



Interview with Ashok Joshi, President & CEO Ceramatec



In February of 2000, Dr. Ashok Joshi became the new owner, President & CEO of Ceramatec. With a strong commitment to the market-driven creation of new products that leverage the infrastructure, expertise and 25 years of experience in product development, Dr. Joshi has pursued an ambitious plan to forge new strategic alliances, develop new products and develop new companies dedicated to the commercialization of these products. Dr. Joshi was awarded the Medal for Science and Technology by the Governor of the State of Utah. He is an active member in the Industrial Research Institute and has twice been the keynote speaker at the International Conference on Ionics. Dr. Joshi received his PhD from Northwestern University in Materials Sciences. AJ can be reached at aj@ceramatec.com

Interview conducted by Doug Berger, INNOVATE LLC. doug@innovate1st.com

Doug: Three topics seem to be of great interest to you in the area of innovation: 1) your business model for spinning off ventures when they are ready for commercialization; 2) your observations from the contract research world as to where major companies succeed and fail, and some recommendations for how they might operate more effectively; 3) operating a company on a very small, nimble scale. With which of these topics would you like to begin the interview?

AJ: Let's start in the area of operating the company on a smaller scale. As far as my company is concerned, when I acquired it in 2000 there were only 55 people. It has tripled since then. If we were an R&D center in a large company, we would be considered quite sizeable.

There are some common things that really should be done to make the business grow as a contract research company. First, empower your scientists. They have very good ideas. Encourage them to put those ideas into proposals and getting funds. We created a unique model of giving incentives to scientists. When a contract award is granted with their idea, they get some rewards. If the overall company wins several awards, they get part of that incentive as well.

Secondly, we have established excellent corporate collaborators, such as Air Products and Chemicals. The world knows that Ceramatec and Air Products have been collaborating for the past 11 years. Their managers are inspirational to my company. I must say that Air Products is a unique company. They have supported us through some difficult times, which has been a very important element in our success. This is generally atypical of big organizations. Big organizations usually give you an R&D contract and then blame you and get upset about small things. R&D is a high-risk business - failures happen. The knowledge obtained from failures is often used for future successes. Instead of getting frustrated, if you support people, you will get a lot more from R&D than you otherwise would.

The third point is to lower the ego of high-level managers. I truly believe that containing ego is one of the most important elements in motivating or inspiring your scientists. You always think that you and the managers are basically on the same level

as your scientists. You have a responsibility, but you do not have the power. It is critical to instill this element. We make sure that nobody blames anybody for failure. If there is a failure, managers take overall responsibility and sometimes even support the failure itself. Once you start thinking in this way, it makes a tremendous environmental change in the organization. You have to access somebody else's idea in its totality and see that idea from the perspective of making the idea useful for the human society. Once you are in that hot spot, you will do wonderful things in any company. It is an especially hard thing to do, but once you start training your mind in that way, it becomes a wonderful thing for the organization. I am very fortunate to have scientists with little ego.

Doug: AJ, this is one of those principles familiar to people who have grown up with non-Western spiritual traditions, but is foreign to Western culture. For you, this is a very practical way of building and running a business.

AJ: That is not true. Many Western philosophers say the same things. This is not a new idea; it is putting it into practice, however, which is very difficult. You have an ego and a soul. I believe you have to operate more on the soul side than on the ego side. Every time that you are in the business, you need to pinch yourself whenever you have a reactive mind. You do not have to react to anything, really. You can act, of course, but you do not want to react. Therefore, every time you catch yourself in the reactive mode that is not good for the organization.

These are the three things that, if done, regardless of whether the company is small or large, or the small department of a large company, it has to grow. People make it grow. Actually, in my belief, everybody is talented - everyone. The only question is how you put together all of these instruments and play.

Doug: Moving into the next part of our conversation, what do major companies do well, what do they do poorly, and what are your recommendations regarding contract research.

AJ: There are several points to cover here. We are technology focused. We approach larger companies who are in that field because we do not have the funding or full spectrum of capabilities to take technologies to commercialization. Typically, we approach business development people because they understand the market. However, they immediately throw us into their R&D area, which is a big mistake because R&D has no incentive to take somebody else's R&D. This is how companies promote the "not invented here" syndrome. Ideally, R&D should be involved, but the champion should be the Business Development Market. Unfortunately, that hardly ever happens.

Innovation does not come without associated risk. In large corporations people tend to avoid the risk because taking the risk means going through a difficult period. Large corporations make that period difficult to survive, which is why we took one of our devices under development to a smaller company - a \$200 million company. I had easy access to their CEO and they were hungry - hungry to grow their company. They took the same device, which had been rejected by several large companies, and in the same market space, they made it very successful.

