

Sam Pitroda Father of Modern Indian Telecom Was First to Grasp Role of Telecommunications in Making India a Modern Society - His Work Founded on Intimate Grasp of Need to Bring Appropriate Technology to Understanding of Society and Economy **Highlights**

Editor's Introduction: With his interest in the social and economic impact of technology, Sam reminds us of Dave Hughes with, instead of Colorado Springs or Namche Bazar Nepal, the canopy of India on which to paint. But contrary to the Wal*Mart concepts of American "consumerism" Sam's ideas are tailored to actual observed needs of Indian villages and as dependent of integration with human resources as with technology. For example from the BSNL page on Sam "The key contribution was the RAX, or rural automatic exchange—small, cheap and robust phone switches that helped take telephony to rural India, forming its telecom backbone." The 'STD/PCO' phone booths "displayed the phone call cost and generated an instant bill at the user's end, instead of at the telephone exchange." <http://www.bsnl.in/Knowledge-base.asp?intNewsId=34343>

The Sam Pitroda Page

The Sam Pitroda Page on Silicon India offers a good introduction to Sam's ideas and writing:

"An inventor, a technocrat, and a social thinker, Sam Pitroda is a genuine visionary.

Aside from his immense tangible work in telecommunications, Mr. Pitroda also shifted paradigms: he made the case that telecommunications – along with substantial food, clean water, and adequate shelter – were a fundamental component in the process of modernization.

By introducing small, rural exchanges to India, he brought the telephone to some of the world's most previously isolated region. He also made the case that accessibility, not density, should be the focus of the implementation of telecom. By providing public access – the bright yellow STD PCO boxes that you encounter

in India are a manifestation of his efforts – Mr. Pitroda revolutionized the state of telecommunications in India – and provided a model for other developing nations.

In implementing these changes, Mr. Pitroda worked closely with Rajiv Gandhi, as the Chief Technology Adviser to the Prime Minister. Mr. Pitroda, who holds some fifty patents internationally, is currently the CEO of WorldTel, an international telecommunications corporation."

http://www.siliconindia.com/magazine/index_sam.asp?category_id=55

On May 7, 2004 from **Professor Sumit Majumdar's Introduction:** Sam spent a number of years as the Chairman of WorldTel which is a company set up under the auspices of the ITU to help get funding for creating viable ISPs in the underdeveloped world. Sam has just returned from 35 days of campaigning for the Congress Party in India.

Pitroda: Friends: Good evening. Invariably I get more credit than I deserve. This afternoon when I returned to Dallas, I called Professor Majumdar and said; "what do you want me to talk about?" He said "why don't you talk about your story?"

So let me tell you a bit about my journey into telecom. There are some lessons that I learned and would like to share with you. I was born and raised in a small little town in India, in a place that is almost tribal. Orissa. There were 8 in the family. My father had a fourth grade education and his dream was to make sure that his kids go to college mainly because every time he saw the British white man he couldn't talk to him. This was the story of many families in India who spent a lot of time and money put-

ting their children through schools.

I went to school in Vadodara and then one day when I was studying for my masters in physics I read a newspaper story that President Kennedy had decided to send men to the moon. I was young stupid, energetic and I said: "I want to go there." But I had no clue as to what to do in order to get there. I decided to come to Chicago. There I saw my first snow and I had never used a telephone in India during the first 22 years of my life. In those days if someone had a telephone in India he was too rich to be my friend. My first phone call was made in the US with a rotary dial. A black telephone with an electro-mechanical switch.

I went to MIT. Got a degree and by accident got a job in telecommunications. At the time, I had no idea what it meant. I wound up designing digital switching systems during the early days of digital communications. System five at GTE. Everything in those days was an invention because you were right in the forefront. You didn't know that you were inventing. Anything that made common sense came out as a great invention. Five thousand patents and every year the company held a nice dinner like this and gave us a \$100 patent award. And after about six or seven of those I just quit.

At age 31 I quit and started a business with two American friends, Mr. Penny and Mr. Brown. I told them: "I want to design digital switching systems for you." I built the business for six or seven years. Met my friend Paul Sanjit at Rockwell. Rockwell decided to buy the company that Penny, Brown and I had built. They paid \$15 million in cash which was a lot of money in 1979. I never had any money. None whatsoever because, as I started to study, my wife and I brought our entire family to Chicago. Seven brothers and sisters. Seven wives and

husbands. We put everyone through college. My parents. Her parents. A typical Indian mafia.

So all of a sudden, you get millions of dollars and you must decide what you do with it? In those days interest rates were about 16%. The prime was 12. You could put this money in CDs and get a wonderful return. I was 38 and could stand to quit. I retired for three year and then decided to go back to India. I had not been there for about twenty years. When I tried to make a phone call to my wife at home, I could not do it. For about twenty minutes all that happened was: “hello, hello” repeated on and on. The next day there was a ceremony for dead telephones on the street. People were carrying dead telephones as to a funeral to burn them. I thought this was pretty interesting. What it meant was that phones just don’t work.

