Leveraging Quality Processes in Technology Businesses
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P. R. Ganapathy: We will now move on and we would like to throw some light on investments that have been made in the area of quality, productivity, domain, and technical expertise, highlighting the concrete business benefits more importantly that have been delivered to Infosys' clients because of these investments. Firstly, we will start with quality, both in the conceptual sense as well as quality as it is applied to the delivery organization. Quality of course is a fundamental pillar of the Infosys model from way back in the early 90s when we were ISO-9001 certified. Mr. Satyendra Kumar is head of the Quality and Productivity Group and Mr. Padmanabha Rao, who is the head of the Delivery Excellence Group will now walk you through quality at Infosys and what it means for it's clients.

By way of introduction, Satyendra Kumar has been Vice-President and Head of Quality at Infosys since September 2000. Prior to joining us, he was Head of Quality at IMR Global and he worked as Deputy Chief Executive at Tata Quality Management Services, there quite importantly, he was very closely involved with the famous JRD QV award which is completely based on the Malcolm Baldrige framework, so he has a very sound hands-on experience in that area. He has also been a software quality consultant for over 30 companies in India and abroad. He is a certified TickIT auditor and a ISO lead auditor. He has a postgraduate degree in electronics from Delhi University.

Padmanabha Rao is a postgraduate in Electronics and Communications from Madras University and has a postgraduate Diploma in Operations Management from IIT Madras. Paddy, as he is known in Infosys, has over 20 years of industry experience, 10 of which were in software. He has worked on advanced avionics systems in India and abroad, and he setup and scaled up Delphi Automation Systems software facility here, which extensively uses the capability maturity model too. Interestingly, Paddy was one of the first six sigma master black belts in India, which he acquired when was with GE Medical Systems. Paddy and Kumar will now walk you through quality and what it means for Infosys' clients.

Satyendra Kumar: Good afternoon to you all.

LEVERAGING QUALITY. Quality in Infosys to us is all about excellence. This **excellence** journey let me take you through quickly how we have been through last one decade. We began sometime back in the early 90s systematizing our processes looking at the effectiveness of our processes, making them more formal, and which resulted in to ISO 9000 certificate way back in 1993, when we were about 1000 people. We moved on, the ISO 9000 gave us a kind of framework for the basic processes in terms of structure and in terms of some systemization at the core level. We looked at what are the other kind of valuable models and tools all around us, and we found there is a model called CMM – Capability Maturity Model, we used that model thereafter for couple of years, which led us to a CMM Level IV certification assessment way back in 1997. From there, we further went on to achieve Level V in the year 1999 when we were around 4000 employees within the company. In year 2000, after achieving Level V, we felt that there is a need to look at now how do we leverage all our strengths and how we do leverage various tools, techniques, models, available globally around us and we launched a very big initiative, an umbrella initiative called Infosys Excellence Initiative.

Now, the point to be noted and the significant area to be noted here is that, on one hand, we were growing phenomenally in terms of our growth, in terms of business, in terms of numbers, and on the other hand, we kept our commitments, we kept our convictions very-very strongly all through, where if you look at, it is very easy to slow down the time when your business and the number of people growing around us; so that conviction within all Infoscions had been very strong and we have remained very focused on the quality and systemization front. You have seen the slide earlier from Meera that what we have been trying to do all along in last few years is that we look at our strengths in terms of various strengths available, in terms of services, in terms of products, in terms of infrastructure, global presence, and we try to leverage this to provide and to ensure a effective and superior value proposition to our customers in terms of their market, their time to market, the predictability, and reduced total cost of ownership.

Now, how do we do that, how do we leverage the quality to do that? What we have tried to do is under this umbrella of Infosys Excellence Initiative, we have started looking at organizational excellence today, we do not look at just excellence within software engineering alone. So, what we do is, after achieving CMM Level V, we tried to look at leverage around same Level V, same Level V by the way is just one behavioral pattern, it is not an end in itself, you reach there, it gives you a infrastructure, a provision to move on for improvements further and further, so we leverage our CMM Level V strength, specially in the software engineering areas. So, engineering areas in other words what I am trying to say is, we use the model CMM to keep on improving ourselves. The areas such as business processes, which are typically the customer related transactions or the customer contact related issues, what we do there is, these are the areas where you will come across functionality from sales to delivery to HR to quality and they become very difficult to improve.

