The Follow-up Study Report on

e-Government Service Deployment Plan

for

Royal Government of Cambodia

October 2009

Office of the Council of Ministers
National Information Communications Technology Development Authority (NiDA)
in cooperation with
Japan International Cooperation Agency (JICA)

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Abbreviations and Acronyms

Chief Information Officer	CIO
Contents Management System	CMS
Council of Administration Reform	CAR
Database	DB
Environmental Data Management	EDM
European Union	EU
Government Administration Information System	GAIS
Hardware	H/W
Human Resource	HR
Information and Communication Technology	ICT
Information Technology	IT
Investment and Cooperation Department	ICD (MEF)
Japan International Cooperation Agency	JICA
Management Information System	MIS
Ministry of Agriculture Forestry and Fisheries	MAFF
Ministry of Commerce	MOC
Ministry of Culture and Fine Arts	MCFA
Ministry of Economy and Finance	MEF
Ministry of Education Youth and Sports	MOEYS
Ministry of Environment	MOE
Ministry of Foreign Affairs and International Cooperation	MFAIC
Ministry of Health	MOH
Ministry of Industry Mines and Energy	MIME
Ministry of Information	MOInfo
Ministry of Interior	MoInt
Ministry of Justice	MOJ
Ministry of Labour and Vocational Training	MLVT
Ministry of Land Management, Urban Planning & Construction	MLMUPC
Ministry of National Defence	MOND
Ministry of Parliamentary Affairs and Inspection	MONASRI
Ministry of Planning	MOP
Ministry of Post and Telecommunication	MPT
Ministry of Public Works and Transport	MPWT
Ministry of Religions and Cults	MRC
Ministry of Rural Development	MRD
Ministry of Social Affairs Veteran and Youth Rehabilitation	MSAVYR
Ministry of Tourism	MOT
Ministry of Water Resources and Meteorology	MWRM
Ministry of Women Affairs	MWA
Multi Service Provisioning Platforms	MSPP
National Administration Information System	NAIS
National ICT Development Authority	NiDA
National Information Infrastructure	NII

National Institute of Statistics	NIS
National Social Security Fund	NSSF
Natural Resources Assessment	NRA
Office of the Council of Ministers	OCM
Operation and Maintenance	O&M
Personal Computer	PC
Phnom Penh	PP
Phnom Penh Municipality	PPM
Provincial Administration Information System	PAIS
Synchronous Digital Hierarchy	SDH
Software	S/W
State Secretariat of Civil Aviation	SSCA
State Secretariat of Civil Service	SSCS
Synchronous Transfer Module	STM
Technical and Vocational Education and Training	TVET

Executive Summary

Let us start to describe as the Summary what can be foreseen as a result of "Follow-up study 2009" for "e-Government Service Deployment Plan" jointly performed by NiDA personnel and JICA experts in 2008.

The follow-up study team surveyed and studied changes of ICT development of the Government, selecting 11 government ministries out of 29, from the viewpoint of e-Government service deployment between August and September 2009 just one year after the previous study in 2008. The 8 government agencies out of the 11 are the same agencies surveyed last year, so that the changes could be obtained by superposition.

The team concluded that ICT development has smoothly been going on in some ministries, while some other ministries are being kept undeveloped as they are. The reason why such a contrast can be observed seems to be:

> The ministries that know harnessing power of ICT tend to utilize ICT more and more, thus enhancing utilization ICT upward.
> The ministries that little use harnessing power of ICT tend to be unaware of potentiality of its power, thus resulting in less development of ICT.

There is a contrast between the two groups; one is in virtuous spiral and the other one is in vicious spiral. In case of the government ministries in which harnessing power of ICT is very low, there will be three weak points, less awareness of use of ICT, no nomination of high rank officer to responsible position in developing ICT and less budget allocation for ICT development. These three have surely been driving a vicious spiral in ICT development.

The above situation will imply that there is a certain digital divide among the government ministries and that such a gap will be widened more and more, if not rectified and remedied. However, there will be no serious worry in this concern. The gap only simply suggests relative difference between the developed and the undeveloped in the Government. It is sure that the ministries undeveloped in harnessing ICT power can catch up with the ICT advanced agencies, if adequate measures are taken, allocating budget, preparing a suitable development plan, introducing systems step by step and developing human resources.

NiDA is implementing GAIS/PAIS services on behalf of the Government. Particularly, PAIS is important ICT resource of Cambodia, since this PAIS has been constructed over NII as an entire IP platform over SDH. The PAIS/NII is ready to serve secure IP platform to each ministry or agency nationwide. It is recommendable that any e-Government service will be deployed on the PAIS/NII platform so that economical, reliable and secure service can be obtainable. Hopefully, the digital divide among the ministries can be improved, coupled with increase of utilization of the PAIS/NII platform.

Finally, the team has proposed two projects, which can be implemented together or

separately of each other, considering results of situational analysis of ICT development in the Government, progress of PAIS/NII project of NiDA, impact of ICT on socio-economic development of Cambodia and tendency of ICT development in the world. Those projects are:

a. Comprehensive Portal Enhancement
If the three kinds of Government operation portal sites, Government Portal, Business Portal and Citizen Portal, are properly functioning, there may be likelihood that economy and society of Cambodia can be developed more openly and actively. Since construction of those comprehensive sites is rather easy work, it is recommendable to consider that NiDA will study implementation of such a Portal Enhancement Project, included in PAIS Expansion or other possible project.

b. Nationwide e-Government Service Deployment with Cloud Computing
Concept of cloud computing is rather wide. Nonetheless, services provided by cloud computing can be split into three major categories as indicated in Wikipedia:

1) **Software-as-a-Service (SaaS) :** Software-as-a-Service (SaaS) is the broadest market. In this case the provider allows the customer only to use its applications. The software interacts with the user through a user interface. These applications can be anything from web based email, to applications like Twitter or Last FM.
2) **Platform-as-a-Service (PaaS**): Platform-as-a-Service is a set of software and development tools hosted on the provider's servers.
3) **Infrastructure-as-a-Service (IaaS):** Infrastructure-as-a-Service like Amazon Web Services provides virtual servers with unique IP addresses and blocks of storage on demand.

Figure 1. Concept of Cloud Computing
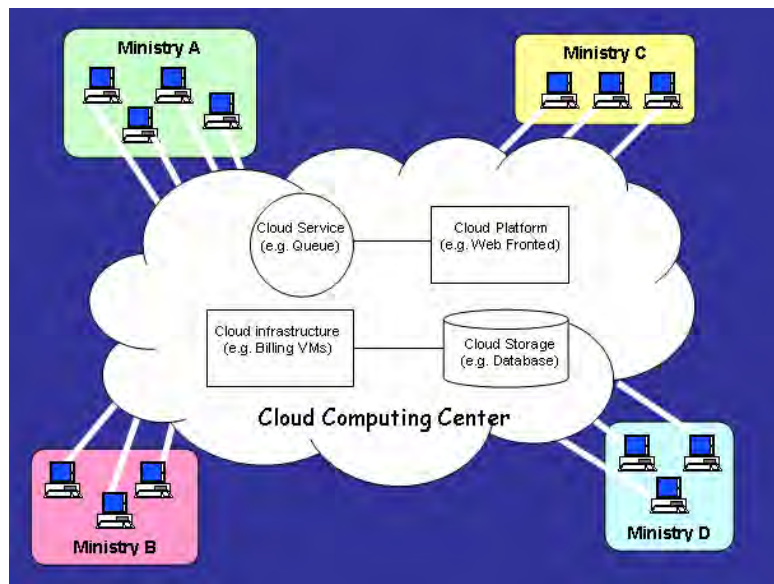
The remarkable advantages of cloud computing will be:

Resource of computing can be consolidated; hardware/software, human resource and O&M facilities can be consolidated, saving those resources and avoiding duplicated investment.
It is possible to keep up high grade information security status of e-Government services.

In the above, it shall be reminded that cloud computing can be realized subject to availability of high-speed broadband transmission media, i.e. good telecommunication infrastructure.
In case of Cambodia, use of cloud computing is beneficial and even profitable from the viewpoints of dimensioning and service menu arrangement. The existing e-Government services available at each ministry can survive even if cloud computing is employed. Those will gradually be merged into the cloud.

PAIS/NII will be expanded nationwide, covering remaining 14 provinces. It is strongly recommendable that the two proposed projects will be implemented included in this expansion. Hence, it is suggestible that NiDA will immediately initiate a study on "Comprehensive Portal Enhancement" and "Nationwide e-Government Service Deployment with Cloud Computing".

1. Background

This report, "The Follow-up Study Report on e-Government Service Deployment Plan for Royal Government of Cambodia", is an additional report to the first report which was compiled by NiDA and JICA team as a part of the "Project for Capacity Building on ICT Management for NiDA". The initial survey was conducted from August to October in 2008, targeting 29 government agencies in Phnom Penh about their e-Government readiness. Along with this initial survey, follow-up survey was conducted in September 2009 by the new NiDA and JICA team (herein after, study team 2009) to grasp the progress of e-Government services deployment in each government agencies, to confirm whether it is on a right track of the "e-Government Service Deployment Plan", which was authorized by the Office of the Council of Ministries.

1.1 Objectives

Objectives of this survey are indicated bellow as to draft an additional guideline to implement e-Government service deployment, reflecting on its needs.
   The objectives of this survey are:
   - To implement continuous (additional) study of "e-Government Service Deployment Plan" by conducting face-to-face meeting with targeted ministries and grasp their achievements during this one year.
   - To summarize achievements, analyze the situation and compile the best practice, to share with government ministries.
   - To propose some ideas to boost e-Government Service Deployment based on its plan.

1.2 Target Government Ministries

According to the result of last year's assessment, 25 government agencies out of 29 which responded were classified into three categories, "advanced", "average", and "behind", based on the level of an e-Government readiness index. Taking this index into consideration, this year in turn, the assessment was conducted toward 11 selected agencies, covering all classified categories. These 11 selected agencies include 8 ministries which were also the respondents to last year's assessment and 3 newly surveyed ministries which were categorized as "Unknown" last year.
The targeted government agencies are listed below:
(1) Repeatedly surveyed ministries
   ・ Ministry of Education, Youth and Sports("Average")
   ・ Ministry of Environment("Behind")
   ・ Ministry of Health("Average")
   ・ Ministry of Information("Average")
   ・ Ministry of Interior("Average")
   ・ Ministry of Labor, Vocational and Training("Average")
   ・ Ministry of Tourism("Advance")
   ・ Ministry of Women's Affair("Behind")

(2) Newly surveyed ministries
- ・ Ministry of Agricultures, Fisheries and Forest("Unknown")
- ・ Ministry of Land Management, Urban Planning and Construction("Unknown")
- ・ Ministry of Post and Telecommunications("Unknown")

1.3 Survey Approach

Survey was conducted upon the approach described below:

a. Obtaining an interview appointment with the focal points of selected 11 government ministries.
b. Sending assessment sheets by email to targeted ministries, asking to fill in until the interview. Particularly for the repeatedly targeted agencies, send the result of last year's assessment for reference.
c. Conduct an interview based on assessment sheets, focusing on the change of ICT situation in this one year and new proposal or goal of short/mid/ long term to deploy ICT.
d. Analyzing and compiling the obtained data, including chart creation and radar plotting.
e. Feed back the analyzed results to the interviewed agencies.
h. Create a study report, based on the results.

Materials which the team used for the survey are indicated below. Outline and findings of the survey were compiled by the study team.

- Assessment sheets (Same as last year)
- The Study Report on e-Government Service Deployment Plan (Published Last year)
- ICT Planning Toolkit v1.0 (Published last year)

1.4 Duration

The follow-up survey was conducted from 16 August to 15 September, 2009 for one month. The intention of the team was to conduct a survey as "fixed-point observation".
In this context, the team has intentionally made arrangements with the same focal points in each government ministries, using the same questionnaire of last year. This survey approach was effective for obtaining valuable result, regarding the time constrains of the survey period.

The survey schedule in detail is described in Figure2. Occasionally, the interview appointment needs to be rescheduled, due to the unavailability of the focal points in the government ministries. However, based on the build up human relationship from last year and the continuous effort of the study team members, all of the targeted agencies successfully responded to the survey.

Figure 2. Survey Schedule

Preparation	Study	Analysis	Wrap-up & Report
Aug. 16 - 23(1 week)	Aug. 24 - Sep. 6(2 week)	7 - 8(2 days)	9-11(3days)
- Understand Project context - Understand Goal and expectation of study - Introduce approach of this study at High-level Seminar	- Create handbook how to conduct follow-up - Make list of ministries and authorities to which study will be done - Conduct study and collect information	- Summarize collected information - Analyze the results - Identify best practice and/or non-progress case and find-out their reason	- Make study report - Revise or add some sypplement to "e-Government Servie deployment Plan" and "Toolkits"

1.5 Study Team Members

Bellow Box shows the member of the study team 2009.

NiDA : Mr. Vanndy Ouk (lead) : Taking lead of the follow-up survey
        Ms. Sith Narasy
        Ms. Pin Ravin
JICA   : Mr. Hideo HOYA : Initiating follow-up survey, proposing approach
         Ms. Misaki KIMURA - Project coordinator

2. Situational Analysis
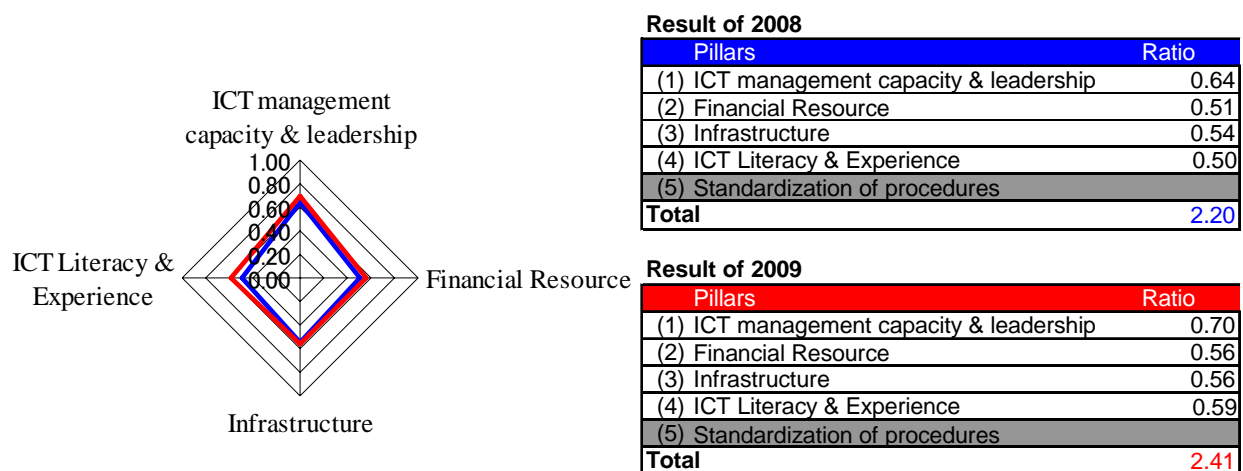
2.1 Overall e-Government Readiness

According to the result of last year's assessment, this year in turn, the assessment was conducted toward 11 selected ministries, using the same questionnaire of last year. These 11 selected ministries include 8 ministries which were also the respondents to last year's assessment and 3 newly surveyed ministries. (Chapter 1 describes in detail about the selection of government ministries.) These 3 new ministries will not be taking into account when representing the ratio comparison of 2008 and 2009, in which only the results of constantly surveyed 8 ministries are reflected to the e-Government readiness growth of this one year.

The method of classifying 11 surveyed ministries into three categories, is the same of that used last year, whereby enclosed are this year's analysis as stated in Table 1.

As an overall view, ICT developments were observed in every government organization, however, the existing digital divide between ministries has become exacerbated.

The comparison of the standard chart plotting average of statistics of the surveyed identical 8 ministries of 2008 and 2009 are depicted below. As indicated in Figure 3, the e-Government readiness index has improved in all four aspects. The average of the total index in 2009 is 2.41 points, while in 2008 it was 2.20 points. The most improved apparent pillar in performance was "ICT literacy & experience" with "ICT management capacity & leadership" and "financial resource", in second and third places respectively. Most of the ministries scored "Infrastructure" ratings as "low progressive aspect".

Figure 3. Average e-Government Readiness Index Comparison of 2008 & 2009

Result of 2008

Pillars	Ratio
(1) ICT management capacity & leadership	0.64
(2) Financial Resource	0.51
(3) Infrastructure	0.54
(4) ICT Literacy & Experience	0.50
(5) Standardization of procedures	
Total	2.20

Result of 2009

Pillars	Ratio
(1) ICT management capacity & leadership	0.70
(2) Financial Resource	0.56
(3) Infrastructure	0.56
(4) ICT Literacy & Experience	0.59
(5) Standardization of procedures	
Total	2.41

* This ratio covers only the 8 target ministries surveyed in both 2008 and 2009.

The PAIS and NII shall contribute to bridging the digital divide by bringing improvements in ICT development, particularly for those areas lagging behind. Since the PAIS and NII will be completed in December 2009(estimated), NiDA's main role is to initiate the usage, and be actively involved with agencies lagging behind in ICT development. We anticipate that this newly launched asset will play a key factor in enhancing infrastructural development of e-government.

Presented in Table1, most of the ministries have achieved the upper ranking category. The government agencies in "average" level are endeavoring to move forward. In contrast, those ranking at the "Behind" level seem less motivated. In fact, MoEYS has accomplished a significant improvement by joining "advanced" level, due to fostering of ICT literacy training, sponsored by UNICEF. MoInt has also enhanced local area network by obtaining internal funding. MLMUP achieved remarkable progress as well, though this can be attributed to differing perspectives of the interviewees questioned in the survey, which were not identical to those of last year's survey. The figures used here are based on answers from interviewees, some of which used their estimated figures in their reckoning. Some fluctuation may occur depending on their estimations.

