Post-Evaluation Report (2014-2)

The ICT Technical Assistance Project for Caribbean Country

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Report Content

1. Acronyms

ADOC	APEC Digital Opportunity Center
AIMS	Agriculture Information Management System
APEC	Asia-Pacific Economic Cooperation
ASYCUDA	Automated System for Customs Data
ATLAS	Advance Transportation Licensing System
CARICOM	Caribbean Community and Common Market
CITO	Central Information and Technology Office (Belize)
CMS	Crime Management System
CRS	Car Registration System
CSRS	Civil Status Registration System
DPADM	Department of Public Administration & Management (St Lucia)
EA	Executive Agency
ECTEL	The Eastern Caribbean Telecommunications Authority
EU	European Union
HIS	Health Information System
IA	Implementation Agency
ICT	Information and communication technology
ITRI	Industrial Technology Research Institute of Taiwan
ITU	International Telecommunication Union
MOFA	Ministry of Foreign Affairs
NITO	National Information Technology office
NTUT	National Technology University of Taipei
UNDESA	United Nations Department of Economic and Social Affairs
WSIS	World Summit on the information Society

2. Executive Summary

The ICT technical assistance project for Belize, St Kitts and Nevis and St Lucia started in 2007 and completed in 2012; total budget is NT$ 213,718,256.The objectives of this project is to assist beneficial countries to build up government ICT capacity. In order to achieve this objective, the project constructed well-equipped ICT center. The project used ICT center as a platform to train civil servants and promote e-Government applications. These competitions were not only for establishing government ICT capacity, but also improving public service quality. Regarding to the project outputs, this project established ICT center in Belize, St Kitts and Nevis and St Lucia, 8 national portals, 11 e-Government applications, National Top-level domain management and government e- mail service. This project also hosted four regional ICT seminars to promote e-Government knowledge and best-practice in Caribbean region.

This evaluation report assessed the project contributions to the beneficial countries; assessment standards referred to TaiwanICDF project performance criteria namely relevance, effectiveness, efficiency, and sustainability. The project relevance assessment aimed to analyze whether the project design framework and its intervention logic meets to actual demands of e-Government development. The efficiency and effectiveness assessment is to review these developed e-Government applications functionality and information quality, the quantitative research adopted to assess the project efficiency and effectiveness. As to the project sustainability, evidences and information that collected from on-site visiting were adopted to identify the possibility of project sustainability.

Findings of this evaluation report summarized as followed: ICT center in Belize and St Lucia operations are in good condition, Belize and St Lucia executive agency has ability to manage and maintain ICT center. Regarding e-Government applications operation, 7 out of 11 applications are fully operated, but 4 had been shut-downed.
Due to the ICT enable environment not formulated yet, the effectiveness of the

e-Government application promotion is not clear.

It is not doubt that ICT technology and facilities stills taking important role to assist Caribbean countries to develop its e-Government applications. However, before TaiwanICDF tempted to conducted e-Government approach project. It will be better if a project invests more time and resources to review the rationality and effective of candidate agency's procedures. Meanwhile, candidate EA/IA capacity also should be taken into account that includes communication ability, the leadership and EA/IA commitment to the project objectives and the completion of national ICT infrastructure.

It also recommended that project performance monitoring and reporting system arrangement should also include in the project contracted works and the regulation arrangement in the law document. Another consideration is of the objectives setting and mutual responsibility inside project management. The regulation arrangement maybe includes project participants' responsibility and work quality requirement. And TaiwanICDF should more focus on local talents training and organized ICT local services team. An excellent ICT local service team is eligible to join e-Government development and maintenance. Their ability will enhance project sustainability and avert risks in project detention.; thus TaiwanICDF will be eligible to shorten the project schedule and upgrade project efficiency.

3. Evaluation Purpose, Questions, Methods and Limitations

3.1 Purpose

International Cooperation and Development Fund (TaiwanICDF) regulations call for independent evaluations of the performance of the TaiwanICDF's assistance projects. The identification of results contributes to informed decision-making, fosters organizational learning, and promotes greater accountability and transparency.

Information and communications technology (ICT) is one of the TaiwanICDF's

strategic priorities. The TaiwanICDF has been implementing ICT technical assistance in the Caribbean, Asia-Pacific and Africa for more than a decade. However, the TaiwanICDF's management personnel have also noted the need for the organization's ICT development projects to be improved with respect to project design and implementation, based on rigorous project performance assessment and review. For this reason, this evaluation report focuses on the formulation of the design of ICT projects and the experiences acquired from the implementation of such projects. The expected results of this evaluation report are to provide suggestions and perspectives to the TaiwanICDF regarding the causality of e-government intervention outputs to outcome, the effectiveness of e-government project design and improved partnership arrangements as part of the implementation of ICT-related development projects, as well as a feasible and efficient project monitoring framework for such projects.

□   ***Clarify causality of outputs to outcome***

According to the project completion report[1], the expected outcome of this project was:

-   *To optimize administration processes in terms of the provision of e-government applications and the ICT abilities of personnel at public agencies.*
-   *To enhance the quality of governance in order to promote organizational innovation, public satisfaction and trust toward government policy.*

With respect to project design, it was assumed that the three major outputs that would be effective in facilitating the expected outcome were the establishment of national ICT centers, the design and installation of e-government applications, and ICT training programs.

The project assumed that government units could benefit from the provision of e-government applications because information systems have been recognized for their efficiency in improving administrative quality and shortening operation times. The project also assumed that the ICT-related capacity of personnel at public agencies would be upgraded through training in and the use of e-government applications.

Such project assumptions would seem to simplify the causality between outputs and

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[1] The project completion report for ICT technical Assistance project in Caribbean region, March, 2013, TaiwanICDF.

outcome. Many factors can affect the quality of public services and the ICT-related capacity of personnel, so it would be difficult to say that a public agency could rely solely on e-government applications to achieve the goal of improved governance. Furthermore, according to previous project monitoring reports, many stakeholders had earlier indicated that development in some countries was not sufficiently advanced to support the implementation of an e-government project. For this reason, this evaluation report assesses:

- What factors affect e-government projects in attaining the expected outcome, and whether these factors are internal or external to such projects; and
- The successful features of e-government projects, and their intervention logic.

□ *Inquire into the effectiveness of project internal management*

The project's internal management was also one of the crucial factors that may have influenced project performance. According to the project completion report, a number of e-government applications that were developed by project contractors have not been fully operational since being handed over to the relevant EA/IA. Some stakeholders argued that the developers and consultants who were in charge of the design of applications did not completely understand the nature of government units' business processes because most applications were designed and developed in Taiwan, and that this also provided few chances to communicate with consultants. Indeed, a number of pitfalls emerged as soon as these government applications started to operate.

This evaluation report will suggest that inefficiency and redundant management caused these pitfalls, and that ambiguity and overlapping communication among project actors led to difficulties in controlling contractors and the quality of consultant services during project management. The report tends to suggest a simpler, more straightforward and more efficient method in managing the performance of contractors and consultants as part of ICT-related development projects.

□ *Propose a feasible monitoring and evaluation framework*

TaiwanICDF management has mandated that a results chain be included in project

design documents since 2012. Prior to this date, projects managed by the TaiwanICDF did not monitor projects at the outcome level, focusing rather on activities at the output level. Management was primarily concerned with the deliverability of a project's schedule and the quality of its outputs.

The consequence of an output-focused monitoring framework is that management was effective in managing a project's products, but also that projects were less connected to partner country's development objectives than they might otherwise have been. The lack of specific indicators which would otherwise be used to monitor a project outcome may also have led to delays in project scheduling due to overlooking the influence of external effects. Obviously, some pitfalls, such as delays to project schedules and failures to achieve expected results, may well have been due to this insufficient project monitoring and evaluation framework.

For this reason, this evaluation report intends to propose a monitoring and evaluation (M&E) framework suitable for adoption as part of ICT-related development projects, and especially for those focused on e-government. The proposed M&E framework focuses on EA capacity and target group demands, assessing the possibility that the lead target group for project intervention may change their mindset and behaviors because of the provision of ICT knowledge and skills. Based on an understanding of behavioral changes in the target group, the outcome would be that a number of results take place inside the target public agency with immediate effect, and which in the long run would also raise public satisfaction regarding the service quality of public agencies.

A further feature of this proposed M&E framework is that project managers are able to assess the quality of project outputs, and thus can review the performance of consultants and contractors at a project's appraisal and implementation stages. It could then be possible to inform management about risks, allowing project managers to takes remedial action as necessary to prevent a project from failing to achieve its objectives.

□   ***Suggest an institutionalized arrangement for attributing project responsibilities***

Partnership is essential to ICT-related development projects, with both the TaiwanICDF and an EA having a stake in project management. Both sides should share monitoring information so that they can make decisions about the allocation of project resources and share responsibility in initiating remedial actions.

From the experience of project implementation it is apparent that commitment and capacity of the EAs and the implementing agencies (IAs) affected project performance. The majority of project activities were implemented by the TaiwanICDF, with the establishment of ICT centers and the design and installation of e-government applications being conducted by TaiwanICDF IT engineers or Taiwanese contractors, for example. However, EA and IA supervisors and IT engineers also had important roles in helping target groups to adopt e-government applications, and also provided maintenance services as part of the operation of the applications.

However, not all EAs and IAs fulfilled these requirements, or expectations for this project. Some IAs were unaware of their responsibilities in this project, which made it difficult for other project stakeholders to conduct project activities within or with those IA organizations. This could provide one of the reasons that certain e-government applications have not been under operation.

Very little information provided by EAs or IAs is to be found in previous project monitoring reports, while project management arrangements and contracts did not require EAs or IAs to take responsibility for the monitoring and evaluation of project performance.

Finally, project contracts attributed few responsibilities and made few arrangements for communication. The lack of institutionalized project monitoring and performance review processes may have lowered the efficiency of project internal management. This evaluation report intends to suggest that an institutionalized project communications chart, or an arrangement for attributing project responsibilities, could

be helpful in improving project internal management.

3.2 Evaluation Questions Design

3.2.1 Primary Evaluation Questions

A results-based approach is taken to evaluating the project, with an evaluation framework based on the project results chain. Since the project did not adopt certain measurable indicators for monitoring project outcome, this evaluation report applies a retrofitted results chain in accordance with project objectives described in the completion report, aiming to evaluate the rationality and effectiveness of the project. Evaluation questions are based on the retrofitted results chain. For further details of the retrofitted results chain, please refer to Appendix 4.

The primary evaluation questions are focused mainly on the achievement of the project objectives, aiming to measure to what extent the project contributed to supporting target groups and stakeholders. For the evaluation matrix, please refer to Appendix 3. The primary evaluation questions were:

- *Was the project design framework relevant to the e-government strategies and overall national development strategies of St. Kitts and Nevis, St. Lucia and Belize?*

- *Were the products and services delivered by this project effective in terms of EA and stakeholder demands, and can they be proven to have been efficient and cost-effective?*

- *To what extent did project contributions and investments improve or affect project participants' attitude and behavior such that the project would remain effective after its completion in 2012?*

3.2.2 Setting of evaluation questions in accordance with OECD evaluation criteria

In order to better evaluate project results, this evaluation report follows OECD evaluation criteria, namely *relevance, effectiveness, efficiency* and *sustainability.* Evaluation questions were designed in accordance with the definition of each criterion.

▫ *Relevance*

This evaluation report assesses the project's relevance by measuring project design, intervention logic, the consistency of the project in relation to a partner country's national ICT strategy or policy framework, and the involvement of project stakeholders in the project design and implementation.

Ⅰ. *Project intervention logic*

Did the project intervention logic represented by the project's design and objective-setting activities refer to other e-government or ICT development projects? In terms of ICT interventions designed and implemented in St. Kitts and Nevis, St. Lucia and Belize, why did this project assist specific public agencies to develop e-government applications, and what procedures did the project adopt to identify the demands of public agencies?

Ⅱ. *Consistency of project related to partner countries' national ICT strategies*

To what extent did project design and the associated framework respond to a partner country's demands in that the intervention logic included activities and outputs to be delivered by this project as a proper response to national development objectives and e-government strategy in St. Kitts and Nevis, St. Lucia and Belize? In addition, did project designers consider circumstances and limitations in partner countries before conducting project design activities in/for these countries?

Ⅲ. *Project design and stakeholder involvement*

Did TaiwanICDF management inquire as to stakeholders' opinions before developing the project's intervention logic? How were stakeholders' demands measured in

reference to the procedures or processes conducted by project designers, and furthermore were stakeholders' demands carefully analyzed before the project manager accepted/refused stakeholders' requirements?

□ *Effectiveness*

To measure the effectiveness of the project, factors that may be involved in the formulation and implementation of the project but which lie out of the project's intervention scope need to be identified and checked to understand whether project performance was effective in achieving objectives.

Ⅰ. *Circumstances*

UNDESA and the ITA suggest that governments should prepare an "enabling environment" in order to make e-government project arrangements successful and acceptable, and thus an enabling environment should have been taken into consideration before the project launched specific interventions in partner countries. Was there an awareness of the importance of an enabling environment, and were resources invested in an enabling environment, before help was provided to EAs and IAs to develop e-government applications?

Ⅱ. *Achievement of intended outcome*

How did this project achieve its intended outcome, and to what extent did the project achieve its intended outcome? In order to answer this question, this evaluation report identifies the causality of outputs to outcome; evidence suggests that the project failed to attain its intended outcome. This report also suggests what hindered the project in achieving its goals.

External effects should also be taken into account as part of this report's assessment of the project's contribution, and especially those of other development agencies, such as the EU's provision of ICT assistance to Caribbean countries, weighing up whether these external effects improved or lowered the effectiveness of the project.

Ⅲ *Promoting organizational innovation*

This refers to institutional development and behavioral changes that may take place in EAs and IAs. To what extent did the TaiwanICDF intervention contribute to

improvements in ICT authorities and associated administration? Did the TaiwanICDF intervention change the behavior of civil servants and ICT officers, thereby enabling people to enjoy better public services and/or promoting more transparent communication between government and people?

□ *Efficiency*

An assessment of the efficiency of the project refers to internal management, procurement management and partnership efficiency.

Ⅰ. Internal management issues

Most project managers at TaiwanICDF headquarter are contracted rather than regular employees, which may affect the accumulation of knowledge and the transference of experiences due to relatively high employee turnover rates. Have turnover rates made it more difficult to accumulate knowledge and improve the quality of project design and implementation?

Ⅱ Quality of outputs and activities

Were the products and services delivered by this project effective in terms of EA and IA demands, and can they be proven to have been efficient and cost-effective?

Considering that 80 percent of the project budget was spent on hiring consultants and sourcing Taiwanese application developers, the quality of procurement is one area of focus that this evaluation report will measure.

□ *Sustainability*

I. Project impact

To what extent will it be possible for the outcome and outputs achieved and delivered by this project to sustain positive influence over the target group EAs and IAs? Did capacity building also enable EAs and IAs to operate government applications and ICT centers as appropriate?

II. Qualifications of local technicians

Considering that ICT centers and e-government applications need to be maintained by qualified IT technicians and engineers, this evaluation report also measures

whether EAs and IAs have sufficient ICT technician teams in place to support this project. This will be measured by asking:

- Do EA and IA ICT technicians have sufficient knowledge and resources to conduct their given job?
- Did this project assist EAs and IAs to build teams capable of developing e-government applications independently? Do they have the ability to identify, design and plan feasible IT projects independently?

III. External circumstances and local society demand

Considering the rapid changes in the development of ICT, it is necessary to confirm that the kind of intervention represented by the project remains effective in assisting partner countries in facing future challenges. To what extent are e-government projects still ranked as priorities to the project countries? And if the development of e-government applications is not a priority to a partner country, does the partner country have a clear roadmap or concept on future national ICT development?

3.3 Evaluation Methods and Limitations

3.3.1 Evaluation methods

Considering that measurable indicators were not set up to measure the project outcome, this evaluation report adopts both quantitative and qualitative methods to measure project contributions and thereby objectively measure the project's substantive contributions to EAs and IAs.

▫ *Survey design*

This evaluation report use surveys to measure the causality of the project's outputs to outcome, referring to the "Information System Success Model" as a framework for questionnaire design. The Information System Success Model, proposed by William H. DeLone and Ephraim R. McLean in 1992, assumes that a successful information system should be able to help organizations to improve operational capabilities and individual performance. This model assumed that six facets may affect the success of IT systems, namely system quality, information quality, information usage, user satisfaction, and the impact of the IT system on individuals and organizations. For the detailed questionnaire, please refer to Appendix 4

Table 1 The Evaluation Questions Design

e-Government Outcome
To improve the quality of public agency service. To Promote and optimize administrative processes. To enhance public sector personnel IT capability

Project Evaluation Criteria

Relevance	Effectiveness	Efficiency	Sustainbility
Project Design Quality Project Outputs Intervention logic Interested parties to participate Cooperation Effectiveness	Project Management Effectiveness Consultancy services and vendor product test Achievement test plan Correlation between outputs and outcomes Beneficiaries of the	Put up an effective plan outcomes Examine the cost-effectiveness Program Effectiveness Consultancy services and Contractors management Human resource issues	Needs of the target groups Co-operating effectiveness Co-HR

	attitudes and behaviors	Cooperation Unit Capacity Building	
Questionnaire and interview			
Project design and content architecture is consistent to national IT development UN e-government index	Information Quality System Quality Impact of IT system to individual and organization	Information Quality User satisfaction System development Costs	System usage Institutional and human resource functions

3.3.2 Qualitative method

In order to clarify some details that may have affected project performance, interviews with key stakeholders formed an alternative method of collecting information. EA and IA technicians and IA supervisors were the main interviewees.

4. Project Background

4.1 Country Context and TaiwanICDF Strategy Priority

4.1.1 Why e-government?—rationalizing project intervention logic

The TaiwanICDF conducted the project from 2007 to 2012. The objective of the project was to improve efficiency, transparency and accountability in partner countries. The project was designed to establish national ICT centers in each country, with such centers expected to take on the responsibility of national Internet administration and the provision of ICT policy and implementation. In order to help public agencies to improve service quality, the project also involved the provision of customized e-government applications designed in accordance with such agencies' operational and management processes. To promote government transparency, the project also helped some government departments to set up government portals designed to enable citizens to access government information through the Internet.

Total funding amounted to NT$213.72 million over the six-year period from 2007 to 2012. This funding was spent on e-government development, and the establishment of government portals and national ICT centers. Regarding project internal management, the TaiwanICDF formulated a task force to conduct the project, composed of resident (in-country) project managers and a project manager based at TaiwanICDF headquarters. Consultants were recruited to conduct the project's various task-specific activities.

□ ***E-government as a tool for facilitating transformation***
The objective of e-government is defined differently by development organizations, academics or public agencies. Different groups agree, however, that cost-effectiveness, management efficiency and government transparency are key.

The UN urged its member countries to invest in e-government in 2010 and proposed an e-government index composed of three aspects representing a country's stage of development, namely human resources, telecommunications infrastructure and

government online presence. The goal of e-government is to measure better governance in citizen satisfaction, administrative efficiency and cost effectiveness. Based on the performance of the e-government index, the UN has also suggested stages of e-government that can be applied to identify a government's stages of enablement and thus show more clearly the conditions in a country and the assistance needed to gain comparable scores to other countries on the economic development index.

