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South Korea

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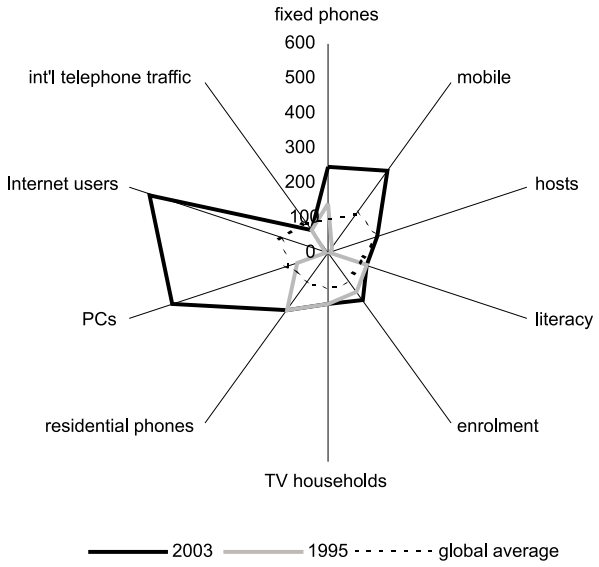

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Overview

South Korea (referred to as Korea in this chapter) is currently ranked highest in the world in terms of the development of information infrastructure. The country also enjoys the highest penetration of broadband Internet. As of November 2003, 11 million households (or over 70 percent of total households) and all schools have broadband Internet connections. As high-speed Internet becomes entrenched in everyday life, online services evolve from simple information searches to multimedia services, including e-commerce, online entertainment and e-learning.

Internet usage figures have shown a steep upward trend with the ever-deepening penetration of IT into government and social life. In 1997, the number of Internet users was only 1.6 million, but in 2000 it jumped to 19 million. This figure topped out at 30 million in 2004, representing 65 percent of the total population aged six and older (Korea Network Information Center, 2004).

ICT industrial production contributes 25.1 percent to Korea's GDP, the highest among OECD member states. ICT exports take up a high 28 percent of total exports. Korea ranks fourth in the world in the production of ICT devices. Notably, the mobile phone market has grown at such an astounding rate that it now surpasses the fixed-line market, with 68 percent of the total population, and 79 percent of the population aged between 10 and 80 years, now using mobile phones.

Korea has faced great structural transformations in every field since the 1990s. As a result of rapid political democratisation, civil society's influence over the government has increased and political transparency has improved noticeably. Knowledge-based industries like IT have developed to become a growth engine of the economy, while traditional manufacturing industries have declined in terms of their economic contribution. Socially, the activities and influence of young netizens have increased and the rights and benefits of historically neglected groups, such as women and labourers, have been extended.

ICT is an important enabler of such social structural transformation of Korea. The new technologies have helped to change communication structures from the top-down and one-way model to participation with lateral and two-way flows of communication. This change has noticeably improved democracy, equality and transparency. In addition, the rapid development of broadband Internet has enabled the provision of high-quality services at very moderate costs and promoted the social participation of various classes of people including the younger generation. The widespread diffusion and adoption of ICT has also become a core factor in spurring the growth of Korea's ICT industry. The new technologies are affecting every facet of Korean society as an enabler of change and development by transforming the operational processes of major organisations, including the government and businesses, as well as changing people's lifestyle and values.

However, the active and broad application of IT in Korea is only a recent phenomenon. Until the mid-1980s, Korea suffered from a shortage of wired telephones. There were only a small number of mobile phone users in the mid-1990s, and Internet use was limited largely to certain organisations, such as universities and research institutes. In the late 1990s, however, Korea experienced an explosive ICT growth. The number of mobile phone users passed the ten-million mark in 1998, while the number of Internet users broke through that mark in 1999.

In order to understand why Korea's ICT growth was so rapid within such a short period of time, it is best to look at national strategies rather than market mechanisms. This does not mean that market mechanisms did not contribute to ICT development. In fact, through competition in the telecommunications market, efficiency was raised and private investment accelerated. However, the market mechanism of Korea at the end of the 1980s was not that different from those of many other countries because of the global trend of telecommunications market liberalisation. Thus, analysing

Korean ICT growth based on market mechanisms would not be that enlightening. More revealing insights could be obtained by studying the effective combination of the traditional ICT development strategy in place since the 1980s with the new development strategy created during Korea's economic crisis in 1997–98 that is based on a knowledge-based economy.