Table 1. Advanced, Average and Behind categorized organizations of 2008 & 2009

Category	Total Index	Result of 2008	Result of 2009
Advanced	> 2.4 points (more than 60%)	OCM, MEF, MFAIC, MoInt, MOP, MOT, PPM	MoInt, MOEYS, MOH, MOInfo, MPTC, MOT, MAFF, MLMUPC
Average	< 2.4 points > 1.8 points (45%) (above average)	MOC, MCFA, MOEYS, MOH, MIME, MOInfo, MLVT, MOND, MPWT, MRD, MWRM, SSCS, SSCA	MLVT
Behind	< 1.8 points (45%) (below average)	MOE, MONASRI, MOSAVY, MWA	MOE, MWA
Unknown	Not available	MAFF, MOJ, MPTC, MRC, MLMUPC	

The e-Government index comparison between years 2008 and 2009 of 8 ministries and 3 newly surveyed ministries in radar chart is shown in Figure 4, on the next page. The blue dotted line indicates the ratio of 2008 and the red line indicated that of 2009.

Figure 4. e-Government readiness index of 11 government organizations

Blue doted line:2008, Red line:2009
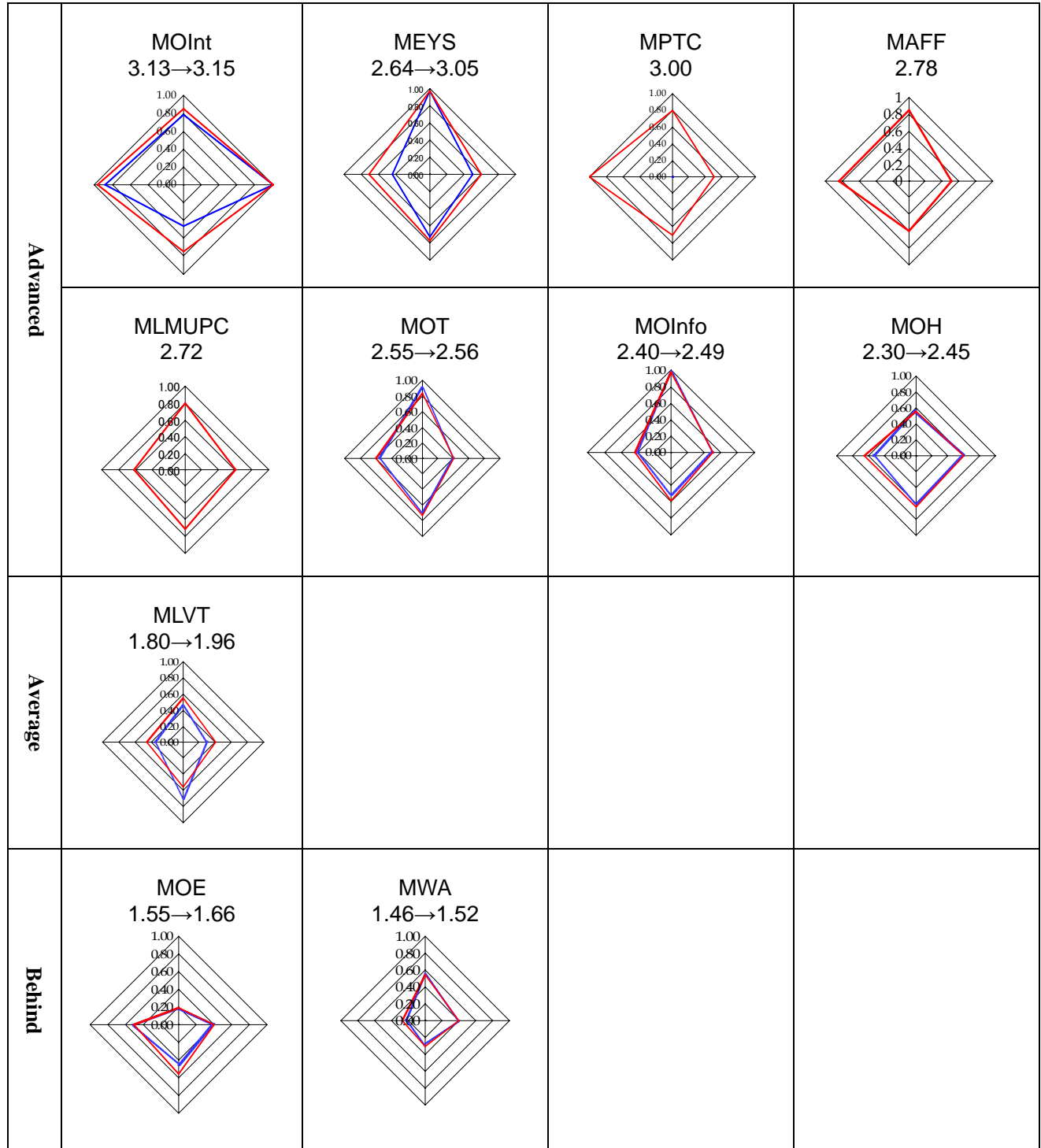
2.2 ICT Management Capacity and Leadership

2.2.1 ICT management unit/ personnel

ICT management is not simply installation of computers nor collection of information. It is vital for ICT personnel to understand the correct e-government concept in order to utilize technological solutions in accomplishing reform and governance, by fostering procedural automation, encompassing all time and space, empowering relevant people to change the mentality of bureaucrats. To bring Cambodia to a sophisticated e-Government level, ICT personnel will confront many challenges as indicated below:

➢ **The level of ICT governance is rising, but it is not sufficient**
Figure 5 represents the number of ministries and the ratio of existing dedicated ICT office of 8 repeatedly surveyed targets in 2008 and 2009. Ministries which replied that they have dedicated ICT office has increased from 4 to 5 in this one year. MLVT which answered it was planning to establish an ICT office for 2008, have realized it in 2009. Not only did more ministries establish ICT offices, they expanded and consolidated their ICT governance further. MoInt has established "ICT Task Force", other than the ICT Office, expanding its authority.

Figure 5. Dedicated ICT Office
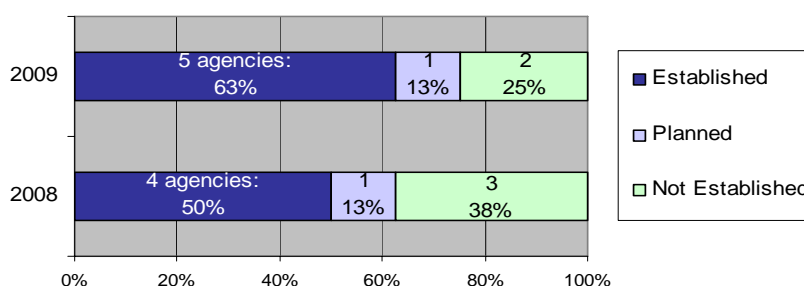
* This ratio covers only the 8 target ministries surveyed in both 2008 and 2009.

In compliance with the rising ratio, it is obvious that government agencies are acting on formulating ICT office to propose and react on ICT development.
Based on the interview, "Behind" categorized agencies which mostly do not have dedicated ICT office, apparently have little ideas how ICT can profoundly affect the performance of an organization. As a consequence, there is a tendency that, because of they are solely focusing on the technological potential of ICT only, they are not considering what ICT may bring to ensure corporate governance within the ministry.

➢ **Lack of incentives and less opportunities to retrain ICT personnel**
According to the results of particular ICT skills which the ICT unit possesses, only MLVT was found to expedite enhancing their ICT capability, whereas the others have failed to increase their ICT capabilities. This implies that most of the government agencies failed to retrain ICT personnel during this year. Many of the government agencies are facing difficulties in retraining their personnel,

owing not only to the insufficiency of ability, but also to the low level of incentives and unsatisfactory circumstances for putting the theory into practice.

➢ **"Web Development and Hosting": the most commonly demanded skill for ICT personnel**
In response to the question of urgently required ICT skill, 5 out of 11 government ministries raised "Web Development and Hosting" as of great significance. This implies that one of the main tasks imposed on ICT Office is Web publication. Ministries which have not yet launched a web site are urgently required to create own ones, and the ministries which already have websites are expected to expand online service and to integrate with existing databases.

➢ **Skilled ICT personnel face difficulties in fully engaging with their job due to low salaries**
In Cambodia, low salaries of civil servants are the major obstacle in fostering human resource development at the government agencies. Many of the interviewees expressed that their performance was affected negatively by low salary which consequently leads them to seek another job in the private sector. Particularly, young ICT graduates tend to shift their work to the private sector or have part-time jobs, due to the fact that their salary is not sufficient.

➢ **Very small numbers of women involved in ICT area**
The census revealed that there is a gender divide within the ICT personnel at present. ICT unit which consist of female staff included only 2 ministries out of the 11, MoLVT and MLMUPC. This derives from lack of gender awareness on the part of ICT decision-makers, and the prevailing social attitude towards females in preventing their participation in technological fields. The promotion of gender rights within ICT is of paramount importance to the outcome, because ICT can help woman enhance their economic and social empowerment, with proactive participation in workplace.

2.2.2 Leadership in ICT Promotion

e-Government requires strong leadership for a succeed. Strong leadership can ensure the long-term commitment of resource allocation and expertise amplification and cooperation between disparate units. In accordance with this, current situation in terms of leadership is indicated below:

➢ **The Need to foster constructive attitudes towards ICT at "Behind" level**
On the whole, positive attitude towards ICT is accelerating, however not enough at the Behind level. With comparison to the survey in 2008, there is a considerable attitude change towards ICT promotion. Out of 11 surveyed, 5 ministries answered that they have "strong support" from executives, 2 ministries with "show understanding" and 1 ministry with "interested".
In order to achieve the e-government transformation, leadership of ICT unit is imperative at all levels of government. Thus, this is a good sign to push e-government innovation, planning and provision.

<u>Figure 6. Attitude towards ICT Promotion</u>

How supportive is the executive towards ICT usage in your ministry?
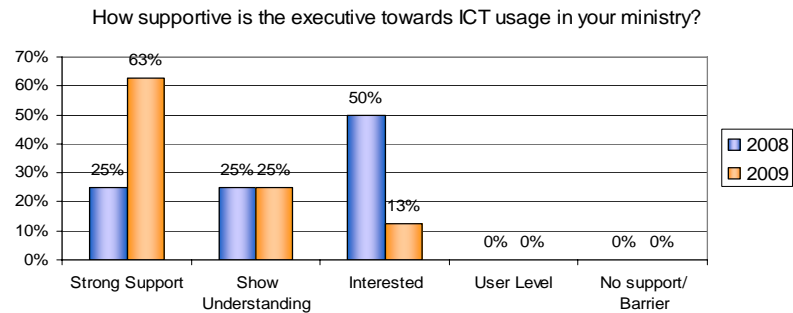
* This ratio covers only the 8 target ministries surveyed in both 2008 and 2009.

However, negative attitudes among "Behind" level government agencies are still prominent, as revealed in their results. In order to narrow the digital gap, a key element is to renovate the attitude or ideas towards ICT usage at the "Behind" level of government agencies.

➢ **Difficulties in exercising leadership due to inadequate authority vested to ICT personnel**
Even the government ministries which have dedicated ICT Office were found out to be poor in ICT governance due to inadequate authority. MoInt and MoInfo were the only government ministries with a department dedicated to ministry-wide ICT matters. Strengthening existing governance concepts within e-government is an important step towards improving the coordination of process and system within and across government ministries, changing the way that government operates. Therefore, it is essential to empower ICT personnel, so that they can take the initiative in ensuring the support from all relevant departments.

➢ **Scarcity of collaboration within and across government agencies**
As repeatedly mentioned, due to inadequate authority of the ICT Office, ICT personnel are not allowed to collect information, nor to involve in ICT projects of other departments. Information is collected at many units at the same time within the ministry; moreover, the units are not linked together. Rectification of these independent activities is strongly recommended in the earlier stages, to avoid duplication of application development, and to reduce transaction cost in all areas.

➢ **Information sharing is strongly dependent on personal relationship**
Depending on issued directives and personal relationships, information can be free, or has to be paid for. Information is not distributed freely among the units. Information is rarely disseminated actively, especially within the "Behind" ministries. This leads to a lack of resources for data collection, and creating barriers to construct centralized information system.

2.3 ICT Literacy

As a result, each of the government ministries either improved or maintained their ICT literacy, by providing free or subsidized training courses.

Based on the methodology of last year, ICT literacy is assessed in seven areas, word processing, spread sheet, presentation, e-mail, web browse/search, file and printer sharing. It is rated from (1) to (5) on a scale, corresponding to (1) none, (2) less than 20%, (3) 20-40%, (4) 40-60%, (5) more than 60%. Figure 2 presents the average ICT literacy index of 2008 and 2009. It tends to increase half a point from 3.0 points, which means about 50% of the staff are estimated to possess basic computer skills. Those ranked as high ICT literacy include, MoInt, MPTC, MOE, MAFF and MoEYS. MoInt has repeatedly ranked as "high ICT literate" due to their 3 months ICT training provided regularly to every policeman by HRD department.

Figure 7. ICT Literacy of government officials (Estimated)
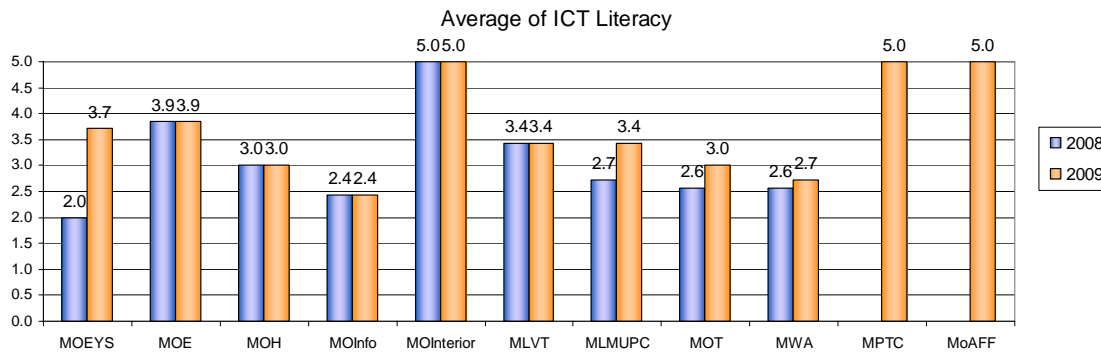
> **Half of the government officials possess three basic administration skills; Word Processing, Spread sheet, Presentation**
> It revealed that all of the seven types of computer skills have improved, and show a stable growth. As seen in Figure 8, more than half of the government officers are thought to be able to use Word Processing (word), Spread sheet (excel), Presentation, scoring 69%, 61%, 58% respectively. This implies that they have continued to make an effort to improve and fortify their ICT literacy.

Figure 8. ICT Literacy of government officials (Estimated)
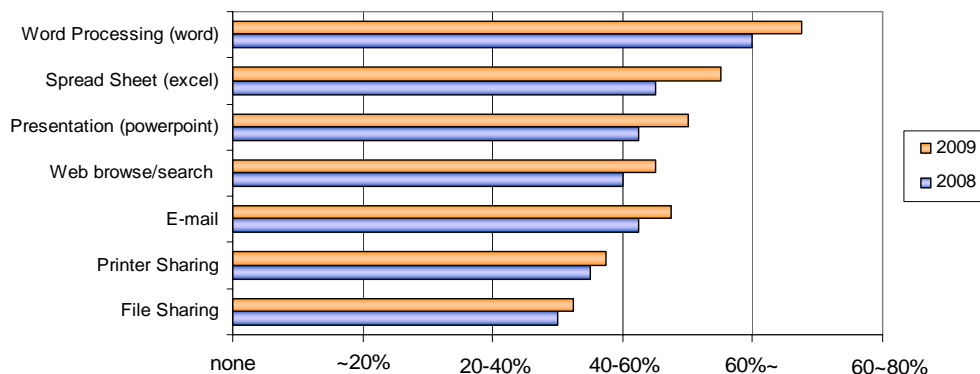
> ➤ **Printer/ File sharing difficult to utilize due to low practice and unwillingness**
>
> It seems that the factor of low Printer/ File sharing diversifies from Behind to advanced level within the government ministries.
>
> Since printer and file sharing is a premise on Local Area Network (LAN), low penetration initially persists for the ones which do not possess basic infrastructure. Not only the physical capability but also those ministries which are equipped with LAN are apparently facing resistance to practical action, due to unwillingness. Based on the interview, LAN existed in 8 ministries out of 11 ministries. This means 73% retain LAN. Despite the physical availability, it revealed that only 24% of PCs on average are connected, which is less than that of last year. This means that the majority of government agencies are not yet exploiting the full potential of LAN in order to promote ICT development. In Fact, one of the advanced ministries expressed that even though their staff gained expertise and infrastructural experience, they are apparently not willing to put it into practice.

2.4 Infrastructure

Many government agencies implementing e-government have struggled to develop a basic infrastructure by not taking advantage of new technologies and communication tools. Even if the government agencies possess the will, because of the lack of the necessary basic infrastructure, they face initial difficulties in the deployment of e-Government services throughout their territory. Some agencies may develop new approaches to solve problems and make efforts to build in their own ICT infrastructure, while others may partner with the private sector, in order to invest in programs to increase ICT access.