Figure 1 The Development of e-Government
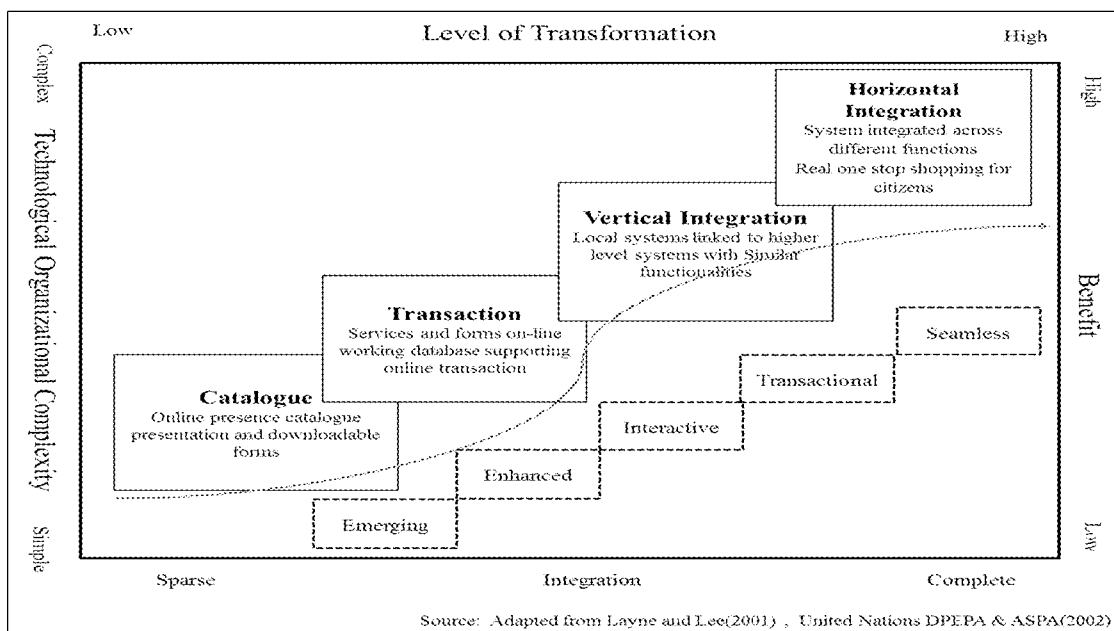
A different perspective proposed by Layne and Lee in 2003 identified and labeled e-government development as the four stages of catalogue, transaction, vertical integration and horizontal integration. This definition focuses more closely on the integration of e-government functionality and the applications and content provided by e-government portals. In other words, Layne and Lee place more emphasis on inter-departmental cooperation. Nevertheless, they also suggested that an enabling environment should be not limited to well-established telecommunications infrastructure or the excellence of human resources if one is to identify the circumstances surrounding e-government development, further suggesting the complexity of organizational functionality and the availability of ICT technology. In other words, Layne and Lee believe that organizational facts, such as management

ability, process efficiency, regulation, leadership, personal IT ability and continuity education, are as important as facts regarding ICT technical knowledge or the availability of equipment.

Some development organizations, such as the ITU, the World Bank and the EU have taken similar perspectives. The ITU, for example, has suggested that before a country decides to invest in e-government, the four dimensions of infrastructure, policy, governance and outreach should be taken into account[2]—note that policy, governance and outreach, although being influential factors, are organizational rather than technical issues. The World Bank and the EU have taken different but similar views on the essentials of e-government, identifying them as (1) better service delivery to citizens; (2) improved services for business; (3) empowerment through information; (4) transparency and anti-corruption; and (5) efficient government purchasing (Fitsilis, F. et al, 2012).

□   *The four stages of e-government development*

The elements of e-government should include information technology and improvements to administrative procedure (Torres, L., et al). However, the content of government services, once available in electronic formats, may result in a downgrade in service quality if constant maintenance is not provided. Although citizens access public services electronically, the cost and waiting time is the same as paper-based processes. This does not comply with the objectives of e-government.

An alternative perspective suggests that e-government development could be identified by the essentiality of public agency services: Marcin Sakowicz of the Warsaw School of Economics has suggested that e-government is a process through which stakeholders have engaged online services. The feedback provided by stakeholders and communication between stakeholders and public service providers

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[2] According to the ITU e-government implementation toolkit published in 2009, it recommended check items before e-Government policy and strategy formulated. For the governance, central government   should notice IT security for citizen personal privacy and national security. For the governance, administration process, legal procedure and back-office   implementation have to be reviewed, and , more   important, to be re-engineering if the review results   show weakness   in the governance .(ITU, 2009)

is a process of shaping, debating and implementing public policies.

The four dimensions here are e-services, e-management, e-commerce and e-democracy, and can be found as functions in every public agency, but here are transformed into electronic forms. For example, a traffic authority may publish its regulations, processes and forms in the form of e-services, enabling citizens to check, learn and download before starting to apply for something.

Table 2 The comparison of e-Government theoretical definitions

Definition and feature of the e-Government	The Four Stages model of e-Government development	The dimensions of e-Government
Emerging Presence An official government online presence is established	**Catalogue** Online presence, Catalogue Presentation, Downloadable Forms	**E-services** The use of electronic delivery for government information, programs, strategies and services.
Enhanced Presence Government sites increased; information become more dynamic		
Interactive Presence Users can download forms, e-mail official and interact through the web	**Transaction** Services and Forms online Working database supporting online transaction	**E-management** Referring to the behind-the-scene information systems supporting the management and administrative functions of public institutions
Transactional Presence Users can actually pay for services and other transactional online.		**E-Commerce** Linking business side of government interaction. The exchange of goods and services is conducted
Seamless Full integration of e-Services across	**Vertical Integration** Local systems linked to higher level systems, within similar functionality	

administrative boundaries		over the internet
	Horizontal Integration System integrated across different functions, Real one-stop shopping for citizens	**E-Democracy** Responding to Various issues and achieve economic and social objectives

(Adapted from: UNDAP & ASPA, 200; Gupta. M. P. & Jana, D., 2003; Sakowicz, M., 2003)

E-services need solid and effective back-office support, known as e-management. E-management means that due to administrative processes being substituted by an information system, a public agency's employees are able to receive inquiries, applications or complaints through the Internet, and that any necessary information can be inquired from an agency database, relieving citizens of the need to the visit the agency to apply for something, and instead use computers in their homes or offices. E-commerce means that citizens can not only apply for services online, but are also eligible to use online payments. E-commerce needs regulation and inter-department/ agency cooperation, mainly from financial institutions and national revenue services.

Comparing the three e-government theories, the evaluation adopted by the UNDAP and the ASAP definition of the development of e-government formed background knowledge for evaluating the state of ICT in the project's participant countries. If e-government services relied heavily on a country's telecommunications infrastructure and human resources, the higher score for the e-government index indicated that the country was at a more advanced stage of development per the UNDAP and ASPA definitions.

▫ *How e-government affects people's behavior and the operation of organizations*
The results of the UN's biannual e-government survey and the indicators used by the survey provide circumstantial information that provides policymakers and providers of assistance background knowledge before they take actions. However, knowing such background knowledge does not necessarily indicate that a feasible solution will be

delivered, as interventions may lose focus due to the fact that a project's objectives or design framework are not suited to solving stakeholders' problems. Issues of causality should be carefully reviewed and project scale should be measured in accordance with the objectives that an intervention intends to attain.

In terms of a review of e-government theories, the project results chain and the intervention logic behind the design and implementation of the project indicate a focus on e-services and e-management. Contractors were required to establish some government portals for the project's participant agencies, most of which had to be changed regardless of their initial presentation or design functions. The development, installation and commissioning of e-government applications took up to 70 percent or more of project expenses compared to telecommunications infrastructure or human resources development.

5.2 Theory of Change

The TaiwanICDF's commitment to ICT assistance began as early as 2000[3]. Although the TaiwanICDF's involvement in ICT for development began early, ICT projects were not a feature of operations until the project started in 2006. Before that time, the organization's main interventions involved IT education and donations of ICT equipment designed to reduce the "digital divide" in partner countries.

Table 3 shows the project history from 2006 to 2012. To review project design and implementation, it is easy to divide the project's life cycle into three phases, since each phase can be differentiated by its designated activities and outputs, and thus also its different project participants, including TaiwanICDF project managers, partner country EAs, and contractors and consultants, all of whom took project positions that may have strengthened or diminished the effects of project design and implementation. Results may also vary across the different countries due to the influence of project participants, as the abilities and contributions of project participants are also a crucial

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[3] The TaiwanICDF joined in an international initiation called World Link Program, this program aimed to reduce digital dividend.

factor affecting a project's results.

The three phases suggested in this evaluation report are: project initiation; consultant and contractor involvement; and re-engineering and handover. The key events of each phase are summarized in Table 3.

Table 3 The Project History

2006 to 2007	2008 to 2011	2011 to 2012
Project Initiation	Consultant and Contractor Involvement	Re-engineering and Handover
- Feasibility study, fact finding missions were dispatched during 2006 to 2007 - Budget was committed by MoFA, Taiwan ICDF send first ICT project manager(engineer) to St Kitts and Nevis in 2007, and the second ICT project manager (engineer) send to St Lucia later than that year. - 2008 St Kitts and St Lucia ICT center established, they operated by TaiwanICDF until the project handover to executive agencies - 2009 residence project manager (engineer) for Belize had dispatched to Belize. -	- Since 2009 to 2011, TaiwanICDF delivered 11 government systems and some governmental portals - Project outputs in St. Kitts and Nevis. Health Information System for JNF Hospital, Vehicle Registration System for Police force and Inland Revenue office, Human Resource System for Governance Units.	- The project management change operation entity, so the project design had been changed as well. TaiwanICDF tended to sponsored a new project to instead this project. - End of 2011. Taiwan MoFA suggested TaiwanICDF did not terminated project prior the schedule data. - TaiwanICDF suspended the project renovation and turned it focus on EA/IA capacity building

4.2.1 Overview of project design and implementation

▫ **Background to project design**

In 2003, the World Summit on the Information Society (WSIS) proposed the Geneva Action Plan, urging developed countries to commit to narrowing the digital divide in developing countries. The Taiwanese (ROC) government also recognized the Geneva Action Plan as a part of its official development assistance policy, and in 2004, an ROC delegation at APEC called for action to narrow the digital divide through the so-called APEC Digital Opportunity Center Program, ADOC. In 2005, the TaiwanICDF assisted its government in conducting [drawing up?] ADOC plans in APECT member countries.

At the same time, the TaiwanICDF was also conducting other ICT-related technical assistance in the Central American countries of El Salvador, Belize and Panama, providing ICT assistance for education. Project activities in those countries were as follows:

- In Belize, a project aimed to improve ICT capacity in government units, including through the development of e-government applications and ICT training for government officers. The creation of a national portal was also proposed as part of project activities.
- In El Salvador, a project focused on training ICT professionals and teachers, as well as the establishment of digital opportunity centers in remote rural areas.
- In Panama, a project assisted an agriculture college to establish an agriculture information system, with a training program also provided to agriculture officers.

Before the TaiwanICDF officially began work with its Caribbean partner countries, it had accumulated a number of experiences in the ICT for education sector. However, it should be noted that there is a difference between ICT for education and for e-government, and that such interventions and their objectives are very different from one another.

In 2006, Taiwan's Ministry of Foreign Affairs (MOFA) urged the TaiwanICDF to appraise the possibility of conducting ICT projects in St. Kitts and Nevis when Prime Minister Dr. Denzel Douglas visited to Taiwan and proposed ICT as a sector through which Taiwan and St. Kitts and Nevis could potentially build cooperation.

In 2007, MOFA decided to include ICT technical assistance as part of Taiwan's official aid portfolio in Caribbean partner countries. In terms of language and its political and legal systems, Belize is closer to the Caribbean than to Central America, and so project work was also directed to include Belize. During the project initiation phase, St Kitts and Nevis, St Vincent and the Grenadines and Belize were in the project scope; later, in 2008, the Republic of China (Taiwan) and St. Lucia resumed diplomatic ties and St. Lucia was also brought in as one of the project's beneficiary countries.

▫ **Project preparation, 2006-2007**

The TaiwanICDF dispatched two missions to St. Kitts and Nevis, St. Vincent and the Grenadines and Belize during 2006 and 2007. The first mission, dispatched in August 2006, gathered information about institutions and the general status of the beneficiary countries, and suggested that investment in ICT infrastructure was necessary before the TaiwanICDF conducted e-government assistance in these countries.

The second mission, dispatched in February 2007, comprised senior officers from the TaiwanICDF and Taiwan's Industrial Technology Research Institute (ITRI). The mission's appraisal report specifically proposed that since ICT facilities in the participating countries were insufficient for the implementation of an effective e-government project, that it might be more efficient for such countries' long-term development to establish national level ICT centers, serving as digital data centers and as national training hubs for ICT technicians.

The two missions essentially recommended the same project intervention and objectives, namely that the establishment of national ICT centers would contribute toward the development of e-government applications and government portals.

Two facts should be highlighted here. Firstly, Internet connection quality and access costs: Certain consultants had observed that problems with telecommunications infrastructure could be a risk to the project, and thus would expect improvements to the Internet network to be made in parallel with the development of e-government applications and government portals. The TaiwanICDF did not take up network improvements as a project activity because private sector actors in the project countries were already providing such services, albeit at great expense. Secondly, the intentions of authorities in St. Vincent and the Grenadines: Certain consultants indicated that the government of St. Vincent and the Grenadines had a clear perspective as to national ICT development, but lacked any designated government unit responsible for planning and implementing national ICT policy. Hence, the intentions of St. Vincent and the Grenadines seemed to be less strong with regard to the project, which is a worry that the appraisal mission noted in its appraisal report.

□   **Project implementation, 2007-2012**

Two ICT technicians were assigned to work in St. Kitts and Nevis and St. Lucia from late 2007, and an ICT technician was assigned to Belize in 2008. These technicians were responsible for the establishment of national ICT centers, as well as for identifying demands for the development of e-government applications among candidate public agencies.

At that time, the TaiwanICDF relied on the knowledge and experience of external professional agencies to design the project framework: Despite having resident project managers in place to implement project activities, capacity was not sufficient to deal with the project's planned activities or stakeholders' demands, and thus the TaiwanICDF needed external consultants to assist in the project's detailed design. It should be noted that different consultants were in charge of the design of the project's framework (ITRI) and the design of its activities (Hewlett-Packard, Taiwan).

As soon as ICT centers were established, the project started to develop tailor-made e-government applications for selected public agencies, with teams comprising the

TaiwanICDF's resident project manager, vendors and consultants forming taskforces for the design and development of e-government applications. Such operations were managed by the project manager, including budgets, procurement and project supervision. The external consultants assisted the project manager in identifying and analyzing administrative procedures and paper-based processes at candidate public agencies, and then prepared an analysis of system requirements to be provided to vendors. Vendors did not participate in system analysis, and were obligated to develop and install e-government applications in accordance with the analyses of system requirements. Vendors were also responsible for testing functions, user training and training for local network management. Project outputs designed by external consultants and vendors are summarized in Table 4.The table 4 showed the project proposed activities at the project initiative stage

Table 4 The outputs of the project

St Kitts and Nevis	St Vincent and Grenadines	Belize
- ICT center establishment - DNS server、e-Mail server、Directory service server. - e-Government application for Ministry of Technology. - National portal, Portal of Ministry of Foreign Affairs and Ministry of Technology	- Multi-Homing Gateway - Criminal Records databases	- ICT Center establishment - Government Internet fundamental service for Bureau of Immigration - Border Management system - Portal of Ministry of Foreign Affairs

The functioning of taskforces appeared to be efficient at the time they were operating,

and the project appeared to be productive. From 2009 to 2012, the project saw the development and installation of 11 e-government applications, as well as the establishment of several national portals and well-equipped ICT centers in St. Kitts and Nevis, St. Lucia and Belize. Three regional ICT conferences were also held. The project also assisted the government of St. Kitts and Nevis to manage its country code top-level domain name and government e-mail system. Regarding project costs, the TaiwanICDF employed four on-site ICT technicians, five project managers and conducted 13 procurements to fulfill project demands. The total cost of the project was NT$213,718,256.

□ **Project reengineering and handover, 2011-2012**

Separately to the project's main activities, the government of St. Vincent and the Grenadines and the TaiwanICDF had not reached a consensus on the location of the national ICT center, and the development of e-government applications was behind schedule. At the TaiwanICDF's invitation, the secretary-general of the Taiwan Provincial Assembly, and ITRI and National Taipei University of Technology (NTUT) experts visited St. Vincent and the Grenadines to assess an alternative project framework. The mission identified a gap between the demands of St. Vincent and the Grenadines stakeholders and the designated project outputs. After reviewing the state of ICT in St. Vincent and the Grenadines and the government's national ICT policies, the mission recommended that project intervention could instead take the form of the construction of a nationwide network, proposing an alternative project involving the construction of a fiber-optic network connecting government units, schools and community learning centers, and which would serve as a national telecommunications framework enabling government units to develop e-government services for the public benefit. Since this significantly altered the project framework that had been designed for St. Vincent and the Grenadines, the TaiwanICDF terminated the project's designated activities in St. Vincent and the Grenadines in December 2010.

During this period, the TaiwanICDF noted that the project framework seemed to be less relevant to certain stakeholders, and its management wanted to understand

whether interventions would be effective in attaining the project's intended outcome. A midterm assessment was thus conducted in August 2011, recommending that:

- The project should be closed prior to the planned completion date, and that a new project should be developed in its place;
- The new project should be designed in accordance with the actual demands of stakeholders, follow a project cycle, and be initiated following a feasibility study, respecting stakeholders' opinions; and that
- Based on the principle of bilateral cooperation in ICT for development, the new project should aim to develop partnerships with regional or international organizations such as CARICOM and ECTEL.

The new project, to be known as the Caribbean ICT Application Upgrade Plan, was approved the TaiwanICDF's board at its 58th Board Meeting. The approved budget was approximately NT$80 million, to be funded by the TaiwanICDF itself. Although the TaiwanICDF was preparing to terminate the project earlier than the scheduled completion date of December 2012, certain EAs had different opinions about this matter. The former EA in Belize, for example, was a public service department that had shifted to become the Central Information Technology Office (CITO) under the Ministry of Finance in 2012 following a change in ruling party, bringing with it new perspectives and policy as to Belize's national ICT development. MOFA also expressed concern about the consequences of the project's early termination, and hence the TaiwanICDF proposed an integrated action plan at its 61st Board Meeting. The integrated action plan merged essential ideas about improved project effectiveness and project localization, for example, with the regional project arrangements.

As part of the new project, the TaiwanICDF intended to allocate resources and expand the role of TaiwanICDF technicians by introducing the role of project manager to the implementation of the new project. This solution, to some extent, caused the TaiwanICDF to reflect upon previous experiences regarding project identification, appraisal and implementation, and, given that the process highlighted a number of

problems rooted in the project framework, can essentially be seen as a kind of project re-engineering, and the plan in fact served as a method used to improve the project's effectiveness and sustainability. It is hard to assess whether the project re-engineering plan was effective given that the project was handed over within a year, which is surely too short a time for project re-engineering to have had much effect.

□ **Project handover**

The project was handed over to EAs in December 2012, before which the TaiwanICDF had transferred the operations of national ICT centers and e-government applications that had been developed, as well as capacity building in, e.g. network management, and program design training.

5.2.3 Project post-handover status

The TaiwanICDF conducted project post-evaluation in October 2014, about two years after the project had been officially handed over to EAs, with on-site visits taking place from October 14 to 28. The evaluation manager visited national ICT centers and interviewed project stakeholders, including ICT officers, technicians currently managing e-government applications, and stakeholders who had participated in the design and development of such applications. A number of e-government application users were also invited to take part in an evaluation survey in order to assess project effectiveness and efficiency of the project. For the evaluation schedule, please refer to Appendix O.

