

## Telecommunications Policy toward an Information Society in Korea

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Dr. Kim, the Director of the Institute, distinguished guests, ladies and gentlemen:

First of all, I wish to congratulate Dr. Kim and the members of the Institute of Social Sciences for their success in organizing this symposium, and I am grateful to them for granting me the opportunity to speak as a special guest of the symposium.

It is my great honor to discuss with my fellow participants the general theme of "The Challenge of the Information Society: Human Implications". I am particularly pleased to touch upon the role and direction of Korea's telecommunications policy in preparing for the forthcoming information society.

People say that we are presently experiencing the shock of the information revolution. As the 20th century comes to a close, we face two challenges; the social challenge to change existing social structures and the technological challenge to make these social changes possible.

The industrialization from the middle of the 18th century up to the present has produced material abundance. Industrialization enhanced production and economic development by replacing human muscles with machines. Despite its benefits, however, negative consequences of the industrialization have become apparent. Environmental destruction and pollution have posed a serious problem. The two oil shocks harshly and plainly exposed the limited nature of natural resources and society's dependence on these limited resources. In addition, industrialization has resulted in unbalanced concentration of population and industries in the small number of megapolitan areas; class conflicts between the rich and the poor; and widespread materialism which tends to dehumanize modern man.

How can we overcome the demerits of industrial society, and continue to pursue a utopian society with material abundance and mental happiness?

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This is our motive for pursuing the information society. The recent and dramatic development of science and technology in microelectronics and telematics (the combination of computer and telecommunications) provides a possible solution to the above question.

While industrialization relied heavily on expending natural resources and energy, informationalization entails circulating information. With information it is possible to create more value and wealth spending far less amount of material and energy. In an information society great emphasis is placed on producing, storing, processing and analyzing information. Therefore, it is natural for telecommunications and computers to be the pivotal social infrastructure.

The information society, however, will not necessarily lead to the utopian society that we envision. If information, which is the most essential resource, becomes concentrated in the hands of a privileged minority, the disparity between the rich and the poor could be intensified. Then, the information society would serve to exacerbate some of the demerits of the industrial society. In order for the information revolution to guide society closer to a utopian society, it is essential for information to be easily accessible to all members of society. For this reason, telecommunications policies should be aimed at popularizing and facilitating the use of information.

Now, I will briefly describe the present and future of Korea's telecommunication policies.

Until the 1980s, telecommunications had not drawn much attention from the government as an important infrastructure. As a result, capital investments in telecommunications development had been negligible. Statistics show that Korea had 2.4 million telephone subscribers at the end of 1979. That is approximately 6.3 telephones per 100 people. At that time, the backlog of telephone subscriptions was a serious problem and the level and variety of telecommunication services were underdeveloped. Long-distance DDD call service was available between major cities only and international subscriber dialling service was not available. Mobile telecommunications, data communications and special call services were not available.

The remote alienated small villages did not have access to basic telephone services. The lack of telecommunications service became an acute source of inconvenience in the people's daily economic life.

There are several reasons for the underdevelopment of telecommunications

services. First, there was inadequate investment as a result of a misconception of the role of telecommunications in economic development. Second, since the MOC had the dual responsibilities for operating the day-to-day telecommunications business and making government policy, there was a lack of initiative to set a dynamic and vigorous long-term policy for the development of telecommunications.

In the 1980s, however, telecommunications services in Korea are undergoing dramatic changes and growing tremendously. With the merging of computers and telecommunications, the construction of ISDN(integrated services of digital networks) is in sight, high standards in communications services are being vigorously pursued and the MOC is concentrating its efforts on making a future-oriented policy toward telecommunication development.

The changes started with the restructuring of the communications organizations. The Ministry of Communications has become mainly a policy-making body by relinquishing its role as a common carrier. In addition, the MOC has assumed the sole authority to oversee the nation-wide communications networks such as broadcasting networks and independent communication media which had in the past been controlled independently by different departments of the government. Furthermore, the MOC is taking positive steps towards the information society by initiating projects for fostering the growth of the information industry, popularizing the use of information among the public, promoting R&D activity and training specialized manpower,

I should perhaps go into a little more detail on this organizational aspect. First, the Korea Telecommunication Authority, a public corporation, was set up in 1982 to carry out the day-to-day telecommunication operations. This step became necessary because the quantity and quality of public telecommunications demand outgrew the scope of government control in terms of budget, manpower and technology. Second, the Data Communications Corporation of Korea was founded in 1982 to provide data communications services, a major component of the information society. Third, the Bureau of Telecommunications Policy was created within the MOC to make policy for the efficient allocation of telecommunication resources and implementation of long-term policies. Lastly for the purpose of pooling the ideas of academia, industry, government and research centers, many specific committees were formed. These committees include the Telecommunications Technology Committee, the Telecommunications Promotion Committee, the Committee

for National Communications Coordination and Telecommunication Development Task Force.

