Chapter 14

Information Technology

14 INFORMATION TECHNOLOGY

I. INTRODUCTION

14.01 The advent of the Information Age, where information has become the cutting edge of global competition, has thrust Information Technology (IT) into the forefront of national socio-economic development. IT has been recognized as a strategic enabling tool to support the growth of the Malaysian economy as well as enhance the quality of life of the population. During the Sixth Plan period, substantial investments were directed towards laying the basic IT infrastructure as a step towards establishing a sophisticated network of facilities and services. Consequently, there was an increasing usage of IT in both the public and private sectors to improve efficiency, productivity and overall economic competitiveness. To provide a more formal and focussed structure for IT policy and programmes, the National Information Technology Council (NITC) comprising members from the public and private sectors was established.

14.02 During the Seventh Plan period, advancements in IT are expected to have a significant impact on the development process and lifestyle of the population. Recognizing the potential of IT, efforts will focus on promoting its extensive application and usage. In this regard, IT infrastructure will be expanded and a number of national IT-related programmes and projects implemented to accelerate the wider use of IT in the various sectors of the economy. This will enable Malaysia to sustain its competitiveness in the emerging digital economy as well as attract new investments and create economic opportunities in IT-related activities and services.

II. PROGRESS, 1991-95

14.03 Both the public and private sectors undertook investments in computer hardware and software to facilitate the use of IT in providing goods and services

more effectively. The development of IT infrastructure, such as the telecommunications network as well as IT-related services and training, was expanded in tandem with the demand for such facilities and services brought about by the increased investment in IT.

Use of IT

14.04 Recognizing the strategic role of IT in enhancing productivity and competitiveness, investment in IT grew rapidly at an average rate of 24 per cent per annum from RM1.3 billion in 1990 to RM3.8 billion in 1995. The number of personal computers (PCs) also increased substantially from 160,000 units in 1990 to 310,000 units in 1995.

14.05 In terms of IT expenditure by sector, banking and finance constituted the largest share or 27 per cent of total expenditure in 1995, as shown in *Table 14-1*. This was followed by the manufacturing sector which accounted for 13 per cent of total expenditure, a doubling of the share recorded in 1990. Other sectors that invested substantially in IT included Government, oil and gas, distributive trade and utilities.

14.06 The *banking and finance sector* invested substantially in IT as part of its efforts to improve customer service, increase productivity, reduce costs and generate revenue from enhanced product offerings. In this regard, new technologies enabled banks to provide customers with additional facilities such as home-banking, remote banking, integrated account statements and self-serving terminals. IT was recognized as a key strategy and tactical tool for the large and medium banks to position themselves in delivering products and services. According to a survey conducted in 1993 by the Institute of Bankers Malaysia, large- and medium-sized banks accounted for three-quarters of the overall spending on IT by the banks.

14.07 Overall investment in equipment and hardware accounted for about half of the spending on IT by banks, as shown in *Table 14-2*. The large banks accounted for about 40 per cent of the expenditure and the balance expended by the small and medium banks. The higher proportion of expenditure on IT equipment and hardware by the small and medium banks was mainly due to the building up of IT infrastructure to enhance their productivity and competitiveness. The large banks undertook investment in IT equipment mainly for upgrading and modernization as they already have established IT infrastructure.

TABLE 14-1

IT EXPENDITURE BY SECTOR, 1990 AND 1995

Sector	*1990*		*1995*		*Average Annual Growth Rate, 1991-95*
	RM million	*%*	*RM million*	*%*	*%*
Architectural, Engineering & Construction	–	–	152	*4.0*	–
Banking & Finance	507	*39.0*	1,026	*27.0*	*15.1*
Distributive Trade	91	*7.0*	304	*8.0*	*27.3*
Education & Research	52	*4.0*	114	*3.0*	*17.0*
Government	156	*12.0*	380	*10.0*	*19.5*
Plantation & Mining	26	*2.0*	76	*2.0*	*23.9*
Manufacturing	78	*6.0*	494	*13.0*	*44.7*
Oil & Gas	234	*18.0*	380	*10.0*	*10.2*
Transportation	39	*3.0*	114	*3.0*	*23.9*
Utilities	39	*3.0*	266	*7.0*	*46.8*
Home & Personal	–	–	76	*2.0*	–
Others	78	*6.0*	418	*11.0*	*39.9*
Total	**1,300**	***100.0***	**3,800**	***100.0***	***23.9***

