



Entrepreneurship in the CPI: Paving the Road to Innovation

With innovative technologies, small and efficient business models that omit bureaucratic decision-making processes, and fast-paced pioneering mindsets, startups are becoming more prominent in the chemical process industries (CPI). Venture capital investment in U.S. startups (across all sectors) reached \$148 billion in 2017 alone (1).

Charles Roe, the Chief Technology Officer and Cofounder of AlgiSys, is an entrepreneur with a focus on the production of bioproducts from microalgae. He views startups as a vital aspect of the growing chemical economy. “Startups typically excel at both commercializing emergent technology and developing a business model to monetize their innovation,” he says. “Startups also have the latitude, perhaps even the luxury, to take bigger risks than in the context of a large chemical company.”

Despite their importance to technological development, the relatively high failure rate of startup companies is enough to discourage many potential entrepreneurs from pursuing their ideas. Targeting the financial issues that cause new ventures to fail is one tactic that can help them transition into profitable companies. “Many startups struggle with raising the funds to sufficiently operate and bridge the ‘valley of death,’” says Roe. This term typically refers to the challenge of covering a venture’s negative cash flow until its products or services generate substantial revenue from customers.

Established corporations have the ability to inject capital into projects, have more developed marketing strategies, and can minimize costs more easily with their existing infrastructure. Startups, on the other hand, must establish their presence in a particular field and generate enough attention to bring in ample funding from outside investors. “Large chemical companies and startups each play different roles in commercializing innovation within the context of today’s industrial landscape. Corporations are indispensable when it comes to funding, strategically partnering with, and eventually acquiring startups,” explains Roe.

Most chemical engineers receive very little business and legal training during their undergraduate studies, which can pose a challenge for those who want to start their own business. Entrepreneurs must be ready to tackle the technical, financial, legal, and managerial hurdles that stand in the way of founding and sustaining a startup. For example, a working knowledge of intellectual property is crucial for the sustainability of a startup, as entrepreneurs must clearly define and take steps to protect their patents, trade secrets, trademarks,

and copyrights. By some estimates, U.S. intellectual property accounts for up to 38.2% of the total gross domestic product (GDP) across all industries (1), yet engineering curricula at most universities do not acquaint students with the concepts necessary to run a successful business.

One way to increase the number of innovative undertakings, particularly in the chemical sector, is to make entrepreneurs aware of the demands for specific new technologies. According to Roe, biotech startups often generate more publicity than endeavors in other areas of the CPI, and have a more mature venture capital community to draw upon for investment. However, many other sectors, such as energy, materials, analytics, nutrition, polymers, coatings, separations, consumer products, medical devices, and nanotechnologies, are ripe with opportunities for innovation.

Many of the technologies that we enjoy today came to life through entrepreneurs who decided to take the plunge to form a startup. However, Roe explains, “Being an entrepreneur isn’t for everyone, and it requires a strong tolerance for taking calculated risks and the ability to bounce back from failure. I do believe that some people may have a predisposition toward entrepreneurship, but it can also be nurtured and promoted. I think we can do a better job of encouraging college students, researchers at government laboratories, and scientific personnel within corporations to innovate and think like entrepreneurs.”

“Startups are a great way to pioneer cutting-edge technology that could become the future of the chemical industry,” says Roe.

The Chemical Ventures Conference (CVC) 2019, hosted by AIChE and the National Council of Entrepreneurial Tech Transfer (NCET2), will explore untapped investment and startup opportunities in the chemicals sector. Experienced entrepreneurs and venture capitalists will come together to discuss strategies for successful startup companies. The conference will foster discussion about the relevance of startups in the CPI and provide vital information to potential entrepreneurs. It will connect innovators with venture capitalists to help cutting-edge ideas become reality.

The Chemical Ventures Conference 2019 will take place at the Delaware Innovation Space in Wilmington, DE, April 23–24.

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1. Pridham, D., “Entrepreneurs: Here’s Good News for 2018,” *Forbes*, <https://www.forbes.com/sites/davidpridham/2018/01/10/entrepreneurs-heres-good-news-for-2018/#24e4b04e6659> (Jan. 10, 2018).