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# Recalibrating San Antonio's education network for the new tech economy

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The seeds for the next generation of talent to lead San Antonio technology companies are being sown right now. And there are more than two dozen local executives with a keen interest in being farmers of sorts as the irrigation system — that is the educational pipeline — for the new crop of technology employees and even executives appears to be a bit out of alignment.

The San Antonio area has seen an influx of professionals from across the country to fill in the gap that many see between the current educational profile of San Antonio’s workforce and local employers’ demands. Some businesses active in San Antonio hedge their bets by co-listing the work city of job postings, willing to fill the same job in a bigger market with a deeper talent pool, Business Journal research shows.

And even as local economic development officials are working to keep up with the changing tide and investing money into workforce development programs to support industry certificates, many question whether a typical computer-related bachelor’s degree — which most employers still demand as a minimum requirement — is relevant to today’s needs.

## Tight market

San Antonio tech startups face a shallow talent pool for senior software developers with niche skills, prompting some to find creative or even drastic means to bring on people with the skills needed to innovate and grow.

In one case, a local tech entrepreneur has established a practice of moving data scientists and statisticians between different venture-backed startups that he runs. Meanwhile, a business that struggled to find people capable of realizing its product vision resorted to luring away another company’s entire development team. And a fast-growing local cybersecurity company even tried



CARLOS JAVIER SANCHEZ | SABJ

doubling the price of a service in an effort to reduce demand temporarily in hopes of giving itself some breathing room to hire new workers — it didn't work, and the customer demand kept increasing.

What such tech startups have in common is that they need people with certain skills as they try to rapidly develop products and business models. And not only do they need skills beyond what's being taught, but they also often need such folks faster than local institutions can crank them out.

"Entrepreneurs don't have a lot of time to sit around and connect with elected officials or even educational institutions to talk about what they need," said Julie Huls, former CEO of the Austin Technology Council, who moved to San Antonio to join The DoSeum's staff before leaving to start her consulting company the HulsGroup.

While Huls is bullish on San Antonio's potential, she said there's a huge gap in the workforce supply and demand, especially in technology. And she sees parallels between the situation today in San Antonio and what she observed in Austin as that city's workforce development was slow to adapt to changes in demand for certain skills.

"When I came to Austin [seven years ago], there were a lot of angry people," she said. "They were going to community colleges, pursuing technical tracks within their high schools, and they get out — even some of them with a four-year degree — and they find that employers didn't want to hire them because they had the wrong skill set."

Such job seekers' experiences were validated from the employer's perspective when the Austin Technology Council did a survey of 50 tech industry leaders in which 60 percent agreed that local certifications at school districts and community colleges were irrelevant.

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Check out the charts below for data on the number of graduates in the San Antonio region with computer-related degrees.

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Huls is particularly concerned about high-growth businesses moving their operations away from San Antonio if they can't find qualified talent. In Austin, she found that companies with fewer than 200 employees and sizable venture capital investment were the "most vulnerable in terms of leaving the market" when they had trouble finding qualified employees.

### **New graduates, old jobs**

San Antonio's economic revival, driven in part by tech, means that companies need technology industry employees now — not in four years when the latest incoming college students graduate.

In 2014, about 759 computer science-related graduates entered the San Antonio labor pool from regional universities — from bachelor's to master's and beyond. During fourth quarter 2014, there were 2,800 job postings for technology jobs in the market, according to Burning Glass Technologies labor insights, which is collected by The Computing Technology Industry Association, or CompTIA, a trade organization that certifies tech workers.

One year later, 1,069 such graduates hit the ground. During fourth quarter 2015, there were 4,100 job postings for tech jobs in the San Antonio area, according to CompTIA.

In 2016, 1,241 computer science-related graduates from San Antonio-area institutions — across all

degree levels — entered the market. Between 2015 and 2016 there were about 843 new jobs added to the market and thousands of job postings for technology industry workers, according to CompTIA reports.

