SENATE

KINGDOM OF CAMBODIA

IT Master Plan for the Senate

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Senate

IT Master Plan for the Senate

FOREWORD FROM THE SECRETARIAT GENERAL OF THE SENATE

The Senate was incepted in 1999, and it is still young both in terms of its age and its functioning capability which requires a lot of institutional arrangements before becoming more mature and more dynamic.

Like any other young entity, the Senate is currently facing many difficulties that it needs to overcome if its leadership wishes to mobilize its energy and strength to ensure that the timely and successfully carrying out its mandates and tasks as planned.

In order for it to be effective, efficient and conform to the continuing trend of expansion of democratic pluralism and a bicameral system of the Legislative body, the Senate shall have, apart from its newly achieved 5 years Strategic Plan, a navigational mechanism, a visionary guidepost called IT (Information Technology) Master Plan. It will be construed as the main pillar for the Senate development in our contemporary era of the Information Technology.

IT Master Plan is master pierce of a large number of key information on strategic goals and objectives in which figure the intranet, extranet networking, Library Management Information System (LIBMIS) which including Catalog Module, Lending Module and E-Library, Electronic Documents Managements System (EDMS), Inventory Management Information System (IMIS), Finance Management Information System (FMIS), Human Resources Management Information System (HRMIS) and training structures, systems, policies and procedures toward which the Senate intend to achieve in short, medium and long terms period as divide in 3 phases.

In the next 5 years ahead, the Senate needs to secure the support both technical and financial from friendly countries, the International Community and business circles to make its mission and objectives succeed.

The Secretariat General of the Senate would like to dedicate this IT Master Plan as an effective navigation for the future great success of the Rule of Law and Democracy, the prosperity and happiness for our Khmer Nation.

Phnom Penh, 18th September 2003

Oum Sarith
Secretariat General

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Executive Summary

This Information Technology Master Plan identifies key directions and objectives for the use and management of information technology for the Senate for the next 5 years. The plan provides a vision for IT development based on the goals identified in the Secretariat General new Strategic Plan (2003 – 2008).

The overarching goal within this plan is to strengthen the capacity of the Secretariat General of the Senate to efficiently deliver services in line with other modern parliaments. The objective is to ensure the Secretariat General and Senators are able to fully participate in the development of legislation through the establishment of an information technology environment that is accessible, sustainable and adaptable to change. This plan makes recommendations on infrastructure, software application, and human resource development, in order that the Senate has a well functioning IT facility to support Senators, officials and staff of the Senate and Secretariat General in their work. Improving the performance of the Secretariat General will result in Senators benefiting from a working Secretariat, which will directly improve the work of the Commissions.

A principle philosophy behind the development of this plan is the concept of information sharing by way of Intranet, Internet and Extranet services. Creating an Intranet will promote improved working practices and flexibility by facilitating information access, communication and collaboration within all the commissions, departments and offices of the Senate, and in the future, with its Parliamentary partner, the National Assembly. By creating such a service, it is also intended to provide the general public and civil society with improved access to parliamentary documentation via the Internet and through an E-Library service.

An important aspect of this plan is to allow the Senators, officials, staff, partners and supporters of the Senate to gain a shared understanding of the Institution's priorities and goals for the next five years. Broad implementation time scales and general costs are provided, so senior management and officials of the Senate, along with their partners and donors are able to make informed decisions with regard to supporting (financially and technically) each implementation phase of this plan in the coming years.

1. Introduction

Information Technology is playing an increasingly important role in the work of the Senate and Secretariat General. Having a well functioning, modern IT infrastructure is essential if the Secretariat General to improve its overall service to the Senate, both in terms of its core vision and in its day to day operations. Developing a strategy for the improvement and installation of an IT system that enables the timely exchange of information and increases the level of internal networking is an important first step in achieving this goal. These factors demand a broad-based, and strategic approach to information technology planning.

This Master Plan sets out to the way forward for IT developments within the Senate. It sets out an IT vision and plan for the next 5 years based on the new Strategic Plan of the Senate (2003 – 2008). This Master Plan is intended to help guide short, medium and long-term decisions on technical (infrastructure and software application), human resource development (HRD) and financial issues relating to the development, use and support of IT facilities for the Senate in the most cost efficient way.

The initial priority areas for work are identified, both in terms of process improvement (namely in enabling timely and free access to documents relating to draft law) and area of work. This requires helping improve the work of the Commissions by assisting the Secretariat General to provide better support and advice. This also requires identifying which departments need to have IT systems as a first priority to achieve this objective (namely the Council of Law; Department of Legislation and the Library).

It is recognised in the Secretariat General strategic plan for the Senate that the institution is essentially an information-driven organization. It is also recognised that the existing facilities require upgrading and there is also a lack of a proper up-to-date informatics network – the normal working tools of any well-functioning legislature. Improving this situation requires the creation of systems designed to electronically document the workings of Parliament and the Secretariat, ranging from developing specific applications to support the Senate's document management systems and financial management needs, through to the creation of an E-Library. This approach needs to be complemented by developing the capacity of staff in information technology skills, by providing thorough customised training and appropriate documentation to support them in their work.

In this respect, this Master Plan aims to achieve the Senate's specific IT strategic goal (as detailed in the main strategy document) of:

'Develop an information strategy that includes planning and installing a modern information system and information technology infrastructure'.

by undertaking the following steps:

- Undertake a comprehensive review of the current Information Technology (IT) situation in the Senate in cooperation with the National Assembly.
- Conduct a thorough IT needs analysis relating to the administrative, material and legislative needs of the Senate.

- Develop a short and long term IT infrastructure plan covering the design, purchase, installation and implementation of new systems and obtain donor funding to implement the IT plan.

- Undertake a phased and progressive installation plan focusing on the most urgent IT needs.

- Develop and implement an IT training plan that takes into account the need to maintain and repair new systems, as well as providing training on repairing office electronic equipment such as computers, printers and photocopiers.

- Redesign and update the Senate Web-site.

An important aspect of this plan is identifying the three main 'strands' that need to be introduced in the coming years; these strands are complimentary of each other and cover all aspects of the Senate's above aims. These strands are:

- IT Infrastructure
- Applications Software
- Human Resource Development

These strands will be implemented in varying degrees over the next 5 years, in the following Phases:

- Phase I (short-term, 2003-2004)
- Phase II (medium-term, 2004-2006)
- Phase III (long-term, 2006-2008).

The Table at Appendix A shows how the main strands will be implemented over the duration of these Phases, and provides a concise overview of this IT Master Plan.

Implementing this Master Plan will therefore directly benefit Parliament and Senators by creating a Secretariat General that directly contributes toward improving the work of the Commissions. In addition, general communication will be speeded up, not only inter-departmentally within the Senate, but also at a future date with the National Assembly and government Ministries. Important information with regard to National legislative issues will be shared in a more systematic, structured and timely manner. Officials and Committees of the Senate will be able to make key decisions regarding National issues by being able to access information relevant to the wider local and international arena. This will develop an understanding how global frameworks need to be considered and incorporated within the Kingdom's developing National policy and legal frameworks, and help Cambodia to succeed in meeting its international and regional obligations through organisations such as Asean, the United Nations, and the World Trade Organisation (WTO).

2. Background and context to the IT Master Plan

As explained in the introduction, the need for an IT Master Plan comes from the stated goals detailed in the Secretariat General Strategic Plan for the Senate. The Strategic Plan recognised that in order to become a well-functioning Institute, the Senate needed to develop an institutional wide IT strategy that considered not only the technical and infrastructural

needs of the Institution, but also the important human resource development requirements. In this respect, this Master Plan takes into account many aspects beyond the IT component.

Information Technology will play a vital role in the future work of the Senate, especially in helping the Institute achieve its overall vision and goals. At a specific level, the introduction of this Master Plan will enable the Secretariat to meet its specific obligation for the safe keeping of all official Parliamentary documents, as well as maintaining the records of proceedings of the Senate and for keeping custody of these records and documents. A role that extends to responsibility for maintaining all the official records and minutes of meetings for the plenary sessions; the Permanent Standing Committee; and the nine Commissions of the Senate. However, an important factor to remember is that technology should not drive the way the institution operates - its function is to provide access to information and services, and support the workings of the Institution.

In preparing this Master Plan, the views of many staffs and key people working at the Senate have been sought in order to ensure the final recommendations and proposals are in accordance with users needs and overall strategy of the Senate. A special thanks is owed to all those people for their advice, support and helpful suggestions in developing this plan.

2.1. The evolving IT environment

The IT environment is changing at a rapid rate. The purpose of acknowledging this here more fully is to be clear that what is proposed today in terms of infrastructure, systems, hardware and software is based on the most up-to-date knowledge at the time. It is important to note that all of these IT elements change at a pace quicker than other technology development in our modern history, and what may be recommended today, may be very different to what may be recommended or needed in 2006, or in 2008. In this regard, like the Secretariat General Strategic Plan for the Senate, this IT Master Plan should be viewed as a 'living' document that needs to be updated on a regular basis as technology and circumstances change.

One of the changes taking place in the external IT environment that the Senate needs to respond to is the capability to handle multiple information sources. One goal of this Master Plan is to ensure that particular concern is met through interconnection (where appropriate) to the Intranet, Internet and Extranet via a single, high speed network. This is important to allow senior management access to the necessary MIS (Management Information System) databases, as well as accessing documents in the library and through other sources.

Another important factor taking place in the external IT environment that is central to this plan, is the rapid growth of Cambodia's own human resources in the field of information technology. Many people are now becoming qualified in computer maintenance, installation, system support, and skilled in using software at an advanced level. The changes taking place in the external environment need to be recognised, and responded to at an Institutional level so the Senate does not find itself out of step with the rapid rate of technological change taking place elsewhere in the country: particularly in the education, technical and commercial sectors. The approach to supporting the Senate in responding to this environmental pressure is detailed more fully in the section on Human Resource Development (Section 6).

Although it is not possible to have a clear vision of what the world will be like in IT terms in 5 years time, it is possible to make some predictions based on what is happening in terms of current research and development within the IT industry. The trend is toward media-rich and interactive communication technologies that integrate data, voice, sound and video. An important aspect of this IT Master Plan will be the need to periodically consider the impact the convergence of computer and voice services is likely to have on the future working of the Institution as a whole, or in part. Such convergence will allow desktop computers to be used as telephone handsets via a single wiring system, enabling users to overlap between voice and e-mail applications etc. It is important to consider these aspects in the evolutionary phases and periodic reviews of the IT plan, and particularly when planning new infrastructure design and installation. At some stage in the future it will be possible for the commissions and departments of the Senate to hold video conferences with their counterparts in parliament's of other countries, providing the appropriate technology is purchased and installed.

A changing IT environment means it is also possible that mobile computing devices will become as cheap as mobile phones by 2008, and this is an important future consideration for the Senate in the way it uses IT 'work-wise'. Some senior staff and Senators already have lap-tops, which allows them portability in their work, and as they become cheaper, more people are likely to use them interchangeably between work, home and when they travel (nationally and internationally) with a desire to use simple video conference facilities. The Senate needs to be mindful of the need for staff to have a 'plug and go' option as they bring their own data devices into work, and also how these will be supported maintenance and security wise when that time arrives. The security of data is considered in more detail in Section 7.