So, what we do is we use is six sigma suite of tools, Six Sigma has a number of tools. We use one of the tools called cross-functional process mapping, which is CFPM tool, and last two years, we have had phenomenal gains using this model. Looking at the management processes with the company, may it be strategy planning, may it be customer-relationship management, or leadership areas, we use the Malcolm Baldrige framework, which I am sure many of you are aware of that, that is the model, which in US, companies every year who apply for it, get assessed, and the President of America recognizes or awards these companies which are typically two or three companies in that excellence bracket. So we use, for management processes, the Malcolm Baldrige model, and we have been using it for last two years, have derived tremendous value out of it, and I will recite to you in a short while. Now, what I am trying to say here is looking at the organizational excellence, we use various models and approaches today in an integrated manner within the company, and what me and my colleague Padmanabha Rao would try to do is take you through these few areas what we have done and what we have achieved so far.

Taking on to the first one, engineering areas, that is our core areas, having said that CMM is the model we use for it, now which are the thrust areas in that. There are a couple of thrust areas I am going to talk about. Number one and the foremost important to us is the defect prevention. As you know that if we inject defects as we build our products and services from starting till end, we tend to inject some defects. Now, those are the defects if you can take control of them, if we know where do we strength quantitatively and if we know how to control them, definitely our time spends, our overruns will be reduced, our rework cost will be reduced, we will be more predictable, and we provide a better solution to our customers.

So our focus in the last few years had been to look at organization level as well as project level, look at, identify these common defect types, prioritize them, find solutions, find different processes, improve the processes, pick them, throw, implement them and keep on monitoring them, and this is done at both levels. There are defect reduction or prevention teams at organization level as well as each project level. What it clearly gives us is it helps in reduction in the defect injection which are typically the in-process defects when you build your services and products, and the second one is the reduction in the delivered defects, what you deliver to the customer has to be defect free. Now, typically some defects get delivered, so you got to identify them much earlier in the game and you got to deliver much less of it.

Some of the examples of that, if you look at the defect reduction and the defect injection case, you saw this chart earlier from Priti that we have been measuring our defects regularly over years and we have been looking at the baselines where do we behave. If in this chart you look at, that the defect injection or in-process defects have been continuously reducing quarter by quarter over years and what is more important and what I want to highlight here is that we benchmark these across best-in-class, across globally, and the two of the benchmarks mentioned here which have been derived from the IEEE survey which was published a year and a half ago in US. The survey published various companies behaving at level V and IV, where are their baseline defects today, and we find ourselves in a very-very good and strong position, and we are positioned where our defect rates today in Infosys are much better than the international benchmarks globally.

Looking at the reduction in the delivered defects, defects typically found in acceptance phase or in the field, what we find ourselves there is another Caper Jones name, those of you who are in the software engineering would know that he is a guru in the software quality matrix or the software matrix. He has published in the year 2000 various global benchmarks of level V, level IV, and level III companies. Now, even with the reference to that benchmark, we stand quite strongly in a very strong position that our delivered defect rates are much-much lower than the benchmark published by Caper Jones. What it really gives us indirectly is definitely a superior value to the customers in terms of time to market because if we know our defect rates and if we are much lower in defect rates, definitely we not only deliver ourselves earlier to them but their own customer, they have been able to market their services and products much on time. In other words, they also get much predictability, predictability from us that we have been able to provide them solutions much faster, and predictability to them to be able to use those solutions for their customers, which are much better in the quality.

Looking at another thrust area or the focus area for us other than the defect prevention has been the process change management – what it means is process improvement management. How do we improve our processes all the time. Now to us, it is a very simple game that we have various mechanisms in the company where we look at suggestions, where we look at how to identify those areas for improvement, we prioritize them, form teams, pilot them across the company, deploy them, measure them, and keep improving it forever. What really is at stake here is the improvement in productivity and the next one is definitely the value what is perceived from us and by the customer. So, if we focus on the process change management, if we constantly look at the processes, it is basically with two views that one is we need to improve our productivity so that we can leverage the cost of our customer and as well as we provide the value what he perceives from us to be provided.

Some of the examples of that, you saw this chart again in the morning from Priti that our productivity has been constantly going high over the last few years, in fact if you look at the numbers, there is a significant improvement over the last 18 months after having achieved same level V, and again here what I am trying to and you may note, significant point is that with reference to the benchmark we are way above, and we have been much above, not only above, but we have been constantly improving on that too. If you look at the value perceived by our customers from us, and this value could be in the form of honoring commitments, delivering the promise, partnering, value for money, servicing emerging needs. In all of these dimensions, we have annual customer satisfaction service. Now, through these surveys, we find that we stand really much above on the scale of 1 to 7 and it is a matter of pride for us that we have not only been above, and survey by survey, we have been constantly improving that too. In other words, it leads again back to that the value to the customer in terms of time to market and predictability.

