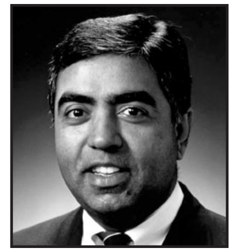
Interview



with Sanjiv Ahuja

Laying the Groundwork for Success

On 21 May 1999, the Software Systems Division of Telcordia Technologies (formerly Bellcore) in Piscataway, New Jersey, achieved the Software Engineering Institute's Capability Maturity Model Level 5 capability. Following the assessment, Bill Curtis of TeraQuest Metrics, one of the three SEI-authorized lead assessors who conducted the evaluation, interviewed the president of Telcordia Technologies, Sanjiv Ahuja, about his views on executive leadership for improvement programs. Ahuja came to Telcordia from IBM. Prior to his promotion to president, he provided strong executive leadership for Telcordia's Software Systems Division.

When did you join Telcordia, and what were your initial objectives for its software operations?

Ahuja: I joined Bellcore exactly four years and eight months ago today—on 21 September 1994. At that time, we had some major challenges facing us. Our revenue, quality, employee moral, and customer satisfaction were all declining. We had a business that needed to be turned around in many ways.

The challenges we faced are the same ones that all software companies face when they decide to make changes—moving to a more disciplined process, focusing on accountability, and balancing software development's creative side with the need for consistency and repeatability.

How did you use ISO certification and the CMM as a guide for making these changes?

Ahuja: Although our main focus was to continuously improve our own process, ISO 9001 and the CMM provided external guidance that were important motivators for our teams. Basically, we used these external barometers to make sure we were on the right path during our journey. They have caused us to analyze our business decisions, to reset some of our goals, and to focus on continuous improvement.

How do you think achieving a Level 5 capability has improved Telcordia's operations?

Ahuja: Over the last four years, since we began our journey toward Level 5, our software business has doubled, our profits have grown, and we have measured customer satisfaction at better than 95%. Our on-time delivery is solid—98% to 99% over the last three years. Our field fault rate has dropped dramatically. Every single way of measuring the business shows how important the focus on the CMM has been. It even shows up in our employee retention rate, which is in low single digits, and that's unheard of in the current telecommunications business environment. Bottom line, it helps us continually improve our products to satisfy our customers. However, we also recognize that Level 5 is not the end of the quality journey; it is another milepost in our effort to continuously improve.

The Quality Method of Operation

How did you use your quality method of operation (QMO) to focus on these performance issues?

Ahuja: The QMO is a thin, commonsense, standard process framework that is used by all software developers at Telcordia. But the QMO is not just a process; it is also a way of doing business. Many companies have adopted software processes without understanding that people generally think processes are in the way. We successfully built a development life cycle—a living document, a living process—that truly assists people in achieving their project goals.

How did you create the QMO so that people would buy in?

Ahuja: We created the QMO in an effort to balance the need for consistency and repeatability with the need for flexibility. Early in our journey we recognized that there were many effective practices being used by our teams. Our software engineering process group and representatives from all the teams were involved in defining our commonsense approach based on these practices and industry standards such as CMM and ISO 9001.

Second, in all candor, we didn't give people a choice about whether or not they would use the newly developed process. We believe that local procedures allow a necessary degree of flexibility, but there are some basic tenets of the QMO that are not negotiable. The QMO is a lot like society. There are many individual variations, but there are also some basic rules that everyone must follow.

What role does the Telcordia's senior management play in relation to the QMO?

Ahuja: That role has evolved over time. It started in some ways as one of a stern parent saying, "This is the process, and thou shalt follow it." We defined expectations for each product team: follow the process, meet your commitments, and deliver on time with quality. We emphasized that the process must evolve, that it should become "best in class." We assumed that all Telcordia employees wanted to use the best-available process for meeting their goals. After we had that process and it began to produce the results we wanted, we became cheerleaders. Our role has evolved from defining the process and setting goals to coaching, supporting, and applauding the development effort.

How did you deal with resistance from middle management?

Ahuja: First, we expect middle management to be willing to measure what they are doing. As I mentioned before, there is a basic expectation for management at all levels to be committed to the process and accountable for what they do. We had to create some turnover in the middle and upper management team to ensure everyone was committed to changing the way we worked. We looked for people who were willing to make that commitment.

Can you summarize the basic principles that you tried to embody in the QMO?

Ahuja: The QMO defines a set of controlled documents, quality records, and basic steps that are expected from every software development team. Following the QMO, accountability is audited on a regular basis. The process also calls for monitoring during each of its phases. We need to be able to measure our progress. An analysis of our measurements serves as the basis for predictions about levels of quality and how to avoid mistakes that were made in the past. The process's predictive nature is truly a key to its success.

Why do you think so many software managers and executives don't use measures more effectively?