3. Current problems faced by the Senate with regard to legislative process, IT facilities, network infrastructure and human resource capacity

The Senate faces a number of problems with regard to its existing IT facilities and its network infrastructure. CIT has conducted a comprehensive survey of the Senate's existing infrastructure, software applications, hardware, working practices and human resource development needs in formulating this IT Master Plan. The survey methodology included:

- Studying the existing procedures and work flow of the commissions and departments.
- Assessing the computers and equipment currently in use.
- Assessing the current IT knowledge of staff and officials working in the Senate.
- Conducting in-depth interviews with members of commissions and departmental staff to assess existing needs and future requirements with regard to IT and associated work based practices.

The purpose of this approach was to develop an IT Master Plan based on the most holistic range of information within the time available.

The Senate and Secretariat General are similar to other parliaments throughout the world in the sense that they rely very much on the effective collation and dissemination of information, in which technology plays an important role. Although there is a good number of existing individual computer work stations (161), however, the Senate doesn't have a central electronic information data storage which allows Members and key persons at the Senate to access to information without any major barriers. The Senate also lacks a proper up-to-date network

connecting its own work and that of the commissions that allows for the effective transfer and sharing of data. This situation means there is no means of accessing information in advance (particularly draft Bills being considered by the National Assembly); no reliable mechanism for creating or maintaining an 'institutional memory'; and no reliable and safe system for storing official documentation or retrieving it once stored.

Disseminating information relating to the activities of the Senate and creating an institutional 'identity' is also an important task for the Senate and Secretariat General. However, this has not been an easy task mainly due to a lack of the necessary Information Technology and appropriate financial resources that would allow the effective dissemination of information to the public throughout the Kingdom. Distribution of the Senate publication, aimed at providing information on the procedural workings of the Senate is limited due to restricted funds and appropriate technical support necessary to widely produce and distribute information. Putting such publications in the public domain (on the World Wide Web for example) would allow the public and civil society to better understand the work of the Senate.

3.1. The existing process of internal and external information flow of the Senate

Improving the Senate's contributions as a legislative body is a necessary top-priority to enhance the democratisation process and the rule of law in a framework of good governance and promotion of democracy in Cambodia. There is more demand that the laws adopted are open for public consultation, taking into account public interest, and to ensure they are good laws; regionally acceptable to minimum standards; and are consistent within a more unified system. In undertaking this process, the Senate has a number of key functions which are described below. It is important to understand these functions when considering how the provision of IT can help improve the Institution's work.

One of the key functions of the Senate is its 'Refinement Function'. This important function relates to legislative process and is aimed at improving the quality of the laws and legislation already drafted by the Royal Cambodian Government and adopted by the National Assembly. This improvement role focuses on the efficiency, quality and value of draft legislation, and takes into account issues such as the strengths and weaknesses of draft legislation and the impact it will have when finally passed. Much of this role is detailed in Article 113 of the amended Constitution. In addition to the Refinement Function, Senate also has a 'Provision of Alternatives function'. This function requires the Senate to support the Royal Cambodian Government and the National Assembly by helping choose legislation that is relevant, concise, and in the interests of all Cambodia's citizens and civil society. Making these processes and functions more efficient is central to this IT Master Plan.

Improving the passage (or flow) of draft bills and information exchange within Parliament and its Parliamentary Commissions is of crucial importance and must be considered the top priority within this IT Master Plan. It is, therefore, briefly worth describing what that process involves before the main problems are identified. In brief, the current passage of draft bills originates from the National Assembly. The Senate has one month to review a bill (the period is reduced to five (5) days when a Bill is declared urgent). If the Senate is not able to vote on the bill within the time provided, the law is adopted as voted on by the National Assembly.

In practice, many bills are forwarded to the Senate marked 'urgent. This leaves the Senate in the impossible position of reviewing bills in the given time. Moreover, even when the bill is not marked urgent, experts believe the one-month review period is insufficient for a proper review of a complex bill. Draft bills are rarely widely distributed to other Senate Commissions or Senators due to cost and an inefficient distributing system. This means that the other Commissions (beside the Commission's whose responsibility it is to examine the bill), do not have a reasonable period of time to access documents and voice their concerns at an initial stage. This inevitably means that bills are rushed through without a due consultation process being engaged in. In this sense, it appears a partisan approach to information sharing takes place, therefore deliberate withholding of documentation is engaged in, meaning Senators are unable to fulfil their duties of representing the people as constitutionally mandated.

The communication difficulties (often because of lack of facilities and adequate resources) between departments and bureaus responsible for facilitating the passage / distribution of the draft bills through the Senate also contribute to considerable delays in the system. This is often due to poorly defined procedural processes for the distribution of legislative documents and subsequent timely flow of information.

As can be seen from the main issues above, the current passage or flow of draft bills causes considerable problems for the effective functioning of Parliament, and is a major barrier for Commissions when coming to fulfil their duties. The main challenges lie specifically on how the Senators and/or Members of the Commission can effectively access draft bills (in order to understand the debate at National Assembly level), thus enabling Senators and Commission Members time to study draft bills before they are officially delivered.

In addition to above, the lack of internal networking (essentially an Intranet), file sharing, access to the Internet (especially for the Research and Legislative groups) and general communication all add up to a poor level of service and contribute significantly to Parliament being unable to perform its tasks according to its Constitutional Mandate.

The lack of IT facilities and a suitable infrastructure also extends to the knowledge and skill base of staff with regard to IT application, and these too need to be improved. Recommendations for overcoming these issues (i.e. establishing an Intranet) are detailed in Section 4, which is seen as key to improving this critical aspect of the Senate and Parliament's work.

It is worth pointing out that if this key area of the Senate's work is not improved, then the Senate will be unable to move toward becoming a well functioning Institution in line with other modern parliamentary institutions throughout the world. In this sense, the importance of acknowledging these limitations and accepting solutions / recommendations aimed at speeding up the information flow and data sharing is essential for helping Parliament meet its constitutional mandate. Without this step forward, draft legislation will continue to be processed in a way that is partisan, inefficient and costly. It will limit / prevent the public and civil society participating in the development of legislation which places a limit on democratic progress.

3.2. Computer and software assessment

The Senate uses some 161 computers and 126 printers. These are dispersed through the many Senate buildings. The condition of some are reasonable, however, many require upgrading or replacing if they are to be compatible (i.e. efficient) with the new technology made available through this Master Plan. Due to financial constraints and lack of IT coordination, the Secretariat General does not have a periodic plan for purchasing, replacing and/or upgrading hardware when it becomes obsolete. The majority of staff use Windows 98, but do not know how to use it to its full potential. Only a small number of computers are connected to the Internet. There is no means of allowing Senate staff access to the Internet at all times in a cost-effective way. However, the Senate Library has a LAN that enables dialup access to the Internet (when the Library is open).

The current Firewall (the software that prevents unauthorised access to the system from outside, and also protects the system from viruses) is minimal and subjects the Institution's existing systems to unnecessary risk. This risk is likely to become exacerbated in the near future as virus/worm sophistication increases, meaning that other users connected via the LAN will also be at increased risk.

The survey conducted looked at the IT equipment currently used by the Senate Commissions in detail. The full specification is too detailed to include here (as the information extends to room location, processor type, RAM, HDD, CD-ROM, LAN card, operating system, software applications, and cabling) of all 161 computers used by the Secretariat and the Commissions. However, the table below shows the number of computers used by the Commissions, and the proposed number of computers recommended to comply with the objectives of this Master Plan.

Commission	Current computers (No.)
Protection of Human Rights and Reception of Complaints	8
Finance and Banking	8
Economy, Planning, Investment, Agriculture, Rural Development and Environment	8
Home Affairs, National Defence, Interior, Investigation and Anti-Corruption	8
Foreign Affairs, Information and Propaganda	8
Legislation	8
Education, Religious Affairs, Culture and Tourism	7
Public Health, Social Actions, Labour and Women's Affairs	7
Public Works, Transport, Post and Telecommunications, Industry, Energy and Commerce.	7
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The table below shows the existing computer for the Secretariat General.

Department	Current computers (No.)
Administration	8
Procedure	5
Finance	5
Technical Affairs	13
Protocol	4
International Relationship	2
Library and Research	16
Cabinet of the Speaker	8
Cabinet of the First Deputy President	2
Secretary General	6
Assistant of Deputy Secretary General office	3
Assistant of Secretary General Office	4
Senator	13
Assistant of Second Deputy President	2

The overall observation is that there is not sufficient computers for the Senate's needs (it is recommended that 50 additional desktop computers are purchased to meet needs). The vast majority of computers have Pentium II processors and are capable of being used efficiently through to approximately 2006, when they will need upgrading. However, a number need upgrading to facilitate connectivity to the Intranet / LAN through the purchase of LAN cards and appropriate software etc.

3.3. Working practices

From the survey it was clear that there is a need to increase ability to initiate legislation; make recommendations on draft laws and proposals; hold constructive informed debate during plenary sessions; monitor law enforcement; and implement the Internal Rules and Procedures of the Senate. Therefore, a central aspect of this IT Master Plan is helping improve the whole legislative process, so that the work of Senators and that of the nine commissions is strengthened. The support vehicle for helping achieve these goals and priorities is the Secretariat General of the Senate. It is believed that the introduction of a proper informatics facility will help achieve these aims, and at this point it is important to restate that improving the work of the Secretariat is the key to improving the work of the Commissions. The Secretariat is the main body for supporting, advice, research, information dissemination etc. and without improving the work of the Secretariat, the work of the Senate's Commissions will never be improved.

One of the problems with regard to current working practice is that Senate staff lack experience of how IT systems can improve and support a modern parliamentary system. Consequently there is a lack of useful material specifically designed for Senators, staff and the public on the various working aspects of the Senate. There is a need to digitise this information, as well as the production of parliamentary records and to develop ways to improve public access to these records.

At a general level the staff in the Secretariat use their computers mainly for word processing (some use spreadsheets such as Excel). Information is not usually shared, due to both technological and working practice problems, and much information in documentation form is generated by hand in paper format. Staff do not generally use/have access to internal e-mail, Intranet or extranet facilities. Currently, there are a number of data 'sources' (e.g. commissions, departments etc.) that produce data but with no means of integrating or sharing the data they generate. This situation means the efficiency of workflow between the relevant commissions and their supporting departments are poor. There are a number of individuals within the Institution (and outside, such as Ministries) who would benefit from access to such data for purposes of work.

One of the main issues the Senate faces in its work (particularly in relation to document sharing) is ensuring the integrity and accuracy of documents (and other data) as it passes through commissions and departments. Changes made to documents at one location are unlikely to be 'mirrored' in the same document if a copy is held elsewhere - ensuring data integrity is essential for correct decision making. The existing number of disconnected information sources (i.e. no file server to hold the document at a central, single source) puts this integrity and accuracy at risk. It is necessary, therefore, to establish and introduce mechanisms and procedures that manage data in a coordinated way and also makes that data accessible to people whom have a legitimate cause to access it.

Currently there is no customised application software to allow individual departments to conduct and manage their work and business in the most effective and efficient way. The main issues identified when consulting Senate staff and officials were:

- The library has no effective means of cataloguing its resources.
- There is no inventory control system to record and track institutional assets and equipment (this will be essential to support future audit processes).
- There is no human resource management system to support effective HRD and personnel management practices.
- The payroll system is manual and the financial accounting system is not tailored to institutional requirements.

Although not all the above are first-priority issues for the Senate (due to availability of financial resources), they are issues that impact on the performance of the Institution as a whole.

3.4. Current Infrastructure provision

The Senate operates from a number of buildings on one main site. These buildings are not networked. Where cabling exists within buildings it is Category 5 (original installation). There are no fibre optic cables. The local network (which should allow information sharing on draft bill analysis, challenges and comments, Internet access, shared use of printers, e-mail and file sharing and storage) where it does exist can be classified as 'poor'. Poor networking means documents are not efficiently shared, they become lost, and multiple versions of documents exist on peoples' desktops that quickly become obsolete. None of the Senate buildings are linked to any other institutions, such as nearby Ministries or the National Assembly.

