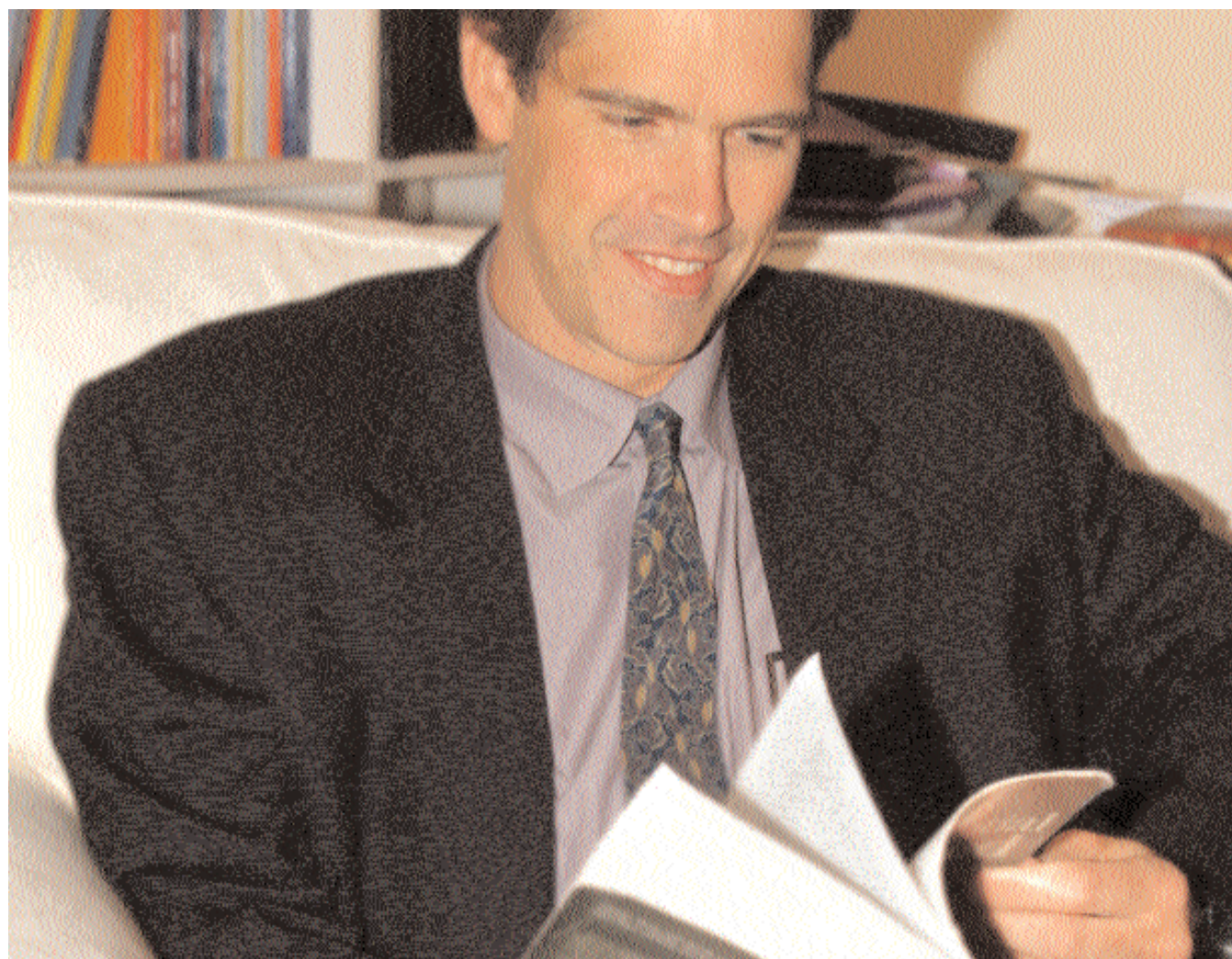


The Clifford Chance Centre invited **Andrew Hargadon** from the University of California at Davis to talk about technology brokering

# Tapping the networks of innovation



**B**etween 1876 and 1881, Thomas Edison's small laboratory produced revolutionary innovations in high-speed, automatic and repeating telegraphs, telephones, phonographs, generators, voltmeters, mimeographs, light bulbs and filaments and vacuum pumps. Since that time, many organisations have tried to replicate the success of Edison's lab by creating their own R&D facilities – pursuing the best and brightest graduates and setting them free to work on the leading edge of science and technology. Most have failed.