First among these insights, Korea has been promoting ICT development strategies for a long time through such projects as the Time-Division Exchange (TDX) Development Programme launched at the end of the 1970s, the National Basic Information System (NBIS) project started in 1987 and the Korea Information Infrastructure (KII) project begun in 1995. These projects were aimed at solving different problems Korea faced at various points in time. The TDX programme was introduced to overcome the shortage in wired telephones by developing a digital switching system. The NBIS project was aimed at developing basic databases and computer networks for public administration, research and education, as well as banking and finance. The KII project set out to create a world-class broadband network that connects the whole nation.

The explosive growth of ICT in the late 1990s can be regarded as the cumulative result of a series of national projects begun nearly 20 years ago. The government consolidated wired telephone networks, data networks and major databases with the goal of quickly building an information society via ICT utilisation and ICT industry development. During the process, strategic cooperation between the government and the private sector was made possible by the emergence of competitive private enterprises and the expansion of the domestic ICT market. The government played a primary role in initiating national projects at the beginning; but once the market had developed, it devolved that role to the market and switched its attention to the next generation of projects.

The 1997 financial crisis provided another opportunity for the reinforcement of Korea's ICT development strategy. The fundamental cause of the crisis was overinvestment in manufacturing. The transformation from a manufacturing-centred economy to one that is knowledge-based was necessary for overcoming the crisis. Korea had chosen the ICT industry to form the core of its knowledge-based economy at that time. The size of investment in the ICT sector, as a percentage of total investment, was only 2.4 percent before 1999, but it jumped to 4.2 percent in 1999 and grew continually to 4.8 percent in 2000, 5.7 percent in 2001 and 6.1 percent in 2002. At the same time, the contribution of the ICT industry's production to GDP increased from 8.8 percent in 1988 to 12 percent in 2003, which may be considered as a success in the structural transformation of the economy.

The rapid growth of ICT has led to Korea being ranked first place in the world in terms of broadband Internet services. In addition, the diffusion of PCs in 2002 was 23.5 million, or one PC for every two persons in the country. In other words, the fundamental ICT infrastructure has been completely built. In the case of information usage, the e-government project is approaching the final stages of implementation at the departmental level. E-commerce has also expanded widely, and the number of online banking users reached 17.7 million in 2002, 148 times more than three years before. The ICT industry has been contributing more than 30 percent of the annual GDP growth registered in Korea since 1997.

However, there are some remaining issues to be solved before Korea can fully attain an advanced information society status. Of top priority is the issue of increasing value creation and productivity through ICT usage. So far, the government has continually promoted process improvement, such as business process reengineering (BPR), and supported the development and diffusion of applications aimed at increasing efficiency in business and productivity in government. However, the efforts have not been very fruitful because of poor cooperation between related organisations and the lack of policy and structural improvement. The potential of ICT is not being fully tapped because Korean customs and social consciousness do not fully fit into the ICT paradigm.

Other major issues waiting to be solved are the digital divide and the misuse and abuse of ICT. Even though the number of Internet users has exceeded 65 percent of the total population, Internet use remains low among disadvantaged groups, such as the elderly, the uneducated and the lower-income people. At the same time, spam has grown rapidly at an average annual rate of 200 percent between 2001 and 2003. Misuse of personal information, hacking, virus attacks and cyber defamation are also on the rise. Although these are problems that every country is facing, they are more critical in Korea because of the highly developed ICT environment and the high speed of connections.

Various measures have been taken to address these issues. Firstly, productive IT usage is being promoted in government and business through establishing an e-government committee that reports directly to the President as well as implementing e-government holistically. Secondly, a Broadband Convergence Network project has been launched to advance the information infrastructure. It aims at integrating broadcast media and communication channels as well as building a secure Internet environment by 2010. Thirdly, nine new industries are being nurtured to sustain the development of the ICT sector.