□ *Current status following project handover to Belize EA*

The project's outputs, such as the national ICT center and e-government applications, were handed over in November 2012. Due to a change in the ruling party, Belize has also had a different EA since 2011. For this reason, the evaluation mission could not contact the project's previous EA, the Public Services Administration Department, since certain key personnel have left their positions. Instead, the mission visited the CITO and the Belize Archives and Records Service.

The project intended to complete important work in Belize, specifically the fitting out of the national ICT center and communications equipment, and the establishment of a games and investment management system, a records management system and a management system for the Belize Bureau of Standards, as discussed below.

- ***Games and Investment Management System:***

  The Gaming and Investment Management System has long been abandoned. System management personnel said that they had experienced difficulties in inputting data due to Internet connection problems, experiencing frustration when the system shut down unexpectedly and lost all of the data that had been input.

  The director said that he could not insist that his employees use the system because system response times were too slow and time-consuming. When the evaluation manager asked system management personnel to demonstrate the system's functions, they were unable to do this having misplaced the required login details.

- ***Archive Information Management System***:

  Archive and records management personnel still operate this system. However, this system only provides immigration, police and government personnel records, with some 30 other categories of records being managed by another system. IT personnel adopted open source software to develop a bespoke system. The head of the archive and records management service submitted a proposal to the evaluation manger clearly expressing the department's need for advanced digital archiving technology. The objectives of the project were not related to digital archiving but rather focused on on-line applications for preserving and leasing records.

- ***Supplies Control Unit Database:***

  To date, 112 trade agencies are registered on the system, which enables such agencies to apply for trade certification on line. System users said that functions and the quality of data are good, but that system stability needs to be improved.

Since the database does not include trade data prior to 2012, the system cannot provide information analysis due to limitations in the quantity of data available. It should be noted that the TaiwanICDF has been conducting another e-government applications development project since 2013, and that the Supplies Control Unit Database has been included in the project scope. The objective of the new project is to expand system functions to include agriculture products, and to connect to Belize's customs management system, ASYCUDA, the automated system for customs data developed by UNDESA.

- ### National ICT center maintenance and operations:

    The national ICT center is in good condition. EA employees have been stationed and carrying out operations in the building for more than three years.

- ### Finding 1: Employee turnover affected project efficiency

    The frequency with which resident project managers turned over could have been a risk that degraded the quality of project outputs.

    System design did not match partner's requirements, which occurred because the time spent on appraisal was too short to allow consultants stationed in Belize to be effective. Scheduling pushed consultants to rely on forms, operating documents and/or information provided by a small set of users. They were not able to assess workflow, and travel costs prohibited them from conducting on-site interviews.

    If resident project managers work closely with consultants, then they would be able to assist consultants without any barriers to communication, reducing the rate of errors. In this case, however, the frequency with which resident project managers turned over led to vendors and consultants communicating directly with Belizean partners, yet the EA did not have substantial knowledge of program development or workflow analysis, with both sides suffering due to the loss of a project intermediary.

- ### Finding 2: EA capacity affected project efficiency

    The previous EA did not participate in applications development due to a lack of

or too few qualified IT technicians. Human resources problems set applications development back, and similarly, applications maintenance had to rely on the relevant vendor, which was less efficient and more time consuming.

□ *Current status following project handover to St. Lucia EA*

The project assisted the government of St. Lucia to develop e-government applications for the police force and the Department of Traffic at the Ministry of Justice, and at the Ministry of Agriculture, as well as equip a national ICT center. E-government applications and the national ICT center were handed over to the Division for Public Administration and Development Management (DPADM) in December 2012. On-site evaluation found that only one system, the Citizen Status Registration System (CSRS), had been abandoned due to regulatory issues, while three other systems remained functioning properly. The national ICT center is in good condition and the DPADM has taken full responsibility for its operations, including the costs of building maintenance.

In general, the maintenance and operational status of e-government applications is satisfactory, although the performance of the CSRS had been affected by regulatory problems and issues relating to archives preservation. Some users complained that functions and system stability were not meeting their expectations; however, EA IT engineers are able to resolve primary issues.

- *Advanced Transportation License Authority System (ATLAS):*

    The system has been under operation since 2008, and its current status is satisfactory with respect to the issuance of driving licenses and the renewal of registration information. The head of the department insisted that employees learn and use the system in 2008. However, the vehicle registration and issuance system is not operational due to IT functionality, with differing opinions being held regarding system response times and design functions. In fact, vehicle licensing

procedures are more complex than for driving licenses since car owners must pay vehicle tax, insurance and pass an automotive safety inspection before applying for a vehicle license.

- *Crime Management System:*

Although members of the police force were reluctant to use this system, it was nevertheless put into operation, and thanks to the foresight and insistence of leadership, is now being widely used in every police station in St. Lucia. According to IT trainers, the system has expanded through a number of functions as required by the leadership of the St. Lucia Police Force. The evaluation manager also checked system outputs, data quality and form-producing functions, and found that system data had been regularly renewed in the past three months, indicating that the system is user-intensive.

- *Agricultural Information Management System*:

The resident project manager initiated a focus group for the evaluation mission, with a number of agriculture extension officers, regional agriculture office assistants and IT staff joining the discussion. According to experiences shared by the assistants, the system has helped them to deal with routine tasks very efficiently. They also made suggestions regarding IT functionality, as to how upgrading system functions would make the system more user-friendly, since currently they have adopted paper-based processes in parallel with using the system, because certain data is incorrect due to typos or operational problems.

- *Civil Status Registration System:*

The accuracy and availability of data has been one of the external effects having an impact upon system availability and implementation. The capital of St. Lucia suffered a fire in 1950, destroying birth certificates and records, meaning that many citizens' records are incomplete. Furthermore, the government does not mandate citizens to register newborn children. These two factors have affected the relevant government unit's ability to collect birth-related data.

- *Finding 3: Provision of e-government applications may not lead to administration efficiency*

Certain managers said that they were satisfied with system functions and that the high quality of outputs had given them the confidence to promote IT applications in their organizations. Such managers are very experienced administrators and have an excellent understanding of the meaning and regulations underpinning government processes, and may well be satisfied with the time saved and the quality of legal documents delivered by systems. However, they also appreciate that there is no room for error in public services and have thus decided not to give up a number of paper-based processes, instead running such processes in parallel with system-based processes. Although dual processes add to operating times and employee workload, it was also mentioned that most government units' operations are paper-based, and that units need to maintain paper-based operations. However, the more that units adopt IT applications in place of paper-based operation, the more people will be accustomed to transacting business on the Internet, and then paper-based operations will gradually disappear.

- *Finding 4: System maintenance continues to rely on applications developers*

Although engineers at the national ICT center are able to provide "first-aid" services in fixing system operation failures, they cannot modify programs or add new functions. Local IT engineers are also unable to solve complex programming issues and applications have thus relied on assistance from the original developers of such applications. This is not a sustainable solution for St. Lucian partners. Since the TaiwanICDF continues to sponsor the St. Lucia government through a new e-government transaction project, and the same resident project manager remains in St. Lucia, local engineers have access to the resources needed to resolve complex system failures. However, any change in TaiwanICDF policy such that the project is discontinued or the resident project manager is changed poses a risk that could affect project sustainability in St. Lucia.

❑ *Current status following project handover to St. Kitts and Nevis EA*

The evaluation mission visited St. Kitts and Nevis from October 19 to 20, 2014, conducting interviews at the St. Kitts and Nevis Police Force, the Inland Revenue Office, JNF Hospital and the National Information and Technology Office (NITO). With the building housing the national ICT center under renovation, equipment donated as part of the project was placed in a temporary office.

The project assisted the NITO to develop a Car Registration System for St. Kitts and Nevis Police Force, a Health Information System for JNF Hospital, and a Human Resources System for the government's Governance Improvement Unit. It should be noted that the evaluation mission was unable to contact the Governance Improvement Unit and thus has no data with which to elaborate upon the Human Resources System.

- *Car Registration System (CRS):*

The CRS has been abandoned due to the failure of data exchange between the CRS and the Standard Integrated Tax Administration System (SITAS) managed and operated by the Inland Revenue Office. The attorney-general of St. Kitts and Nevis informed the evaluation manager that the CRS had been unable to read data correctly since the Inland Revenue Office had changed SITAS's data sequence. Local IT technicians had been unable to modify the program, and thus the police force had given up the CRS and reverted to paper-based operations.

The evaluation mission also visited the Inland Revenue Office to collect more information about the development of the CRS, its operation and the issues that had forced it to be shut down. Inland Revenues Office representatives demonstrated SITAS functions and said that they didn't understand why the police force had developed its own system because SITAS could already provide all of the information needed by the police force regarding driver licenses and vehicle licenses. The head of the office explained that he was invited to join in system analysis meetings, and said that he had only attended the meetings but had not given many comments on the design of the CRS.

- *Health Information System (HIS):*

  The HIS is operating well. The evaluation mission conducted surveys with clinic clerks and interviewed managers to consult on their opinions as to the utility and stability of the system. Their comments on the system functions were positive, and most clerks agreed that the functions as designed were user-friendly and comprehensive, saying that they hadn't spent too much time adapting to it. However, managers complained that the system still cannot produce printed receipts, and thus clerks have to add clinical fees to receipts by hand, which patients must then hand in to a cashier. The TaiwanICDF initiated a supplementary hospital information program with JNF Hospital in 2012.

- *Finding 5: Leadership and commitment are crucial to driving the success of information systems*

  Although a number of IT technicians were absent from meetings during the evaluation mission to St. Kitts and Nevis, it was still possible to collect information from other project participants about the roles of the EAs during project implementation, and possible to understand the quality of cooperation.

  In the case of JNF Hospital, it was clear that leadership has played an important role in driving the success of the information system established there. The hospital's administration officer had insisted that everyone whose work touches upon the HIS and its applications understand the purpose of system operations, and provided immediate feedback to the vendor as HIS development progressed, and insisted that IT technicians respond to problems that had arisen once the system went online.

The same story was seen with the crime management system for the St. Lucia Police Force and with the CITO in Belize. Leadership at these organizations had a clear view on how to apply IT technology to operational processes, and they also knew how to direct foreign assistance, using such resources and know-how to help their

organizations attain certain goals. Thanks to such clear perspectives and strong commitments, information systems had penetrated into the daily operations of these units, with personnel being expected to modify attitudes and behavior to meet the goals set by their leaders.

- *Finding 6: Inter-departmental cooperation affected project relevance*
  The CSR case demonstrates the crucial point that inter-departmental cooperation can affect project relevance. Since the act of e-governance essentially digitizes administrative processes, then if a process connects to other government units, the project designer will need to take inter-departmental cooperation into consideration when identifying stakeholder demands.

  Comparing the ATLAS adopted by St. Lucia with the CRS adopted by the St. Kitts and Nevis Police Force, the difference between these two government agencies was that St. Lucia's traffic department is mandated to charge payment for licenses, whereas in St. Kitts and Nevis, the Inland Revenue Office is the only government agency assigned responsibility for government taxation and payment. The police office in St. Kitts and Nevis is only in charge of reviewing drivers' traffic violation records, and since the Inland Revenue Office controls taxpayers' personal information, the police force receives up-to-date data from the office.

  According to information provided by the police force and the Inland Revenue Office in St. Kitts and Nevis, it would appear that it was unnecessary for the police force to develop its own system, which instead could have shared information provided by the Inland Revenue Office. The TaiwanICDF may now only need to assist the police force in identifying cross-department functions for the purpose of cooperating on license-issuing procedures, and elaborate how the two agencies could coordinate with each other in sharing data and information. As such, the target group of the project should ideally have been the Inland Revenue Office rather than the police force, since the Inland Revenue Office relies on information systems more than the police force.

5.Project Performance

The total performance of this project is *Compliance*, the performance description of project rated as Compliance is quoted as follow, and details of each criterion average score and ranking interval refer to Appendix 2

> *The overall performance of the project is Compliant. The result and content are relevant to the interests of the R.O.C. and the national development objectives of the partner nation. The project met most of the projected goals, but the cause-effect relationships between the project activities, output and results are not clear. Internal management needs improvement, but the issue does not affect the quality of the output. The partner organization interacted with the project team on good terms, but the mechanisms and functions need improvement. The partner organization needs assistance up to a certain level before the organization is able to properly maintain the operation of this project.*

5.1 Relevance (The relevance of this project is C, Compliant, and weighted score is 3.19)

5.1.1 Intervention Logic

- ***Project design in line with international e-government trends***

  In the project plan by ITRI, the framework adopted by ITRI also used the concept of e-government development phases. Thus the project's design framework and its sequence of activities, outputs and outcome was reasonable and properly considered an enabling environment for e-government. Hence the project required resident project managers to establish national ICT centers in the first project year because IT infrastructure is fundamental to e-government development. The project also assisted in building national portals that provided open and transparent communication and enabled communication between governments and people.

- ***Project failed to identify the causality of outputs to outcome***

  Although the project framework clearly set out an e-government road map for each country, it failed to identify external effects and overlooked the influence of external effects. Specifically, Internet connection quality is an essential condition

that needed to be taken into consideration prior to digitalizing governments' administrative services. National ICT centers were also essential but their effectiveness was degraded due to the low quality of telecommunications.

- **_Responsibilities and commitment of EAs_**

   Four information systems, namely the Gaming and Investment Management System of the Belize Investment Unit, the Crime Management System of the St. Kitts and Nevis Police Force, the Civil Status Registration System in St. Lucia and the Human Resource Management system of the St Kitts and Nevis Governance Improvement Unit share the common feature of the failure of the EAs. Since e-government application developers and systems analysis consultant were foreigners, although resident project managers were assigned to assist system development and identify government department demands, such managers' backgrounds were insufficient to meet the variety of IT knowledge covered by the project's activities and content. For example, the background of the resident project manager in St. Kitts and Nevis was in ICT hardware development, and not in software or enterprise development. The role of the EAs was crucial to the project, but professional knowledge was insufficient for them to control the project design, despite being effective intermediaries between foreign specialists and local government units. Thus, both sides spent little time and resources on communication — a risk that led to irreversible mistakes.

Example 1: Gaming and Investment Management System

The system was dedicated to the Belize Investment Unit of the Ministry of Trade, Investment Promotion, Private Sector Development and Consumer Protection. This unit was originally under the Ministry of Finance and was then transferred to its current authority due to a change in the ruling party in 2009. According to descriptions and comments about this system, the head of the unit and counterpart of the project had appeared to be cautious in communicating certain vital information to partners, for example with respect to system functions such as those enabling the unit to control gaming machine repayments and the reissuing of licenses. It is possible that this

contributed toward the rejection of the systems by businesses and consumers using the systems on line, especially since they might have had to pay more to acquire licenses. Nevertheless, this kind of information couldn't have been gathered in advance prior to the commencement of such operations through the project.

Example 2: Car Registration System, St. Kitts and Nevis Police Force

The CRS would appear to represent a classic case of ineffective communication and demonstrates the consequences of mistakes directly or indirectly caused by such problems when conducting a project.

Regarding communication between consultants, the police force, the Inland Revenue Office and system developers, these four actors each attempted to make the others understand their own demands. The beneficiary of the project was the police force, but the Inland Revenue Office has certain resources, namely registration information for vehicles and vehicle owners, and thus an effective way to have developed the system would have been to negotiate the sharing of information with the Inland Revenue Office, with the police force clearly describing how the information-sharing model could be formulated in terms of the arrangement of an information system arrangement. This role could only have been taken on by the EA, and not the foreign consultant. In other words, the EA did not fulfill its responsibility to the project.

Example 3: Civil Status Registration System, Ministry of Justice, St. Lucia

An EA should have sufficient knowledge about its country's regulations and laws, as such information is crucial to e-government projects.

In the case of the CSRS, although the EA was involved in communications and systems analysis work, the CSRS ultimately malfunctioned not because data and birth data was incomplete, but because of national regulations and local social custom. In East Asian societies, parents are obligated to report the birth of a new child to household administration officers; this is viewed as a social norm. The fact that this is not the case in St. Lucia made project implementation difficult. Consultants and vendors imagined that St. Lucia would have the same, or very similar, household administration institutes as in Taiwan, whereas in reality it does not. If the EA had

stated this information clearly to the resident project manager and the TaiwanICDF, it is unlikely that the project would have made the CSRS a priority for e-government in St. Lucia, instead using project resources more efficiently elsewhere.

5.1.2 Project Consistency

- *Project intervention logic did not meet e-government demand in St. Kitts and Nevis*

World Bank data for ICT infrastructure in St. Kitts and Nevis shows that the number of Internet connections, mobile phone users and imports and exports of ICT-related goods and services are higher than the Caribbean country average, which demonstrates that national ICT capacity is fairly well developed. Figures in the UN's e-Government Development Index over 2004 to 2008 also show the country's e-governance (0.9976) progressing at a higher rate than the Caribbean country average (0.9964), which is to say that e-government development in St. Kitts and Nevis requires different assistance compared to St. Lucia and Belize. However, the project appraisal report did not note this and project design represented a one-size-fits-all intervention in all three countries.

In its *National ICT Strategic Plan* published in 2006, the St. Kitts and Nevis government ranked Internet domain management, telecommunications management and regulation, and the provision of Internet application tools to government units as among the country's ICT priorities, and with ICT technician training, government units' ICT knowledge and the policy planning of government officers ranking as more important than the development of e-government applications. This indicates that the project intervention was not aligned to the national e-government goals and status of St. Kitts and Nevis.

- *Project intervention logic did not meet e-government demand in St. Lucia*

World Bank data and the UN's e-Government Development Index ranking both indicate that ICT infrastructure and the progression of e-government in St. Lucia are slightly lower than the regional average, which means that St. Lucia is

relatively underdeveloped in terms of ICT. It should be noted that globally governments have progressed far faster than St. Lucia, despite the St. Lucian government and the TaiwanICDF having spent more resources in trying to move government ICT capacity forward.

The St. Lucian government had previously set out the country's needs with respect to investment in telecommunications infrastructure, stating that education, health and agriculture were the sectors to which it had wanted to introduce ICT technology, so as to improve efficiency in these sectors. To better assist St. Lucia's e-government practices, the TaiwanICDF and the government of St. Lucia should review their project's contents to determine whether the original plan remains effective in helping St. Lucia to attain its goals.

- *Project intervention logic did not meet e-government demand in Belize*

Belize published its national ICT strategy in 2007, at approximately the same time that the TaiwanICDF began to assist the country. Referring to the contents of strategy, it is disappointing that the strategy did not review Belize's then-current circumstances, and that the goals, schedules, planned activities and demands that should have formed the main contents of the strategy cannot be found. The evaluation manager consulted the head of the CITO and was informed that the strategy had not been practiced following its publication.

Referring to the publication date, it was the Public Services Administration Department that had proposed this plan. Thus, it is reasonable to conclude that the department lacked ICT knowledge and was unclear as to the concept of e-government. Looking at e-Government Development Index rankings, Belize's progression has since been significant in that before the TaiwanICDF's intervention, the progression rate of e-government in Belize was 0.12 compared to a Central American average of 0.92, far behind the regional average. In 2012, the situation had been reversed, with the progression rate of Belize at 0.26 compared to a regional average of 0.4. As such Belize has made significant progress in e-government development, so the TaiwanICDF may have had some contribution to this.

