on the operational excellence of the management of the enterprise. When conglomerates divest non-synergistic businesses, the total market capitalization of the resulting companies is usually higher than that of the original company. Thus the equity market does not reward the shareowners of companies that successfully nurture start-up businesses with minimal synergy to the ongoing business. In general, to increase their market capitalization, large companies need to start and expand synergistic businesses.

Model for innovation and new product creation

The simplified model for innovation and new product development shown in the central part of Figure 1 will be used as a framework for describing a set of useful interactions between established enterprises and the venture community. The earliest stage in this innovation model has to do with strategy and idea creation. New opportunities can be identified by recognizing significant trends in customer requirements, high growth industries, and emerging technologies.

To exploit these opportunities, new concepts must be developed. In many cases, new ideas involve new breakthroughs in technology and further concept development. This activity is shown in the second stage in the model.

Once the concepts have been validated and the most difficult technological hurdles have been overcome, product or service creation and commercialization can begin. Concurrent product development in this third phase requires simultaneous development of the product, the manufacturing capabilities, sales, distribution, and marketing strategies. Adaptations to the product must often be made based on the comments from the early customers for the products or services.

After a new product or service has achieved its initial success in the market, on-going management enables market expansion by increasing the coverage of sales channels, new derivative products, enhancements to capabilities of the first product, etc. This is shown as the fourth stage in the model.

Venture Community Interactions

The innovation model presented above will be used to describe in a systematic way the interactions between a corporate research function and the venture community. A visual representation of the interactions is shown in Figure 1.