Source: Association of Computer Industry Malaysia (PIKOM)

TABLE 14-2

DISTRIBUTION OF BANKS' IT EXPENDITURE BY ITEM, 1993

Item	*%*
Equipment & Hardware	*44*
Salaries	*17*
Software	*15*
Data Communication	*7*
Services	*6*
Others	*11*
Total	***100***

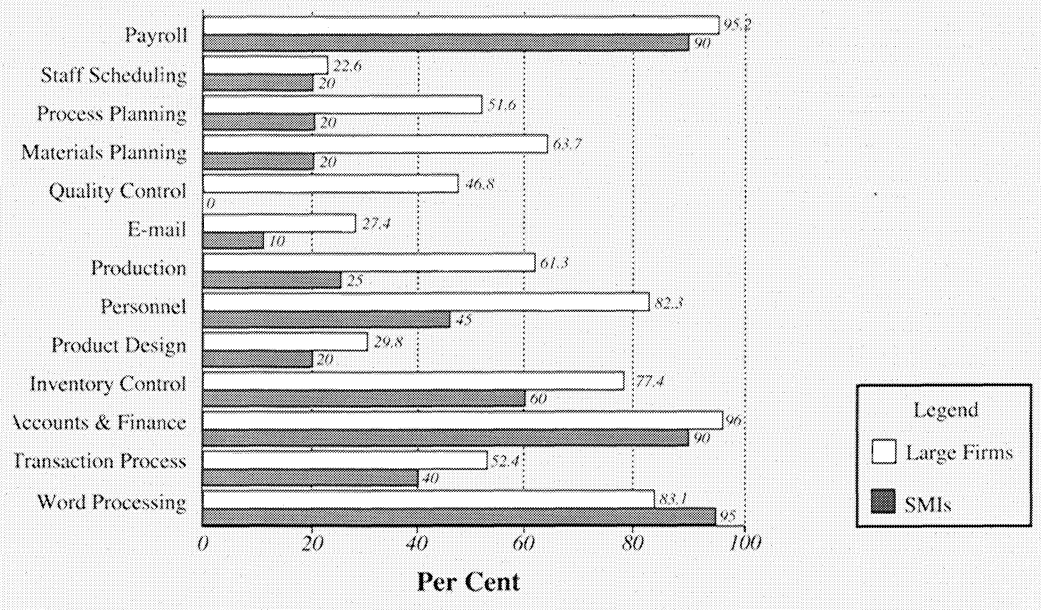
Source: Institute of Bankers Malaysia

14.08 For the *manufacturing sector,* a survey on the usage of IT conducted in 1994, indicated that IT was mainly applied in administration. As shown in *Chart 14-1*, the majority of IT applications were in the areas of accounts and finance, payroll, word processing, personnel records and inventory. However, there were indications that manufacturing firms planned to increase the use of IT in more strategic functions such as product design, quality control, process planning, production and materials planning. These functions will be enhanced with the use of computer programmes such as computer-aided design (CAD), computer-aided manufacturing (CAM), and computer-aided engineering (CAE) as well as robotics. The survey also showed that the small- and medium-industries (SMIs) lagged behind the larger enterprises in IT applications in manufacturing processes, as shown in *Chart 14-2*. The gap was due to the lack of financial ability and specialized manpower in the SMIs.