- Too short to observe the effectiveness of project change

Referring to the changes in e-government rankings for Belize, St. Kitts and Nevis and St. Lucia, it is not difficult to see that the progression of these three countries in e-government has been slower than the global average. Global ICT is changing rapidly and emerging ICT technologies and applications, and the availability of smartphones, are forcing governments to review their national ICT strategies more frequently than ever. Unless modified, regulations and policy may not be able to follow business and civil society demands.

Table 5   UN e-Government Ranking of St. Lucia, St. Kitts and Nevis and Belize for 2004 to 2014

Year/National ranking	2004	2005	2008	2010	2012	2014
St. Lucia	64	74	85	88	90	104
St. Kitts and Nevis	72	72	78	75	81	90
Belize	76	97	107	120	124	120

Source: http://unpan3.un.org/egovkb/en-us/

The TaiwanICDF did notice that the original project goals and plan were unable to meet these three countries' demands given changing ICT trends. In 2010, the organization conducted a mid-term project review and the mission's *Back to Office Report* suggested that a regional project could be more effective in solving some of the problems that had afflicted project implementation, for which reason the TaiwanICDF recalled its resident project managers in Belize and St. Kitts and Nevis. At the same time, the TaiwanICDF also proposed a project reengineering action plan that would be conducted by a regional project manager. This reengineering plan was approved by the TaiwanICDF's board, but was not implemented after 2010 when MOFA urged the TaiwanICDF not to terminate the project prior to contracted dates. However, the regional project manager still took full responsibility for conducting the project's designated work items and assisted the TaiwanICDF to hand over the project in 2012.

5.2 Effectiveness (The effectiveness of this project is D, Substandard, and weighted score is 2.67)

5.2.1 Achievement of project outcome

The evaluation mission conducted a survey of e-government users, the managers at assisting agencies and EA officers and IT specialists who were a part of the project. Referring to the results, the distribution of users' appraisal regarding the function of information systems and data quality is partly satisfactory, such that the ranking for System Quality is between "acceptable" and "good," and for Information Quality is "good." In terms of users using the system to conduct business, the ranking for System Usage is "acceptable," as is the ranking for User Satisfaction. Nevertheless, the ranking of information systems in terms of Individual Impact is "good." For a summary of results, please refer to Table O; for the detailed statistical report, please refer to Appendix O.

Table 6 Summary of Evaluation Result

	SystemQuality	InfomationQuality	SystemUsage	UserSatisfiaction	IndividualImpact
平均數	3.9489	4.3044	3.5500	3.6533	4.2500
個數	30	30	30	30	30
標準差	.79898	.77838	1.02847	1.15422	.89472
組別的中位數	4.1333	4.4667	3.6500	3.7200	4.3286
平均數的標準誤	.14587	.14211	.18777	.21073	.16335
最小值	2.40	2.73	1.50	1.60	2.60
最大值	5.40	6.00	5.80	5.80	5.70
變異數	.638	.606	1.058	1.332	.801
峰度	-.688	-.560	-.248	-.837	-.800
偏態	-.295	.070	-.014	.217	-.161
中位數	4.2000	4.4667	3.6500	3.8000	4.3000
幾何平均數	3.8647	4.2349	3.3914	3.4704	4.1533

- *Survey results partly prove theoretical assumptions*

  The hypothesis of the Information System Success Model assumed that the success of an organization successfully promoting and embedding information systems into its operations is decided by system functions and data quality. Human factors are also involved in system success due to users wanting to use the system. As a consequence of system success, users' behaviors and mindsets change, such that users get used to applying the system to improve the efficiency of processes and upgrade their knowledge of IT technology. This is believed to be helpful in enhancing organizational capability.

The survey results showed that most interviewees were less satisfied with system functions (μ = 3.94 σ = .798), but quality of information gained higher satisfaction by comparison (μ = 4.30 σ = 0.7783). This can be confirmed with others figures: total satisfaction on the quality of information was higher than for system functionality, for systems developed for different agencies or for users of different nationalities, which shows consistent attitudes toward various systems' functional design and applicability.

Looking at user satisfaction for systems, the overall result showed that this was low (μ = 3.65, σ = 1.02). Looking at the frequency of system use, which is how often users applied systems to assist routines, for their degree of use of a system, and how many functions they had used, the results were also low (μ = 3.55, σ = 1.15). However, the results for the frequency and degree of use of the systems could be controversial since the variables for system satisfaction and users' attitudes to systems were not consistent. Indeed, each interviewee's answers about their frequency and degree of use of systems varies greatly, from which it can be inferred that not every user or agency used the e-government application as its main tool for processing routine work. Interestingly, the majority still agreed that information systems do modify behavior and that their working efficiency had improved (μ = 4.25, σ = 0.89).

Referring to the project's intended outcome, the provision of e-government applications improves administration service quality. Regarding personal IT skills, the high figure (μ = 5.06 ~ 4.00) showed that e-government influenced personal capacity as promised, including promoting innovation and optimizing administrative processes because users perceived the importance of information systems, understood system functions and the information output, and understood that the system helped to improve services.

Although the systems seem to have been helpful in improving self-esteem in terms of work quality, users did not agree that the systems had completely freed them from making errors (μ = 3.50 ~ 3.90). From this can be inferred that the design of system

functions did not allow users to spend less time on checking the accuracy and veracity of documents or data. However, instead of having a negative attitude toward the accuracy and veracity of system data, interviewees were in high agreement that system applications made it possible to provide accurate information to their superiors so that they could make correct judgments (μ =4.36), and thus that their supervisors can make decisions without the need to consider whether information was applicable to its business (μ = 4.43).

In general, the survey results showed that to some extent, e-government applications were helpful in modifying the quality of public agency services and in upgrading personal and professional and IT knowledge.

5.2.2 The contribution of project management toward project effectiveness was weak

Survey results indicated that interviewees were not satisfied with the design of system functions, and that the project's activities and outputs only partially achieved their expected results.

Analysis finds that user satisfaction with system administrators and system outputs (reports and data) was low (μ= 3.63, 3.40). The availability and quality of system information (μ= 3.06), system stability (μ = 3.3), operating fluency (μ = 3.3) and system response speed (μ = 3.5) are all low. The poor scores for system transfer functions may have been due to slow Internet speeds; however, the possibility that system programs or processes were of poor quality, and thus caused users to expend time on invalid operations, cannot be ruled out. Comparing system quality, information quality and the eligibility of users, the accuracy of information and the matching of data files to processes, and the convenience of information output (search) functions and information representation, etc., all average between 4 and 5.

5.2.3 External factors

Political factors may have affected the project results. The ruling party in Belize changed during 2011, with the People United Party winning more than half of the seats in the House of Representatives. The new cabinet reorganized some government agencies and thus the EA for the project in Belize was shifted to the Central Information and Telecommunication Office under the Ministry of Finance. However, since the TaiwanICDF had also decided to modify the project reporting system by transferring to a regional project manager rather than a resident project manager, the organization at that time also decided to hand over the project to the EAs in each country at the end of 2011. External influences upon project results may have been weak due to the project not initiating any new actions in these three countries, with most project work, such as improvements to e-government functions or the procurement of equipment, having been done before 2011.

Table 7 Contracted Project Costs by Year and Country

5.3 Efficiency (The effectiveness of this project is C, Compliant, weighted score is 3.09)

Nation	Expenditure item	2007	2008	2009	2010	2011	2012	subtotal
Belize	e-Gov. apps development and maintenance	11,863,000	2,800,000	7,350,000	6,947,515	4,715,115	3,447,640	37,123,270
	Consultant service	1,900,000	3,060,000	2,993,333	7,000,000	2,566,667	1,758,747	19,278,747
St Kitts and Nevis	e-Gov. apps development and maintenance	11,863,000	13,763,000	9,800,000	6,947,515	4,345,699	398,064	47,117,278
	Consultant service	1,900,000	3,060,000	2,993,333	7,000,000	2,566,667	3,302,932	20,822,932
St Lucia	e-Gov. apps development and maintenance		7,500,000	9,800,000	7,104,971	4,939,187	4,044,736	33,388,894
	Consultant service		3,060,000	2,993,333	7,000,000	2,566,667	1,664,580	17,284,580

- *Efficiency of project inputs—cost-benefit analysis*

Project costs are divided into two parts: personnel costs, including compensation to resident project managers compensation; and administration and ICT center maintenance and procurements, including the development of e-government applications and national portals and ICT equipment. The highest expenditure was for e-government applications, as this item was contracted to software design companies and consultant companies.

By country, project costs were highest in St. Kitts and Nevis (NT$67.94 million), followed by Belize and then St. Lucia.

Table 8 shows a comparison between the development and maintenance costs of still-operational e-government applications and out-of-service e-government applications. In terms of the number of operational systems and out-of-service systems in different countries, St. Kitts and Nevis is ranked first place because three of its four applications are currently shut down or abandoned due to lack of resources and/or knowledge to keep these systems in operation. The lowest number of out-of-service systems is in St Lucia, with only one system having been abandoned at low cost.

Analyzing the cost-benefits of the project, systems that were abandoned could be viewed as sunk costs, since the value of an e-government application is based on system availability and usage rates, and, moreover, the more users that adopt the system and the more frequently they use it, the more efficient the system can be said to be. If a system does not work, then previous investment in development and maintenance counts for nothing, as it is impossible to retrieve any residual value from an abandoned system that cannot be sold to another organization, or which cannot be divided into operational parts and non-operational parts due to functioning as a whole. The total cost of such out-of-service systems for the project is NT$76,762,515, representing 35.9 percent of the total project expenditures.

Table 8 Commissioned cost each of e-Government application

Country	Average cost by country	Average cost by e-Gov. apps	Cost by out of service application	Noted
Belize	56,402,017	18,800,672	18,800,672	Operating Apps. AIMS SCUD Out of Services Apps Gaming & EPZ
St Kitts & Nevis	67,940,210	22,646,737	45,293,474	Operating Apps. HIS Out of services Apps CRS HRM
St Lucia	50,673,474	12,668,369	12,668,369	Operating Apps： ATLAS CMS ARS Out of services Apps： CSRS

Assessing the development of e-government systems in terms of market prices, the average cost of an e-government application was around NT$13,000,000 (approximately US$430,000). Such prices could be considered expensive to partner countries relative to the annual incomes of their national governments. Since government agencies may wish to seek alternative solutions for performing processes electronically, the first-choice alternative could be a software package available on the consumer market, or for a government to directly negotiate with a software developer to obtain a more competitive price. Microsoft, for example, sells Access, a form of database management software, at US$261-299 for each two-year license. International development organizations have also provided free or low-cost systems to middle-income or more advanced countries. The Standard Integrated Tax Administration System (SITAS), for example, was provided by CARICOM after CARICOM had asked a North America software developer to build it.

Considering the high sunk cost of the project, that the project's e-government applications were in general too expensive for partner country governments and that the value of systems are virtually zero if abandoned, project inputs are ranked as inefficient.

- *Efficiency of project management processes*

  In reviewing the project's implementation methodologies and checking the implementation of the framework plan, a flowchart is provided below to illustrate consultants' process analysis and installation of system functions; system manufacturers' design, building and installation of the system in accordance with consultants' specifications; and resident project managers' assistance in helping system users to respond to system problems or propose new features, and help in promoting the use on-line systems to solve operational problems.

  A review of the performance of consultants and vendors is necessary given the project's high costs for e-government development and low user satisfaction for system functions. According to the information from the project manager and the work reports of resident project managers, the model for coordinating the development of e-government applications is shown in Figure 2.

Figure 1Communication network arrangement of the project
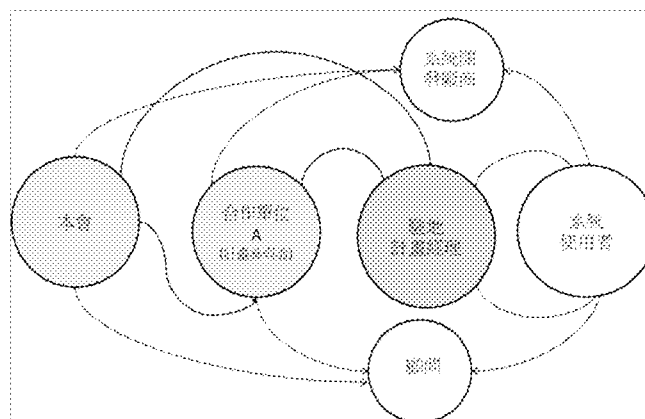
According to project reporting arrangements, overall management was assigned to the TaiwanICDF project manager; the resident project managers, vendors developing

e-government applications and ICT consultants reported to the project manager. system end users and the staff of participating public agencies were only eligible to propose demands or grievances about system usage and functions. The EAs or resident project manager had the right to check the quality of vendors' or consultants' work in terms of enforcing legal action in accordance with contracts. Certain issues arose during project implementation due to an inadequate reporting system, as discussed below.

Coordination during e-government application development

The TaiwanICDF commissioned the design and development of e-government applications in Taiwan. The design and quality assurance for e-government applications was contracted to one software company, while information system development was contracted to another. Both companies were obligated to fulfill procurement requirements within one year, and had less than one month to work with EAs and end-user agencies. The tight development schedule and travel expenditures pushed vendors and consultants to complete systems analysis in a very short time. Project consultants conducted few meetings and acquired few of the forms or documents used by end-user agencies before designing the information system framework.

Insufficient information led system development in wrong direction

Although tight scheduling is common in the development of information systems, in this case two issues, namely culture and language, rendered the situation complex and rather uncontrollable. Consultants designed e-government applications based on the personal experience and knowledge they had accumulated while working with the Taiwanese government and companies, with professional intuition leading them to adopt solutions that they thought would be useful, but which may not have been adequate when transferred to and used by a partner country's government agency. For example, the functions of the Human Resources System developed for the government of St. Kitts and Nevis were based on attendance records, with salaries, bonuses and subsidies being calculated in accordance with employee attendance. This system

operates well in Taiwan, but encountered opposition when introduced to the participating agency, which may have been because employee compensation is not provided based on attendance but also on an employee's contribution to the organization, including responsibility and work load.

In some cases, insufficient information was available due to the end-user agency providing the wrong information, or not passing information on to related stakeholders, such that each side spent excessive time in considering and confirming information delivered by project participants. Each side did not want to misunderstand or lose information, which delayed the development schedule.

- ***Balance between profit generation and sustainable business***

    Only one software company was commissioned to develop 11 e-government applications for three countries. For this vendor, the client was the TaiwanICDF and not the end-user agency. Thus, the vendor was concerned with the TaiwanICDF's assessments and comments rather than the requirements of end users and EAs.

    Resident project managers played an important role given that the vendor could not and did not react to end user agency demands. As soon as an end user agency encountered an operational problem, the manager would take several actions to resolve this, the first being to identify whether the problem had occurred due to the quality of Internet connection and/or factors external to the system itself. If all such factors had been excluded, then the resident project manager would turn to the vendor for assistance.

    It was a reasonable process to expect resident project managers to resolve problems with system operations, and all parties involved in the project felt comfortable with this arrangement. However, it should be noted that only one vendor provided system maintenance, and the resident project manager was unable to receive instant assistance. Long distances and travel expenditure made it

impossible for the vendor to provide regular training or timely responses to user inquires. The TaiwanICDF and its resident managers were unable to commission system maintenance from other companies in the local market due to barriers resulting from contractual arrangements with the vendor. Vendor and consultant performance degraded project efficiency and reduced competition to the advantage of the vendor.

5.4Sustainability (The Sustainability of this project is C, Compliant, weighted score is 3.16)

5.4.1 St. Lucia
- Sustainability of ICT center

Since 2007, the ICT center has been a node spreading knowledge and best practices in e-government within the country. The facilities and equipment are in good condition, and the location is ideal, being close to the city's downtown area and allowing easy access to ICT resources.

The St. Lucian government took over the center in 2012 and it remains fully operational. The only point of concern is that the building where the center is located is not government property, which poses a risk if the rental contract is suspended and the government is unable to find a similar building.

- ### Sustainability of e-government applications

Except for the Ministry of Justices' CSRS, most e-government applications in St. Lucia are operating well. In terms of rating the sustainability of e-government systems, ATLAS takes first place because it has three conditions supporting its sustainable operation, namely financial support, leadership commitment and user adoption. Financial support is coming from license applications and exchange fees, which have been sufficient to pay an IT company for system maintenance. As for leadership commitment and user adoption, the head of department has a clear concept of information systems and how to use the system to improve the efficiency of processes, and has insisted that all employees learn and use system functions, which is a necessary step in embedding information systems into internal management.

Regarding the Department of Agriculture's AMS and the police force's CMS, these two e-government applications have a high possibility of bringing long-term, sustainable benefits to their respective government units. For the AMS, this is because extension officer assistants have adopted the system and because the relevant IT engineers have plentiful knowledge of IT. For the CMS, the commitment of department managers and a well-organized approach have ensured

that the system is fully operational and that data produced by the system is reliable and up-to-date.

5.4.2 St. Kitts and Nevis

- ***Sustainability of ICT center***

  The ICT center in St. Kitts and Nevis has been closed for hygiene reasons, as the building has been contaminated by mold. Although the government has committed to repair the building, it remains out of service and ICT facilities have moved elsewhere. It was not practically possible to judge the sustainability of the ICT center when the evaluation mission visited St. Kitts and Nevis.

  - *Sustainability of e-government applications*

  Only the HIS remains fully operational since the project was handed over to the government of St. Kitts and Nevis. The other two systems, the CRS and the HRS, have been abandoned. There is a high possibility that the HIS will provide a constant contribution to JNF Hospital. The HIS is similar to ATLAS in St. Lucia in that both agencies have financial support derived from bonuses generated by the operations of the organization. Leadership commitment and user adoption also provide strong evidence for inferring the sustainability of the system.

5.4.3 Belize

- ***Sustainability of ICT center***

  The ICT center in Belize represents the only building actually constructed as part of the project. The CITO has operated and managed the center since the project was handed over to the Belizean government in 2012. The condition of equipment and facilities is good, and there is a high possibility that the center will provide a sustainable contribution to Belize's government in the future.

- ***Sustainability of e-government applications***

  Three e-government applications, namely the Gaming and Investment Management System, the Archives Information Management System and the Supplies Control Unit Database, were handed over to the Belizean government in

2012. The Supplies Control Unit Database has been selected as a model for proliferating the experience of developing e-government applications in Belize, and thus it is possible that the database will continue to provide service to the government. However, the small number of system users could be a risk if employee rotation affects system usage. As for AIMS, although the Bureau of Archive and Records Service still uses the system to manage immigration, police and government human resources archives, the sustainability of the system would appear to be low as the bureau has sought improved solutions by substituting Microsoft software.

The Gaming and Investment System is unsustainable as it did not meet end-user demands. Furthermore it lacked leadership support and user adoption was weak.

6. Lessons Learned and Recommendations

7.1 Lessons Learned

7.1.1 Appraisal of institutional and cooperative capacity

In terms of experiences of developing e-government applications, it is obvious that the capacity of EAs and end users (IAs) had a crucial effect on project effectiveness and efficiency. Project designers were obligated to precisely assess the organizational functions of EAs and IAs, such as their executive ability and organizational climate, which demonstrates that such agencies were driving forces or impedances in the project achieving its intended results.

Examples such as ATLAS in St. Lucia and the HIS in St. Kitts and Nevis demonstrate certain successful factors that are best taken into account when planning e-government assistance or ICT for development projects. The persons supervising the implementation of both systems clearly understood what information system would help their organizations' functionality, and the limitations of such systems. In addition, the more users an e-government application has, the more the application creates value for the organization. In other words, if the EA/IA is reluctant to introduce information systems to modify a process, or the EA/IA does not assist system developers and/or project designers to understand the nature of its business, it will be difficult to attain system development which perfectly meets EA/IA demands. Furthermore, some unexpected situations may take place under which users refuse to use the system developed, frustrating the project manager and related project participants and tamping the enthusiasm to pursue better management in the organization.

