

Creating a Knowledge Economy

To deliver equitable growth and a good quality of life to its people, India must leverage information technology, says **Sam Pitroda**



Imagine India as a society where a vast knowledge network connects a school in a remote village with some of the best available teachers in the country. Knowledge is accessible to all Indians irrespective of their economic status and it facilitates discussion, debate and collaboration among institutions of all kinds – education, basic research, health and weather. Information technology is leveraged to unclog the judicial system, which is creaking under the load of millions of pending cases, which would otherwise have taken 15 years to clear. This revolution is possible because of a seed that was sown more than 20 years ago, when India's telecom privatisation started and some path-breaking Indian technology institutions, such as C-Dot were set up. The person who was responsible for this infrastructure is now envisioning a societal transformation using the same infrastructure. This generational change will take time to unfold, but it is as inevitable as the telecom privatisation was under Rajiv Gandhi, who gave his political backing to this reform – even though it looked unthinkable then. That took 20 long years, but it brought India to a higher level of growth and set the stage for India's information technology revolution. Innovation had a chance to flourish in 1984, as the conditions were right – there was just the right combination of political will, the right ideas and talent. The same conditions prevail now too, and this is the right time for us to carry out the next phase of growth, says Sam Pitroda, Advisor to the PM on Information, Infrastructure, and Innovation. Speaking to CFO Connect, Mr Pitroda says that to sustain the growth momentum already unleashed, India needs to build its human potential and the starting point is to provide its people access to information and opportunities.

Do you see any continuity in your current role as advisor to the PM on information infrastructure, and innovation, and your earlier role as Chairman of the Knowledge Commission?

My focus for the last 25-30 years, from 1981, has been on access. Initially, we looked at access to telecom, and our emphasis was on IT as the driver of modernisation in the country. This involved setting up a rural telephone exchange system with STD PCOs. We did indigenous development and digitised the network. We also built human capacity, by training young people. Also, with telecom we started the process of privatisation in the country, which took very long to fully play out. It took more than 20 years for us to fully realise that we were on the road to substantial growth and telecom was our driver, helping among other things, our software exports to reach USD 60 billion a year. It also struck us that to sustain this growth we have to build our human capacity, and to realise this goal we set up the Knowledge Commission. For me it was very encouraging when the PM, in his first tenure, committed to develop a plan to modernise higher education, school education, libraries, portals, and build a Knowledge Network. Together there are about 25-27 subjects in the knowledge roadmap. But implementing the roadmap will take another 20 years because there are several political issues. Also, many of these matters are state subjects. So, the plan for knowledge is on the table and it has kicked up a debate on higher, vocational, and school education.

What kind of infrastructure will you need to facilitate this?

We have already built an information

infrastructure in the country, but it is disjointed with everyone working on a different track. We have close to a million miles of optic fibre; there is more fibre laid than we have been able to utilise - whether by the Railways, GAIL, VSNL, or private sector companies, such as Airtel, Reliance, and the Tatas. Given the enormous amount of bandwidth that is available with us right now, if we upgrade equipment on these fibre links, we will have enormous transmission infrastructure. On the other hand we also have lots of data bases, for example we have 21 security data bases including those of the air force and the military. Further, the states have their own infrastructure and then we have thousands of servers. So, we have this enormous potential to capitalise on this hardware / software infrastructure and a potential talent pool.

How can we leverage our information infrastructure?

We need to transform our public delivery system in a very different way like no other country has, for IT infrastructure has seen a patchwork growth in most countries. Even the US, where the health IT infrastructure has grown over a long period of time, and where 15 per cent of GDP is spent on the health sector, has not seen the health sector benefit from IT. For us, this may be an opportunity, and we can create something unique, as today there are a lot more tools available that we can use. And this is what the Knowledge Commission was suggesting when it recommended setting up a Knowledge Network that will facilitate discussion and debate, resource sharing and collaboration (between major institutions for health, weather and education and research applications). IT can really transform, and I have been saying for 25 years that IT brings about openness and connectivity, builds a network, fosters democratisation, and decentralisation, and, as a result of all this, brings about generational transformation.

Has work on the knowledge network already begun?