Local online content

Portal and community sites

Web portals have made tremendous progress in building their brands, quality and content, and they are attracting more users. Many portals have reduced their dependence on

Internet advertising by diversifying their revenue sources through offering various e-commerce services and providing Internet entertainment, an area that used to be monopolised by old-media channels. In 2003, some popular portals were able to induce growth by expanding their web community base and offering a wider range of subscription-based entertainment services. As the mobile Internet market continues to expand rapidly, popular portals are developing products that deliver content via services integrated across wireless Internet and fixed-line networks.

Internet news and educational content

Internet newspapers are under increasing competition from web portals and websites operated by television networks that also offer up-to-date news. A few independent Internet newspapers, however, have successfully introduced subscription fees for premium content.

Online educational services are offered in the form of corporate training and adult extension classes. The B2B corporate training business is expected to surpass the B2C market. In 2003, online corporate training grabbed nearly 28 percent of the entire corporate training market, which is worth nearly 800 billion won (US$1 = 1,040 won).

Entertainment

Currently, popular Internet music sites consist mainly of webcasting and peer-to-peer (P2P) sites. The P2P service Soribada is the most popular music site among Korean users, while Bugs Music is the largest music-streaming website. In 2003, the Korean Internet film market was estimated to be worth around 80 billion won, while the turnover of the game industry was valued at 4.4 trillion won. Online games accounted for 704 billion won, or 16 percent of the total game market and an increase of 28 percent over 2002. The popularity of online games can be attributed to the presence of numerous PC *bang* (Internet cafés) and broadband Internet.

Online services

E-government

In early 2001, the government established the E-Government Special Committee, which reported directly to the President. It also invested more than US$118 million over two years in informatisation promotion funds for 11 major projects. The civil service eventually saved an estimated US$4.7 billion in operating expenses after these e-government initiatives were successfully implemented.

In April 2003, the new administration inaugurated the Presidential Committee for Government Innovation and Decentralization to carry out the President's agenda. The committee comprises five subcommittees for (1) administrative reform, (2) personnel reform, (3) decentralisation, (4) financial/tax reform and (5) e-government. The President's agenda includes innovating the government, and e-government has been chosen as a strategic tool for carrying out this agenda. The e-government committee will focus on the following areas: electronic administration, expanded common use of public information, service-oriented BPR, enhancement of the civil service, enhancement of business service, expanded electronic participation, reform of e-government-related laws, and specialisation of IT manpower and organisations. The committee identified 31 priority tasks for a five-year period beginning 2003.

E-commerce

According to a survey of the e-commerce industry conducted in the second quarter of 2003, the size of the B2B market was estimated to be around 50 trillion won, and the turnover of the e-marketplace had increased to 1.6 trillion won after registering a 15.5 percent growth over the corresponding period in 2002. There were a total of 264 e-marketplaces in the second quarter of 2003. There were also 3,320 online shopping malls, 36.8 percent more than the same period in 2002, with total sales reaching 1.7 trillion won.

The Government e-Procurement System, which is a one-stop resource for processing all the procurement of central and local governments as well as public organisations, is now known as the National Market (*http://www.g2b.go.kr*) and attracts increasing participation from the industrial sector. According to the above survey, the total value of B2G trading stood at 5.2 trillion won.

ICT industry

The rapid expansion of the ICT industry has aided the growth of the Korean economy. The amount of added value realised by the industry grew from US$25.9 billion in 1996 to US$73.7 billion in 2002. Such high growth has led to a considerable increase in the industry's share of the export market, rising from 23 percent in 1997 to 28.5 percent in 2002. The industry's contribution to Korea's real economic growth increased dramatically in the 1990s, from a mere 4.5 percent in 1990 to 50.4 percent in 2000.

Domestic consumption and exports will continue to drive the progressive growth of the industry. In recent years, the share of ICT exports as a portion of total ICT production has been around 40 percent, underlining Korea's rise in the world IT market. Thus, even in times when the domestic market suffers a slowdown, growth through strong exports is still possible.

