

**Address to the fifth convocation of the “Dhirubhai Ambani Institute of Information  
and Communication Technology”**

*31<sup>st</sup> January 2009*

I am indeed very happy at being invited as the chief guest for the Fifth Convocation of DA-IICT. In a short period of 8 years this remarkable institution, established by the Reliance ADAG group, has emerged as a major educational and research institution in the country and has contributed significantly to developments in the field of information and communication technology. This indeed is a sector in which India has acquitted itself admirably, and has shown the whole world that in the words of the well known author and columnist Thomas Friedman the world is really “flat”. But a flat world has not come about by itself. It is most definitely the result of rare vision by several business leaders in this country and the creation and availability of skills of a very high order that have provided the base for development of knowledge and its applications in this field. It would not be an exaggeration to say that in all the areas of industrial endeavour and modernization in this country the most impressive growth and development that has taken place in recent decades is in the field of ICT. It would also be relevant to mention that despite the outstanding success achieved thus far the potential for a substantial contribution to further development is perhaps the most significant in this sector. In particular, ICT has the ability not only to contribute to economic development in a conventional sense, but also by changing the direction of economic growth, such that it becomes truly sustainable.

India and a large part of the developing world still have some glaring deficiencies and shortcomings that clearly limit human development and welfare to an unacceptably low level. If we take India itself some startling numbers would cause deep concern to those who are sensitive to the failure of our planned development thus far.

- Of the global 9.2 million under 5 deaths in 2007, 21% occur in India.
- 40% of all un-immunized children (9.7 million of 24.5 million) reside in India.

- 22% of all maternal deaths (117,000 of 536000) occur in India.
- Of the world's population that practices open defecation, 55% are in India.
- More than 1 in every 5 (21%) of all primary age children out of school are in India (21 of 101 million children).
- India accounts for 38% of all child brides (23 of 60 million).

The definition of sustainable development most widely used as provided by the Brundtland Commission states that it is “development that meets the needs and aspirations of the present without compromising the ability of future generations to meet their own needs”. ICT and its applications can provide a major contribution to the promotion of sustainable development if we accept the importance of this definition.

It is now being increasingly realized that ICT has the potential to cut administrative costs through the reorganization of administrative structures and provision of a large range of services. Electronic delivery points to access knowledge and information can be provided in homes, schools and libraries. A range of multimedia and multilingual service delivery outlets can be located in public places, and provide information to meet the specific needs of citizens through the use of video, audio or multiple languages. Conceptually, it should be possible for knowledge kiosks to be provided where access cards could be used just as automated teller machines enable access for withdrawal of cash. Quite apart from routine administrative functions that conventionally require applications on paper and their cumbersome processing, smart cards through the use of appropriate ICT systems can not only help in a number of speedy administrative transactions, but can even be used effectively for targeted delivery of subsidies for those who are specifically designed to receive these as part of subsidy policies. My institute TERI has done substantial work, for instance, in devising a system by which kerosene subsidies can be made available to those below a certain income level or below the poverty line using smart cards. It is well known that pricing kerosene in general at far below market rates only leads to large scale diversion of this

product for adulteration of other petroleum products. An ICT based approach would, therefore, eliminate illegal transactions and at the same time enhance the welfare of the poor.

However, the most relevant applications of ICT, particularly in a country like India where the large majority of our population still lives in rural areas, are in the fields of health and education. With growing numbers the provision of health care through conventional means is going to become much more challenging. ICT applications make it possible for medical professionals to exchange knowledge and information which would save time and money. Transfer of patients records need not take place physically, but can be substituted effectively by electronic transfers. Tele-medicine as an activity has grown significantly, but in our country it still has to make any measurable impact. Tele-medicine can provide medical care to people in their homes and most importantly in isolated areas or in times of emergency. I recently had a discussion with a senior political leader who was emphasizing the importance of creating a vast road network in some of our mountainous areas, so that whenever there is a health emergency people can be moved to suitable locations where medical facilities and care are available. A possible solution to such a problem could be the extension of tele-medicine in those areas where building roads may be difficult for reasons of cost or environmental impacts. To bring about a major expansion of tele-medicine would of course require appropriate training and significant changes in attitude on the part of medical professionals, who would have to be the leaders of any such change. As a beginning, perhaps, some specific areas like tele-radiology could make a breakthrough, which could be followed by expansion of other aspects of tele-medicine. In this whole arena, like mobile telephones, a country like India can certainly take the lead and ensure that we do not lag behind the developed countries. It is heartening to see that mobile telephones are growing at unprecedented rates in India as well as China. In the foreseeable future developing countries could attain the same density of mobile telephone usage that exists in the developed world. There is no reason why we cannot move ahead rapidly in other areas as well.