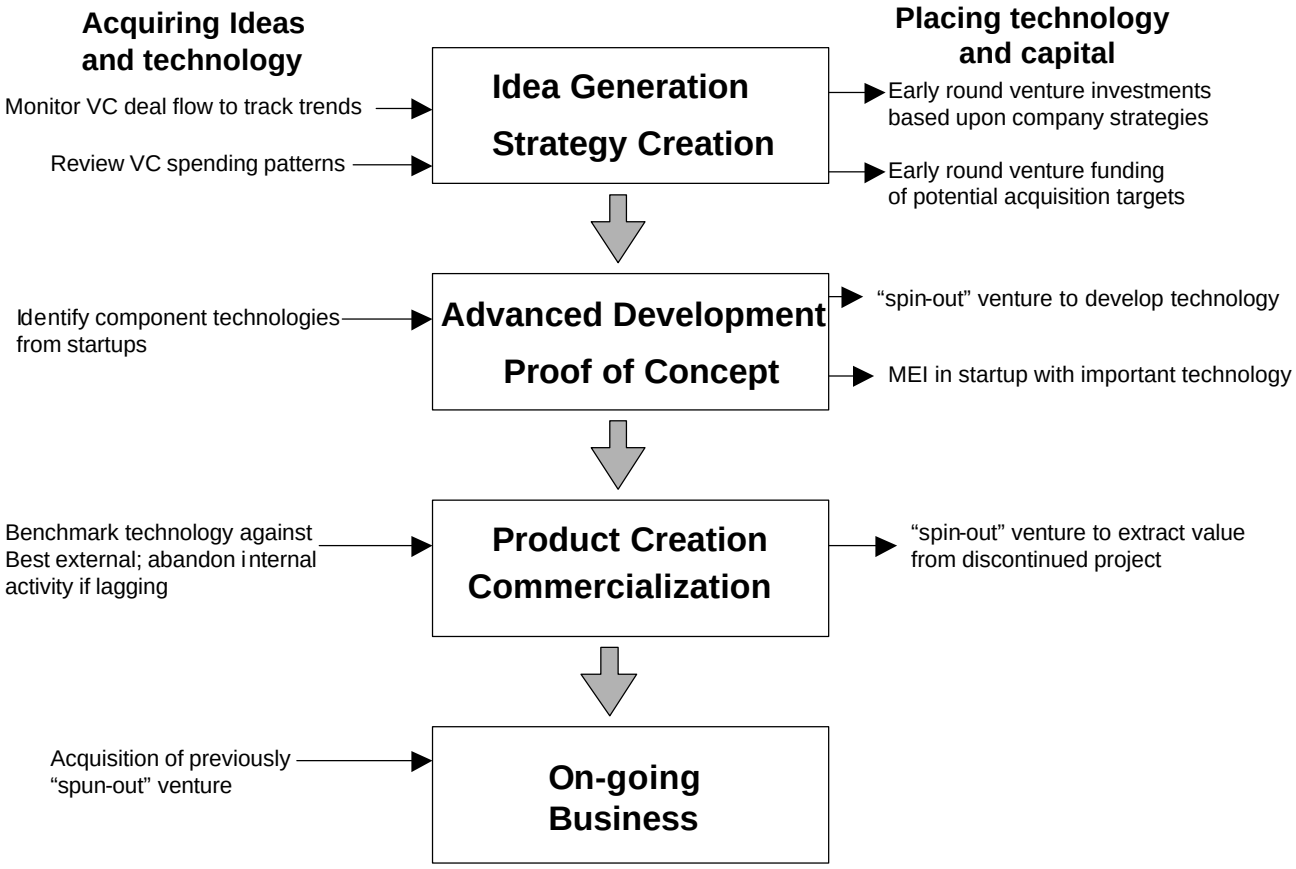

Figure 1. There are a number of significant of interactions between established companies and the Venture Community that can occur throughout the technology development lifecycle.

Acquiring ideas for strategy creation

In the rapidly changing high-tech industry, the new revolutionary ideas often come from new, agile start-ups. Mike Volpe, the Chief Strategist of Cisco is reported as saying "My number one fear is always the little guys."(8) In her book, "The King-Makers - Venture Capital and the Money Behind the Net," Karen Southwick describes the corporate venturing activities of Intel, Cisco, and several other large high technology companies (9). (Note that the number of corporations involved in venture funds is large enough that there is a newsletter devoted just to this subject, the Corporate Venturing Report [10].) As I will discuss below, these companies have many reasons for funding start-ups. But one of the primary reasons is to obtain early information about ideas that are being proposed to venture capitalists. The set of ideas and business plans being submitted to venture capitalists are referred to the as the "deal flow." Note that typically more than 10 business plans are reviewed for every 1 that is funded, so a large number of plans are reviewed by the venture fund managers (7). Established companies that are visible and committed investors in start-ups have access to a stream of proposed deals. By observing patterns in technologies, markets, and business models of deals in the "deal flow", such companies become aware of many new trends at a very early stage. (Or at least they are aware of what entrepreneurs think the new trends and attractive industries might be.) This information can be used to adjust and adapt the internal strategies for the ongoing businesses of the companies making the investments.

Information about start-up activity is available in the open literature and from industry consultants. The Red Herring Magazine and website cover venture activity in technology (11). Several published surveys of venture capital activity by business category are available, such as those published by Price Waterhouse Coopers (12) and the San Jose Mercury (13). The VentureSource database provided by VentureOne is also a well known and complete source of information about a

number of pre IPO capital placements by major venture capitalists (14). Companies wishing to monitor new areas of venture activity can use these sources, and others.

Existing enterprises may have other ways to obtain information about new start-up activity, such as when their employees leave to form or join a start-up. Employees in large companies may also become aware of start-ups through friends, neighbors, and colleagues.

Placing capital and ideas in new ventures based on corporate strategies

Most large enterprises develop fairly detailed long-range strategies for their entire enterprise and for the particular business lines within the business. External investment strategies are often the outcomes of such strategies. For example, Intel has had a strategy of investing in companies creating applications that require increasing amounts of computing power; Microsoft has funded companies who will expand the number of applications that run on Windows (9). In the mid 1980's, Apple established a fund to provide high financial returns and to support third party development of McIntosh software (7). These are all examples of supporting the expanded ecosystem of companies that provide a complete set of products and solutions to customers, thus expanding the size of the total market.

