E-government and the impact of information and communication technology
in the business world of Shenzhen, China.

DENG Ping, Director
Shenzhen Statistics Bureau
No.1 Tongxin Road, Shenzhen,
518027, P.R. China
e-mail: dengp@sz.gov.cn

Abstract

China is a developing country. Shenzhen, not long ago a small town with very little industry, was
given the status of a special economic zone and has since become one of the 4 most powerful cities
in China.

The paper will expound the great contribution of the information and communication technology
in Shenzhen’s economy. In particular, it will deal with e-government and the impact of information
and communication technology in the business world of Shenzhen.

The first part will be about e-government and the impact in the business world of Shenzhen. It
will mainly describe the present state of e-government and its impact in the business world.

The second part discusses the impact of information and communication in the business world of
Shenzhen. It will state that information and communication have exerted great influence and drive
in the mainly industrial Shenzhen.

In the third part, it will be shown that, in future, information and communication will be a major
factor for Shenzhen’s development.
China, as a developing country, is being transformed from a traditional system of planned economy to that of socialist market economy. During this great reform, Sense Special Economic Zone, which was a frontier town with simple and small throughput in 1979, is now listed as one of top four cities in economy in China. GDP of Sense has been developed from 196 million Yuan (RMB, the same below) to 190.815 billion Yuan in 2001, and its per-capita GDP develops from 606 Yuan in 1979 to 42323 Yuan (to be converted to USD 5114 or so) in 2001. During 23 years from 1979 to 2001, GDP of Sense at an average annual rate of 29.51%. It has created splendid achievement that attracts the attention of the world and it is now, according to the national requirement, marching towards the target of taking a lead in basically realizing modernizations. A lot of supporting factors account for the economic achievement of Sense, in particular, the special economic zone (SEZ) policy in the 80th and IT in the 90th. IT, which has found its deeply felt influences in every line in Sense, has become one of the most important factors of promoting the progress of productivity.

All previous and current government leaders of Sense attach great importance to the development and application of IT. Not only has a special informationalization management organization been established and have preferential policies of developing informationalization been issued, but also it has taken a lead in utilizing IT in the governmental departments, so that Sense has become one of the cities with the earliest “e-government”. At present, the rudiment of “e-government” has come into being. “e-government” mentioned below just refers to this rudiment.

I. E-Government and the impact of Sense upon the Commerce

i. Present Development Situation of the E-Government of Sense

The e-government mainly features normalized and electronized implementation of the daily work of the government and the basic realization of the work in the public network. At present, Sense is carrying out items according to the requirements set in “Sense E-Government Planning” one by one and marching towards the target of e-government.

1. More and More Perfect Infrastructure

World-shaking changes happened in the information and communications network of Sense nearly through 20 years of construction and development. Institutions engaged in the information and communications network construction and operation have developed from the original one, Sense Telecom to seven, Sense CATV, China Mobile Telecom, China Unicom, China Jitong, China
Netcom, Great Wall Broadband, etc., with various businesses developing very fast. Sense Telecom has built up a high-speed telecom network that covers the whole city mainly by means of fiber cable, integrating the digital transmission and program control switching into a whole. The fiber cable network has been established for 60 governmental office buildings at the municipal and district levels so that the convenient high-speed access measures of establishing fiber cable in buildings and residential and office quarters has been realized, such as ISDN, ADSL, PSTN, DDN, frame relay, wireless access, composite broadband access, etc. An open business platform is under construction, so as to efficiently support the information application development and that of the information industry in Sense. Its communications capability, technical layer and service have reached the international advanced level. In addition, features of HFC structure, broadband and high speed of Sense CATV have been fully utilized so as to realize the comprehensive application of CATV network and the co-cable transmission of three networks of image, data and telephone, and provide transmission services of digital TV, NVOD and digital information, as well as conference TV, tele-medical treatment, tele-education and family shopping. In the internet access services that are offered to the market there are 1000 ports.

