



## **SIMON FRIED**

Simon Fried, as a strategy consultant and marketing advisor, has worked with multinationals and start-ups across a broad range of industries, including financial services, fast-moving consumer goods (FMCG), automotive, retail, medical devices and software. Past positions include roles with Monitor Company, the Financial Services Authority, Oxford Risk, Mountainview, Oxford University and Eternegy.

# Emerging from the 'valley of death'

Simon Fried talks to **Neil Tyler** about reinventing the market for conductive inks and PCB prototyping.

Founded in 2012 by a collection of seasoned entrepreneurs, Nano Dimension is focused on the development of advanced 3D printing technologies and associated materials. Along the way, it has developed a technology that combines inkjet, 3D printing and advanced nanotechnology.

Simon Fried, initially Nano Dimension's chief marketing officer and now its chief business officer, has been able to bring his experience to the company, not only in terms of business development, but also in raising funds.

"For companies operating in hardware or chemistry, as we are, raising seed capital can often prove impossible," he explained. "Most of the funds that are available tend to chase those developing apps or software.

"Despite that, we've managed to navigate the 'valley of death' and come out the other side with a healthy bank balance and products in the Beta phase of development. We're a listed company and our funding has come from select investors, rather than through an Angel or venture capitalist."

According to Fried, the company has benefitted from a combination of good timing, luck, stable markets and last, but not means least, a compelling story.

"Among our primary products is the first 3D printer dedicated to printing multilayer PCBs," Fried noted. "We have also developed a conductive ink that can be used for ultra-rapid prototyping of complicated multilayer boards."

Earlier this year, at CES in Las Vegas, the company unveiled DragonFly 2020, a 3D printer designed to combine advances in inkjets, 3D printing and nanotechnology.

Navigating the perilous runway from start-up to product launch isn't easy, but the launch of the printer heralded an exciting time for the business.

"Since the company was set up, we have worked hard to create a centre of excellence around a team with years of experience in key fields such as chemistry, inkjet deposition and software," Fried said. "That team has been successful in combining those skills in material deposition, printer and software, which means we can now offer what we think is a valuable manufacturing alternative for PCBs."

This year's first quarter has been exciting for the

company. Among some significant achievements have been its listing on NASDAQ in March and the filing of a number of patent applications.

"The launch of DragonFly2020 went very well," said Fried and the company has now signed an agreement with Flextronics to serve as the printer's primary manufacturer and supplier. "This agreement supports our plans for the delivery stage of our printers towards the end of 2016," Fried explained.

According to Fried, the company's vision to merge 3D printing with printed electronics is not intended for makers, but rather for the 'industrial business end of the market'.

"Our focus has always been on the enterprise market, which means that we have to look at everything from scalability and the materials used to develop a printer with high enough resolution to provide the components used in electronics."

Building multilayer PCBs for professional grade printed electronics requires high quality and predictable materials and equipment.

"Companies that are involved in electronics manufacturing and design typically outsource production, invest significant capital and experience long turnaround times with PCB prototypes. That's the market we are after.

"We believe these types of company are looking for a cost-effective, fast and safe means for prototyping and we are looking to supply them with a solution that will provide them with a multilayer in house PCB prototyping service that will be faster and more flexible."

Research conducted earlier this year by Nano Dimension amongst more than 2000 potential customers, including engineers and PCB designers, threw up some interesting findings, according to Fried.

"We used a survey to better understand their needs; how much they spent on prototyping, how complex were their PCB designs."

While most respondents were from North America, the survey brought in results from around the world, including nearly every European nation. Respondents included a mix of company sizes, with nearly 75% working for companies with fewer than 500 employees, and slightly more than one quarter working for companies with more than 500 workers.

The research found that 93% of companies worked with short run, low volume external PCB prototyping services at some point each year; that PCBs were being designed with a much higher layer count, so prototyping was becoming more complex and expensive; and that many respondents were worried about the loss of IP as a result of using external companies to supply prototypes.

"The offsite PCB prototyping process has many downsides," Fried contended. "It's expensive, it's time consuming and it puts IP at risk. However, I believe that our survey reflects a market that's ready for 3D printing, perhaps ushering in a new era of PCB engineering.

"I think we've reached a point when engineers will be able to print their own quality multilayer PCB prototypes in house cheaply and quickly," he concluded.

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