Cisco is reported to identify areas of strategic interest, such as high speed optical networks, and work in partnership with some selected venture firms to encourage and fund start-ups in these areas. As an early investor, they are then in a position to monitor the technology, the market, and to fully acquire some of these companies that are successful and are synergistic with Cisco (15).

Acquiring technology for advanced development

Bob Zider points out that "Contrary to popular perception, venture capital plays only a minor role in funding basic innovation." (7). This is because most venture fund managers are looking for businesses that can become successful in a few years. Thus basic innovation remains the domain of government labs, universities, the labs in medium and large companies.

The increased number of venture-funded start-ups, however, provides an alternative source of technologies and ideas to launch some types of advanced development activities. Start-ups do an excellent job of selecting technologies that can be productized within the financial and time constraints specified by their investors. Most start-ups are constrained to develop a specific technology with a specific market focus. In many cases, such technology can be a very useful component technology for a broader product concept. It is mutually beneficially for the established venture and the technology developer to identify such opportunities. The advanced development and product creation functions of established enterprises must identify and evaluate such technologies as a matter of routine business. (How to conduct an organized search is described in the paper by Chatterji [16] .)

Note that there are a number of possible business relationships between an established enterprise and a technology supplier, such as licensing, joint development, joint venture, etc. The advantages and disadvantages of these relationships is well documented in the literature (16, 17). In some cases, the technology available from a start-up is deemed to be strategically important. The company receiving the technology can then choose to make an equity investment in the start-up to gain some control over the future strategy and share in the growth of the company. An acquisition can be made in those cases where the perceived value of the start-up is sufficiently large.

Placing ideas from the advanced development phase into external ventures to harvest value

After the advanced development/and or concept development phase, the on-going enterprise may wish to pursue the opportunity, but may be lacking some critical skills, resources, or knowledge. Joint ventures and partnerships with established companies is a traditional solution to this problem. If the challenge is speed of execution, or if the technology requires a new business model, then it may make sense to consider the possibility of a "spin-out. Interaction with the venture funded community may be appropriate in such cases. The opportunity can be "spun-out" into a "start-up" with the enterprise maintaining a minority equity position. Such an approach leverages external investment, shares risk with external partners, allows the opportunity to be pursued with greater speed, and allows access to expertise that may not be in the enterprise. Of course, in exchange for the risk sharing, the upside and some of the control must be shared with external parties. Brady and Ehrlich describe how to determine when an external investment strategy is appropriate (6).

In the opposite situation, the ongoing enterprise may determine not to pursue the resultant business, but could determine that the core technology has value. Reasons for not pursuing the technology could be primarily internal factors such as lack of synergy with the current businesses, or lower perceived returns than other opportunities. The enterprise may then wish to pursue ways of extracting value from the technology. Technology licensing and "spinouts" are two recognized ways.

Many companies "spin out" new companies with technology that has not been adopted internally. Several recent articles (17, 18) have been written that describe how Lucent New Ventures Group (NVG) "spins out" ideas from Bell Labs that are not adopted by the business units.

Note that Lucent acquired several of the companies created by NVG. One way of looking at these situations is that Lucent has leveraged capital from the venture capital community to create a new business that could not be funded with internal funds. As well as leveraging capital, Lucent was also leveraging the management competencies in the venture world that were not available in Lucent and could pursue a new business model. By reacquiring the company, they were able to purchase a company with an established business concept in exchange for the customary premium that is paid when a successful company is acquired. (During 2001, Lucent faced difficult business conditions and chose to shut down one of these businesses and "spun out" another for the second time.)

Active corporate venturing programs must resolve many tensions with the on-going businesses (e.g. 5). From a corporate research management perspective, one of the more interesting challenges is to provide a value proposition for the developers and researchers who stay with the firm that is perceived as comparable to the one provided by the "spin-out." For many researchers, the stability, resources, and technical challenges present in an established enterprise may be preferable to the constraints and risks associated with a start-up.