There have been changes in the legal and institutional framework for telecom services too. In 1983 the Telecommunications Basic Law was enacted in order to strengthen the policy making function of the MOC and to facilitate the systematic development of telecommunications. This law empowers the MOC to pursue informationalization of society. In addition, a Law concerning Development, Expansion, and Popularization of Computer Networks was enacted in 1986 for the development and distribution of computer networks as well as the creation of a foundation for telecommunications networks.

Korea faces the problems arising from industrialization such as pollution, urbanization and juvenile delinquency. In addition, the government tries to achieve a high rate of employment through continuous economic growth and establish socio-economic goals based on national consensus. Moreover, Korea must induce widespread innovation to all industries including heavy industry, fiber and construction. How can these problems be solved? We have to create new markets and new demands by cultivating the information industry and expanding information flows through the development of the telecommunications industry.

To meet the current social needs and pursue the goal of the information society, the MOC will continue to develop facilities and services and to promote the information industry and R&D activities which are related to the telecommunication industry.

### **A. Modernization of Facilities and the Fulfillment of Telecommunications Demand**

Let us look in detail at the results of the measures taken by the MOC. First, the demand for most types of telecommunications services will be satisfied in the near future through the expansion of the quantity and types of services. Since 1982, the MOC has invested more than one thousand billion won for expanding telecommunications facilities. Continuing the present level of investment, we supply more than 1 million lines annually. As a result, the total number of telephone lines has increased from 2.8 million in 1980 to 8.8 million in 1986. This number of lines will completely elim-

inate the backlog of telephone subscriptions in urban areas, thus enabling us to supply one telephone to each family. In the year 2001, the total number of lines will reach 22 million, equivalent to one telephone for every two persons, the level of telephone saturation of the developed nations. By 1987, the telephone system will be completely automatized and electronic telephones will be provided to villages of 10 or more households and remote islands of 50 or more inhabitants, which means residents of remote villages will enjoy the same level of telephone service as that for the urban residents. As for long-distance telephone service, digitalized switching networks were in operation between the 22 major cities at the end of 1984. By the end of 1987, DDD service will become available even in small towns.

### **B. Improvements in the Variety and Quality of Telecommunications Services**

Along with the increase in the quantity of telephone services, the quality has also improved remarkably. Various advanced telecommunications services became available with the development of technology and social demand.

The initiation of special call services in 1982 made available such services as abbreviated-dialing, call-waiting, call transfer, hot line, three way calling, alarm call services and time announcement service which tells the exact time through a computer voice. Since 1983, the cordless telephone has been on the market.

In mobile telecommunications, the automobile telephone service, which uses the cellular method, is available in Seoul area and will be available in all the major cities after 1986. Paging service, which is presently operating by the tone method, will gradually be changed to the display-to-tone method. Since 1983, the ISD services has been available in most major cities. ISD allows every subscriber who uses the electronic system to dial directly with 75 areas of 68 countries. This service will be available to all subscribers by 1988.

In the field of telematics services, the overseas data bank service started in 1983. Packet switching network began operation in Seoul, Pusan and Taegu in 1984 and expanded to include Taejon and Kwangju in 1985. The PSDN service has expanded by installing MUX facility in 13 major cities. The CSDN will begin operations in 1988 after a trial period.

Since 1985, the common use of computer facility and digital leased line service has been available. Electronic mail service and voice mail services are presently available. By the year 1990, new media services such as videotex, telemetering, tele-conference, teletex service will also be available.

### **C. Actualization of the Integrated Services of Digital Networks**

In recent years, the developed countries have set as their goal for telecommunications services the actualizing of the ISDN, the integrated services of digital networks, combining technologies of the computer, semiconductor and telecommunications. Although there are still some ambiguities and discrepancies among the different systems, the ISDN is an integrated network of voice and non-voice data. The ISDN functions like a network of highways. As a result of the network's high speed, wide range and flexibility, information can be transmitted in various forms with economic efficiency and high quality. This network may be the most important infrastructure of the information society.

In order to prepare for the information revolution and to maintain their relatively advanced status in the coming eras, developed nations are actively pursuing the actualization of the ISDN.