2. Construction of the Application System

(1) Sense Information Network established by the municipal government of Sense, is a comprehensive computer information network system that is composed of Sense Municipal Leaders’ Office Service System, Sense Municipal Government Information Service System, Sense Municipal Cadres’ Web Institute, Sense Social Information Service System, Sense Statistics Automation System and Statistics Information Exchange System of Big and Middle-Sized Cities in China, etc., aiming to provide an open and mutually-connected environment and public exchange platform for the information construction in Sense and promote the information of the national economy of Sense.

In the perspective of network technology, Sense Information Network is a comprehensive broadband multimedia on the basis of ATM technology and internet technology. It fully utilizes the post and telecommunications network and CATV network to set up a uniform communications network exchange platform for the municipal government and authorities.

In the perspective of system features, Sense Information Network, which has adopted a variety of advanced technologies, is very good in function integration, with many services, supporting energetically the national information industry. It starts at a high point in technology, is advanced in both platform and network, integrates the party and political organs into a whole and covers a wide range. It has innovative information service means and methods. Firstly, those of the same line in China have apprised VOD system records news reported by CCTV and other stations to the VOD server on time, for the reference of municipal leaders of Sense at any time. Secondly, it accesses the real-time dynamic video supervision signal to municipal leaders’ desk top, so that leaders can see what is actually happening in important places such as every road, port, reservoir, etc. In particular, when dangerous situations or sudden accidents happened, leaders can see the situation on the spot directly in their office so that they can make their decisions and give instructions as soon as possible.
The networked office system of various functional bureaus and offices of the municipal government has been completed. The networked office or file manipulation is realized for bureaus and offices. For example, the direct network report system in the Tax Bureau and Statistics Bureau, makes possible direct tax-paying and statistic data report in the enterprise and it is thus unnecessary to send people to go through procedures concerned in the functional authorities.

In sum, Sense is well prepared for the basic conditions of “e-government” and the information expressway branches have been established. It will work only if they are connected with main trunks. According to the requirement of planning of the government, various functions of “e-government” will be basically realized in 2003 and perfected in 2004.

ii. The Influence of E-Government on Commerce

The influence of e-government on the commerce is mainly reflected in the optimized environment. Firstly the work efficiency of the government has been obviously improved; and secondly, the communications between the government and various circles of the society has become faster and more convenient. The cost of communications between the enterprise and government and society has been greatly reduced and the efficiency increased. Of course, it is obvious that the government plays a direct role in the society.

1. E-Government Has Efficiently Improved the Investment Environment

As stated above, Sense municipal government has basically realized the internal network office, and more than one half of the government affairs have realized the network operation in the face of internet. Network ratification, network complaint, network inquiry, etc. have been applied widely, as has much increased the transparency and efficiency of government affairs, and efficiently improved the investment environment. Sense has thus become one of the most excellent cities in the investment environment in China.

(1) The e-government has improved the transport environment.

Sense, covering an area of 2020 square kilometers, has a population of 7 million (including a floating population), nearly 400,000 automobiles and 2197 kilometers of roads, including 157 kilometers of expressway. In such a case, it is very difficult to keep smooth transport and orderly operation. After the electronic operation is introduced to Sense Transport Administration Bureau, the orderly administration in the transport operation has been basically realized. That is to say, the administration efficiency, transport order and all the social environment quality have been improved. In the electronic operation of the Transport Administration Bureau, what deserves to be mentioned is the real-time supervision system. Pickup heads are found in all the thoroughfares and most of the crossroads and the transport situation in Sense is sent to the Transport Administration Bureau in real time. By the assistance of various propagandas by TV and broadcasting stations, the phenomenon of violating traffic regulations can be efficiently checked, so as to reduce occurrences of traffic accidents. For example, in 1996, vehicles in Sense totaled up to 221885, and there were 1278 traffic accidents that year; and in 1997, “the real-time supervision system” began to be put into use. In
1998, there were 244050 vehicles and the population increased by 370,000 compared with that of 1996. However, there were only 1288 traffic accidents that year. That is to say, when vehicles and population increased by 10%, transport accidents only increased by less than 1%, decreased by 11.2% compared with those of 1997.