7.1.2 Less efficiency in project cooperation and coordination

Coordination in this project was inefficient, and complex reporting arrangements meant that project participants were unclear about certain issues. The client of the consultants and vendor in this project was not any EA/IA but rather the TaiwanICDF.

An inadequate reporting system meant that EAs/IAs had a weak influence upon the consultants and vendor, and in some situations did not feel responsible for the system that had been tailor-made for them.

The changing of project participants was also a risk that may have degraded project effectiveness, especially under this kind of complex cooperative relationship. This is most obvious in the case of the CRS in St. Kitts and Nevis, the CSRS in St. Lucia and the AIMS in Belize. The consultants thought that systems analysis had been comprehensive, and that such analysis was thus adequate for vendors to develop the systems in accordance with systems analysis requirement. In actual fact, however, they had not looked deeply enough into organizational management, and some observations noted by consultants were not completed. For example, the Archives and Records Services in Belize thought that the assistance to be provided by the project would involve national records preservation, but this is very different from the information system developed.

7.1.3 *Knowledge to be kept inside organization*

This project was the first full-scale ICT project designed and implemented solely by the TaiwanICDF. At the time of the project's inception, the TaiwanICDF relied on a professional agency's knowledge and advice in planning the project framework, while implementation was contracted to a vendor. To some extent, therefore, the project's performance was decided by the capacity of external organizations.

This strategic arrangement allowed external organizations to participate in the project, and may have been efficient in gaining a "quick-win" in terms of intervening, but in the long term, the TaiwanICDF should be looking to build its own ICT for development capacity and organize specialist teams for project implementation. For this reason, it would be better for the TaiwanICDF to establish an ICT for development knowledge database and tool box comprising documents and reports submitted by the consultants and vendor. The TaiwanICDF and EAs/IAs would also

be advised to cooperate in sharing experience through official and unofficial communications channels.

The TaiwanICDF also paid for costs. Sunk costs due to out-of-service systems took up nearly 40 percent of the total cost of the project. Some costs were essential due to unfamiliarity with performing budget controls for e-government development, but others could have been avoided in advance by noting the lack of commitment of EAs/IAs and the inefficiency of coordination arrangements.

Another limitation to the project was the quality of procurement. Unlike, for example, its agriculture projects, the TaiwanICDF does not have its own technicians/teams specializing in ICT, and thus much of project implementation was contracted to a Taiwanese vendor. The vendor had plentiful knowledge and experience in ICT but was weak in language and international exposure. This risk made project management difficult in terms of managing for project results.

7.2 Recommendations

7.2.1 Quantifiable indicators to monitor and measure the outputs and outcome

The lessons learned show how important it is for a project to have quantifiable indicators with which to regularly monitor the project's planned outputs and intended outcome. A set of quantifiable indicators allow project managers to know in advance whether the project is deviating from its intended outcome, and can also predict how much effort is still required for a project to achieve its desired objectives.

For ICT or e-government projects, the Information System Success Model is applicable to monitoring and evaluating the project results. This model suggests that system quality, information quality, information usage, user satisfaction and impact on individuals and organizations affect the process of adopting ICT within organizations. Each of these dimensions can be broken down to several indicators, each of which in turn can be applied to the design of a project's monitoring framework.

The results of the evaluation mission's survey confirm certain basic approaches suggested by this model. For instance:

I. Good information and systems quality motivates users and willingness to adopt e-government applications;

II. Information applicability and user satisfaction increases the effectiveness of individuals' work;

III. Improving the effectiveness of individuals' work enhances organizational effectiveness.

This path to success was particularly identifiable in the cases of ATLAS and the AMS. Since the agriculture extension assistants felt that the system was useful in helping them to manage routines more efficiently, they presented suggestions. Although certain suggestions could in fact be described as grievances, nevertheless their purpose

was to constructively pursue a more user-friendly system in terms of enhancing the accuracy of data and thereby reducing the inconvenience of accessing paper-based sources. This is what is meant by "good information and systems quality motivates users and willingness to adopt e-government applications." In the case of ATLAS, the head of department found that license-printing functions had received good comments from citizens, and thus the department intends to invest in the development of new functions. This is what is meant by "improving the effectiveness of individuals' work enhances organizational effectiveness."

In the future, project designers would be advised to take user behavior into account at the beginning of a project, during its appraisal phase. In addition, the regularly assessment of user satisfaction is crucial to enabling project management to modify system functions, and, moreover, to modifying a project to meet beneficiaries' demands.

7.2.2 Suggestions on analyzing institutional and organizational capacity

It is essential that a project designer appraise and analyze EAs/IAs' capacity before a project kicks off, and specifically professional capacity, knowledge and understanding of ICT, influence over other agencies and the number of qualified employees who will be in charge of project implementation.

In its initial stages, the project engaged the Public Administration Service Department as an EA. However, if a project's essence is focused not on improving government administrative process but rather introducing ICT-related practices to the government agency, then other agencies, such as government or university IT maintenance units, could also be considered candidates in terms of eligibility for project participation.

In addition, ethics and reputation cannot be overlooked when a project is seeking potential EAs. To some extent the correct allocation of resources depends on the integrity of leadership.

7.2.3 Monitoring and evaluation policy should be incorporated into projects' legal documents

The relationship between the resident project manager and the head of an EA is based on reciprocal obligations and responsibilities to one another. This relationship could be recognized and enhanced in terms of shared authority over project monitoring and evaluation. In some countries, the ROC ambassador would be an ideal candidate for chairing any committee dedicated to managing project performance, although this could be adjusted in accordance with partner country circumstances.

In some extreme circumstances, if the project has to be terminated prior to its given completion date for some specific reason such as a change in the external environment, then the best way to utilize aid resources would need to be settled, as would any arguments which have arisen. A committee could serve as a negotiating platform so that both sides were able to propose improved solutions that enabled resources to be withdrawn or reallocated while still maintaining the efficiency of the project.

7.2.4 Incubate local technical teams

The project did attempt to train local technicians in the hope that they would take over the development of e-government applications. However, this was difficult for them without having participated in system development. At present the IT technicians trained as part of the project can assist in user troubleshooting but are unable to modify the programs and settings underpinning such systems.

The development of local technical teams should be taken into account in a project's framework. Such teams could fill several niches during project implementation, enhancing the efficiency of resource utilization.

TaiwanICDF technicians would benefit by raising the skills of local technicians as this would introduce local know-how into the project, improving project results and helping the project team to reduce the risks created due to difficulties in

communicating with other foreign stakeholders. In this sense, both sides could gain some benefit from cooperating in this way.

Another consideration is the creation of a healthy, competitive environment. Having the TaiwanICDF rely on one or a small number of vendors to conduct project activities could be risky, and furthermore expensive in terms of project services, even though relatively simple and routine work could be replicated in an EA/IA. Fostering local technician teams and contracting them to perform project activities could improve the effectiveness of project management. Eligible local technical teams could check and balance the role of any vendor(s).

A mature local technical team would also contribute toward the resident project manager by saving a great deal of time and resources that would otherwise be spent communicating project ideas to vendors far from the project site. Thus, the resident project manager would have more space and time to concentrate on stakeholder demands rather than redundant communications.

Appendix1 . Project Basic Data

Project Name	The ICT Technical Assistance Project for Caribbean Country
Project Objectives	□ To optimize administration processes in terms of the provision of e-government applications and the ICT abilities of personnel at public agencies. □ To enhance the quality of governance in order to promote organizational innovation, public satisfaction and trust toward government policy.
Important milestones of the project	**The conceptual stage** 12, June, 2006, Project identification mission to St Kitts & Nevis, St Vincent & grenadines and Belize **The analytical stage** 30, March, 2007, Project Appraisal mission to St Kitts & Nevis, St Vincent & grenadines and Belize **The implementation stage** □ 06,June, 2009, The first e-Government applications design mission □ 17,October, 2009. The first procurement acceptance mission for e-Government application commission and installation of 2009. □ 07, May, 2010, The second e-Government application design mission. □ 12, December, 2010, Project supervision and the second procurement acceptance mission for e-Government commission and installation of 2010. □ 13, December, 2010, A project supervision and new project appraisal mission to St. Vincent and grenadines. □ 11, April, 2011, Project supervision mission. □ 15, August, 2011, A appraisal mission for the project modification, a feasibility study to propose alternative project framework. □ 29, November, 2011, The third procurement acceptance mission for e-Government application commission and installation. □ 8, August, 2012, The project supervision mission.

	The completion stage
	□ 24, December, 2012, The project completion mission.

Project Cost	*Budget (Actual)*				
	Year	NT$		US$	
	2007	14,745,892		0	
	2008	44,102,464		410,885	
	2009	40,877,456		0	
	2010	22,105,497		0	
	2011	24,671,295		17,293	
	2012	47,161,218		114,062	

Project Scope	**Outcome** □ Well-equipped ICT center being a platform to integrate IT units of government agency, to train and educate government employees and citizen with practical IT skills and knowledge. □ In terms of providing standardized and systematic e-Government application, the public agency is eligible to adopt system based process in order to improve administrative efficiency. Provision of e-Government application enhanced government officers and employees IT ability. □ e-Government applications being a channel to promote cross-department communication and coordination, provision of e-government assist public service quality. **Outputs** Since 2009 to 2012, TaiwanICDF delivered 11 government systems and some governmental portals □ For Belize: National ICT Center, Archives information management system,. Gaming and Investment management system and Supplies Control Unit Database. □ For St. Kitts and Nevis: National ICT center, Health information system, Vehicle registration system, Human resource system, national root DNS managing assistance, government e-mail service assistance. □ St. Lucia: Civil status registry system, Crime management system, Advanced transportation license authority system and Agriculture information system. **Activities** □ National ICT Center establishment. □ Government officers and government employees IT ability training □ ICT Policy and best practices sharing

Appendix 2 Aggregate Project Performance Indicators

Relevance（3.19, C）

Sub-Criteria	Key Performance Indicator	Score (tick as appropriate) 1 Very Low 5 Very High
1-1 Intervention Logic	1-1-1 Degree to which the project's expected outcome (project goal) achieved the policy goal of the partner country in terms of its development.	1 2 3 4 5 □ □ □ ■ □
	1-1-2 Degree to which the project met the interests of the R.O.C. in the partner country (region) in terms that secured the diplomatic relationship between the R.O.C. and the partner country.	1 2 3 4 5 □ □ □ ■ □
	1-1-3 Degree to which the project met the vision, strategy and development goals of the TaiwanICDF.	1 2 3 4 5 □ □ □ ■ □
1-2 Project Consistency	1-2-1 Degree to which the design of the results chain could be deemed to have been able to meet the needs of the target group when the project was approved by the Board of the TaiwanICDF.	1 2 3 4 5 □ □ □ ■ □
	1-2-2 Degree to which the outcome of implementation met the development goals of the partner country upon project completion or transfer.	1 2 3 4 5 □ ■ □ □ □
	1-2-3 Degree to which the target group benefited from the outcome or products of this project upon completion or transfer.	1 2 3 4 5 □ □ ■ □ □
1-3 Formulation Quality	1-3-1 Degree to which the results projected in the project feasibility study were realized in actual implementation. This should include the environmental, economic (industrial), technological and legal aspects of project implementation.	1 2 3 4 5 □ □ □ ■ □
	1-3-2 Degree to which the project was able to identify stakeholders and facilitate communication to a sufficiently wide scope to enable its comprehensive formulation.	1 2 3 4 5 □ ■ □ □ □
	1-3-3 Degree to which the implementation capability of implementing agency met expectations. This should include the aspects of organization, SOP and operation standards, quality of human resources, past performance and financial health.	1 2 3 4 5 □ ■ □ □ □
	1-3-4 In terms of the quality of problem analysis, degree to which the project was able to identify the causes of problems precisely, and analyze the scope of influence of these problems and propose feasible solutions.	1 2 3 4 5 □ □ □ ■ □

		1	2	3	4	5
	1-3-5 Degree to which the outcome, outputs and activities of the project were reasonably planned with respect to the relevant relationship between causes and effects.	☐	■	☐	☐	☐
	1-3-6 Degree to which the design of the results chain took limitations in the local environment into consideration and was deemed practical and feasible.	☐	☐	■	☐	☐
	1-3-7 The indicators of outcome and outputs, the baseline and target, used to monitor the effectiveness of this project are reasonably set.	☐	☐	■	☐	☐
	1-3-8 Degree to which the methods used and the frequency of the collection of project-monitoring data were able to provide sufficient information to project managers.	☐	☐	☐	■	☐
	1-3-9 Quality of the design of the project's milestones and work plan.	☐	☐	■	☐	☐
	1-3-10 Degree to which the design of the project enabled the optimal identification of risks and the effective planning of risk buffering and mitigation solutions.	☐	☐	■	☐	☐

	Summary (Please summarize the performance of each sub-criterion)
Intervention Logic	The project's intervention logic was correct in that the project was able to enhance partner countries' ability to use ICT, with the introduction of e-government systems improving working efficiency and fostering professional ICT-related human resources. Furthermore, the project's inclusion of partner countries' government departments as potential cooperating partners enhanced the development of long-term bilateral relationships, as a result of which the project yielded benefits in terms of consolidating partnerships.
Project Consistency	When the project was approved by the Ministry of Foreign Affairs in 2007, the project's activities, outputs and expected outcome were consistent with the partner countries' requirements, namely the donation of ICT centers at which partner country officials and TaiwanICDF personnel could gradually build information systems. Upon project completion most government agencies were still benefitting from project-related systems. However, ICT technology develops so fast that it took too long to build such systems, as a result of which the original

	expected outcome was losing efficacy year by year, and leading the TaiwanICDF to initiate new projects in 2011. From this, it can be said that the project was consistent with partner countries' development requirements, but that due to changes in external conditions and internal management during implementation, the project was not able to satisfy partner countries' requirements vis-à-vis ICT development.
Formulation Quality	Pre-project research was comprehensive and sufficient for planning the e-government development process from the point of view of government agencies and administrative processes. Project activities and outputs were also planned sequentially in terms of procurement tenders and commissioned manufacturers. However, the time allotted to system analysis was too short; experts lacked understanding of local environments and laws, resulting in problems relating to labor division, laws and agency functions, and ICT systems were unable to yield their expected results. To summarize, the absence of any reasonable appraisal of implementing agencies' capacity, and indicators, meant that system functions did not meet cooperating organizations' expectations when the project entered its implementation phase. Poor Internet connectivity also had an impact on system usage.

Effectiveness（2.67,D）

Sub-Criteria	Key Performance Indicator	Score (tick as appropriate) 1 Very Low 5 Very High
2-1 Achievement of Project Outcome	2-1-1 Degree to which the target group needs the services, products or knowledge resulting from the project after the project was implemented and evaluated.	1　2　3　4　5 ☐　☐　☐　■　☐
	2-1-2 Degree to which the project achieved the outcome as scheduled and projected?	1　2　3　4　5 ☐　☐　■　☐　☐
	2-1-3 Degree to which the outputs of the project met their projected quality.	1　2　3　4　5 ☐　■　☐　☐　☐
2-2	2-2-1 Degree to which the efforts of the implementing agency made a substantial contribution to the outcome and target group.	1　2　3　4　5 ☐　☐　■　☐　☐

Management Effectiveness	2-2-2 Degree to which project personnel (including experts and consultants engaged on a short-term basis or the personnel of the commissioned organization) contributed to the achievement of the outcome.	1 ☐	2 ■	3 ☐	4 ☐	5 ☐
	2-2-3 Degree to which the project was effectively promoted such that the target group understood the content of the project and was willing to accept the concept, knowledge and methods planned to achieve in this project.	1 ☐	2 ■	3 ☐	4 ☐	5 ☐
Summary (Please summarize the performance of each sub-criterion)						
Achievement of Project Outcome	The governments in Belize, St. Lucia and St. Kitts and Nevis still require improvements in terms of ICT capacity. To take the CMS in St. Lucia and the SCD in Belize as examples, the two managers of the systems received positive feedback while using the systems and are willing to continue using the systems and improving the efficiency of the systems. The systems still being used are assisting their respective governments to improve administrative efficiency. In addition, survey results indicated that users appraised the functions of information systems and data quality as partly satisfactory, such that the ranking for System Quality, Information Quality, User Satisfaction and System Usage was between "acceptable" and "good." The overall performance of the project was "acceptable," which translates to a score of 3.					
Management Effectiveness	It is difficult to assess the contributions from the three governments, since only the counterpart in St. Lucia (DPADM) had a high level of participation, while counterparts in the other two countries had much lower levels of participation. Data from surveys and interviews indicated that although consultants and vendors were able to provide services based on contracts, they did not try to understand the requirements of end users and EAs comprehensively, nor observe end users' problems while using the system. Consequently, users were generally unsatisfied with system functions, and this evaluation therefore finds much room for improvement in the performance of consultants and vendors.					

	Regarding changes to the target groups, it was found that individuals had a major impact on improving the efficiency of work and resolving paper work-related problems, with certain individuals willing to invest more time and resources on improving systems. Nevertheless, some systems have still been abandoned because too few users access them. Overall, this aspect of the project is assessed as meeting the relevant standards, with no serious mistakes.

Efficiency (3.09, C)

Sub-Criteria	Key Performance Indicator	Score (tick as appropriate) 1 Very Low 5 Very High				
3-1 Efficiency of Inputs	3-1-1 Based on the information available now, degree to which the products, services and knowledge resulting from this project represented appropriate solutions for the target group.	1 □	2 ■	3 □	4 □	5 □
	3-1-2 Degree to which the budget of this project (projected funding requirements) was able to meet the requirements of project implementation.	1 □	2 □	3 □	4 ■	5 □
	3-1-3 Degree to which the project was able to effectively utilize resources and maximize the effects of such resources.	1 □	2 □	3 ■	4 □	5 □
3-2 Efficiency of Processes	3-2-1 Degree to which the activities of the project could be implemented as planned and delivered products (services) on time or in advance.	1 □	2 □	3 □	4 ■	5 □
	3-2-2 Degree to which TaiwanICDF personnel were effective in communication and the cooperative relationship helped to enhance the efficiency of project administration.	1 □	2 □	3 ■	4 □	5 □
	3-2-3 Degree to which the implementing agency effectively communicated with other local organizations or stakeholders, serving as a bridge between the project team and the local community.	1 □	2 □	3 ■	4 □	5 □ □
	3-2-4 Degree to which the implementing agency complied with the legal documents signed between the two parties and implemented the project as pledged in the agreement (including, if funding was pledged, degree to which the implementing agency ensured such funds were in place on time).	1 □	2 □	3 □	4 ■	5 □
	3-2-5 Degree to which the implementing agency assisted the project team in implementing the project in good faith, and disclosed project-related information fully during project implementation.	1 □	2 ■	3 □	4 □	5 □
	3-2-6 Degree to which project efficiency was monitored and regularly audited against a set of indicators and mechanisms based on a DMF (design and monitoring framework).	1 □	2 □	3 ■	4 □	5 □
	3-2-7 Degree to which the project was able to effectively manage the work of the project team (specialists and consultants) and facilitate them to effectively achieve the expected outcome.	1 □	2 ■	3 □	4 □	5 □

	3-2-8 Degree to which the project was able to implement local procurement in conformity with regulations and the quality of the procured products met requirements.	1 2 3 4 5 ☐ ☐ ☐ ■ ☐
	Summary (Please summarize the performance of each sub-criterion)	
Efficiency of Inputs	The average cost per e-government application was around NT$15,000,000. Such prices could be considered expensive relative to the annual incomes of partner countries' national governments. System building and installation was fine, proceeding on schedule according to plan, and never exceeded its annual budgets. The TaiwanICDF dispatched only one project manager to each country to coordinate specialist working tasks, and so the budget for personnel was quite low. Most of the project budget was invested in conducting the project's tasks.	
Efficiency of Processes	Although the systems delivered by consultants and vendors did not satisfy the requirements of end users, the efficiency of such systems could be improved gradually. The project managers dispatched by the TaiwanICDF maintained good relationships with their local Taiwanese embassy, as well as project counterparts and end users in each country, and so consultants and vendors were able to complete contracted tasks in a short space of time. Excepting the quality of the systems, no serious mistakes arose in terms of procedures or management of procurement. Counterparts also abided by project implementation in good faith. Overall, this aspect of the project is assessed as meeting the relevant standards, with no serious mistakes.	

