

# South Korea

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## Overview

Over the past ten years, Korea has emerged as a global leader in the journey towards a digital society. It is currently ranked highest in the development of information infrastructure, with the highest penetration rate of broadband Internet (OECD, 2001). As of November 2002, ten million households (or 69 percent of the total number of households) and all schools were connected to broadband Internet. Korea is also ahead of other countries in Internet use; Internet banking is used by about 14.5 million people and 63.5 percent of all stock trading online (as of July 2002). Finally, the IT industry of Korea leads the world market, especially in the areas of semiconductors, mobile phones and LCDs.

The rapid development of IT in Korea has been closely related to the shift in the national development strategy from industrialisation to informatisation. Since the 1960s, Korea has emphasized industrialisation as the top priority national agenda and achieved remarkably rapid growth, expanding real GDP by 8.7 times during 1970–2001 (Korea Bank, 2002). However, with the current paradigm shift towards a knowledge-based economy, the greatest concern for Korea now is to enhance its competitiveness through productivity increase via informatisation of society as a whole. In fact, investment in IT has drastically increased to US\$40 billion in 2001 from US\$5.75 billion in 1990 (NCA, 2002b).

The economic crisis in 1997 helped accelerate the transition to a knowledge-based economy. The government responded very aggressively to the crisis by expanding IT investment and promoting the use of IT. As a result, Internet use exploded in 1998. The number of Internet users was only 1.6 million in 1997, but it increased to 3.1 million in 1998, 10.8 million in 1999, 19 million in 2000, and reached up to 24.4 million (representing 56.6 percent of the population aged seven and above) by the end of 2001 (KRNIC, 2002). Broadband Internet also demonstrated a similar pattern of growth. The number of households connected to broadband Internet was only 10,000 in 1998, but it increased to 300,000 in 1999, 4 million in 2000, 7.8 million in 2001, and 9.2 million in June 2002 (or 64 percent of all households).

Korea enjoys very favourable conditions in other ICT areas. In telecommunications, it entered a mature stage with 57 telephone lines and 61 mobile service subscribers per 100 persons in 2001. Currently, the number of PCs per 100 people is 25, which means Korea is ahead of Italy (19) and Spain (17). Moreover, with Internet cafés prevalent throughout the country, Korean people can access the Internet anywhere any time.

The development of the information infrastructure has changed the way Koreans use IT. According to a survey by the Korea Network Information Centre (KRNIC), the proportion of people connecting to the Internet at home increased from 48.8 percent in 2000 to 61 percent in 2001 (NCA, 2002c). In terms of access type, the ratio of xDSL to leased line has reversed from 26:40 in 2000 to 50:28 in 2001. As high-speed Internet is entrenched in everyday life, Internet services have developed from simple information searches to multimedia services, including e-commerce, e-entertainment and e-learning.

The digital divide is a major hurdle to overcome in Korea's transition to a knowledge-based society. For several years, the government has made various efforts to reduce socioeconomic gaps in Internet access. It has provided financial support to telecommunications companies for construction of high-speed information networks in remote areas since 1999 and has developed and sponsored basic computer literacy programmes for 10 million people since 2000. As a result, the digital divide has been narrowed considerably in some typical areas, such as online gender balance. However, there still remains a significant gap with respect to age, income, region and occupation.

Since the 1990s, Korea has made remarkable progress in the journey towards a knowledge-based information society. It has pioneered new IT services and markets such as xDSL, CDMA and Internet cafés while constantly trying to keep pace with fast-changing global trends. IT will be the main engine of growth for the Korean society of the future, as it has been for the past ten years.

## Content

Most of the digital content consumed by the Korean people is produced in Korea and written in the Korean language, Hangeul. Because Hangeul is very easy to learn, even for children and foreigners, illiteracy is virtually non-existent in Korea. However, most Koreans are not fluent in foreign languages, with the exception of the young and the educated. Accordingly, foreign content is not widely used in the text format but is popular in multimedia formats such as music and graphics. The predominance of local digital content is also reflected in international Internet traffic, of which outbound traffic is over 15 percent greater than inbound traffic, as of 2002.

Compared to the enormous volume of analogue content, digital content is still insufficient to meet a great variety of demands in cyberspace. To promote the digitisation of analogue content and the production of new digital content, the government launched the National Knowledge and Information Resource Management Project in 1999 and selected four strategic target areas. They are science and technology, education and research, culture, and history. In the private sector, IT venture companies have played a key role in developing digital content and related services.