In France, the President asked a special advisory group to study the impact of computers and telecommunications technologies on France. The group published the report "the Telematique Society" and coined the word "telematic". The German government set up a committee for the development of telecommunications systems and is pursuing the development of the ISDN. Japan is planning to complete their Integrated Network Services system, a system similar to the ISDN, by 1995. Japan is vigorously supporting this plan through both government and civilian organizations. The Korean government has a plan for completing the ISDN by the year 2000. This plan calls for the most appropriate system for the predicted future telecommunications demand and technology.

There are several different approaches towards structuring the ISDN. However, the primary goal should be for an equitable and widespread use of information among all members of society.

The ISDN has several basic requirements. The individual telecommunications networks for telegraph, telephone and data should be digitalized and

interconnectable. Through this comprehensively digitalized network, various modes of services such as telephone, telegraph, data and picture will be possible. Further, pricing should be determined by the amount of information transmitted, rather than by distance. Digitalization of the telecommunications network requires the digitalizing of the transmission, switching and subscriber systems. Since the cost of digitalizing all these systems at once is impossible, Korea, as is the case with many other countries, is taking a step-by-step approach and thus digitalizing gradually.

While still utilizing the present non-digitalized system, we replace wornout facilities with new digitalized systems, install new digitalized systems when we expand, slowly digitalize and merge the subscriber lines and gradually expand packet switched networking which will eventually connect with the public telephone network. This will increase the efficiency of existing lines and lower the cost of installing subscriber lines. Our approach towards building the network is to improve the efficiency of present facilities and make plans to incorporate new technology when it is certain to develop.

Since 1984, the new digital switching system has been put into service in the rural areas. The TDX system which was recently developed by domestic technology began operating this year. Between 1987 and 1991, digital switching systems which are presently undergoing testing will be installed in the urban areas. The mechanical switching system which ceased supplying in new areas in 1984 will be completely removed by 1996. The supply of analog switching systems will be reduced gradually and then completely terminated after 1992.

For the digitalization of transmission systems, digitalized M/W, PCM and fiber telecommunications will be supplied. In particular, long-distance digital transmission will be available through the optical fiber trunk lines which are under construction on the Seoul-Pusan highway and Olympic highway. Between 1986 and 1988, the submarine optical fiber cables between mainland and Cheju island will be constructed. From 1987, the transmission lines of major cities and long-distance calls will be completely digitalized. Satellite communications, which upgrades and modernizes transmissions, will be widely available from the 1990s. When all these steps are completed by the beginning of the 2000s, the ISDN will have been actualized.

### **D. Policy for Popularizing the Use of Computers**

As already mentioned, we must emphasize the development of a prosperous society through the information revolution. Information, because of its exponential growth characteristic, is apt to be more unevenly distributed than energy and resources. Therefore, the information society may create greater disparities in wealth distribution than the industrial society. To solve such problems that face us, we must make sure that information is easily accessible to all members of society by expanding telecommunications networks and diversifying information services. This is the ultimate goal of the telecommunications policies of the MOC.

Many steps have been taken towards making telecommunications networks more widely available at lower costs.

In 1983, the PSTN was opened up to computer terminals and facsimile. This was the first step towards integrating the telematic services and had a great impact on stimulating the electronics industry and on facilitating related technology development. Since the subscribers could independently choose terminals from the market, various kinds of terminal equipments were developed. As a result, both the related industry and the export industry made improvements.

With respect to pricing systems, it is essential to change from the distance dependent system to the information capacity dependent system. This pricing system allows customers from all parts of the nation to use at standardized and lowered prices of new services such as facsimile, videotex and teleconferencing. Customers will also be able to interconnect freely between computer terminals and data terminals. This will popularize the use of databank and database services.

The MOC plans to convert to an information dependent system through several step-by-step changes in the pricing system. The present system of multi-step systems will gradually change into an uni-step system for the whole country by the late 1990s. Along with this simplification, strategies for lowering the prices of communications are being pursued to make information less costly to the public. As a first step towards uni-pricing, the 9 stages of long-distance calls have been reduced to 5 stages. Further, the prices of adjacent area calls and evening long-distance calls have been



lowered. On the average, there has been a 17% decrease in the tariff rates of long-distance calls. The purpose of decreasing is to accommodate the expanded economy and living area and to bridge the gap between long-distance calls and adjacent area calls.

