

Overcoming the challenges of nanosensor technology and finding opportunities for growth

Interview with Dr. Josep Montanyà, CEO, Nanusens



Dr. Josep Montanyà

In a previous issue, we asked Nanusens about their innovative nanosensor technology. This time we asked about the journey and challenges.

Let's start by asking how the company was started? Back in 2003, I thought that the way of making MEMS sensors using special custom production lines was going to present a bottleneck as it was clear that the demand was going to escalate as devices were increasingly being made 'smart' by adding sensors. So, I founded a company in Spain called Baolab Microsystems in 2003 to develop a new way to make MEMS sensors by starting with standard CMOS production and then designing sensors that could be made using only CMOS.

Why had no-one else done that? We soon found out that the metal structures that form the sensors distort when they are released from the dielectric. If anyone had tried this at the time, they would have probably given up but I thought we could solve the problem by designing structures that took the stresses into account so that the final released shapes were what was wanted and also stable.

The builders of medieval cathedrals did the same thing in their designs that allowed for the building to settle into the final required shape. Learning how to do that is Darwinian in that, along the way, bad designs fail and fall down so that only the good designs survive. We would

have to do the same process of trialling designs to see which actually worked in the final product. And, unlike the builders, we did not have generations of previous work to build on which is why ours has been a very long journey while we pioneered this approach.

That must have fund raising very difficult? It was. Evolution is always easier to understand and invest in than revolution. And we were pioneering a completely novel, untried and untested approach. That's high risk in the eyes of investors. But, the potential to completely disrupt an already established market with a product that is so much easier to mass produce in volume to meet a growing demand, was what convinced investors to back us. Although it took a while to find investors who could understand what we were proposing. By 2012, we had solved many of the design problems and were about to release our first CMOS MEMS sensor, a compass, when our majority investor decided to put Baolab up for sale as they wanted to close the fund. As they had over 50%, we were powerless to stop them. What's more, they were asking a highly inflated price and refused more sensibly priced offers. In the end, they closed the company in 2014.

That must have been devastating? It was but I learned valuable lessons from it. The Americans always say that they like investing in someone who has gone bust

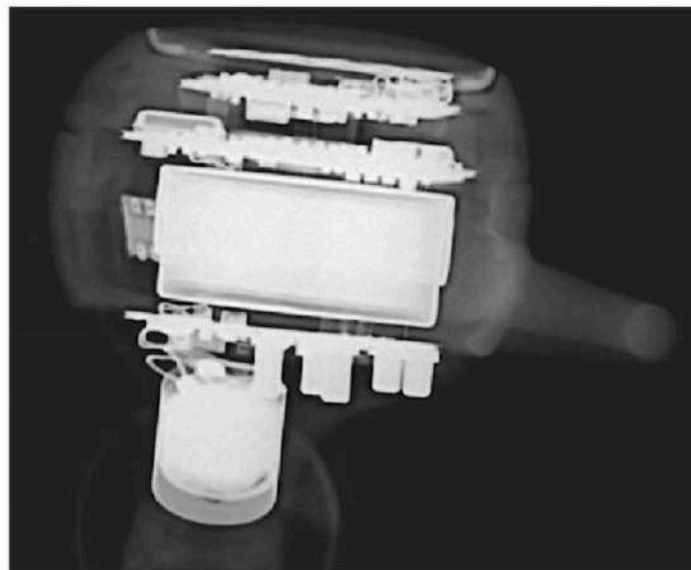


before as that is the best way to learn how not to do it again! We knew our concept of MEMS within CMOS worked which meant that we had something tangible for the next set of investors as naturally I formed a new company immediately called Nanusens. And this time, no VC has a majority shareholding! In fact, we have three VC companies which also brings in some extra expertise, advice and contacts than just one does.

And you also did crowdfunding. How well did that work out? Very well. We raised about two million pounds via CrowdCube. After the last experience, I

wanted to continue with risk diversification of the investors. We could have got another VC onboard but wanted to see if crowdfunding would work for a high technology company. Again, pioneering a novel approach as most crowdfunding is for easy-to-understand consumer products not novel chip structures built in giant fabs. We had to hone our message and pitch so that it was easily understood by people without an electronics background. We focussed on the growing earbud market where our sensors could provide up to 20% longer battery life giving us a clear story. What surprised us was the investment interest from the UK. The tech giant ARM had created a market of tech savvy investors looking for the next ARM to invest in. But there was a problem. They all wanted to take advantage of the UK's Enterprise Initiative Scheme (EIS) that reduces the risk and outlay for investors. But EIS only applies to UK companies so we moved the company's headquarters to London and made the Barcelona office a subsidiary. That got us approved for EIS within a few weeks, who were very supportive in guiding us through the process, and investors flooded in.

Finally, any other benefits to becoming a British company? Having a UK headquarters means that we have easy access to key high technology companies – both customers and suppliers. It also means that we have access to the UK's R&D tax credits and other UK government company support initiatives which will be very helpful. On the other hand, we are now paying far more attention to Brexit than we did before!



Earbud xray

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