During the survey, Senators expressed the desire to have a 'automatic vote registration facility' to record the votes of Senators following debate. Recommendations for such a system are made in Section 4.

3.5. Current IT human resources and skills of staff

3.5.1. IT skills of staff

A skills and knowledge assessment of staff was conducted for this Master Plan, which identified the following general issues.

- Most staff use computers solely for word processing and make little use of the extensive range of other applications.
- Staff generally do not have a sufficient range of skills or knowledge to enter the correct information into the computer.
- There was a lack of working methodology in computer usage, which points to poor work efficiency.
- Staff do not know how to format or create documents correctly.
- Staff do not really understand the software packages provided as part of their system software.
- Most staff do not know how to manage documents efficiently.

Generally speaking, the overall knowledge and skills of staff with regard to IT use within the Senate was limited to word processing (although some staff who had access to the Internet demonstrated sufficient user competence in basic searching and accessing Internet e-mail accounts such as Yahoo and Hotmail). In terms of overall knowledge and skill application, little use was made by staff of other software programmes (such as spreadsheets, Power Point), although some individuals did demonstrate competency within these areas.

3.5.2. IT support

The current Senate IT Team is very small. Their existing knowledge and level of skills are insufficient to perform the required existing tasks, or future ones as the IT needs for the Senate grows and evolves. There is no database administrator (as there is no database to be administered) and no programme developer to write in-house programmes. There is no network manager and no one currently provides any 'Web Master' service or function. Finding staff to undertake these roles and responsibilities will be essential for a well-functioning Institutional IT system. Recommendations for approaching this issue are considered in detail in Section 6.

3.6. Connection to other institutions

Currently there is no means of communicating with other institutions, such as the National Assembly and Ministries (e.g. Council of Ministers; Ministry of Assembly Relations and Inspection) other than through ISPs (usually e-mail) or telephone, and this is providing that the other institution has the necessary IT facilities in place.

3.6.1. Video link to the National Assembly

Currently there is no means of observing the activities of the National Assembly while they are in session, discussing draft legislation etc. One of the desires expressed by Senators during the survey period was for the ability to observe proceedings in the Assembly (on a one way basis i.e. not for the Assembly to view the workings of the Senate). Recommendations for this are made in Section 4.

3.7. Problem summary

In Section 3 a number of critical issues have been considered that affect the smooth and efficient working of the Senate (and Parliament as a whole). These include the workflow of commissions and departments; existing IT support, provision and infrastructure; Secretariat working practice; existing human resource capacity and IT skills; and communication with the National Assembly. Many of these issues can be overcome by installing the appropriate IT infrastructure, equipment, software and by providing necessary training and support. This aspect is discussed in more detail in Section 4 below, which outlines potential solutions in terms of infrastructure (establishing an Intranet so information can be freely shared), software application, and human resource development (which includes establishing an IT Team, providing workshops for Senators, and training for officials and staff of the Senate on the use of IT.

4. IT Master Plan Recommendations

4.1. Recommended Infrastructure

The main infrastructure feature for the Senate will be the establishment of an Intranet. This will allow all commissions, departments, bureaus etc. to access information in a free and timely way through a mechanism designed to improve the distribution of draft law and exchange of information. The Intranet is one of the principle mechanisms for speeding up the passage and flow of draft bills as discussed in Section 3.1. One of the main ideas behind establishing the Intranet is to create a neutral, non-partisan 'holding area' for draft bills and other relevant documentation that can be accessed by all concerned in a timely manner. Another important feature of creating a 'free' holding area through the Intranet means that draft bills and other documentation do not have to be circulated in paper format - thus saving time, and considerably improving efficiency and effectiveness, whilst reducing cost.

Phase I of this plan concentrates on the main priority areas which are the Council of Law; Department of Legislation; and the Library Group – and the Bureaus within each of these Departments. These are considered Priority One in the infrastructure development phase. Additional departments will follow according to next level priorities and available funding. The first step in enabling an Intranet is creating a LAN within the Priority One offices, and then ensuring these are networked. Once this has been achieved, connectivity to the Internet can economically follow (discussed in more detail at 4.2.1).

A good network infrastructure should underpin all IT services – it is the backbone of the complete IT system. The services the infrastructure should support include Intranet, Internet, e-mail access, administrative applications, library services, and support for video conferencing. It should also have sufficient and reasonable capacity to absorb new technologies as they come on stream, without the need to upgrade the infrastructure or replace it completely

(although that situation should be planned for at some time in the future). A good infrastructure allows desktop machines, printers and software to be run in an efficient and cost effective way. Although it is not part of this initial proposal, it is useful to bear in mind that the infrastructure (if supported by the appropriate hardware and software) can support telecommunications, security and fire alarm systems should this be required at a future stage.

For Parliament as a whole (the Senate and the National Assembly) to function effectively and fulfil its constitutional mandate, it is essential that a secure, high-speed network between the two is created. Such a network will allow the rapid sharing of data, draft bills (research, bill analysis and recommendations) and video conferencing, meaning business is conducted more effectively and efficiently. A dedicated link between the Senate and the National Assembly (and eventually Ministries) will allow voice and data to be shared between the Houses very economically, as no third party link will be required.

The following paragraphs provide detail as to some of the necessary infrastructure requirements within this plan.

4.1.1. Cabling

An important aspect of the infrastructure design is to install the correct and appropriate cabling. There are two types of cabling recommended for this IT Plan: local data wiring and optical fibre or Wireless. These are discussed below.

4.1.2. Local data wiring

Local data wiring (i.e. used for connecting file servers to desk tops etc.) should be based on category 5e cable (to support Gigabit Ethernet) for the initial Phases of this plan. Any alternative wiring products should be given careful consideration as to their compatibility with any existing and future installations.

4.1.3. Optical fibre

In Phase III of this plan it is proposed to use optical fibre (fibre optic cable) to connect the National Assembly and the Senate, once the National Assembly has moved to its new location. Additionally, as more government institutions come on stream for fibre, then given the right connectivity, it will be possible to link the Senate with selected Ministries. The fibre optic used should include both multimode and monomode fibres depending on the needs of the Institution and changing technology towards 2006 - 2007. The details and costs of this initiative are detailed more completely in the IT Master Plan for the National Assembly.

4.1.4. Electric static prevention

In order to protect the hardware from electric damage (power surges, lightening strike etc.) and ensure continued operation during power outages it is recommended that all computers/ components have a means of voltage regulation, UPS (uninterrupted power supply, or battery back-up) and ground connection. Furthermore, all buildings should have anti-lightening rods installed to ensure equipment is not damaged should lightening strike.

4.1.5. Purchase of new computers

It is recommended that all the new proposed desktop computers are installed in Phase I. This will allow staff to become familiar with their use, have somewhere to put their training into practice; and will also allow the speedy establishment of the Intranet as that phase of the plan gets underway.

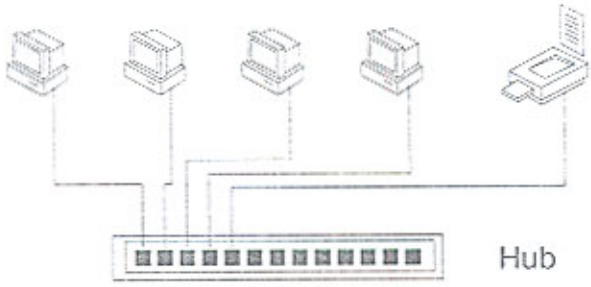
4.2. Infrastructure and Hardware Development

4.2.1. Phase I infrastructure works (2003 – 2004)

This Phase is the first step in establishing the Intranet by creating the necessary conditions to support its introduction. This will allow access to all centrally stored data at no cost (eventually allowing the National Assembly access at a later stage) and to the Internet. As explained in previous Sections, this aspect is key to improving the work of Commissions through increasing the efficiency and effectiveness of departments. In the early stages of this Phase, there are a number of critical tasks that need to be undertaken to ensure subsequent phases can proceed according to the broad Master Plan. These are:

- Create a LAN within each Priority One department (i.e. Departments of Legal Research; Department of Legislative Procedure; and the Library Group) by installing Category 5 cabling.
- Identify (upgrading if necessary) a suitable computer to be the local file server.
- Install appropriate software to allow local e-mail connectivity.
- Initiate access to the Internet via a local ISP.
- Install voltage regulators/UPS where appropriate.
- Purchase 50 new computers, and necessary hardware (and software); including new printers, scanners, cabling etc.
- Upgrade 150 computers
- Assign maintenance contract for above until in-house staff can take on board maintenance tasks.
- Create a LAN within selected Priority Two departments.

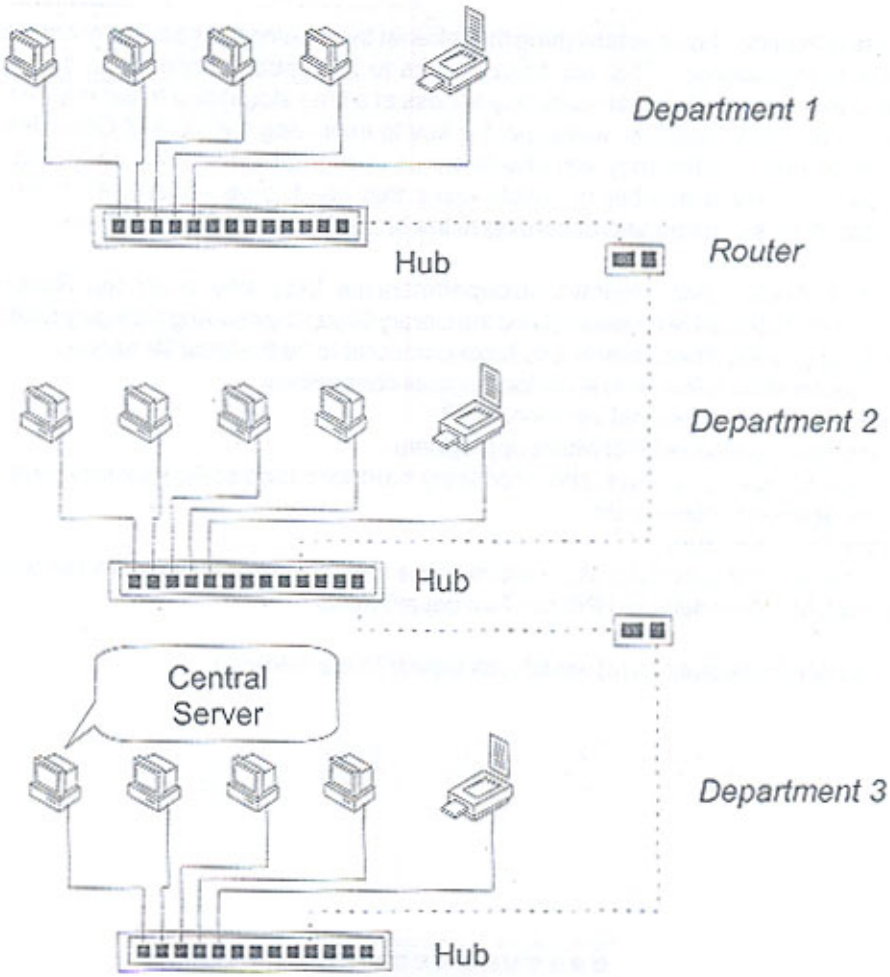
Creating a LAN (in diagram form) would look similar to the following:



Computers on Local Area Network (LAN) of one department connected through a hub can share files, printers and can communicate throughe-mail. The LAN can be configured to have one server or non (peer to peer).