2.4.1 National Information Infrastructure (NII)

Below, I would like to expound on NII, the government fiber optic cable network which complies with the demands of safe, secure and stable infrastructure for ICT access.

NII will launch in December 2009, connecting headquarters of all ministries in Phnom Penh to nine other provincial headquarters including Siem Reap, Sihanouk Ville, Banteay Meanchey, Battambang, Kampong Cham, Kampong Thom, Kandal, Takeo and Kompot. NII is a part of the Provincial Administration Information System (PAIS) project financed by the Korean Government. Application development and IT Center construction/operation are the other two components of NII. NII delivers privileges of high-speed connection linking Access Network to Backbone Network through 2.5Gbps (STM-16) over fiber optical cable and Connection between Access Node and Remote Node of 155Mbps (STM-1).Furthermore, the network is secure and stable enough in design to have dual ring structure preventing network failure, due to the breakdown of an access node.

Figure 10 represents the conceptual network configuration incorporating the physical locations and network components as depicted in Figure 8. The list of Access Node and Remote node is also shown in Table 2.

Figure 9. Logical Network Configuration of NII
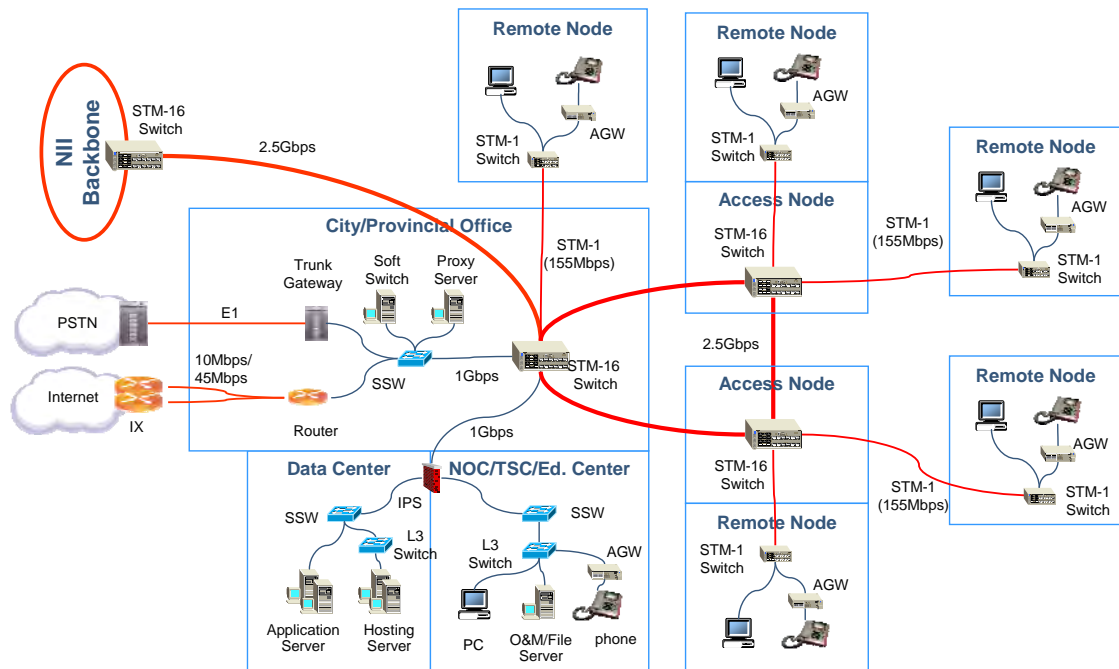
Source: Kisan Telecom

Figure 10. Physical location and network components

Source: Kisan Telecom. The study team of 2008 combined the three layers in this layout.

Table 2. List of Access Node and Remote Node

1. Phnom Penh

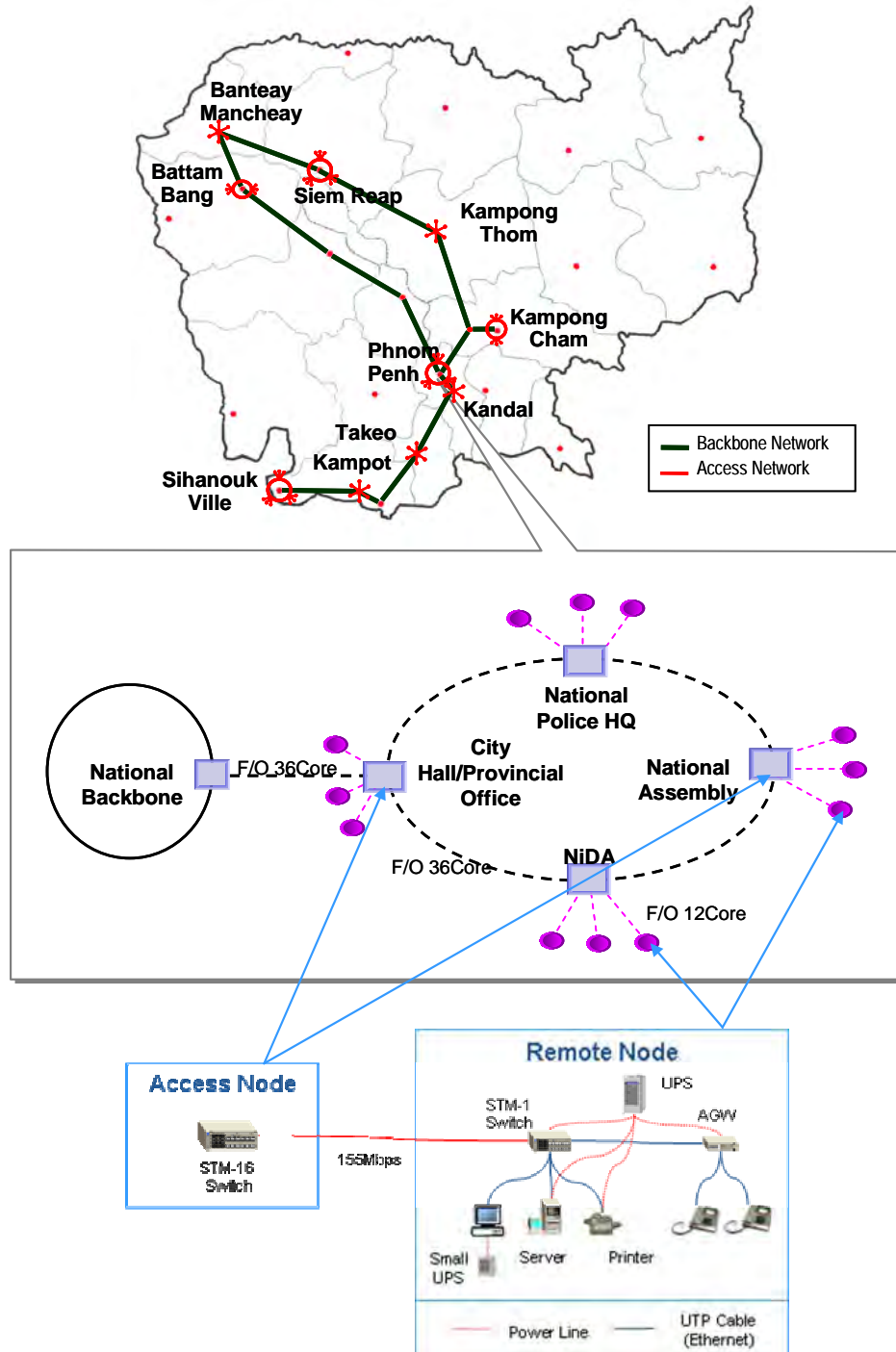| No.	Access Node	Remote Node
1	City Hall	Ministry of Information
2		Disaster Management Authority
3		Ministry of Economy and Finance
4		Ministry of Public Works & Transport
5		Ministry of Post and Telecommunication
6		CDC
7		Daun Penh District Office
8	Ministry of Water Resource	Ministry of Women Affairs
9		Ministry of Commerce
10		Ministry of Industry Mines and Energy
11		Secretarial of Civil Aviation
12		Custom Office
13	National Assembly	Ministry of Foreign Affairs and International Cooperation
14		Ministry of Parliamentary Affairs and Inspection
15		Ministry of Environment
16		Royal Palace
17		Ministry of Religions and Cults
18		Ministry of Justice
19	Ministry of Planning	Secretariat of Public Function
20		General Department of Land Management
21		Ministry of Land Management, Urban Planning & Construction
22		Ministry of Social Affairs Veteran and Youth Rehabilitation
23		Chomkamon District Police Office
24		Chomkamon District Office
25	Ministry of Tourism	Ministry of Education Youth and Sports
26		Daun Penh District Police Office
27	Motorcycle Registration	7 Makara District Police Office
28		Dongkor District Police Office
29		Phnom Penh University
30		Phnom Penh International Airport
31		Red Cross Hospital
32		Royal Academic School
33		Dang Kor District Office
34	Commisariat Police Office	Meanchey District Police Office
35		Ministry of Culture and Fine Arts
36		Ministry of Interior
37		Royal School Of Administrative
38		Senate
39		Ministry of Agriculture Forestry and Fisheries
40		Meanchey District Office
41	NiDA	Ministry of Rural Development
42		Ministry of Defense
43		Ministry of Labor and Vocational Training
44		Ministry of Health
45		Tax Office (Tax Department, MEF)
46		Office of the Council of Ministers
47		Toulkok District Police Office
48	National Police HQ	Vehicle Registration Office
49		Police Statistic Office
50		Traffic Police Office
51		Rosey Keo District Police Office
52		Rosey Keo District Office

2. Siem Reap

No.	Access Node	Remote Node
1	Provincial Office	Provincial Cadastral Office

No.	Access Node	Remote Node
2		Red Cross Hospital
3		Department of Tourism
4		Tax Office
5		Department of Women's Affairs
6	Department of Agriculture, Forestry & Fisheries	Department of Finance
7		Motor office & Vehicle Office
8	Provincial Police Office	Customs Office
9		District Office & District Cadastral Office
10		Seim Reap International Airport
11		District Police Office
12	Department of Education	Commune Office
13		Commune Police Office
14		One Window Service Office

3. Sihanouk Ville

No.	Access Node	Remote Node
1	Provincial Office	Department of Water Resource
2		EDC
3		Maritime Port Administration
4		Industry Mines and Energy Department
5		Airport
6		Customs Office (Sihanouk Ville port)
7	Provincial Police Office	Provincial Motor Office & Vehicle Office
8		Department of Education
9		Provincial Cadastral Office
10		Department of Rural Development
11		Cambodia Red cross
12		Department of Woman Affair
13	Department of Tourism	Department of Commerce
14		Department of Information
15		Department of Agriculture
16		District Office & District Police Office
17		District Cadastral Office
18	Department of Health	No4. Commune Office & No4. Commune Police Office
19		Sihanouk Ville Referral Hospital

4. Kampong Cham

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Cadastral Office
3		Kampong Cham District Office & Kampong Cham Cadastral District Office
4		Kampong Siem District
5		Provincial Motor Office & Vehicle Office
6	Department of Agriculture, Forestry and Fisheries	Cambodia Red Cross
7		Commune Office
8		District Police Office
9		Department of Information

5. Battam Bang

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Cadastral Office
3		Commune Police Office
4		District Police Office
5		Commune Office
6		District Office & District Cadastral Office
7		Tourism Office
8		Motor Office & Vehicle Office
9	University of Management	Red Cross Hospital

6. Kampong Thom

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Police Office

3		Motor office & Vehicle Office
4		District Office & District Cadastral Office
5		Commune Police Office
6		District Police Office

7. Banteay Meancheay

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Police Office
3		Provincial Motor Office & Vehicle Office
4		District Office & District Cadastral Office
5		Commune Office
6		District Police Office

8. Kampot

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Police Office
3		Provincial Motor office & Vehicle Office
4		District Office & District Police Office
5		Provincial Cadastral Office

9. Kandal

No.	Access Node	Remote Node
1	Provincial Office	Provincial Motor office & Vehicle office
2		Takhmao District Office & Cadastral District Office
3		Provincial Cadastral Office
4		District Police Office
5		Provincial Police Office
6		Takhmao Commune

10. Takeo

No.	Access Node	Remote Node
1	Provincial Office	Provincial Police Office
2		Provincial Cadastral
3		District Office & District Cadastral Office
4		Provincial Motor office & Vehicle office
5		District Police
6		Commune

Source: NiDA & Kisan Telecom, as of October 2008.

Although 132 offices in total are indicated in the list, some departments located at different compounds with the ministry's headquarters in Phnom Penh are not connected unless it is specified in the list. Moreover, district offices of various ministries which are not in the same location as the Provincial headquarter offices are not connected, either. However, those offices that have less expectations to earn the privilege of NII shall not be discouraged－Remote Node Access is possible by investing a relatively small amount, as the network is designed to be accessible. Therefore, it is not necessary to invest a vast amount to create a basic infrastructure. Realizing network connection by the basis of NII is much more efficient and cost-effective. National Operation Center run by NiDA will be in charge, and serve as a technical support center to guide the network configuration. Not only the guidance to network configuration but also hosting service, backup service and operation and maintenance services are provided by National IT Center at three location. Upon the request, other government agencies can also accept these services as summarized in Box1 next page.

<div align="center">**Box1. Services provided by IT Centers of NiDA**</div>

- **Hosting Service**

    It is possible to provide various hosting service, with currently acquired IT Center facility and addition to hosting system. The following services can be provided to government agencies.

Service	Description
Co-Location Service	· The IT Center provides lease of physical facility such as space, rack, power, network, etc., of the acquired hosting area. · The customer installs their servers and network equipment to the co-location space. · Under the customer care, operate and manage computer, and others.
Server Hosting Service	· It is to provide lease service of the server acquired from the IT Center. · By leasing the server, operate customer owned application S/W. · Provide O&M service of the server.
Shared Hosting Service	· It is to provide lease service of server's disk and CPU acquired from the IT Center. · It is to provide O&M service of the server.
Application Hosting Service	· To provide lease service of generalized application. · It is to provider O&M service of the server and S/W.

Management Service	· The facility that uses hosting service will be provided with following services:
	  - Provisioning of H/W and S/W Configuration.
	  - Network, Server, Application and traffic Management.
	  - Security Management.
	  - Facility Management.
	  - Call Center and Help Desk service.

- **Backup Service**
    The role of the backup center is as follows;
    - Regular automated backup for the gathered/processed/ stored data of the various server of the National IT Center.
    - In case fault occurs in the major server of the National IT Center, process work on behalf of the application server.

- **O&M Service**

    O&M Service will monitor and control the IT resources to maintain optimal performance through the integrated enterprise O&M system. Therefore, the O&M systems will monitor operation status of systems at real time and prevent occurrence of problems in advance. Also, it will analyze and report the status, symptom, and problem solving to network administrators.

Service	Description
Management Service	· The facility that uses hosting service will be provided with following services. · Provisioning of H/W and S/W Configuration · Network, Server, Application and traffic Management · Fault management, and performance management of H/W and S/W. · Security Management · Call Center and Help Desk service
Security Service	· Provide security control service including detection and prevention of security infringement and Anti-Virus. · Network security, server security, DB security and desktop security.
User Support Service	· Help Desk service, technical support, desk-side support, training service.

Source: Kisan Telecom

Therefore, we suggest government agencies to take these services into consideration to spur of e-government service.

For any inquiry or any further information about NII, please call the under mentioned National Operation Center or NiDA website (http://www.nida.gov.kh/)

> National Operation Center of NiDA
> Phone Number for Technical Service: (023)-224-326

2.4.2 Current Network infrastructure and ICT equipments

Regarding the background information of NII, fact findings from the e-Government survey 2009 are indicated below:

> ➢ **Lack of expertise in utilizing LAN and WAN**
> The study team recognized that only a few number of ICT personnel have expertise in network infrastructure and can distinguish Local Area Network (LAN) and Wide Area Network (WAN). When it comes to the procedure of inter-ministry, LAN is a crucial network structure providing the following advantages: Printer/File sharing, mass-storage device sharing, internet connection sharing, internal email exchanging, high-speed data transferring, et al. Furthermore, from the viewpoint of information security, LAN is much more of a countermeasure. In contrast to these advantages, the fact is that only 24% of PCs on average are connected to LAN. Moreover, those PCs connected to LAN mostly own a peer-to-peer connection to the printer. This reality indicates that the majority are not yet benefiting from the full potential of LAN. The more objects you connect to LAN, the more you

benefit from the extent of its capability. As mentioned previously, since many of the government officers are loath toward linking and sharing, it is recommended that government officers are convinced as to the infinite benefits which LAN can bring, and incorporate psyche issues in order to tackle the promoting of the use of LAN.

➤ **Intention towards connecting central and provincial governments emerging**

5 government ministries out of 11, expressed the necessity to connect between central and provincial offices. MoLVT mentioned that they correspond frequently with provincial offices to enforce decentralization about labor, training and safety transfer. Thus network infrastructure is strongly necessary in order to improve information exchange with the provincial offices. MAFF replied that due to collecting and disseminating agricultural product market prices in 11 provinces, network connection is required. MoEYS says that they have an intention to disseminate Online Curriculum by local network to provincial offices. MoH mentioned that they wish to have network infrastructure to improve the report submission on a quarterly basis from the provincial offices to administration department in Phnom Penh. Furthermore, MoInt intends to provide a Video Conference System available among central office and to Military Generals in the provinces.

NII is the answer to meet these requirements. After the launching in December 2009, it will be ready to be utilized within 132 offices, the headquarters of all ministries in Phnom Penh, and nine other provincial headquarters.