(2) E-government has solved the bottle-neck problems in foreign trade.

Sense is a city with the export-oriented economy, taking the industry as the guide and export as the support. The ratio of three industries in Sense is 0.9:52.6:46.5. Its export has ranked the first among big and middle-sized cities for continuous nine years. Its total import and export volume hit USD 68.620 billion in 2001, including the export of USD 37.480 billion. This achievement can hardly be achieved without the giant contribution of “e-government”. Since Sense neighbors Hongkong, a lot of cargoes for export or import should go through the customs of Sense. Various container trucks queued up to go through the customs of Sense each day before, and has seriously affected the circulation rate and limited the volume of trade. Through efforts made by the customs of Sense, electronic operation has been realized and the efficiency of key links such as applying to customs, check, tax payment, etc. has been obviously improved and the circulation rate has been doubled, so that the foreign trade development has been greatly promoted.

(3) The e-government in each department has played an active role in the improvement of the investment environment.

E-government in each department has produced positive effect for concerned business. For example, the electronic industrial and commercial registration has sped up the birth rate of enterprises; the networked tax report has reduced the production cost; the direct network report of statistics data has improved the data quality and data production speed, so that the statistics consultation service in face of the society has reached a new level; the e-transaction in the real estate, has made the stock and its price in the real estate market become more transparent and increased the volume of trade of the real estate; an e-personnel department has made clearer the status quo of human resources (allotment, use, etc.) in the society; e-planning, programming and construction have made fairer and more reasonable the establishment, ratification and construction work of projects due to their normalization and transparency; an e-security department has obviously improved the working efficiency of the public security, so as to make people’s life much more convenient. For example, the normal overseas business travel has been more convenient since the procedure for a certificate has been sped up.

2. E-Government Has Promoted the Realization of the Network Function in Commerce.

At present, there is an essential difference between developing China and developed countries in Europe and America: socialist China is now in the important stage of structural reforms, and state-owned economy is the main composition of Chinese economy; although the State supports co-existence and simultaneous development of several ownership systems, and the State is weakening its management for enterprises and transforming the management to macroeconomic regulation as main management method, in view of present situations, the condition of state-owned economy being main composition of Chinese economy remains difficult to change. Therefore, as
compared with developed countries in Europe and America, Chinese Government has greater management effect and influence on the enterprises and the society. In such a macro environment, Sense Municipal Government takes the lead in offering online official service, which produces positive effect on all walks of life. Business circle is the first to respond, and many enterprises purchase equipment and offer online office within them. Enterprise groups, financial institutions and large department stores all have established their electronic network and many of the enterprises enjoy the benefits from information network and enter the international cycle in advance. For example, in international petroleum price, in the past the enterprises obtained the price information from consultation companies, but now they obtain the information through direct inquiry at websites, reducing intermediary links and costs.

3. E-Government Reduces Distance between Enterprises and Government

The government releases its public information to various stratum and corners of the society at real time, and there are various electronic screens in all major public places in the city, with touch screens distributed in the information points in a reasonable way. The public can search for public information and commercial information of the governments easily, quickly and free of charge (for example, schedule flights and airline tickets), and thus working efficiency of the governments and efficiency for the citizens to handle business are substantially increased.

In short, e-government has produced deep effects on business circle, and with its increasing perfection, its influence will be further increased.