Implementing the above will enable people within a department/office to communicate freely with each other by internal e-mail, share files, access the Internet, and back-up data to a local file server. However, the installation should be made on a priority basis, with the Department of Legislative and Procedure, Department of Research, and the Library being identified as top-priority. For each of these Departments, a full quota of PCs is needed, along with a departmental scanner, printer, e-mail server, and connection to the Internet via a lease-line modem link.

Establishing the beginnings of an Intranet would look something like the following:



One possible configuration is to link all departments through routers.
Each department is called a sub net.
There should be a server for central depository of shared data.

4.2.2. Creating access to the Internet

Within Phase I it is recommended that connection to the Internet be facilitated once departments are networked and staff have had their desktops upgraded. It is estimated that the most cost effective way of achieving this will be to lease 1 line (256K baud rate) dedicated to Internet provision (at a cost of US$ 1,700 per month per line for unlimited use, and US$ 200 installation fee, and phone line costs US$ 100 per month) from an ISP provider (costs quoted are from Camnet, the cheapest ISP provider in Cambodia – see Appendix D for detail). If the Senate is not networked first, then a number of ISP lines will need to be leased (approximately one for each building not connected by LAN). Although it is preferential to avoid this option, in the short-term pending full/partial networking it may be viable alternative.

The preferred option will allow Senate users to access the Internet efficiently and cost effectively (it is assumed that staff will not all require access to the Internet at the same time), however, increasing the baud rate to 512K is not a problem should this be required.

Introducing such a system will ensure that when users come to access the Internet, they can do so in a speedy way, and not be constrained by the current 'slow' connectivity rates. However, it is recommended that this installation be undertaken progressively, only when LAN phases have been completed (to save unnecessary expenditure). Providing access through other means without preferential tariff agreements with an ISP provider is likely to prove costly, with no means of identifying or controlling expenditure levels (some ISP rates are as high as US$ 3 per hour).

An important point to note here is the rapidly changing cost structure of Internet provision in Cambodia. Internet rates have fallen from near US$ 8 per hour access rates (1999), to near 50 US cents per hour access rates (2003) at Internet outlets. The cost provided in this plan is based on initial discussions with an ISP provider, however, it will be necessary to check prevailing market rates at the time of proposed connection, and to review them on a contract by contract, or year by year basis as rates change.

4.2.3. Phase II infrastructure works (2005 – 2006)

Phase II of the infrastructure works involves linking all the departments/offices within the Senate site together.

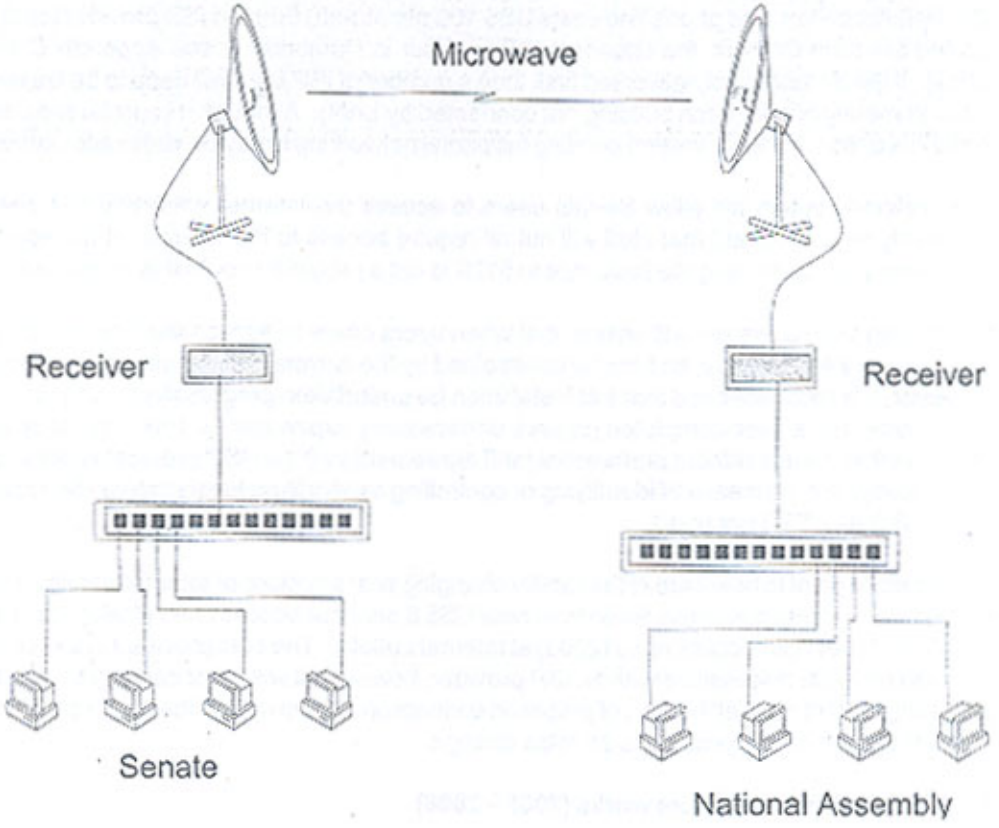
These steps include:

- Purchase of 25 computers, hubs, switches etc. to enable central file server for all Senate data.
- Create a LAN within remaining Priority Two, and Priority Three departments.
- Link the closest Senate buildings via Category 5 links.
- Establish a wireless link between the Senate and National Assembly and obtain license from MPTC (this is detailed fully in the National Assembly's IT Plan).

The diagram on the next page shows how a wireless link between the Senate and National Assembly would look conceptually.

4.2.4. Connecting the Senate and National Assembly (using wireless technology)

As previously mentioned, Parliament can benefit considerably from a dedicated link between the two Houses (both cost and working practice wise). In Phase II of this Master Plan it is recommended that a wireless link between the two Houses be established.



A wireless using microwave link allows the two Houses to share data and communicate freely. Each house can use the Intranet, Extranet and Internet links

This will enable all those on the networked system to share data (and voice) over a dedicated link and engage in video-conferencing activities if the appropriate equipment is installed. The wireless link is recommended for two reasons. First, the National Assembly will relocate to its new building in Phase III of this plan and move to using fibre-optic cable for the link between the two Houses – funding and licences permitting. Second, the wireless equipment can be transferred to the new building and be used as network contingency should the fibre-optic link be disrupted (e.g. through maintenance or inadvertent road/building works).

The proposed microwave link is to use Wireless Outdoor Bridge, with a capacity of 18 Mbps, and a maximum distance of 10 km. This is compliant with IEEE 802.3. (See Appendix D for full specification). Such a link will allow the National Assembly and Senate to seamlessly share the central database.

4.2.5. Phase III infrastructure works (2007 – 2008)

The main component of Phase III is connecting the Senate and National Assembly by using fibre-optic cable, for the reasons more fully explained in the paragraph above.

- Implement main server link between the Senate and National Assembly.
- Purchase necessary hardware to support fibre-optic link and create fibre-optic link.
- Upgrade Operating System and software.
- Purchase and install one-way video capture (from National Assembly to Senate)
- Purchase and install interactive voting system.

4.2.6. One-way video link to National Assembly

An expressed intention of the Senate has been to observe the proceedings taking place in the National Assembly. This would require installing a video and voice capturing system within the National Assembly chamber, and relaying sound and images to certain locations within the Senate site. If fibre optic has not been installed at the stage this is required to go live, then one alternative would be to transmit the data over a SDSL lease line. The cost for this installation is detailed in Appendix A.

4.2.7. Interactive voting system

The Senate is keen to have an 'interactive voting system installed' with full voice conferencing system. This would allow Senators to register their votes electronically by use of smart card technology and for digitized records to be maintained. The cost for this installation is detailed in Appendix A.

4.3. Costs

The costs for Phases I, II and III are detailed in Appendix A. With regard to maintenance costs, it is recommended that a competent contractor be appointed to maintain, service and repair the entire Institute's IT facilities until in-house staff are capable of taking on board the role themselves. Although electricity costs will rise as a result of this plan, the increase is not considered significant.

5. Recommended approach to Application Software

The cost of software is a significant part of any IT budget and makes software selection an important aspect within the development of the IT plan. Generally speaking, for most desktop applications the use of powerful graphical interfaces (such as Microsoft's Windows) is sufficient for the majority of users. However, there are a number of specialist tasks that the Senate conduct in which application software should be specifically developed. The reason for this is to:

- Develop suitable software in the Khmer language.
- Develop databases that are specific to departmental needs (e.g. finance, inventory control etc.).
- Ensure that applications can interface with each other (Khmer-User-Interface).
- Ensure that the system is able to 'grow' when the Senate's needs grow.
- Ensure there is on-site IT support to correct any software issues.

Although developing and maintaining specific software is generally more costly than packaged software, it is clear from the above criteria that purchasing packaged software is not really an option given the Khmer language and interface requirements. Moreover, software development costs will be shared between the two Houses, making it a much more economically viable proposition. Additionally, training will be required for all users (but this is true of any new software package). Following consultation with key individuals it is proposed that the Senate develop specific software to meet its needs in the following areas (in order of priority development).

- Library Management Information System (LIBMIS)
- E-Library
- Electronic Documents Management System (EDMS)
- Human Resource Management Information System (HRMIS)
- Inventory Management Information System (IMIS)
- Financial Management Information System (FMIS)

Each of these is described in more detail below.

5.1. Library Management Information System (LIBMIS)

The purpose of the LIBMIS is to keep track of all printed material (such as periodicals, journals, books) and other mediums (e.g. CDs, video, sound cassettes etc). The LIBMIS has two modules, a catalogue module and a lending module. These are described briefly below.

- Catalogue module – the purpose of this module is to catalogue all mediums (from books to video) in line with internationally recognised library coding indexes, such as the US Library of Congress indexing system. This will allow users to search for material (using a library search engine) by author, title, key word, subject, publisher, date etc.

- Lending module – the purpose of this module is to maintain an accurate record of all material loaned through the library, keeping details of borrower, items lent, return dates, fines for late return etc.

It is expected that a 'library lending card' system (possibly along bar-code technology lines) will need to be developed with the 'lending module', and this would need to be done in consultation with the appropriate library staff.

5.2. E-Library

The concept of an E-Library is an important one for the Senate, in the sense that it is central to the Senate's strategic plan for creating greater access to Parliamentary publications (both for the public, and at a more restricted level for Senators, officials and staff of the Institute). The Senate has recognised there is a need to improve the production of parliamentary records and develop ways to improve public access to these records.

Making the necessary documentation available through the E-Library concept is a first step in moving toward greater access of documentation for all concerned. Such a move needs to be developed in accordance with the Senate's strategy for making information available via

a Senate Web Site. However, it must be recognised that within any move toward making non-digitised documentation available in electronic from requires a considerable change in role and work for staff associated with the storage and production of documentation.

Making documentation more accessible can help overcome the problems identified in the Strategic Plan with regard to information sharing. Namely the lack of documentation specifically designed for Senators, staff and the public on the various working aspects of the Cambodian Parliament. It will also help new Senators find relevant literature to induct them in the workings of the parliamentary system, and information that clearly describes the roles and responsibilities of various departments, committees and other relevant procedural functions.