➤ **Awareness for information security is rising**

As the intention towards connection of central and provincial offices emerges, awareness of information security issues also arises. MoInt, MPTC and MLMUP raised the necessity of facilitating end-user precautions in information security and enforcement against attackers. MoInt showed concerns about security measures taken when establishing safeguards which are fundamental element for any system to operate correctly.

➤ **Lack of provisions for ICT equipment procurement**

MoInt and MOEYS expressed that as much as the quantity of ICT equipment increases, the provisions of ICT equipment procurement will be required. MOEYS is on the process of setting up a provision for ICT equipment to maintain a consistency between various teachers training centers with numerous PCs. They consider that creating provisions of ICT equipment ensures the quality control and standards, as well as to streamline and speed up the procurement.

2.5 Web Publications

Governments can go further, by creating websites that allow users to obtain public information and to conduct transaction online. Conducting the online procedure can contribute to potential cost savings, accountability enhancement through information logs and productivity improvements.

The study team surveyed web presence of all 29 government ministries by browsing their website by internet. As stated in figure 11, 21 agencies out of 29 have a web presence, resulted by 2 agencies newly launching a website during this one year, which are MOE and SSCA. Even more, several ministries upgraded their websites by providing new online service, Khmer contents and so on. Nonetheless, it revealed that only nine web sites are updated on a monthly basis and among them, only four, which are MOC, MOND, MPTC, MRD are up-to-date, providing new information every week.

Figure 11. Web presence and hosting location
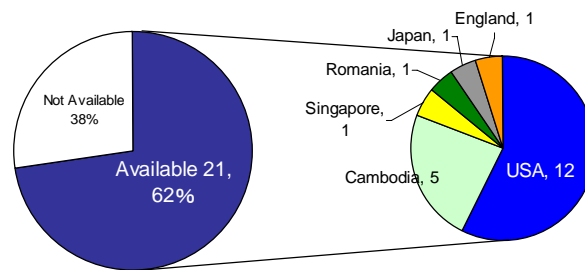
➢ **Low reliance on domestic service escalates hosting abroad**
The study team surveyed website hosting location by using Domain Name Lookup Tool provided via internet (http://whois.domaintools.com/).
As a result, even though the numbers of government web sites are rising, government ministries skewed to hosting abroad, mainly by hosting in U.S.A. As presented in Figure 11, it revealed that more than half are hosting in other countries. Interviewees consider that hosting services abroad provides more security precautions, and less cost than that of domestic hosting services.

➢ **Limited localization of Web contents to ensure accessibility for all**
According to the study, 12 out of the 21 existing web sites were found in Khmer content, which are OCM, MOC, MCFA, MEF, MOE, MOH, MIME, MoInfo, MPWT, MRD, MOT and PPM. According to last year's survey, MoEYS originally post information in Khmer, since renovating their website this year, an English site is only available. Broadcasting information on websites in local language is essential when it comes to serving services to local citizen, especially for marginalized people in rural areas. Government ministries need to take into account that content with Khmer language has to reflect the extent of both civic and public participation.

There are 2 main reasons for government ministries for not having websites, nor being frequently updated. One is insufficient financial resources to offer online service, and the other is lack of expertise to develop and maintain the existing websites.
In order to tackle these obstacles, recommendations for web publication are described in the following Box2.

<div style="border:1px solid black; padding:1em;">

Box2. Recommendations for Web Publication

❖ **Take advantage of web hosting services provided by NiDA**
Financial issues can be addressed by utilizing server hosting service provided by the IT Center of NiDA. Taking advantages of NiDA's currently acquired IT Center facility, government ministries can apply and take advantages of lease hosting service supplied by NiDA to publish a website. In fact, there were many ministries which showed strong interests when introducing these hosting services.

❖ **Utilize private sector competence to enhance existing online service**
Lack of expertise in developing and maintaining the existing websites can be addressed by utilizing private sector competence. MPTC and MOT have sophisticated website presence, which have been developed by private companies. MLVT has not yet established a website and expressed that they have an intention to outsource web creation to a private company. It is an effective alternative way in utilizing the private sector's competence to develop a website.

</div>

2.6 Access to financial resources

In many development countries, lack of internal and external financial resources is an impediment in the promotion of ICT. Cambodia is not an exception. ASEAN countries are investing in ICT development, expecting that ICT based interventions can contribute to socio-economic development including poverty alleviation. On the other hand, the situation in Cambodia is described as follows:

➢ **No significant change of budgeting for ICT improvement**
As presented in Figure 12, comparing to the data of 2008 and 2009, the improvement in the budget for ICT was almost negligible. More than half of the ministries stated "almost impossible" or "difficult" when accessing ministries internal funding which is the same result as last year. Many of the officials expressed their difficulties to request the budget. Since the availability of finance directly reflects to the digital gap issue, a necessity exists to enable all ministries to gain access to funding.

Figure 12. Budget for ICT improvement

Difficulty of getting ministry's internal fund for ICT

Difficulty of getting ministry's external fund for ICT
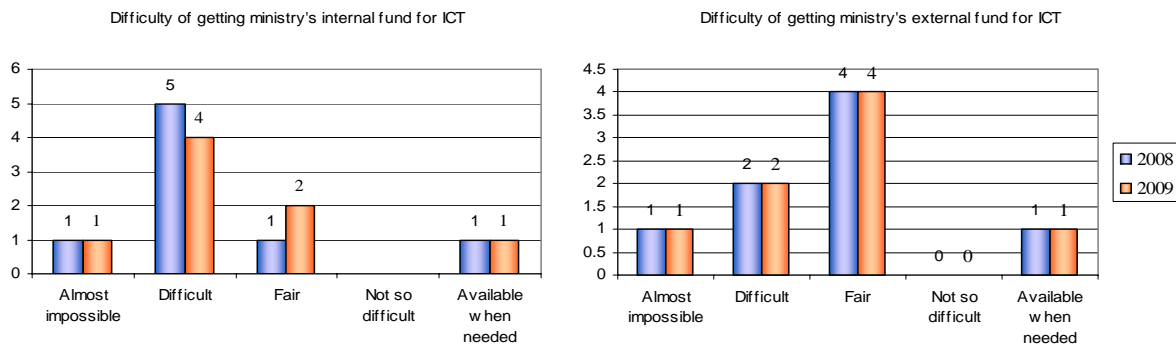
* This ratio covers only the 8 target ministries surveyed in both 2008 and 2009.

> **Low capacity to create a proposal to request for funds**
> In order to expedite funding, it is imperative to prepare quotes and proposals in order to convince internal directors and international sponsors. However, not many of them are capable of creating these types of official request.

2.7 Common issues and proposed actions

Based on the summary of issues, actions and programs recommended last year, the study team of 2009 modified the figure by adding several updated findings, as depicted in next page. The summary chart in the next page shows the relationship of issues, activities and programs at a glance. Some actions are proposed by CIOs of various ministries from the interviews of assessment.

The activities are grouped into five programs; (1) ICT Governance Program, (2) ICT HRD Program, (3) Network and Security Program, (4) Khmer R&D Program, and (5) Standards and Documentation Program. These programs are essential to create an enabling environment for all government ministries to move forward with ICT usage in their workplace, and ultimately to provide e-Government services for the public.

Issues identified

Actions recommended

Programs

Accessibility to ICT

- Low computer diffusion in the government
- Fragmented Peer to Peer LAN only for the Internet
- Limited Internet connection often slow and unreliable
- Poor Inventory management on ICT assets
- Predominant use of free e-mail account than official account with ".gov.kh"
- Word Processing and Spread Sheet: the only skills more than half have

ICT Literacy

- Low Web Browse and Email skills in low accessible environment
- Low skills of Printer/File sharing due to low practice
- Khmer Unicode issue: high switching barrier
- Scarce allocation of ICT staff dispersed across departments

ICT management unit/personnel

- Poor ICT governance institutionalized
- Ministry-wide ICT dedicated offices without adequate authority
- Low incentive to retain skilled ICT personnel in the government
- Very small numbers of women involved in ICT area

Leadership

- Positive attitude towards ICT, but not enough
- Attitudes vary by personal capacity at mid-level
- Face difficulties due to inadequate authority vested to ICT personnel

Standardization

- High sectionalism and low transparency on procedures
- Limited published information on public service procedures
- Lack of provisions for ICT equipment procurement

Information Systems

- Duplicated investments in application developments
- Little usage of open source platform
- Maintenance cost needs to be carefully planned for ICT projects
- Risky when more stakeholders involve
- Many simple standalone databases without linkages
- Information sharing strongly dependent on personal relationship

Web publication

- Low security on websites leading to be hosted outside the country
- Various websites under a ministry with different domain names
- Scarcity of budget and technical staff to sustain web sites
- Most websites are static and rarely updated
- Lack of Localization of Web contents to ensure accessibility for all

Access to finance

- No budget line for ICT equipments and services
- Limited resource mobilization capacity

Actions recommended:

- Collective fund mobilization activity for ICT equipments (e.g. PAIS/NII)
- Training on LAN & Client/Server, File sharing and Printer sharing
- Collectively negotiate with ISPs for government rate for internet services
- Provide government wide e-mail service (to be implemented by PAIS Project)
- Develop easy Khmer Input Method using Unicode
- Put sub decree on the establishment of ICT Departments in all ministries
- Create Priority Mission Group for ICT staff
- Legal establishment of ICT Coordination Committee (G-CIO)
- Set legally binding common e-gov't goals e.g. All forms on web by 201X
- All ministries create ICT plan for their own, involving mid-level management
- Support WID (Women in Development) in the ICT Sector
- Provide ICT trainings at mid-management level in key areas
- Documentation of procedures of key public services and publish on web
- Create provisions for ICT equipment procurement
- Ensure Information systems projects intimated to NiDA/G-CIO
- Encourage information system projects to be developed by local private sector
- Develop e-Gov inter-operability guideline
- Promote NII and web hosting service for government agencies operated by NiDA
- Promote use of CMS for government websites
- Re-design and update the government web portal with search function
- Training on dynamic web development and CMS
- Update websites with Khmer language
- Create budget line for ICT equipments and services
- Training on proposals writing and Request for Proposal (RFP) writing

Programs:

1. ICT Governance Program
2. ICT HRD Program
3. Network and Security Program
4. Khmer R&D program
5. Standards & Documentation Program

3. e-Government Service Deployment Proposal

As a result of this survey, the study team 2009 found out that there is some progress in e-Government readiness. However, at the same time, it also revealed that some government ministries status remains the same with no-progress, especially in the "Behind" ministries. This implies that the digital divide between ministries obviously exists and becoming wider. Furthermore, the survey unveiled that human resource, financial support, ICT literacy and hardware resource are still not tangible enough. It means that "Behind" categorized government ministries are going to face a long journey to become as "Advanced".

Cambodia is a country where the number of citizens is approximately 13 million and the average age in the early twenties. Also the number of the population of productive age is not dominant and, of course, the number of skilled ICT engineers is not tangible enough in the country. The number of citizens of Cambodia is almost the same or slightly greater than that of Tokyo, Japan. This can be said that the size of e-Government Service Deployment in Cambodia is almost the same as that of local government in Tokyo, which can be implied that scale of Cambodian government can be considered as SME (small medium enterprise) if it is stated in the industry sector.

In Japan, Ministry of Economy, Trade and Industry (METI) has started to enforce SMEs by promoting "SaaS/Cloud Computing" infrastructure to strengthen SMEs ability in their business to measure cost effectiveness and solve human resource issues. Meanwhile, some local governments in Japan had decided to adopt cloud computing for services to their citizens taking the advantages of cost-cutting. It suggests that e-Government in Cambodia does not need to be as same as that of large countries, like U.S and/or Europe. It might be enough to establish e-Government services in some local government in those countries.

Based on the situational analysis described above, Cambodia should consider more available and acceptable approach with less cost, less human resources and less hardware recourses in reasonable time frame to implement e-Government Service Deployment Plan.

Last year, e-Government service deployment plan was drawn for its first time. However, due to insufficient amount of financial resource, ICT personnel in each government ministries were facing difficulties to allocate enough human resources, IT training, servers/storages and PCs.
Following is a proposal to aggregate current IT human resource and budget and proceed to e-Government Service Deployment with less cost and efficient way.

The study team has proposed two projects, which can be implemented together or separately of each other, considering results of situational analysis of ICT development in the Government, progress of PAIS/NII project of NiDA, impact of ICT on socio-economic development of Cambodia and tendency of ICT development in the world.
Those projects are related to the encircled portions in Figure 13, next page.

Figure 13. e-Government Service Deployment Plan
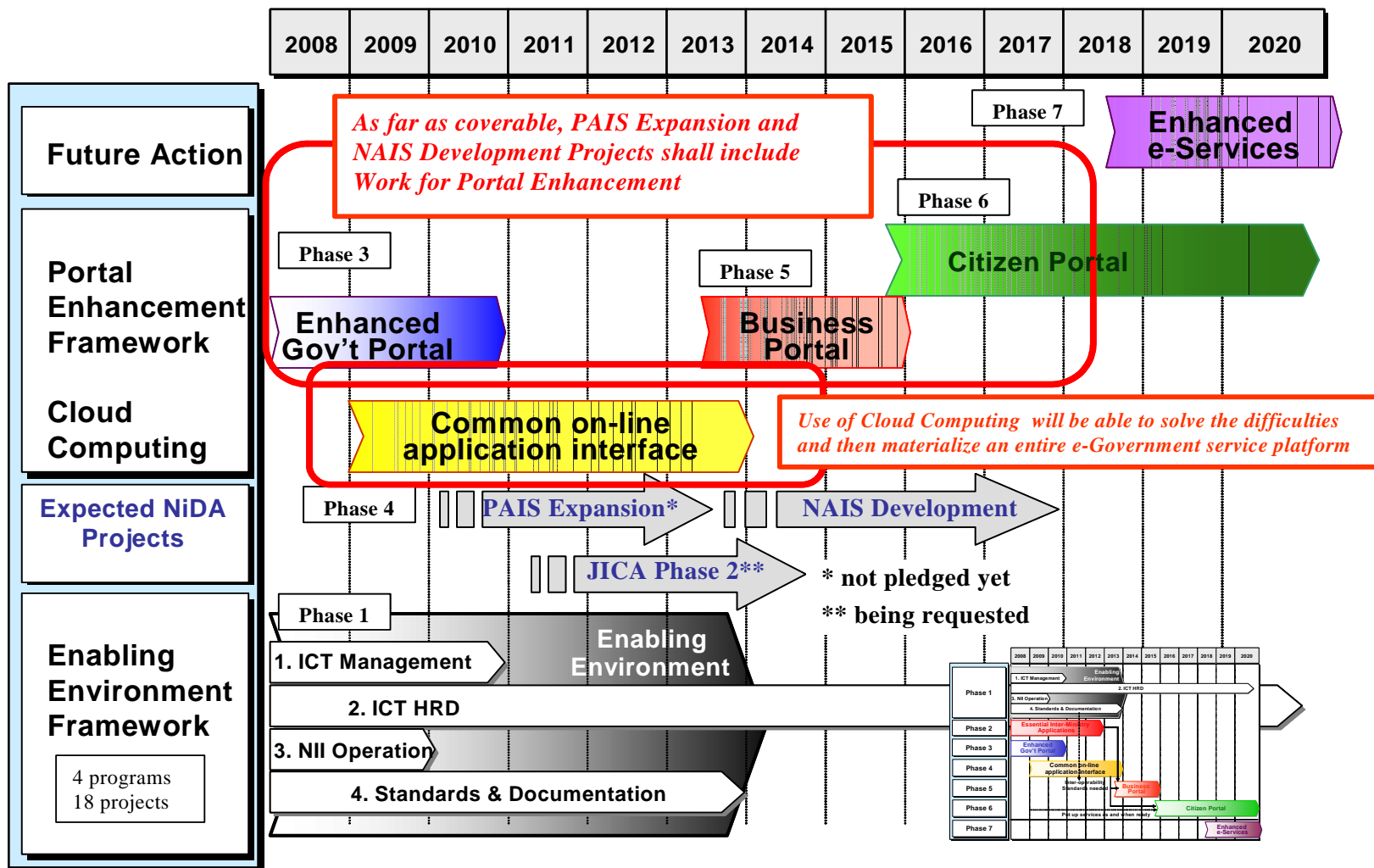
* Originally drawn by study team 2008 and modified by study team 2009

a. Comprehensive Portal Enhancement

If the three kinds of Government operation portal sites, Government Portal, Business Portal and Citizen Portal, are properly functioning, there may be likelihood that economy and society of Cambodia can be developed more openly and actively. Since construction of those comprehensive sites is rather easy work, it is recommendable to consider that NiDA will study implementation of such a Portal Enhancement Project, included in PAIS Expansion or other possible project.

b. NiDA Cloud Computing Center (e-Government Service Deployment Center)

Concept of cloud computing is rather wide. Nonetheless, services provided by cloud computing can be split into three major categories:

1) **Software-as-a-Service (SaaS) :** Software-as-a-Service (SaaS) is the broadest market. In this case the provider allows the customer only to use its applications. The software interacts with the user through a user interface. These applications can be anything from web based email, to applications like Twitter or Last FM.
2) **Platform-as-a-Service (PaaS):** Platform-as-a-Service is a set of software and development tools hosted on the provider's servers.
3) **Infrastructure-as-a-Service (IaaS):** Infrastructure-as-a-Service like Amazon Web Services provides virtual servers with unique IP addresses and blocks of storage on demand.

This center should have three functional teams, such as Public relation team, Development/Operation team and Call center team.