14.09 During the Sixth Plan period, efforts were undertaken to promote, expand and upgrade IT applications and advanced manufacturing technology in the industrial sector. Government agencies such as the Standards and Industrial Research Institute of Malaysia (SIRIM) and the Malaysian Institute of Microelectronics System (MIMOS) complemented these efforts through specific programmes to introduce and promote the usage of new technologies incorporating

CHART 14-1

IT USAGE IN MANUFACTURING COMPANIES, 1994



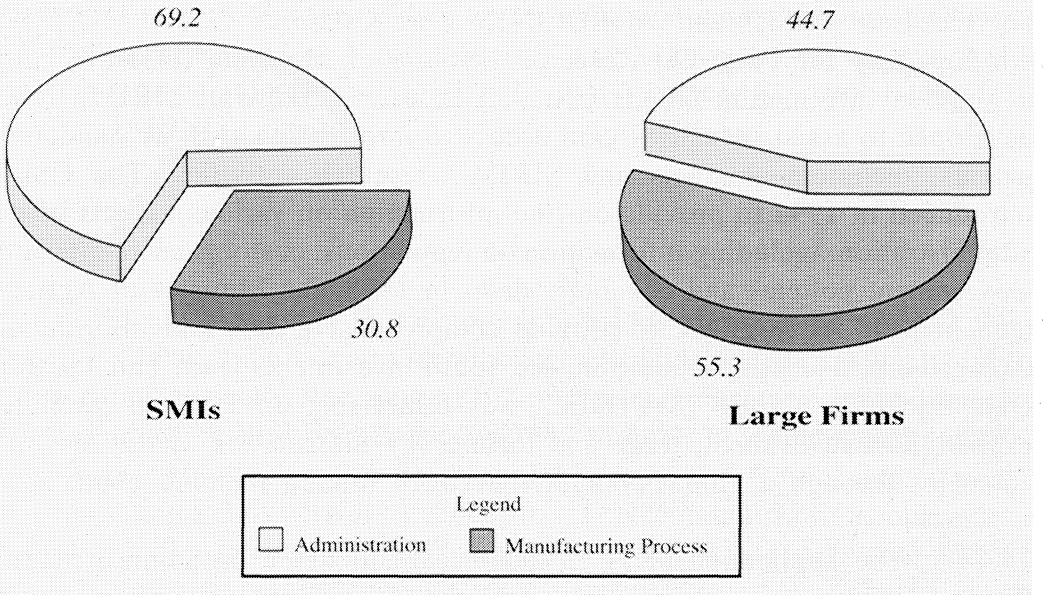
IT. In this regard, SIRIM provided training in CAD/CAM/CAE while MIMOS undertook research and development (R&D) and provided training in Very Large-Scale Integrated Circuit (VLSI) design. In addition, MIMOS assisted industries in software development, product development and printed circuit board (PCB) design, fabrication and assembly activities as well as in the provision of IT services. The shortage of relevant industrial and technical skills especially in SMIs, however, constrained the wider use of IT.

14.10 In the *transportation sector,* IT was used to improve efficiency in business operations. In this regard, the Electronic Data Interchange (EDI) was installed to facilitate electronic submission of documentation, enable tracking of consignment status and standardize the use of trade documents and processes to expedite the movement of goods at the ports. Malaysia Airlines (MAS) further enhanced the utilization of IT systems in front-line operations such as reservation, ticketing and pricing, and flight operations. In addition, MAS launched the Malaysia Cargo Network (MacNet) to facilitate air cargo transactions. The Malaysian International Shipping Corporation (MISC) installed the MISC*NET to facilitate information flows between its headquarters in Kuala Lumpur and agents worldwide. The system provided linkages to cargo booking, maintenance and repair, container tracking, and documentation.

CHART 14-2

IT USAGE IN THE MANUFACTURING SECTOR BY FIRM SIZE, 1994

(%)



Use of IT in the Government Sector

14.11 During the Plan period, the use of IT in the Government sector focussed on enhancing productivity and efficiency as well as in improving the quality of service. In this regard, computerization was accelerated, with approvals for computerization amounting to RM1.4 billion for the Plan period. In addition to traditional areas such as revenue collection, counter services and information management, IT was also used in new areas such as retrieval systems, work automation and image processing.