5.3. Electronic Documents Management System (EDMS)

The purpose of the EDMS is to make existing paper documentation available and accessible in an electronic format (and is closely associated with the E-Library concept). This encourages good documentation management and allows users to retrieve documents via a search engine facility on an author, subject, date etc. basis, or even by a full-text search. This facility allows speedy and efficient retrieval of documents that are stored on a database. An added bonus of the system is the reduction in paper copies produced, thus saving money on the purchase of paper products.

Developing a proper archive facility is seen as a key objective of the IT Master Plan and is intended to help overcome some of the difficulties staff face in maintaining and managing archive material as highlighted in the Strategic Plan (it can take between several days and several months for staff to find the existing paper based documents). As always, however, careful consideration needs to be given to exactly what process is used in transferring existing paper based products into a digitised format, and how these are catalogued and coded for future retrieval purposes.

5.4. Human Resource Management Information System (HRMIS)

The purpose of the HRMIS is to assist managing the Senate's human resources in an efficient manner. This extends to developing a database to contain personal details of all the Institute's employees, their career and training histories, probationary and staff development reviews undertaken, and all other relevant data that can be used to optimise the Senate's use of its human resource base. The HRMIS can help the Senate better plan its institutional structure for the future, and assist in devising HRD strategies that ensure staff skills and competencies are used in the best interests of serving the Senate. The HRMIS should interface with the FMIS (on a restricted access basis) to ensure payroll runs etc. are accurate and up-to-date.

5.5. Inventory Management Information System (IMIS)

The Supply Office of the Senate requires a suitable IMIS that provides control and tracking of inventory costs and inventory levels – essentially assets and consumables of the Institution. The intention with the IMIS is to record assets and consumables at location, track dispatches, transfers and receipt of goods between locations and from external suppliers. The IMIS will be particularly useful in managing costs of consumables and provide invaluable during periods of financial and inventory audit.

5.6. Financial Management Information System (FMIS)

The FMIS has a number of key functions. Among these is the ability to track income and expenditure and provide senior management with accurate data in relation to Institutional costs, both in local Khmer currency and other country currencies for which the Senate has responsibility managing.

Payroll facilities will be an important feature of the proposed FMIS. Currently the payroll run is undertaken manually which provides opportunity for 'error' in recording staff salaries and expenditures. The FMIS will automatically generate salary lists, payroll reports and produce pay slips etc. This provides an invaluable tool for budgeting and meeting internal audit requirements.

The FMIS will also contain a 'fixed asset register' module that will help the Senate manage its assets in a financially responsible manner (taking into account depreciation), and helping in planning new purchases and making informed decisions with regard to asset disposal. This latter aspect is especially useful where high depreciation assets are concerned. The system may be extended to handle the Senate's procurement requirements should this be considered desirable.

5.7. Approaches to developing application software

The approach to developing software will require the Senate's IT Team to work closely with staff from the departments of Finance and Administration, Personnel, Library etc. to develop a common application and development framework that allows for effective integration and data exchange. The key aspects for developing software must take into account problem solving capabilities, flexibility, ease of use, accessibility, security, clear written guidelines on use and development, and efficient technical support.

One extremely important point to note within the move toward 'digitising' work practices is that many practices are currently paper based and undertaken manually – and the change in working practice this will have on the staff who currently perform these tasks. It is likely that their roles and functions will change considerably and progressively over the course of this Master Plan, and acknowledgement of this should be accounted for in the Senate's overall HRD strategy for absorbing new IT practices into existing staff working practices.

For user support to be effective and efficient it is important that the use of other and diverse software packages (for tasks that can be conducted with the recommended application software) is discouraged. This general rule should also be extended to deciding the choice of software packages on price alone. The Senate should develop a code of good practice concerning the use of unauthorised or 'pirated' software – this is important as a number of international organisations are expected to support the Senate in funding this plan. Wherever possible, the use of site or bulk software licences should be used to make software installations economical.

5.7.1. Phase I Application Development (2003 – 2004)

- Develop LIBMIS and EDMS in conjunction with departmental users on a priority needs basis (as specified in Section 5).

5.7.2. Phase II Application Development (2005 – 2006)

- Develop HRMIS, IMIS, FMIS in conjunction with departmental users on a priority needs basis
- Update LIBMIS and EDMS in conjunction with departmental users growing needs.

5.7.3. Phase III Application Development (2007 – 2008)

- Update LIBMIS, EDMS, HRMIS, IMIS, FMIS in conjunction with departmental users growing needs.

The costs for the above Phases are detailed in Appendix A.

6. Recommended approach to Human Resource Development

As stated in the Introduction, a key aspect of this Master Plan is the development of the Senate's own human resources. In order to ensure Senators, officials and staff of the Senate are able to perform their roles effectively, an approach needs to be developed to build the capacity of all concerned in information technology skills, by providing them with thorough, customised training, and the appropriate documentation.

An important aspect of the HRD strategy is ensuring that information technology is seen as a tool, not a goal in itself. The technology provides options and opportunity, but the Institute must mobilise its staff to make best use of it in the most appropriate way. A number of IT related studies suggest that making existing paper-based processes electronic can be relatively expensive and more time intensive than originally perceived i.e. some paper based systems are actually quicker and cheaper to run than their digitised counterparts. Careful thought needs to be given to exactly which processes are brought into the IT domain. Moreover, the necessary changes in productivity and effectiveness require a change in the way the activities of the institution are conducted, and as such, this HRD element of the IT Plan must be seen as an integral part of a wider strategy to HRD in the Institute as a whole. This will require senior management support, commitment and direction to ensure the strategy succeeds as a whole.

The Human Resource Development (HRD) component of this plan needs to be viewed at two levels. First, there is developing a capable IT Team to manage the entire IT requirements of the Senate. Second, there is the need to hold workshops introducing the necessity of IT for Senators, as well as training officials and staff of the Senate in the correct use of the new systems and software. These two strands of the IT HRD strategy are discussed below.

6.1. IT Team

The role and function of the IT Team is critical to the success of this Master Plan. The IT Team performs the necessary functions that ensure the entire IT infrastructure, network, hardware, software, systems and applications are kept operational and maintained to acceptable standards. Amongst the many roles of the IT Team will be the need to:

- ensure that systems are developed in accordance with Institutional strategy
- plan for new hardware
- maintain and back-up databases

- repair and maintain hardware
- correct problems when they occur
- ensure system security and network resilience
- create and design the Senate's Web pages
- introduce Senators, officials and staff to relevant IT needs

A primary concern in any HRD IT approach is that the staff responsible for the development and maintenance of the IT systems, infrastructure and hardware must continually update their skills to keep pace with the rapidly changing IT environment. Without this, the support to the Institution will not be as efficient and effective to meet its real needs.

It is recommended that the Senate develop an IT Team broadly following the structure outlined below.

The tasks and functions of the above positions are described more fully in Appendix B, and may be usefully used to develop part of the job descriptions and person specifications at a later date.

Two specific roles that need to be created within this Master Plan is the 'Web Master / Systems Engineer' position, and the overall 'IT Managers' position. Phase I of this plan needs to recruit to these two positions (or train internal staff), and prior to doing this suitable job descriptions and person specifications must be developed to ensure the most suitable candidates are appointed to the posts.

6.1.1. Alternative approaches to 'in-house' human resource development

This plan has been developed on the need to increase 'in-house' human resource capacity principally in terms of developing the IT Team. However, there are additional options that should be reported here, if only to ensure the Secretariat General and Senate that other possible alternatives have been considered. Each option has both advantages and disadvantages, and if considered as serious alternatives more research needs to be undertaken. For the purposes of this document, they are only commented on briefly.

6.1.2. Outsourcing or contracting in

In a competitive market place it is often more economically viable to 'contract in', or 'outsource' parts of the IT support function. This has advantages in that there are clear Service Level Agreements (SLAs) between the user (in this case the Senate) and contractor.

Contract costs are usually clear and can be budgeted for on an annual basis; and the staff of the contracting company are normally familiar with the rapidly changing IT market. The disadvantage in this approach is that it does little to develop the human resource capacity of the Institute itself.

6.1.3. External recruitment

The HRD component of this plan is based on training existing staff, or recruiting internally to important IT posts, such as the Web Master and Systems Engineer positions. However, it may be more speedy to provide the Senate's needed support by recruiting people to these positions externally, who already have the necessary skills and competencies, rather than training from within.

6.1.4. Hybrid approach

The Hybrid approach is a mixture of all the HRD components of this plan. Recognising that internal HRD is key to the development of the Institution as a whole, and thus supporting internal training to develop IT capacity, but also recognising that some tasks and functions are best contracted in. This would be especially useful in the short-term, in which 'in-house' IT Team trainees could shadow external specialists to learn in an 'on the job' fashion, with the view of phasing out external support in the medium to longer-term.

Whatever approach is chosen, key to successful IT HRD for the IT Team is the necessity to keep pace with changing technology.

6.2. HRD of Senators, officials and staff of the Senate

The second aspect of HRD within this Master Plan is improving the capacity of all those individuals who are not part of the IT Team, but who require to be familiar with IT and its application to support the Senate's day-to-day business needs. This group of people can generally be referred to as 'end-users'. The end-user concept can be further thought of in two distinct types; these are the:

- Staff user, who operates the business source (e.g. data processing): and the;
- Executive or management user, who uses data to aid solving problems, make decisions, and plan strategy.

The requirements of each group in development terms is distinct, although not necessarily separate, as the executive or management user may only need to know the basic principles of the system, not detailed operating knowledge. Recognising that Senators, officials and staff of the Senate all have differing needs in relation to IT is central to this HRD component. Administrative staff may have to develop fairly detailed knowledge of the application software that they are using (e.g. payroll staff, library staff) in order to be competent in its use, ensuring the information is entered correctly and the system produces accurate data. Whereas Senators and senior management will primarily be concerned with accessing data (rather than inputting it) and making decisions based on their interpretation of it. Therefore,

for some members of staff who need a high level of skill in application software (payroll, library cataloguing, inventory management etc.), it may be appropriate for tests or examinations to be introduced. This would allow management to satisfy themselves that the competency of the individual is in keeping with their work based needs to operate and understand the system, and also provide evidence as to the efficacy of the training provided (as a means of monitoring and evaluation). Such an approach, however, would not be appropriate for senior management and officials.

Within the initial context of this plan, it is believed that the most appropriate approach to HRD is a systematic approach based on providing workshops and training in 'basic, intermediate and advanced levels' of IT knowledge and application. As workshops and training progress, and individual skill requirements become more clear (as work based practices evolve within the new IT environment), it is recommended that the HRD strategy be re-visited and considered in conjunction with the Senate's overall HRD strategy, and the appropriate follow-up provided.

It is of course recognised that a number of staff already possess competent skills in IT, and not everyone is at the same starting point for learning. Training courses and workshops therefore have to be broadly tailored to meet the specific needs of individuals, whether that person is at the beginners, intermediate or advanced level. However, it is not the intention within this plan to offer bespoke development (other than to members of the IT Team). The reason for this is primarily based on cost, as individual approaches are unrealistic given the early stages of this Master Plan.

6.2.1. Approach to developing human resources

As mentioned in the analysis of the Senate's human resources (Section 3), there are a number of shortcomings and weaknesses in the skills and knowledge of Institutional staff at all levels. The recommended approach to is to design a number of relevant workshops and classes of varying levels of difficulty. These will be targeted at different audiences, such as management, staff, end-users, Senators and the IT Team. The objective will be to offer support relevant to an individuals needs (i.e. their day-to-day work) and will be accompanied by 'applying their learning in practice' when they return to their places of work (recognising that training without work based application is of minimal value). Another objective is to build the capacity of staff generally in a progressive manner, and at some future stage, management approval permitting, staff may take courses to enhance their own knowledge regardless of relevancy to current work requirements. This approach will ensure that the Senate's staff and officials will grow in capacity, enabling them to seek promotional opportunities beyond their existing work skill area. A number of courses have been designed in outline for 'users' and the IT Team, separated into the following groups.

