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FROM LABS TO MARKETPLACE

UA business spinoffs up, but money from them to school dips

Technology developed by faculty helps create jobs

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The University of Arizona is pushing high-tech innovation from laboratories to the marketplace.

But while UA is posting record numbers of business spinoffs, revenue paid to the school from technology transfer agreements continues to decline.

Six new companies based on technology developed by UA faculty and staff were launched in fiscal year 2008 ending June 30, said Patrick Jones, director of the UA Office of Technology Transfer.

Startups are companies that have completed a licensing agreement with UA for intellectual property critical for the business, he said.

The former annual record was five spinoffs, set in fiscal 2005 and 2002, Jones said.

The new businesses, when mature, could create high-tech jobs as well as offer UA payments from licensing agreements, he said.

But even with the increase in spinoffs, revenues from licensing UA-owned technology dropped 46 percent from fiscal 2007 to fiscal 2008, he said.

UA was paid \$583,007 in licensing revenue in fiscal '08, compared to \$1.1 million in fiscal '07 and \$1.6 million in fiscal 2006.

This money comes from past agreements with companies who pay to use technologies

developed at UA, Jones said.

Two projects in the works for some time that offered potentially big payoffs to the UA - an erectile dysfunction drug and a skin cancer treatment - ran into problems and terminated licensing agreements that had meant payments into UA coffers, Jones said.

"There is no guarantee of success. Not everyone survives," he said. "Technology transfer facilitates the movement of technology and discovery at the university into beneficial uses."

Vacillating tech transfer revenue cycles are typical, said Goldie Blumenstyk, a senior writer with the Chronicle of Higher Education.

"It's not unusual what we see there," she said. "Income is always up and down on these kinds of things. Often schools who have the biggest income have one or two big deals.

"Typically only two out of 10 (tech transfer spinoffs) really take off anyway," Blumenstyk said.

While licensing revenue is down, growth of the number of new spinoffs paints a positive picture for UA tech transfer efforts, Jones said.

"It's not just the six from last year, its the strong pipeline we have going into 2009," Jones said. "I would rate that were doing very well. What I see this year looks good in terms of new startup formation.

"Already this year there is a very strong pipeline of companies coming along. Fiscal year 2009 should - knock on wood - repeat the 2008 performance or better it," he said. "We have a real range of technologies coming up, and in their own way they are all great.

"Our revenue numbers won't show it for a while; they will always lag," he said.

UA is prohibited from owning shares of companies, so tech transfer startups agree to give the school a warrant for a value of the company that can be cashed in when the company is viable and has cash in the future, he said.

"We are charging a rent on our technology. We are not directly investing in the company," he said.

Royalties depend on the nature of the technology and range from 1 percent to 20

percent, with most ranging from 2 percent to 10 percent, he said.

The percentage is negotiated, and factors include the perceived value of the operation, how long the UA will have to wait to receive benefits and risks involved, he said.

"Our focus is on enablement and fairness. UA is a social institution with business constraints, not a business institution with social constraints," he said. "The companies wouldn't exist except for the university's technologies."

UA-developed technologies fall close to the tree.

"Over 75 percent of our startups are in Arizona, and more than 25 percent of our licenses are to Arizona entities," he said. "We like licensing to Arizona companies - it makes sense. We try to promote connectivity of the university to the community."

The economic downturn could make it difficult for spinoffs working to grow and bring technologies to market to obtain funding, he said.

"What I see this year looks good in terms of startup formation, but it is hard to tell what the effect of a strong recession will be on that," Jones said. "Investment capital is tightened up quite a bit."

Carbon fiber can strengthen, protect building materials
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The sight of a stack of rusting rebar in the courtyard of the University of Arizona Civil Engineering Building led an engineering professor to develop and commercialize a new construction technology.

Hamid Saadatmanesh has shown that high-tech carbon fiber can be used to strengthen, repair and protect conventional building materials.

In 1987 Saadatmanesh, then a young, new assistant professor of civil engineering and engineering mechanics, pondered developing a construction material impervious to corrosion after seeing rusted metal rebar outside his office window.

"Immediately plastics came to my mind," he said. "I wanted to make plastic as strong as steel."

His research showed plastic was not strong enough to fit the bill.

But he determined that flexible, woven sheets of carbon fiber could be used to reinforce or repair steel, concrete and wood structures.

The fiber-reinforced polymer technology could leave the refurbished item four times stronger than before, he said.

The fiber sheets are attached to a structure with specially formulated epoxy, then impregnated with liquid resin that bonds with the fibers and makes them strong and rigid, he said.

That allows inexpensive, quick repairs or strengthening of damaged bridges, buildings or other structures.

"It's a remedy to bring something back to its original strength or better," he said. "The beam becomes as good as new or better in a fraction of the time without cutting or welding."