14.12 There was an increase in information flow through computer networking as well as information sharing and utilization among government agencies. The Public Services Network (PSN) contributed to the Government's efforts to upgrade efficiency and productivity, particularly in the provision of counter services, by offering on-line services through the computer network facilities at the post offices and *Bank Simpanan Nasional* (BSN) branches. This enabled post offices and selected BSN branches to offer services for the renewal of driving and business licences as well as for the payment of road tax and utility bills.

14.13 Specialized databases were developed to provide quality and timely information both to the general public and the private sector as well as to assist them in their dealings with the Government. A number of public databases, such as the Palm Oil Information On-Line Service (PALMOILIS), SIRIMLINK, Civil Service Link (CSL) and AGROLINK, were established. PALMOILIS was developed by the Palm Oil Research Institute of Malaysia (PORIM) in 1993 to provide information on the palm oil industry. Likewise, SIRIMLINK was developed to assist industries gain access to information such as standards and patents, technical abstracts and SIRIM's research activities. The CSL was introduced in 1994 to provide on-line information on various aspects of public administration, including information on regulations, customs tariffs, incentives, Government policies and economic data. In 1995, the Ministry of Agriculture launched the AGROLINK to provide comprehensive data and information on the agriculture sector. In addition, the South Investment, Trade and Technology Data Exchange Centre (SITTDEC) was established in 1993 to promote the exchange of investment, trade and technology information among developing countries through a global computer network linking member countries.

14.14 The application of IT in health care focussed on administration and finance. Information systems were established for patient registration, admission

appointments, bill collection, accounting, pharmacy inventory management, and clinical and health research data analysis. However, efforts were initiated to utilize IT more extensively in areas such as health information network, telemedicine and medical education to further improve medical care and health services.

14.15 With regard to the use of computer in education, programmes were launched with the objective of exposing students to basic knowledge in computer literacy. At the primary level, the computer-assisted teaching and learning programme was implemented in 1994 as a pilot project for 15 schools. This programme utilized computer softwares for mathematics and the English language which were designed by the Computer Technology Laboratory of the Ministry of Education. At the secondary level, a computer literacy pilot project was launched involving 60 schools in the rural areas. The students were introduced to computer applications such as database, spreadsheet and word processing. Students in the secondary technical schools were also taught designing and programming using softwares such as CAD/CAM.

14.16 As an extension to the computer-in-education programmes, *Jaringan Pendidikan* (Education Network) was introduced in 1995 as a pilot project involving 50 secondary schools. *Jaringan Pendidikan* facilitated communication and interaction between students and teachers as well as access to educational information, both within and outside the country, through the computer network connected to Internet. In addition, similar efforts were undertaken by local universities and training institutions to develop computer networking with adequate linkages within the campus and between campuses as well as with access to international information through the Joint Advanced Research Integrated Networking (JARING), the local gateway to Internet.

Infrastructure for IT

14.17 Rapid advancements in telecommunications technology enabled the transmission of text, graphics and video through channels which previously only carried voice transmissions. Recognizing that a telecommunications infrastructure capable of supporting multimedia applications through broadband technology forms the backbone of the information superhighway, the Government issued basic telecommunications network licences to six telecommunications operators during the Sixth Plan period, to provide network infrastructure and value-added services.

14.18 With the increase in the number of network operators, there was a rapid expansion of telecommunications infrastructure and increased competition among them. To facilitate wider access, efforts were undertaken to encourage the operators to provide modern services at reasonable prices and interconnect with each other.

14.19 In 1991, the JARING Project was launched as an extension to *RangKom*, which was a smaller computer network developed under the Fifth Plan. JARING promoted information exchange and database development through access to the Internet at affordable costs through a nation-wide network based on open standards. With the installation of a satellite link between Malaysia and USA in 1992, JARING was connected to the Internet. This provided Malaysian users with accessibility to the Internet in more than 140 countries, through nodes located in 20 major towns in the country. Consequently, the number of JARING subscribers increased rapidly from 30 in 1992 to 14,400 in 1995. Correspondingly, the number of users was estimated to have increased from 90 to 43,200.

