

# Finding, Forming, and Performing: CREATING NETWORKS FOR DISCONTINUOUS INNOVATION

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**M**any industries today face a fast pace of technological and market change where the shifts are not just more-of-the-same. Instead, they are characterized by periods of discontinuous change in which the companies that emerge as the new winners often have competencies, backgrounds, and networks of relationships that are very different from the previous incumbents. Lego used to compete head-to-head with Mattel and Hasbro in brick sets and action figures; now it has to come to grips with the latest digital device or online offering from Sony, Nintendo, and Electronic Arts. GSK used to see Merck, Novartis, and Pfizer as its principal competitors; now it is equally worried about the proliferation of new drug compounds from biotechnology companies. While discontinuous changes of this type have occurred throughout history, there is evidence that they are becoming more frequent and more severe.<sup>1</sup> The implication for many firms—and particularly those in fast-moving, high-technology industries—is that they need to increase their capacity for *discontinuous innovation*, i.e., the implementation of new technologies, products, or business models that represent a dramatic departure from the current state of the art in the industry.<sup>2</sup> This article examines how firms create new networks (with customers, suppliers or other partners) as one part of this capacity for discontinuous innovation.

## The Challenge of Discontinuous Innovation

Discontinuous innovation can take many forms. It is often driven by the development of an entirely new technology, such as the solid-state white-light-emitting diode technology patented by Nichia Chemical that threatens to make the traditional heated-filament light bulb obsolete;<sup>3</sup> it may be brought about by

the emergence of new markets, such as digital photography or mobile telephony; and it may be triggered by dramatic shifts in the political or economic scenery, such as the deregulation of the national postal services in Europe that is underway at the moment.

Regardless of the initial source of change, the effect of such discontinuities on incumbent firms can be dramatic. Research has shown consistently that new technology or market opportunities are typically developed first by new entrants, and established players either find themselves scrambling to catch up (Lego in digital games, Motorola in mobile infrastructure) or they lose out altogether (Polaroid in digital photography, DEC in the PC industry).<sup>4</sup> There are also cases where incumbent firms have successfully managed the transition of their business models to incorporate discontinuous technological changes (retail banking and the Internet, IBM and the emergence of the IT services industry). Such cases suggest that it is certainly possible for firms to be successful at discontinuous innovation, even if the chances of success are low.<sup>5</sup>

There are three broad sets of reasons why so many firms struggle with discontinuous innovation. First, the fruits of discontinuous innovation are uncertain, hard to make sense of, and typically slow to emerge. The new offering does not emerge perfectly formed like Venus from the sea; instead, it typically comes together in a fragmented and apparently *ad hoc* manner, so many firms give up along the way and fall back on their investments in more incremental but predictable projects. For example, RR Donnelley, the Chicago-based printing company, created a digital printing business in the late 1980s, but it struggled to build a coherent offering for the relevant target markets and the initiative failed.<sup>6</sup>

Second, firms find it difficult to break out of established and hitherto successful routines. Their existing structures and processes are organized around a

historically determined set of customers and products, and their reward and incentive systems are geared to maintaining and improving on the established system. Intel, for example, has poured hundreds of millions of dollars into new opportunities beyond its core microprocessor business, but it continues to be completely reliant on that business for its revenues and its profits.<sup>7</sup>

Third, and of most relevance to this article, the forces of inertia extend to the firm's networks and systems of relationships. It is well known that long-term and deep relationships are powerful positive

resources for incremental innovation.<sup>8</sup> However, research has also recognized an important corollary: *the ties that bind may become the ties that blind.*<sup>9</sup> In other words, the strength of an existing web of relationships is itself a fundamental obstacle to

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change. For example, UK retailer Laura Ashley found itself in trouble in the 1980s by staying committed to a shrinking target market of women wanting traditional floral designs as well as to a high-cost workforce in Wales. Apple Computer's well-publicized problems in the mid-1990s were at least partly the result of its refusal to build relationships with new suppliers, distributors, or software partners outside its own inner circle of allies.<sup>10</sup>

The challenge of discontinuous innovation has been recognized for many years, and it has been the subject of a considerable amount of academic research. One line of research has focused on the effect that different types of innovation have on industry structure and on the performance of incumbent and entering firms.<sup>11</sup> A second set of studies has attempted to understand emerging customer needs in newly formed markets and the approaches firms can use to address them.<sup>12</sup> A third approach has been to focus on the cognitive barriers managers face in building awareness and making investments in unfamiliar areas and the tactics they can use to overcome these barriers.<sup>13</sup> Finally, a fourth major line of research has focused on understanding the internal mechanisms firms use to manage their innovation activities, including the role of marketing and design, the "probe and learn" process, and the creation of separate venturing units.<sup>14</sup>

Our approach here is to focus on one particular aspect of the problem, namely, how firms create new networks to enable discontinuous innovation. Our research suggests that such networks can be an important source of new insights, competencies, and relationships for the firm as it attempts to make sense of the changes affecting its industry. Unlike the other approaches mentioned above, it has received very limited research attention to date. Many other researchers have examined the roles of networks in building an innovation system, but their focus has typically been on building and maintaining an existing network rather than on the challenge of creating a new set of relationships that might complement or even supplant the existing ones.<sup>15</sup>

The research we report here offers a framework for making sense of the management challenges associated with creating new networks. It is based on detailed case studies of firms in Europe and North America that were seeking out ways of addressing the discontinuous changes underway in their business environments (see Appendix). Clearly, the nature of the changes facing these firms varied enormously, but the common theme facing all of them was a recognition that they had to move beyond their existing, tried-and-tested relationships if they were to succeed in capturing value from the emerging opportunities in their industries. The networks created by these firms took many forms—some involved identifying prospective suppliers of new ideas or technologies, others were prospective customers or governmental institutions that the firm was seeking to better understand (see Table 1).