### Portal and community sites

Major Korean portal sites succeeded in introducing subscription services in 2001, and most of them are expected to secure relatively stable profits in 2002. Education and entertainment content (cinema, cartoons, horoscope, mobile phone rings, etc.) makes up the majority of subscription content. Yahoo Korea is concentrating on webcasting services, while Lycos Korea is strengthening its entertainment business by acquiring music site Getmusic as well as focusing on cartoons, webcasting services and Internet movies. Naver has also succeeded in the subscription entertainment business by unifying Hangame. In addition, Daum introduced a new subscription e-mail service called Online Postage, in the latter half of 2001 for commercial group mail service with more than 1,000 recipients. Finally, Avatar Service, which started in November 2000 and is one of the most popular subscription services has contributed considerably to improving the financial conditions of most Korean portal sites.

### Internet news

As Internet news grows in popularity, newspaper publishers are introducing subscription services for news articles and additional content including education, stocks, finance and employment. Internet news sites also profit from selling articles to other content providers as well as from raising added value through reprocessing content. In 2001, some Internet news websites, such as INEWS 24 (a pure Internet

## South Korea facts

**Total population:** 47,639,618 (2001)<sup>a</sup> (estimated)

**Rural population as a percentage of total population:** 20.3% (2000)<sup>a</sup>

**Key economic sectors (in terms of value added):** Wholesale and retail trade, semiconductor and telecommunications equipment, construction, finance and insurance<sup>b</sup>

**Literacy in the national language:**

Estimated to be virtually 100%

**Computer ownership per 100 inhabitants:** 25 (2001)<sup>c</sup>

**Telephone lines per 100 inhabitants:** 57 (2001)<sup>c</sup>

**Internet hosts per 10,000 inhabitants:** 90 (2001)<sup>c</sup>

**Internet cafés/telecentres per 10,000 inhabitants:** 5 (2001)<sup>d</sup>

**Internet users per 100 inhabitants:** 54 (2002)<sup>e</sup>

**Cell phone subscribers per 100 inhabitants:** 61 (2001)<sup>c</sup>

**Ratio of incoming to outgoing Internet traffic volume:** 0.86:1 (2002)<sup>f</sup>

**Internet users per 100 women:** 52.4 (2002)<sup>e</sup>

### Sources:

- (a) Korea National Statistical Office <<http://www.nso.go.kr>>.
- (b) Bank of Korea <<http://www.bok.or.kr>>.
- (c) ITU, World Telecommunication Indicators 2002 Database.
- (d) Korea Internet PC Culture Association <<http://www.ipca.or.kr>>.
- (e) Korea Network Information Centre <<http://www.nic.or.kr>>.
- (f) National Computerisation Agency <<http://www.nca.or.kr>>.

newspaper delivering IT and Internet-related articles), achieved much success with their subscription services. The following is a short list of Internet news sites, compiled by the Korea Press Association in 2001, with brief descriptions of the areas covered and services provided by them:

- Kdaily.com: Analytical reports on education and stocks.
- Donga.com: Analytical reports on education.
- Digital Chosun Daily: Database, entertainment, analytical reports on education.
- Media KHAN: Entertainment, analytical reports on stocks.
- Internet Hankyoreh: Analytical reports on jobs and education.
- Joins.com: Database, analytical reports on jobs, education and other topics.

- Hankooki.com: Entertainment, analytical reports on education, jobs and other topics.
- Mk.co.kr: News articles, analytical reports on stocks, finance, education and jobs.
- Hankyung.com: News articles, analytical reports on stocks, finance and education.

### Internet advertising

Although the size of the Internet advertising market in 2002 was expected to reach US\$100 million, the growth rate is slowing down as a result of companies reducing their marketing expenditures during the current economic recession. The reduction in advertising is also due to scepticism regarding online advertising. In 2001, new forms of online advertisements, such as game banners, animation, pop-up banners and mobile Internet advertisements, were experimented with.

### Online entertainment

**Internet music:** After a rapid growth in 1999, the Internet music market has stagnated since the middle of 2000. Many Internet music companies are changing their business model to record distribution or reducing the scale of their business. Faced with problems related to profit margin and copyright issues, most sites offering MP3 files have closed down and they now provide only streaming services. Currently, popular Internet music sites consist mainly of webcasting and P2P sites. The P2P service site Soribada, the most popular music site among Korean users, had over 4.5 million members and 400 thousand users daily, as of May 2001. However, since the Recording Industry Association of Korea filed a copyright violation suit against Soribada in January 2001 and the subsequent temporary ruling against it by the court in July 2002, its future is now uncertain and precarious.