Manpower for IT

14.20 With the rapid increase in IT investments, a total of 27,174 IT-related personnel was required during the Plan period, as shown in *Table 14-3*. The skills required were in the areas of systems development and engineering, operations management, consultancy, training, R&D, software development and database management.

14.21 On the supply side, the total output of IT-related manpower from public and private sector institutions amounted to 20,166 personnel. Of this, one half was accounted for by public sector training institutions. The public sector provided training at the basic degree and diploma levels in IT-related courses such as computer science, electronics and computer engineering, computer science and education, computing and information systems, and information technology and systems. IT courses were also provided by the private sector at the degree and certificate levels with accreditation from international institutions such as City and Guilds, British Computer Society and Australian Computer Society. However, the training capacity of the public and private sectors was not sufficient to meet the strong demand for IT-related personnel.

TABLE 14-3

OUTPUT AND DEMAND OF IT MANPOWER, 1991-95

	Number
OUTPUT	**20,166**
Public Sector	**10,166**
Universities & Colleges	*6,520*
Degree	3,141
Diploma	3,379
Polytechnics	*3,646*
Diploma	885
Certificate	2,761
Private Sector	**10,000**
DEMAND	**27,174**
Public Sector	3,042
Private Sector	24,132
GAP (Output less Demand)	**–7,008**

National Information Technology Council

14.22 Recognizing the urgent need for greater coordination and leadership in the planning and management of IT as a strategic tool for national socio-economic development, the National Information Technology Council (NITC) was established as a think-tank and advisor to the Government on IT development. The NITC initiated the process of formulating a national IT plan and identifying key programmes which will contribute to the transformation of the Malaysian society into a knowledge-based society. Several programmes, such as seminars and exhibitions on IT, aimed at increasing awareness on the importance and relevance of IT in enhancing quality and productivity of output at the national, organizational and personal levels, were implemented under the aegis of the NITC.

III. PROSPECTS, 1996-2000

14.23 During the Seventh Plan period, concerted efforts will be made to strengthen the foundation for building a knowledge-based society and economy. Given the strategic role of IT in the attainment of this goal, major initiatives will be undertaken to expand the nation-wide information infrastructure network and services. The thrust of IT development will be to:–

- *ensure widespread diffusion and application of IT within and across sectors to stimulate productivity and competitiveness and further improve the quality of life;*

- *develop a national action plan to ensure a more systematic approach to manage IT development in the country. In particular, this will involve the development of an IT culture, the implementation of national application projects such as the Multimedia Super Corridor (MSC) and intelligent city as well as the necessary telecommunications infrastructure;*

- *expand IT education and training in line with the anticipated demand for IT-related skills, knowledge and expertise;*

- *review laws and regulations that restrain the development of IT;*

- *promote the development of the local IT industry, in terms of design and production of innovative products, systems and services, to generate new growth opportunities as well as skills and employment in high-tech areas;*

- *develop Malaysia into an IT hub with international IT companies operating from Malaysia; and*

- *enhance IT awareness among the population.*

IT in Sectoral Development

14.24 Greater emphasis will be placed on the wider application of IT in national development. By the end of the Plan period, IT investment expenditure is expected to double its current level. While IT applications in manufacturing, services, education and health will be promoted, priority will be accorded to ensure a coordinated approach at the national level.

14.25 The *manufacturing sector* in the shift towards knowledge-, capital- and technology-intensive industries, will have to make adjustments in its production and marketing processes to meet the challenges of an increasingly competitive global trading environment. The integration of IT into the production process and the use of robotics and CAD/CAM will help manufacturers boost production, reduce costs and ensure the quality of products. SIRIM, which uses IT in its design engineering services for rapid prototyping, will facilitate firms to reduce turnaround time and prototyping costs. In addition, IT will enable the exchange of inter-firm data and information, thereby facilitating procurement, subcontracting and electronic payments. This will enhance the practice of just-in-time and flexible manufacturing and help manufacturers minimize inventory costs and produce customized goods. Large local firms and MNCs are expected to take the lead in computerization and automation, as they have the necessary financial capacity as well as the capability to acquire technology from abroad, and undertake relevant in-house R&D initiatives. The SMIs, however, will require technical support and assistance to invest in IT, since they lack the necessary manpower and finances.