**TABLE I.** Examples of Networks for Discontinuous Innovation

<b>Idea Networks</b>	A set of relationships with individuals and organizations who the firm can tap into to help solve technical problems or to brainstorm new ideas. For example, P&G's Connect and Develop and Eli Lilly's Innocentive.
<b>Corporate Venturing Networks</b>	Involves building relationships with hundreds of prospective new ventures and other VCs with a view to developing a window on new technologies and making selective investments in promising new ventures. For example, Intel Capital Nokia Ventures.
<b>Lead User Groups</b>	A set of relationships with leading-edge customers who help the firm to experiment with and try out new product ideas. For example, Lego's Mindstorm User Group or the BBC's Backstage.com project.
<b>Cross-Industry Alliances</b>	Creation of relationships with various different actors in a particular industry to achieve something that they cannot achieve on their own. For example, Rio Tinto's work with sustainable development agencies on its Breaking New Ground initiative.
<b>Communities of Practice</b>	Cross-boundary and cross-organizational groupings engaged in experience and idea sharing around shared knowledge fields, particularly at the intersection point where two "knowledge worlds" collide. For example, technical groups/knowledge communities at 3M, Xerox, and HP.
<b>Supplier Networks</b>	Networks of partners with whom firms share their strategic roadmaps and invite ideas and inputs to shaping and delivering on new and alternative visions. For example, Rolls Royce and its strategic supplier program.
<b>Open Invitation Networks</b>	Networks of self-selecting volunteer partners who organize around a specific project or issue. A recent example was the innovative approach to film financing by Thai-American film producer Tao Ruspoli who invited investors to contribute a dollar (or more) and become associate producers of his next film.

## Building Networks for Discontinuous Innovation

The challenge facing firms in building new networks can be broken down into two separate activities: identifying the relevant new partners; and learning how to work with them. Once the necessary relationships have been built, they can then be converted into high-performing partnerships. It's like the recipe for effective teamworking (forming, storming, norming, and performing) except that here it is a three-stage process: finding, forming, and performing.

Consider first the finding and forming parts of the process.<sup>16</sup> *Finding* refers essentially to the breadth of search that is conducted. How easy is it to identify the right individuals or organizations with which you want to interact? Do you already know exactly who they are, or will you need to put considerable effort into locating the right actors? Finding is enabled by the scope and diversity of your operations and by your capacity to move beyond the traditional way of thinking in your industry. It is hindered by a combination of geographical, technological, and institutional barriers (see Table 2).

*Forming* refers to the attitude of prospective partners towards your firm. How keen are they likely to be to work with you? Do you expect them to work hard to build the relationship themselves, or do you expect them to resist your

**TABLE 2.** Barriers to New Network Formation

Primary Objective	Type of Barrier	Description
Finding Prospective Partners	Geographical	Discontinuities often emerge in unexpected corners of the world. For example, world leadership in wind power emerged in Denmark, a small country with economic and social reasons to push alternative energy. The result was small scale but scaleable wind turbines—a classic piece of disruptive innovation. <sup>a</sup> Geographical and cultural distance makes complex opportunities more difficult to assess, and as a result they typically get discounted.
	Technological	Discontinuous opportunities often emerge at the intersection of two technological domains: for example the nutraceuticals market emerged by linking advances in the food and pharmaceutical industries. However, scientists from different disciplines struggle to communicate effectively, partly because of language differences, <sup>b</sup> and partly because of the different communities in which they work.
	Institutional	Institutional barriers often arise because of the different objectives or origins <sup>c</sup> of two groups, such as those dividing public sector from private sector, and profit-seeking from not-for-profit organizations. For example, one entrepreneur interviewed during the research had no interest in building a company around the novel medical product he had created: he just wanted to generate a fair return on his intellectual property so that he could get back into his research laboratory. When a large firm approached him about commercializing his product, it took a while for them to fully understand his perspective.
Forming Relationships with Prospective Partners	Ideological	Many potential partners do not share the values and norms of the focal firm, which can blind it from seeing the threats or opportunities that might arise at the interfaces between the two world views. For example, McDonalds has experienced a serious backlash as social attitudes to fast foods have shifted from those valuing convenience to growing concerns about childhood obesity and its complications.
	Demographic	Barriers to building effective networks can arise from the different values and needs of different demographic groups. On the customer side, every company has an implicit target market it understands, but opportunities often emerge in new demographic groups they don't understand, such as female customers in the auto industry, or children in mobile phones. On the employee side, the needs of Generations X and Y are very different to those of their parents, and require innovative approaches in the workplace.
	Ethnic	Ethnic barriers arise from the deep-rooted cultural differences between countries or regions of the world. Such differences (for example, in terms of attitudes to time, uncertainty, or gender differences) have been well researched <sup>d</sup> and continue to represent substantial barriers to the formation of new business networks. For example, banks doing business in the Islamic world have to adapt to the demands of Sharia law, which, among other things, forbids usury, i.e., the payment of interest.

