



Profile

The Chemical Engineer as Entrepreneur

Charles Roe has noticed some intrinsic qualities that define entrepreneurs like himself. “They tend to be fearlessly optimistic, and have learned to constructively handle failure and rejection. They also usually have an unshakable faith in what they are doing,” he observes. “Of course, many engineers are uncomfortable with the risk-taking associated with starting a company. However, I’ve found the potential rewards to be worth the risk.”

Roe is the co-founder and chief technology officer of Algisys (Cleveland, OH), a biotechnology company that uses algae to produce nutritional oils and high-protein additives for the supplement, food and beverage, animal feed, and pharmaceutical industries. Running a start-up company, he believes, “gives me greater ability to influence the direction of the organization and more autonomy to determine where to focus my time and resources. I value being able to choose where, when, how, and what I work on.” He also enjoys “the thrill of pitching my company to potential investors, as well as recruiting and persuading other people to join in my endeavors.” Working for himself and his stakeholders also motivates him to succeed.

Roe received his BS and MS in chemical engineering at the Univ. of Pittsburgh and the Univ. of Pennsylvania, respectively, before earning a PhD in chemical engineering at Michigan Tech. After moving to Cleveland in 1999, he held engineering jobs at General Electric and Glidden, before getting his first taste of the entrepreneurial side of science and engineering at NineSigma, an open innovation company. “I worked with executives, managers, scientists, and engineers at Fortune 500 companies to identify and source technologies for next-generation products,” he says. A short stint at SearchPath International, an executive recruiting firm, set the stage for his work at NineSigma. “The sales and consulting experience that I developed as a recruiter were instrumental in landing a position at NineSigma and working in open innovation.” These experiences sparked an entrepreneurial spirit in Roe, who co-founded Algisys in 2009 to commercialize and scale up the patented research developed at a university laboratory.

Engineering runs in Roe’s family — three consecutive generations of engineers precede him. However, he is the first to break the tradition of working for a large corporation in order to start a company of his own. This, he says, is out of personal interest, but also fiscal necessity.

Roe’s father, a PhD metallurgical engineer, spent most of his career at one company. “He earned a good living as an engineer and could comfortably support our family on one income. But the world has changed,” he points out. “By my estimation, today’s compensation packages have not kept up

with inflation and have lost a great deal of their economic value. Starting my own company offers the opportunity to potentially achieve financial freedom and live the American dream. It also offers the opportunity for financial setbacks, but the rewards are well worth the risks.”

Roe considers himself as much a spiritual leader as a business leader. Cleveland’s Word of Grace Church — where he is a deacon — gave him his first opportunity to sit on the board of an organization. “I’ve seen few organizations with such a diverse leadership team and stakeholders, and my work at the church has helped me to develop better interpersonal skills and learn more about the human condition,” he comments.

His humanitarian activities are wide-reaching. He is currently a Special Scientific Adviser to the Secretary General of the United Nations’ Intergovernmental Institution for the use of Microalgae Spirulina Against Malnutrition (IIMSAM), a project aimed at eradicating global hunger. He is also involved in H₂OPE Biofuels (which advocates hydrogen energy solutions) and Across Borders (which creates sustainable community initiatives in developing countries). “There’s a strong synergy between my external board activities and my work at Algisys. I’ve probably learned more about leading people and managing relationships at these other organizations than at any of my places of employment,” he notes.

Roe also serves as chairman of AIChE’s Cleveland Section and a director of the Management Div., which keeps him connected to other chemical engineers. “Given that no one can be an expert in every area of chemical engineering, I rely heavily on my network to advise me when I reach the limits of my own knowledge, expertise, and capabilities,” he says. Indeed, he emphasizes, “entrepreneurship is a team sport. Start-up companies are built upon strong partnerships, with each individual bringing different skill-sets, educational backgrounds, and expertise to the enterprise.”

Roe would like to see more chemical engineers start technology-based companies. He recommends that prospective entrepreneurs first obtain work experience, to acquire some business acumen and industry-specific expertise. “Study the trends in a particular industrial sector before choosing a product or technology to commercialize and bring to market,” he advises. “Intelligence and knowledge are no substitute for wisdom and experience.”

Roe credits his faith with helping him to maintain a positive outlook amidst the difficulties of starting a company. “It’s not a trivial task to simultaneously engineer a marketable product, develop a management team, court capital from investors, negotiate contracts with suppliers, solicit business from customers, and keep your sanity — while not going bankrupt.”

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