**Internet movies:** Although Internet movie companies are producing a relatively large volume of digital content, they have a weak profit structure whereby only a few companies are making profits. Most sites screen old movies by purchasing screening rights from production companies long past the holdback period. However, a recent change is noteworthy in that many Korean films are beginning to be screened on the Internet before they are released on video. Production and screening of made-for-Internet films are also on the rise.

**Games:** The gaming market in Korea has grown very quickly with the rapid spread of “PC bangs” (Internet cafés) and broadband Internet. Korean makers of online games are considered strong competitors in the global market. In fact, Korean online gaming companies, such as NCSOFT <<http://www.ncsoft.co.kr>>, ACTOZ Soft <<http://www.actoz.com>> and JC Entertainment <<http://www.jcworld.com>>, are

advancing into foreign markets, including the USA, Japan and Taiwan. The online gaming market in 2001 recorded over 50 percent growth from 2000 thanks to the rise in sales of Lineage and the successful subscriptions of Hangame and Fortress 2. In addition, in the area of mobile games, some companies recorded monthly sales of over US\$75,000 in 2001 by charging subscribers for game downloads and introducing innovative mobile game platforms, thereby unleashing the market’s potential.

### Online services

Compared to the remarkable achievements in the information infrastructure, the development of online services in Korea has been judged as one step behind the most advanced country in this area, the USA. For instance, the progress of e-government services in Korea was ranked 15th among 190 countries by a UN report (UN, 2002), and e-commerce readiness was ranked 21st among 60 countries by a survey of the Economist Intelligence Unit (2002). From the perspective of technology and service quality, however, Korea is not behind any other country in the development and application of state-of-the-art IT such as web portal, mobile technology, knowledge management and digital signature.

### E-government

The drive for e-government in Korea started in 1987 when the government launched the National Basic Information System (NBIS) Project to deploy IT applications and systems in five core areas: administration, finance, education and research, national defence, and public safety. As part of NBIS, the National Administrative Information System was built featuring nationwide networks and databases for basic administrative information regarding residents, property and vehicles. Such databases were designed to enable the government to provide location-independent services. The system was completed in 1996 and laid the foundations for the development of e-government.

Since the mid-1990s, the e-government strategy changed from the construction of basic databases to the development of online services. Notable achievements include the KIPOnet, which promoted online applications of patents, with 81.4 percent of the applications processed in short time, saving more than six months over the old system (NCA, 2002a).

The Customs Administration Information System, launched in 1994 to streamline customs administration and reduce logistic costs in import and export procedures, is currently used by all trading companies and is connected to all related institutions. The One-Stop Service System for Export and Import Cargo (PORT-MIS) is another example of service improvement via online transaction and

information sharing. The number of documents required for port administration has been reduced to 16 from 75, and processing time decreased to two minutes from two hours.

From the late 1990s, the government began to emphasize cross-agency initiatives to provide integrated online services. As part of such efforts, the government commenced development of an integrated information system for all common services of local governments in 1997 and introduced an electronic document exchange service among government agencies in 1998.

On recognising that lack of coordination and cooperation among agencies had hindered further advancement of e-government towards integrated one-stop services, the government inaugurated the Special Committee for E-Government in January 2001 under the supervision of the President and involving independent experts and deputy ministers of related agencies. The special committee articulated the basic principles and directions of the e-government initiative:

- identifying high-payoff projects, focusing on multi agency IT initiatives which make use of existing resources and thereby eliminating redundancy
- applying IT only after business processes have been re-engineered
- integrating budget allocation

The special committee formulated 11 strategic initiatives for e-government in May 2001 and successfully completed them in October 2002. The 11 initiatives aimed at integrating and innovating government online services. The following projects were undertaken as part of these initiatives:

**Innovation of Government Services for Citizens (G2C and G2B)**

**Government E-Service Centre:** This project established a portal site and public information sharing system for five major databases in the areas of resident registration, property, vehicles, corporate sector and taxation.

**Social Insurance Service Portal:** This links four insurance services: medical, national pension, employment and accident compensation. It also provides one-stop services in these areas.

**Government-wide E-Procurement System:** A single procurement window was set up making all procurement-related processes available online, such as registration, tender, contract and payment.

**Home Tax Service:** This provides 24-hour online services for tax declaration and payment, document issuance and tax counselling.

**Improvement of Government Productivity (G2G)**

**National Financial Information System:** This was established for financial information sharing.

**Integrated Administrative Information System of Local Governments:** This integrates the information systems for all administrative affairs, such as resident registration and property, finance and tax, at the local government level.

**Educational Administrative Information System:** This is an online logistics system for school and educational administration that connects schools, education offices and the Ministry of Education and Human Resources Development.

**Personnel Policy Management System:** This is a standardised system for the whole human resources sector and includes recruitment, promotion, payment and training of public service personnel.