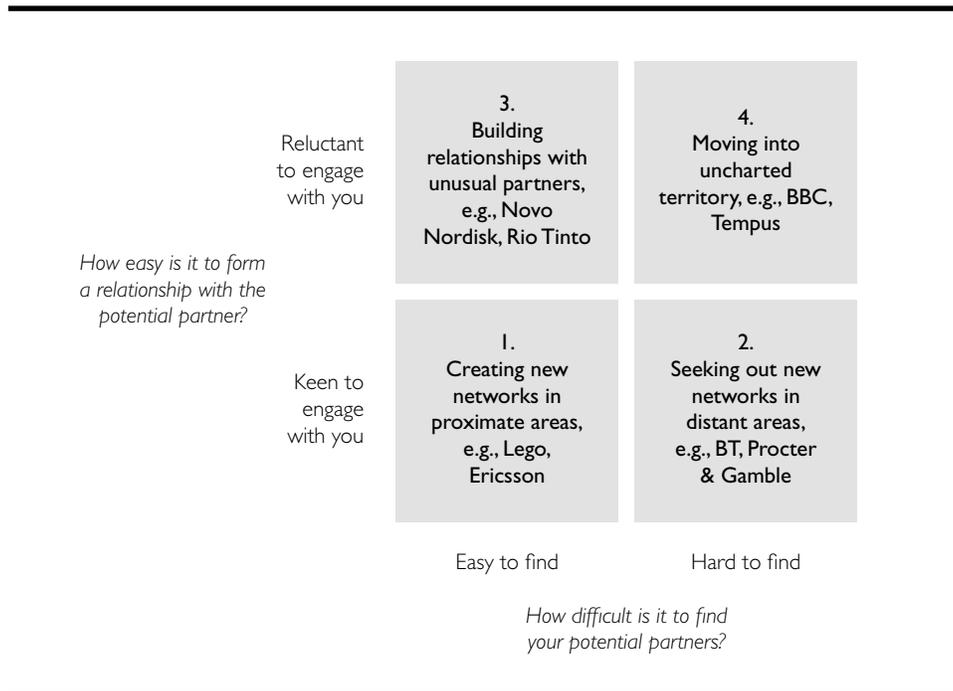
a. For a detailed discussion of Denmark's success in the wind energy industry, see R. Garud and P. Karnoe, "Bricolage versus Breakthrough," *Research Policy*, 32/2 (February 2003): 277-301.

b. Sometimes even a simple language gap can be a big barrier—and occasionally the misunderstandings can have dramatic effects. The Mars Climate Orbiter, launched in 1998, almost completed its epic voyage to Mars but unexpectedly disappeared from radar screens just 49 seconds before landing. NASA's investigation into the \$125m disaster discovered the problem was simply that the JPL controllers were working in metric units whereas engineers at Lockheed Martin had been working in Imperial units.

c. It is widely acknowledged in the social networks literature that similar actors are more likely to form close ties. See J.M. McPherson, L. Smith-Lovin, and J.M. Cook, "Birds of a Feather: Homophily in Networks," *Annual Review of Sociology*, 27 (August 2001): 415-444.

d. For research on differences in national culture, see G. Hofstede, *Culture's Consequences* (Thousand Oaks, CA: Sage Publishing 1980); F. Trompenaars, *Riding the Waves of Culture* (New York, NY: McGraw Hill, 1997).

**FIGURE 1.** Four Generic Approaches to Network Building



overtures because of their different perspectives? Forming is enabled by your past experiences with relationship building, the strength of your position within your industry, and an open attitude towards knowledge sharing. It is hindered by a range of barriers that may be ideological, demographic, or ethnic in nature, as well as by more generic concerns about the protection of intellectual property.

### Generic Strategies for Building Networks

When these two aspects are set against each other, four separate approaches can be identified. Figure 1 illustrates this simple framework.<sup>17</sup> It is important to note that while this framework captures the static positions a firm might find itself in vis-à-vis one prospective partner network, it also has a dynamic element. For example, it suggests ways in which a firm can develop its competencies and re-evaluate its opportunities to switch from one position in the framework to another, and thereby change its approach.

#### *Creating New Networks in Proximate Areas*

The bottom-left part of Figure 1 represents the relatively straightforward challenge of creating new networks with potential partners that are both easy to find and happy to do business with you. Many traditional business relationships sit in this box, and the emphasis in such cases is typically on negotiating the appropriate terms for a commercial relationship, and then on managing the relationship on an ongoing basis. In the present context, however, this box still

offers considerable challenges because we are concerned primarily with those networks of relationships that are not “business as usual.” So, even though the actors in question may be well known to the firm and are keen to become involved, the decision to invest in relationships with them is likely to have an uncertain and perhaps long-term payoff.

Consider, for example, Lego’s decision to develop its next generation Mindstorms product using a network of lead users of the first generation product. The company created a Mindstorms User Panel for this user community. Working for the most part remotely over an 11-month period, these lead users collaborated with Lego to finalize their product for the launch of Mindstorms NXT at the Consumer Electronics Show in Las Vegas in 2005. Lego also decided to outsource the new software for the NXT version (the software for the previous version had been created in-house) as they wanted more intuitive software. Lego’s experience after the first Mindstorms product had been that the enthusiastic user community was an asset, despite its hacking into the old software and sharing this information on the web. As described by Lego Senior Vice President Mads Nipper, “We came to understand that this is a great way to make the product more exciting. It’s a totally different business paradigm.”

By thinking differently, Lego was able to reach out to its lead users in what was—by their standards—a highly unusual collaboration. Mads Nipper and his team guessed correctly that their “lead users” would love to be involved in the development of their next generation product, so it proved to be quite straightforward to set up the appropriate forum in which they could interact. In recognition of the success of this program, Lego stated in January 2006 that it was looking for 100 more citizen developers.

Another example is provided by the Swedish mobile infrastructure company Ericsson, which in 1999 sought to improve the quality of its access to university-based research. Rather than sponsor research studies at arm’s-length, as they had done in the past, they designated key individuals to liaise directly with sponsored faculty and to hold quarterly meetings to review progress against their goals. As with the Lego example, this new approach was relatively simple to put in place, but it quickly helped to build personal relationships that facilitated a more effective two-way transfer of knowledge between Ericsson and its university partners.

Taken together, the cases that are located in the lower-left quadrant suggest three key elements to new network building:

- Approach the potential new partners directly; you know who they are, and there is every reason to think they will be receptive to your proposals.
- Structure the relationship carefully to overcome the institutional or demographic differences that separate you; lead users and university professors often have very different world views to profit-making firms, and it takes time to understand what motivates and excites them.