Acquiring technology for new product creation

Technology components from venture-funded companies continue to be important in this phase. The resources required in a Product Creation phase are larger than those required in earlier phases, so the possibility of using external capital, such as an equity investment in an external company, becomes a more serious option. For example, in the pharmaceutical industry, joint ventures are common in this phase to share the expense of drug trials. Again, a venture-funded entity may be desirable when attributes such as speed, new management talents, new business models, and emerging higher-risk technology are required.

As the product creation phase progresses, the status of the internal development becomes more evident. During this phase is very important to benchmark the internal capability versus the technology available in potential joint venture or acquisition targets. If the internal development falls behind the technology available externally, it is likely that an acquisition, minority equity investment, or some other partnership is preferable to productizing non-competitive technology.

Extracting value from technology developed during Product Creation

Similar to the Advanced Development phase, options to extract value from developed technology are created in this phase. If projects are cancelled in this phase, there will be more motivation to explore value extraction such as "license out" or "spin out" because the technology will be more mature and the cumulative investment in the technology will be larger.

In general, spinouts should be viewed as a "consolation prize" by the enterprise and not a primary objective. As was previously discussed, equity positions in spun-out companies will create less shareowner value than synergistic businesses retained within the corporation. Researchers in established enterprises should therefore be challenged to create compelling new opportunities that are pursued by their own company.

Venture capitalists demonstrate great creativity in extracting value from companies whose funding is not extended; this challenges established enterprises to improve value recovery for internal investments. Chesbrough argues that established corporations retain more learning from their internal ventures than do external start-ups (4).

The Resource Allocation Challenges associated with Venture Capital Interactions

The set of possible interactions between venture funded organizations and established enterprises that have been described in this paper provide more choices for corporate resource allocation. A set of the possible investments that an enterprise can make to sustain, grow, and acquire new businesses is shown in Figure 2. Complicating the situation even more are the

