XX IASP WORLD CONFERENCE ON SCIENCE & TECHNOLOGY PARKS
Habitats of Excellence: Managing and Promoting Innovation
June 1-4, 2003 – Lisboa, Portugal

ENHANCING INDIVIDUAL HABITATS THROUGH CLUSTERING OR NETWORKING: PARADOX OR ENLIGHTENED SELF-INTEREST?

Laura R. Meagher, PhD
Senior Partner, Technology Development Group
Laura.Meagher@btinternet.com

INTRODUCTION

STPs are of necessity in competition with each other --- or are they? If the world of high tech companies is viewed as a finite pie, to be split in ever-smaller pieces among hungry, clamouring parks, all-out competition would seem to be the only strategy. However, in a global environment increasingly shaped by continuous innovation, this may not be the case. Instead, efforts of sufficient critical mass to foster successful innovation by companies may actually increase the size of the pie. Collaboration across parks may, surprisingly, benefit each park, if a habitat particularly conducive to innovation is the result.

In fact, some of the richest ecosystems in the world, the rainforests, are made up of multiple interconnected mini-habitats, and are burgeoning with evolutionary innovation. This incredible biodiversity is comprised of multiple species filling a variety of specialised niches. For example, species of orchids mimic particular species of insects to such a degree that they lure specialised pollinators and thus allow the species to reproduce another generation. Species of "poison arrow" frogs have evolved both toxins that they can secrete and bright coloration to warn off predators before they even get close to the toxin, thus keeping the frogs alive and able pass on their genes to the next generation. Bromeliad plants capture rainwater in their centre, in which frogs and insects live in a smoothly functioning miniature habitat. Insects, fungi and bacteria thrive on the rainforest floor, breaking down fallen trees and animals in a process of decomposition that conserves and recycles the energy of the rainforest ecosystem. Indeed, one of the hallmarks of the rainforest ecosystem is that, through its multiple species and their evolutionary innovations and interactions shaping and inhabiting a complex series of miniature habitats --- rainforests possess more energy than do most other ecosystems in the world.

Pursuing this analogy, a central premise of this presentation is that new sorts of interaction across STPs may generate innovation in the sense of successful companies providing novel products and services. Connectivity across the habitats in a broader ecosystem of innovationmay increase the level of "energy" such that each STP benefits more than if it were a simple, miniature habitat on its own. Economic development will occur through increased numbers of companies, commercialised products and services, and jobs.

APPROACH

This presentation will draw upon an in-depth study conducted by Technology Development Group. Sharing of insights will lead to the posing of broader questions and challenges for STPs internationally.

In 2001-2002, Technology Development Group conducted a study funded by Scottish Enterprise Edinburgh and Lothians to explore potential for synergies across STPs. The question driving the study was: ***Can the parks, by working together, add value to their companies and thus to themselves?*** The central goal was to contribute to the successes of several nearby parks outside of Edinburgh, Scotland: in particular, the Pentlands Science Park, the Roslin BioCentre and the Edinburgh Technopole. In conducting the study, however, best practices in promoting innovation among tenant companies were captured for multiple parks internationally. In turn, findings of the study may be applicable to STPs internationally and should at the least provoke healthy debate.

Methods employed during the study included:

- an extensive benchmarking analysis of over 50 features for each of 10 parks;
- a workforce and innovation survey;
- semi-structured interviews with tenant companies;
- compilation and analysis of local graduate statistics;
- visioning retreats with leaders;
- background research into local and global trends.

Technology Development Group was also able to draw upon its extensive experience base in developing and marketing research-related economic development initiatives.

This presentation will develop the hypothesis of synergy in considering:

1) International benchmarking of over 50 features for each of 10 parks;
2) Views of tenant companies as to potential enhancements;
3) Prospects for co-marketing;
4) Enhancement of management through co-operation; and
5) Generation of new levels of "energy".