Sustainability (3.16，C)

Sub-Criteria	Key Performance Indicator	Score (tick as appropriate) 1 Very Low 5 Very High
4-1 Sustainability of Outcome	4-1-1 Based on the information available now, possibility of maintaining the current achievements under the available human resources, other resources, institutions and financial status, and natural resources.	1 ☐ 2 ☐ 3 ■ 4 ☐ 5 ☐
	4-1-2 Based on the information available now, degree to which external factors, including the natural, economic (industrial) and political environment of the partner country (region), have had a positive effect on the long-term development of the project (please give a higher score if such criteria are better and more visible).	1 ☐ 2 ☐ 3 ☐ 4 ■ 5 ☐
	4-1-3 Based on the information available now, degree to which the project's risk control mechanism(s) is/are able to effectively identify risks and ensure that the project will not be jeopardized by unforeseen risks.	1 ☐ 2 ☐ 3 ■ 4 ☐ 5 ☐
4-2 Sustainability of Project Management	4-2-1 Based on the information available now, degree to which the management (production) methods established by this project and the revenues generated are able to sustain its continuous operations and create value.	1 ☐ 2 ☐ 3 ■ 4 ☐ 5 ☐
	4-2-2 Based on the information available now, degree to which the implementing agency of this project is in good financial standing and follows internal management practices that support sustainable operations and are able to maintain the sustainability of the project's outcome.	1 ☐ 2 ■ 3 ☐ 4 ☐ 5 ☐
	4-2-3 Based on the information available now, possibility of the continuing participation of the target group or stakeholders in the project.	1 ☐ 2 ☐ 3 ☐ 4 ■ 5 ☐
Summary (Please summarize the performance of each sub-criterion)		
Sustainability of Outcome	Apart from the ATLAS, CMS, AIMS and SCUD systems, other systems are expected to be abandoned within a few years due to budgetary problems and/or a lack of IT technicians and resources. However, St Kitts, Belize and St Lucia are developing into medium-income countries and mobile devices are becoming widely available of late, so it is getting easier for people to access the Internet. Consequently, it is likely that	

	ICT and e-government will remain priority areas of development for these three countries for the foreseeable future.
Sustainabilit y of Project Managemen t	Project management methods prior to project completion were unable to create local value. The three main reasons were that (i) local technical team never participated in system analysis, design or installation; (ii) budgets exceeded original expectations due to Taiwanese vendors' travel expenses; and (iii) counterparts and end users were unable to express their requirements and comments effectively. In terms of counterparts' ability to maintain operations, this can only be assessed by current counterparts since the original counterparts have been changed. Regarding the willingness of partner countries to participate in the project, it should be noted that the governments of the project's partner countries remain greatly committed to e-government and ICT.

Definitions of Scores

1	The result does not meet the standard of the criterion by a significant margin or a major fallacy is present. "Major fallacy" is defined as a practice which has or could cause major loss or damage to the reputation of the TaiwanICDF or which violates the laws of the R.O.C. or the partner country.
2	The result does not meet the standard of the criterion and major improvements will be needed.
3	The result meets the standard of the criterion without major issues.
4	The result meets the standard of the criterion, but some improvement may be needed.
5	The result meets the standard of the criterion without any issues.

3. Criteria Rankings

The scores are distributed to four rankings: Excellent, Good, Standard, Substandard and Poor. The scores representing the four rankings are then used to represent the evaluation result of the respective criterion. For example, the score for the criterion "relevance" of a project is 4.2, which falls into the ranking of "Good" (B).

Criterion	Ranking	Interval between Rankings and Score
Relevance (25%)	Excellent	A $4.6 \leq N \leq 5$
	Good	B $4 \leq N < 4.6$
	Compliant	C $3 \leq N < 4$
	Substandard	D $2 \leq N < 3$
	Poor	E $1 \leq N < 2$
Effectiveness (25%)	Excellent	A $4.6 \leq N \leq 5$
	Good	B $4 \leq N < 4.6$
	Compliant	C $3 \leq N < 4$
	Substandard	D $2 \leq N < 3$
	Poor	E $1 \leq N < 2$
Efficiency (25%)	Excellent	A $4.6 \leq N \leq 5$
	Good	B $4 \leq N < 4.6$
	Compliant	C $3 \leq N < 4$
	Substandard	D $2 \leq N < 3$
	Poor	E $1 \leq N < 2$
Sustainability (25%)	Excellent	A $4.6 \leq N \leq 5$
	Good	B $4 \leq N < 4.6$
	Compliant	C $3 \leq N < 4$
	Substandard	D $2 \leq N < 3$
	Poor	E $1 \leq N < 2$

4. Performance Intervals

The overall project performance ranking will be the average score of each criterion's scores. However, the combinations of rankings are adjusted based on the priority of each criterion. The principles are:

(1) if a project is ranked as *Excellent* or *Good* in the overall performance but contains an "E" ranking in any of the criteria, it will be directly ranked as *Compliant*, and

(2) if a project is ranked as *Compliant* in the overall performance but contains more than two "Es" or three "Cs" in the combination of rankings, it will be directly ranked as *Substandard.*

Project Performance

Performance		Reference Interval	Description of Performance
Performed well	Excellent A	$4.6 \leq N < 5$	The performance of the project is excellent; **the project can serve as a Best Practice for other projects or TaiwanICDF departments.**
	Good B	$4 \leq N < 4.5$	The performance of the project is deemed good.
Compliant C		$3 \leq N < 3.9$	The overall performance of the project is deemed compliant, which means the project **met the required standard of the TaiwanICDF.**
Substandard D		$2 \leq N < 2.9$	The overall performance of the project is deemed substandard.
Poor E		$1 \leq N < 1.9$	The overall performance of the project is deemed poor.

Appendix 3 The Evaluation Matrix

Design matrix for: Project evaluation for ICT project for Caribbean Countries: St. Kitts & Nevis, St. Lucia and Belize.	Project Manage Wang, How- Cha
Main evaluation Issues: - Does the project design framework is relevant to St. Kitts & Nevis, St. Lucia and Belize e-government strategy and total country development strategy. - Does products and services delivered by this project were effective for executive agencies and stakeholder demands, and can be proved as efficiency and cost-effectiveness. - In what extent, project contributions affect to project participants attitude and behavior, improvement and investments given by this project would remain effective although this project had been completed in 2012.	**General evalua** Results-based E

Question	Sub-question	Data source	Design
1. Project design and its framework responds to partner country demands, - To what extent, the intervention logic that included activities and outputs delivered by this project, responded to St.	**1-1 Quality at entry, project design** Project framework and results-chain design: Did the project design refer to similar project appraisal reports or other kinds of project design documents?		Literature review

Kitts, St Lucia and Belize National development strategy and e-government strategy. - Did the project designer consider circumstance and limitations before project conducting designed activity?	**1-2 Quality at entry, activity and output design** In terms of ICT interventions designed and implemented in St. Kitts and Nevis, St. Lucia and Belize, what procedures were in place in terms of providing specific government apps to certain government departments?		Qualitative research		Interview with project participants	Content analysis	
	1-3 Inclusivity, stakeholder involvement Did the TaiwanICDF inquire about stakeholders' opinions before developing government app services? How were stakeholders' demands measured, and were procedures or processes conducted during each appraisal mission? Furthermore, were stakeholders' demands carefully analyzed before the project manager accepted/refused stakeholders' requirements?		Qualitative research		Interview with current and previous project manager	Content analysis	
	1-4 Cooperation efficiency According to supervision reports issued in 2010, 2011 and 2012, some suggestions indicated that government apps did not take cross-functional communication and cooperation into account. Was this recognized as a shortcoming while evaluating the usefulness and efficiency of government apps?		Qualitative research		Interview with current and previous project manager	Content analysis	
2. Effectiveness - UN DESA and ITA suggested the government should prepare an	**2-1 Achievement of intended outcome** How and/or to what extent has the project outcome been achieved?		Quantitative research				

"enabling environment" that makes e-government project arrangement to be successful and accepted. - Does this project aware the importance of enabling environment and invest resources in "enable environment" before project start.	**2-2 Dealing with attribution** Were there any known or unknown external effects? —for example, the EU is also providing ICT assistance to St. Kitts and Nevis? If so, to what extent were such assistance projects also integrated into the project's intended outcome/objectives, and did these external effects increase or decrease the effectiveness of this program?		Qualitative research		Refer to e-government survey 2008-2014	Second-hand data analysis	
	2-3 Outputs to outcome and output quality <u>Causality of outputs and outcome</u> As indicated in supervision reports, to what extent did shortcomings in government apps degrade project quality? Also, to what extent did some successful cases also stimulate project participants (local project managers and users) to develop new functions based on government apps?		Quantitative research		Choose 3-4 agencies to take part in survey		
	2-4 Capacity building This refers to institutional development and behavioral changes at the ICT center, to the development and installation of government apps, and to capacity building conducted before this program completed. To what extent did the TaiwanICDF intervention contribute to improvements in ICT authorities and associated administration?		Qualitative research				
	2-5 Changes in attitude and behavior Did the TaiwanICDF intervention change civil servants' and ICT officers' behavior, thereby enabling people to enjoy better public services and/or promoting more transparent communication between government and people?		Quantitative research		Survey service quality, system stability quality	Frequency distribution and	

3. Efficiency - In terms of "with and without" scenario analysis, does this project truly delivers values to project participants? - Do products and services delivered by this project were effective to meet executive agencies and stakeholders demands, and can be proofed as efficiency and cost-effectiveness.	**3. 1 Measuring economic/financial data** Were project costs efficient relative to the quantity and quality of the project's outputs? This category can be evaluated in terms of (a) enhancing government efficiency and effectiveness, leading to cost saving; and (b) improving service delivery.		Financial analysis				
	3.2 Consultant and procurement quality This refers to measuring the quality of consultant, contractor and supplier services, referring to contracts or other agreements for a measurement of service quality. Survey and interview results will also be referred to measure consultant, contractor and supplier performance.				Survey service quality, system stability quality, information quality	Frequency distribution and chi-square test	

Appendix 4 Project activities map

Appendix 1-a : Mapping Activities and results delivered by Caribbean Country
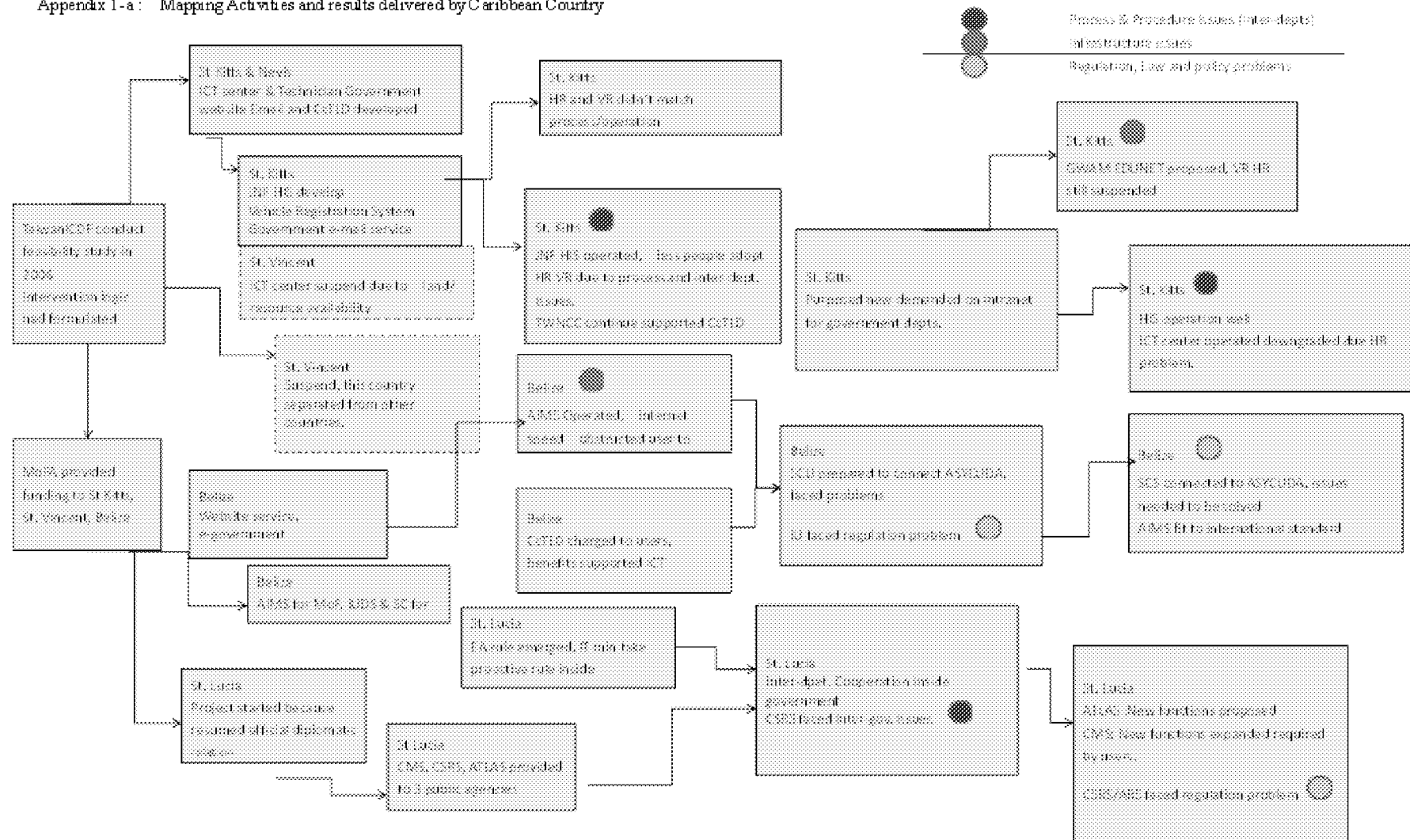
Appendix 5 Evaluation Questionnaire

Dear Partners

The Information and Technology Project for Belize/ St. Kitts & Nevis/ St. Lucia was sponsored by the TaiwanICDF and as part of Republic of China (Taiwan) aid for this country since 2007 to 2012. The purpose of this survey is to understand your comments and observations toward certain aspects of e-government systems that sponsored by TaiwanICDF and as part of this project. On the following pages you will find 55 questions, each designed to measure the effectiveness and efficiency of e-government system. You are invited to rate each question based on the descriptive scale below it, providing a score suited to your professional judgment.

The lowest score is 1 and the highest is 6, please cross/tick it.

1	2	3	4	5	6
☐	☐	☐	x	☐	☐

Thank you for your cooperation and assistance.

Information (Only used for data analyze)

Gender	Age
Male ☐ Female☐	20 to 30 ☐ 31 to 40 ☐ 41 to 50 ☐ 51 and Above ☐
How many years have you been working for this organization?	Your current position in the organization
1 year ☐ 2 years ☐ 3 years ☐ 4 years ☐ 5 years and Above ☐	Manager ☐ Staff, administration ☐ Staff, technician ☐
Your education level (years in school)			How many years have you been responsible for e-Government project/policy	
Elementary School	6 years	☐	1 year	☐
High School/	7 - 9years	☐	2 years	☐
Junior	10 – 12 years	☐	3 years	☐
High School/	13-16 years	☐	4 years	☐
Senior	17 year above	☐	5 years and Above	☐
College or				
University				
Post-graduate				

A. System Quality

The data delivered by the system is always correct	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I always can inquire up to date and correct data from the system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

Data and information delivered by the system is sufficient	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

This system is easy of use	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I can always connect to the system when I need it	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I agree with that the system is simple and comprehensive	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

My job requires to complete data processing, query, statistics and so on, the system can be handle almost of.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I agree the system functions are useful to help me to do given jobs	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I agree that the system is accurate and function design is correct.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I agree the system design is flexible, that user enable to require new function when I think it is essential for our business.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

The system is so steady that rarely occurs shut down or can't be operated.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

I agree that the system function is integrated with process.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
when it comes to paper work, the efficiency of use of system is much higher than the conventional	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
This system operation is very smooth, the speed of system response meets expectation. It doesn't take too much time if I operate the system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
I don't need to wait for a long time while I tend to use the system to inquire data or to produce report.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

B. Information Quality

I agree information and data delivered by the system is important to me	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Information and data given by the system is relevant to procedure and process.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Information delivered by the system is sufficient enough that I don't need to look up other sources.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
The data or information delivered by the system helps me to do given jobs.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Data is clear and understandable	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Documents produced by the system are match to regular format	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Data and information delivered by the system are correct, reliable and certified free of error	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
information is presented in the same format and compatible with previous data	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Information is compactly represented without being overwhelming	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
The system always can delivered t data and free of recheck by hand	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Information and data delivered by the system is up to date, so that I can catch up soon and continuously developing business	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

The availability of the system output is suitable for its use at a time	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Outputs delivered by the system are easily to be substituted by other in-kind system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
The information delivered by the system are comparable that able to be switched information between objectives.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Information is unbiased, unprejudiced and impartial	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

C. System Usage

	1	2	3	4	5	6
How long have you been using the system (1 means less than 1 years, 5 means more or equal to 5 years)	☐	☐	☐	☐	☐	☐
How many times do you inquire data or information from the system (1 means never, 5 means always)	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
I how many time do you connect to the system (1 means never, 5 means always)	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
How many functions have you been using so far (answer in percentage 1: 20%, 2: 40%, 3: 60%, 4: 80%, 5: 100%)	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
How many reports/documents you address from the system (such as certification or invoice, 1 means less than 10 per working day, 5 means more than 100 per working day)	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐

D. User Satisfaction

	1	2	3	4	5	6
Are you satisfy with relationship between IT specialists and engineers	☐	☐	☐	☐	☐	☐
Are you satisfied with system's functions and outputs	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
Do you think this system provided all the information you need	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
To what extent, do you like function and features of the system	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐
To what extent, do you adopt data or information provided by the system to make decision?	1 2 3 4 5 6					
	☐	☐	☐	☐	☐	☐

E. Individual Impact

I understand the information that the system provided to me	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
I didn't encounter any difficulties while I using the system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
I can completely interpret the information provided by the system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Now I know that information technology is helpful and important to my business	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
When I found a mistake in report or document, I could identify problem easily and solve it through system	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
In terms of the system assistance, I would not give a wrong judgment.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
In terms of the system assistance, I can help department heads to decide accurately better.	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
In terms of the system assistance, I am more efficiency than before,	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Learned from information and data provided by the system, now we improve process to meet public demands	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐
Now we predict public demands more capable than before, and plan before hand to address demands	1	2	3	4	5	6
	☐	☐	☐	☐	☐	☐

F. Aid effectiveness and valuation

1. Individual power of influence	Now I think I am able to improve our department performance, provide better services for people.
2. Personal valuation of I/S	If I am department head, how much budget I am willing to pay for this system which included services. Please give a number form the lowest to the highest price.
3. Willing to pay for information	If you need to pay to obtain document/ report/ information, how much money do you willing to pay from the lowest to the highest price.
4. Policy and consensus	In your opinions, to what extent, e- Government policy has become the consensus of various departments.
5. Objective setting and action plan	Do departments have set the target path of e-government? Are they aware that regulations and procedures that should be adjusted in order to create enable environment.

