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Abstract

This paper traces the development of Information Technology (IT) in the Malaysian Public Sector, focuses on current situation of IT infrastructure, discuss on the problem related to the development and the research implications from the IT implementation. Among the major IT projects being discussed are the Civil Service Link (CSL), Public Service Network (PSN) and the Electronic Data Interchange (EDI). The IT infrastructure being discussed includes nationwide IT network based on fiber-optic, microwave and satellite technologies to provide a durable and equable information superhighway. This paper also discusses about Jaring (Joint Academic and Research Integrated Network) which has national links and international gateways.

1 Introduction

It is commonly recognized that to become fully developed, a country needs to have a strong Information Technology (IT) foundation, both at the infrastructure and the usage levels. The use of IT must be properly planned and executed to enable users get what the technology has to offer to the fullest extent. It should not be an after-thought or add-on. To make a strategic decision, vision plays a crucial role. It is important for the top-level decision maker to sufficiently understand IT and the usage of technology to effectively incorporate aspects of IT while drawing up plans for the country.

Government at the highest level should accord priority to the development of policy for information technology infrastructure. Big firms and Government bodies in the country at present are making heavy investments in so called IT and Information Management Systems (IMS). What role does the Government have to play here? According to the Tell (1974) these IT or IMS would inevitably fall short as long as the development of public Scientific and Technical Information (STI) systems and networks do not go in parallel, and as a corollary, they regarded the achievement of IT and IMS for Government to be an important objective. Tell (1974) also recommended that Governments should have a responsibility for manpower and education programs, as well as for research and setting up of experimental programs to determine the practicality of serving the needs of researchers, engineers, administrators and policy makers.

This paper traces the development of IT in the Malaysian Public Sector, focuses on current situation of IT infrastructure, problem related to the development and discuss on the research implications from the IT implementation.

2 IT Development

The Government has emerged as the country's third biggest user of IT after banking, oil and gas industries. The history goes back to the year 1965 when the Government bought its first computer, an IBM Sys/360 for the National Electricity Board to run a payroll system. At last count, the Government has 109 mainframes, 274 minicomputers and 30,000 microcomputers distributed throughout 629 agencies. A MAMPU survey conducted in 1992 revealed that 59 agencies have yet to computerize.

According to Malaysian Administrative Modernization and Management Planning Unit (Mampu), from 1988 to 1992, 320 Government IT projects were approved with total value of RM749.94 million. In 1993, Mampu approved another 79 IT projects worth an estimated of RM197.83 million. The computerization projects include work going on at universities, Royal Malaysian Police, the Royal Customs and Excise Department, the Education Ministry, Dewan Bahasa dan Pustaka, the Registrar of Societies, the Kuantan Port Authority, Radio Television Malaysia and Islamic Center. In addition, the IT projects also include the upgrading of the Defense Ministry's financial systems, the upgrading of the Internal Revenue Department's computer system and the computerization of Federal Agriculture Marketing Authority (FAMA). The Malaysian Science and Technology Information Center (Mastic) was established two years ago to enable Malaysia to compete effectively in information-based industries. All the investment was done in order to provide smooth and prompt delivery of service to the public.

Realizing that the successful implementation of IT in public sector depends on the Government top administration, the Government has planned several IT awareness programmes for the Government top administration. In 1982 The National Computer Training Center (NCTC) at National Institute of Public Administration (INTAN) was set up to train public sector personnel in the field of IT. In NCTC, the managers are given special computer training such as diploma in Management Science and System Analysis and Design. The Government also provide loans to the Government servants to acquire personal computers.

In 1984 The Information Systems and Chief Executive Management Unit (SMPKE) was set up to create computerized Decision Support Systems for the top and middle executives to increase efficiency, effectiveness and public sector productivity and also to expose the top executives in the public sector to the advancement of computer technology in the retrieval of vital information for the management of the administration.

In 1991, the Government introduced the public sector Open Systems Programmes (PSOSP) to ensure

compatibility and interoperability of computer systems installed at all Government agencies. Under the programme, all IT procurement will be required to comply to a minimum set of determined standards in order to facilitate integration and networking. The Government also has set up the National Telecommunication Policy (NTP) that calls for the development of a sophisticated IT infrastructure to meet the country's needs in achieving the national vision 2020.