The presentation will conclude by offering a new model for tactical collaborations across STPs. In addition, suggestions will be made for useful tools such as the Action Options and Implications for Marketing Checklists developed during the study.

INTERNATIONAL BENCHMARKING

An extensive benchmarking analysis examined some 50 features for each of 10 parks, among them the three Edinburgh parks (Roslin BioCentre, Pentlands Science Park, Edinburgh Technopole); two high profile UK parks, Cambridge Science Park and Oxford Science Park; one of the oldest US STPS, the Research Triangle Park and its younger neighbour the Centennial Campus in North Carolina which is developing an internal distributed network of S&T "villages"; and the three parks of the Technology Network of the Basque Country (Alava, Bilbao, and San Sebastian), distinctive ---and perhaps prescient--- in their co-marketing strategy.

Over fifty key features of STPs were defined and placed in a framework generated to include four categories of STP features: specific Capacities, Facilities, Services and Location features. With these matrices, specificity combined with conceptual categorisation made it possible to consider the impact of increasing "critical mass" and thus to analyse potential benefits of synergy if multiple parks were to join forces regarding some particular features.

The 15 features related to **Capacities** included parameters related to *current and growth space, acreage and numbers of companies and of staff,* but covered parameters influencing prospects for knowledge transfer, such as also *technology focus (foci), affiliated research strengths, technology transfer capacity, development/manufacturing capacity*, and so on. *Financial arrangements* were captured in general terms and distinctive *"claims to fame"* were noted.

Some 8 features related to **Facilities** were assessed, with various *communication-oriented features, specialised facility highlights or specialised instrumentation,* and *animal accommodation* among those captured.

The many (21) **Services** considered ranged widely, from *security to pro-active business support, from training to PR and marketing.* Some services were aimed particularly at the well-being of individual staff in an STP community, such as *dining, sports/fitness, or childcare*.

Another 10 features related to **Location** were covered, among them *transportation and access* for various customers or partners, as well as access to *cities and social/cultural* activities. Finally, an attempt was made to at least consider the intangible but important *"innovation culture"* in or near the STPs.

As would be expected, STPs varied in the degree to which they provided particular features. Nonetheless, comparing and contrasting provision generated understanding of how the Edinburgh parks (the object of this particular study) stacked up against other STPs. The matrix format made it particularly straightforward to consider the relative standing of the Edinburgh STPs both individually and as a group. Clearly, components of each individual park habitat in the Edinburgh area, when added together, created a much more complete range of offerings. Whether viewing other STPs as competition or simply as a frame of reference, together the three Edinburgh STPs were much more impressive in scope and in detail when considered as a cluster or network. Furthermore, distinctive niches or competitive edges emerge from looking at the three neighboring parks as an interrelated ecosystem against the backdrop of the other STPs. New patterns could be seen.

In addition, moving from analysis toward operations, "implications" arising from objective assessment of offerings by other STPs stimulated fresh thinking as to new ways in which the neighboring Edinburgh STPs might work together. Such implications were considered during "visioning retreats" of the leaders of the three parks and affiliated economic development leaders. It became clear that, in theory at least, 1) current tenants could benefit from a greater range of offerings; 2) prospective tenants could be lured with a more compelling argument; 3) management of each park could become more effective; and 4) increased interactions could elevate the "buzz" or energy in the system.

ENHANCEMENT OF PROVISION FOR TENANT COMPANIES

Benchmarking matrices of features offered by other STPs were utilised to consider possible enhancements of provision among the three Edinburgh parks and related neighbors. For example, semi-structured interviews were conducted with park leaders and tenant firm leaders to explore further ways in which cooperation could increase tenant satisfaction, helping tenant companies to innovate and succeed commercially. Tenant firm leaders were positive toward the idea of drawing upon relevant features at any of the three parks, finding the idea of a broader "ecosystem" more helpful to innovative companies. Among the more obvious examples were access to a wider portfolio of specialized equipment or animal facilities.