Ahuja: People aren't always comfortable facing reality. Measurement gives us facts that we don't always want to hear, but they are absolutely necessary. You can't improve if you haven't assessed your weakness, but some managers just don't want to know about their weaknesses.

The other reason that some managers and executives don't use measures more effectively is that they believe the processes necessary to acquire those measures are limiting and expensive. I think it's almost sinful for any software executive to avoid analyzing, monitoring, and measuring what they're doing. They are certainly not adding value if they're not measuring what they're doing.

How do you respond to people who think that defined processes such as the QMO are too bureaucratic to work in a fast-paced market?

Ahuja: Process doesn't always imply bureaucracy. Having the discipline to apply a standard process is one of the fundamental rules for success. We have a wonderful real-life example of a project team that completed a critical project in nine hours using the QMO! Under order from the Federal Communications Commission, they added or modified 3,000 instructions spread through 40% of a 1-million-line program. They went from requirements analysis through regression testing overnight. In the next year of operation, there were no failures related to these changes. I believe the answer that Telcordia team members would give you if asked that question is that rework costs far more than the discipline of doing it right the first time.

What kind of guards have you put in place to protect against becoming overly bureaucratic?

Ahuja: First, we built in a tremendous amount of feedback from all levels. No one group owns the QMO. We have a process group of approximately a dozen people for an organization of 3,500 that helps to define and make changes to the QMO and to assist projects in monitoring their process. So there aren't enough bureaucrats to impose a lot of bureaucracy. Part of the process group audits each product to make sure that everyone is following the process, but even those audits are focused on helping people improve.

Second, we won't let the process be onerous. The QMO is part of everyone's life; it is part of being software professionals. Last year, we added over a thousand people in the software organization. Most of them came from CMM Level 1 organizations, and very few of those people will ever want to go back to that way of doing business. If they thought that their old way of doing business was better, they'd say it. They don't.

We also avoid bureaucracy by giving every single employee a way to make suggestions to improve the process. Many of those suggestions are aimed at removing bureaucracy or things that don't add value from the process. We try to listen to our employees on all aspects of the business, including the software process. When there is enough listening going on, the process becomes living and evolutionary.

Team Development and Executive Insight

How do you know that Telcordia's results are not primarily derived from inheriting stellar software talent from the old Bell Labs?

Ahuja: That's a very interesting question. As a company, we did inherit stellar software talent at divestiture. However, remember that divestiture happened 15 years ago. It isn't just the people who were part of this company 15 years ago who have produced the results that we have achieved. It's also the thousands of people who have been added to this company. They are people who have the talent, skills, motivation, and commitment to quality that get the results we expect. We had a foundation and then proceeded to build on that foundation.

How have these changes affected Telcordia's culture?

Ahuja: Four years ago, I would say we had pride in our work and certainly a great deal of technical expertise, but we weren't feeling like winners. I believe every single employee feels like a winner today; we have developed a winning team atmosphere.

Be true to your commitment—your commitment to your employees and to your customers.

One of the assessors for the recent CMM evaluation is from one of our largest customers, and he has been assessing our software capabilities since 1980. He told me that one of the most obvious changes in our company has been a tremendous change in attitude. Telcordia employees have a different attitude toward quality today.

What primary responsibilities should an executive personally undertake to lead a change effort?

Ahuja: One important responsibility is to clearly communicate the need for change. People need to know a leader's expectations. Another area of responsibility is to be visible in your commitment to change and to communicate, communicate, communicate. I can't emphasize that enough. I believe that people need to see the goal and then constantly be updated on milestones in achieving that goal. Identified measures of success are critical for any successful improvement program.

A software executive must also be willing to make the tough calls, whether that means being late on a deliverable to meet quality criteria or making changes in the team. I also believe that it is important to walk the halls, talk to team members, listen to what is going on within the organization, and actively participate in quality activities.

What would you have done differently?

Ahuja: In hindsight, we know that there were a number of detours we took along the way. If we had focused on predictability earlier, we could have shortened the road to Level 5. We had some very long debates over the need for predictability in the software development process. We decided to take some other steps first. We should have attacked this area earlier than we did. It would have been hard, but the rewards would have been worth the effort.

What things would you like to predict right now?

Ahuja: Of course, I'd like to be able to predict during development if a project is going to be on time and if it is going to be within cost. But most importantly, can we predict the quality that a product is going to have when it is delivered? Predictable processes take much of the mystery out of development. What shocks me now is that in our industry, good predictive practices are the exception. They should be the norm.

What advice would you give to people who want to become software executives?

Ahuja: My advice is very basic. Be true to your commitment—your commitment to your employees and to your customers. When you empathize with your customers, you will not ship poor quality, and you will deliver on time. If you care for your employees, you will create and manage a work environment that is conducive to success. Have a thorough understanding of the business you are in and provide leadership. Businesses fail not because employees don't work hard or don't want to excel. They fail due to poor leadership. ❖