I decided that this was a problem worth addressing myself to. I started going to Delhi every two weeks – spending two weeks in Delhi and two weeks in Chicago – just for the heck of it. I started talking to everyone whom I could get my hands on to see what could be done. Finally someone asked why I was spending so much time in India and in a moment of ignorance I said: I want to fix your telephones. Ignorance is a great asset. If I had known then what I know now, I would never have tried. I had no idea what it really meant to undertake a task like this.

In 1981 the Indian democracy and Indian political system had no talent in this field. Someone then said: if you want to do anything, you must meet with the Prime Minister of India. Through a contact after six months of waiting I got an appointment for 10 minutes with Mrs. Gandhi. Two hours before the meeting I cancelled it.

The reaction was strong: “No one cancels an appointment with the Prime Minister. Who is this crazy guy?” I replied this is very serious. I need one hour. If she cannot give me one hour I do not want to waste my time. Not surprisingly on that day I did not get an hour. Consequently I waited for about eight months.

After eight months I had a call from India saying “yep. She is going to give you an hour.’ They had figured out that this guy named Pitroda was really trying to do something. He’s possessed. He comes here on his own. Talks to everyone but nobody quite knows what he wants.

The Infrastructure of the Infrastructure

Finally Mrs. Gandhi gave me one hour. She had her entire cabinet and I gave her a slide presentation on how to change India by changing telecom systems in India. I told her that information technology is about openness, connectivity, networking, democratization, decentralization and, as a result social transformation. It is more important to fix India’s telephones than to work on agriculture. Telecom should be seen as the infrastructure of the infrastructure. If you had better telecom you had better hospitals. If you had a better phone system, your organizational systems will work.

When I gave the presentation, her young son Rajiv Gandhi who became prime minister later was there. We met then for the first time in 1981 and some how we clicked. Accident of fate. If she understood one thing it was that this guy wants to do something. Very good. She said that whatever Sam wants to do give him a chance to do it. So then the question of me was: “what do you want?” I kept saying “nothing.” And everyone kept saying; ‘what do you mean by nothing?’ I said I don’t want a salary. I don’t want a job. I don’t want a title. I just want this done.”

This was just about at the same time that the movie Gandhi was released. I have seen it time and time again. Gandhi came from the same state Punjab, that my parents came from. I became very forceful and said this is time to do something interesting and crazy. Finally I made up my mind that for the next ten years I would work on the Indian telephone system. I talked to my family and my wife. And then Mrs. Gandhi died and Rajiv became Prime Minister. I met him in January and he and I decided that I must go back to India for good.

I moved my family and changed my nationality back to Indian because there were headlines in Indian papers claiming that the CIA had planted an agent in the cabinet. The key task in front of us was to build human resources. We realized that if we wanted to build IT communications infrastructure, we must build people first.

We hired 500 young graduates of IIT and other universities and began to train them in on our own, in digital development and rural exchanges because we knew that the telephone exchanges that we were designing would be tied to each of them as a normal operation. We built some of these systems on our own – from scratch and then in 1985 we decided to privatize telecom. I invited fifty manufacturers to meet in a hotel and said to them anyone who pays 500,000 rupees will have a license to manufacture their technologies. We did this because the government controlled all these licenses. That was the beginning of privatizing manufacturing in telecom. Then we decided to privatize the Bombay and Delhi telephone company known as International BNSL.

By then I was deep into the system. We could handle telecom and had 550,000 employees and 27 unions. Then I started work on technology missions. I was in charge of water, literacy, immunization, agriculture and baby development. I had 11 million people working on these six programs. Every day I was on national TV. It was like being on a drug all the time. So much energy, power, enthusiasm and at the same time so many unknowns looking for access everywhere because everything needed to be fixed. No people, no systems, no processes, no procedures. There were four of us who started at 6 in the morning and would end our day at one or two the next morning, every day, seven days a week.

Finally I had a heart attack and had a quadruple by pass and nearly died and I basically ran out of money. I used to work for one rupee a year that was then ten cents. After 11 years what looked like a lot of money in 79 didn’t look like any money in 1991. I had two kids

in college. A daughter at MIT, a son at Michigan. Tuition was \$75,000 and if I didn't make \$150,000 I could not pay for their tuition. So I decide that I would come back to the US and make a living again. I came back. Then I was 53. I had no visa. The day I arrived on a tourist visa I went for a driver's license. In India a guy came to my house to deliver my drivers license. Here I had to go take an exam and I was scared to death that I would flunk.