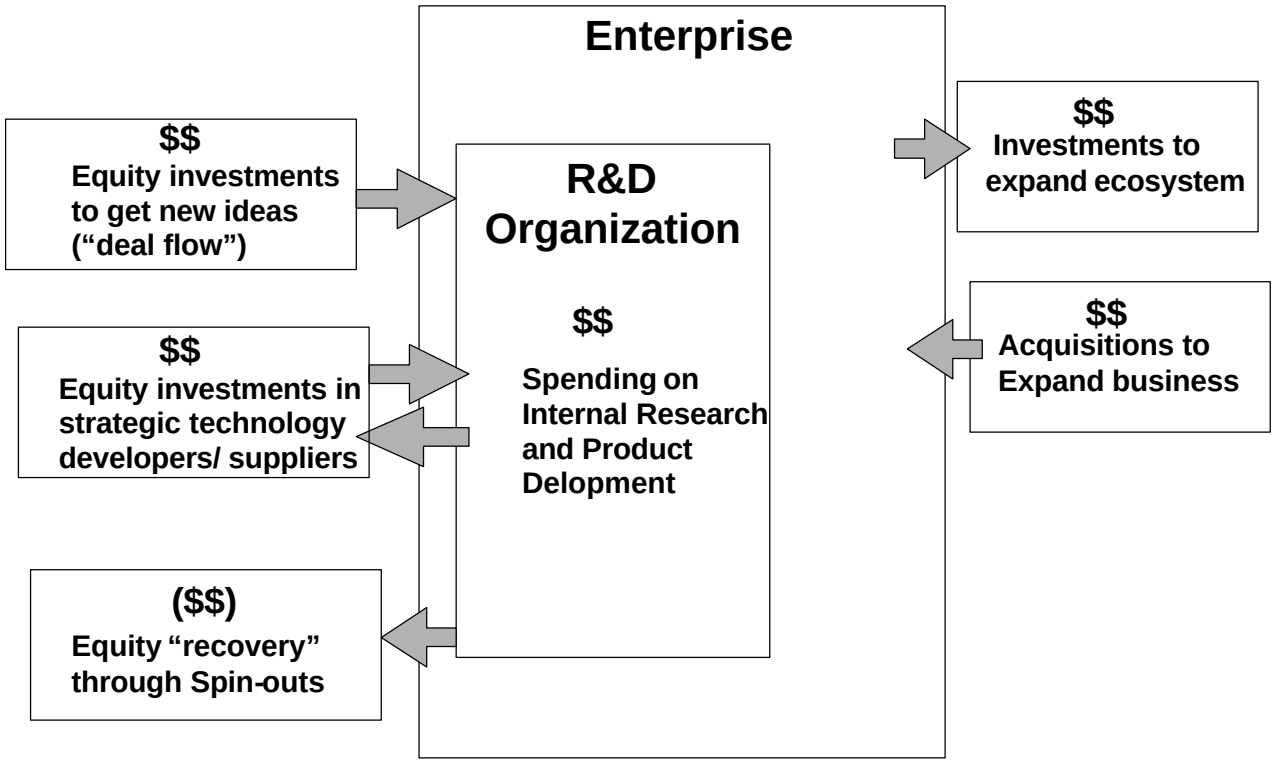

Figure 2. Established enterprises can use equity investments in new ventures to capture ideas and technology (represented by arrows flowing into the enterprise) or to take advantage of ideas (arrows flowing outside.) Value recovery for technology, represented by ($$), is possible with "spin-outs."

different possible accounting models for some of these funds (e.g. expenses against current revenues, capital expenses). Spin-outs represent a mechanism to recover value, impacting either current expenses or future expenses depending on whether cash or stock in the new venture is accepted in exchange for the contributed technology. Ideally, each corporation should optimize for their given business situation the distribution of resources among these investment alternatives.

Adapting Venture Capital Management Practices to Corporate R&D

There are has been much written about the management techniques of the Venture Community (7, 19). Many of these practices are not easily replicated by an on-going enterprise. For example, it is difficult for existing enterprises to offer the large upside financial benefits of start-ups (6). But there are some practices that can be adapted to a corporate setting, and some of these are described below. This list is intended to be representative but not exhaustive. Because the proportion of equity investment being placed in venture funds is increasing relative to new placements in other forms of equity, some analysts may conclude that the venture community has some management best practices that should be emulated by established enterprises.

1. Be prepared to "Kill your children"

In his article on "How to bring the valley inside", Gary Hamel describes the reluctance of existing companies to pursue ideas that will "kill an existing business."(20) Of course, since venture capitalists don't manage on-going businesses, and so don't have any synergies to exploit, this is not an issue for them.

But if an ongoing venture identifies ideas and concepts that have the potential to "kill an existing business," then those opportunities should be analyzed in more detail and pursued. It is better for the on-going company to replace its own existing businesses with a new replacement business than have some other company do it. Hewlett-Packard has pursued

several “business killing” ideas. The InkJet™ printing technology was pursued as a separate business, even though it competed directly with the lower end LaserJet™ printing business. For the same reasons, Kodak has made in extensive investments in digital photography even though digital technology threatens their silver-halide businesses.

2. Stimulate new ideas and invest in good ones

The lure of wealth and fame encourages prospective entrepreneurs to write business plans and submit them to venture capitalists. The venture capitalists have the “luxury” of reviewing many plans before deciding to fund them.

Often, the senior executives in existing enterprises do not see the same range of ideas for new opportunities. (The ideas may exist within the organizations, but they do not rise up the management chain.) Managers in such organizations traditionally do not review a large number of ideas before deciding to move into new areas.

Several writers, including Richard Foster and Sarah Kaplan (20) discuss programs to encourage new ideas. As an example, they describe how Shell has a process to solicit ideas from employees that are reviewed by a board, with early-phase funding available for some of the winning ideas. Gary Hamel discussed the same point in his article (21).

3. Funding and Milestone Management Practices

Venture capitalists are legendary for allowing the prospective entrepreneur only a limited amount of time to make his or her initial business plan presentation. To even schedule an appointment, an effective “elevator pitch” (limited to the 30 seconds required for just a short elevator ride) is often required. In our research organization we challenge the researchers to develop effective “elevator pitches” for their research proposals, and challenge them to be condense the value of their proposed research into a short presentation. This exercise helps them understand the essence of their ideas.