14.26 During the Plan period, a targeted approach will be adopted to promote the use of IT in businesses and manufacturing industries, particularly in the small- and medium-enterprises (SMEs). In this regard, the SMEs will be facilitated to undertake studies on the potential applications of IT in their production processes and business operations. In addition, joint research projects, aimed at internalizing innovative processes and systems within enterprises, will be encouraged between research institutions and SMEs in areas such as artificial intelligence, robotics and process automation.

14.27 The strong global demand for business and consumer electronic products will provide growth opportunities to the local manufacturers of IT-related products such as semiconductors, computer peripherals and telecommunications equipment. Due to the increasing demand for PCs with multimedia applications, the business sector will have to upgrade both machines and peripherals to enhance its capability for strategic planning and management, thus boosting sales for such equipment and parts. Demand for consumer electronic products such as televisions, car stereos and video players will increasingly be driven by consumer affluence and the need for additional product features. Cordless and cellular phones which are experiencing an exponential growth in many areas of the world, represent another potential area for the local manufacturers.

14.28 The *services sector* will be nurtured to sustain the growth of the manufacturing sector and become a leading sector of the economy. An integral

part of this strategy will be to incorporate specialized IT applications in the development of a modern, efficient and competitive services sector. There are five intermediate services essential to producers that could be transformed into buoyant sub-sectors to serve both domestic and external demand, particularly in this part of the region. These intermediate services include communications (especially telecommunications), business and professional services, finance, insurance and transportation. However, the rapid expansion of these services will depend greatly on the rate of modernization and integration of IT.

14.29 In the area of *tourism*, the Government and private sector are expected to invest in the latest technologies for more effective distribution and marketing of tourist products and services. These include the use of computer reservation systems, electronic databases, transforming destination pictures to computer disks and marketing through the Internet. The *distributive trade* sector will be encouraged to improve its systems and increase efficiency through investments in IT with electronic-point-of-sale systems, bar codings and scanning as well as automated handling systems.

14.30 With developments in IT, the quality and efficiency of *education and health* services are expected to improve. The introduction of the information superhighway will provide electronic communications accessibility within the country and worldwide to further promote interactive distance education and telemedicine. Interactive distance education will provide the rural population with equal access to learning materials and information. The distance education system will also enable Malaysia to become a regional education and training centre. Telemedicine, which is based on a similar approach, will allow Malaysian medical specialists to provide on-line consultancy services.

14.31 The development of the Federal administrative centre at Putrajaya will be used as a catalyst for transforming to new and more efficient modes of governance and public administration. Higher levels of efficiency and productivity are expected with process reengineering and the use of state-of-the-art IT. Towards this end, the provision of Government services through electronic means and multimedia technology will be introduced to enhance efficiency and provide high quality services. Relevant technologies will also be used to enhance the security of electronic transactions.

14.32 During the Plan period, the relevant government ministries and agencies will accelerate the implementation of IT-related projects, such as client/server

technology to increase efficiency in processing, computer networks to improve connectivity and encourage resource and information sharing, image processing technology for document handling and verification, as well as advanced computer systems to handle a larger volume of transactions. To ensure the smooth implementation of the IT programme, all ministries and agencies will prepare comprehensive information system plans to facilitate the development and application of databases for strategic and decision-making purposes. A study will be conducted to determine IT personnel requirements in the public sector and an action plan formulated for the development of the requisite skills.

Human Resource Development

14.33 The most significant impact of IT is expected to be on organizational structure and operations. New modes of information transmission, processing, management and utilization have the effect of flattening organizational structures and expanding the span of control. The availability of computer-aided decision support systems and greater access by individuals to these systems, contribute to reducing the number of workers at the supervisory and middle management levels. However, greater use of IT in organizations is expected to result in the increasing demand for workers with computer and information management skills. In addition, the rapid development of new technology and applications in general and specialized fields, such as manufacturing, publishing, health and education, will create a growing demand for a computer-literate workforce as well as professionals in specialized fields conversant with these technologies and their applications. The IT industry will therefore, require various specialized skills such as software engineering, systems development and data management.