The use of ICT for education is already taking place to some extent, but here again the potential is very large. High speed communication networks are making it possible for teachers to function

together and to develop training material jointly. Videoconferencing as well as computer-conferencing has substantial potential for learning in rural areas of this country. Similarly, adult education, creating higher knowledge levels among employees and industrial training can also advance significantly from the use of interactive digital video and CD Roms. Even though costs of ICT applications are declining, in some cases the cost of new infrastructure, and the replacement of existing methods can prove to be an impediment. However, in a country where educational systems require major expansion, at least in respect of new infrastructure it is essential to ensure the full use of ICT knowledge and experience. Those areas where new programmes and facilities are being installed should take full benefit of sophisticated ICT developments.

I would in conclusion like to highlight the need for ICT in dealing with natural disasters and weather related events that pose a threat to human life and property. The world is facing the growing challenge of climate change, which has the possibility of affecting every economic activity across the globe. The projected increase in frequency and intensity of extreme events could cause substantial damage to life and property. Climate science has advanced at a phenomenal rate largely because powerful computers can now run very complex models that simulate climatic conditions on land as well as the oceans. Our assessment of future changes in the climate as a result both of natural as well as human factors is dependent largely on the power of models that are being used today and our ability to assess the impacts of climate change in different parts of the world. In response to future projections of these events, governments, civil society and even business organizations can take effective measures to adapt to changes that would occur.

I would like to give the example of a major heat wave that took place in parts of Andhra Pradesh in 2003, as a result of which almost 4000 people lost their lives according to official records. The Chief Minister of the state set up a committee chaired by me to look into that occurrence and suggest measures by which such a disaster could be met through actions that would save human lives. He also rightly wanted to know what steps would be required to prevent loss of life and damage in projected such occurrences in future. When studying this major problem, it became apparent that ICT infrastructure could have saved perhaps all the lives that were lost if it had

been put in place properly and utilized effectively. There was, for instance, no early warning provided to the victims of the heat wave. Nor was there any follow up in terms of providing medical advice to those who suffered from heat stress, such as the need for oral rehydration therapy and simple healthcare for those who were affected. Even television channels could have been used to spread proper awareness and information to protect the lives of those who were affected were not used. There are several examples of coastal disasters where people affected can be warned on a timely basis and evacuated before the disaster itself takes place. When a hurricane hits the coast of Florida, the infrastructure available is used to provide adequate warning and notice to those likely to be affected, and entire townships are evacuated. When a cyclone of even lower intensity hits the coasts of Bangladesh or Orissa, major damage takes place, because not only is there lack of shelters and infrastructure to house those who are affected, but there are inadequate systems for early warning and guidance. Today even mobile telephones could be used as an effective medium to provide early warning and thus save lives and property.

I am happy that this institution has provided talent and knowledge for working both in the public and the private sectors, but since this is a research institution, I hope you would create knowledge and models for application in a diverse set of fields, some of which I have briefly referred to in this talk.

If India has to emerge as a knowledge economy, then we necessarily have to look at goods and services being produced on the basis of upgraded skills both on the part of producers as well as consumers. The intellectual drive for a movement in that direction will have to come out of institutions like the DA-IICT. It is imperative that those engaged in the development and use of ICT broaden their vision and explore areas of application that would enhance the welfare of Indian society and lead us towards a pattern of sustainable development.

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