The Government Integrated Telecommunications Network (GITN) was launched in 1992 to enhance the data communication infrastructure for an integrated network environment. In 1994, the Government introduced other new technology such as Civil Service Link (CSL), Public Service Network (PSN), Electronic Data Interchange (EDI) especially for customs and ports, general hospitals and the immigration department. Other IT projects include electronic document management systems, smart card, wireless technology and work flow automation tools in Government agencies.

CSL was launched in August 1994. Actually it is an information center that will be responsible for acquiring, organizing and making available, on request, information pertaining to various aspect of public sector administration. CSL is in line with the aspirations of the country in striving for an information-rich society and the Government quest to establish a world-class civil service. CSL services include on-line search and retrieval, announcement and broadcasts, document delivery and referral services.

The second major IT project is Dagang-NET, the backbone to Malaysia's EDI infrastructure which was launched in October 1994. It's objective is to serve as the communication gateway for at least 500 business communication players, representing both Government agencies and private companies. The pilot run was launched for Port Klang Community System involved electronic transfer of documentation, including import transaction and submission of customs declaration.

PSN is a computer network which links all Government agencies. It uses Wide Area Network infrastructure that enables an organization to extend its counter services on-line through computers and telecommunication equipment at post offices. PSN comprises four components including the Branch Systems Application which captures transaction input; the Network System Application which connects the post office branch to the host agency; the Agency Host Systems Application for updating the host agency's database; and the Accounting Systems for monitoring transactions.

To ensure that Government agencies are using the right technologies in their computerization programmes and to coordinate and monitor IT programmes in different agencies, the Government is in the process of forming a National IT Council (NITC) (Tengku Ibrahim, 1994).

In general, IT development in Government has to be approved by the Malaysian Administrative Modernization and Management Planning Unit (Mampu) and Treasury. The Government department are encouraged to adopt a standard methodology for system analysis and design in particular the SSADM and for project management, they are encouraged to adopt a standard methodology for project management in particular the PRINCE (Project in a Controlled Environment) methodology to control the progress in the implementation of IT projects. Since many Government IT projects are developed on turnkey basis by supplier, the government acquire IT vendor to implement quality management systems such as ISO 9000 to ensure that supplier deliver quality information systems which stick to the standard as formulated by Industrial Standard Committee on IT (ISC/IT).

3 IT Infrastructure

IT infrastructure is a key element in any computerization effort. Infrastructure for IT refers to variety of organizational arrangement for supporting computing, including recharge systems and purchasing procedures, as well as the human resources which Anderson and Brent (1989) identified. Workable computing arrangements also depend upon a set of supporting resources, which can be physical, technological or social. Physical resources include the space to place equipment; technological resources include electricity and telecommunication lines. The social resources include people skilled in using and repairing equipment and practices for allocating resources.

The NTP underlines the importance of telecommunication infrastructure to meet the country's need for the next century. Malaysia needs to build an infrastructure for a nationwide IT network based on fiber-optic, microwave and satellite technologies to provide a durable and equable information superhighway. Malaysia will have its own satellite in orbit which is expected to be launched in December 1995. The communication satellite is called Malaysia East Asia Satellite (Measat) which is owned by a private company. With Measat launch, other areas in telecommunication infrastructure in line with NTP include microwave, VSAT, packet switching and frame relay technologies all destined to contribute to the information superhighway. When completed, this superhighway can channel voice, data and image simultaneously through advanced digital technology.

For Malaysia, the task of identifying and carrying out R&D on key technologies applicable in local context has been mainly entrusted to Malaysian Institute of Microelectronics Systems (MIMOS), an agency operating under Science, Technology & Environment Ministry. MIMOS scope of activities ranges from microelectronics, the building blocks of today's high technology to complete systems. MIMOS was established to initiate the formation of various infrastructural facilities and enable the microelectronics industry to grow at a rapid pace and in right direction. MIMOS become operational on January 1, 1985 as a unit in the Prime Minister's Department. It is a public funded research and development institute.