14.34 Computer education and training programmes in the public sector will be intensified and expanded to cover all schools, as well as higher education and training institutions. The content of these programmes will be revised to meet the skill requirements and increasing demand for IT personnel. New skills, such as computer operations, and information management and application, will be incorporated into the education and training curriculum. Increased investments in computer and related infrastructure will be undertaken to ensure students have access to IT applications. In addition, pre- and in-service training will be provided to teachers to enhance their knowledge in IT applications.

14.35 The private sector will be encouraged to complement the Government's efforts to promote computer literacy. Among others, procedures will be streamlined for the setting up of private institutions providing training in IT, as well as

expediting approvals for conducting new courses. Procedures to expedite withdrawals from the Human Resources Development Fund for priority areas such as IT training for employees will also be formulated.

14.36 In order to enhance public awareness on the importance, use and benefits of computer applications, the media and other forms of information dissemination will be extensively utilized to complement measures already initiated at the school and tertiary levels. In this regard, television stations, in particular, will be encouraged to feature relevant educational programmes with a view to expanding knowledge and applications of IT.

National Action Plan

14.37 To ensure coordinated planning and management of IT development in the country, the NITC will formulate a national action plan. Amongst others, the plan will chart the necessary steps to promote the development of Malaysia into an IT hub and will outline the scope, size and schedule of plans and programmes as well as identify the necessary infrastructure support in terms of education and training. The plan will also identify the undertakings and contributions of both the public and private sectors.

Multimedia Super Corridor and Related Infrastructure

14.38 The development of Putrajaya will spearhead the establishment of the 15 by 40 kilometre Multimedia Super Corridor (MSC), stretching from the Kuala Lumpur City Centre (KLCC) in the north to the KL International Airport (KLIA), Sepang in the south. The MSC is expected to provide the catalyst for IT development in the country through:–

- o demonstrating the effectiveness of multimedia in increasing efficiency and productivity in the production and delivery of goods and services in both the public and private sectors;

- o creating supply and demand for the multimedia industry located in Malaysia for the world market; and

- o ensuring the installation of appropriate technology to maximize the utilization of the infrastructure available in the MSC, including KLIA, Putrajaya, the transportation network and the electronic superhighway.

14.39 The Government will develop the KLIA and Putrajaya which will be equipped with state-of-the-art communications technology and IT infrastructure, while the private sector, especially world-class multimedia companies, will be encouraged to locate in the MSC to undertake remote manufacturing and introduce high value-added IT goods and services, enabling Malaysia to become an IT hub. Software and systems companies in the computer, telecommunications and broadcasting industries will be promoted in the MSC. In addition, priority will be given to businesses integrating both the print and electronic media, including publishing information services, broadcasting and film industries.

14.40 Priority will be accorded to the development of a world-class telecommunications infrastructure comprising fibre optics, satellite and wireless technology, and services. The development of the information superhighway through the telecommunications infrastructure will be accelerated during the Plan period. With a total planned investment of about RM25.4 billion, in addition to RM20.3 billion already spent in satellites, fibre optics and broadband technology by private operators, it is envisaged that the telecommunications infrastructure will enable the mass application of IT nationwide. A Telecommunications Master Plan will be formulated to provide guidelines, among others, on interconnection and standard of services, in order to promote greater efficiency and accessibility. Telecommunications operators will be encouraged to upgrade and improve services to further support the development of interactive multimedia and IT. In addition, the launching of Malaysia's own satellites, MEASAT I and II, will provide immediate and simultaneous point-to-point and point-to-multipoint telecommunications and broadcasting services throughout the country.

14.41 JARING will be extended to form the base for the establishment of the Malaysian national information infrastructure which is capable of using multimedia technology. JARING exchanges and access points will be distributed throughout the country to provide an integrated communications network for the public and private sectors as well as to enable interactive distance learning. In this regard, MIMOS will be given an allocation of RM400 million to establish another 100 nodes throughout the country and to increase the capacity of JARING. It is expected that the number of subscribers will increase to 400,000 by the end of the Plan period. Steps will also be taken to ensure access to JARING at affordable costs.