The material can also be used to repair leaks by coating the inside of large pipes without digging them up, he said.

It can also reinforce buildings in geographic areas prone to seismic activity.

"With this technology, you could build buildings that are 100 percent earthquakeproof," he said.

The material can also be used to protect structures from the elements and repair corrosion damage, he said.

Saadatmanesh said that metal Salt River Project light poles in the Phoenix area were refurbished with carbon fiber to prevent deterioration from rusting.

"When we find a pole that has noticeable degradation at the base from corrosion or rust, when we think that pole might be compromised, we can inject this carbon fiber epoxy into the base of the pole," said Scott Harelson, an SRP spokesman.

He said more than 1,000 SRP light poles were refurbished using the technology.

"It allows us to have a strengthened pole that is safe and secure without having to replace the entire pole," Harelson said. "It's cheaper than replacing a pole, and the customer typically likes that we don't have to tear up the sidewalk and disrupt a business or property to replace a pole."

UA's administration is in a phase of encouraging entrepreneurship and embracing technology transfer and encouraging researchers to spin off new companies, Saadatmanesh said. That has not always been the case during his tenure, he said. At times in the past, tech transfer activities were discouraged, he said.

"UA now encourages technology transfer and job creation. It's not a taboo," he said. "Before, you had to be really careful. It was difficult to transfer technology."

However, such top-level support does not always trickle down, he said.

Some faculty members who spin off companies have been saddled with heavier teaching loads or other additional activities, he said.

Saadatmanesh has been busy commercializing the technology he developed.

HJ3 Composite Technologies LLC was one of the companies the UA Office of Technology Transfer said was spun off in fiscal year 2008 ending on June 30, by completing a licensing agreement.

HJ3 Composite Technologies was incorporated in 2002, Saadatmanesh said.

Saadatmanesh said he has since left that company and launched CarbonWrap Solutions LLC, where the company slogan is "Solutions looking for problems."

His companies have been involved in more than 100 projects worldwide, he said.

And growing and emerging markets - such as homeland security and the proposed economic stimulus package - open the door for new applications, he said.

"This is an evolving technology - it is problem driven," he said. "We are constantly developing and pushing the envelope on this technology. The application of this technology is literally limited by one's imagination. It's still evolving; you can always do it better."

ADDITIONAL INFORMATION

2008 SPINOFF FIRMS

Six new firms based on technology developed by UA faculty and staff were spun off in fiscal year 2008 when they signed licenses for foundational technology.

They are:

- HJ3 Composite Technologies, LLC, founded by Hamid Saadatmanesh, UA professor of civil

engineering and engineering mechanics, is providing consulting services and advanced composite materials to provide stronger, lighter and less expensive construction materials to the building industry. The company is based in Tucson.

- International BioComputing Corp. is based on the commercialization of BioPortal, a research product of the Artificial Intelligence Lab at the UA's Eller College of Management. The company is dedicated to developing and providing biocomputing, bio-agent and public health information software systems and solutions to the marketplace. Hsinchun Chen, UA professor of management information systems, is involved in the firm, which is based in Tucson.
- Phoenix Biometrics, Inc. plans to develop a device to detect and measure chemical and biological agents harmful to human lung tissue. The company is in Tucson and involves Mark L. Witten from the UA College of Medicine.
- Renascent Materials LLC is a Tucson-based company commercializing a high-strength iron carbonate cement developed by David Stone while he was a graduate student in the UA department of soil, water and environmental sciences. Conventional cement is made in a high-temperature process that releases large amounts of carbon dioxide. The company provides an environmentally friendly alternative to traditional cement.
- Solar Technology Research Corp. Inc. was formed to commercialize an invention aimed at producing solar-grade silicon at significantly reduced costs. A recipient of Science Foundation Arizona catalyst funding, Solar Technology Research Corp. involves David C. Lynch from the UA College of Engineering. The company is based in Tucson.
- TIPD LLC is engaged in the development of photonic devices and systems for applications such as optical and radio frequency communication, sensing and biophotonics. The company, based in Tucson, was founded by Nasser N. Peyghambarian, professor of optical sciences at the UA.

UA VS. PEERS

How the University of Arizona compared to peer universities in fiscal 2007 technology transfer activity.

School License income Startups

University of Arizona \$1.2 million 3

Texas A&M \$7.6 million 1

University of North Carolina, Chapel Hill \$2.1 million 0

University of Utah \$17.5 million 18

Michigan State University \$5.6 million 5

Source: The Association of University Technology Managers

UA LICENSING REVENUE

Fiscal year Actual Percent change

2008 \$583,007 -46

2007 \$1.1 million -33

2006 \$1.6 million 63

2005 \$993,842 34

2004 \$742,210 -5

INSIDE

UA professor Hamid Saadatmanesh's flexible, woven sheets of carbon fiber help repair - and strengthen - conventional building materials.

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