II. Influence of Information Technology on Business Circle

Science and technology are No.1 productive forces. We all seem to understand this truth, but it is not easy to fully understand its meaning and commit to actions. Since the 1990s, when Sense gradually lost its superiority in policies, views and structural systems, it regulated its policies at proper time, formulated development strategy with foresight and wide views, laid great emphasis on the key problem----technological innovation and increasing scientific and technological level, and took many practical and feasible actions. The government constantly offers and periodically perfects the preferential policies for production and development of hi-tech products, and all the trades gradually increase their investment in R&D every year. The result of China’s R&D resource clearing in 2000 showed that in Sense the investment in R&D accounted for 2.9% of its GDP, equivalent to that of developed countries in 1997 and ranking at the second in medium- and large-scale cities in China. This percentage is quite high in developing China. That results in high-speed development of hi-tech industry, pushes the sustainable and steady growth of Shenzhen’s economy and makes Sense to still become the city that develops the economy fastest in China. At present, the output value of its hi-tech products accounts for more than 42% of its gross industrial output value. In Sense, more than 90% of these hi-tech products are IT products. A lot of information technologies in Sense are at relatively leading positions in China, for example comprehensive business wide-band accessing technology of Huawei Group and Zhongxing, high-resolution digital TV technology of Konka and Chuangwei, prior and subsequent working process of large integrated circuits as well as high-power semi-conductor project of SEG and Xianke. In addition, there are several world-class new technologies. By relying on IT technologies, IT products in Sense are not only produced at a large production scale, but also they are of high
quality and sell well, and enjoy high reputation in China, so that “headquarters being set up in Sense” becomes a superiority in product marketing. Since IT technology is the one with high penetration and diffusion, it can be spread to almost all the social and economic fields, including agriculture, industry and service sector, ranging from automatic control of production line to various IC cards and certificates, all of which contain information technology. People perceptibly or imperceptibly enjoy conveniences brought by it. Therefore information technology almost produces increasingly profound influence on all walks in Sense and effectively pushes progress of productive force. The industry benefiting most from such influence is information equipment manufacturing industry, and information service sector and financial sector also are flourishing vigorously, being pushed by information technology.

(1) Information equipment manufacturing industry has been an important pillar of Shenzhen’s economy

Electronic information products of Sense experience a development process from processing materials supplied by customers to developing their own products, developing from large traditional processing and manufacturing to owning a batch of hi-tech and transforming from production of “light, small, fine and new” products to operation at a scale. Through development of twenty years, up to now, it has formed eight production bases including computers, program-controlled switching systems, telephones, special-use integrated circuit designs, photoelectrons, audit and video equipment, network system integration, and software. Various electronic component manufacturers are distributed all over in Sense as flagship as well as surrounding areas and Pearl River Delta, and form strong supporting capability. At present, more than 95% of components needed for consumable electronic products are supplied locally, and parts and components are locally supplied for 3,000,000 or more floppy disk drives, main boards and magnetic heads of computers, and more than 90% components are locally supplied for computer and communication products. Sales amount of electronic component market in Sense ranks at top position in Chinese electronic market. In 2001, in information equipment manufacturing industry in Sense, the output value of only electronic and communication manufacturing industry reached RMB157.4 billion, representing 51.12% of gross industrial output value of Sense. Local key enterprises such as “Great Wall”, “Konka”, “Huawei”, “Zhongxing”, “SEG” and “Huaqiang”, plus domestic famous enterprises such as “Chuangwei”, “Legend” and “Beida Fangzheng” moving to Sense, and transnational companies such as “IBM”, “Compaq”, “Seagate”, “Sanyo”, “Xeron”, “Phillips”, “Nortel” and “Lucent” take part, Sense has become significant production and development base in complete sets of computers, mass general-purpose digital switching system, cordless telephones, digital mobile communication, wireless access, optical fibre and optical fibre cable, wireless paging, liquid crystal displays, color TVs, and colour monitors. The statistics data shows that most of electronic information products of our city are for export, and their export amount accounted for more than 50% of the total export amount. Among all the industries, electronic information industry makes the greatest contributions to economic growth and export. We can say that IT industry is a major factor to push economic growth of our city.