A national network is already com-

We have close to a million miles of optic fibre, and most of it is unutilised. If we upgrade equipment on these fibre links, we will have enormous transmission infrastructure, which we can capitalise on



ing up through the consolidation of 11 different networks that have been set up by different agencies over a period of time. We will also put some virtual networks like the health knowledge network, which will sit on top of the national network. The national network will connect 5000 ports with 10 gigabits of bandwidth and cover all our universities, our R&D labs, health research, and agriculture. To set up the network we first identified five categories where information infrastructure can make a substantial difference. These are in improving productivity and efficiencies, reducing costs, delivery, and governance. Then we identified the sectors where we can apply this, such as in education and health, governance, the Railways, food distribution, and NREGA. The chairman of the network is R Chidambaram, Principal Scientific Adviser to the PM. We have some very good talent in the country, and if we put the right group together, and have the right amount of patience, we will be able to achieve our goals.

How confident are you that education is being given the right priority?

The Knowledge Network will modernise our approach to education. It will answer the questions: How can we transform distance learning, and open course sharing? How can we connect a professor from Chennai with 5000 small colleges? There will

be better software packages for school admissions, exams, and there will be new content. Continuous changes in IT infrastructure will ultimately transform education and make it more equitable, so everybody can have laptops, for instance.

Do you see some dilution in quality seeping in, given the government's ambitious plans to expand education at all levels?

There will always be some of that. IIT Kharagpur began in a garage, and the quality was bad in the beginning. That's how everything gets started, and you cannot expect everything to be of the same quality. This is at the start, but when you mature, it is different.

How satisfied are you with the progress made on the recommendations of the Knowledge Commission?

I wish we could have done a few things faster, but the point is that the Knowledge Commission really stirred up the debate on knowledge, and there is a certain amount of work that has already been done which is all in the public domain.

What will be required to set up the health network?

For the health network we will need to standardise electronic health records, and create and manage large databases. Four teams have been set up in the ministry, and I have spent almost a month there. The Health ministers Dinesh Trivedi and Ghulam Nabi Azad have been very supportive in our endeavour.

In which other area can the Knowledge Network make a difference?

We have 30 million cases in the law courts, and it will take 15 years to dispose them. We asked ourselves how can we reduce 15 years to three years, and the answer is technology. I have spent four to five months understanding the legal system in India and I find that the Attorney-General and the Solicitor-General, and even the Chief Justice (with whom I spent an hour discussing this idea) are very enthusiastic and believe that it

can be done. There is now a whole team that is working on this. It will require changing some processes and practices; for example permitting depositions on video, creating people courts, providing video conferencing to everybody among other things. In the field of governance, the knowledge network can also be used to connect the 250,000 panchayats countrywide, and provide high bandwidth which can be used to train panchayats. The panchayats can also have video conferencing which the people will respond to since it allows you to sit and talk to somebody, and see their faces while talking. Another area is the NREGA, under which 200 million people have to be paid and all their information has to be documented and reconciled. It is only with IT that you can do all this.

Do you think mobile-money can reduce leakages in payments in the rural areas? Safaricom of Kenya, another developing country, has had a successful track record of mobile money transfers.

The Safaricom model of mobile money is not scalable, as it does not follow banking regulation (I just finished reading a book on the march of mobile money). Banks will remain banks and mobile operators will be what they are, so let's not turn mobile operators into banks because people don't trust anybody but banks with their money globally. So, it is okay to have small money transfers for purchases on your telephone bill, but I am not going to have my airline ticket on my telephone bill as there are regulations here. In Kenya there are no regulations, so this can happen, but not in America, Europe, or in India. But, while banks have to deliver the money, mobile phones can be used as a channel in the delivery of the money. This is one way in which we can root out inefficiencies in our system. For instance, on pay-day in a government office in Maharashtra, I was very surprised to see a truck roll up with money. I told them that instead of doing this they should just deposit the money directly in the employees' accounts, and give them an alert on their cell phones to tell them that it has



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been transferred into their accounts. Another example of inefficiencies in the system is that of the Railways. Since I am now heading a commission on Railways reform, I have been spending time with the officials for the last three to four months and I find that they are all very capable people. But we are continuing with our old signalling system (we use electro mechanical signalling placed every mile or two), which lets us have a throughput of only 150 trains per day on the tracks. This is like building expressways and sending only four cars every hour, because until you get four cars to go through, you can't send out the next four! But if we had installed a modern day electronic signalling system based on GPS (satellite imagery), which can track every coach, we could have put 900 trains on the tracks and increased efficiency of that track five to seven times. This is the power of information

that people have not understood. This is the efficiency that we are talking about and I see enormous and unique opportunities in these areas. In the next five years we will begin to put systems in place, and these will take time to show results.

How do you rate India on innovation? We file far fewer patents than even China, let alone the US.