Even if the larger region of university graduates are included — that's only 3,589 students with computer-related degrees.

Most technology jobs, even those that need specialty coding skills, often also require a computer science or computer information systems degree as a foundation. While many laud vocational coding schools, it's unclear whether those programs can graduate the next generation of executives or company founders — people who are building the new round of San Antonio-based companies.

The career tracks of computer science and computer information systems degree holders differ a bit. In general, computer science majors are taught how algorithms work and may end up becoming analysts, programmers, engineers or even software developers, while computer information systems is more of a management and chief technology officer path.

In 2016, four main San Antonio area colleges — University of Texas at San Antonio, Texas A&M University - San Antonio, Trinity University and St. Mary's University — produced 116 graduates with bachelor's degrees in computer science. That was up more than 100 percent from 52 computer science graduates in 2015.

Also in 2016, UTSA and the University of the Incarnate Word graduated about 118 students with bachelor's degrees in computer information systems, up from 90 in 2015 — or 31.1 percent.

Beyond that, there are master's and doctoral degree graduates in computer science and related STEM degrees — that includes cybersecurity.

UTSA has carved out a niche in cyber degrees that span its College of Business and College of Science. In 2016, 45 people graduated with master's degrees across cybersecurity specialties, up slightly from 41 in 2015 — the majority of whom went through the business track. Meanwhile, the number of graduates earning doctoral degrees in cyber fields fell from six in 2015 to two in 2016.

Other colleges have started master's programs in recent years and don't have graduates yet. The University of Texas at Austin in 2015 created a Center for Identity, an institute focused on detecting identity theft, understanding fraud and ensuring privacy. That same year, St. Mary's, through its department of computer science, launched a master's degree in cybersecurity that includes courses such as applied cryptography and software security. UIW created several new degree tracks in San Antonio that would add to the local STEM workforce — from science and engineering to mechanical engineering and engineering mechatronics — but it will be a couple of years before those graduates enter the market.

### **What is qualified?**

Qualified employees are the lifeblood of any business. And it's especially true in the technology industry, where workers are often tasked with engineering innovative products — either for other companies or for consumers — that need to work as envisioned, lest a company fail.

But finding qualified people can become more difficult when, as some argue, the true definition of "qualified for the job" is changing, even as many job descriptions in San Antonio appear to remain the same with a bachelor's degree in computer science or related fields still a staple among minimum

requirements.

One problem is that college doesn't necessarily instill intangibles that go a long way in determining whether someone will succeed in the workplace.

"Character, loyalty and motivation is not necessarily something that you can teach," said Jonathan Earley, CEO of Laserbird Academy, a San Antonio-based internet school startup. "I personally believe that degrees are overrated. I learned the craft [in college], but I didn't learn about the entrepreneurial or business aspects of things."

Computer science degrees don't assure employers that someone is ready for the tech workforce, Earley said. He's met computer science majors who managed to graduate from college without learning computer coding languages or how to build products — another basic skill that employers demand in tech. And even for computer science majors who do learn languages like Ruby or Python, many employers want people with at least five years of experience who have learned the art of adapting to a fast-moving market.