- Executive management (EM)
- Staff (S)
- Hardware Maintenance (HM)
- Software Maintenance (SM)
- Developer / Programmer (DP)

Appendix C shows the outline detail of these courses, following the acronyms ascribed above.

6.2.2. Balance of responsibilities

An essential approach to success of this HRD Plan is to develop a balance of responsibilities between the IT Team and departments of the Secretariat General. This essentially means that clear guidelines must be agreed as to the responsibilities of each. For example, departments must take the lead in ensuring their staff have the correct equipment to perform their work tasks, as this will be beyond the scope of the IT Team's role. Likewise, the IT Team must take the lead in developing systems and infrastructure that meet the needs of departments, and not expect departments to provide them with detailed specification of how a system should be developed.

The following Phases broadly outline the necessary activities involved.

6.2.3. Phase I Human Resource Development (2003 – 2004)

- Give seminar presentation to all Secretariat General Staff of the Senate, Senators, partners etc. on the IT Master Plan and its implications for the next 5 years.
- Develop job descriptions for Web Master /System Engineer and IT Manager and recruit to posts.
- Establish remainder of IT Team.
- Conduct training for modules EM 1–3, SE 1–3, HM 1–3, SM 1, DP 1-5.
- Conduct training on LIBMIS, EDMS for departmental users

6.2.4. Phase II Human Resource Development (2005 – 2006)

- Give seminar presentation to all Secretariat General Staff of the Senate, Senators, partners etc. on the progress of the IT Master Plan and any recommended changes.
- Conduct training for modules DP 6-8.
- Provide follow-up training as required.

6.2.5. Phase III Human Resource Development (2007 – 2008)

- Conduct training for modules DP 9-11.
- Provide follow-up training as required.

7. Security of IT systems and information

An important concern for the Senate is the security of its data. Effective policies and procedures that relate to information security are of particular importance and a necessary component of a resilient IT facility. Although the security of equipment does not appear to be an immediate concern for the Senate, the security and privacy of information needs to be given some careful thought, both in terms of accidental loss, and deliberate attack in both the short and long term.

An increasingly mobile IT world means that unprotected data can be easily 'burned' to CD, copied to disc, or simply e-mailed outside of the Institution with the minimum of ease. As more and more policies, procedures, personal staff data, financial records, bank account details etc. become digitised, there is a need to think about protecting these records from (a) unauthorised access (b) unauthorised copying and removal from site. This situation equally applies to persons wanting to gain access to the Institutes IT systems from outside (hackers) or from viruses and similar hazards. Careful measures to protect Institutional information and systems from external electronic attack need to be installed through the use of up-to-date technology.

To respond to the above concerns, policies need to be developed as part of the IT HRD strategy that makes clear the approaches to:

- Firewall
- Backing-up
- Password protection
- Disaster recovery
- Copying and removal of data

These are addressed in turn below.

7.1. Firewall

The existing Firewall should be upgraded with minimal delay with one of a number of protection programmes readily available on the market (such as McAfee, Norton etc.). A systematic procedure should be put in place for updating the programme on a regular basis.

7.2. Backing-up

The main purpose of backing-up is to ensure that critical systems, software and Institutional data can be restored if lost. The backup of information stored on centrally managed servers must be undertaken on a regular basis and carefully stored – this responsibility lies with the IT Team Manager. It is expected that individual departmental staff will take responsibility for their own backup arrangements.

7.3. Password protection and restricted access

Access to the Institutions network should be governed by a 'password' system on a hierarchical level. For particularly sensitive data (e.g. payroll, finance, security), access should be restricted on a 'need to know basis', and appropriate policies developed for the security of key passwords etc.

Clear guidelines should be developed so that Institutional equipment is not used in such a way that brings the good name of the Senate into disrepute (e.g. prohibiting access to pornographic Web sites). Basic information on the usage of IT systems should also be logged, to prevent misuse and unauthorised access of the Institutes data.

7.4. Disaster Recovery

It is not considered feasible at this stage to develop a full IT disaster recovery plan for the Institute (e.g. the duplication of network cables). However, some consideration should be given to the continuity of Institutional business in the event of an IT disaster e.g. major fire that destroys servers and cables.

Sensible precautions such as locating central computer equipment in clean, secure accommodation with adequate space, power supplies, environmental control (air conditioning and humidity protection) is considered a necessary minimum.

7.5. Copying and removal of data

There will be a need for written procedures that clearly state the Senate's protocols and procedures for copying data to storage devices (CDs, floppy discs, portable hard-drives, laptops, flashcards etc.) that are not used for work purposes. This policy will also need to be clear about the removal of data from Senate premises.

8. Implementation and Project Management of the IT Master Plan

Following formal adoption of the IT Master Plan by the Senate, it will be necessary to enter an 'implementation phase' that sets out specifications, time scales and costs in a more detailed manner. These should all be described in an implementation or operational plan at the necessary time. The Phases described below give an indication of the main activities that need to be implemented during all three phases of this plan. These include.

- Infrastructure Development (Phases I to III)
- Application Software Development (Phases I to III)
- Human Resource Development (Phases I to III)

These phases are summarised at Appendix A.

Key to success of this plan is effective project management. This will ensure key phases are achieved within the time scales stated, and importantly within the permitted budget. Good project management will also ensure that the training provided is having its intended effect, and that judgement is facilitated by effective monitoring and evaluation procedures.

At the appropriate time, detailed plans and time frames will need to be produced and all those who will be affected by the plan need to be informed and consulted as to what the physical and work practice changes will mean for them. This aspect is essential if the new IT for the Senate is going to be introduced and managed in a smooth way. To achieve this objective (including the effective implementation of the plan as whole), it may be worth considering establishing two formal groups along the following lines.

- IT committee – the purpose of this committee would be to make rapid decisions concerning changes, the development and implementation of this plan. The committee could be made up of senior individuals who have the authority to make recommendations and approve them without the need to seek a higher level of approval. This is essential to ensure that potentially costly delays do not occur in IT implementation.

- IT User Group – the purpose of this group would be to provide user feedback on the implementation aspects of the plan, such as how staff perceived training, was the training useful, are the systems meeting departmental requirements etc. It is likely this group would be made up of staff from most departments within the Secretariat, along with representatives of Senators and officials from committees.

9. Assumptions in the development of this Master Plan

- A number of assumptions have been made in the formulation of this IT Master Plan. Should any of these assumptions change in coming years, then it is essential that the plan is revisited in detail, and the impact the changes are likely to make fully assessed.

- Departments will cooperate in the sharing of data, and data is inputted in a timely, systematic way.
- Staff are released from their work duties to receive training.
- The commitment to widening access and participation will continue.
- More aspects of the Senate's core functions (both administrative and legislative) will be conducted electronically.
- The Senate will undertake, within its broader HRD strategy, to transfer relevant paper based documentation into electronic versions. This is important for all administrative functions, and especially the Library.
- Senate users will need and expect a high standard of up-to-date facilities, ease of use, reliability, networked services and quality technical support.
- Supporters of the Senate's work will provide the necessary financial support needed to implement this plan.

10. Costs and technical specification

All the costs included in this Master Plan are general and approximate. It is not possible to provide exact figures without detailed building surveys, equipment specifications, number of persons to be trained etc. Costs (particularly for IT) change rapidly. They can go down as well as up, especially over the course of a 5 year plan. As a result these costs should be taken as a guide: exact costs will need to be confirmed closer to the time of proposed purchase and installation. Equipment costed if branded and of high quality i.e. not cloned, reconditioned, or sub-standard equipment.

At Appendix D, the technical specification of the equipment is detailed (where that technical specification is available). The specification has been kept at a moderate level as not to

overwhelm the reader with unnecessary detail. Needless to say, however, at the time of proposed purchase and installation much of this specification will have changed technology wise. The intention here is to provide the reader with a broad idea as to the technical nature of the equipment referred to throughout this document.

11. Conclusion

In this IT Master Plan, the Senate aims to create an integrated IT strategy for infrastructure, human resource development, data management and access to meet the increasing need for timely, accurate and relevant information that will allow the Senate to meet its overall strategic goals - in particular, improving the overall passage of draft legislation designed to enable State reform. An additional anticipated benefit of this plan will be a more productive, effective and efficient use of human and parliamentary resources that shall contribute to lessening overall expenditure in a number of key areas.

Implementing the plan will directly benefit Parliament and Senators by creating a Secretariat General that directly contributes toward improving the work of the Commissions. In addition, general communication will be speeded up, not only inter-departmentally within the Senate, but also at a future date with the National Assembly and government Ministries. Important information with regard to National legislative issues will be shared in a more systematic, structured and timely way. Parliamentary archives and other records will be accessible to all manner of groups ranging from civil society, Ministries, partners, Senators etc. all in a cost-effective way. Officials and Committees of the Senate will be able to make key decisions regarding National issues by being able to access information important to the wider international arena (such as the Millennium Declaration). This will develop and understanding of how global frameworks need to be considered and incorporated within the Kingdom's developing National policy framework if Cambodia is to succeed in meeting its international and regional obligations through the UN, Asean and WTO for example.

Detailed plans and time frames will need to be produced for all aspects of infrastructure, training, and software development. And all Senators, officials and staff that will be affected by the plan need to be informed and consulted as to what the physical and work practice changes will mean for them and their future work. This aspect is essential if the new IT for the Senate is going to be introduced and managed in a smooth way, and it is suggested that an effective 'change management' strategy be developed alongside the wider IT Master Plan to ensure the changes are undertaken and achieved in the best possible way. The proposed IT Committee and IT User Group could play central roles in helping achieve this.

It is envisaged that effective implementation of this IT Master Plan will enable the Senate and Secretariat General to better perform its mandate according to the Constitution of the Royal Kingdom of Cambodia.

About this IT Master Plan

This IT Master Plan was prepared by Cambodia Information Technology Ltd. (CIT).
CIT is a private company created in 1999 and run by a team of expatriate from Europe and Singapore.
CIT aims to develop the high quality, innovative and cost effective IT solutions for its clients and partners.
Our priorities are to bring the Human Resources in Cambodia to the same level as its neighbouring countries.

Managing Director

Mr. Visal HUOR is Managing Director of CIT and is a founder of International Data System (IDS) in 1987. An IT Engineering Company base in France working in the large IT projects for the National Bank of Paris (BNP) and Aerospatiale (French Space Company), EDF/GDF (French Electricity and Gas Company).
In Cambodia 1995-1997, he was the former professor of the Royal Administration School (ERA) and Consultant for the National Bank of Cambodia (NBC).

Project Manager

Mr. Ung Yean has worked in the IT field for the last 22 years (15 years in the US and 7 years in Cambodia). He has works as consultant to develop and help company/organization implementing IT infrastructure and human resource development. He has contracted with the World Bank, UNDP, Microsoft and other companies. Mr. Yean holds a Master Degree in Computer Science and BS in Mathematics from the American University Washington D.C.