C

Appendix 6.   Project Expenditure List

年度	Subjective	Items	NTD$	USD$	NTD$ Sum up by items	USD$ Sum up by items	Total Sum up by items
96	Personnel	Compensation for resident project manager	$2,125,604.00	$0.00	$2,125,604.00		
	e-Government installation	ICT center and payment 3, 4 to Contractors	$12,150,668.00	$0.00	$14,276,272.00		
	Travel expenditures	Ticket purchased for Project manager and travel subsidy	$469,620.00	$0.00	$12,620,288.00		
	Round up		$14,745,892.00	$0.00	$14,745,892.00		$14,745,892.00
97	Personnel	On-site project managers salary and insurance expense Project assistance salary and insurance expense	$484,784.00	$0.00	$15,230,676.00	$0.00	
	e-Government installation	St. Kitts & Nevis ICT center operation expense; Contract installment (ICDF-2008-038) full payment; Constract Instalment(ICDF-2008-025) Payment I & II	$42,813,038.00	$194,996.14	$58,043,714.00	$194,996.14	
	Travel expenditures	鐘玄清技師川裝費； Project associate joined in ICT confernece	$407,301.00	$9,553.35	$58,451,015.00	$204,549.49	
	Equipment procurement	ICT center established in St. Kitts	$397,341.00	$206,335.07	$58,848,356.00	$410,884.56	$57,456,212.20
	Round up		$44,102,464.00	$410,884.56		$13,353,748.20	

98	Personnel cost	Project assistance salary and insurance fee	$505,856.00	$0.00	$59,354,212.00	$410,884.56	
	e-Government installation	Installment (ICDF-2009-032), Full payment(phase I to IV) Installment (ICDF-2009-058), Full payment(phase I, II)	$30,396,110.00	$0.00	$89,750,322.00	$410,884.56	
	Travel expenditures		$581,600.00	$0.00	$90,331,922.00		
	Equipment procurement		$9,393,890.00	$0.00	$99,725,812.00		
	Round up		$40,877,456.00	$0.00			$40,877,456.00
99	Personnel	Project manager and assistance salary and insurance fee	$594,199.00	$0.00	$100,320,011.00		
	e-Government installation	Contract Installment (ICDF-099-019) ; full payment Contract Ibstallnent (ICDF-099-055) ; Phase I	$20,961,288.00	$0.00	$121,281,299.00		
	Travel expenditures		$550,010.00	$0.00	$121,831,309.00		
	Round up		$22,105,497.00				$22,105,497.00
100	Personnel	Project manager and assistance salary and insurance (some portion was shared by 2010)	$2,114,897.00		$123,946,206.00		
	e-Govern	Contract Installment	$21,376,152.		$145,322,35		

ment installation	(ICDF-100-025)	00		8.00		
Travel expenditures		$1,180,246.00	17292.85	$146,502,604.00		
當年度小計		$24,671,295.00	$17,292.85	$171,173,899.00	$410,884.56	$25,172,787.65
	01:29					
101	Personnel cost	Project manager and assistance salary and insurance (some portion was shared by 2010)	$2,587,359.00	$25,461.40		$436,345.96	
	e-Government installation	Contract Installment (ICDF-101-018) for Consultant services Contract Installment (ICDF-101-045) for Capacity Building Contract Installment (ICDF-101-038) for Application design and installment	$20,417,937.00	$88,600.70		$524,946.66	
	Travel expenditures		$24,155,922.00				
	Round up		$47,161,218.00	$114,062.10			$50,469,018.90

Appendix 7 Project Implementation Records

(2007-) Appraisal work items	(2008-2012) Actual work items	Implementation Agency	Executive Agency	Consultant	2008 莊士民專案經理 駐克：李勝廣	2009 劉正偉專案經理/ 何美滿專案經理 駐克：李勝廣 駐露：郭慧莉	2010 何美滿專案經理/ 林幸儀專案經理 駐克：李勝廣 駐露：郭慧莉	2011 林幸儀專案經理 駐克：李勝廣 駐露：郭慧莉	2012 林幸儀專案經理/ 傅建維專案經理 駐克：李勝廣 駐露：郭慧莉	結案後狀態
ST KITTS & Nevis ICT 中心建置 政府網路基礎服務（DNS Server, E-mail server, Directory service server） 科技部E化系統（Human Resource System） 國家入口網站、科技部、外交部	Human Resource system	Governance Improvement Unit	Department of Information Technology(2007-)	建置：工研院 (2007) 監督：工研院 (2005-2006)、惠普 (2008-2010)、資拓宏宇(2011-2012)			系統功能使用數/率：5/83%	人事資料更新 107 筆/月	結案移交，使用率低	系統使用狀況不明
	Vechicle Registration System	St Kitts & Nevis Police Force/ Inland revenue office	Department of Information Technology	建置：惠普(2008) 監督：惠普 (2008-2010)、資拓宏宇(2011-2012)	建置	測試與修正	系統測試 車輛登記數 59/月	車輛登記 50/月	資料之歸屬(ownership)所衍生之資料正確性與權責問題待克國 IRD 財稅部門與 TD 交通部門協商與釐清…資料移轉測試人員與協調人似乎未能有效合作(資拓宏宇，2012)	克方將系統委由當地軟體公司維護
	Health Information System	JNF Hospital	Department of Information Technology	建置：惠普(2008) 監督：惠普 (2008-2010)、資拓宏宇(2011-2014)	建置	測試與修正	使用功能數 18/100% 掛號人數 2825 人次/月	掛號人數 1765 人/月	結案，JNF 全院資訊化為新計畫之主軸，系統使用效率高	該系統為 2013 年起執行之聖克里斯多福資通訊計畫主體，持續協助 JNF 醫院管理電子化暨醫療管理流程改善案
St Lucia 台露建交後，本案顧問即由工研院改為惠普，露國系統建置建議皆為惠普所設計	Advanced Transport Licensing Authority System	Traffic Dept.	National Information Communication and Technology center(2008-)	建置：惠普(2008) 監督：惠普 (2008-2010)、資拓宏宇(2011-2012)	建置	測試與修正	系統使用率 47% 車輛登記為 0 筆 駕照發行/1705 月 駕駛資料更新 /1883 筆	924 筆/月駕駛人資料更新 955 筆/月駕照印製 車輛登記 0 筆	ATLAS 新增車牌、車零件等四項功能後結案移交	交通部資通訊人員自行維護
	Crime Management System	Royal St. Lucia Police Office	National Information Communication and Technology center(2008-)	建置：惠普(2008) 監督：惠普 (2008-2010)、資拓宏宇(2011-2012)	建置	測試與修正	系統使用功能數/率：20/42.9% 分配案件查詢 1392 次/月 案件查詢 1319 次月 羈押犯人查詢 203 次/月 案件調整查詢 243 次/月	598 使用者 報案紀錄 1215 筆/月 案件分配 4425 筆/月 案件查詢 3879 筆/月	CMS 新增在押嫌犯與證物保管等新增功能，結案由使用單位自行維護	警察 IT 部門人員自行維護

國家	計畫	System	Unit	建置單位	建置/監督		狀態	資料量1	資料量2	備註	維護
		Civil Status Registry System	Ministry of Justice	National Information Communication and Technology center(2008-)	建置：惠普(2008) 監督：惠普(2008-2010)、資拓宏宇(2011-2012)		建置	補登 3095 筆新生兒資料	補登 4332 新生兒資料 出生資料確認 109 筆/年 當年度新出生資料 3304 筆	使用率偏低，本年度顧問團隊與專案經理出訪皆未安排系統使用訪談。（資拓宏宇，2011)	司法部門資訊人員自行維護
		Agriculture Resource System	Ministry of Agriculture	National Information Communication and Technology center(2008-2012)	建置：惠普(2009) 監督：惠普(2009-2010)、資拓宏宇(2011-2012)		建置	農產品監控 216 筆 農產市場資料率 1365 筆/月	出口資訊 0 筆 農產市場資料 62533 筆/月 農夫資料 57 筆/月 農作施作 15 筆/月 農作收穫 5 筆/月	系統已取代農部推廣部門既有系統	農部人員自行維護
Belize	建置 ICT 中心、移民局網路基礎服務、Broader Management system、政府網站：外交部	Archives Information Management System	Belize Archieves and Record Service, Ministry of Tourism	Ministry of the Public service (2007-2012)	建置：惠普(2009) 監督：惠普(2009-2010)、資拓宏宇(2011-2012)		建置	移民資料 5166 筆、警察資料 1636 筆	49143 筆資料轉入作業 檔案外借 7 件/月 檔案輸入 365 件/月	貝方研擬運用開放原始碼軟體 AtoM 改善或擴充系統功能	檔管局人員自行維護
		Supplies Control Unit Database	Belize Bureau of Standards, Ministry of Economic Development, Commerce and Consumre Protection.	Ministry of the Public service (2007-2012)	建置：惠普(2008) 監督：惠普(2008-2010)、資拓宏宇(2011-2012)	建置	測試修正	3238 筆非農進口申報資料、2 進口商使用系統申報	非農產品紙本/線上作業比為 171/700 電腦作業每月 31 件 系統申請 18 件/月 系統審查 11 件/月 系統核准 0 件/月、不核准 0 件/月	該系統與聯合國「海關數據自動化系統」(Automated System for Customs Data，ASYCUDA) 進行資料界接之可行方式。	2013 年起執行之新計畫
		Gaming & EPZ Database System	Investment Unit, Ministry of Economic Development, Commerce and Consumre Protection.	Ministry of the Public service (2007-2012)	建置：惠普(2008) 監督：惠普(2008-2010)、資拓宏宇(2011-2012)	建置	測試修正	3554 機台資料，新增資料 84/月	資料更新 508 件/月	使用率偏低，顧問團隊與專案經理出訪皆未安排系統使用訪談(資拓宏宇，2012)	使用狀況未明

Appendix 8 UN e-Government Ranking from 2001 to 2013

Broadband subscribers (per 100)

Broad band users growth rate ，The World Bank

ICT Exports

ICT Products Import/Export，The World Bank

ICT Services Import/Export ，The World Bank

Internet Users (per 100 people)

Internet users (per 100 people) ，The World Bank

Secure Internet server
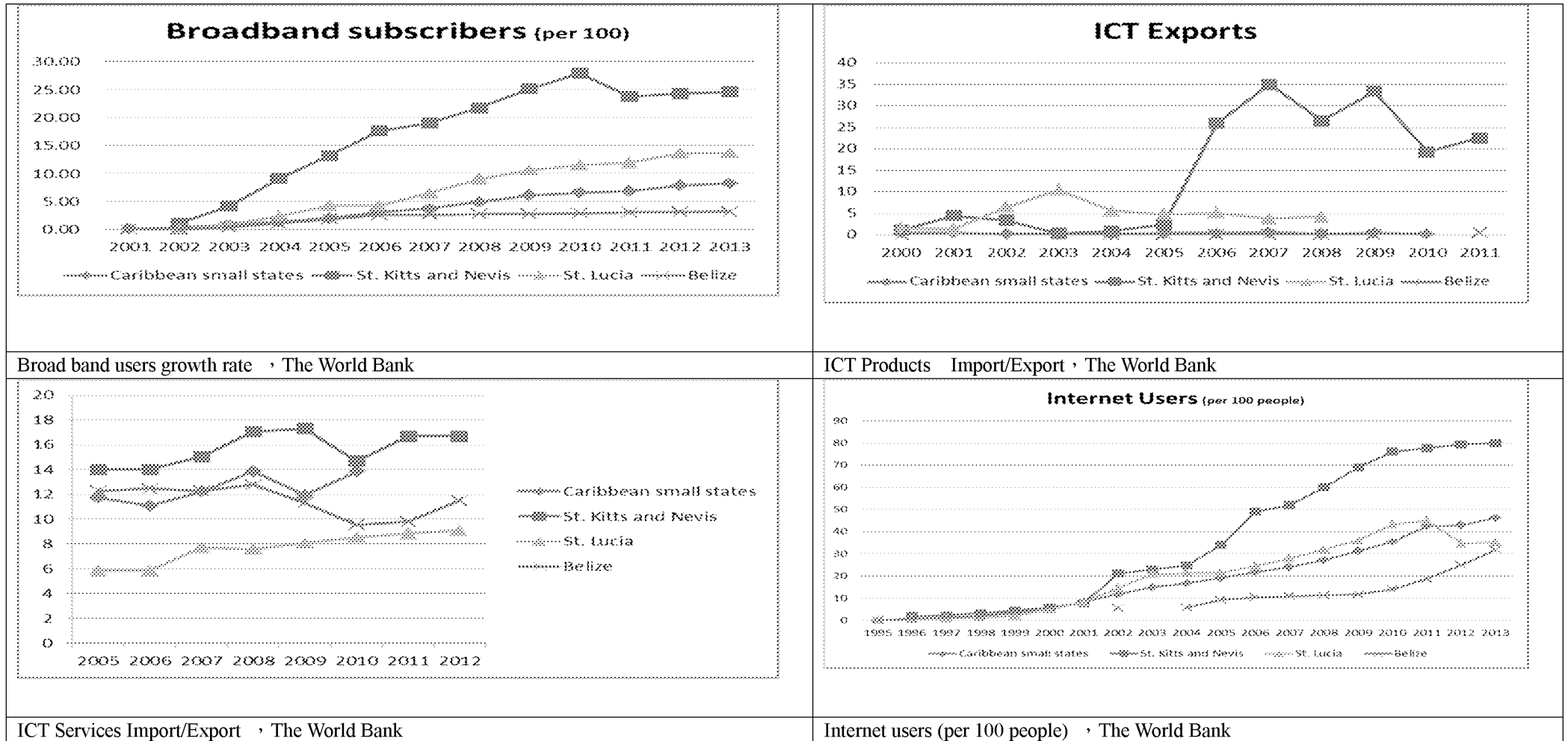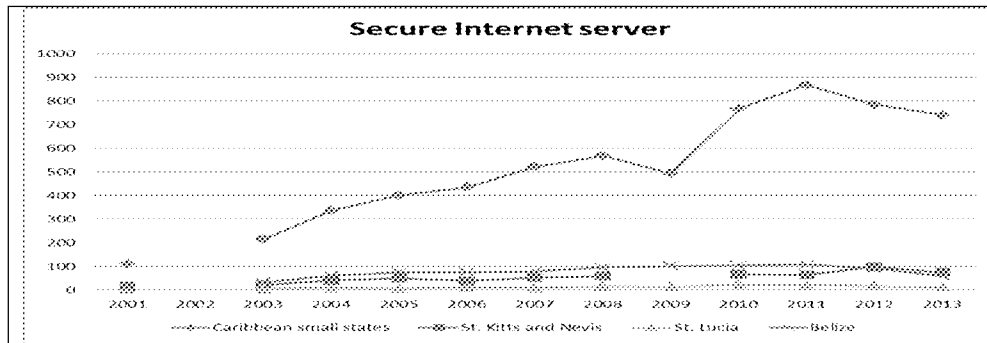
The growth of Secure Internet server The World Bank

Telephone lines (per 100 people)
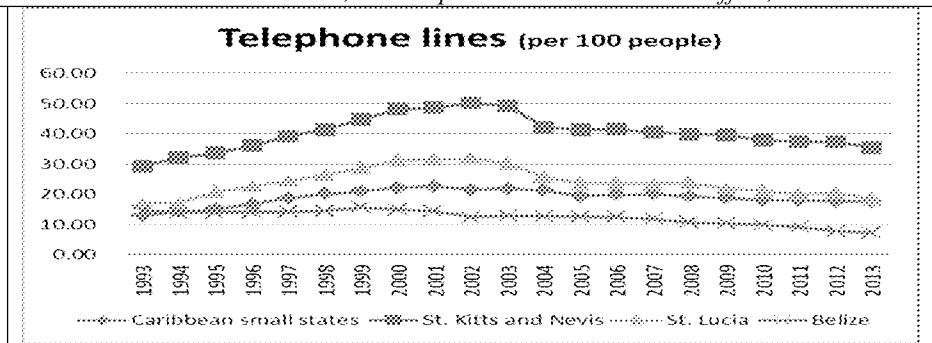
Land Lines per 100 people，The World Bank
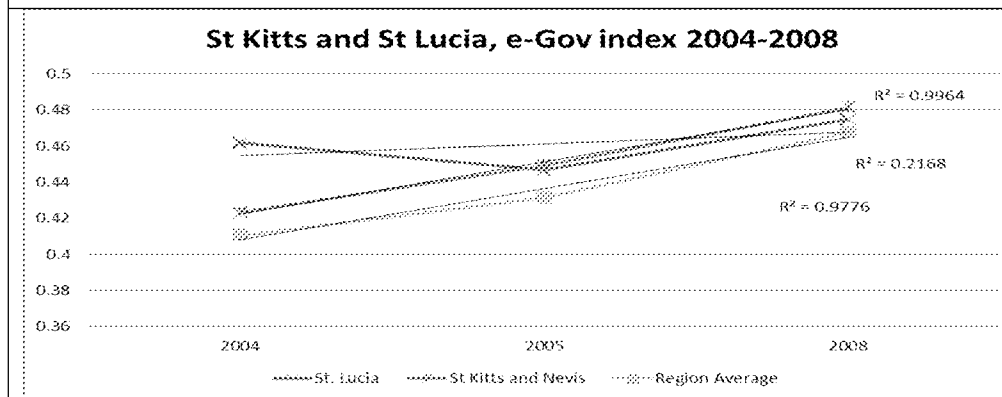
St Kitts and St Lucia, e-Gov index 2004-2008