Public Relation team will assess the needs of each government ministry, regarding the services which should be provided by cloud computing center. Web portal service might be one of the most valuable services which the center can provide. The team has to share these needs to Development/Operation team, promptly and in a proper manner. For better operation, the staff of the center should be qualified and skillful ICT personnel.

Related to NiDA Cloud Computing Center, the team would like to suggest following ideas. Those are:

・NiDA Cloud Computing personnel (Linkage and collaboration with other ministries)

Working group member of NiDA Cloud Computing Center will be mainly consists from NiDA technical staff. Addition to this, the working group should include a key person to ICT development assigned from each government agency. NiDA will train each assignee on ICT technology, development/operation skill, and e e-government services deployment method through cloud computing system for certain period, such as two years. After the certain period, the assignees will return back to their affiliated government agencies and become key ICT personnel in their agency.

・NiDA Cloud Computing Center Funds

NiDA Cloud Computing Center should be "e-Government Service Deployment

Center" which provides e-Government services to all ministries through cloud system. By utilizing could system, each government agencies does not need to develop application or upgrade the system. Moreover they do not need to train their staff for system development/operation. They can concentrate into their daily work. It is suggested to allocate special budget, integrating ICT budget in each government agencies for this task to improve ICT situation as a whole.

By establishing NiDA Cloud Computing Center, resources, such as human resources, financial resources, Hardware resources (servers, etc.) will be effectively consolidated and investment duplication in service deployment will be eliminated.
The advantages of this approach are indicated as below:

(1) Optimizes NiDA and other government agencies to train, equip, or adopt the information security regarding e-Government Service Deployment separately. NiDA Cloud Computing Center will be the unifying center to protect from cyber attack, electricity black-out, and etc. Protecting the only and the unified ICT administration facility optimizes the logistics rather than that of multiple government facility located at various places.

(2) Consolidates IT human resource scattered in each government agencies and promotes efficient and effective use of them. From the viewpoint of each government agency can possess skillful IT staff with cost effective way. Also, they do not need to have system development/operation/maintenance staff by their own. Minimum number of IT staff will be enough.

(3) Provides the opportunity to ICT personnel from various government agencies to obtain latest technology skill, expertise and actual hands-on training, while they are in NiDA Cloud Computing Center. The Center can focus on preparing technology training program targeted to the ICT personnel providing wide range of training Program.

(4) Also, it is obvious that each ministry does not need to upgrade and/or maintenance their e-services because they do not have service facility its self.

Figure 14. Current and Proposed e-Government Concepts
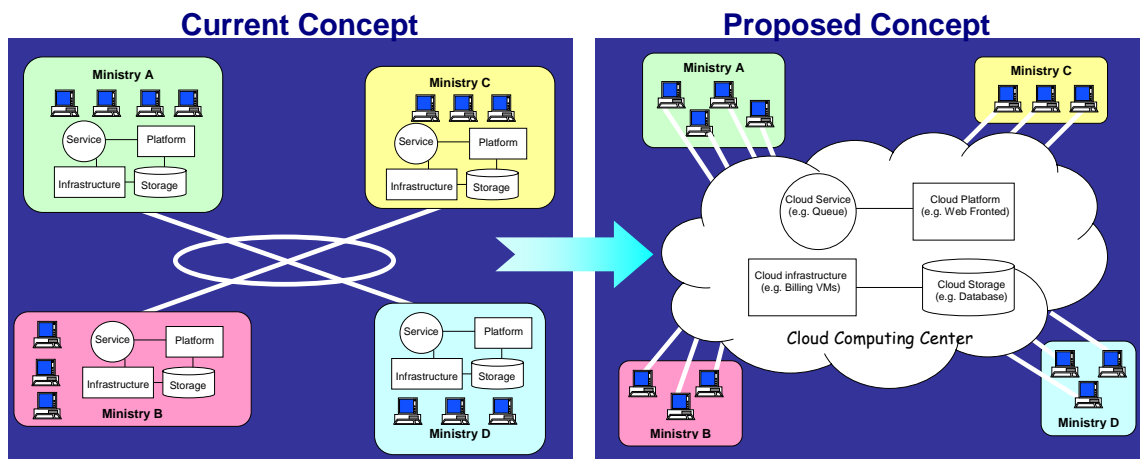
This "NiDA Cloud Computing Center" approach will solve many issues and difficulties, such as lack of human resources, lack of financial support and lack of hardware by consolidating those resources to the center and utilize them efficiently and effectively. It will assist "Behind" category agencies to provide good quality e-Government Services to themselves and citizens.

Please be reminded that, as the most essential point, such cloud computing, if introduced, will be able to release burdens or loads of the ministries on ICT development, which are related not only to costs of ICT development, but also to responsibility for ICT development as well. The responsibility surely covers information security matters.

Yet, this is just a proposal to Royal Government of Cambodia as well as to NiDA management, the study team 2009 is willing to discuss possibility of this approach amongst related organizations and personnel and wishes Cambodia to step forward to realize this e-Government service deployment action in the near future.

Acknowledgement

Appendix I

ICT Planning Toolkit
For Government Agencies

Version 1.0
October 2008

National Information and Communication Technology
(ICT) Development Authority

Foreword

It is my pleasure to distribute this Information and Communication Technology (ICT) Planning Toolkit to all government CIOs. The objective of this toolkit is to facilitate your organization to come up with your own ICT plan. It guides you through the planning process on how you can effectively use ICT to enhance your organization.

Although NiDA has been promoting the use of ICT in the government since its establishment, the usage is still very limited partially due to lack of infrastructure. We are in the process of constructing the National Information Infrastructure (NII) which connects government agencies in 10 provinces. In addition to its basic services provided to all of you, such as government-wide VoIP phone and e-mail services, we will have IT centers which can provide network management services. To best make use of this common asset, we encourage every government agency to have its own ICT plan. With your ICT plans in place, NiDA can study how we can best coordinate various needs and facilitate ICT development in the government.

To this end, NiDA is working on e-government service deployment plan at the national level, which encompasses your ICT plans. The importance of having e-government service deployment plan is to share ICT requirements of the government and to effectively use existing resources, to avoid duplication, and to mobilize additional resources as RGC as a whole.

We request your cooperation in our effort to come up with the plan and look forward to collaborate with you in materializing your ICT plans.

October 2008

PHU Leewood (PhD.)
Secretary General
National ICT Development Authority
Office of the Council of Ministers

Table of Contents

Acknowledgement

Introduction

Background Information and Communication Technology (ICT) is changing our way of life. It is also changing the way government works. Many governments have been harnessing ICT to make their public services better for the people. Having being fully aware of the potential of ICT, Royal Government of Cambodia has also included "promoting extensive use of Information Technology in all aspects of governance and government", in the National Strategic Development Plan (NSDP), 2006-2010.

e-Government Service Deployment Plan Mandated to formulate and implement IT promotion and development policy, National ICT Development Authority (NiDA) under the Office of Council of Ministers is promoting the use of ICT in the government. NiDA has implemented e-Government projects, Government Administrative Information Systems (GAIS) and Provincial Administrative Information Systems (PAIS) which include National Information Infrastructure (NII), government-wide broadband network. This infrastructure provides a wide scope for all government agencies to develop applications which suite their needs. To facilitate the effective use of it, NiDA has embarked on the study on e-Government Service Deployment Plan, which deals with common goals, concepts, and issues in promoting e-Government services.

Why ICT Plan? Without incorporating ICT plan of each ministry, e-Government Service Deployment Plan cannot be substantive. However, not many ministries have documented their own ICT plan yet. NiDA understands that it may not be easy to plan how to effectively introduce this technology in daily government works at each unique environment. This is why NiDA intends to build capacity on ICT Planning at each Ministry and to have draft ICT plans of all ministries as a result. The ministry's ICT plans will feed into the e-Government Service Deployment Plan.
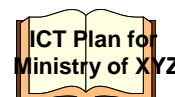
Target users of this toolkit This toolkit has been developed in order to provide guide to identify areas where ICT can be effectively used in any government office. It is targeted to ICT officers at mid-career level, in charge of promotion of ICT in each government organization. The officers who conduct this exercise are desired to have experience in implementing ICT projects, especially in application development. The forms in Appendix are provided as tools and required to be submitted to NiDA at the workshop.

Icons   ⬚ Resources: This section provides useful resources for further information.
                          Also it also refers to inputs to the activity in some cases.

                          ⬚ Annex: This sign shows which tool in the Annexes to be used.

                          Point ☝ : It shows important point to be remembered.

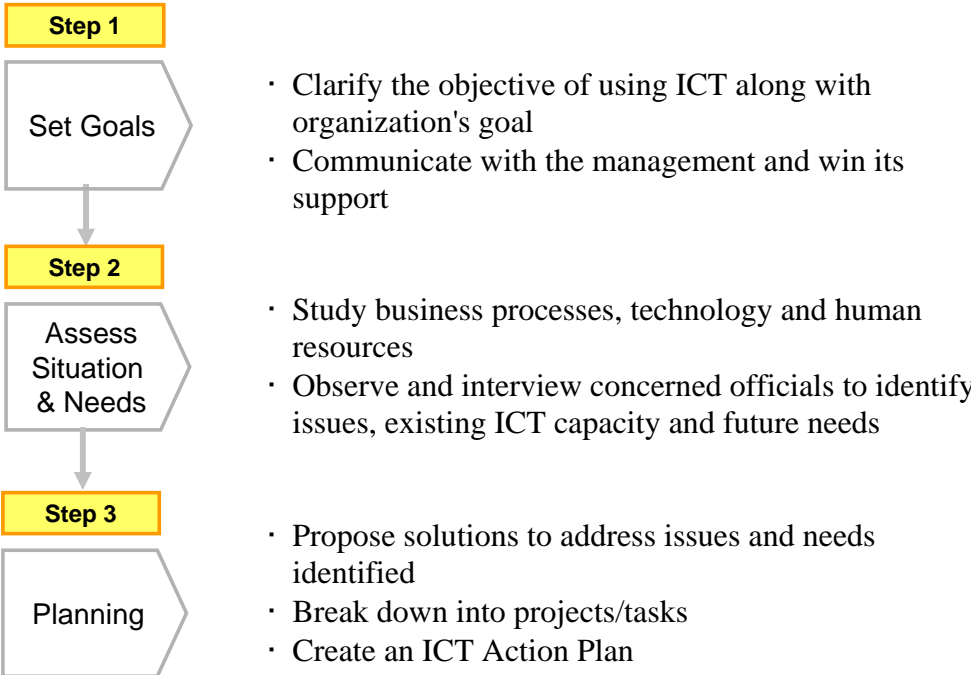**Contents**   This toolkit contains the following topics:

What is ICT Planning?

Definition In this toolkit, ICT Planning is defined as "<u>identification of areas where ICT is effective to achieve organizational goals</u>". Because this is for government agencies, we focus on identifying e-government applications.

ICT Plan typically defines, but not limited to:
- General information about the ministry, including mission and responsibilities
- Achievements in ICT related activities
- Objective of ICT plan
- Current situation and future needs of ICT in the ministry
- List of action items with expected outcome
- Timeframe of action items
- → ICT Plan Template is attached as Annex I.

Approach ICT planning can be understood broadly in three steps as described below.

Step 1

Set Goals
- Clarify the objective of using ICT along with organization's goal
- Communicate with the management and win its support

Step 2

Assess Situation & Needs
- Study business processes, technology and human resources
- Observe and interview concerned officials to identify issues, existing ICT capacity and future needs

Step 3

Planning
- Propose solutions to address issues and needs identified
- Break down into projects/tasks
- Create an ICT Action Plan

Team It is highly recommended to formulate an ICT planning team with a senior official as the team leader in each ministry. The members can include representatives from all (general) departments at mid-career level who knows best about each functions of the ministry (deputy directors of departments, for example). This will make your planning process faster and easier, and also effective in tackling ministry-wide issues.

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How to use this toolkit

There are three components to this toolkit as shown below, Guide, Assessment Sheet and ICT Plan Template.

ICT Planning Toolkit
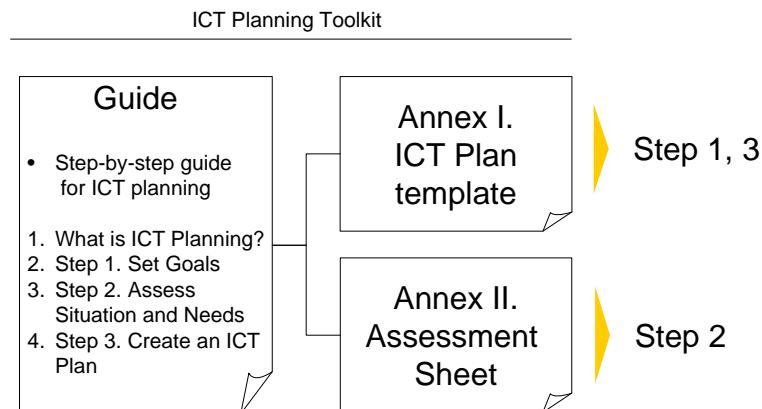
Guide	This booklet is the guide. It takes you throughout the planning process.
ICT Plan Template	Attached as Annex I. In Step 1, write goals on the template. This shall be completed at "Step 3. Create an ICT Action Plan." Finally, this is going to be the output of this entire exercise.
Assessment Sheet	Attached as Annex II. It is used for "Step 2. Assess Situation and Needs"

¨ Resources

There are a lot of ICT Planning guides for government agencies freely available on Internet. You can search with the key words, "ICT planning guide" or "IT planning guide", and "government". Some of good references include:

- Strategic IT Planning and Management Guide (US Dept. of Health and Human Services):
  www.acf.hhs.gov/nhsitrc/it_planning/strategic_planning/index.html
- State of Mississippi Information Technology Services IT Planning Guide:
  www.its.ms.gov/planning_agency.shtml

Step 1. Set goals
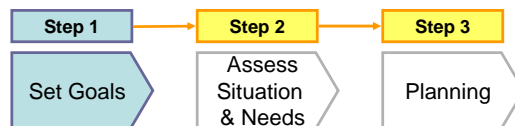
Basic Principle

Though we all know, it is still worth reminding that ICT is a tool, not an end itself. It helps you to achieve your organizational goal. Thus, it is essential to know where exactly you want to reach and what you want to achieve (see below). Make sure that your ICT Plan will contribute towards fulfilling your ministry's mission and achieving the ministry's goals and targets.

Point ☞ **Align ICT Plan with the ministry's goals.**

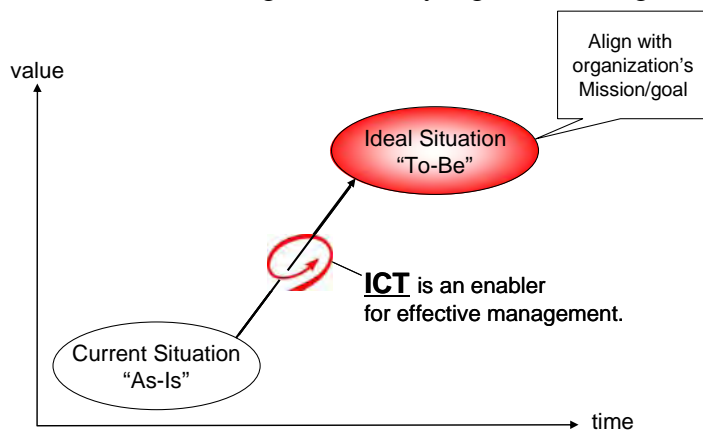**Step 1-1. Summarize ministry's mission and targets**
(🗎 Annex I)

- What is the mission of your ministry?
- What is the priority issue that ministry is trying to solve in the near future?

If you know the answers,
→ Summarize them onto the first section of Annex I, "1. Ministry's mission and goals."

If you don't know the answers,
→ Collect relevant legal documents, such as Royal Decree, laws, acts, etc., and try to make a summary. If you have ministry's master plan or action plans, these can also be useful inputs (see 🗎Resource section below).

Tips for writing summary:

The summary should include the <u>present</u> and the <u>future</u> visions on what organization is trying to achieve. This is important because the ICT plan should cover the information needs in the future. The description should be brief and broad, summarized within a few paragraphs. Make sure you refer to the sources when you quote!

5

**Step 1-2.
Define
objectives of
ICT Plan**
(🗎 Annex I)

Based on the ministry's mission and targets, the objectives of ICT Plan can be defined. For this time, NiDA has already provided the following common objectives for all ICT Plans, except for those already been documented.

<u>Common Goals of ICT Plan</u>

1. To increase the internal efficiency
2. To improve public services
3. To collect data for policy analysis

A common set of objectives is necessary for this exercise in order to have consistency in the e-Government Service Deployment Plan at the national level, which focus on improving public service delivery. These objectives shall not contradict with your ministry's mission and targets. Rather, they should guide you in identifying realistic action items in achieving the Ministry's mission and targets. You can rephrase or add to the above common goals in the same line if necessary.

**Step 1-3.
Communicate
with the
management**

After drafting the ministry's mission and targets, set up a meeting with the management.

In the meeting with the management,
- Explain about the ICT planning, show the statement you drafted to the management and have it validated.
- Ask your management how they think the ministry's mission can be achieved and discuss how ICT can contribute to achieve the mission.
- Assess how well the executives understand the potential of ICT.

It is critical to involve the management from the first stage as your ICT Plan has to be approved by them at later stage to make it official.

Point ☝ Win support from the Management!

Resources To summarize the ministry's mission and goals, you can start with reviewing the relevant sections of the "National Strategic Development Plan (NSDP) 2006-2010." It identifies the targets for the planned five-year period.

- National Strategic Development Plan (NSDP) 2006-2010
  www.cdc-crdb.gov.kh/cdc/aid_management/nsdp.pdf

In NSDP, some section already defines the need for critical information, which needs to be mentioned in the summary.