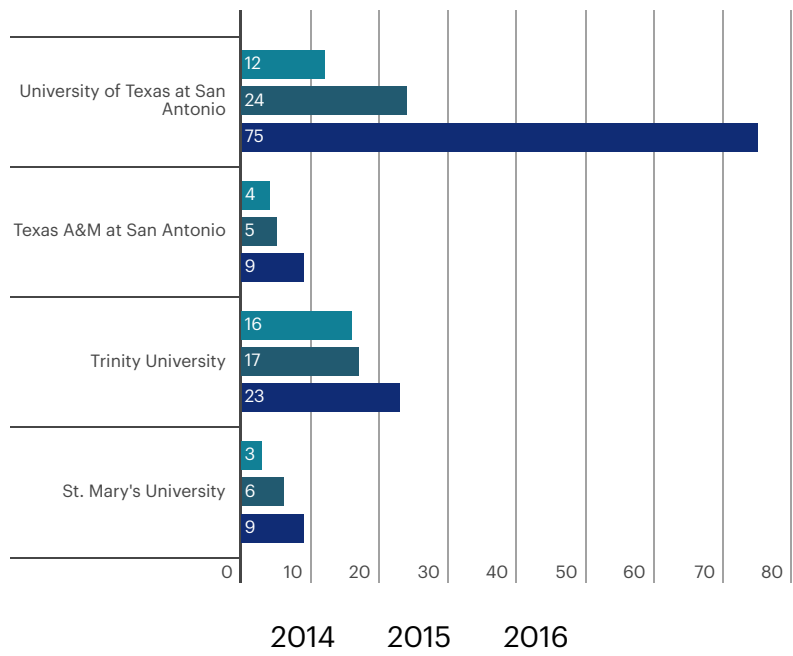
Paul O'Brien, who lived in Silicon Valley for years, is now a technology startup consultant and venture capitalist in Austin through 1839 Ventures LLC. He suggested one issue is that Texas' university system looks to its students, particularly postgraduate students, to generate revenue by developing technology that universities can commercialize. By contrast, he noted, California schools focus on graduating doctoral students and encouraging them to take what they've created to launch tech startups with the long-term expectation that they will later contribute to their alma maters' endowments. Over time, O'Brien said, Texas' method has led to a shortage of tech company executives.

"In Texas, people seem to be desperate to find [chief technology officers], vice presidents of engineering," he said. "Where would an entrepreneur go? Where their work gets tied up in the university or where their work benefits from being part of a school system that's trying to be innovative?"

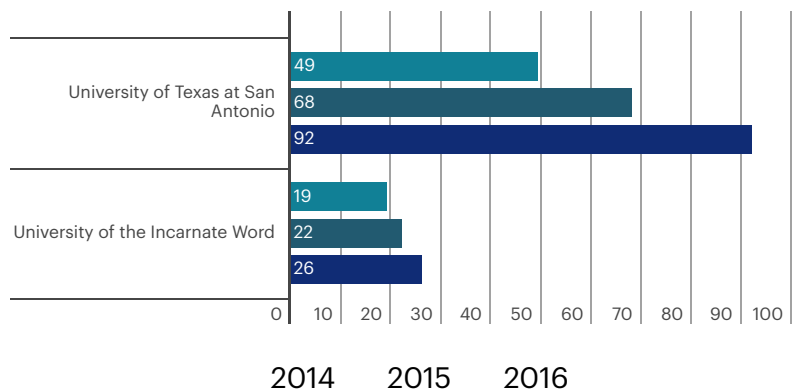
In that vein, O'Brien suggests that there's too much focus on incubators and building skills that are commodities.

"That's why the technical trade schools we've seen emerging in the past couple of years are starting to fail," he said. "You can get a decent job as a coder, but you're not likely to get a C-level or executive job. You need to have that deeper and broader skill set."

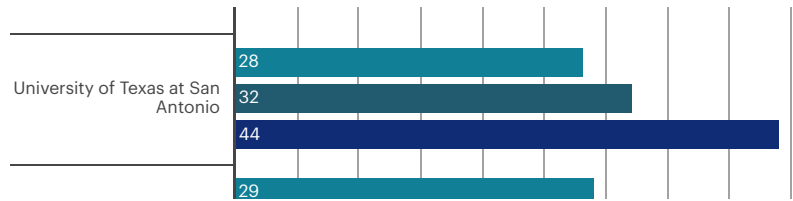
# COMPUTER SCIENCE GRADUATES (BACHELORS 2014-2016)



# COMPUTER INFORMATION SYSTEM GRADUATES (BACHELORS 2014-2016)



# COMPUTER SCIENCE GRADUATES (MASTERS 2014-2016)



**Kristen Mosbrucker**

Reporter

*San Antonio Business Journal*