IT-Related Legislation

14.42 A comprehensive review of IT-related legislation will be undertaken to promote a more orderly development of IT and ensure that the prevailing laws and regulations do not constrain the nation's efforts in becoming an information-rich society. This is necessary due to the convergence of computer and communication technologies as well as multimedia technology which has given rise to a new working and living environment with teleworking, telecommerce, teleconferencing, telemedicine and extensive use of EDI. These developments have had an impact on the organizational structures and *modus operandi* of businesses as well as personal and social lifestyles. In addition, these have also resulted in the overlapping of traditionally well-defined lines of ownership, administration, and regulation of the communications network and their contents. In view of this, the existing laws and regulations will be reviewed to ensure that national and personal security and interests are safeguarded. These include IT-related laws and regulations such as the Contracts Act, 1950, the Evidence Act, 1950, the Telecommunications Act, 1950, the Copyright Act, 1987 and the Broadcasting Act, 1988.

Development of the Local IT Industry

14.43 The IT industry will be promoted as a new growth sector as its development will contribute significantly to the expansion of industrial activity, as well as the creation of higher levels of technology and skills. The advancement of the industry will be stimulated by encouraging new product development, fostering strategic linkages between domestic and international firms, and by providing support for IT promotion.

14.44 Measures will be taken to improve the business environment, attract new investments and promote the growth of existing enterprises in the local IT industry. In this regard, software design and hardware manufacturing have been designated as promoted activities with a view to developing the Malaysian microelectronics, telecommunications and computer industries into major players in the world IT market. During the Plan period, the software industry will be further developed into an exporter of software products and services. The hardware industry will focus on high volume and high value-added manufacturing as well as the development of own-brand computer components and peripheral products. Emphasis will be given to developing expertise, creating new opportunities, as well as accelerating technology transfer in areas such as software development, consultancy, systems integration, computer and peripherals manufacturing, hardware maintenance and warehousing. In addition, the growth of local content providers will be encouraged to provide locally generated data and information to complement the information flow from abroad brought about by access to the Internet.

Malaysia as an IT Hub

14.45 Efforts will be taken to enable Malaysia to develop into an IT hub with international companies establishing their regional headquarters in Malaysia for high value-added IT industries. This will enable MNCs to network activities across the globe from a single location in Malaysia. Such networking include remote manufacturing and management that will interlink offshore activities through IT, particularly multimedia technology.

14.46 MNCs will be encouraged to conduct R&D locally and provide state-of-the-art IT services, thus providing added impetus to the development of the local IT industry, and increasing international linkages and networking. Special attention will be accorded to the creation of more effective joint ventures between domestic and foreign enterprises to enhance local technological capability and R&D, as well as the provision of training in specific areas of IT.

IV. ALLOCATION

14.47 A sum of RM2.3 billion[1] will be allocated to ministries and agencies to invest in IT-related programmes and projects. These include the establishment of the national information infrastructure, provision of training, installation of computer networks to improve connectivity and encourage resource and information sharing, acquisition of image processing technology for document handling and verification, and installation of advanced computer systems to handle a larger volume of transactions.

V. CONCLUSION

14.48 The Sixth Plan period focussed on building the initial infrastructure required to promote the usage of IT in the public and private sectors. During the Seventh Plan period, efforts will be intensified to expand and upgrade telecommunications infrastructure and skills, which are prerequisites for the development of IT. The Government will play a proactive role by providing a conducive environment for the advancement of IT in the country. In this regard, an action plan will be formulated to provide the framework of participation for both the public and private sectors. It is expected that the private sector will increase the usage of IT as an enabling tool to augment productivity, efficiency and competitiveness. In addition, local investors are expected to take advantage of opportunities in the global IT market through the development of existing IT industries as well as the promotion of new and own-brand goods and services.

[1] Includes provision for leasing of computers under the operating expenditure.