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## Universities and Incubators

### This is the sixth in a series of articles on Rebuilding the Entrepreneurial Economy.

by Daniel Lovering



The inspiration behind Neil Soni's company was the way in which he decided to attend Carnegie Mellon University over his early favorite, Johns Hopkins. For him, the collaborative nature of the learning environment was a key factor in choosing a school – but one that was impossible to assess from brochures, U.S. News rankings and college guides. Only through campus visits and by talking to students and other inside sources did he gain the insight he needed. What if that process could be captured on a website as an efficient way for prospective students to make more informed decisions about where they'll spend their college years, he wondered.

He created a way to do it and built a company around it with help from CMU – all while he was still in school.

A few blocks away, several new ideas born to students on the University of Pittsburgh campus are also in various stages of commercialization, including technology that allows for the controlled release protein therapies to specific tissues that has implications for wound healing and hearth attack recovery.

In fiscal 2010, the nation's universities launched 651 start-up companies and the home state of the licensing institution became the primary place of business for 498 of them, according to an annual licensing survey conducted by the Association of University Technology Managers (AUTM), a trade group.

Groundbreaking technologies and new companies that percolate from research universities have long been key ingredients of the success of the nation's largest venture capital markets.

Universities in the entrepreneurial hotbeds of California and New England have a long history of commercializing technology and consistently rank among the highest in the nation in producing start-up companies. Massachusetts Institute of Technology, for example, began its technology transfer program in 1940 and produced 17 new companies in fiscal 2010, according to the AUTM survey. The 10-campus University of California system, which started transferring technology in 1979, produced a total of 75 new companies in fiscal 2010.

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Overpopulation

The commercialization of academic research has a shorter history in Pittsburgh and the process of licensing those ideas and technologies has only recently been refined. But experts say the city's universities hold the talent and innovation that is crucial to the growth of the region's entrepreneurial economy.

Similarly, a handful of technology-based economic development agencies – state-backed organizations that fund and advise start-ups – have bolstered the economy, though some warn that start-ups should not become dependent on them.

Carnegie Mellon University, which is renowned for computer science, and the University of Pittsburgh, which is strong in the life sciences and engineering, are “like two jewels of the region,” said Ron Bianchini, CEO of the data storage company Avere Systems and a former Carnegie Mellon professor. “There are brilliant students coming out of those universities. Finding the bright students, the people who can invent the technology – they're here.”

The good news is that the transfer of technology out of the two universities and into the marketplace has picked up in recent years. The cautionary news is that spinouts across the country have gone out of business at historically high rates in recent years amid the economic downturn, according to AUTM.

Carnegie Mellon's technology transfer program started in 1992, and start-ups emerging from it jumped from one in 1995 to 10 in fiscal 2010, according to the AUTM survey. Pitt opened its technology transfer office the same year and saw start-ups climb from two in 1995 to 10 in 2004. Pitt reported that six new companies were launched in fiscal 2010.

Start-ups are only one way the universities transfer technology into the marketplace, and new companies represent only one measure of their activities. They also license technology to existing companies and forge partnerships with corporations.

“The concept of commercialization, technology transfer, has undergone a sea change in the last couple decades,” said Chris Briem, an economist with the University of Pittsburgh's University Center for Social and Urban Research. “I think we're still sort of learning how to commercialize technologies.”

Spinoffs at Carnegie Mellon soared after the university revamped its licensing policy about a decade ago to ease relations with faculty members who wanted to start companies, said CMU vice president of research Richard McCullough. CMU used to take as much as a 20 percent stake in new companies plus, in some cases, a board seat. McCullough described that policy as “just nuts,” and said, “we decided the best thing to do was to create a policy where there's no negotiation.” The new policy calls for a five percent stake for the university. “We call it ‘5 percent and go in peace.’”

Pitt's policy is more flexible, said Marc Malandro, director of the university's tech transfer office. “We couldn't see a one-size-fits-all deal that makes sense across the broad spectrum of technologies we have.” With about 75 percent of its technology focused in health sciences, companies coming out of Pitt typically face regulatory hurdles and an expensive, years-long development process. These are costs a software company generally would not have.

Pitt doesn't produce as many start-ups as CMU, partly because faculty members are prohibited from becoming CEOs due to conflict-of-interest rules at Pitt. More important, health sciences companies often partner with larger firms rather than market their products independently.

Nevertheless, ideas ripe for commercialization are rolling out of Pitt at a high rate and the school has more sharply focused on taking ideas from the lab to the market in recent years. The Institute for Entrepreneurial Excellence, for example, has emerged as an asset for supporting faculty and student innovators, as well as those in the community. And Pitt's business school reshaped its undergraduate and graduate education around several strategic initiatives, entrepreneurship being one.