### **E. Fostering the Telecommunications and Information Industries**

Today the electronics industry consists of the telecommunications industry, software industry and systems engineering industry. To develop the telecommunications industry, the KTA is utilizing its purchasing policies to develop domestic industries. Standardization of products are being pursued to help the suppliers make stable planning. Further, the MOC announces its plans of long-term demand for technology in order to provide industries with sufficient time to develop the required technology.

To foster the components industry and small businesses, the MOC is taking a wide range of measures to assist the firms specializing in components and larger firms are required to purchase such locally manufactured items. In addition, to develop telecommunications engineering which is technology intensive and high value added, laboratories are giving technical assistance.

To systematically monitor the quality of components of telecommunications equipment, a quality assurance group has been created within the KTA. This group works to make the quality testing and trial testing conform with international standards. For this purpose, the quality assurance system of telecommunications facilities was started last year.

The MOC is working to achieve the state of the art in telecommunications facilities in order to promote the export of telecommunications technologies and facilities. Exportable telecommunications parts are being investigated to expand the foreign market. In addition, the MOC organized the committee for telecommunications promotion to seek advice from academia and industry. This committee consists of several sub-sections to give policy recommendations and to solve the problems of various subjects.

This year, a Law concerning Development, Expansion, and Popularization of Computer Networks was enacted to support the development of the telematics industry, including the information processor industry, information processing hardware industry and other related industries. Although there are general guidelines, there is no comprehensive government policy for the

telematics industry. Fortunately, there is a separate section for telematics in the 6th Five-Year Plan which will go into effect next year. However, it is still unclear as to who will specifically be in charge of cultivating the telematics industry. The MOC plans to organize the development of the telematics industry into three areas; information facilities production, information processing and information communication. Further, the plan includes reorganizing the policy making bodies of the government to provide a solid foundation for all of these areas. Domestic technology in computers and peripherals will continuously be developed through government-led projects like the National Networking Plan. The R&D of the basic and applications technologies of the information business will be carried out by national laboratories and universities.

### **F. R&D Management and Manpower Planning**

In order to compete with the technologically advanced countries in the 2000s, Korea must strengthen its ability to develop core technologies, expand its technologically skilled manpower and increase its investment in technology. Core technologies required for building the ISDN are systems engineering, optical fiber technologies, man-machine interfaces, satellite and radio communications, information processing and switching, semiconductor and integrated circuit engineering, materials and components, communications and information theory.

The MOC's high technology R&D plan allots 3 percent of the total annual sales of public telecommunication business for developing the required technology for the ISDN. Furthermore, research organizations are being reshaped to effectuate inter-institutional cooperation, participation in international projects and reinforcement of the committee system for more effective R&D management.

Stressing specialization in R&D activity, the ETRI, Electronics and Telecommunication Research Institute, will concentrate on electronics, telecommunications and computer technology, develop the integrated telecommunications network technology for the information society, and provide technical assistance to the business sector. The National Computer Agency, which will be established in the near future, will be in charge of software development, standardization and technology development for computer networks. The KTA and other service organizations will develop systems

engineering and necessary technology with their own teams. The ICR, Institute for Communication Research, will play an active role in studying and recommending telecommunications policies. The universities will educate highly qualified manpower and conduct basic and material engineering research. The laboratories of industry will focus on the production and design of technology and engage in joint research to stimulate and strengthen non-government R&D activity.

The domestically developed TDX is a state of the art system combining semiconductor and computer technologies. The TDX had an initial capacity of 6,000 lines and supplied 24,000 lines last year. This year, it will supply 189,000 lines. This system will be further developed into the Korean standard exchange system having a 50,000 line capacity. In addition, we have exerted our efforts on developing optical telecommunications systems, teletex terminals and videotex terminals which will be the core facilities in the information society.

For manpower development, the MOC plans to concentrate on manpower quality in the telecommunications and information technology fields. We support the training of highly educated students through overseas training and funding of research activity in universities abroad. We also strengthen domestic education by supporting projects in basic and applied research.

The MOC plans to have over 6,000 people with highly qualified training by the year 2001. Further, we will make a long-term investment to educate a large number of middle-level technological manpower.

## G. Conclusion

Thus far, I have introduced the direction of telecommunications policy in Korea. In brief, the telecommunications policies are aimed to effectively guide Korea through the information revolution and place the nation on the forefront of the information society. Our basic approach is to make information easily accessible to the entire population in order to build a well balanced and prosperous society.

The ideas and efforts of the MOC alone are not sufficient for building such a society. The energies of government, industry, universities and research centers must be combined to enlist the effort of the entire nation. Further, as we move closer to the "Global Village", international cooperation and optimal technology transfer become increasingly essential.