**Government E-Document Exchange:** This enables the preparation, approval, distribution and storage of all governmental documents to be done electronically.

**Infrastructure of E-Government**

**Government E-Signature and E-Seal System:** This sets out to ensure reliability in information distribution and electronic administration.

**Government Information System Consolidation:** This provides 24-hour professional services in securing information resources.

**E-commerce**

The size of the e-commerce market in Korea had already surpassed US\$44 billion in 2000. It was US\$63.7 billion for the first three quarters of 2001, of which US\$18.7 billion was transacted in the first quarter, US\$20.5 billion in the second quarter and US\$24.5 billion in the third.

**Business-to-Business (B2B)**

According to a survey on the e-commerce industry for the third quarter of 2001, the B2B market size was estimated at around US\$24 billion, a significant increase from the previous year. Specifically, buyer-centred trading took up 76.5 percent of the total with US\$19 billion. Collaborative trading among businesses was valued at US\$15 billion or 80.6 percent of buyer-centred trading. Trading at of the e-marketplace rose continuously to US\$845 million or 3.4 percent of B2B e-commerce, increasing 14.3 percent or US\$106 million compared with the previous quarter. The

number of e-marketplaces was 270 in the first quarter of 2002, rising from 218 in the corresponding period of 2001.

#### **Business-to-Customer (B2C)**

As of March 2002, there were 2,334 online shopping malls in Korea, increasing 15 percent from 1,900 at the end of 2000. Sales reached US\$321 million in March 2002. In 2001, large portal sites such as Daum Communications, Yahoo Korea and Lycos Korea appeared as profit makers in e-commerce. In the case of Daum, its e-commerce sales figure has surpassed that of advertising and is steadily growing at 20–30 percent every month. Books are the most popular items purchased online, taking up 19.3 percent, while computers, hardware and accessories, and home appliances are next on the list.

#### **Business-to-Government (B2G)**

The total B2G trading value in the third quarter of 2001 was US\$1.21 billion, involving 37 central government ministries and agencies and 19 local governments. It was estimated that the central government made US\$1.198 billion through B2G e-commerce, most of which through the National Procurement Service. Procurement operations, partially performed using EDI, have been expanded to 500 items since 2001.

#### **Financial services**

The number of Internet banking users reached 14.5 million in June 2002, doubling the total of 7.4 million users in June 2001. Almost all Korean banks offer Internet banking services, such as account enquiry and corporate loans. In particular, large banks are providing high-quality financial services such as B2B electronic payment, e-mail banking, and online customer relations management; and 18 out of 20 domestic banks are offering mobile banking services.

The number of securities companies offering online trading services increased from 27 in 1999 to 38 as of November 2001. Despite the inactivity of the stock market, the number of online traders and transactions increases continuously. Online trading increased from 56.9 percent of total transactions in 2000 to 63.5 percent in 2001. In terms of transaction amounts, online trading accounts for over 95 percent of the KOSDAQ market and approximately 75 percent of the Korean Stock Exchange's total transaction volume.

#### **Mobile commerce (m-commerce)**

After mobile Internet services were launched in 1998, the number of subscribers grew to about 23 million as of October 2001 and various kinds of services have been introduced. The market is estimated to grow to US\$3.5 billion by 2005. Venture companies have rushed into the mobile market as content providers, and a few have entered foreign markets. The number of registered companies providing mobile digital

content increased from 122 in 2000 to 378 in October 2001.

The number of subscribers to m-commerce in 2000 was one million, accounting for only 3 percent of all mobile service subscribers, but it is expected to increase steadily to 19 million or 45 percent of all mobile service subscribers by 2005. The B2B m-commerce market is expected to grow to more than 4.3 million subscribers, while the B2C market is anticipating 15.6 million subscribers.

### **ICT industries and services**

Korea's IT industry has recorded solid growth since the 1990s. In terms of production, the industry has grown tenfold, from US\$11.7 billion in 1990 to US\$115.8 billion in 2001. Despite the lacklustre economy in 1997 the industry showed a 30.4 percent growth, and it registered 16.7 percent, 30.4 percent and 23.3 percent growth in 1998, 1999 and 2000, respectively.

Exports by Korea's IT industry increased from US\$9.2 billion in 1990 to US\$38.5 billion in 2001. At the same time, imports increased from US\$7.5 billion in 1990 to US\$27.3 billion in 2001, recording a continuing surplus in the sector's trade balance. Major export items include memory semiconductors, mobile phones, monitors, LCDs, PCs and satellite broadcast receivers. Major import items include non-memory semiconductors, transmission equipment, mainframe computers, mini computers and work stations.