The total number of workers in the ICT industry stood at approximately 697,000 at the end of 2002. The number is expected to grow continuously at an annual average of 4.4 percent, exceeding the 1.3 percent average rate for Korean industries, to reach 1,443,000, or 6.3 percent of the total national workforce, by 2006.

Key national initiatives

Broadband Convergence Network (BcN) project

A master plan for BcN was launched in December 2003 with the goal of building superhigh-speed networks that will facilitate the integration of telecommunications and broadcasting services and of wired and wireless networks using high quality-of-service features and IPv6. The aim is to create an environment that allows users to access all products and services conveniently, regardless of the information transmission model. BcN is in keeping with the trend of integrating telecommunications, broadcasting and the Internet. Conversion to IPv6 will solve the problem of address shortage with IPv4 and will provide more stable Internet services. An environment for fast mobile communication will be established to enable high-speed access at 2 Mbps through various types of wireless terminals.

The plan will proceed in three stages. The first stage, running from 2004 to 2005, will witness the exploration, development and elaboration of the initial concepts outlined in the plan; ISPs will provide partial services during that period. In the second stage, stretching from 2006 to 2007, up to eight million subscribers of wired and wireless services will have access to bandwidth of 50–100 Mbps. Finally, in the third stage, which spans 2008 to 2010, BcN services will cover the entire country with subscriptions upwards of 20 million.

Promising technologies for the next generation

In August 2003, the government announced that it would promote nine promising technologies that it trusts will boost Korea's economy. These promising technologies are (1) intelligent robots, (2) home networks, (3) next-generation PCs, (4) next-generation mobile telecommunications, (5) digital content, (6) system-on-chip, (7) telematics, (8) embedded software and (9) digital television. The production value of ICT products is projected to increase by around 112 percent and ICT exports to expand from US$46 billion in 2003 to US$100 billion by 2007.

Enabling policies

Broadband IT Korea Vision 2007

Broadband IT Korea Vision 2007 was launched as the fourth master plan in December 2003 to succeed the third master plan, e-Korea Vision 2006, unveiled in 2002. The new plan, which adds some new projects to the previous plan, focuses on improving national productivity and individual quality of life through informatisation. BcN, discussed earlier, is part of this plan.

Broadband Internet in Korea

Korea currently has the most advanced broadband Internet infrastructure in the world. The number of broadband Internet subscribers has doubled every year since 1998 and exceeded 11 million in December 2003. This total represents 21 percent of the population in the country, but in actuality most Internet users in Korea are using broadband, with one broadband connection usually shared by several people. According to research by the Korea Network Information Center (2004), the number of Internet users in Korea in December 2003 was 29 million or 65.5 percent of the population, with 95.9 percent of them using broadband.

Three factors led to the rapid development of broadband Internet in Korea. Firstly, the development of broadband services was made possible by the nationwide Korea Information Infrastructure project, which saw the installation of a backbone network linking 144 cities with optical cable that created an Internet environment with no speed limit. Additionally, the laying of fibre-to-the-curb optical cable in residential areas enabled xDSL services to be provided everywhere in the country.

Secondly, liberalisation of the telecommunications sector helped to accelerate the expansion of broadband Internet. This move eased entrance into the broadband Internet market, which requires simply the filing of a notification as a value-added telecommunications service provider. The liberalisation succeeded in attracting fresh private investment while improving the quality of service. Charges to subscribers were reduced to a flat monthly rate of US$40.

Finally, an active ICT education programme catalysed demand and growth. The government has supported ICT education for ten million people since 2000 that is aimed at introducing people to ICT and training them to make use of Internet-based services. Housewives are a special target group, and the success of these programmes has led to homes being turned into ICT hubs.

With the installation of the Broadband Convergence Network, the country should be able to not only enjoy high-speed Internet services running at more than 50 Mbps but also benefit from high-quality services with the convergence of wired and wireless services as well as telecommunications and broadcasting services by 2007.

Government IT management

As the informatisation process matures, enhancing the effectiveness and performance of information resources will prove to be more important than introducing information resources. Furthermore, effective management of information resources is urgently needed to realise a true e-government. The government has been reviewing each year the status of IT management and the legal problems facing public institutions regarding their information resources. The Government Information Technology Management Reform Act aims to address these problems by introducing IT architecture into Korea's IT management system.