Example: section for "Employment creation and better working conditions"
Develop a labour database and statistical system with disaggregated data by gender, disabilities and other relevant social factors (NSDP pg.69).

In the reference material sited in the previous chapter, "Strategic IT Planning and Management Guide (US Dept. of Health and Human Services)," it also provides a good guiding chart in defining your goals for ICT plan (see especially the first box about mission-critical responsibilities).
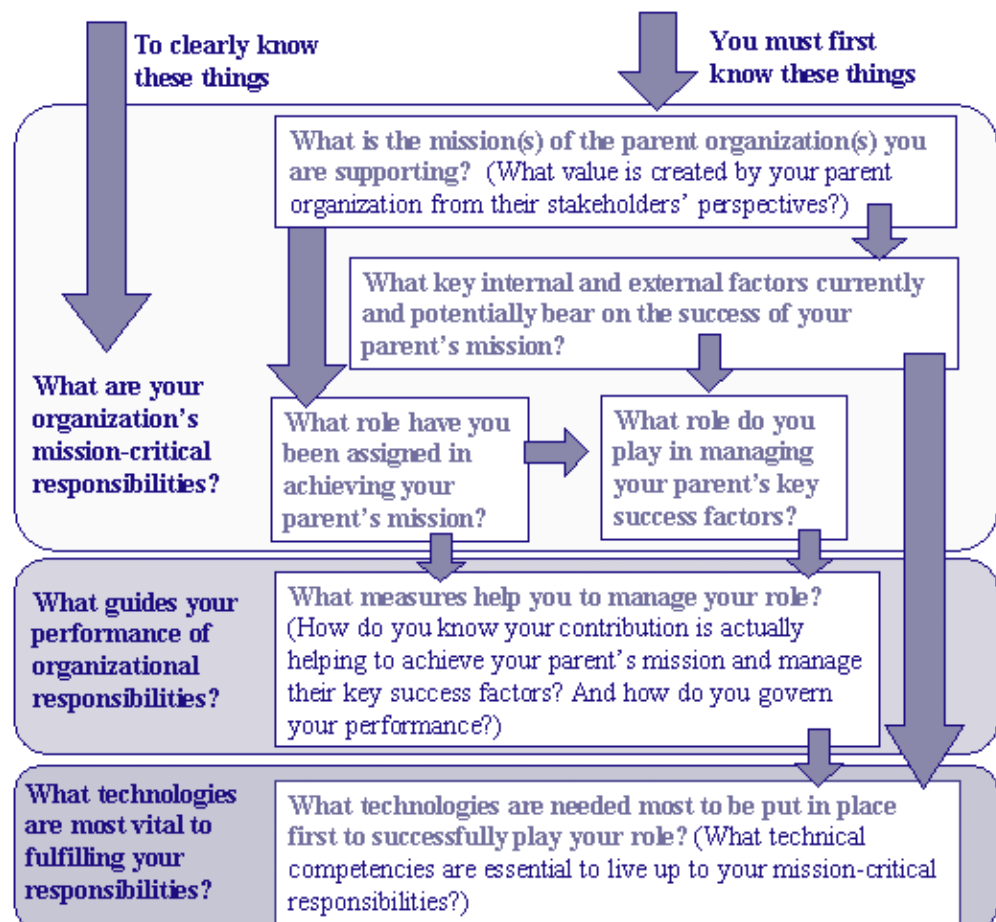
Source: www.acf.hhs.gov/nhsitrc/it_planning/strategic_planning/back.html (accessed in September 2008)

Step 2. Assess Situation & Needs
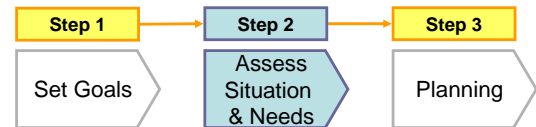
Basic Principle

The basic principle of the assessment bases on the concept of Business Process Re-engineering (BPR)*, in a very simplified way. The assessment is divided in two folds as follows.

- Process Review → ☐ Q4 sheet of Assessment Sheet excel file
  The process review is normally conducted exhaustively to the targeted organization. However, for this exercise **we limit the target to public services**, as explained in the next section. We should have an exhaustive list of public services of your ministry as a result. This list will be the basis for planning ICT solutions in Step 3.

- Reality Check → ☐ Q1, Q2, Q3 sheets of Assessment Sheet excel file
  It is essential to assess the level of readiness for accepting the new technology into your workplace, especially at an infant stage of technology adaptation. This assessment is intended to avoid plans to become over-ambitious and unrealistic.

* To learn more about BPR:
http://en.wikipedia.org/wiki/Business_process_reengineering

Focus of the Assessment

For the purpose of e-Government Service Deployment Plan, this assessment will focus on public service delivery of each ministry, than other types of work such as policy making or administration work.

Three types of gov't work

- G2G: e.g. budgeting
- G2B: e.g. company registration
- G2C: e.g. vehicle registration

Public Service Delivery	Policy Making

- Drafting policies
- Drafting laws & regulation
- Project/program management, implementation

Administration

- Accounting, personnel, procurement, IT, etc.

© NiDA
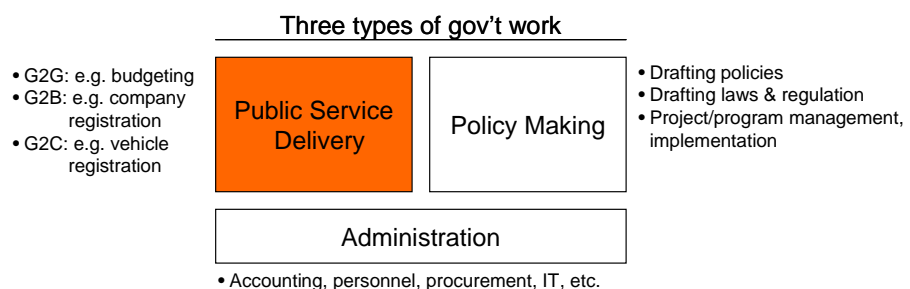
Step 2-1.	The first step is to simply open Annex II
Check	Assessment Sheet in Excel file and
questions in	review all questions. Identify who has
the	information about them. If your
Assessment	department or unit cannot cover
Sheet	information of all the questions, go to
(☐ Annex II)	the next step 2-2. If you have almost all
	the answers, continue from Step 2-3.

Step 2-2.	If you have many departments and other organizations
Organize an	under the ministry, it will be useful to formulate a team
internal team	consisting of each member from all departments as
for data	mentioned in Step 1-3.
collection	
(optional)	Distribute Annex II Excel file to them and have "Q1-3(internal)" sheet filled
	for you. You can aggregate the collected information for assessment.

Step 2-3.
Fill up
Assessment
Sheet for
Reality Check
→Q1, Q2, Q3
(☐ Annex II)

- There are 12 groups of questions altogether, including ICT infrastructure, management capacity, information systems, budget, leadership, website, etc. By filling up these questions, you will be able to conduct *Reality Check*.

- Some questions are more difficult than others. In the Excel file, explanations are provided for some questions as comments. Just place your cursor onto the cell which has red mark on the upper right corner. The comment box appears as shown below.

| **Step 2-4.** **Fill up** **Assessment** **Sheet for** **Process** **Review →Q4** (⬚ Annex II) | • For the sheet Q4, which is for *Process Review*, you can start with listing public services operated in your ministry. Then, contact the person in charge of the service, and try to fill in the entire row together, referring to the instruction and sample given at the top row. Start with at least 3 most used services. Add rows if necessary. |
| | ☞ It is better to confirm the information in Q4 sheet by yourself especially when you are not familiar with the type of services in question. Visit the site where services are provided, especially to verify the information about areas of improvement. |

> **Point** ☞ **Visit sites and Verify the information yourself!**

Tips for **Interview**	*Before interview*
	• Conduct preliminary research about the office you are visiting.
	• The first document you should find is their <u>organization chart</u>.
	• Try to acquire as much information as possible prior to the visit, such as related laws, regulations, sector programs, handbooks, manuals, and reports.
	• Try to understand what their primary tasks are. Review the sector program especially related to ICT. It is useful to use text search (Ctl+F for Word) and use key words such as "information", "system", and so on.
	• Confirm the appointment time a few hours before the interview.
	On the interview
	• When you first meet the interviewees, introduce yourself and thank them for taking time for this interview.
	• Clearly state the purpose of interview and show official letter (if any).
	• Ask whether they have done any work related to this interview (such as filling up the assessment sheet).
	• Take notes to all what the interviewees said, including topics which do not exactly fit to the questionnaire sheet.
	• Ask for a copy of related documents, such as laws, regulations, sector programs, handbooks, manuals, and reports.
	• If answers are not ready, ask the interviewees to collect and send later.
	After the interview
	• Complete filling up all the information on the assessment sheet within the same day of the interview. Otherwise, you will forget the details or get mixed up with other interviews.
	• Create a supplementary note when the interviewees said many things which cannot be entered into the assessment sheet.
	• Follow-up with the interviewee for more information or clarification.

Step 2-5. Analyse Collected Information → Reality Check part (⬚ Annex II)

- Before you start the analysis, make sure that:
  - · You have completed assessment sheet;
  - · You understand the ICT situation in your ministry roughly.
- Open Annex II. Assessment Sheet excel file, go to "Indicators" sheet, and to 2. Reality Check/ICT Readiness Assessment

Question		Answer	rate	max score	Your Score
4-1	Separate ICT unit	Yes	1	1	1
		No	0		
4-2	# of ICT staff	High (more than 1staff/100PCs)	1	1	1/2
		Low (less than 1staff/100PCs)	1/2		
		None (no dedicated ICT staff)	0		
4-3	Academic background of ICT staff	Master, Bachelor, or Diploma of Engineering/Technology are more than half	1	1	
		Master, Bachelor, or Diploma of Engineering/Technology are less than half	2/3		2/3

- Fill in the score which corresponds to your answer in each item. Take the example of the first row corresponding to question number 4-1 in the assessment sheet
  1. The question asks "Do you have a dedicated ICT mgmt unit in the Ministry?" Answer to this question is either "YES" or "NO".
  2. "Rate" column shows the score you will get from your answer.
  3. If your answer is "YES", you get 1 point. If your answer is "NO", you get 0 point.
  4. Enter "1", under "Your Score" column in corresponding row.

- Rating of each item is self-explanatory. However, for some ratings, you need to calculate from data in the assessment sheet. For example, under (3)Infrastructure, "Access to PC" is calculated by the following equation:

$$= \frac{\text{Number of Staff}}{\text{Number of PC}}$$

Thus, you need to calculate the equation in order to decide on the rating.

- For "(5) Standardization of procedures", we omit this part from our assessment this time, due to lack of information. However, it is important to assess the documentation level of all procedures in the ministry. Documentation means provision of laws, regulation, Prakhas, and procedural handbooks, guideline, etc. Little documentation means little standardization of procedures. If procedures are not standardized, it will be difficult to introduce computers to automate such procedures.

- After you fill in all the ratings under "Your Score" column, you will automatically have your own "ICT Reality Chart", which depicts the status of ICT usage in your ministry (see next section for how to read the chart).

How to assess your chart

The ICT Reality Chart is designed to visually grasp the stage of ICT development within your ministry as compared to others in Cambodia. Also, it is useful to understand the strength and weakness of the ministry in promoting ICT.

When you have full score, you will get full diamond shape as shown below left. Let's say that it is the ideal situation. When you have all half score, you will get half diamond shape as shown below right. This point is merely half points, not average. Let us use this half score as our baseline for assessment.

Ideal Situation (Full Score)   Average Situation (half score)
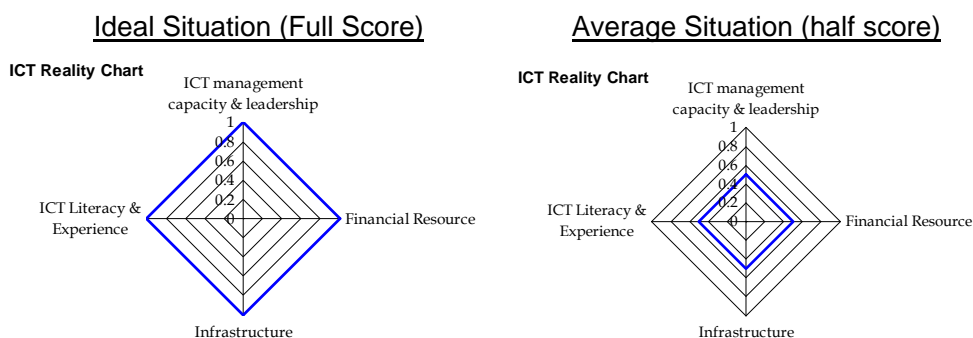
Bearing the above shapes in mind, you can evaluate your position by looking at distance from the baseline, half score. Let's take the following example.
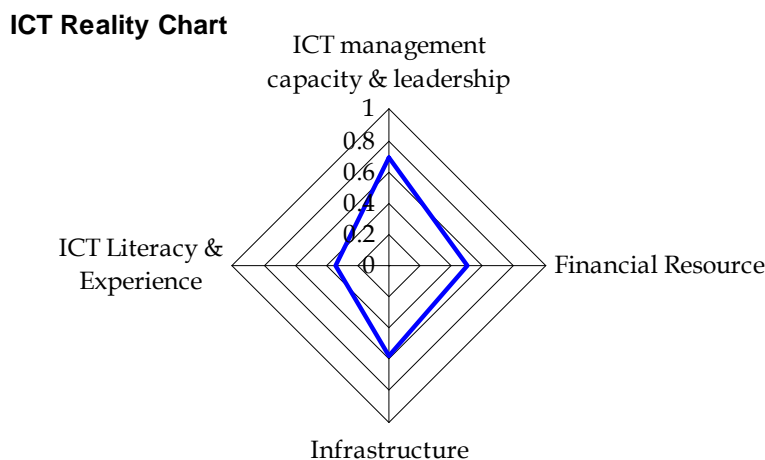
This organization has overall good position since it has slightly bigger or similar size of diamond in comparison to the baseline. Also, it has more than the average points in "ICT management capacity & leadership" and "Infrastructure," which are their strength. On contrary, it has lower points in the area of ICT Literacy & Experience. In this case, we can say, for example:

- This ministry needs to strengthen ICT literacy of all staff.
- Due to limited experience in ICT projects, the ministry should estimate more contingency for the upcoming ICT projects.
- Access to infrastructure and financial resource is about half way.

Needless to say, the assessment indicators and the baseline must be reviewed and modified for each survey.

Step 2-6. Summarize your achievements and current situation based on Reality Check
(⮂ Annex I, II)

Briefly summarize the current situation under "3. Achievements in ICT related activities", "4. Current Situation of ICT environment of Ministry" section in the Annex I, ICT plan template. It maybe useful to have the heading of four pillars of assessment for section 4:

· Infrastructure
· ICT management capacity & leadership
· Financial Resources
· ICT literacy and experience

You are free to add whatever issues you are facing in your ministry related to ICT usage for administration. Do not be lengthy in any of the items.

Copy and paste the "ICT Reality Chart" from the Annex II. Assessment Sheet to the ICT Plan template. See sample below.

(Sample Description on Annex I. ICT Plan template)

3. Achievements in ICT related activities

(1) Ministry's homepage   URL: www.moh.gov.kh
The website contains various policies and programs for health sector, both in Khmer and English. It is fully managed by the Department of Planning & Health Information (DPHI).

(2) Information Systems

No	Name	Functionalities	Year
1	Health Information System (HIS)	Manage health related statistics and indicators	Late 90s

(3) Other ICT Activities
HIS Strategic Plan 2008-2015 has been created by The Department of Planning & Health Information (DPHI).

4. Current Situation on ICT environment of Ministry

ICT Reality Chart
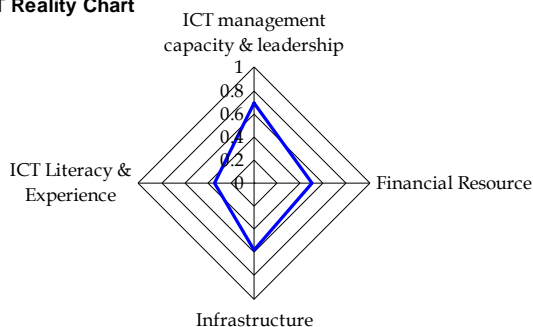
ICT literacy & experience
• Most employees of the ministry do not possess basic computer skills, such as word processing, spread sheet, and even typing. The ministry needs to strengthen ICT literacy of all staff.

ICT management capacity & leadership
• There is no officer who has ICT background or understands ICT. Recruitment of such personnel is urgently required. ---- (continue)

**Step 2-7.
Analyse
Collected
Information
→ Process
Review**
(⬚ Annex II)

Q4 sheet is designed to identify needs for computerizing processes in your ministry. By listing public services in the table, you will be able to identify services which have potentially high impact after computerization.

Since we have only listed public services, which are routine in nature, all services have potential for computerization. In this step, we prioritize the services for computerization based on five factors.

Factors	Corresponding Column	Criteria	Rationale
Number of Stakeholders	Other organization involved	Low	High number of stakeholders tends to lead ICT projects into failure. Start computerization with procedures which can be completed within your organization..
Level of Documentation	Law/Regulations/Manuals	High	Little documentation of procedures often means little standardization. Computerization cannot take place without standardization. Consider documentation activity first.
Volume of processing	Volume	High	Computerization of procedures can bring efficiency when the volume is high. If the volume is low, the impact will be very limited. For example, if you have only 100 records to manage, you don't need database but rather use excel sheet.
Duration taken for each process	Lead Time	Long	One of the aspects of improving public services is speed. When lead time is long, there is a scope for speeding up the service delivery.
Relevance to political agenda/ Number of beneficiaries	Other issues	High	Priority will be given to the services related to priority areas of the sector program or minister's agenda. As has been said, ICT is an enabler to achieve organizational goal. Also consider number of beneficiaries directly or indirectly benefit from improving the service.