Surveys, software development and training

Mrs. Kéo Sary KONG has worked as IT expert, project leader and enveloper for many years. She has contracted with the World Bank as IT Expert to develop the Civil Servants Database including Census, ID Card Issue, Human Resource Management Information System (HRMIS). Mrs Kong has worked with many companies on France in the IT fields such as AUREUS Company (France), S.E.E.E. Company (France), ORDICONSEIL Consultancy Company, A.P.R.O. Consultancy Co, DEUTSCH Co. Mrs. Kong Holds a number of degrees from: System Analyst (Ecole Polytechnique Féminine) DESS Système d'Information Diplôme du 3e cycle (IAE de Paris : Université de Paris I)
Strategic Management of Information Technology (INSTITUTE OF SYSTEMS SCIENCE of the National University of Singapore).

Surveys, software development and training

Mr. Guttaro Kong has an extensive experience on the IT field. He has worked in the Cambodian Council of Ministers as a team leader to develop the Civil Servant Database and other projects. He has worked with R.B. GESTION S.A. COMPANY (France) as IT Director, and other companies, FERMA COMPANY (Subsidiary Company of SIEMENS in France), WANG COMPANY (France) and many others. Mr. Guttaro holds a chemistry degree from UNIVERSITY AIX-MARSEILLE III (France), Technical training in Robotic Process Control from SIRTES RENAULT AUTOMATION.

Costs – Phase I 2003 – 2004 (Infrastructure, Software Application, Human Resource Development)

Activity	Estimated Cost US$
Infrastructure • Create a LAN within each Priority One department (i.e. Council of Law; Department of Legislation; and the Library Group) by installing Category 5 cabling. • Upgrade suitable computer to be the local file server. • Install appropriate software to allow local e-mail connectivity. • Initiate access to the Internet via a local ISP. • Install voltage regulators/UPS. • Purchase 50 new computers, and necessary hardware (and software); including new printers, scanners, cabling etc. • Upgrade existing 150 computers • Assign maintenance contract. • Create a LAN within selected Priority Two departments. • Install lightening rods for 10 buildings. • Internet running costs.	**US$ 154,550**
Software Application Develop application software for Priority One applications • Library Management Information System (LIBMIS) • E-Library • Electronic Documents Management System (EDMS)	**US$ 84,300**
Human Resource Development • Develop job descriptions for Web Master /System Engineer and IT Manager and recruit to posts. • Establish remainder of IT Team. • Conduct training for modules EM 1–3, SE 1–3, HM 1–3, SM 1, DP 1-5. • Conduct training on LIBMIS, EDMS for departmental users	US$ 146,000

Costs – Phase II 2005 – 2006 (Infrastructure, Software Application, Human Resource Development)

Appendix A Senate

Activity	Estimated Cost US$
Infrastructure • Purchase of 25 computers, hubs, switches etc. to enable central file server for all Senate data. • Create a LAN within remaining Priority Two, and Priority Three departments. • Link the closest Senate buildings via Category 5 links. • Establish a wireless link between the Senate and National Assembly and obtain licence from MPTC (this is detailed fully in the National Assembly's IT Plan). • Internet running costs.	**US$ 84,300**
Software Application Develop application software for • Human Resource Management Information System (HRMIS) • Inventory Management Information System (IMIS) • Financial Management Information System (FMIS) Update • Library Management Information System (LIBMIS) • E-Library • Electronic Documents Management System (EDMS)	**US$ 182,500**
Human Resource Development • Conduct training for modules DP 6-8. • Provide follow-up training as required.	**US$ 15,000**

Costs – Phase III 2007 – 2008 (Infrastructure, Software Application, Human Resource Development)
Appendix A Senate

Activity	Estimated Cost US$
Infrastructure • Implement main server link between the Senate and National Assembly. • Purchase necessary hardware to support fibre-optic link and create fibre-optic link. • Upgrade Operating System and software. • Purchase and install one-way video capture (from National Assembly to Senate) • Purchase and install interactive voting system. • Internet running costs.	**US$ 407,500**
Software Application Update software for • Human Resource Management Information System (HRMIS) • Inventory Management Information System (IMIS) • Financial Management Information System (FMIS) • Library Management Information System (LIBMIS) • E-Library • Electronic Documents Management System (EDMS)	**US$ 25,000**
Human Resource Development • Conduct training for modules DP 9-11. • Provide follow-up training as required.	**US$ 15,000**

Appendix B-T Team Roles

Hardware Maintenance

Roles and Responsibilities	Knowledge and Experience
• Undertake preventive maintenance (defrag, scandisk) to avoid risk of hard disk crashes. • Maintain computer and cable network. • Solve user problems (hardware, connectivity and network). • Log all maintenance problems. • Management Drivers Software. • Assists and advise users to use computer/equipment.	• Computer technology. • Network technology. • Network cabling. • Telecommunication technology. • Electronic analogue and digital. • Connecting devices. • Difference between: operating system, network, application program and utility program. • Basic software for hardware testing.

Software Maintenance

Roles and Responsibilities	Knowledge and Experience
• Set-up program for users. • Instruct how to use programs. • Configure the system including the browser for the Internet. • Fix software problems.	• Computer technology. • Network technology. • Telecommunication technology. • Connecting devices. • Difference between: operating system, network, application program and utility program.

System Engineer

Roles and Responsibilities	Knowledge and Experience
• Evaluate and select system (hardware/software). • Install and update Operating System. • Configure System. • Install and update application software. • System security, Strategy, Planning. • System Development. • Administrate, organise and manage users. • Follow up system problems. • Advise maintenance teams. • Working closely with network administrator and database administrator.	• Technology knowledge. • Computer technology. • Network/Operating System. • Programming skills. • Technology trends. • Project management. • Conflict resolution. • Business operations. • Information sharing.

Web Master

Roles and Responsibilities	Knowledge and Experience
• Evaluate and collect all information to be published to the Internet. • Design and implement we pages • Install and configure web pages • Modify, update and maintain information on the pages	• Computer, OS and networking • Knowledge of web server (how to configure to run web pages) • Knowledge of server side programming

Network Administrator

Roles and Responsibilities	Knowledge and Experience
• Administer the network. • Design network architecture. • Set-up network security. • Set-up network configuration. • Provide privilege for using system resources. • Manage server/clients. • Advise on and install new computer/devices. • Work closely with system engineer and database administrator.	• Computer technology. • Network technology. • Cabling technology. • Programming skills. • Technology trends. • Project management. • Conflict resolution. • Business operations. • Information sharing.

Database Administrator (DBA)

Roles and Responsibilities	Knowledge and Experience
• Vision IT needs and its purpose within the Institute. • Ability to implement goals that focus on IT efficiency. • Understanding of business issues and the alignment of IT activities to business objectives. • Interacts with senior leadership to ensure alignment of IT activities. • Development information system. • Coordinate design team with end-user. • Planning and Strategy. • Data backup • Data centre management and operations. • Data architecture. • Working closely with network administrator and system engineer.	• Technology knowledge. • Some Programming skills. • Technology trends. • Project management. • Conflict resolution. • Business operations. • Information sharing. • Data structure. • Data Module.

Team Leader for Application Development

Roles and Responsibilities	Knowledge and Experience
• Study the needs of end users. • Write requirements to develop the application. • Design and implementation of the application. • Write user manuals. • Write technical specifications.	• Analytical problem analysis and solving. • Programming language. • Knowledge of database management. • Network concept and configuration. • Technical author skills.

Application Programmer

Roles and Responsibilities	Knowledge and Experience
• Develop algorithm to solve given problems. • Code the program in a programming language. • Document the written codes.	• Programming language. • Algorithm and data structure.

Appendix C- Workshop and Training Modules

General course outline for workshops and training modules

Course Number	Title	Level	Course Outline
EM-1	Beginning Microsoft Office (Windows, Explorer, Word, Excel)	Beginner	▪ Understanding how computers work ▪ Create and organize folders and find or classify files. ▪ Some tools easy to: ☑ copy file ☑ modify existing file ☑ save file in folder on different kinds of support ☑ print
EM-2	Microsoft PowerPoint	Beginner	▪ Understand application. ▪ Distinguish types of slide. ▪ How to use PowerPoint.
EM-3	Internet/World Wide Web	Beginner	▪ Understanding the Internet. ▪ How to surf online and work offline. ▪ Components of web page. ▪ How to: ▪ Copy web page and save. ▪ Download files. ▪ Send and receive E-Mails. ▪ Send and receive E-Mails with attached file. ▪ E-Mail management.

Course Number	Title	Course Outline	Prerequisite course
SE-1	Beginning Microsoft Office (Windows, Explorer, Word, Excel)	▪ How to organize work. ▪ Work methods. ▪ User's behaviour for job efficiency and effectiveness. ▪ Understanding how computers work. ▪ Create and organize folders and find or classify files. How to: ☑ Create documents effectively ☑ Use tools according to need ☑ copy file and modify existing file ☑ save file and different kinds of support	
SE-2	Microsoft PowerPoint	How to: ▪ Distinguish types of slide. ▪ Create Animation slide. ▪ Link slides. ▪ Insert picture, WordArt ▪ How to copy slides and modify.	SE-1
SE-3	The Internet and the World Wide Web	▪ Understanding the Internet. ▪ How to surf online and work offline. ▪ Components of web page. How to: ▪ Copy web page and save. ▪ Download files. ▪ Send and receive E-Mails. ▪ Send and receive E-Mails with attached file. ▪ E-Mail management.	

Training Courses for Hardware Maintenance				
Course Number	Title	Level	Course Outline	Prerequisite course
HM-1	Beginners Hardware Maintenance • Computer Hardware • Network Hardware (peripheral, cables, wireless) • Software (fundamental knowledge) • Windows, Explorer, Word, Network	Beginner	Distinguish functionality of: ▪ Main board ▪ Modem (internal, external) ▪ Video card, ▪ Network card Distinguish problems of: ▪ Software ▪ Hardware 1. Use control device 2. Install hardware, software (configuration) 3. Repair hardware, cable and test 4. Hardware assistance to end-user	
HM-2	Intermediate Hardware Maintenance • Network software and Hardware • Internet, E-mail • Network Configuration • Cabling	Intermediate	Distinguish functionality of: ▪ Main board ▪ Modem (internal, external) ▪ Video card ▪ Network card, cables. Distinguish problems of: ▪ Software ▪ Hardware ▪ Use control device ▪ Install hardware, Software (configuration) ▪ Repair hardware, cable and test ▪ Hardware assistance to end-user	HM-1

Training Courses for Software Maintenance				
Course Number	Title	Level	Course Outline	Prerequisite course
SM-1	Advanced Office Application • Windows, Explorer, Word • Configuration • Install and use Khmer font	Advanced	▪ Formatting documents. ▪ Printing documents. ▪ Tools ▪ Insert picture, WordArt, ClipArt ▪ Create Tables ▪ Create file by Mail merge	
SM-2	Software Applications and Tools	Advanced	Study and setup commonly used applications and tools such as: ▪ office package ▪ virus detection program ▪ graphics packages ▪ web page design tools ▪ script applications	

Training Course for Developer/Programmer				
Course Number	Title	Level	Course Outline/Objectives	Prerequisite course
DP-1	Introduction to Database Programming	Beginner	Database concept and programming Design and implementation of Table Query, Form, Report Permit students to design and implement a simple database to use within an organization. The database can be shared in a client-server environment	SE-1
DP-2	Introduction to Visual Basic Programming	Beginner	Allow students to write applications using the Visual Basic Language. The applications range from database front-end to utility programs.	SE-1
DP-3	Introduction to Web page design	Beginner	Design and implement simple web page for the World Wide web.	SE-1
DP-4	Introduction to Network Operating System	Beginner	Operating System and Network concept. Learn to setup and configure network operating system for LAN and intranet	SE-1
DP-5	Introduction to Graphics Design	Beginner	Learn Graphics page layout using the Graphics packages. Simple objects and text composition	SE-1
DP-6	Advanced Database Programming	Advanced	Study large-scale enterprise database design and implementation including security. Implement business database application using the available packages on the market such as MS SQL and Oracle.	DP-1