Open source movement

Korea's open source software (OSS) industry has been in constant development since the release of Linux; hence it has the ability and sophistication to compete with foreign developers. However, domination of the Korean market by a few commercial software companies – Microsoft, Oracle, IBM, Sun and Hewlett-Packard – has retarded growth in the use of OSS.

OSS offers the advantages of interoperability, greater reliability as well as lower security risk and eliminates reliance on commercial software vendors. With these in mind, the government launched a pan-department council in which government departments and affiliated organisations participate to promote the use of OSS in government and public services.

The other advantage of OSS is reduced costs. Switching operating systems running on Microsoft Windows or UNIX to Linux will reduce the total system operating cost by 80 percent. Hence, the Ministry of Information and Communication (MIC) has earmarked US$14.2 million for the development of Linux technologies. It has also driven Korea's development of core Linux technologies by adopting Linux as the operating system for next-generation Internet servers since 2002. Another US$15 million has been allocated for 2003–2007 to be invested in developing OSS for PC operating systems and Internet browsers. MIC is also collaborating with various private organisations on the Home Network Prototype Project using OSS, which will run until 2007 on a budget of US$26 million (US$8.9 million from the government and US$17.1 million from private sources). In addition, the ministry plans to increase its support for university clubs involved in OSS experimentation and research.

The Korean Association of Information and Telecommunication has undertaken several projects, beginning in 1999 with the full support of MIC, which are geared towards furthering Linux's diffusion across Korea's PC market. At the same time, the Public Procurement Service has assigned the Linux software as a public procurement item for administrative information networks and has also pushed for the spread of Linux.

At the international level, Korea collaborated with China and Japan to launch a Northeast Asian forum to deal with issues surrounding the diffusion of Linux in the region. The three countries are establishing regional cooperation on open source issues, including information sharing, standardisation, joint research and pilot projects.

Linux is now also used in cellular phones. Motorola introduced in summer 2003 the SmartPhone, which operates on the Linux platform, and Samsung Electronics has started retailing its Linux-based cellular phone in China.

Research and development

The government has all along supported the development of the ICT sector and has created favourable conditions for Korean companies to participate in the sector. As a result, the competitiveness of Korean firms in the global ICT market has strengthened, and the ICT industry has become a driving force behind Korea's economic growth. Strategic R&D investments in some technologies have brought great success. Prime examples of successful investments include TDX technologies, optical transmission systems, CDMA systems and DRAM, which together have created a market worth 168 trillion won, 220 times the 760 billion won spent on the R&D of these technologies.

Commercialisation following successful R&D of major technologies, such as CDMA, has created numerous job opportunities and enlarged the pool of ICT experts and professionals. ICT-related ventures have emerged rapidly as central players in Korea's economic development and growth, displacing some of the traditional growth industries. The development of core technologies and the fostering of a critical mass of experts and professionals have become important facets of the national agenda.

Trends

Korea has undergone three stages of IT development since the early 1990s. The first stage, which lasted into the mid-1990s, saw the government successfully complete the construction of basic databases. The next stage witnessed the development and promotion of online services customised for the government, businesses and individuals, as well as the networking of the entire nation with high-speed connections. Starting around 2000, the government concentrated its efforts on integrating various information technologies, services and institutions. Many in government and business have expected the integration efforts to bring about considerable changes and improvement in the way society operates. Yet, for various reasons, the final stage is proving to be the most difficult to implement fully. In order to maximise the benefits of informatisation, it is necessary to continue reforming the legal and institutional systems and, at the same time, raise the capacity to utilise IT in all segments of society.

In this respect, a technology-centred approach, which proved so successful in the rollout of broadband Internet in Korea, will cease to be effective, efficient and sufficient. Hence, a new paradigm should be explored. An institution-centred approach is recommended, with the main focus on BPR, human resource development and institutional development. If the past gives any indication of the future, all signs suggest that IT investment will soon come to be evaluated less by its obvious, tangible benefits but increasingly by the value, implicit and explicit, it creates for society.

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