Technology – What role must Asia play?

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(Greetings)

Good Morning Ladies and Gentlemen,

It is a great pleasure and honor for me to be here and have a chance to address our distinguished guests and in particular the young students from Asian countries during this 4th Hitachi Young Leaders Initiative event. The organizer has suggested that I should speak under the title "Technology – What role must Asia play?" How will Asia rise to the challenge in the New Millennium?

(What is 'technology'? and Why do we need 'technology'?)

I would like to start by reminding all of us that we have used technology since the Stone Age for hunting, cultivating, or producing and preserving foods. Technology for mankind has been developed over a long period of time to enhance the capability of people in order to overcome difficulty and improve their daily life. Medicine and medical technology help expand our life expectancy. We use a car, a ship, an airplane, or even a spacecraft to extend beyond our natural capabilities for travel and transportation. We use a telephone and currently the Internet to communicate with people who live far away around the globe, and so on. It might be said that while science is the search for understanding of nature, technology is the adaptation of the discovered scientific knowledge to practical use.

(Biotechnology and the molecular revolution)

As we enter the new millennium, one may ask "what is the challenge of the future?" Can science and technology rise to these challenges?

One wonders if human beings will be able to defeat one of the greatest challenges of the twenty-first century: AIDS. Will we also be able to cure cancer, one of the world leading

causes of death? Scientists believe that the answers lie within the realm of **genetic engineering and biotechnology or - to be more precise – biomolecular research.**

I could not find the latest statistics of AIDS victims. However, according to the 1996 report of the United Nations Joint Program on HIV-AIDS, 1.3 million people worldwide have developed full-blown AIDS symptoms, a rise of 25% within just one year. The number of people who died of AIDS-related diseases in 1995 was 900,000. Everyday, 8500 more people are infected with HIV. Some epidemiologists have estimated that this year in 2000, there may be 100 million people infected by AIDS, far more than all the people killed by the world wars in the twentieth century.

By analyzing the HIV at the molecular level, scientists can now explain the mysteries surrounding AIDS. Also knowing the genetic makeup of HIV is the key to devising a cure. Progress has been made using this knowledge, scientists at New York University have tested 26 patients with a combination of drugs – Indinavir, AZT and 3TC and found out that 24 of them have no trace of the AIDS virus left. However, researchers are also cautious about conclusion as they also find out that every day the HIV also develops a new genetic nature of its own.

Although no one is claiming to have turned the corner on HIV yet, the molecular biology has opened up several avenues for cures, raising optimisms to new levels. This new method known as molecular medicine will be the way much of the research into disease will be conducted by 2020, using DNA research, computer, and virtual reality to find a cure at the molecular level.

The basis of molecular medicine lies in the good understanding of the genetic map and DNA sequence of a virus. It was June this year that the success of mapping human DNA known as the Human Genome Project was announced by the President of the United States and the Prime Minister of the United Kingdom. This will lay the ground-work for scientists to understand more of genetic diseases including the deadly cancer. There are 200 different kinds of cancer and no one knows precisely which therapy will be most effective against cancer. However, the biomolecular revolution has now cracked the mystery of cancer. It will

eventually replace the primitive tools of chemotherapy, surgery, and radiation available today. Many scientists believe that by 2020 entire classes of cancers will be curable.

Apart from providing excellent solutions for our future health, genetic engineering and biotechnology also promises to solve the world food shortage that I will touch on later.

(The information technology revolution)

However, let me now turn your attention to the second revolution in technology which is currently taking place i.e. in ***Information Technology*****.** During the period of 1900s, one can witness the rapid growth of information technology led by the pervasiveness of Internet. According to a UN report in April this year, there are 276 million users increasing at around 150,000 per day, 200 million terminal devices increasing almost at 200,000 per day, and 1.5 billion pages of web sites increasing at about 2 million pages per day. The Far Eastern Economic Review in September 2000 reported that Goldman Sachs Research estimates the worldwide on-line gross revenue in 1999 as US$225 million and will be around US$7.5 trillion by 2005.

This IT revolution will have a great impact on all sectors of a country – on industry, economy, culture and society – and will change the socioeconomic aspects of the world even more than the industrial revolution. E-mail has become a common mode of communication among Internet users. One can now download a song from a website. Airplane tickets can be bought through the Internet. Books can be ordered online. Banking is adopting Internet banking to reduce its transaction cost. The list goes on.