DP-7	Advanced to Visual Basic Programming	Advanced	Write advanced applications using Visual Basic Language. Use the Visual Basic to implement front-end for the SQL back-end such as MS SQL and Oracle.	DP-2
DP-8	Advanced Web page design	Advanced	Design and implement professional web page using advanced tools and scripts. Teach the web page implementation	DP-3
DP-9	Advanced Network Operating System	Advanced	Study in-depth the Network Operating System currently employed in business and organizations. Learn how to program and configure internet/intranet services.	DP-4
DP-10	Server-side Programming	Advanced	Write server-side application to run with web page. The applications allow interaction and information gathering with and from the users.	DP-7, DP-8
DP-11	Advanced Graphics Design	Advanced	Advanced graphic technique for page layout. Use layers to compose graphic page. Multiple page composition.	DP-5

Training Session
Short Term

Training Courses for Executive/Management		
Course Number	Title	Number of Sessions
EM-1	Beginning Microsoft Office (Windows, Explorer, Word)	10
EM-2	Microsoft PowerPoint	10
EM-3	Internet/World Wide Web	10
Training Courses for Staff		
Course Number	Title	Number of Sessions
SE-1	Beginning Microsoft Office (Windows, Explorer, Word)	10
SE-2	Microsoft PowerPoint	10
SE-3	The Internet and the World Wide Web	10
Training Courses for Hardware Maintenance		
Course Number	Title	Number of Sessions
HM-1	Beginning Hardware Maintenance	1
EM-2	Intermediate Hardware Maintenance	1
EM-3	Internet/World Wide Web	1

Medium Term

Training Courses for Software Maintenance		
Course Number	Title	Number of Sessions
SM-1	Advanced Microsoft Office	1
Training Courses for Developer/Programmer		
Course Number	Title	Number of Sessions
DP-1	Introduction to Database Programming	1
DP-2	Introduction to Visual Basic Programming	1
DP-3	Introduction to Webpage design	1
DP-4	Introduction to Network Operating System	1
DP-5	Graphics Design	1

Long Term

Training Courses for Developer/Programmer		
Course Number	Title	Number of Sessions
DP-6	Advanced Database Programming	1
DP-7	Advanced to Visual Basic Programming	1
DP-8	Advanced Webpage design	1
Training Courses for Developer/Programmer		
Course Number	Title	Number of Sessions
DP-9	Advanced Network Operating System	1
DP-10	Server Side Programming	1
DP-11	Advanced Graphics Design	1

Appendix D-Technical Specification

Computer and Network

No	H/w Type	Description	Qty
1	Server	* Intel Pentium Xeon DP 2.8GHz /533MHz within 512K Cache L2 ECC (Support dual CPU)	4
		* 512MB PC2100 CL2.5 ECC (Up gradable to 12GB , 6x2GB)	
		* 1.4MB 3.5" Floppy Disk Drive.	
		* Integrated dual channel Ultra 320 SCSI Controller	
		* 8Mb ATi Rage Video card integrated	
		* Integrated 10/100/1000 Base-TX Gigabit Ethernet card	
		* 48X IBM IDE CD-ROM Drive	
		* IPS/2 mouse, keyboard , 1 Parallel, 2 Serial, 3 USB 1 Keyboard, 1 Mouse	
		* Tower with 2 x 560W Hot-Swap power supply	
2	PC Desktop	* Intel P4.18GHz Processor	75
		* RAM 256MB	
		* HDD 20GB, 52X CD-ROM	
		* Network card 10-100 Mbps	
		* Sound Card	
		* CDRom	
		* 15" Monitor	
		*IPS/2 mouse, keyboard , 1 Parallel, 2 Serial, 3 USB 1 Keyboard, 1 Mouse	
		* UPS	
3	Switch Hub	Catalyst 2950 switch	10
		24 10/100 TX port	
		2 100FX Port	
4	Router	Cisco Router Cisco Router 2610	5
		Ethernet Modular Router w/Cisci 10S IP Software	
		2-Port Serial WAN Interface Card	
		16-Port Asynchronous Module	
5	Auto Voltage	2000VA	30

Computer Upgrade

No.	DESCRIPTION
1	* LAN Card * 128MB SD Ram * 60GB Hard disk Drive * CPU PIII 933Mhz * Auto voltage regulator 2000VA

Leased Line Speed and Cost

Line Speed	Installation Fee	Monthly Fee	Phone line cost Per month	Total Cost per Month
64 Kbps	$ 200	$ 500	$ 100	$600
128 Kbps	$ 200	$ 900	$ 100	$1,000
256 Kbps	$ 200	$ 1700	$ 100	$1,800
512 Kbps	$ 200	$ 3200	$ 100	$3,300
1 Mbps	$ 200	$ 6000	$ 100	$6,100

Microwave Link using Wireless Outdoor Bridge

Capacity	Description	
Speed	18 Mbps aggregate throughput	
Maximum Distance	6 miles/10 Km line of sight	
Data Interface	Ethernet Interface	10/100BaseT via AC power adapter
	Connector	RJ-45 female modular plug
	Cable Type	CAT5
	Compliance	IEEE 802.3
Digital Line Interface	T1 Digital Interface Optional Channel via indoor external	
	T1 multiplexer	
	Connector RJ-45 female modular jack	
	Compliance ANSI T1.403	
Power/Environment	AC Power Adapter included, 110 VAC or 220 VAC,	
	450mA; Output: 24V DC, 1 Amp	
	DC Power (to unit) +18 to +28 VDC	
	Power Connector Power over Ethernet CAT5 cable	
	RJ-45 connector	

Maintenance Services for 100 Computers (Printer, Monitor, Scanner): per year

* Maximum Response Time : 8 Hrs
* Minimum Response Time : 2 Hrs
* Time allowance per Month 100 Hrs
* Extra Hrs of work Rate can be carry over the next consecutive month

Video capture system

Item Model	Sub Items	DESCRIPTION	Qty
Video Conference System	WiewStation 512	- 30 Frame per second/ ~4BRI	2
		- ISDN: ~512kbps Support(H.320)	
		- LAN: ~ 768kbps Support(H.323)	
		- CODEC Camera(12 Times Zoom)	
		- Dual Monitor, VCR Record/Play	
		- AV, Connection Cable	
		- Voice auto tracking Camera	
		- High Quality Remocon Mike(1EA)	
AMX Control System	VPX-CP	C122- ViewPoint Express System	1
	VPT-CP	6" Wireless LCD Touch Panel	
	AXCENT3	Main Controller	
	AXR-RF	RF Receiver	
	PS2.8	Power Supply	
	Special	Control Software Program	
External Camera	EVI-D30	External Camera	4
TV	CT-29K10(Samsung)	Platron TV	9

Interactive Voting System

No.	ITEM CODE	DESCRIPTION	QTY
DCN Voting system	LBB 3500/15	EXTENDED CENTRAL CONTROL UNIT	1
	LBB 3542/00	Voting Control Unit W/LCD	1
	LBB 3541/00	Voting Control Unit	74
	LBB 3516/00	100M INSTALLATON CABLE	3
	LBB 3543/15	Chip Card Checking Equip.	75
	LBB 3525/00	Chip Card Checking Equip. Bracket	75
	LBB 3559/05	CHIP CARD 100 SET	1
	LBB 3557/00	CHIP CARD ENCODER	1
	LBB 3590/00	DCN START-UP SOFTWARE	1
	LBB 3585/00	SYSTEM INSTALLATION SOFTWARE	1
	LBB 3581/00	ID CARD ENCODER SOFTWARE	1
	LBB 3575/00	PARLIAMENTARY VOTING SW	1
	BB 3580/00	DELEGATE DATABASE SW	1
	LBB 3506/00	POWER SUPPLY	1
	LBB 3512/00	DISPLAY DATA DISTRIBUTION BOARD	1
	Manufacture	ELECTRONIC BOARD	1

Appendix E-Glossary

Application software - software that has been developed to solve a particular problem, to perform useful work on specific tasks. Application software may be either custom or packaged.

Custom software (or tailored software) - software designed and developed for a particular customer. This is a kind of software that you would hire a computer programmer (a software specialist) to develop. Such software would perform a task that could not be readily done with standard off-the-shelf packaged software.

Database - generally, a depository of information located on a central server where anyone - with appropriate network and permission - can gain access.

Database administrator (DBA) - an expert on database management, system software and application software.

Extranet - is a secured network that allows business partners to access each other's Intranets.

Fibre-optic - uses laser light to transmit light wave (instead of current) through a hair-line glass fibre nearly the speed of light to carry information.

File server - a local computer that stores data for a number of users, allowing them to back-up data to a secure unit.

Firewall - software that prevents unauthorised access to the system from outside, and also protects the system from viruses.

Hardware - consists of all machinery and equipment in a computer system. Hardware includes computers, printers, scanners and other devices connected to a computer.

Information System (IS) - an arrangement of people, data, processes, interfaces, networks, and technology that interact to support and improve both day-to-day operations in an organization (sometimes called data processing), as well as support the problem-solving and decision-making needs of management (sometimes called information services).

Information Technology (IT) - a contemporary term that describes the combination of computer technology (hardware and software) with telecommunications technology (data, image, and voice networks).

Internet - is a self-regulated network of computer networks connecting millions of computers and containing pervasive information. The Internet connects various services on-line and networks of the world. The Internet is said to be the 'network of the networks'. The principle of the Internet rests on communication and data origination at high speed of enterprises, governments, universities and individuals.

Intranet - is a corporate network that functions with Internet technologies, such as browsers and search engines, using Internet protocol.

Network – a system of interconnected computers, telephone, or other communications devices that can communicate with one another. A network allows users to share applications and data; without networks, information could not be electronically exchanged.

Network administrator - someone who has in-depth knowledge of hardware, system software, and network infrastructure. A network administrator designs network architecture.

Network Architecture – a framework of how the computer/equipment are interconnected. This includes communication protocols, formats, and standards to which all hardware and software in the network must utilise. Network architectures attempt to facilitate the operation, maintenance, and growth of the communication and processing environment by isolating the user and the application program from the details of the network.

Network professional – a person who has extensive experience in the technical aspects of computer, communication and computer connection technology.

Network server (or server) – a central computer that holds databases and programs for a number of PCs, workstations, or terminals, which are referred to as clients.

Packaged software - is off-the-shelf program developed for sale to the general public. Users mostly encounter are word processing programs, spreadsheet programs, and office suites. Some small companies and organization use packaged software e.g. accounting packages.

Protocol - is language computers use to communicate with one another.

Software (or programs) - the electronic instructions that tell the computer how to perform a task.

Software maintenance team - a team responsible for maintaining software in a good running order, installing new packages and helping fix any particular software problems.

Software specialist/programmer – a person who has extensive education or considerable experience in developing computer programs.

Stand-alone - meaning a computer that is not connected to any other computer.

System engineer - someone who has in-depth knowledge of computer hardware and software, and is able to configure the hardware/software to reflect different user needs.

System Software - controls the allocation and usage of hardware resources and enables the applications software to run. System software, which includes the operating system, allows the computer to manage its internal resources.

Web Master - someone who has in-depth knowledge of Web applications and design.

Wireless – a means of allowing communication without cabling (as in mobile phone technology). The means for communication is usually through microwave links.