Why? Because much of our understanding of the innovation process – and hence our approach to innovating – comes from something called the Great Man Theory. The Great Man Theory is the notion that behind every great innovation is a single individual – usually a man. But the reality is always more complex. Thomas Edison didn't invent the light bulb any more than Henry Ford invented the automobile or the Wright brothers invented the airplane. Neither did Watson and Crick work in a scientific vacuum.

The sociologist Max Weber said “Man is suspended in webs of significance he himself has spun.” To date, the innovation literature has focused on the man at the expense of understanding the webs that suspend and support him. For all we know about Edison the man, we know very little about the work of the laboratory. I've spent the last ten years studying businesses that innovate continuously. Surprisingly, I found that the people and organisations that innovate are no smarter, no more courageous, no more rebellious than the rest of us – they're simply better connected, and better at connecting, to the world around them.

What I learned from these firms was that they systematically used old ideas as the raw materials for one new idea after another. Edison's system for electric lighting combined technologies from the telegraph, arc-lighting, and gas industries. Ford's mass production combined ideas from granaries, breweries, sewing machines, and meatpacking plants. Rarely, if ever, could these firms point to an individual inventor and rarely, if ever, did they see their work as inventing.

I call their strategy technology brokering: firms that do it serve as intermediaries, or brokers, between otherwise disconnected worlds. Sometimes this is industries, markets, organisations, and even divisions within organisations. They use their position to spot old ideas that can be used in new places, new ways and new combinations. And they use their connections across these otherwise disconnected worlds to bring together the right resources to make change happen.

Ironically, the modern corporation is best positioned – and least qualified – to exploit this strategy. They often have diverse network connections through their dealings across different markets and across a wide range of customers, suppliers, and competitors. Yet their strategies, work practices, and reward systems rarely support – and more often undermine – their ability to tap these networks to generate truly breakthrough innovations.

So what makes it possible to create revolutionary innovations from pieces of old technologies? The fragmented nature of the larger, networked world. New technologies emerge and develop within small worlds – whether that is nations, industries, markets, organisations, or operating divisions within organisations. Such technologies emerge in one world but rarely move into others.

Technology brokers find ways to move between these different worlds.

And by doing so, ensure that they will be among the first to see how the ideas of one world can be used in new ways and new combinations somewhere else. So if you want to invent the future, you need to put yourself – and your organisation – in position to see how the people, ideas, and objects of any one market might be used in new ways somewhere else. This is technology brokering.

Of course, if technology brokering was easy we'd all be doing it. The reason we're not is because making such a strategy work – whether at the individual or organisational level – requires developing two distinct and often contradictory strengths.

First is the ability to bridge distant worlds: those people or firms that move easily across a range of different industries or markets are in a better position to see how the technologies of one market can be used in new ways (and in new combinations with other technologies) to solve the problems of another. Moving between multiple worlds, you're more likely to question the rules, to see the opportunities that nobody within that world can see. Albert Szent-Györgyi, who discovered vitamin C, once said, “Discovery is seeing what everybody else has seen, but thinking what nobody else has thought.”

Technology brokering also requires building new communities around those innovative recombinations. Rather than rebelling against the old social order, technology brokering focuses on building new networks – new entangling alliances around the emerging ideas. And here is where most aspiring inventors make their fatal mistake. “Build a better mousetrap and the world will beat a path to your door.” Every young inventor has heard Emerson's advice but, in fact, it is bad advice. The world will not beat a path to your door. Since the US patent office opened in 1828 it has issued some 4400 patents for mousetraps and yet only 20 or so have made any money (the most successful, the spring trap, was patented in 1899).