Now, let me recite to you the dimension how we have gone about few years in terms of deploying, we have gone strength by strength towards trends, we have looked at newer ways to deploy, newer ways to find, and one of the major bottlenecks would be issues which various companies face, whether they are in the CMM or any other model is that how do you institutionalize, after achieving CMM level V, really not many companies move further. We have been able to move much further in last two years than what we did at the time of first assessment in 1999 and that dimension of deployment, I will request Paddy Rao to explain it to you. Thank you.

Mr. Padmanabha Rao: Thanks Kumar. Just to reintroduce myself, though my name is Padmanabha Rao, all of you can very affectionately call me as Paddy. Let me also apologize ladies and gentlemen, because myself and my colleague Kumar are standing between you and an excellent lunch. Sorry for that. He talked about internalization, what does quality stand for? Is it a certification process, does it help us in business, and does it add value to the customers, can we quantify them? These are the questions which I will try to address step by step to the extent possible. All of us know very well that what a customer really cares for – only three things, cost, time, and delivery defects. We can translate them into several sub-elements, some of which as mentioned in the screen.

It relates to the *abinitio* issue project cost, the maintenance cost, the predictability, reliability, so on and so forth. While we are internalizing this in delivery, how are we doing it, what is our response? There are three responses to this. The first one is a structural response, which is a robust deployment of quality and delivery. The second is the system response where we sustain this deployment through system solution. The third one is the business metric. It is the variable cost productivity. For doing all these things, we use a capability maturity model of reference frame as well as the six sigma tools to achieve all these things. Let me first talk about the robust deployment bit. We have a unique mode call ROFO, it stands for responsibility, ownership, and focus. As I said in the previous slide, this is a structural response to the need. The best way to internalize is to own it up internal to the delivery organization. My colleague Kumar talked about this delivery excellence movement where we have 10 years plus experienced delivery managers who have faced the customers taking the role of a quality champion and deploying the process. They along with project specific software quality advisors carry forward the entire deployment.

The delivery excellence managers partner with quality through what is called the process council in defining what is right process for the organization which adds to the business benefit as well as the customer benefit and the lead, the deployment. Then, along with what we call as the working group, they try to continue to evolve the process, because as the situation changes, the market changes, the technology changes, we need to continue to look at the process and see whether it needs improvement. While doing all these things, the senior management provides the required periodic structural review mechanism to ensure that we are on the right track. The delivery excellence managers enable, empower, and enhance the deployment process. In a multi-locational, large organization like ours, it is very difficult to sustain the deployment until we do it through a system solution.

We need concurrency, we need (**audio blackout**), and we need consistency across the several locations. When we engage ourselves in complex business solutions, which we do, we engage with the customers in several fronts. It could be proposal, contract, resource, managing the project, keeping track of it, so on and so forth. This calls for tremendous amount of data information to be passed around the various managers, development managers and the leadership to ensure that we deliver value to the customer. Therefore, we have to come out with the solution called Integrated Project Management System. Many organizations respond to this challenge by having satellite databases and systems. But, we believe in integrating all of them together and provide a hierarchy of views because we recognize, at different levels of the company, the need for decision-making is different. By doing this, we are transforming the intranet as a decision enabler, not as just a conduit of information and data. Let me now touch upon how does these all things translate in terms of cost.

When we look at the cost from the quality perspective, there are two elements. One is the effort and the second the rework, review, testing and training. The effort is very much lean as almost as a fixed cost depending upon the scope of the project. Have we done anything better? Has the quality process helped us to improve it? The chart you see on the top alongside the effort bubble is the comparison of productivity for the year 2000 and 2001, and we see that it has helped us to increase the productivity by 10% and the tool chart which you see on the second row is the variable cost. Again, when you compare the 2000 and 2001, we find there is a reduction in the variable cost by 5%. When you see these things together, it helps us in supporting the cost leadership. Today in the morning, we talked about the competitive situation in the changing the global scenario. A cost leadership is a phenomenal leverage. This helps us to support ourselves in different price points and different segments.

The cost element predominantly is a business element _____. If you look at the customer's perspective, there are two parameters of cordage, which are very important, one is the schedule slip, are we delivering on time? Because all of us know that this influences to a large extent time to market. When we compare once again our performance in the year 2000 and 2001, we find that the average schedule slip has come down to 3.7% from 19.6%. On the deliver defect, this is very important for the customer because it increases our delays in time to market, and for us, it increases the cost. The mean delivery defect has come down to 38% from 8.8% of last year. When we look at all these things together, this helps us in creating a more predictable, more reliable business solution to our customer. We believe that CMM and six sigma goal, the strategy evolved by our corporate quality will help us to scale up and transform ourselves from a project engagement to a relationship engagement of multimillion dollar situation. With this happy note, I hand this over back to Kumar. Thank you

Mr. Kumar: So, what you have heard so far is on engineering processes and other two dimensions of business process and the management process.