The total number of workers in the IT industry stood at approximately 447,000 at the end of 2001 or 2.1 percent of the total national workforce. Demand for IT human resources in other industries has steadily increased, and the number of IT workers throughout the whole economy reached 1,163,000 in 2001 or 5.4 percent of the total national workforce. This number is expected to grow continuously at an annual average of 4.4 percent, exceeding the 1.3 percent rate for all industries, and it is projected to reach 1,443,000 or 6.3 percent of the total national workforce by 2006.

The upsurge of the IT industry has benefited the Korean economy. The amount of added value realised by the industry grew from US\$25.9 billion in 1996 to US\$54.2 billion in 2001. Such high growth led to a considerable increase in the share of GDP contributed by the IT industry, which jumped from a mere 8.1 percent in 1996 to 13.0 percent in 2001 – the highest proportion among OECD member countries. The industry's contribution rate to Korea's real economic growth increased dramatically in the last decade, from just 4.5 percent in 1990 to 50.4 percent in 2000.

The continuing growth of the IT industry is driven by the expansion of domestic consumption and increase in exports. As such, even during times when the domestic market suffers a slowdown, growth is still possible through strong exports. In recent years, the share of IT exports has been around 40 percent of total IT production, which implies that the Korean IT industry has actively taken advantage of the rapid growth of the world IT market.

## Hardware industry

Korea's semiconductor industry has shown remarkable growth in the past 20 years and Korea ranks third in the world in terms of total production and accounted for 7.6 percent of the global market in 2000. In particular, Korea has secured a superior position in the development of next-generation products and technology through extensive facility investments to boost productivity in the memory sector including DRAM, which has captured approximately 40 percent of the global market. Korea has been the largest DRAM manufacturing country in the world since 1998 and has emerged as the second largest manufacturing country in total memory semiconductor production, of which DRAM constitutes a major portion.

As one of the major IT items produced in Korea, mobile phones recorded US\$10.5 billion in total production. In particular, exports increased from US\$446 million in 1997 to US\$7.2 billion in 2001. Korea, by being the first to commercialise CDMA technology, secured an unrivalled position in the CDMA mobile phone market. Moreover, by entering the GSM mobile phone market abroad, Korean manufacturers are diversifying their overseas markets. Currently, the proliferation of wireless Internet services and the introduction of third-generation mobile communication services are contributing to the growth of the mobile phone industry.

Lastly, Korean LCD companies are continually increasing their share of the global LCD market, which stood at 37.8 percent in the fourth quarter of 2000 and jumped to 41.5 percent in the second quarter of 2001. The competitiveness of Korean LCDs lies in well-developed related industries, such as computers and home appliances, as well as sophisticated mass production capacity built with huge facility investments.

## Software industry

The software industry's value has been rising continuously, and the proportion of this industry within the IT industry as a whole has been increasing from 5.0 percent in 1998 to 5.7 percent in 2000 and 7.4 percent in 2001. The contribution of this industry to GDP also increased to 1 percent in 2000 from 0.5 percent in 1998.

Computer-related service production in the domestic market set a record of US\$7 billion in 2000, growing 50 percent annually from US\$1.4 billion in 1996. System integration service is the biggest market with 64 percent of the total, and system management and maintenance service follows with 27 percent. Package software production has been growing at an average of 20.9 percent for three years between 1997 and 2000. Package software exports recorded a 98 percent annual growth between 1997 and 2000, with exports valued at up to US\$63.2 million in 2000 alone.

Korea's digital content industry is growing rapidly and expanding into the areas of webcasting, Internet music transmission and even movies requiring high bandwidth. It is noted that this rapid growth comes from the world's top-class broadband infrastructure. The growth rate was recorded at 101 percent for the domestic market.

## Telecommunications services

Korea first launched mobile communication services based on the analogue AMPS (Advanced Mobile Phone System) in 1984. R&D in mobile communications based on digital technology was carried out at the national level from 1989, and service providers adopted CDMA technology for the digital cellular system in 1991. The Electronics and Telecommunications Research Institute carried out R&D on CDMA technology in concert with Qualcomm in the USA and succeeded in developing the first prototype in 1994, finally launching the world's first CDMA commercial services in 1996.

All of these achievements led Korea to launch CDMA2000-1x, the first IMT-2000 service in the world, in October 2000, making it the world leader in CDMA technology. As a result, the number of subscribers exceeded 30 million as of March 2002, and the penetration rate stood at 63.8 percent with more than 7 million subscribers using IMT-2000 3G services.