A better mousetrap, like anything else, succeeds only when those who first came up with the idea convince others to join in their new venture – as investors, suppliers, employees, retailers, customers, and even competitors – each of whom, in turn, bring their own contributions and connections with them. The revolutionary impacts we see from creative efforts are often the result of the community that adopted the initial, well intentioned, but underdeveloped ideas. >



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Here lies the central challenge in technology brokering. The strengths that enable organisations to build new communities – focus, economies-of-scale, strong ties to customers and suppliers alike – make it hard for those same organisations to move easily into new markets and experiment freely with other technologies. The ease with which people move between worlds makes it difficult for them to commit to any one – and just as hard for others to commit with them.

### Tapping the Networks of Innovation

The networks that surround and constitute modern corporations hold the same innovative potential as those that surrounded Edison's lab. They have the same power to constrain that innovation. The challenge for managers is to recognise and tap into these networks in ways that enable innovation while avoiding entanglements.

How could you or I go about a strategy of technology brokering? First, by attending to your own network. How many of your colleagues, friends, customers, or clients inhabit the same small world that you do? How many are from different groups in your organisation? How many from different divisions? How many from outside the organisation?

What are the chances you'll know something they don't already know? How about the chance that, by spending more time with them, you'll learn some-

thing you didn't already know? Here's a simple test – have you had lunch with anyone new in the last week? Why not? The answers to these kinds of questions can tell you how well-positioned you are to see new opportunities before others do. For most, the answers tell us that we need to increase the time and attention we devote to moving into different worlds.

So look past your existing networks. What do you know that might be valuable somewhere else? Where else might people have already solved the problems you're facing now? The answers to these questions are a good start at identifying new worlds to explore.

At the organisational level, firms have pursued technology brokering strategies in a variety of ways:

- As dedicated technology brokers, as professional service firms like Edison's Menlo Park lab, Design Continuum, Clifford Chance – no doubt – and many others.
- By establishing internal technology brokering groups to span the otherwise disconnected worlds formed by divisions within large organisations. Groups within such large and fragmented organisations as Hewlett-Packard and 3M thrive by moving ideas from one division where they're known to others where they are not.
- And by recognising that your firm can generate breakthrough products by

actively pursuing the best people, ideas, and objects that exist already outside the firm – as Apple did with its tremendously successful iPod MP3 player, by pulling together circuit designs, chipsets, and other technologies from half a dozen firms.

Ultimately, it means changing the ways we perceive innovation, the ways we pursue it, and the ways we structure and reward the same pursuits by others. Rather than rewarding R&D for patents produced, papers published, or technologies developed in-house – this means rewarding the relationships groups build across the organisation and outside: What percentage of revenue comes from innovation projects? What percentage of innovations came from outside?

### Concluding remarks

I spent the first decade of my professional life pursuing innovation, as an engineer and product designer working in the Silicon Valley. I spent the next ten years as an academic, studying the same process. What I found in this second career is a simple piece of advice that, had someone told me sooner, would have made the first ten years much easier. We, as individuals and managers, are all capable of becoming more innovative – but only when we stop whacking ourselves on the head, stop trying to think out of the box, stop trying to be that lone genius inventing a brave new world.

The science fiction author William Gibson, who coined the term cyberspace and who created an image of the world-wide web that programmers everywhere have since tried to make a reality, summed it up best when he was asked to explain how he came up with his fantastic visions:

“The future is already here,” he said, “It's just unevenly distributed.”

Rather than make something up, he looked for small groups of people deeply immersed in their own worlds – and imagined what it would be like for the rest of us.

The next time you, or your group, are asked to be innovative – don't look to invent the future, to prove your genius, or to resist the constraints of existing technologies – instead look first to redistribute the present. The truly breakthrough innovations – the ones that change our worlds overnight – will not be found on the leading edge of science and technology but instead off to the side, in the people, objects and ideas of other worlds waiting to be recombined in new ways. ■