We are now entering the knowledge-based society. Some even believe that there is already a shift from the old economy to the new economy. In the old economy, information flow was physical: cash, checks, invoices, bill of lading, reports, face-to-face meetings, analog telephone calls or radio and television transmissions, blue prints, maps, photographs, musical scores and direct mail advertisements. In the new economy, information in all forms become digital – reduced to bits stored in computers and racing at the speed of light across the network.

(What role must Asia play? How will Asia rise to the new challenge?)
Let us now take a look at Asia. What role must Asia play? How will Asia rise to the new challenge? If we looked back, nobody expected that the 'East Asian Miracle' would disappear overnight during the 'Asian Crisis' in 1997. Three Asian countries are doing their best to recover from the crisis. What are the lessons we learnt?

Apart from financial aspects, it has become clear that a country with a strong technology base, Korea for example, has recovered faster than those who have not. Japan, Korea and Taiwan have been among world leaders in microchip production. Singapore was quicker than others in adopting the IT revolution to their advantage. Their 'Singapore One-One Network for Everyone' is world-renowned. Prime Minister Mori of Japan has announced the 'e-Japan' as an avenue to revitalize the Japanese economy. Hong Kong has come up with a construction of 'Cyber Port'. Malaysia is working on the 'Multimedia Super-corridor'. India is well known for their IT industries- exporting to a value of US$3.9 billion in 1999. The Indian IT workers are most sought after by developed countries. Thailand has started their 'Software Park' and has begun to investigate the possibilities to turn Phuket and surrounding provinces into the so called 'the Greater Phuket Digital Paradise'.

However, the Asian countries must not lose sight of the negative impact that IT will have on the society. The Internet can create the 'digital divide' that, if not well planned, can create a gap between countries and within a country. Developing countries tend to lag behind developed countries in levels of Internet penetration. And within a country, regardless of development levels, those with less wealth and education are much less likely to be using the Internet. According to a UNDP report in 1999, the United States, which has less than 5% of the world's population is home to over 25% of all Internet users; South Asia, with almost 24% of the world's population, is home to only 4%.

Within individual countries, for example in Bangladesh, buying a computer costs a Bangladeshi more than eight years' income. A recent survey shows that about 50% of the one million Internet users in Thailand are located in Bangkok. Asian governments must therefore have a proper policy and measure to prevent the digital divide.

It is also a relief that the G8 meeting in Okinawa, Japan August this year expressed concern on this digital divide.

I would like now to go back to the biotechnology as a means to solve the world food shortage. Southeast Asia has been well known as the ‘rice bowl’ of the world. Rice is largely associated with countries of Asia, extending from Pakistan to Japan. Approximately 95% of the world’s rice is produced in Asia and it is in the integral part of the continent. Thailand, together with Vietnam has recently become the world number one exporter of rice. As the world consumption of food is always on the rise, one must think ahead of how to increase the production of agricultural food products. Rice biotechnology research and development seems to be the answer. During 2000-2004: Japan, Korea, China, Taiwan, India and Thailand are joining hands with the UK, Canada, USA, and France in the Rice Sequencing Genome Project. It is expected that the results of the Project will provide knowledge to improve productivity of rice farming. Again, one must not look at one side of the story only. The good understanding of the subject by the common people who are not economists or scientists must be taken care of. Many people, including Asian, are not sure about genetically modified foods. We have read news about demonstrations against this new technology. It still remains a challenge for Asian and world scientists and everyone concerned to find measures scientifically and psychologically to convince the public at large, so that the technology can be of the maximum benefit to all of us.

(Conclusion)

In conclusion, the endless frontier of scientific knowledge will help us understand and discover the mystery of nature and human beings. Technology will help people overcome new kind of diseases and food shortages. On the other hand, we must always be well aware of the social impacts that the technology might bring about and must find well-balanced solutions. The rise of complexity and sophistication of technology will hardly be engaged by a single enterprise, or one nation alone. Collaboration and sharing of knowledge and experiences will become a key to expand the frontier of knowledge, not only within the region but also between the regions.

I do encourage all of you Young Leaders of Asia to join hands together to use science and technology for the benefit of the Asian and mankind.
Thank you for your kind attention.

Further Readings:

1. Kaku, Michio., *Visions: How Science Will Revolutionize The 21st Century,* Anchor Books, A Division of Random House. Inc., New York, 1997.
2. Mann C.L., Eckert S.E. and Knight S.C., *Global Electronic Commerce: A Policy Primer,* Institute for International Economics, Washington, D.C., July 2000.

Blurbs:

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