Doug: Many people could be under the impression that contract research is limited to major companies contracting with you to do basic research and developmental for something that they have in mind. You, however, also have your own speculative research, which you then shop, into the marketplace.

AJ: Absolutely. We actually do the latter more than the former. We come up with ideas and we sell those ideas to larger companies and to the government. If the company becomes interested, then we license. We receive the development money to develop the product for that particular field. For that field, we give them exclusive rights and

keep the rest of the rights. We then use the same technology for creating different products in other fields.

Doug: One of lessons learned for big companies could be profitable, self-funding R&D. You are in the business of technological innovation. You have a business model that makes you a profitable company in the business of technological innovation, which you then shop out for successful commercialization. So, where many companies think of their more basic research and development functions as cost centers in which they need to reduce expenses, your business model actually allows you to run a development group that generates its own cash flow.

AJ: Correct. They want to reduce the R&D function because it's a major cost center. Therefore, they deal with a small company like Ceramatec. Our scientists are hungry to develop new products. When they fund us, they get a lot more for their money.

Doug: I want to talk about risk for a minute. In one regard, being a small company, you are more financially exposed to risk than is a large company.

AJ: I am not talking about financial risk - it is a mental risk. It is easier for large company managers to say "no" rather than "yes." Many managers think about the risk to their position, so there is really a personal agenda not just a company agenda. The influence of personal agenda and politics upon company agenda is much higher in larger companies than it is in smaller companies.

Doug: Another aspect of risk is knowing when to cut off a line of research, not because you have had an individual failure, but because that particular line of research no longer looks promising for commercialization.

AJ: Once we have a promising technology, we give development managers three to six months to tell us whether there is any customer interest. One of our technologies has a deadline coming up in two months. If there is no customer interest, we are going to shut that project down.

Doug: What are other criteria you use to shut a project down?

AJ: We always have to check the cost of the product or cost of the process. When the estimated cost of the project is higher than that of conventional profits, then of course we say that we just have to wait until the time is right. Take a fuel cell, for example. We do government research, and we continue doing government research to bring down those costs and develop new processes, but we are not in the commercialization game. For the past 25 to 30 years, people in fuel cell research have been saying that they are only five years away. Government funding is a good way to fund high-risk research that is not yet commercializable technology.

Doug: Let's pursue an area around your business model or your management model. In the very early stages of your research and development, you are sizing up the economics and pursuing things appropriate to their economic viability in the market. Do you expect your scientists to be cognizant of this? How do you embed the non-technical aspect required for commercialization into the early stages of your research and development?

AJ: I have business development managers who work with the scientists. Our scientists understand what this process looks like, how much it will cost and determine whether the device cost is anywhere close to that of the competition. Together, they need to understand the competitive advantages, niche markets, and potential applications

Doug: We touched on the idea of a business model that gives you the option of licensing when you have something ready for commercialization, as well as one that gives you the option to spin something off yourself for commercialization.

AJ: Correct. That spin off company is also motivational and inspirational to the employees. There are those people who aspire to becoming a CEO or an entrepreneur themselves. I always say that we not only develop technology, but we develop entrepreneurs. We recently formed a company called Emisense, still owned by Ceramatec, with an attractive stock incentive plan for the entrepreneur and his/her team. Emisense is involved in developing ceramic sensors. There is definitely a big market for this emissions technology as the world is presently focused on Energy and Environment.

I have a good entrepreneur and a passionate team, who has worked on this product for the last 2-3 years. They have developed the sensors. We have formed the company with the same group and now they are attracting venture capital funding and corporate funding. I am sure they are going to be very successful.

Doug: In a sense, you are acting as the angel investor incubating a technology, until the technology has progressed to a stage when you can get corporate venture funding for product development. What is your thinking as you decide whether you want to make this development something that Ceramatec will license or something that it will spin off?

AJ: The first and most important criterion is to determine whether I have the entrepreneurs here who want to take the risk. That is fundamental. If an internal staff member comes to me saying, "I really, really want to do this. Can you help me to make it happen?" that is a great thing. Ceramatec will get the maximum out of it because we keep control of the technology instead of licensing and getting five to ten percent royalty. This is far more interesting for me.

The second factor is funding - will it require a huge amount of funding? If it requires massive capital and massive marketing efforts, then it is better to collaborate with a large company and license the technology. For example, the ceramic emission sensor requires a relatively small amount of capital. We can do it with venture capital funding. I have the team that can do it and therefore it is an easy choice for me. Giving them the incentive plan that excites them is also a simple task. On the other hand, Ceramatec's Fuel Cell project will require hundreds of millions of dollars to commercialize. Therefore, we have to collaborate with a large corporation on the Fuel Cell project.

Velcro Points

1. Take the Ego out.
2. Encourage scientists to be entrepreneurial.
3. R&D can be a profit center.