- Build personal relationships at the interfaces with partners to ensure that knowledge transfer occurs; otherwise the potential of the relationships will be squandered.

In sum, creating new networks in proximate areas is relatively straightforward, but it requires a significant investment on the part of the firm to ensure that the knowledge and insights of the partners are internalized.

### ***Seeking Out New Networks in Distant Areas***

In the bottom-right corner of the framework, the emphasis is on *finding* new network partners. The barriers here are typically geographical, ethnic, and institutional. The challenge is to locate the appropriate individuals or organizations from among the many thousands of prospective partners. However, once they have been identified, the process of forming commercial relationships with them tends to be relatively straightforward.

The most appropriate strategy in this scenario involves investing in boundary-spanners and scouts who collectively can forge links with potential partners. Boundary-spanners are individuals who understand both worlds and can make the necessary links between them. Scouts are individuals who have or are prepared to build diverse networks into places or sectors that your firm is unfamiliar with.

Consider two examples from the cases we studied. The first is Procter & Gamble's well-known initiative called Connect and Develop.<sup>18</sup> Building on CEO A.G. Lafley's stated objective to source 50% of the company's innovations from outside the boundaries of the company, P&G has built a massive network of "outside contacts" to complement its internal R&D staff of 8,500. This network has several elements: there are teams of technology entrepreneurs in attractive nodes such as China, Japan, and Italy who seek out individuals and companies doing interesting work in the food science arena; there are more than 800 retirees who work part time in making contacts for P&G that might prove useful; and there are web-based systems for connecting to people with interesting skills and ideas.

The second example is BT's four-man scouting operation in Silicon Valley.<sup>19</sup> It was established in 1999 to make venture investments in promising telecom start-ups, but after the dot-com bubble burst it shifted its mission towards identifying partners and technologies that BT was interested in. The small team looks at more than 1000 companies per year and then, based on their deep knowledge of the issues facing the R&D operations back in England, they target the small number of cases where there is a direct match between BT's needs and the Silicon Valley company's technology. While the number of successful partnerships that result from this activity is small—typically 4 or 5 per year—the unit serves an invaluable role in keeping BT abreast of the latest developments in its technology domain. As Jean-Marc Frangos, the head of the unit observed:

“The most important thing is to have your radar in such a way so the technologies you identify at Silicon Valley are really useful as opposed to ‘a nice to have.’ Being able to identify the mapping of what you see with the various interests is the challenge here...You won’t find the cure for your patient if you don’t really understand what he suffers from.”

These two examples are different in one important respect. P&G’s network of scientists is used in a problem-focused way, in that they are asked for their input whenever P&G’s internal R&D employees have a problem they cannot solve. BT’s California venturing operation, in contrast, is solution-driven, in that it taps into a set of new technologies that may or may not be useful to core R&D activities. However, the point is that both of these networks were difficult to build primarily because of the diversity of potential partners, not because those partners had ideological or demographical differences with P&G or BT.

In sum, the approaches firms used for seeking out new networks in distant areas can be summarized as follows:

- Rather than attempting to do it yourself, new potential partners are best approached through boundary spanners or scouts who specialize in building and maintaining relationships with many people.
- Be prepared to accept redundancy or duplication in the networks that you create; they are designed to be learning opportunities, not contracts for specific services.
- Do not underestimate the difficulty of absorbing the insights gained from these distant networks; give specific individuals direct responsibility for internalizing and applying the knowledge gained from new partners.

### ***Building Relationships with Unusual Partners***

The third scenario is where the potential partners are easy to find but potentially reluctant to engage with you (i.e., the top-left quadrant of Figure 1). This might occur for ideological reasons, or because of institutional or demographic barriers between you and your potential partners. Whatever the circumstances, the challenge of building a relationship with such prospective partners is qualitatively very different to the challenge of seeking out new partners in distant areas.

An effective strategy in this situation involves co-opting prospective partners around a shared goal. Given their initial reluctance to engage with you, our research suggests it is necessary to find a way of transcending the real or imagined differences between them and you and to create a specific project or activity that they find attractive.

Consider the Danish pharmaceutical company, Novo Nordisk. As a commercial organization selling insulin and other diabetes-related therapies into the healthcare industry, Novo Nordisk did not find it easy to build deep relationships with specialists, nurses, and health insurers. Institutional and ideological barriers made close engagement difficult. However, faced with long-term changes in the business environment towards greater obesity and rising healthcare costs, Novo

Nordisk realized that it needed to start exploring opportunities for discontinuous innovation in its products and offerings. Its “Diabetes 2020” process involved exploring radical alternative scenarios for chronic disease treatment and the roles that a player like Novo-Nordisk could play. As part of the follow-up from this initiative, in 2003 the company helped set up the Oxford Health Alliance, a non-profit collaborative entity which brought together key stakeholders—medical scientists, doctors, patients, and government officials—with views and perspectives that were sometimes quite widely separated. To make it happen, Novo Nordisk made clear that its goal was nothing less than the prevention or cure of diabetes—a goal which if it were achieved would potentially kill off the company’s main line of business. As Lars Rebién Sørensen, the CEO of Novo Nordisk, explained:

“In moving from intervention to prevention—that’s challenging the business model where the pharmaceuticals industry is deriving its revenues!...We believe that we can focus on some major global health issue—mainly diabetes—and at the same time create business opportunities for our company.”

By committing itself to the ultimate goal of curing diabetes, Novo Nordisk was able to transcend the barriers that had historically separated it from other stakeholders. The company is now in a strong position to shape the future evolution of the diabetes industry and to build new offerings—for example, around preventative care—ahead of their competitors.