Finally, Korea emerged as the most advanced country in terms of broadband Internet services, which were rolled out within an unprecedented short period of time. The total number of subscriptions stood at over nine million households as of June 2002. Contrary to doubts on the economic viability of this service at the outset, carriers were able to record profits during the first half of 2001 with tariffs set as low as US\$30 per month. The price of ADSL terminal equipment has fallen from US\$700 to less than US\$100, thereby making the service even more accessible to consumers.

## Examples of innovative and key initiatives

### Korea Information Infrastructure (KII)

As the strategic value of the information superhighway grew around the world in the early 1990s, the government prepared the master plan for KII in 1995. The goal was to build three kinds of high-speed networks by 2005: KII-Government, KII-Public and KII-Testbed. In 2000, when the second of the three stages was completed, high-capacity and high-speed optical transmission backbone networks were constructed throughout Korea. Many new technologies have been adopted, including ADSL, cable modem and satellite data communication, principally to increase Internet speed in homes. It is well known that this project paved the way for the successful rollout of broadband Internet in Korea.

## IT education for ten million people

To address the digital divide, the government has provided various educational opportunities to those who are “Internet illiterate” and has developed these into a systemic government-wide education project called “IT Education for 10M People”, which began in 2000. This project has educated many social groups of the “information have-nots”, including farmers, fishermen, housewives and the disabled. In 2002, the government attained the initial goal and set up the second-stage plan for 2002–2004. This project has been judged as a great contribution to the growth of broadband Internet and the IT industry by raising demand for IT.

## Small Enterprises Networking

Small and medium enterprises (SME) that employ less than 50 employees (including the self-employed), which account for 99 percent of the total number of SMEs, have been excluded from the benefit of IT owing to the lack of funding and skills. To improve this situation, the Ministry of Information and Communication and the National Computerisation Agency jointly drew up a plan for the Small Enterprises Networking Project in 2001.

This project aims to help small enterprises connect to broadband Internet and use IT services. In particular, industry-specific services, such as Internet-based point-of-sales service, and end-user training are provided. Small enterprises, which are not even equipped with basic e-business infrastructure, can be provided with PCs or wireless Internet-enabled PDAs and terminals equipped with the functions of Internet phone, credit card inquiry, PC, etc. Charges for these services are set at a minimal level to ease the burden on small enterprises.

## Enabling policies

During the 1990s, the government established two master plans for the development of an information society: the Informatisation Promotion Basic Plan in 1996 and CYBER KOREA 21 in 1999. Through these plans, the government has brought Korea one step closer to the realisation of an information society with the construction of an advanced information infrastructure. However, Korea is now facing great challenges to increase the real value of IT investment.

The government established e-Korea Vision 2006 as the third master plan in April 2002, focusing on improvement of national productivity and individual quality of life through informatisation. This plan differs from the preceding master plans in that it presents more progressive and concrete directions. These directions are as follows:

- To promote informatisation in a result-oriented manner beyond the quantitative expansion of Internet diffusion, endeavouring to improve social systems in general and enhance productivity by reforming methods of conducting business.

- To set a new relationship between the government and the market. In other words, the role of the government will be restricted to laying the foundation for the knowledge-based economy to maximise autonomy and creativity of the private sector.

- To pursue a lead strategy in key technologies and services rather than a catch-up strategy, as was mapped out in the past.

## Increasing the value of IT in every sector of society

The first strategy is to expand digital opportunities for people by maximising the IT capability of all citizens. The government plans to expand the Internet user base to 90 percent of the total population by 2006 and to intensify IT education focusing on high-level education. Another plan is to foster lifelong learning systems, such as online learning, and also to raise the ratio of adults participating in lifelong learning from the current 17 percent to 30 percent, the average level of OECD countries.

The second strategy intends to elevate industrial productivity to the level of G7 countries. In particular, construction of B2B networks in 50 types of businesses will be promoted by advancing standards, logistics and payment basis that are the core foundation of e-commerce. The rate of electronic transactions in core industries such as electronics, shipbuilding and automobile manufacturing is to be improved from the current 4 percent to 30 percent. Moreover, efforts will be made towards securing the environment for online transactions by promoting the use of an online authentication system and additional measures designed to protect consumers.

The third strategy plans to upgrade and expand online services to all areas of the civil service by 2006 on the foundation of the e-government platform completed at the end of 2002. Customised online services will be introduced in the e-government to raise the level of service to citizens through the adoption of CRM technology. At the same time, the foundation for a mobile government will be established.