Learning to Build Large Systems

I had no math in 20 or 25 years and started from scratch as always. But in the process I learned so much in India as to how one builds large systems from scratch. When I went to Delhi India had 2 million telephones for 750,000,000 people. Today we have 60 million telephones for a billion people. I can assure you that in the next 4 years we will have 200 million telephones. We are adding today 2 million telephones every month. There are major private players in telecom. Barta, Tata, Reliance, Hutchinson, BSNL, MTNL. The work force in telecom is huge outside the government.

Consider software. We used to say in 1982-83 we were building a 10 million dollar a year software export business and everybody thought we were crazy. Today we do almost 11 billion in software export. I remember Jack Welch, CEO of GE coming to India. He was supposed to see Prime Minister Rajiv Ghandi who had no time and asked me if I would handle Jack Welch. Jack and I had breakfast. He had his entourage. I had my entourage. Six of his people and six of my people. I was to give him a presentation on software. We got started and I said "Jack, I want to tell you a bit about Indian software. He said Sam, I am not here to buy software I want to sell engines. And I said well I am not buying engines. And he said we what will we do? and I said: 'we better have breakfast.' There was silence for about 90 seconds and all my guys are upset about this arrogant Jack Welch. So we started breakfast and after about ninety seconds Jack said: "OK tell me about software."

I gave him my presentation and he said "what do you want?" and I said Jack give me a 10 million dollar software order. I will use it to quick start software export in India. Then we produced almost nothing. So Jack said 'fine. In 30 days I will have 12 GE executives coming to India, you show them around and convince them.' In 30 days ten people came. My chief of staff organized many meetings and Jack and the ten person team gave us a ten million dollar order. A lot off equipment to Digital and to NIC I think, but that was a big break. Next we got into Y2K development and now Indian software is known all over the world.

In those days television was controlled by government. We had only one channel. We tried very hard to privatize and in the process we made a lot of mistakes as well. But today Indian telecom players are very particular. A few months ago Reliance bought a company called FLAG. Fiber Link Around the Globe in which GE and AIG and others had invested 4.5 billion dollars. Reliance bought FLAG for 170 million. There are major major players in software, business process outsourcing and telecom waiting to happen. India has created almost a million new jobs in IT and telecom. But then again it needs ten million new jobs every year. For all that you see on the surface of IT and telecom really does not affect a large number of people in India. There are issues of water, segregation, housing, health and transportation. But at the same time the IT revolution has given India a lot of energy. People now feel that we can do it. It is the first major success story where we can stand up and say before the world: 'we did it.'

There are now thousand and thousands of entrepreneurs. Capable. Young. Energetic, who feel that they can be successful. It is this process that today is giving India the power that one talks about. At the bottom still there are challenges. Significant challenges. We are hoping that this will percolate down, but it will take some time. On top of this the Indian Diaspora outside is about 25 million people. In my generation in the early 70s there were five million in the USA. Today ev-

erywhere you go you will find the Indian mafia. And there are many students and we are proud of what they have done. Today all of this is very visible and adds to the success in IT and telecom.

The India in which we want to live has to be based on the attitude of human beings and not on IT, high tech and telecom. But because of IT and high tech Bangalore and Hyderbad and other 'miracles' have happened. Twenty years ago no one had ever heard of Bangalore but today Bangalore is know by everyone everywhere. I travel a great deal and in Brazil when I say Bangalore they say: 'we know.'

Current Plans

Plans in India now focus on improving access, reducing cost, building infrastructure, developing content and producing new software applications in the local language. There are all kinds of interesting applications being developed in India for the fisherman, for the farmer, for the teacher - transportation, e-learning. I can give you some examples that I am personally familiar with. In one little village in south India, the okra had some kind of disease and the local farmers were all worried. A couple of young kids decided to put this on the Internet with a picture saying we have a problem in the village. Some agricultural scientist got a hold of it; knew exactly what the problem was; solved it and put the solution on the Internet and the village farmers were rescued. There was a place in western India with an eye problem. Took a picture and put it on the Internet. All kinds of eye experts come to India. I have a friend from Chicago who in the summer would take 12 to 15 American doctors to India for eye surgery and they would do surgery on 20,000 people. All kinds of things like this are going on because of Internet and because people are now web connected. They are part of a larger community. Distances don't matter any more. For a common cause they all come together. Because of IT and what we have done in telecom, India is changing and changing rapidly.

We see what is happening in China.

China is always a measure for India. We have 33 million mobile phones while the Chinese have 150 million. What the Chinese have done in building infrastructure is absolutely remarkable. But at the same time India is just getting there.