This country needs a lot of innovation, and our diversity is a fertile ground for it. Yet, innovation on a grand scale has eluded us. We have seen it only in small bits and pieces, mostly *jugaad* (quick, temporary arrangements to tide over some difficulty) kind of arrangements. While our *jugaad* is great, we need innovation to scale up to serve our billion people. Our innovation does not have to be the Western kind of innovation. I am increasingly convinced that the world over, the best brains have been engaged in solving problems of the rich, and not the poor. For instance, all the innovation that people talk about is only about how to design a better Cartier watch, or the *ipod*, or more applications for the *ipod*. We certainly need to change this paradigm and only India can do this by saying that we are going to be focussing on inclusive growth and all our innovations will have to be different from the Western world. So, we will emphasise on access, affordability, and durability, as opposed to disposability. Our innovations will focus on real need and not demand; the thrust shall be on the needs of the poor rather than the rich. This is an entirely different paradigm of innovation.

Does the Indian environment stifle innovation? Would you say that if you had not gone to the US, you may not have got the patents for your innovations?

Yes, because we do not have the required ecosystem for innovation, which calls for political will, the right mindset, risk capital, and an understanding of the market. We continue to struggle to make ends meet, and it is very difficult for innovation to flourish in such an environment as most of our energy goes into day-to-day routine

matters. Now we can change as we have had a few years of 8-9 per cent growth, and people have seen what is possible. If I had talked of innovation 25 years ago, it would not have made any sense, just as it would not have made any sense if I had spoken of a Knowledge Commission at that time. Building a nation is different from building a company. And when I look at things we did 20 years ago, there were a number of things, which may have happened by accident, and we may have been a bit lucky, but the crucial factor was the political will in Rajiv Gandhi. If he had not given us the political support, one more great idea would have been killed. We need this combination of political will and the right technical people, and at this time, we have got both.

So, do you see receptivity for these ideas in the government?

I think we have a great window of opportunity at this point of time. The PM is committed and understanding, and he has promised full support. When I went to him with the plan for a Knowledge Commission he said it was a great idea, and that's all I needed. And when the recommendations of the Knowledge Commission were ignored by the then minister, a lot of people were very upset. But I told people not to worry, as things will change.

So you have to take a long term view of things, and have patience for waiting for change to take roots?

Yes. When we started the Knowledge Commission we had 35 people debating and arguing for almost a year over one issue or another, and then finally everyone came together and this is what democracy is all about. You have to see it not as a project but as a process. But people make the mistake of looking at it as if social change were a corporate project, and evaluate it in terms of its productivity and efficiency, and they get upset that it is taking such a long time to fruition. I may not like the delay, but I say it is okay, as I did when the recommendations of the Knowledge Commission were blocked.

What is the status of the Knowledge Commission now?

We decided to wind-up the Commission after we submitted our report, otherwise it would lead people to think that we were trying to benefit from the government system. But we will take moral authority and responsibility to help in the implementation of its recommendations. Still, if any of its members want to say anything further to the report, they can meet the new Education Minister Kapil Sibal, and they will be heard.

How will we know if we are making progress in our education system? Should we judge it by the recognition that our professionals receive, say Nobel Prizes?

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winning a Nobel prize. We need to really solve the problems of the poor, and in the process of doing this, if we don't get prizes and awards, it is okay. We are still trapped in the Western model of development, decision making, and the decoration!

Having lived in both worlds the US and India, what do you think Indians can learn from the West?

I have learnt to do a lot of hard work. Even at my age of 67 years, I work 16 hours a day. I have had two heart attacks, but life goes on. For me, life is work-centric, not family or emotion-centric. It is about work - *karma* not *dharma*. We have to keep working for the larger cause, and have a disciplined mind, and the ability to synthesise and analyse what's going on. This is what I have learnt in the 45 years that I have stayed in the US. We should also be creative and respectful to others and have an ethical mind. There are a lot of things to learn from the rest of the world, for instance they have built a great infrastructure for their people, and given a great quality of life.

Where do you see India in 2015 and in 2050?

2015 is just round the corner. I don't see much change by then. By 2050, we will have a new model of learning, and for rural development. I certainly hope that by that time the quality of life improves substantially, especially for the poorest of the poor. I will like the 400 million people who are below the poverty line to live with respect in a reasonable house, have enough to eat, send their children to the best schools and also have access to medical facilities. If we have this by 2050, it will be a great accomplishment. We do not have to be a super power; we just need our own people to live with respect and with proper sanitation, healthcare, food and water. Then, when I see the faces of our clean and healthy school-going children on the street, I will feel happy. As these are our children, and if they cannot have even the bare necessities of life, then, what good is all our achievements? ■