UN e-Government index. St. Kitts & Nevis and St Lucia compared with Regional AVG

St Kitts and St Lucia, 2010-2014

UN e-Government index. St. Kitts & Nevis and St Lucia compared with Regional AVG

Belize and CA, e-Gov Index 2004-2008

UN e-Government index. Belize compared with Regional AVG

Belize and CA, e-Gov index 2008-2014
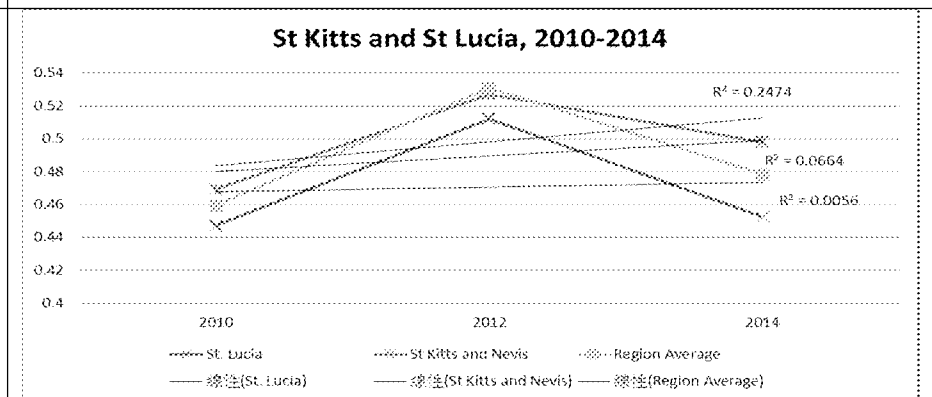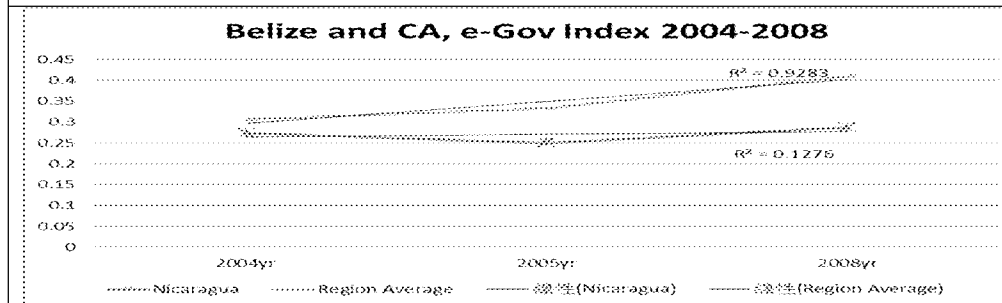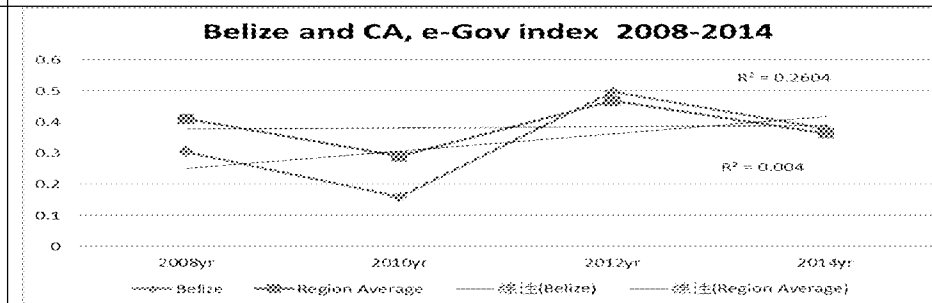
UN e-Government index. Belize compared with Regional AVG

Appendix 9 Evaluation Survey Results

System Quality

		Correctness	Sufficiency	Convenience	Availability	Ease to use	Process	Functional affirmative	Information Correct	Adjust	Stability	Integration	Better than paper based	Smooth	Reaction
Valued answer	Effective	30	30	30	30	30	30	30	30	30	30	30	30	30	30
	Lost	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean			3.8333	4.7000	3.0667	4.3667	4.1000	4.5000	3.9667	4.0333	3.3000	3.9333	4.0667	3.3000	3.5000
Median			4.0000	5.0000	3.0000	5.0000	4.0000	5.0000	4.0000	4.0000	3.5000	4.0000	4.0000	3.0000	4.0000

Information Quality

		Data correct	Document	Data Credibility	Data correctness	Informative	Convenience to get output	Update on time	Data availability	Substantive	Comparative	Free from missing
Valued answer	Effective	30	30	30	30	30	30	30	30	30	30	30
	Lost	0	0	0	0	0	0	0	0	0	0	0
Mean			4.1667	4.1333	4.4000	4.5000	4.2667	4.0000	4.0000	3.8000	4.0000	4.7667
Median			4.0000	4.0000	5.0000	4.0000	4.0000	4.0000	4.0000	4.0000	4.0000	5.0000

System Usage

		Experience	Frequency	Connection	Savvy in system	Document adoption
Valued answer	Effective	30	30	30	30	30
	Lost	0	0	0	0	0
Mean			3.9000	4.1000	3.3333	2.6000
Median			4.5000	5.0000	3.0000	2.0000

System Satisfaction

		IT engineers	Functionality	Information quality	Function affirmative	For decision making
Valued answer	Effective	30	30	30	30	30
	Lost	0	0	0	0	0
Mean		3.6333	3.4000	3.5667	4.0000	3.6667
Median		4.0000	3.0000	4.0000	4.0000	3.5000

Individual Impact

		Importance of IT	Prevent from mistakes	Judge correctly	Assistant to decision making	Improving work efficiency	Improve service quality	Predict	Comprehensive	Savvy in operation (check)	Savvy in function
Valued answer	Effective	30	30	30	30	30	30	30	30	30	30
	Lost	0	0	0	0	0	0	0	0	0	0
Mean			3.5667	4.3667	4.4333	4.2000	4.0000	3.9000	4.7667	3.5000	4.7000
Median			4.0000	4.0000	5.0000	4.0000	4.0000	4.0000	5.0000	4.0000	5.0000

Correctness

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	1	3.3	3.3	3.3
	3.00 acceptable	4	13.3	13.3	16.7
	4.00 good	11	36.7	36.7	53.3
	5.00 satisfy	8	26.7	26.7	80.0
	6.00 excellent	6	20.0	20.0	100.0
	總和	30	100.0	100.0	

Sufficiency

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	3	10.0	10.0	13.3
	3.00 acceptable	9	30.0	30.0	43.3
	4.00 good	7	23.3	23.3	66.7
	5.00 satisfy	7	23.3	23.3	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Convenience

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	1	3.3	3.3	3.3
	3.00 acceptable	5	16.7	16.7	20.0
	4.00 good	5	16.7	16.7	36.7
	5.00 satisfy	10	33.3	33.3	70.0
	6.00 excellent	9	30.0	30.0	100.0
	總和	30	100.0	100.0	

Availability

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	4	13.3	13.3	13.3
	2.00 fair	5	16.7	16.7	30.0

		Quantity	%	Valued %	Accm %
	3.00 acceptable	9	30.0	30.0	60.0
	4.00 good	10	33.3	33.3	93.3
	5.00 satisfy	1	3.3	3.3	96.7
	6.00 excellent	1	3.3	3.3	100.0
	總和	30	100.0	100.0	

Ease to Use

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	3	10.0	10.0	10.0
	3.00 acceptable	4	13.3	13.3	23.3
	4.00 good	7	23.3	23.3	46.7
	5.00 satisfy	11	36.7	36.7	83.3
	6.00 excellent	5	16.7	16.7	100.0
	總和	30	100.0	100.0	

Process affirmative

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	1	3.3	3.3	10.0
	3.00 acceptable	6	20.0	20.0	30.0
	4.00 good	7	23.3	23.3	53.3
	5.00 satisfy	11	36.7	36.7	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Functional Affirmative

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	3	10.0	10.0	10.0
	3.00 acceptable	4	13.3	13.3	23.3
	4.00 good	4	13.3	13.3	36.7
	5.00 satisfy	13	43.3	43.3	80.0
	6.00 excellent	6	20.0	20.0	100.0
	總和	30	100.0	100.0	

Correctness

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	5	16.7	16.7	16.7
	3.00 acceptable	7	23.3	23.3	40.0
	4.00 good	4	13.3	13.3	53.3
	5.00 satisfy	12	40.0	40.0	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Ease to Adjust

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	3	10.0	10.0	10.0
	3.00 acceptable	7	23.3	23.3	33.3
	4.00 good	8	26.7	26.7	60.0
	5.00 satisfy	10	33.3	33.3	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Stability

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	3	10.0	10.0	10.0
	2.00 fair	5	16.7	16.7	26.7
	3.00 acceptable	7	23.3	23.3	50.0
	4.00 good	11	36.7	36.7	86.7
	5.00 satisfy	3	10.0	10.0	96.7
	6.00 excellent	1	3.3	3.3	100.0
	總和	30	100.0	100.0	

System and Process Integration

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	3	10.0	10.0	10.0
	3.00 acceptable	8	26.7	26.7	36.7
	4.00 good	10	33.3	33.3	70.0
	5.00 satisfy	6	20.0	20.0	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

More convenience than Paper based operation

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	3	10.0	10.0	10.0
	3.00 acceptable	5	16.7	16.7	26.7
	4.00 good	12	40.0	40.0	66.7
	5.00 satisfy	7	23.3	23.3	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Operation Smooth

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	5	16.7	16.7	16.7
	2.00 fair	3	10.0	10.0	26.7
	3.00 acceptable	8	26.7	26.7	53.3
	4.00 good	8	26.7	26.7	80.0
	5.00 satisfy	4	13.3	13.3	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Reacting time

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	6	20.0	20.0	26.7

3.00 acceptable	4	13.3	13.3	40.0
4.00 good	13	43.3	43.3	83.3
5.00 satisfy	3	10.0	10.0	93.3
6.00 excellent	2	6.7	6.7	100.0
總和	30	100.0	100.0	

Data Correct

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	1	3.3	3.3	6.7
	3.00 acceptable	4	13.3	13.3	20.0
有效的	4.00 good	3	10.0	10.0	30.0
	5.00 satisfy	9	30.0	30.0	60.0
	6.00 excellent	12	40.0	40.0	100.0
	總和	30	100.0	100.0	

Document matched to process

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	3.00 acceptable	2	6.7	6.7	10.0
	4.00 good	8	26.7	26.7	36.7
有效的	5.00 satisfy	9	30.0	30.0	66.7
	6.00 excellent	10	33.3	33.3	100.0
	總和	30	100.0	100.0	

資訊產出便利度

		Quantity	%	Valued %	Accm %
	2.00 fair	2	6.7	6.7	6.7
	3.00 acceptable	10	33.3	33.3	40.0
	4.00 good	8	26.7	26.7	66.7
有效的	5.00 satisfy	6	20.0	20.0	86.7
	6.00 excellent	4	13.3	13.3	100.0
	總和	30	100.0	100.0	

Assist to conduct routines

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	2	6.7	6.7	13.3
	3.00 acceptable	5	16.7	16.7	30.0
	4.00 good	7	23.3	23.3	53.3
	5.00 satisfy	9	30.0	30.0	83.3
	6.00 excellent	5	16.7	16.7	100.0
	總和	30	100.0	100.0	

Data Credibility

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	3	10.0	10.0	13.3
	3.00 acceptable	3	10.0	10.0	23.3
	4.00 good	11	36.7	36.7	60.0
	5.00 satisfy	8	26.7	26.7	86.7
	6.00 excellent	4	13.3	13.3	100.0
	總和	30	100.0	100.0	

Data correct and comparable

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	2	6.7	6.7	6.7
	3.00 acceptable	6	20.0	20.0	26.7
	4.00 good	6	20.0	20.0	46.7
	5.00 satisfy	10	33.3	33.3	80.0
	6.00 excellent	6	20.0	20.0	100.0
	總和	30	100.0	100.0	

Informative

		Quantity	%	Valued %	Accm %
	3.00 acceptable	5	16.7	16.7	16.7
	4.00 good	11	36.7	36.7	53.3
有效的	5.00 satisfy	8	26.7	26.7	80.0
	6.00 excellent	6	20.0	20.0	100.0
	總和	30	100.0	100.0	

Convenience to get outputs

		Quantity	%	Valued %	Accm %
	3.00 acceptable	8	26.7	26.7	26.7
	4.00 good	11	36.7	36.7	63.3
有效的	5.00 satisfy	6	20.0	20.0	83.3
	6.00 excellent	5	16.7	16.7	100.0
	總和	30	100.0	100.0	

Update on time

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	3	10.0	10.0	13.3
	3.00 acceptable	4	13.3	13.3	26.7
有效的	4.00 good	11	36.7	36.7	63.3
	5.00 satisfy	9	30.0	30.0	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Information Availability

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	3	10.0	10.0	13.3

		Quantity	%	Valued %	Accm %
	3.00 acceptable	7	23.3	23.3	36.7
	4.00 good	6	20.0	20.0	56.7
	5.00 satisfy	10	33.3	33.3	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Data Substantive

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	1	3.3	3.3	6.7
	3.00 acceptable	11	36.7	36.7	43.3
有效的	4.00 good	9	30.0	30.0	73.3
	5.00 satisfy	6	20.0	20.0	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Data comparability

		Quantity	%	Valued %	Accm %
	3.00 acceptable	12	40.0	40.0	40.0
	4.00 good	9	30.0	30.0	70.0
有效的	5.00 satisfy	6	20.0	20.0	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Complete and free from errors

		Quantity	%	Valued %	Accm %
	1.00 poor	2	6.7	6.7	6.7
	3.00 acceptable	3	10.0	10.0	16.7
	4.00 good	4	13.3	13.3	30.0
有效的	5.00 satisfy	10	33.3	33.3	63.3
	6.00 excellent	11	36.7	36.7	100.0
	總和	30	100.0	100.0	

Experience (System Operation)

		Quantity	%	Valued %	Accm %
有效的	1.00 年	5	16.7	16.7	16.7
	2.00 年	4	13.3	13.3	30.0
	3.00 年	8	26.7	26.7	56.7
	4.00 年	5	16.7	16.7	73.3
	5.00 年	6	20.0	20.0	93.3
	6.00 5年以上	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Frequent use by week

		Quantity	%	Valued %	Accm %
有效的	1.00 少於1次	2	6.7	6.7	6.7
	2.00 2次	3	10.0	10.0	16.7
	3.00 3次	9	30.0	30.0	46.7
	4.00 4次	1	3.3	3.3	50.0
	5.00 5次	12	40.0	40.0	90.0
	6.00 5次以上	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Connection rate by internet

		Quantity	%	Valued %	Accm %
有效的	1.00 少於1次	2	6.7	6.7	6.7
	2.00 2次	3	10.0	10.0	16.7
	3.00 3次	5	16.7	16.7	33.3
	4.00 4次	3	10.0	10.0	43.3
	5.00 5次	14	46.7	46.7	90.0
	6.00 五次以上	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Savvy in system operation

	Quantity	%	Valued %	Accm %

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	4	13.3	13.3	13.3
	2.00 fair	5	16.7	16.7	30.0
	3.00 acceptable	7	23.3	23.3	53.3
	4.00 good	7	23.3	23.3	76.7
	5.00 satisfy	5	16.7	16.7	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Satisfaction to document

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	12	40.0	40.0	40.0
	2.00 fair	5	16.7	16.7	56.7
	3.00 acceptable	2	6.7	6.7	63.3
	4.00 good	6	20.0	20.0	83.3
	5.00 satisfy	4	13.3	13.3	96.7
	6.00 excellent	1	3.3	3.3	100.0
	總和	30	100.0	100.0	

IT engineers Satisfaction

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	4	13.3	13.3	20.0
	3.00 acceptable	8	26.7	26.7	46.7
	4.00 good	10	33.3	33.3	80.0
	5.00 satisfy	1	3.3	3.3	83.3
	6.00 excellent	5	16.7	16.7	100.0
	總和	30	100.0	100.0	

System Satisfactio

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	5	16.7	16.7	23.3

	3.00 acceptable	9	30.0	30.0	53.3
	4.00 good	8	26.7	26.7	80.0
	5.00 satisfy	5	16.7	16.7	96.7
	6.00 excellent	1	3.3	3.3	100.0
	總和	30	100.0	100.0	

System Quality Satisfaction

		Quantity	%	Valued %	Accm %
	1.00 poor	2	6.7	6.7	6.7
	2.00 fair	6	20.0	20.0	26.7
	3.00 acceptable	5	16.7	16.7	43.3
有效的	4.00 good	9	30.0	30.0	73.3
	5.00 satisfy	6	20.0	20.0	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

Satisfaction to operation

		Quantity	%	Valued %	Accm %
	2.00 fair	2	6.7	6.7	6.7
	3.00 acceptable	9	30.0	30.0	36.7
	4.00 good	8	26.7	26.7	63.3
有效的	5.00 satisfy	9	30.0	30.0	93.3
	6.00 excellent	2	6.7	6.7	100.0
	總和	30	100.0	100.0	

For assist the decision making

		Quantity	%	Valued %	Accm %
	1.00 poor	3	10.0	10.0	10.0
	2.00 fair	3	10.0	10.0	20.0
有效的	3.00 acceptable	9	30.0	30.0	50.0
	4.00 good	5	16.7	16.7	66.7
	5.00 satisfy	6	20.0	20.0	86.7

		Quantity	%	Valued %	Accm %
	6.00 excellent	4	13.3	13.3	100.0
	總和	30	100.0	100.0	

Corrective

		Quantity	%	Valued %	Accm %
有效的	2.00 fair	1	3.3	3.3	3.3
	3.00 acceptable	2	6.7	6.7	10.0
	4.00 good	9	30.0	30.0	40.0
	5.00 satisfy	9	30.0	30.0	70.0
	6.00 excellent	9	30.0	30.0	100.0
	總和	30	100.0	100.0	

Savvy in system function

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	3	10.0	10.0	10.0
	2.00 fair	4	13.3	13.3	23.3
	3.00 acceptable	7	23.3	23.3	46.7
	4.00 good	8	26.7	26.7	73.3
	5.00 satisfy	7	23.3	23.3	96.7
	6.00 excellent	1	3.3	3.3	100.0
	總和	30	100.0	100.0	

Savvy in system function

		Quantity	%	Valued %	Accm %
有效的	3.00 acceptable	6	20.0	20.0	20.0
	4.00 good	5	16.7	16.7	36.7
	5.00 satisfy	11	36.7	36.7	73.3
	6.00 excellent	8	26.7	26.7	100.0
	總和	30	100.0	100.0	

Important to work arrangements

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	1	3.3	3.3	6.7
	4.00 good	6	20.0	20.0	26.7
	5.00 satisfy	7	23.3	23.3	50.0
	6.00 excellent	15	50.0	50.0	100.0
	總和	30	100.0	100.0	

Prevent form errors

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	5	16.7	16.7	16.7
	2.00 fair	2	6.7	6.7	23.3
	3.00 acceptable	6	20.0	20.0	43.3
	4.00 good	8	26.7	26.7	70.0
	5.00 satisfy	6	20.0	20.0	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Assist to make correct judgment

		Quantity	%	Valued %	Accm %
有效的	3.00 acceptable	8	26.7	26.7	26.7
	4.00 good	9	30.0	30.0	56.7
	5.00 satisfy	7	23.3	23.3	80.0
	6.00 excellent	6	20.0	20.0	100.0
	總和	30	100.0	100.0	

Assist to decision making

		Quantity	%	Valued %	Accm %
有效的	1.00 poor	1	3.3	3.3	3.3
	3.00 acceptable	4	13.3	13.3	16.7

		Quantity	%	Valued %	Accm %
	4.00 good	9	30.0	30.0	46.7
	5.00 satisfy	12	40.0	40.0	86.7
	6.00 excellent	4	13.3	13.3	100.0
	總和	30	100.0	100.0	

Upgrade system efficiency

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	2	6.7	6.7	10.0
	3.00 acceptable	6	20.0	20.0	30.0
有效的	4.00 good	7	23.3	23.3	53.3
	5.00 satisfy	9	30.0	30.0	83.3
	6.00 excellent	5	16.7	16.7	100.0
	總和	30	100.0	100.0	

Improve service quality

		Quantity	%	Valued %	Accm %
	2.00 fair	4	13.3	13.3	13.3
	3.00 acceptable	7	23.3	23.3	36.7
有效的	4.00 good	7	23.3	23.3	60.0
	5.00 satisfy	9	30.0	30.0	90.0
	6.00 excellent	3	10.0	10.0	100.0
	總和	30	100.0	100.0	

Predict business trends

		Quantity	%	Valued %	Accm %
	1.00 poor	1	3.3	3.3	3.3
	2.00 fair	4	13.3	13.3	16.7
	3.00 acceptable	6	20.0	20.0	36.7
有效的	4.00 good	9	30.0	30.0	66.7
	5.00 satisfy	6	20.0	20.0	86.7
	6.00 excellent	4	13.3	13.3	100.0
	總和	30	100.0	100.0	