1. Computers

In 2001, 1642200 microcomputers were produced in this city, increased by 13.6% compared with that of last year. The output of hard disk drives was raised from 2000000 drives in 1999 to
11170000 drives in 2001. The hard disks manufactured by Sense Seagate Company occupy about 15% of international market. The output of magnetic heads manufactured by Development Technology Company ranks at a significant position in the world. The production of main boards, various adapter cards, switches and power supplies of computers is in leading position in the world. Since 1999, the microcomputer industry of Sense started to transform from part and component processing trade as major production manner to industrialized production of complete computers, which accounts for more than 40% of total output of microcomputers in China. In addition, the products and enterprises related with digital network technology also present the trend of rapid growth.

2. Communication equipment manufacturing industry
In 2001, the communication equipment manufacturing industry of our city was developed steadily, and program-controlled switching systems with 29943000 lines were produced in the city in the whole year. Its digital program-controlled switching system industry represented by Huawei and Zhongxing is outstanding in the same trade in China. In 2001, 29660000 telephones were manufactured in the city, and the telephone terminal equipment represented by Euclidian, Yuehai Communication and Wonderful ranks at an important position in China. The foreign wholly owned enterprise Euclidian Electronic (Sense) Company is the largest-scale cordless phone manufacturer in Asia at present, which was set up with an investment of US$50,000,000 and monthly production capacity is 1000000 cordless phones. The mobile phones produced by Kejian Group fill in the vacancy of mobile communication products in our country. The telephone products of our city are developing towards multimedia intelligent terminals, fully digital phones adaptable to comprehensive digital network, video phone-terminals and other leading products.

3. Micro-electronics and components
In recent years, annual production capacity of post packaging of super-large scale integrated circuits of Sense is increased substantially, with its actual output of 961 million circuit boards in 2001. The State appointed 8 design enterprises for integrated circuit “909” project, of which four are situated in Sense. Most of IC design enterprises of this city are able to develop and design the products by themselves. Sense has become one of major integrated circuit packaging and testing bases in our country. SEG-Italy-France Micro-electronics Company and Xianke Electromechanical Equipment Company and Tianma Micro-electronics Company are cutting a figure in micro-electronics industry.

4. Audio and video industry
In 2001, 6600000 colour TV sets were produced in Sense, which thus becomes the first largest production base; besides, 7740000 radio recorders and 8780000 color transistor glass bulbs were manufactured. Sega Hitachi and Zhongkang Glass have become the major picture tube and glass bulb production bases in China. The output value of Konka broke through ten billion RMB yuan as early as in 1998, realizing sales amount of RMB10.53 billion and producing 3200000 colour TV sets.

(II) Information technology has become the core of finance industry
Finance industry is one of the industries that established information networks earliest in Sense. In the keen competition, the banks, funds companies or securities companies all put the task of
increasing information level and offer quick and convenient services to customers above everything else, and have spent a large quantity of manpower, properties, and funds on that. All of them realize online office service. The whole finance industry also really enjoys benefits from the networks and increases working efficiency substantially and obtains generous returns. For example, in banking industry, all the banks have established powerful network systems, and online banks are widely applied. Some of the banks determine employee salary class according to employment posts. The post gaining the highest scores is not operation department or administration department, but computer application department. It is worth mentioning that among the banks in Sense, the bank that lays more emphasis on information technology can obtain better benefits. In Sense, the bank that gains the best benefits is the one that lays the most emphasis on information technology. Thanks to the view of laying much emphasis on information technology in finance industry of Sense, economic benefits of the banks in Sense ranks at the first place among the banking industries in medium- and large-scale cities in China. In recent three years, in spite of the fact that in China the banking industry in many cities were in depressed state and its profit was negative, the banking industry of Sense still developed rapidly at an annual average growth rate of 26.46%, and always maintained a good performance, with no bank making deficit. In 2001, the deposit balance of all the financial institutions in Sense was RMB409.257 billion, increased by 29.2% compared with that of last year, and their loan balance was RMB286.075 billion, increased by 24.8% compared with that of last year.