Several other companies in our sample used similar types of approaches. In 2000, mining giant Rio Tinto took the initiative to reach out to NGOs (such as the International Institute for Environment and Development) by sponsoring an industry-wide study of the role of minerals in sustainable development.<sup>20</sup> This was potentially risky for Rio Tinto, but the initiative allowed the company to develop a good dialogue with actors who had traditionally kept their distance from the company.

At around the same time, oil major BP identified a rather different challenge, namely the emergence of the so-called “Generation Y” whose values in and around work were dramatically different from those of their Baby-Boomer parents. Rather than push them to conform and risk alienating them, BP’s executives put in place a project called “Ignite” in which a group of 20- to 30-year-old employees were asked to brainstorm possible changes to the strategy and organization of the company. By giving them *carte blanche* to pursue the project on their own terms, the executives gained the trust of their Generation Y employees, and in the process some useful new insights into the workplace of the future were uncovered.<sup>21</sup>

Taken as a whole, these and other cases suggest a number of specific tactics that can be used to build relationships with unusual partners.

- Focus on the higher-order purpose or issue that transcends your differences; it may be a major concern such as global warming or disease prevention, or it may be a common “enemy” that you are both competing with.<sup>22</sup>

- Be prepared for a lengthy dialogue to take place before the new partners begin to trust you; the process of mutual adjustment often takes years.
- Try to identify cross-over individuals who have switched allegiance from the world of the prospective partner to your world; they can be very useful in proposing the appropriate ways of making the personal connections between the two sides.

### *Moving into Uncharted Territory*

In the final scenario, represented by the top-right box of Figure 1, the potential partners are neither actors you can easily identify nor are they (once you find them) likely to be keen to engage with you. This is moving into uncharted territory. Of course, the territory may be so hard to navigate that it is not even worth trying, but depending on the nature of the change affecting your industry you may have no choice. For example, many traditional media companies had no choice but to engage with upstart companies and the anti-establishment culture of the Internet when its disruptive potential became apparent.

How do you engage with potential partners in this situation? One approach is gradually to reduce the reluctance of prospective partners by breaking down the institutional or demographic barriers that separate them from you. This essentially pushes the prospective relationship into the bottom-right corner of Figure 1 and allows you to use boundary-spanners and scouts to engage with your prospective partners. For example, consider the case of the BBC, the UK's publicly funded broadcaster. The BBC had a long and illustrious tradition as a producer of broadcast media but in the early 2000s it was trying to deal with the discontinuous challenges of the new digital media environment. How should it deal with this major change in its marketplace? By trying to second-guess a massively complex new world through the efforts of a small R&D group? Or by trying to engage a rich variety of players in those emerging spaces via a series of open source experiments?

Their answer was BBC Backstage, a project that sought to do with new media development what the open source community did with LINUX and other software development. The model was deceptively simple—developers were invited to make free use of various elements of the BBC's site (such as live news feeds, weather, and TV listings) to integrate and shape innovative applications. The strap line was "use our stuff to build your stuff." As soon as the site was launched in May 2005, it attracted the interest of hundreds of software developers and led to some high-potential product ideas. Ben Metcalf, one of the program's founders, summed up the approach:

"Top line, we are looking to be seen promoting innovation and creativity on the Internet, and if we can be seen to be doing that, we will be very pleased. In terms of projects coming out of it, if we can see a few examples that offered real value to our end users to build something new, we would be happy with that as well. And if someone is doing something really innovative, we would like to invite them into the BBC and see if some of that value can be incorporate into the BBC's core propositions."

As this example suggests, the BBC was able to win over a skeptical group of independent developers by showing that they were progressive in their approach to new media development and open-minded to non-mainstream ideas. There is still, of course, some distance between the parties, but BBC Backstage has succeeded in reducing the size of the gap.

A second approach to moving into uncharted territory is to use a middleman, an agent who can act on your behalf in making the link to prospective partners. Consider the case of Tempus,<sup>23</sup> a large consumer products group, and its international launch strategy for Tambura beer. While most of its products had been marketed through traditional big-budget advertising campaigns, Tambura beer launched in Spain through a low-key, word-of-mouth promotional strategy. Whereas most of Tempus's brands were seen as mass-market offerings, Tambura in Spain had developed a cult-like following among independent-minded people—the sort of consumer who Tempus usually failed to sell to.

Tempus decided to launch Tambura internationally by replicating the Spanish model. They hired two consultants who were very well connected in the trendy world of artists, designers, and musicians, and they asked them to start a word-of-mouth promotional campaign for Tambura. Starting in the UK and the U.S., the consultants used their contacts to identify the “cool” bars, clubs, and galleries in key cities, and then they approached up-and-coming artists and opinion leaders in these places to get them interested in Tambura beer. For example, they would give away free Tambura beer when a particular band was playing in a bar or when an artist was exhibiting their latest art.

At the time of writing, the preliminary results of the Tambura campaign were very positive, in terms of the demand for the product among the communities they had reached. However, there is a long way to go to prove its overall success. From the perspective of this research, Tempus's approach provides useful insight into how to build a network where both the “finding” and the “forming” parts of the process are difficult. Tempus used independent agents as a route into a world they did not understand. As well as generating sales of Tambura beer, Tempus also benefits from the insights and perspectives they gained, through the two consultants, into the needs and desires of a community of potential consumers they previously had little contact with.

In sum, moving into uncharted territory involves a combination of the tactics identified around quadrants two and three. You need to work with specialist network builders (some of whom directly work for you, some of whom are free-agents) and you need to develop a reason for the potential partners to work with you in the first place. If the challenges associated with the other quadrants of the framework were substantial, the challenges here are even larger, and the process of creating the necessary networks is likely to take substantially more time.

