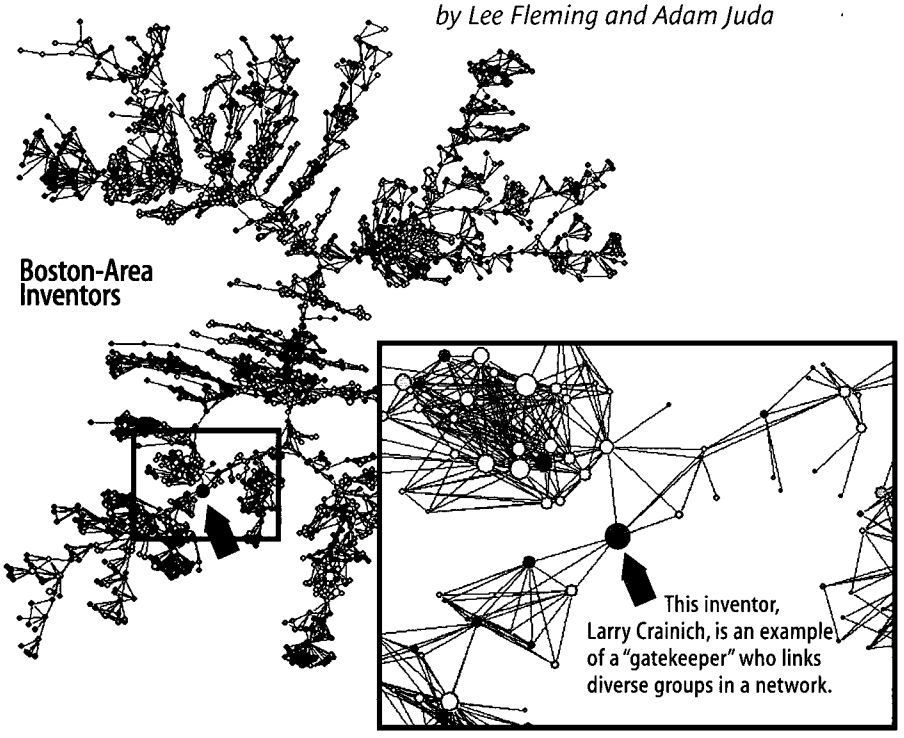
DATA

A Network of Invention

Creativity in a community of inventors hinges on a few well-placed players.

by Lee Fleming and Adam Juda



This chart shows the relationships among Boston-area inventors in the 1990s. Each dot represents a patent holder, with dot size corresponding to productivity. A line connecting two people indicates that they share authorship of a patent. Colors represent different firms or universities. While most inventors have just a few such relationships, some patent holders are "gatekeepers" – they bridge institutions and disciplines to link large numbers of inventors. One such person in this network is Larry Crainich of Design Standards Corporation, based in Charlestown, New Hampshire. He holds medical-device patents dating back to the late 1980s. Gatekeepers are powerful innovation catalysts. (The exhibit was created by Jonathan McPhie, an undergraduate in Harvard University's Engineering and Applied Sciences Division in Cambridge, Massachusetts.)

Social and professional networks are crucial to innovation, but what kinds of connections are best? Our research on relationships among inventors suggests that a relatively few key players can catalyze the agglomeration of many small networks into ever-larger ones and can boost innovation across a whole region.

By studying patent authorship in hundreds of metropolitan areas in the United States, we've measured the dramatic growth over the past two decades in the size and complexity of inventor networks. Not only have the number and percentage of coauthored patents increased, so have the connections between far-flung inventors. As once-isolated groups of inventors coalesce, vast communication webs emerge that span industries and disciplines.

While this high connectivity improves the overall innovative productivity of a region (as measured by patent activity), it is a double-edged sword for managers. Your firm is probably more innovative if it is highly networked, but it is also more exposed to information leaks or "spillovers" that might benefit competitors. How do you reduce risk in such an environment while capturing the benefits of innovation networks? Retreating behind corporate walls usually does more harm than good because it isolates companies from the innovative ferment. Our research suggests that by identifying and nurturing the highly connected "gatekeepers," you can maximize your ability to innovate while minimizing the competitive risk. Gatekeepers (such as inventor Larry Crainich in the illustration) have two defining characteristics: They are prolific technical contributors (usually with advanced degrees), and they work and communicate with many people, both within and across disciplines and organizational boundaries.

Gatekeepers often know a great deal more than their managers about the technical scene in their communities and can help gauge the competitive risk posed by unfettered networking. Often, that risk is lower than you might think. While many firms might be able to benefit from your company's knowledge, most of them don't compete with you directly. Likewise, the flow of ideas into your company through inventor networks is more likely to stimulate innovations for future products than to give you an immediate advantage over direct competitors. To maximize the benefit and minimize the risk of inventor networking, encourage your gatekeepers to aggressively build connections outside of their specific disciplines and industries. These less obvious connections produce surprising new combinations of ideas that can lead to unanticipated breakthroughs.

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