The above criteria are pre-set for our purpose of this study. These criteria depend on the goal of ICT plan as defined in Step 1. For your future use, you can add to or modify these criteria. For example, add criterion of "cost reduction impact", if your goal is to reduce cost of public services. This is why it is important that you agree with the goals with the management before you start the assessment survey because it would be difficult add new criteria as relevant information may not be collected.

Step 2-7.
(Continued)

Now, try to set priorities for which public service shall be computerized first. How to set priorities?

1. Compare the five factors among the listed services.
2. Review whether the factors match the criteria.
3. Number them in order of priority. The service which has most matching factors will get the first priority.

Let's take a fictitious example below to explain the steps for assessment.

Example (This sample is fictitious.)

14. Potential services/processes for computerization

No	Public Service/ Manual Process	Type	Division/Department	Description of the services/processes	Other organization involved	Law/Regulations/Manuals	Volume	Lead time	Issues
Guide	Name of the process	Select from G2G, G2B, G2C	Which Division/Dept is responsible?	Briefly explain what needs to be done to complete the task.	Who is involved in the process? List all of them.	Where is the procedure documented?	How many processing per year? (e.g. # of application)	How long does it take to process one unit?	What is the problem with this process? Why do you want to computerize?
1	Issuance of Employment Cards	G2B	Dept. of Employment	When a company hires new staffs, it applys for employment card. The ministry records the profile of the person with the company which hires him or her. Issue card from our machine.	The dept's HQ and provincial offices (internal)	Labor Law, Application form	10,000	1 week per card	All done manually and difficult search the data
2	Declaration of new company	G2B	Dept. of Employment	When new company is registered with Ministry of Commerce and Ministry of Land Management, the company applies to Ministry of Labor. The new company's information is recorded.	Ministry of Commerce, Minisry of Land Management, Provincial offices	Labor Law, Application form	100	1 month per company	All done manually. Cross checking with other ministry takes a lot of time
3	Job seekers' registration	G2C	Dept. of Human Resources	Placement office under the Dept. works as job matching agent. Placement officers advice job seekers and give a list of jobs that interest them. Placement office also receive vacancy information from business communities.	Placement offices under Dept. in all provinces (internal)	Labor Law, Guide for placement officers	25,000	Average 1 hour meeting for each job seeker	Unemployment is the new government's priority area. Lack of placement officers in the growing demand. It takes a lot of time to find matching vacancy information.
4	Complaints box management	G2C	Dept. of Labor Inspection	Ministry has a complaint box for any employee who is made to work under unlawful conditions. After screening, selected complaints are investigated. Reports submitted to the Minister.	None	Not available	5,000	Not applicable	All done manually. Harsh/illegal working conditions forced by foreign invested factories are a growing concern.

Steps followed in this example:

1. In comparing factors, it is useful to use a sign (arrow in this case) so that you can understand which service match the most at a glance.

2. Factors meeting the criteria are shown in red. The maximum red marks get the highest priority.

3. See below column "Priority." Numbers are noted based on the number of red (R: matching criteria well) and blue (B: fairly matching criteria).

	Number of Stakeholders (Low)	Level of Documentation (High)	Volume of processing (High)	Duration taken for each process (Long)	Relevance to political agenda/ Number of beneficiaries (High)	Priority
	↘	↗	↗	↗	↗	
Employment Cards	1 →	Medium →	10,000 ↗	1 week →	Unknown ?	**2** R1+B3
Declaration of new companies	3 ↗	Medium →	100 ↘	1 month ↗	Unknown ?	**4** R1+B1
Job seekers' registration	1 →	High ↗	25,000 ↗	One hour →	High ↗	**1** R3+B2
Complaint Box Mgmt	0 ↘	Low ↘	5,000 →	N/A ?	Moderate →	**3** R1+B2

In this case, job seekers' registration service gets the highest priority for computerization.

Step 3. Create an ICT Plan

Basic Principle

The basic principle is simply to come up with activities which can fill in the gaps identified between the current situation and the ideal situation.
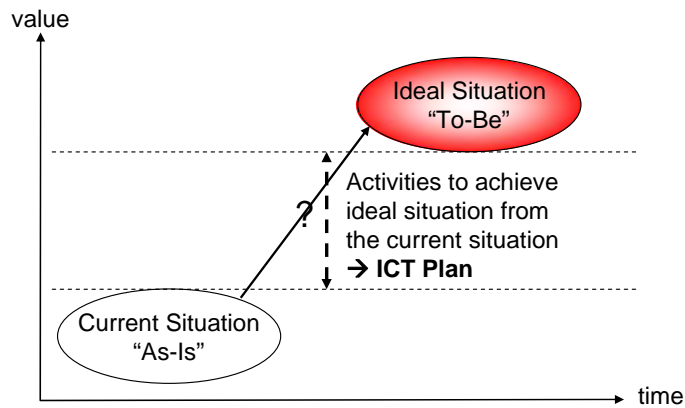
The relationships of activities Step 1, 2 and 3 are depicted in the chart below. From the assessment sheet (Annex II), we have conducted *Process Review* and *Reality Check*, which are inputs to "Application Development" and "ICT Capacity Development" section of "5. Action Items" in the ICT Plan template (Annex I). Note that "ICT Capacity Development" action items shall support "Application Development" plan as Reality Check was conducted to evaluate the readiness of a ministry to accept new technology in the existing processes.
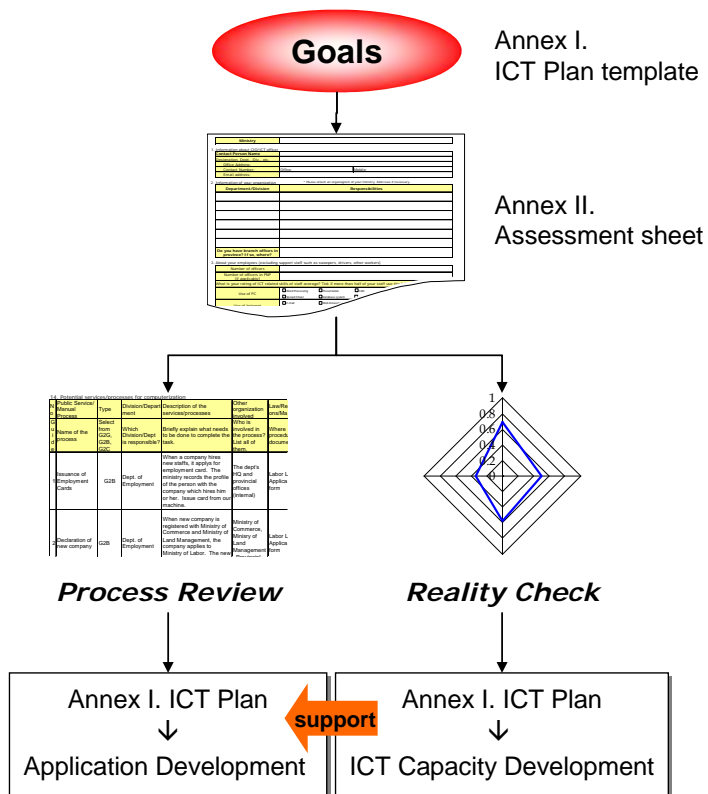
Relationships of activities in ICT planning

Planning concepts for e-Government Service Deployment Plan

The preliminary ICT Planning for the government has already been carried out and the initial concepts of e-government service deployment are already presented in the "An Action Plan for Developing ICT in Cambodia", written by JICA ICT Experts for NiDA, November 2004. This is a useful input to your ICT plan as well. You can follow the basic concepts below.

Although the time frame is not valid anymore, the action plan defines the following two main directions:

1. Gradual deployment from *Basic Services* to *Dedicated Services*
2. Stage-by-stage expansion from *Cities* to *Villages*
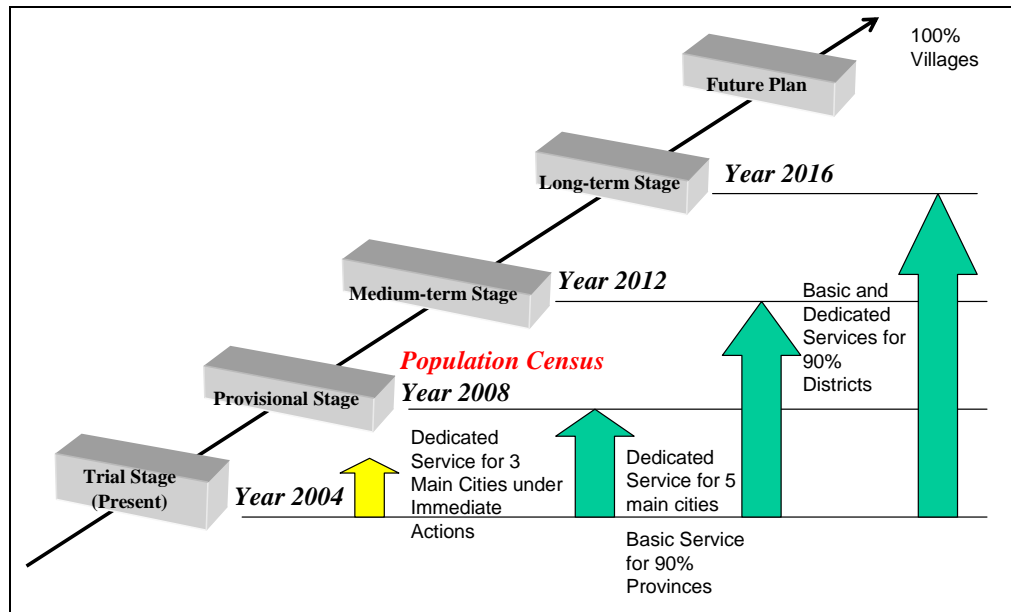
Source: JICA ICT Experts, "An Action Plan for Developing ICT in Cambodia", November 2004.

The definition of "Basic Service" and "Dedicated Service" is as follows:

Source: JICA ICT Experts, "An Action Plan for Developing ICT in Cambodia", November 2004.
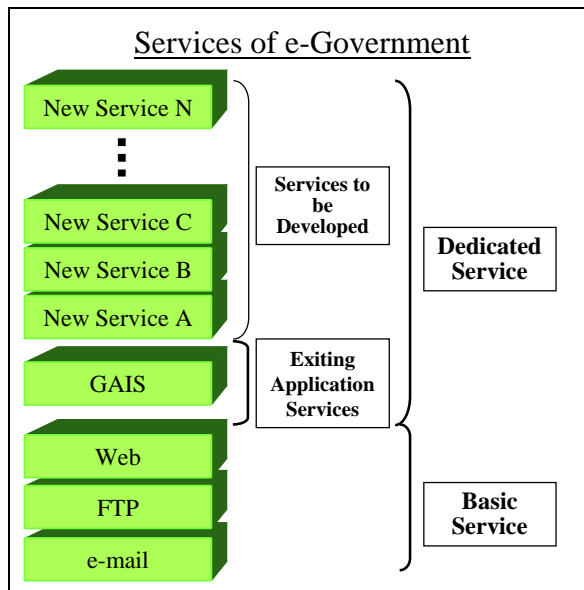
- *Basic Services* include e-mail, LAN, file and printer sharing and Web browsing, which can be furnished with IP technology on the intranet (G-WAN) just like the Internet service.

- *Dedicated Services* refer to services exclusively provided over specifically developed applications, including the existing GAIS services.

Some of the *Basic Services* are provided by NiDA, such as VoIP phones and official e-mail account. You can include these into your ICT Plan.

🗋 Resources **Reference: E-Government Evolution**	Refer to the five stages of e-Government evolution defined by the UN "Global E-Government Survey 2008", with the focus on web based services. First you can think which stage your organization is at, and think of plans to go to the next stage.

5 Stages of E-government Evolution
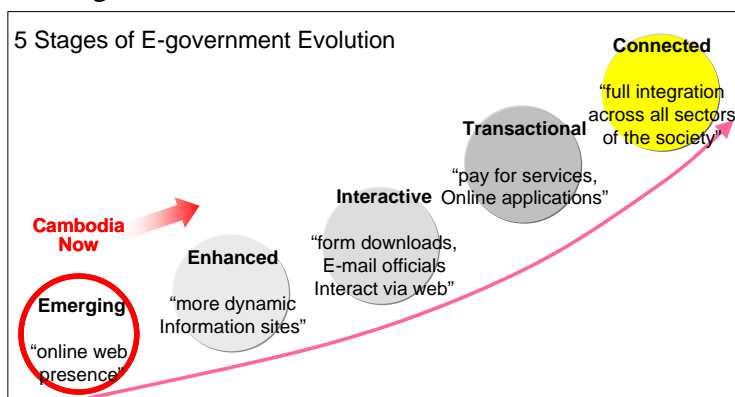
Stage I - Emerging: A government's online presence is mainly comprised of a web page and/or an official website; links to ministries or departments of education, health, social welfare, labour and finance may/may not exist. Much of the information is static and there is little interaction with citizens.

Stage II - Enhanced: Governments provide more information on public policy and governance. They have created links to archived information that is easily accessible to citizens, as for instance, documents, forms, reports, laws and regulations, and newsletters.

Stage III - Interactive: Governments deliver online services such as downloadable forms for tax payments and applications for license renewals. In addition, the beginnings of an interactive portal or website with services to enhance the convenience of citizens are evident.

Stage IV - Transactional: Governments begin to transform themselves by introducing two-way interactions between 'citizen and government'. It includes options for paying taxes, applying for ID cards, birth certificates, passports and license renewals, as well as other similar G to C interactions, and allows the citizen to access these services online 24/7. All transactions are conducted online.

Stage V - Connected: Governments transform themselves into a connected entity that responds to the needs of its citizens by developing an integrated back office infrastructure. This is the most sophisticated level of online e-government initiatives and is characterized by 5 factors (as depicted in the following chart). In addition, e-participation and citizen engagement are supported and encouraged by governments in the decision-making process.

Five characteristics of Connected Stage
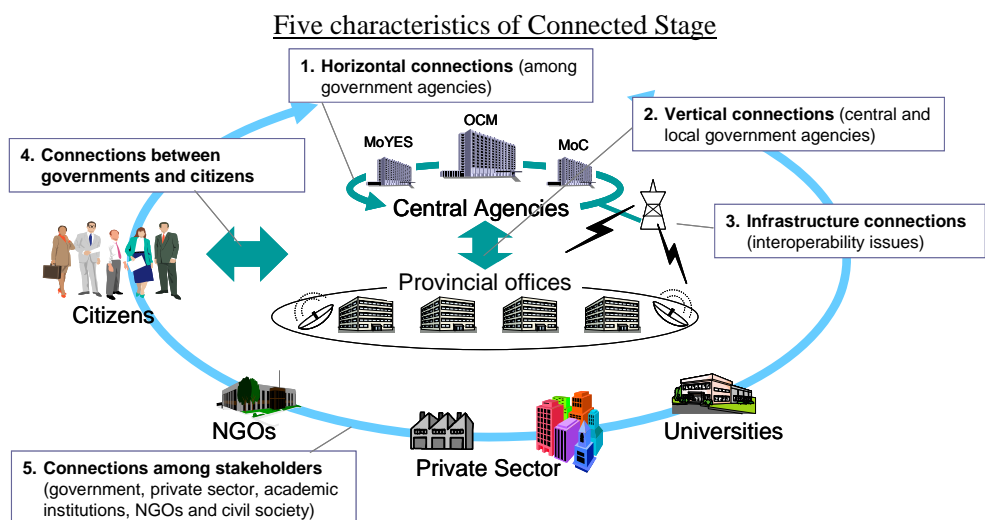
Source: United Nations, "Global E-Government Survey 2008"
(http://www2.unpan.org/egovkb/global_reports/08report.htm)

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Here are some of the examples to apply the five stages in your planning.

- If you don't have web site regularly updated, think about having one so that you can go to "Emerging" stage.
- If you have web site but it is static and not updated regularly, think about adding dynamic component which enables many people to update it. This can take you to "Enhanced" stage.
- If you have dynamic web site regularly updated but no form is downloadable, think about putting blank form (such as pdf file) for public use. This will bring you closer to "Interactive" stage.
- For "Transactional" stage, you may require additional financial resources to make service available online. If there is information system already in place, it maybe easier and less costly to have existing service online. But if the service does not use any application, computerizing related procedures must take place as the first step.
- The "Connected" stage is illustrated above. It requires connections with citizen and business communities and other stakeholders, which may take some years in Cambodia.

Time Frame

As technology advancement is rapid, ICT plan should be reviewed annually. In this exercise, we will plan for the next **five** years.

Step 3-1. List Action Items
(Annex I)

By reviewing *Process Review* and *Reality Check,* you must be having ideas on how to fill in the gap in effectively reaching your goal. List of actions to fill up the gaps needs to be identified.

In the Annex I ICT plan template, list action items in order to reach your target under "**5. Action Items**". You can think about the action items in the following order. In accordance with level of advancement in ICT of your ministry, you can skip the first and second steps.

(1) Action Items to provide ministry-wide *Basic Services* in Phnom Penh
   Example: Connect at least 5 computers from each department to share an internet connection, files, and printers in Phnom Penh.