## Turning New Networks into “Performing” Partners

Consider the broader challenges firms face in turning their new networks into valuable and high-performing partners.<sup>24</sup> Just as with the finding and forming parts of the process, performing requires the firm to overcome a number of specific barriers. These included such things as different attitudes (between partners) towards the protection of intellectual property and differing concepts of equity and trust in commercial relationships, both of which typically stemmed from the underlying ethnic, institutional, or ideological differences between partners.

While most of the firms we studied were still in the process of finding and forming their new networks, a few had reached a level of maturity that allowed us to understand the difficulties that arise in creating long-term business value from such activities. We identified four specific sets of challenges and some initial thoughts about how to resolve them:

- *Keeping the network up-to-date and engaged.* Very often these networks are built in anticipation of future needs, rather than to tackle an immediate and pressing problem; and as such they may not have any immediate value to either side. For example, the international network of scientists P&G created as part of its Connect & Develop model is not on the company's payroll and is not required to deliver any ongoing services to the company. However, its *latent* value—its ability to spring into action when requested—is enormous. In such cases, the challenge is one of creating realistic expectations and ensuring that the members in the network are kept up-to-date with developments inside the company. P&G makes extensive use of its web site to celebrate successful partnerships that have emerged through its network. It updates its partners with e-mails, web-briefings, and events; and it makes good use of periodic face-to-face meetings to keep the relationship fresh.
- *Building trust and reciprocity across the network.* Old habits die hard for many large firms, and it is tempting when working with smaller partners to be very selective about what information gets shared and to seek to impose control over them. However, partnerships rely on the precepts of trust and reciprocity to be effective, and increasingly firms are realizing that the more they give away, the more they get back in return. One recent example is IBM's Innovation Jam, a 72-hour web-based discussion forum in which IBM employees *and* suppliers, customers, family members, and others developed a collective point of view about emerging business opportunities in specific domains. IBM emphasized, at the outset, that the output from the Jam would be a public good. While the company planned to subsequently develop its own proprietary projects around the insights from the Jam, it invited others to do the same. This approach ensured that the Jam was visible and successful—it had 100,000 individual postings, and it resulted in 31 follow-up projects in various parts of IBM.

- *Understanding your own position in the network.* It is tempting for large firms to see themselves as network “orchestrators” who achieve some level of control by virtue of their central position in the network. While this can be beneficial—as it is in P&G’s Connect & Develop—it can also be misguided, because the network may become more valuable if it is given the opportunity to develop its own dynamic. For example, when Sun Microsystems created its Java Developer Network in the early 1990s, it initially tried to control the activities of its partners (the independent software companies who were writing Java code). However, it failed to do so and instead decided to create an open-source community, which quickly took off and took on a life of its own. It is an important reminder that business networks, like ecosystems, cannot be controlled by any single player in them.
- *Learning to let go.* The fourth challenge was only apparent in those cases where firms had been successful in building and learning from their new networks and were faced with the prospect of realigning their core activities away from some of their traditional networks. For example, the German group TUI AG has been enjoying increasing growth as a major player in tourism and related transportation services, but this has required them to let go many of the core activities—and the related networks of players—with which the business began. Founded in 1917 as Preussag AG, it was involved in lead mining and smelting and for much of the 20th century concentrated on commodities such as steel and related fields, bringing with it a network of suppliers of related goods and services. Its strategic progress towards a services-dominated business has meant not only finding, forming, and getting new network relationships to perform, but also letting go of sometimes long-established links. Whereas in 1997 93% of the business was in industrial markets, today 72% comes from tourism and a further 19% from shipping.

## Conclusions

The challenge of building networks for managing discontinuous innovation is—by definition—a tricky one. While it is always obvious in retrospect where a new technology or market opportunity has come from, at the time of its emergence the signals are ambiguous and vague. So companies face two distinct challenges. One is about knowing which technology or market domains to start looking in, and this has been written about for many years by others.<sup>25</sup> The other is about finding and forming relationships with specific partners once those domains have been selected, and this is what we have focused on in this article. Companies need to be conversant with the types of obstacles they will encounter in building new networks and the types of approaches that are likely to be successful in overcoming these obstacles in each case. Table 3 summarizes the key insights and recommendations from the research.

**TABLE 3.** Key Insights and Recommendations

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- Creating new networks involves two distinct activities: *finding* the right prospective partners and *forming* relationships with those prospective partners. There are substantial barriers to each activity.
  - Where the challenges in finding and forming relationships are relatively low, approach potential new partners directly, and structure the relationship to minimize whatever obstacles separate you.
  - Where the challenge is mostly around finding new partners, approach them through boundary spanners or scouts who specialize in such activities, and work very hard on building the capability to absorb insights from these partners.
  - Where the challenge is mostly around forming new relationships with prospective partners, focus on the higher-order purpose that transcends your ideological differences, and try to identify cross-over individuals who can link the two sides.
  - Where the challenge involves finding *and* forming new networks, be prepared to work with specialist and independent network-builders to bridge the gap, and look for ways of gradually breaking down barriers to enable some of the approaches identified above to work.
  - Once the new relationships have been formed, there are a number of things to keep in mind to turn them into high-performing networks: continually keep the network fresh and engaged, build trust and reciprocity across the network, understand your own position in the network, and learn when to “let go” of old relationships.
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## APPENDIX

### About the Research

This article is based on the findings from a four-year research program looking at the ways in which companies approach the challenge of discontinuous innovation. The research was undertaken in two parallel streams. One stream was a series of case studies looking at companies that had responded well or badly to significant changes in their business environment. In total, we interviewed 73 executives in 22 companies, as indicated in the following table. The second stream of work was a series of interactive seminars in which we sought to help companies think through the challenges of discontinuous innovation and put in place new approaches to dealing with these challenges. This second stream of work allowed us to try out some of the ideas in this article and get some feedback on their applicability in a real-world setting. In total, we conducted 15 workshops over a two-year period: nine of these were with single-company groups, the other six were with multi-company groups. Interviews were conducted with a range of managers in the organizations listed below. Their roles ranged from marketing through purchasing to R&D and long-term planning. What they had in common was a responsibility for extending and exploring the selection environment from which the firm drew its innovation trigger signals. Interviews lasted between 1 and 2 hours, and on many occasions we held multiple meetings with the same people to explore and review the emerging themes.