## Upgrading information infrastructure

High-speed Internet of at least 1 Mbps is to be considered as “social overheads capital” to ensure that every citizen has access to it at a low charge anywhere in the country by 2005. Conversion to Internet protocol version 6 (IPV6) will be carried out to solve the problem of IP address availability in IPV4 and to provide more stable Internet services. Considering future technological developments, an environment for mobile communications will be established to allow the use of high-speed wireless service at the speed of 2 Mbps through various wireless terminals.

Policies to ensure safety and reliability in cyberspace to counter information security problems are being developed more intensely in an advanced IT environment. Continuous efforts are also being made to offer the latest technology for a next-generation information infrastructure.

**Strengthening international collaboration**

e-Korea Vision 2006 will strive to share Korea’s advanced informatisation experiences by actively participating in various international organisations, such as OECD, ITU and APEC, and expanding its contribution to the global information society by cultivating IT manpower in developing countries to close the international digital divide.

**Regulatory environment**

The government has supported continuous improvements and revisions of related laws and regulations to accommodate rapid changes in an information-based society and the revolutionary development of digital technology. The government has annually selected, enacted and revised 190 IT-related laws and regulations.

*Framework on Informatisation Promotion Act*

Enacted on 4 August 1995, enforced in January 1996 and partially amended in January 1999, this Act aims to consistently and efficiently promote the activities driven by government institutions, such as informatisation, infrastructure building for information and communications, and KII Project management at the national level. This is a basic Act on the national informatisation policy and stipulates the establishment of the master plan for informatisation promotion, fostering of information and communications industry infrastructure, upgrade of information and communications infrastructure, and operation of the Informatisation Promotion Fund.

*Utilisation and Security of the Information System and Protection of Personal Information Act*

This Act, enacted on 16 January 2001, is a representative law regarding the use of the information and communications network. It stipulates the preparation of a policy for promoting utilisation of the network, securing Internet address resources, digital messaging usage, protection of personal information of ICT service users, protection of youth from lecherous and violent material, security of the network, control of copyright infringement on the network, and restriction of unsolicited commercial e-mail “spam”.

*Digital Signature Act*

This Act deals with the use of public key infrastructure to ensure the security and reliability of data messaging and to promote its usage. It was enacted and promulgated on 5 February 1999 and enforced on 1 July of the same year.

*Framework on E-Commerce Act*

Enacted on 8 February 1999, it stipulates the basic issues related to e-commerce, such as vesting the digital document with the same level of legal effect as that of a written document, securing the reliability of e-commerce, protecting consumers and driving forward the policy for e-commerce promotion.

*Promotion of the Digitisation of Administrative Work for the E-Government Realisation Act*

This was enacted on 28 March 2001 to improve productivity, security and social equality of administrative institutions, as well as to promote the digitisation of administrative work, such as digitisation of administrative management, service digitisation, reduction of documentation work and promotion of e-government.

*Management of Digital Content Act*

This was enacted on 28 January 2000 to promote the digitisation of public analogue content and the flow of digital content so that the public and private sectors can actively utilise information and knowledge resources, scattered across the central and local governments and other public institutions.

*Closing the Digital Divide Act*

This was enacted on 16 January 2001 to narrow the gaps in the access to and use of IT by helping low-income earners, the disabled and the elderly, who are at a disadvantage because of economic, physical and social conditions.

*Protection of Major Information Infrastructure Act*

This intends to establish a systematic and comprehensive counter-measure for the protection of major information and communications infrastructure against illegal access and computer viruses which are becoming more serious as the dependency of major social infrastructures on the information and communications system grows. It was enacted on 26 January 2001.

*Privacy Act*

This was enacted on 7 January 1994 and enforced on 8 January 1995. It aims to prevent invasion of privacy as a result of inappropriate usage and illegal access to personal information, which is more likely to occur with increased computerisation of businesses and the establishment of a nationwide administrative computer network. It clearly specifies the criteria for the collection and processing of personal information and guarantees various rights for the information owner with regard to disclosure and correction of personal information.



*Public Record Management of Public Institutions Act*

This law intends to establish a uniform organised system for the collection and maintenance of public records in institutions such as the National Assembly, the government, courts of justice and local self-governing bodies. It was enacted on 29 January 1999.

*Software Industry Promotion Act*

This law resulted from the amendment of the *Software Development Promotion Act* in January 2000. It systematically stipulates the establishment of a middle- and long-term basic plan for software industry promotion, infrastructure development for the industry, such as a software promotion facility and complex, professional manpower training, etc. The aim is to comprehensively develop this core industry, which may determine the national competitiveness in the information-based society of the 21st century.

*Consumer Protection in E-Commerce Act*

Defining fair transactions of services and goods in e-commerce and telemarketing, this Act protects consumer rights, boosts market confidence and promotes the development of the market economy.