(III) Information service sector develops rapidly

Nowadays the information service sector of Sense is developing smoothly. Of over 3000 information service enterprises in this city, more than 2000 enterprises are information consultation and service enterprises, and finance, securities, laws, real estate and computer value-added services are becoming hot spots of information consultation and service market.

1. Modern information service sector----emerges like bamboo shoots after a spring rain

In recent years, with high-speed development of the Internet economy in the world, various kinds of information service institutions are developing rapidly like the bamboo shoots after a spring rain. These institutions are of many kinds and their services cover a wide scope, and have formed an industrial sector with initial features. Currently in this city there are more than 3000 authorities, institutions and enterprises that have registered their domain names on the Internet and registered over 3250 independent websites. Now in this city there are about 600,000 network users of various kinds and more than 450 enterprises are mainly engaged in database service and Internet service. Online office, online transaction, e-report to taxation authorities, e-declaration to the customs, online shopping, online banks and online securities transaction are widely applied. In addition, online hospitals and online colleges and universities, and other online service items have emerged.

2. Advertising sector --- per capita advertisement volume ranks the first in China

As information technology keeps developing, creative advertisement, design and fabrication level are constantly improved in Sense. There are more than 100 advertisements won prizes in international, national and provincial best-advertisement contests. Meanwhile, a group of
advertisement operators with high design and fabrication quality and large scale also have emerged in Sense. The advertisement operators in Sense are increased from 103 enterprises in 1991 to nearly 1000 enterprises at present, and employees in advertising sector are increased from 1400 persons in 1991 to nearly 10,000 persons at present. Advertising business volume is increased from less than RMB 235 million in 1991 to more than RMB 2 billion at present. Although there are relatively fewer advertising media in Sense, its per capita advertising fee ranks among the top ones in China.

3. Computer software industry ----has huge potential

Software industry is relatively pure IT industry, and its main investment is manpower. Sense Municipality is one of the cities that established the software industry earlier in China, but its operation is not satisfactory, and its development scales and benefits cannot cater to the development of Shenzhen’s economy. Currently, there are more than system integration enterprises, and about 10 enterprises that are specially engaged in software development and have formed their unique features. Of these software enterprises, Wanguo Software Company under Sense University has strong strength, and its advantage is to develop banking business processing software, system analysis software and supporting software; Golden Disc software has its unique features, and occupies shares of a high percentage in domestic market; Yadu’s geographic information system software, China Banking System’s financial accounting software and Yuanwang Town’s multimedia software are representatives of software industry of Sense. “Yuanwang Town”, “Dawn”, “Legend”, and “Modern” are developing from software developing to system integration and become the outstanding companies of Chinese software industry. In short, Sense is leading in the development and application of securities software, education software, finance software, and geographical information system and multi-media technology in China. Presently related authorities of Sense Municipality are paying close attention to the development and construction of the software industry park, and taking a series of preferential policies and necessary measures to turn its backward state. The software industry is expected to develop faster in the coming years.

4. Books, publishing, printing, radio broadcast, television, movies, post and telecommunication, and other information service sectors also make remarkable achievements.

In addition, it is expounded in the influences of e-government on business firms that information technology also produces deep influences on commerce, trade and other fields, therefore it is unnecessary to go into details here.

III. Summary

Information technology is exercising extremely deep influence on the development of national economy and society of Sense, and brings about world-shaking changes in commerce. By relying on information technology, Sense practise the objective of creating new superiority, and scaling new height, sets forth the new idea of “pushing Shenzhen through information to become the first to basically realize the modernization”, determines the development strategy of giving priority to developing information industry and increasing information level, and speeds up the construction of “e-governments”. It can be predicted that in subsequent development, information technology still will become one of the most important factors for pushing rapid development of national economy and society. E-government also will play a greater role in increasing the competitiveness of Shenzhen and making Shenzhen to merge into international trade system as soon as possible.