Firm	Number of Interviews	Job Titles of Interviewees	Which quadrants (in Figure 1) does this firm illustrate?			
			Q1	Q2	Q3	Q4
AstraZeneca	2	Director of Market Intelligence, Director R&D Strategy	X	X		
BBC	2	Head of Innovation, New Media Coordinator				X
BMW	3	Head of Innovation Lab, New Projects Manager, External Sourcing Manager		X		
BP	1	VP, Chief Technology Office			X	
BT	7	Chief Technology Officer, Group Strategy Director, Innovation Managers (x3), 21 Century Network Manager, Futures Program		X		
Cerulean	3	Managing Director, New Product Development Manager, Purchasing Director	X			
Coloplast	6	CEO, Vice President R&D Ostomy Division, VP R&D UCC Division, Team Leader New Business, Development Group, COF Co-ordinator	X	X		
Diageo	3	Group Innovation Director (past, present), New Venture Manager				X
Ericsson	3	Group Innovation Directors (x2), Head of Venturing		X		
Grundfos	4	Product Development Director, New Products Manager, Purchasing Manager, Innovation Team Co-ordinator		X		
GSK	3	OTC Innovation Manager, Director of University Linkages, Head of Venturing		X		
IBM	3	VPs Responsible for Innovation Jam (x3)	X			
Lego	3	Engineering Manager, NPD Co-ordinator, Global Sourcing Manager	X			
McDonalds	1	Chief Marketing Officer, UK			X	
Novo Nordisk	6	New Venture Planning Head, Innovation Manager, PDS Director, Stakeholder Relations Coordinator, New Business Development Manager in Novozymes, CEO Northern Europe			X	
Procter & Gamble	3	VP responsible for Connect + Develop, Research Fellow, Technical Centre Innovation Manager		X		
Rio Tinto	5	CEO, Group Head of Innovation, Business Unit Heads (x3)			X	
Shell	3	Innovation Manager; Manager, Global Procurement (Expro)			X	
Siemens	5	Purchasing Manager; Medical R&D Co-ordinator, Telecomms Systems Development Head, New Projects Manager, Marketing Development Head		X		
Unilever	4	R&D Coordinator; Manager, European Development Section NPD Manager; Head of Unilever Ventures		X		
UBS	2	Head of Market Strategy & Development; Director of Strategic Planning	X			
Visteon	1	Innovation Director		X		

## Notes

1. Several authors point to the increasing pace of change driven by: acceleration and globalization in the production of knowledge; internationalization and fragmentation of markets (and their increasing “virtualization” via growth in Internet usage); and increasing political and regulatory uncertainty. See, for example, H. Chesbrough, *Open Innovation: The New Imperative for Creating and Profiting from Technology* (Boston, MA: Harvard Business School Press, 2003); D. Ellis, *Technology and the Future of Health Care: Preparing for the Next 30 Years* (San Francisco, CA: AHA Press/Jossey-Bass, 2000); R. Foster and S. Kaplan, *Creative Destruction*. (Cambridge, MA: Harvard University Press, 2002).
2. This definition is consistent with but not identical to other definitions in the literature. See, for example, G.S. Lynn, J.G. Morone, and A.S. Paulson, “Marketing and Discontinuous Innovation.” *California Management Review*, 38/3 (Spring 1996): 8-36; R.W. Verzyer, “The Roles of Marketing and Industrial Design in Discontinuous New Product Development,” *Journal of Product Innovation Management*, 22/1 (January 2005): 22-41.
3. For more detail on the LED story, see J. Tidd, J. Bessant, and K. Pavitt, “The Dimming of the Light Bulb,” in J. Tidd, J. Bessant, and K. Pavitt, eds., *Managing Innovation: Integrating Technological, Market and Organizational Change* (Chichester: John Wiley and Sons, 2005), pp. 25-28; D. Talbot, “LEDs vs. the Lightbulb,” *Technology Review* (May 2003), pp. 30-36.
4. See G. Gavetti and M. Tripsas, “Capabilities, Cognition, and Inertia: Evidence from Digital Imaging,” *Strategic Management Journal*, 21/10-11 (October/November 2000): 1147-1161.
5. C. Markides and P. Geroski, *Fast Second: How Smart Companies Bypass Radical Innovation to Enter and Dominate New Markets* (San Francisco, CA: Jossey Bass, 2005).
6. D.A. Garvin and A. March, “R.R. Donnelley and Sons: The Digital Division,” Harvard Business School case 9-396-154, Harvard Business School Publishing, Cambridge, MA, 1996.
7. R.A. Burgelman, *Strategy is Destiny* (New York, NY: Free Press, 2002).
8. See J. Dyer and K. Nobeoka, “Creating and Managing a High-Performance Knowledge-Sharing Networks: The Toyota Case,” *Strategic Management Journal*, 21/3 (March 2000): 345-367.
9. See D. Cohen and L. Prusak, *In Good Company: How Social Capital Makes Organizations Work* (Boston, MA: Harvard Business School Press, 2001).
10. Both the Laura Ashley and Apple examples are taken from D. Sull, *Revival of the Fittest: Why Good Companies Go Bad, and How Great Managers Remake Them* (Cambridge, MA: Harvard Business School Press, 2003).
11. See W. Abernathy and K.B. Clark, “Innovation: Mapping the Winds of Creative Destruction,” *Research Policy*, 14/1 (February 1985): 3-21; P. Anderson and M. Tushman, “Technological Discontinuities and Dominant Designs: A Cyclical Model of Technological Change,” *Administrative Science Quarterly*, 35/4 (December 1990): 604-633; J. Utterback, *Mastering the Dynamics of Innovation* (Cambridge, MA: Harvard Business School Press, 1995).
12. See E. von Hippel, “Lead Users: A Source of Novel Product Concepts,” *Management Science*, 32/7 (July 1986): 791-805; C. Herstatt and E. von Hippel, “Developing New Product Concepts via the Lead User Method,” *Journal of Product Innovation Management*, 9/3 (September 1992): 213-221; A. Ulnwick, *What Customers Want: Using Outcome-Driven Innovation to Create Breakthrough Products and Services* (New York, NY: McGraw-Hill, 2005); C. Christensen, *The Innovator’s Dilemma* (Boston, MA: Harvard Business School Press, 1997); C. Christensen, E. Roth, and S. Anthony, *Seeing What’s Next: Using Theories of Innovation to Predict Industry Change* (Cambridge, MA: Harvard Business School Publishing, 2005); R. McGrath and I. MacMillan, *The Entrepreneurial Mindset* (Cambridge, MA: Harvard Business School Press, 2000).
13. There is a long tradition of research concerned with understanding and capitalizing on emerging business trends. See H. Kahn, *Thinking about the Unthinkable* (New York, NY: Simon & Schuster, 1984); P. Schwarz, *The Art of the Long View: Planning for the Future in an Uncertain World* (New York, NY: Currency Doubleday, 1996). For a recent and broader discussion of these issues, see G. Day and P. Schoemaker, *Peripheral Vision: Detecting Weak Signals that Will Make or Break Your Company* (Boston, MA: Harvard Business School Press, 2005).
14. See R.A. Burgelman, “Managing the Internal Corporate Venturing Process,” *Sloan Management Review*, 25/2 (Winter 1984): 33-48; R. Leifer, G.C. O’Connor, and M. Rice, “Implementing Radical Innovation in Mature Firms: The Role of Hubs,” *Academy of Management Executive*, 15/3 (August 2001): 102-113; Lynn, Morone, and Paulson, op. cit.