The school's annual “Big Ideas” competition, for example, showcases the potential students and faculty hold in creating new products and companies. The 2012 winners, engineering doctoral candidates Hunghao Chu and Noah Johnson, created a drug delivery platform that controls the release of growth factor proteins to specific tissues. The global market for such proteins, which have been shown to be effective in such areas as healing wounds and recovering from heart attacks, is projected to reach \$155 billion by 2015. A previous winner, Optimus Technologies, has since opened a pilot production facility in the city and entered into agreements with the City of Pittsburgh's Public Works Department and others to demonstrate its bolt-on alternative fuel system that enables commercial vehicles to run on cheaper-than-diesel fuels, such as vegetable oil.

“Since I've been here, I've seen a real culture shift in the university, and I can see that the faculty are interested in translating their work” to the marketplace, said Malandro, who co-founded a California start-up before joining Pitt's technology transfer office in 2004.

Saving Money, Changing Lives

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Bikers Beware

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Steady as She Goes

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'Now We Have a Hammer'

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Keeping Companies Here

A Culture of Risk

### Universities and Incubators

The Future

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Nobody Home - The Rise of Vacancy

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Pittsburgh Today and Tomorrow 2011

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Reality Check

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At CMU, infrastructure to nurture the bright ideas of students and faculty includes Project Olympus, which provides them with start-up advice, small grants, incubator space, networking opportunities and other support. Although it has been around for less than five years, the project has helped bring more than 60 companies to life, 47 of which have been started by students.

Among them is Soni's firm, The College People, which is creating a website – now in its beta stage – that connects prospective students with current students attending the schools they are considering, as well as other sources, including former admission officers from each college. The idea is to offer in-depth, insider information specific to the schools prospective students are considering, including advice from admission officers on how to make their applications stand out.

Soni, a chemical engineering student, chose CMU over Johns Hopkins after considerable legwork produced the insight he expects to provide online through his company. "I go to Hopkins and one of the things I noticed was that people tended to walk to class alone. I asked them why that is and they didn't think it was weird. They thought it was normal. I asked if they do group work a lot and they said it wasn't that common. I tend to work best in groups. That planted a seed of doubt in my mind. I thought, why can't I access that kind of information? Why doesn't that exist?"

The College People is also one of several companies receiving support from the i6 Innovation System, a joint CMU-Innovation Works project established to help commercialize bright ideas hatched on the region's college campuses. Innovation Works is one of several government- and foundation-supported economic development agencies that work with universities to provide advisory services, investment and space to new companies. Others include the Idea Foundry, Pittsburgh Life Sciences Greenhouse and The Technology Collaborative.

These agencies and the companies they work with have had a "strong and positive impact on southwestern Pennsylvania," boosting jobs, wages, follow-on funding and other factors, according to a 2010 report by RTI International for the Richard King Mellon Foundation, which has invested at least \$22.9 million in the agencies since 2000.

"Pittsburgh is on the verge of reaching a critical mass in terms of the number of successful start-up companies, entrepreneurs, availability of local early stage capital and ability to push and pull university technologies to market," the report said.

But that progress has been threatened by "a mix of grim conditions," including state and foundation funding cuts and a steep decline in local early stage capital.

"If capital flow continues to decrease, Pittsburgh risks becoming an exporter of young high-growth firms and entrepreneurial talent to regions that are willing and able to invest in these companies' growth stages," the report warned.

Nonetheless, some agencies say they've managed to bring companies to the region. The Pittsburgh Life Sciences Greenhouse, for example, has imported 14 companies to the city, according to president and CEO John Manzetti. "They came here not just because we were handing them money, but because they thought we would facilitate their growth."

While many of its start-ups have failed -- most while still in the research phase and before they've committed to marketing their technology -- the agency has also has some spectacular successes, such as the medical device company Renal Solutions, which moved from Indiana and was later sold for \$200 million.

Some experts say agencies such as Innovation Works -- the region's single largest investor in seed-stage companies -- may pose a long-term dilemma.

"The challenge with Innovation Works is that it's essentially a publicly subsidized venture capital fund, and there's a risk that the longer that the public subsidy goes on, the longer a mature private market is delayed," said Michael Madison, a law professor at the University of Pittsburgh who worked with venture capitalists and start-ups in California before coming to Pittsburgh in the 1990s.

"At some point they know that they need to go away, but it's a very Pittsburgh standard phenomenon for enterprises to overstay their welcome."

Andy Hannah, CEO of the printed electronics company Plextronics, said the economic development agencies are "fantastic" in their capacity to provide guidance and funding, but added: "What entrepreneurs need to learn is that they are there to assist and not to be relied on. I think sometimes entrepreneurs use that as sort of their bread and butter. They've got to learn that that's just one piece of the equation."

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