I will take on from here, looking at the business process excellence, as I mentioned earlier that we use Motorola suite of technique called CFPM, Cross Functional Process Mapping. What we do here is that we look at which are the processes we still lack there, which needs to be improved. We define what is happening today as is and we develop what should be to deliver that perceived value by the customer to the customer, detailed design of the process happens, implement these processes and monitor across the company and that is how we keep improving these processes. Some of the examples here, there are plenty of across the company but some of them are recited here, like an example of orders received last year, a few months ago, we ran a CFPM one of the process were our accounts receivable, especially the contract renewals was slipping sometimes.

So, we on the refinement, on the improvement path, a tremendous gain by in terms of revenue gain after this initiative about a million dollar on that and a 15% reduction in the renewal time. Similarly, on the customer relationship management processes, many of the processes which were not so well defined, got defined specially related to customer management skills, customer contact programs, relationship management areas, and the project initiation process, those gaps which were not coming out clearly got filled up very well. The other example is the area talent deployment process. We typically, depending on the needs by sales or by delivery folks, the people have to be deployed globally on different geographic location in a very, very short time frames. So, that process as number of interfaces within the company, sales onwards leading to the HR and had a long iteration sometimes earlier, a year ago or so. Now, we almost improved 50% on the cycle time, leading to today as 96% readiness of those people to be deployed in 22 days, and it also lead to 70% increase on the internal customer satisfaction.

The last dimension on this is the management areas, management processes excellence, what do we do on this, as mentioned earlier, that we use Malcolm Baldrige framework for that. In this framework, what we have been doing last year and half or two years is that we have been inviting Baldrige consultants from US. We have gone through three assessments on this model, the first one Malcolm Baldrige assessment let us to have around 450 marks out of 1000; it is a 1000 scale model. Thereafter, after six months, we had an another one after improvements, which gave us about 525 marks, and the last one which happened around November or December timeframe last year was I.M.C. Ramakrishna Bajaj Award, there is a process in India, which is the model which also uses the same Malcolm Baldrige Framework, and against that model we received about 750 marks. It is has been colored in different colors because in the blue colour, we were really compared with reference to the global practices, but we moved on that and IMC was compared with the Indian practices. Now this award was done by us and we received the trophy this year.

What this model has helped us, is to align some our management strategy management areas like the process brought us an initiative called Infosys Leadership Institute System, which has been formed as you heard earlier was an outcome of one of these assessments, and customer value management. We had been measuring customer satisfaction over years and today we have learned to measure not just the satisfaction but the value what we provide to the customer.

There have been different internal frameworks put in where by we look at the different practices within the company itself within different units called Jugal Bandhi, it has been on for last couple of quarters and tremendous benefits have been derived, and lastly our support functions mainly the finance, administration, resource infrastructure group, all have been aligned, there processes have been systematized, leading to their service levels which are measured and monitored regularly. Just to indicate, just to explain that internal organization polarization has been so important for us that it has been vindicated by one of the surveys, internal partnership survey which we conducted regularly, was interestingly found to be very much in sync with the external customer satisfaction survey, and that is quite a help to us that we are in the right direction what we have been doing to align ourselves is very much in the right order. Looking at how do our customers feel, we have had surveys from 1996 to 2000, and every year we find that our percentage of satisfied customer has been increasing.

In measuring customer loyalty such as not only meeting their needs but customers recommending to other customers about Infosys and considering us better than their other suppliers, in all these fronts, we have been finding that we have been improving in the last two years. We have very interestingly found and that is probably an indication that our quality processes must be delivering great value to the customer, in spite of that there has been slowdown talked about across the globe, but we have had a lot of requests coming in from our key customers that they want us to help in their process journey and in their quality, and this is one of the new initiatives and the valued service we have started providing to our key customers, primarily not to look at more money here, although the money has been plenty coming in as far as the rates are concerned but what is important is to build those relationships further. It is based on the actual implementation experience what we have done over the last one decade or 10 years and this is definitely a testimony of our customer confidence in Infosys quality.

Summarizing what we have done as I mentioned earlier that under Infosys Excellence Initiative, we have started looking at organizational excellence, through various models, through various techniques, we look at CMM level V behavior, we leverage that in our engineering area, we look at six sigma kind of tools to ensure improvement of business processes and we look at the Baldrige framework for the management processes, ultimately to provide a superior value to our customers in terms of time to market, predictability, and reduced **(audio blackout)**. Thank you very much.

P. R. Ganapathy: Thank you Paddy and Kumar. Thank you.