In 1987, MIMOS launched its computer network RangKom (Rangkaian Komputer Malaysia). Then project Jaring (Joint Academic and Research Integrated Network) evolved from RangKom was launched on January 24, 1990. It was established to optimize the use off data communication in the public sector as well as to enhance support research and development, especially in relation to the impact of modern communication technology on socio-

economic activities. One of Jaring's major activities is the coordination of database development in various fields related to science and technology as well as education. Jaring has national links and international gateways. Dedicated leased-lines at speed of 9600bps to 64Kbps are installed to link the installed nodes in various parts of the country according to user's distribution.

Jaring direct international link to InterNet, US, was operational on 1st Nov, 1992. A 64Kbps leased-line link enables Jaring's users to access over 300 foreign databases in various countries as InterNet also connects other networks in USA, Europe, Japan and many other countries. The two-way link via satellite was established between Jaring's nerve center at MIMOS to a National Science Foundation (NSFNet) node in Stockton, California. Together with the National Library, Jaring is also developing distributed database using client-server technology that can provide transparent access to information. The whole nation Jaring coverage is expected to be completed by the end of 1995.

With strong IT infrastructure, Government agency can retrieve basic information from a central database within the Government organization. Having this facility the Government can save money and time from having to fill in so many forms to get service. Through innovative ways of using IT, processes especially between public and Government offices can be automated. It can be applied in many ways but it is difficult for any organization to implement projects without adequate infrastructure.

4 Discussion

IT planning is an important on going process in an organization which should be considered seriously by the organization adopting IT. It seems that Malaysian Public Sector is taking an integrative approach as suggested by Hudson (1989). A few years ago, Malaysia still lacked an overall IT policy because of several factors ranging from insufficient data for planning purposes to lack of political support and the inertia of the Civil Service. Traditionally, IT related activities and policies have been distributed among a number of agencies and Ministries. The National Committee of Data Processing (NCDP) which was established in 1985 for instance, lacks the authority to secure the co-operation of different agencies. It was not backed by adequate technical manpower resources to formulate strategic plan or address critical issues on a national scale (Han, 1994). Hopefully the newly-established NITC can effectively plays it roles to co-ordinate and monitor IT development in different agencies. Malaysian NITC should look at the experience of Singapore's National Computer Board and other advanced countries and to adopt hybrid models.

IT usage in the Malaysian Public Sector has not reached the targeted level. Even though the Government has introduced many new technologies such as EDI, CSL and etc., the public still does not feel and see the changes which should come along with those new technologies. Sometimes the technologies are available but they are not effectively used because the infrastructure is not enough and not fully developed. In some Government agencies, the computers/hardware available are still under-utilize because many applications are still under development. This situation will not arise if IT development projects are properly managed. In this context, management is defined in terms of the traditional processors of planning, organizing, staffing, directing, and controlling the adoption and use of IT in support of the organizational tasks (Brancheau and Brown, 1993).

The public sector view IT as a tool to improve the performance of individuals and groups in organization. IT is also being considered as the principal tool in the re engineering process of the Government services. To ensure the success of the re engineering process, it is important for top-level decision-makers to sufficiently understand IT and the usage of technology. By understanding IT and knowing how the technology can be applied, these decision-makers can effectively incorporate aspects of IT while drawing up plans for the country. It is also important for the decision-makers to understand that computerization plays an important role in transforming our social worlds (Kling, 1991).

5 Research Implications

The introduction of IT to the public sector may create a lot of challenges to the public sector and there are considerable number of issues which may lead to researches. The successful application of IT in organization is closely linked with the planning for, acquisition of and implementation of an organization's portfolio of IT. Research can be conducted to study why are some Government agencies able to exhibit greater success than others in managing such processes based on research conducted by Boynton, et al. (1994).

Another area of research is to study how computer-based information systems are adopted in the public sector, what interest they serve, and what consequences they have for organizational practices, decision-making and work life. It would be interesting to compare the result with the study conducted by Kling (1991).

6 Conclusion

In general, the Malaysian Public Sector already have the good IT infrastructure and applications. There are many potential areas which need further improvement especially in the area of IT management and policy making. The difficulty for policy developers arises from the rapid pace of technological change in computer and telecommunication fields. As a consequence of this rapid change, the policy planners are always in danger of running behind the changes with the result that by the time a policy is implemented, new changes may have invalidated the earlier assumptions.

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