A *Wall Street Journal* editor went to India and China on a trip about 15 years ago. He said in an editorial: when I was in China, I realized that China is very calm at the top. Everything seems to work while there is worry underneath. India is totally chaotic at the top. Mass confusion. Nothing seems to work but somehow it is very calm underneath and everything seems to just connect. It is one of those places where you have water buffalo and somebody peeing on the road, and everything goes at the same time and same pace and everybody is very comfortable. It is that India that is going through a major transformation.

India is building more basic infrastructure in terms of human resources than it has built within the last 50 years. The founding fathers built everything up over 50 years. Universities, laboratories, defense. We hope that the next fifty years will be very different. The colonial masters left very little at independence. India did not produce even a razor blade in 1947. Everything was imported and raw materials were exported. The task was to build basic infrastructure. Now we believe that what we have gives us good prospects. Telecom has played an important role. IT is playing a very important role. We hope that all this will move forward and produce some prosperity for the people of India. We hope that India can meet basic human needs in water, literacy and immunization health and jobs.

The journey has been very important. It has been based on basic experiences in the US that have taught me a great deal. Without what I learned here I would never have the confidence that I have developed. Before going back to India I had those skills built in from my US life. There is so much that this American society offers to young people. You can dream the dream while you start out here. Students here learn that you can do any-

thing if you put your mind to it. This is what I learned going to school in the US. I could go on and on with lots of stories but I thought this would be enough to give you a taste. Telecom wireless connected anywhere anytime is changing the way we work, the way we entertain people, and the way we live.

Broadband Everywhere

For me the real revolution will come with broadband everywhere. So far we have really focused on device communication. What will happen in the next five to ten years will change your idea of telecom completely. Telecom today is all about telephones. Telecom tomorrow will be all about multimedia, about broadband, about all kinds of new experiences and all we have to do is master it. Thank you.

Question: I just returned from India a few weeks ago. I work in telecom and wireless. I met with TRAI – Mr. Baija and with the WPC – Mr Gark and one of the things I find quite striking is the growth of wireless. I know that Reliance got something like seven million subscribers in the first ten months of operation. The price points that they have achieved are just unbelievable. You mention that total telecom penetration now has gone beyond 5% and at last count it has now gone beyond 8% including wireless and with those price points it could, depending on how you count penetration, hit 30%. One of the things that strikes me is that this is still held back by regulation and that one of the ways that Reliance and Tata have succeeded is that they have pushed the boundaries. They have achieved some degree of liberalization but there is on-going dialogue about spectrum management and spectrum release policy. It seems like it is constraining India. I think India will get through this but I don't see exactly where the path is.

Pitroda: You must recognize that the British Raj left India with a lot of interesting procedures and processes. I think it will take a long time to change the bureaucratic mindset. But people are operating in spite of all that – like Reliance

and like Tata and others. Bureaucracy is not in tune with the needs of the entrepreneur. Bureaucracy is about the needs of control. I think it will take some time and this is where I believe IT will play an important role because IT brings about openness and once you begin to put all these processes on computers, things will become a little more transparent. It will happen, but not overnight.

Question: There is a lot of development in software, but do you see some "Intel" arising in hardware advances in India.

Pitroda: I don't see this in the short term because this requires much capital and much risk.

Question: What do you foresee as the possible outcome of this election?

Pitroda: I don't think it will have any impact on the technology, but it does have impact on the mindset. This election is a choice between science and religion – between tradition and technology. I told the voters you must take your pick. This is the reason I went to campaign because I firmly believe that religion is playing too much of a key role in every aspect of life. I will give you one simple example. There is a banqueting festival in India called Vanisha. It happens once a year. When I was growing up in the city of Vadodara there were four banqueting festivals in that town. Forty years later there are 40,000 of these festivals. So in the campaign, I asked what went wrong. From four to 40,000 in 40 years? Can't we have 400?

Question: Can you look ahead 25 years and forecast how India's relationship to the United States should evolve?

Pitroda: We must recognize that India is a democracy. It is the largest democracy in the world. In India life is unorganized. No one knows what the hell goes on. In the US we are so organized. The son of one of my colleagues went to work for the CIA and he said: "look I found there a huge file on your dad." My son was shocked and said why would there be a file on him? Every move of mine was recorded because someday it could mean

something. In India no one will track you down. So in that Indian system there is a lot of freedom of all types. Unfortunately what the US did in the Philippines and in Iran is an example of how we have backed a lot of dictators in the past. The US must recognize India's role in Global politics now. Just because India doesn't have financial power don't underestimate

its moral power.

I think India China and the US are the most important countries going forward in the 21st century. Unfortunately the US has the gold and the golden rule is the one with the gold makes the rules.

Editor – Two good URLs.

<http://www.chennaiads.com/articles/sampitroda.asp> [This is exceptionally good.]

http://www.siliconindia.com/magazine/displaydetail007.asp?article_id=1561



India's Very Attractive Supercomm Booth