POTENTIAL FOR CO-MARKETING

A linkage soon became clear between positive impacts on existing companies and potential for marketing or growth of parks. If current tenant companies viewed particular interactions across the STPs as helpful, any of these same enabling features could also be promoted to additional companies, startups, investors and others. Operationally, cooperation across the STPs could serve two purposes at once: it could benefit existing firms, making them more successful and thus more attractive as "neighbors" for other firms considering location, while also providing a broader range of selling points for any one STP attempting to lure in a new tenant. STP leaders considered various steps such as a joint PR officer, providing each other with information so that each STP's ability to attract companies could improve, listing the aggregate of benchmarking features, and so on.

In addition, for the Edinburgh area, certain common attributes of the locality could be promoted by each park. Extensive data was collected, for example, on the prospective technical workforce, educated at various levels by local institutions, upon which companies in any of the parks could draw. Figures on "intellectual density" of the overall ecosystem were thus made available to each of the STPs as a marketing tool.

Similarly, information was pulled together for all to use on additional key features of the overall ecosystem: some included the social and cultural amenities of nearby Edinburgh, air transportation accessibility and so on. In addition, however, the "technical landscape" of the ecosystem beyond the three parks was noted, including, for example, the building on a contiguous site of a BioManufacturing Campus in which life science companies could produce clinical trial quantities of new pharmaceuticals; another STP slightly further away; the planning stage development of a new medical research STP only 15 to 20 minutes away; and of course the rich research resources of nearby University of Edinburgh and Heriot-Watt University. This built upon the paradigm of a common story that had underpinned the earlier Edinburgh BioAlliance in which the STP and economic development leaders had already played key roles.

Among the recommendations arising from the study was that marketing for any one individual STP could benefit from some collective image as an alliance within one geographical area (e.g., some catch phrase such as "Research and Innovation Zone of Edinburgh" (RIZE)). More specifically, a model recommended was for the STPs to consider marketing themselves as a "multi-campus research park network". This would make it possible to convey a sense of connectedness (as in an ecosystem) while still allowing for autonomy of each STP habitat.

ENHANCEMENT OF MANAGEMENT EFFICIENCY, STPs

Through benchmarking, interviews and retreats, opportunities were also identified for increased efficiencies in management of the parks. Quite specific "nodes of collaboration" made practical sense even in the short term. Working more closely together, STPs could, for example, share or indeed divide up responsibilities for expertise. One clear example was regulatory compliance across multiple categories ranging from human resources to laboratory safety. By distributing out responsibilities for fine detail in different categories of regulations, safety officers from different parks could provide better advice to all the tenant companies for less personnel cost. Opportunities also crystallized as to sharing equipment, whether esoterically technical or pragmatically functional, from specialised animal care facilities to poster making facilities. TDG developed an Action Options Table for future use as a tool for systematic consideration of some 100 possible cooperative actions that could potentially expand provision or reduce costs.

Again, since all ecosystem dynamics are interwoven, this sort of enhanced management efficiency would not only benefit current tenant companies but could also encourage additional companies to seek a home within the ecosystem.

NEW LEVELS OF ENERGY – "BUZZ"

Data was also collected to provide an "innovation profile" that could be used by any of the STPs or economic development leaders to highlight the critical mass of front-edge research and development in the overall ecosystem. Cumulatively, across the STPs, this evidence of dynamic, cutting edge activity was impressive.

Through interviews with tenant firm leaders and a focus group with employees, however, it became clear that even more was desired --- expansion of mutually beneficial commercial interactions among tenant firms. Some tenant firm leaders already provided services to a firm at one of the other STPs; a few were exploring joint ventures. Yet, more information as to what companies did what, or needed what services, or had extra time available on which sophisticated equipment, would contribute toward these sorts of "symbiotic" interconnections that strengthen the well-being of the ecosystem. So, for example, a common Directory, web-based and kept updated, was recommended, as were informal networking opportunities among company leaders across the STPs. Employees sought an interactive "community" drawing upon the aggregate critical mass of staff, perhaps through, for example, common sports facilities or events, and dining options, with ease of transport across the three STPs also an issue.