15. See A. Hargadon, *How Breakthroughs Happen* (Boston, MA: Harvard Business School Press, 2003). Hargadon builds on important insights from the social network literature, including: M.S. Granovetter, "The Strength of Weak Ties," *American Journal of Sociology*, 78/6 (May 1973): 1360-1380; R. Burt, "Structural Holes: The Social Structure of Competition," in N. Nohria and R. Eccles, eds., *Networks and Organizations: Structure, Form and Action* (Boston, MA: Harvard Business School Press, 1992: 57-91). For a detailed description of Ford's innovation in mass production, see D. A. Hounshell, *From the American System to Mass Production 1800-1932* (Baltimore, MD: Johns Hopkins University Press, 1992).
16. This distinction between finding partners vs. forming relationships has some interesting parallels to Jim March's distinction between an organization's imperative to engage in both exploration-oriented and exploitation-oriented activities. See J. March, "Exploration and Exploitation in Organizational Learning," *Organization Science*, 2/1 (February 1991): 71-88.
17. The different strategies for building relationships to potential partners have some parallels to Pfeffer and Salancik's ideas about how a firm reduces its dependency on external actors. See J. Pfeffer and G. Salancik, *The External Control of Organizations: A Resource-Dependence Perspective* (Stanford, CA: Stanford University Press, 1978).
18. The P&G Connect and Develop program is described by its founders in L. Huston and N. Sakkab, "Connect and Develop," *Harvard Business Review*, 84/3 (March 2006): 58-66. For an academic treatment, see M. Dodgson, D. Gann, and A. Salter, "The Role of Technology in the Shift to Open Innovation: The Case of Procter & Gamble," *R&D Management*, 36/3 (June 2006): 333-346.
19. This account is drawn from F. Monteiro and D. Sull, "External Innovation at BT," London Business School teaching case.
20. The work that Rio Tinto initiated was published in a report, "Breaking New Ground: Mining, Minerals and Sustainable Development," in 2002. <[www.iied.org/mmsd](http://www.iied.org/mmsd)>.
21. See L. Gratton and S. Ghoshal, "Improving the Quality of Conversations," *Organizational Dynamics*, 31/3 (Winter 2002): 209-224.
22. Biggart and Delbridge distinguish between instrumental and value rationality as bases of action in exchange. Substantive rationality is oriented to values where actors are morally or emotionally bound to pursue the substantive goal. See N. W. Biggart and R. Delbridge, "Systems of Exchange," *Academy of Management Review*, 29/1 (January 2004): 28-49.
23. Tempus and Tambura are both disguised names. The project in question was experimental and confidential at the time of writing.
24. Academic research has addressed this issue in terms of encouraging partners to identify with the network as a whole, creating a stable and equitable context for the network (perhaps through "umbrella contracts" or exchange forums) and a proactive approach to managing the portfolio of network ties. See S. Mouzas, "Negotiating Umbrella Agreements," *Negotiation Journal*, 22/3 (July 2006): 279-301; B.R. Koka, R. Madhavan, and J. E. Prescott, "The Evolution of Interfirm Networks: Environmental Effects on Patterns of Network Change," *Academy of Management Review*, 31/3 (July 2006): 721-737; C. Dhanaraj and A. Parkhe, "Orchestrating Innovation Networks," *Academy of Management Review*, 31/3 (July 2006): 659-669.
25. See Christensen, op. cit.; Day and Schoemaker, op. cit.; Hargadon, op. cit.

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