Although much has been written about “phase-gate” management processes for product development, in most large enterprises, the objective of “phase exit reviews” is for communication and refinement of objectives rather than making crisp “go/no-go” decisions. Venture capitalists allocate capital to start-ups in phases and insist on concrete milestones, many of them based on external standards, before committing additional funds (22). This strict discipline of demanding performance to specific milestones inspires a higher level of performance from the development teams, and is likely a best practice for a corporate environment as well as a start-up environment.

4. Apply Pre-IPO Valuation Techniques

The value of a pre-IPO company must be determined to establish an initial offering price or to sell the company to a potential suitor. Judgment and experience are elements of the valuation process that are difficult to emulate. But there are at least two aspects of the valuation process that can be applied in a corporate environment.

The first is the identification of “comparables”, where comparables are publicly traded companies that are in the same or similar business. Often such companies have only recently gone public. It is useful to ask the corporate researchers to identify “comparables” for their work and to compare the technology and business models of the “comparable” companies to the internal equivalents. This is a form of competitive analysis that is useful to calibrate the quality of the proposed innovation, and to compare the business model of the “comparable” to the proposed business model.

A second aspect of valuation is to determine possible outcomes, such as the best case, the expected case, and the worst case. Asking the development team to describe the outcomes of their project is a very useful discipline. Mathematical techniques, such as real options (23), are available to provide more quantitative results, if they are desired.

5. Seek to Identify high growth industries and markets

Ongoing enterprises are optimized to grow and extend the current set of businesses. The organizational structure of such enterprises encourages the management teams of the operational units to focus on a growing a particular business or market segment. Often there are emerging attractive businesses that leverage existing corporate competencies that are not yet on the “radar screen” of any business unit. Yet the right employees through determined effort and deliberate effort can discover such opportunities. Such discovery is common both among venture capitalists and among high growth companies. Large enterprises can create teams to actively search for new high growth markets that are synergistic with existing businesses and corporate competencies.

6. People and Performance Management

There are many aspects to the people and performance management practices of the venture community. In fact some venture fund managers report that they are investing in the management team of the new venture as much as the proposed technologies, products, and business models.

There are several aspects of people and performance management that stand out: Venture capitalists seek the best possible available talent to pursue the opportunities they fund (6) and they are willing to make any abrupt management changes required for the success of the venture. Start-ups also aggressively outsource tasks to external talent, focusing internal resources on the core value-added contributions of the new venture.

Although these practices are less common in an ongoing enterprise environment, they are possible. Large enterprises can use management rotation to place the best internal talent on key internal projects. Many of the contractors and consultants that work for start-ups will also work for existing enterprises.

Existing enterprises do need to recognize that the management talents required to sustain an existing business are quite different than those required to start a new business. Furthermore, new business creation activities in an established enterprise may need to be in a different organizational entity outside the organizational structures responsible to run and grow the mainstream businesses. Finally, an established firm may wish to establish a more flexible system of rewards to encourage their best people to pursue large new opportunities that involve greater risk.

Summary

Venture capital investments in 2001 were recently reported to be $32.1 billion, compared to $91.6 billion in 2000, $47.2 billion in 1999, and an estimated $25 billion in 2002 (24). These investment levels are significant, although still smaller than the $146B in R&D spent in 2000 by the 1000 largest R&D spenders in the U.S (25). With these levels of venture capital investment, business planners in established enterprises will have more opportunities than ever to grow by licensing venture funded technology or purchasing venture funded companies.

The performance of traditional corporate research is challenged by these trends. Traditional corporate research can respond by becoming more effective. Certain management practices common in the Venture Community can be leveraged to provide value in the traditional corporate R&D setting. Corporate research can find ways to leverage venture capital and venture funded technology. If corporate research does not respond to these trends, it is likely that established enterprises will increase the corporate resources used to purchase venture funded technology, products and companies to help drive their growth, and decrease investments in traditional corporate research.

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