In short, some felt quite strongly that the combined critical mass of the three STPs should somehow benefit from a range of dynamic interactions that generated a new level of energy, the "buzz" that in the right environment can stimulate a positive spiral of creativity and innovation.

HABITATS AND ECOSYSTEMS: NEW MODELS FOR COLLABORATION

Challenges

Despite such rational assessments of benefits arising from collaboration, relinquishing any degree of autonomy can be difficult for STP managers. Like many of their tenants, they are by nature often entrepreneurial and proactive themselves. Any hint of a corporate merger model could send them flying apart. Yet, perhaps there is room for some new models: a range of more limited collaborations through which the benefit of enhancing one's own offerings to current or prospective innovative companies outweighs the costs of managing interactions with others. Strategic alliances among STPS may become just as necessary as those among companies. Park managers could become role models for tactical collaborations among their companies.

Selected "tactical" collaborations"

Since companies at one park may well benefit from providing or buying services from companies at another park, or indeed from forming a joint venture; collaboration among neighboring or otherwise connected STPs could facilitate this sort of commercial and financial activity, to clear mutual advantage. Examination of possible management activities that could be shared (from regulatory compliance to bringing in legal/financial/business experts) could identify some very easy "early wins" in which collaboration would be easy and benefits obvious. With such experiences building trust, further or more far-reaching collaborations might become possible in time. Differentiation of niches or deliberately crafted complementarity (perhaps across industry sectors, technologies or stages of company maturity) might evolve in such a way as to ease further collaboration.

Distributed Networks: An Ecosystem Model

A highly desirable though totally intangible characteristic of dynamic STPs is "buzz" --- an atmosphere of energy, excitement and creativity that fosters and accelerates innovation. Increased potential for interactions among a larger base of innovative companies can drive the buzz which will itself help lead to more and more innovation, in a virtuous spiral. A distributed

network of STPs could offer more to tenant companies than any one STP. In addition, confidence in this expanded environment could entice more and more first-time entrepreneurs into innovative action --- thus enhancing economic activity and growth even further.

A “distributed network” paradigm is perhaps most like an ecosystem in which multiple independent habitats ---STPs--- thrive but benefit from interconnectedness.

The particular study discussed here focused on potential for a distributed network model of collaboration among neighboring STPS, as an initiative in local economic development. However, its conclusions might have a broader scope. Today, changing technologies make distance less and less of an issue. Physical proximity may not be the only criterion that can generate “connectedness” among STPs. STPS might share a focus on the same technology, industry or type of company, such that together they could achieve a significant position. In other cases, the foci of different STPs might be interdependent. (One could imagine, for example, one STP specialising in proteomics tools and techniques, while another possessed unusual capacities for applications.) Either a shared focus or strategic complementarity could mean that connectivity would benefit STPs and their companies. In addition, when assessed with a degree of imagination, some critically important benchmarking features of STP habitats are not necessarily restricted to proximity; a quest for “critical mass” could lead to collaboration across even geographically separated STPs.

Perhaps indeed more and more STPs will make strategic decisions, based on careful analysis of the features they can offer to their companies, and will join forces with other STPs--- nearby, in the same country, even globally—to enhance their local habitats. The more effective STPs become at fostering innovation, the more other actors in the innovation process will work with them and the more innovative companies will be started up and thrive. The ecosystem will capture more and more critical mass (company activity) and more and more energy (innovation and commercialisation).

CONCLUSION

In nature, a robust ecosystem has many components and many interactions which take place among those components. In innovation as well, STP habitats which make the most of their surrounding ecosystem will help their companies thrive. Perhaps the next challenge to STP leaders, as STPs evolve, is to create distributed networks among STPs, even globally and virtually, to generate rich innovation and commercialisation ecosystems that are the equivalent of lush rainforests teeming with diversity.