**Laws on Protection of Intellectual Property Rights**

The development of digital technology and the Internet has made effective protection and application of intellectual property rights, such as copyright, patent and trademark, more important. The amendment of the *Copyright Act* in January 2000 stipulates the transmission rights of copyright holders and allows replication and transmission between libraries via data processing devices. In addition, the *Computer Program Protection Act* was amended several times to establish computer program transmission rights, banning activities that incapacitate technical protection measures.

**Open source movement**

Open source software (OSS) began to be developed in the late 1980s with the spread of UNIX systems. Most of the early OSSs were related to the Korean language. For example, Hanterm, the oldest and most popular OSS in Korea, was a Korean language font software. In the mid 1990s, the rapid diffusion and adoption of Linux across the world encouraged investments in developing and commercialising OSS in Korea. However, the movement has recently slowed down considerably because of its failure to derive profit from its work, as well as due to the general slow down of the new economy in Korea.

**Research into ICTs**

Developing advanced ICTs

In 2000, the government designated 174 core technologies for development, investing US\$120.7 million in order to gain a technological competitive edge in the world market. These technologies include the next-generation Internet, optical communications, digital broadcasting, wireless communications and computer software. Accordingly, Korea has made more than 1,000 patent applications related to these core technologies in and outside the country. In addition, the government has improved the appraisal system for the selection of research subjects and has helped establish effective research management methods for the efficient utilisation of R&D funds and for maximising the benefits of R&D. At the same time, the government is concentrating on the development of innovative technology that forms the basis of securing sustained national competitiveness in the future. Private sector investment in this area is low since commercialisation in the short term is generally not feasible.

Promoting basic research in ICTs

The government invested US\$88.4 million in the first half of 2001 to support R&D activities of small and medium-sized venture businesses, develop information and communications policies, establish e-libraries and construct the next-generation Internet platform. The government continually looks at leading technologies appraising their technological and commercial merits, providing marketing and commercial support in order to create demand. In addition, it established a Test Support Centre for Optical Parts and Systems at the Gwangju Optical Industrial Complex for developing a quality control system for optical communication systems.

Development of IMT-2000 and wireless Internet technology

The government implemented a technology development plan focusing on WCDMA from 2000 to 2001. With standardisation of post-IMT-2000 technology, many countries will be undertaking further development in this field, thus Korea needs to prepare a development plan for fourth-generation mobile communications by securing cutting edge technology for the long term. Moreover, the government plans to invest a total of US\$4.6 million for technology development in the wireless Internet industry.

R&D of network equipment for high-speed information infrastructure

The development of network equipment technology for high-speed information infrastructure is divided into the HAN/B-ISDN and MPLS projects. The HAN/B-ISDN project

concerns the development and commercialisation of the ATM optical transmission equipment, which is a critical component of the high-speed information network. The government invested US\$527 million in 1992–2001 in these projects. The Multi Protocol Label Switch (MPLS) project deals with the development and commercialisation of MPLS technology to obtain functional improvement of the ATM exchange. This project was injected with investments of US\$173.5 million in 1999–2001.

### Promoting standardisation in ICTs

In order to provide a favourable environment for ICT usage and to encourage the industry to advance into the world market, the government has developed and disseminated ICT standardisation criteria. In addition, to improve the testing and certification systems in the telecommunications sector, the government has improved the process for regulating technical standards to meet the rapid development of IT and changes in the competitive structure of the telecommunications market. For this reason, the government revised the regulation of the technical standards for telecommunications facilities in August 2001. Moreover, it is making improvements to the certification system for telecommunications equipment and promoting mutual recognition between nations in order to overcome technical barriers to trade.

### Future trends

Since the 1990s, Korea has experienced three stages of IT development. In the first stage, the government successfully completed the construction of basic databases in the mid-1990s. After that, Korea entered the second stage to develop and promote online services in government, business and community, as well as to connect the whole country with a high-speed network. At the turn of 2000, the third stage began for integrating different information technologies, services and institutions.

The integration stage is expected to bring about considerable changes and improvement in the way the Korean society works. However, it will be a much more

difficult task than the previous stages. Integration will be accompanied by various political, economic and technical problems, such as conflict of interest, lack of funds for joint IT projects, and a weak foundation for system interoperability.

In order to successfully cope with the challenges and problems of the integration stage, Korea needs to change its IT strategies and policies. Technology-centred approach, which has enabled successful rollout of broadband Internet, will not be effective and efficient anymore. Instead, institution-centred approaches, focusing on business process reengineering, human resource development and institutional development, will be very effective. The performance of IT investments will be evaluated not by tangible achievements but by the value they create for society.

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