(2) Action Items to provide ministry-wide *Basic Services* in Provinces
   Example: Connect at least 1 computer of 9 provinces to NII, send ministry's ordinance to all staff by e-mail.

(3) Action Items to provide *Dedicated Services* in Phnom Penh.
   Example: Design and develop Tourism Management Information System.

(4) Action Items to provide *Dedicated Services* in Provinces.
   Example: Deploy Tourism Management Information System in 10 provinces connected to NII.

(5) Action Items to develop ICT capacity in the ministry.

Tips
- Use *Process Review* to list for Dedicated Services, in the order of priority.
- Use *ICT Reality Chart* to list for ICT capacity development

In the process of listing actions for ICT capacity development, you can start with answering to the following questions.

> Looking at the *Dedicated Services* identified from *Process Review*, what ICT realities need to be changed in order to computerize the identified processes successfully?

- Is your infrastructure enough for such computerization?
- Can your ICT office or officers handle the project?
- Can you identify potential financial supporters?
- Would the staff currently working under the targeted process be able to accept the technology and process changes?

For example, when Ministry of Labour wants to deploy job matching information system for placement officers, the placement officers need to have a minimum basic computer skills.

Step 3-2. Draw Master Plan (Optional) (🖰 Annex I)

You have reached to the final step, which is optional for this exercise.

In this final step, you need to put activity items in time-frame of 5 years. It involves calculating an activity's resources, cost, and schedule based on informed judgments regarding the activity's size and complexity. It is not very simple to make an accurate and feasible plan, because of limited resources. This is why it is optional in this toolkit.

For this exercise, you can simply consider the followings bullet points.

- Consider the precedence relationships of activities and put them in order. For example, you need to document procedures before you start system analysis and application design.
- Roughly estimate how long the activity may take. For the example above, if the procedures to computerize are complex, you may want to take a whole year to complete just documenting procedures and have them officially approved.
- When you have precedence relationships and estimated time duration, you can lay out the lines on the master plan table under "**6. Master Plan**" in Annex I ICT Plan Template.

Item	Type	Year 1	Year 2	Year 3	Year
(1)-1	Basic	─────			
(1)-2	Basic				────
(2)-1	Dedicated		────────		
(3)-1	Capacity	───────────────────────			
(3)-2	Capacity			───────	

It would be useful to include estimate required budget for each activity. For some activities, for example, the cost creating a new website, costing is easy because of a lot of similar experiences in the government and in the private sector. On the other hand, for costing of developing a *Dedicated Service*, we need to collect much more information about functionalities of the application.

Congratulation!

Yes!! Now you have a draft ICT Plan for your own ministry!

Please discuss and modify it with your colleagues in your ministry and have it approved!

Appendix II

template

ICT Plan for Ministry of XYZ (Draft)

October XX, 2008

1. Ministry's mission and targets

Write a brief introduction about your ministry, including a brief history, its mission and responsibility. Some sample sentences are shown below but it is not necessary to follow.

The ministry's mission is to ……..

Currently there are pressing issues on ………

Main dealing organizations (departments/authorities) include XXX, mandated to ………, YYY mandated to ……, ZZZ mandated to ……. The ministry has set a target to achieve …… by the year 20XX.

2. Objectives of ICT Action Plan

Objectives of Ministry's ICT Plan are three folds commonly defined at national level:

· To increase the internal efficiency

· To improve public services

· To collect data for policy analysis

The ICT Action Plan will define a series of actions towards the above objectives in the areas which contribute to achieving the ministry's mission and targets.

3. Achievements in ICT related activities

(1) Ministry's homepage *(if applicable)*   URL: www.xyz.gov.kh

(2) Information Systems *(if applicable)*

No	Name	Functionalities	Year
1			
2			

(3) Other ICT Activities*(if applicable)*

4. Current Situation on ICT environment of Ministry

Analyze current situation on the Ministry's environment in which ICT is used, in terms of ICT management capacity, Infrastructure, Financial Resources, Leadership, Standardization of procedures, and ICT Experience. Use assessment sheet for the survey and analysis.

5. Action Items

(1) Basic Services *(if applicable)*

No	Action
1	Connect at least XX computers in the ministry's head office and 9 provincial offices (by NiDA)
2	Create web site of the ministry and update it regularly
3	Provide government domain e-mail account to all ministry's staff (by NiDA)

(2) Application Development (Dedicated Services)

List needs of new application system required in the future in priority order.

No	Priority areas for computerization	Functionality	Expected outcome
1			
2			

(3) ICT capacity development

List activities which required for enhancement of ICT usage in your ministry, based on the finding above.

No	Activity	Expected outcome
1		
2		
3		
4		

6. Master Plan (optional)

Item	Type	Year 1	Year 2	Year 3	Year 4	Year 5
(1)-1	Basic	———				
(1)-2	Basic				———	
(2)-1	Dedicated		———————————			
(3)-1	Capacity	—————————————————————————				
(3)-2	Capacity			—————————————————		

Appendix III

ICT Planning Toolkit
Assessment Sheet

<u>Objectives of assessment sheet:</u>

To assess current situation and issues in achieving ministry's goal --> Process Review Q4
To assess the hinderances for ICT promotion and implementation --> Reality Check Q1-3
Answer

<u>How to use this sheet</u>

1. Fill up Q1-3 sheets as much as you can.
2. Collect information for questions requiring specific data, e.g. # of PC.
3. Contact a person in concenred department/division who know most about their tasks
4. Fill up Q4 sheet in consultation with the person above to list out tasks you are targetting.
5. Use Q4 sheet to draw issues and future needs from the interviewee.
6. After collecting all information, fill up the Indicator sheet to aggregate the data

<u>Who should fill up the sheet</u>

A person who is responsible for ICT management in an organization.
To fill up Q4 sheet, it is necessary to have people who know about tasks in concerned division.

Ministry	

1. Information about CIO/ICT officer

1-1	Contact Person Name		
1-2	Designation, Dept., Div., etc.		
1-3	Office Address:		
1-4	Contact Number:	Office:	Mobile:
1-5	Email address:		

2. Information of your organization

* Please attach an organization chart of your ministry. Add rows if necessary.

2-1	Department/Division	Responsibilities
2-2	Do you have branch offices in province? If so, where?	

3. About your employees

3-1	Number of officers	
3-2	Number of officers in PP (if applicable)	
3-3	What is your rating of ICT related skills of all officers?	Answer
	Word Processing (word) (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	Spread Sheet (excel) (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	Presentation (powerpoint) (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	Web browse/search (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	E-mail (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	Printer Sharing (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	
	File Sharing (1. None 2. Less than 20% 3. 20-40% 4. 40-60% 5. 60% or more)	

4. About ICT management capacity

4-1	Do you have a dedicated ICT mgmt unit in the Ministry?	⦿ Yes ◯ No	Name:
4-2	How many dedicated ICT personnel do you have?		Total:
4-3	What is their qualification and designation?	Number of ICT Personnel	Designation
	Master		
	Bachelor		
	Associate Bachelor		
	Diploma of Engineering		
	Diploma of Technology		
	Certificate (short course) only		
	others		
4-4	What practical skills do you have within ICT unit or ICT personnel?	☐ Provide help in using basic Windows applications (Win, MS Office, etc.) ☐ Provide help in using basic FOSS applications (Khmer OS, Open office etc.) ☐ Computer maintenance and hardware trouble shoots ☐ Programming ☐ Server set-up and network administration ☐ System Analysis ☐ Plan and propose ICT projects to the management ☐ Web site development and hosting	
4-5	What kind of skill is urgently required at the moment?		

Assessment Sheet

Ministry	0

5. Infrastructure

	Question *all answers must include about provincial offices	Answer
5-1	How many computers do you have?	
5-2	How many printers do you have?	
5-3	Do you have local email system? (e.g. xxx@moef.gov.kh) (1. Yes 2. No)	
5-4	Do you have Local Area Network? (1. Yes 2. No)	
5-5	Approximately how many computers are connected to LAN?	
5-6	Approximately how many computers are connected to the internet?	
5-7	What kind of connection do you have? 1. Wireless 2. DSL 3. Leased Line 4. Satellite 5. Dial-up 6. Others (specify)	Answer
5-8	What is the speed of connection? (Kbps, total in the head office) 1. 64Kbps or less 2. 128Kbps 3. 256Kbps 4. 512Kbps 5. 1M or more(specify)	
5-9	How often does the connection fail/time out? (chose one that best describes the situation) 1. Almost always difficult to access 2. Very often (more than half of times you access) 3. Occasionally (less than half of times you access) 4. Rare (only a few times in peak time) 5. Never fail	

6. Budget for ICT expenditures

	Question *all answers must include about provincial offices	Answer
6-1	What is the average number of computers that you procure in a year?	
6-2	Who has funded the procurement above?	
6-3	How do you rate difficulty of getting ministry's internal fund for services (e.g. internet) and maintenance of ICT equipments (e.g. repair). (1. Almost impossible 2. Difficult 3. Fair 4. Not so difficult 5. Available when needed)	
6-4	How do you rate difficulty of getting external funding for ICT related projects and activities. (1. Almost impossible 2. Difficult 3. Fair 4. Not so difficult 5. Available when needed)	

7. About Leadeship in ICT promotion

	Question Answer -->	
7-1	How supportive is the executive towards ICT usage in your ministry? 1. **Strong support**: The executives themselves vigorously promote the use of ICT. 2. **Show understanding**: The executives understand potential of ICT. Proposals are welcomed. 3. **Interested**: The executives are interested in ICT but have low level of understanding. 4. **User level**: The executives are computer users but not more. Everything related to ICT is left under ICT officer/unit. 5. **No support/Barrier**: The executives do not use computer nor have interest. Sometime they speak against promoting ICT.	

8. Web site and other contents

	Question	Answer
8-1	Address of ministry web site:	
8-2	Where do you host the web site?	
8-3	When was the last time you updated?	
8-4	What is the reason for not having or updating web site?	
8-5	Please list regular publications such as official gazette or annual reports.	

Assessment Sheet

Ministry	0

9. ICT projects
Please provide details of information systems currently operated in your ministry.

Information System	Functionalities	Year of installation	Developer	Users	Programming Language	Database Engine	Is it operated well? Other comments (if any)

Answer

10. Do you have information systems which was developed but is no longer been used? ○ Yes   ○ No

If yes, please list them with reasons why it is not used any more.

Information System	Functionalities	Reason for not using

11. What is your future plan of introducing ICT in your ministry? Do you have ICT plan?

Plan to develop information systems

Information System	Functionalities	Users	Volume	Main purpose

12. Any other issues related ICT in the ministry. If necessary use additional sheet.

13. Would you like to participate in the second workshop on ICT planning to create a draft ICT plan for your ministry?

Assessment Sheet

Ministry	0

14. Potential services/processes for computerization

No	Public Service/ Manual Process	Type	Division/Department	Description of the services/processes	Other organization involved	Law/Regulations/ Manuals	Volume	Lead time	Issues
Guide	Name of the process	Select from G2G, G2B, G2C	Which Division/Dept is responsible?	Briefly explain what needs to be done to complete the task.	Who is involved in the process? List all of them.	Where is the procedure documented?	How many processing per year? (e.g. # of application)	How long does it take to process one unit?	What is the problem with this process? Why do you want to computerize?
1									
2									
3									

Answer

Ministry	0

14. Potential services/processes for computerization

No	Public Service/ Manual Process	Type	Division/Department	Description of the services/processes	Other organization involved	Law/Regulations/Manuals	Volume	Lead time	Issues
Guide	Name of the process	Select from G2G, G2B, G2C	Which Division/Dept is responsible?	Briefly explain what needs to be done to complete the task.	Who is involved in the process? List all of them.	Where is the procedure documented?	How many processing per year? (e.g. # of application)	How long does it take to process one unit?	What is the problem with this process? Why do you want to computerize?
1	Issuance of Employment Cards	G2B	Dept. of Employment	When a company hires new staffs, it applys for employment card. The ministry records the profile of the person with the company which hires him or her. Issue card from our machine.	The dept's HQ and provincial offices (internal)	Labor Law, Application form	10,000	1 week per card	All done manually and difficult search the data
2	Declaration of new company	G2B	Dept. of Employment	When new company is registered with Ministry of Commerce and Ministry of Land Management, the company applies to Ministry of Labor. The new company's information is recorded.	Ministry of Commerce, Minisry of Land Management, Provincial offices	Labor Law, Application form	100	1 month per company	All done manually. Cross checking with other ministry takes a lot of time

Assessment Sheet

3	Job seekers' registration	G2C	Dept. of Human Resources	Placement office under the Dept. works as job matching agent. Placement officers advice job seekers and give a list of jobs that interest them. Placement office also receive vacancy information from business communities.	Placement offices under Dept. in all provinces (internal)	Labor Law, Guide for placement officers	25,000	Average 1 hour meeting for each job seeker	Unemployment is the new government's priority area. Lack of placement officers in the growing demand. It takes a lot of time to find matching vacancy information.
4	Complaints box management	G2C	Dept. of Labor Inspection	Ministry has a complaint box for any employee who is made to work under unlawful conditions. After screening, selected complaints are investigated. Reports	None	Not available	5,000	Not applicable	All done manually. Harsh/illegal working conditions forced by foreign invested factories are a growing concern.

Structure of Assessment Sheet

1. Selection of Service/process --> Q3, Q4 sheet

	Type of work	Category			Criteria
1	Policy Making				(out of scope)
2	Administration				(out of scope)
3	Public service delivery	standardized procedures		volume	high
				frequency	high
				error	high
				lead-time	long
			Answ	stakeholders	small
		Global practices			Included In 20 public services (EU model)

2. Reality Check/ ICT Readiness Assessment --> Q1, 2, 3 sheets

Pillars	Category	Question		Answer	rate	max score	Your Score
(1) ICT management capacity & leadership	Organization	4-1	Separate ICT unit	Yes	1	1	
				No	0		
	ICT personnel	4-2	# of ICT staff	High (a staff maintains less than 35PCs)	1	1	
		=	Number of PC	Low (a staff maintains more than 35PCs)	1/2		
			Number of ICT Staff	None (no dedicated ICT staff)	0		
		4-3	Academic background of ICT staff	Master, Bachelor, or Diploma of Engineering/Technology are more than half	1	1	
				Master, Bachelor, or Diploma of Engineering/Technology are less than half	2/3		
				Associate Bachelor or below only	1/3		
				Non-ICT background + short course only	0		
		4-4	Skill variation	Rating based on variation	0-8/8	1	
	Leadership in ICT	7-1	How supportive?	Strong Support	1	1	
				Show understanding	4/5		
				Interested	3/5		
				User level	2/5		
				No support/barrier	1/5		
						5	0
(2) Financial Resource	Internal Budget availability 6-3			Almost impossible	1/5	1	
				Difficult	2/5		
				Fair	3/5		
				Not so difficult	4/5		
				Available when needed	1		
	Ability to get external resources 6-4			Almost impossible	1/5	1	
				Difficult	2/5		
				Fair	3/5		
				Not so difficult	4/5		
				Available when needed	1		
						2	0
(3) Infrastructure	Access	5-1 3-1	PC (# of staff per PC) = Number of Staff Number of PC	PC for all staff	1	1	
				1-5 staff per PC	3/4		
				6-10 staff per PC	1/2		
				11-15 staff per PC	1/4		
				15+ staff per PC	0		
		5-1 5-2	# of printers per PC = Number of Printer Number of PC	More than 50%	1	1	
				20 - 50%	2/3		
				Less than 20%	1/3		
				no printer	0		
	LAN	5-4	LAN Available?	Yes	1	1	
				No	0		
		5-5	% of PC connected to LAN	All	1	1	
				more than 33%	2/3		
				less than 33%	1/3		
				No	0		
	Internet	5-6	Access (% of total PC) = Number of PC connected Number of PC	more than 50%	1	1	
				30-49%	3/4		
				10-29%	1/2		
				less than 10%	1/4		
				no internet	0		
		5-6 5-8	Speed	above 11.6Kbps/PC	1	1	
				less than 11.6Kbps/PC	0		
		5-9	Reliability	Rating	1-5/5	1	
						7	0

Pillars	Category	Question		Answer	rate	max score	Your Score
(4) Literacy & Experience	ICT skills of general staff	3-3	Word processing (word)	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			Spread Sheet (excel)	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			Presentation (powerpoint)	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			Web browse/search	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			E-mail	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			File sharing	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
			Printer Sharing	None	0	1	
				Less than 20%	1/4		
				20-40%	1/2		
				40-60%	3/4		
				More than 60%	1		
	Experience of ICT projects		Successful projects	Yes	1	1	
				No	0		
			Failed projects (exclude GAIS)	Yes	1	1	
				No	0		
	E-mail	5-3	Local e-mail system Available?	Yes	1	1	
				No	0		
	Web site	8-1	Web site available?	Yes	1	1	
				No	0		
		8-3	Last time updated	Within the same week	1	1	
				Within the same month	3/4		
				Within three months	1/2		
				Withing a year	1/4		
				Not updated more than a year	0		
						12	0
(5) Standardization of procedures	Level of legal documents, documentation of procedures	Q4	example: Legal basis Regulation ministrial ordinance Task manuals	Less than 20%	0	1	
				20-40%	1/5		
				40-60%	2/5		
				60-80%	3/5		
				More than 80%	4/5		
	Omit from assessment scope this time due to lack of information			All	1		
						1	

Pillars	Ratio(=Actual / Max Score)
(1) ICT management capacity & leadership	0
(2) Financial Resource	0
(3) Infrastructure	0
(4) ICT Literacy & Experience	0
(5) Standardization of procedures	

ICT Reality Chart