UNITED NATIONS ESCAP / APCICT

ICT Project Management in Theory and Practice

United Nations Asian and Pacific Training Centre for Information and Communication Technology for Development (APCICT)

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Summary

Projects that focus on the effective use of information and communications technology for development (ICTD) have emerged in the last three decades of the 20th century. Studies have shown that ICTD projects have a high failure rate, in part because of poor project design and management. Government leaders must understand the process of managing projects and be aware of the tools available to raise project success rates. This briefing note begins by introducing three vital elements of ICTD projects - people, process, and technology. Defining, balancing, and integrating these elements can result in optimum project performance. This briefing note also provides a set of disciplines or instructions for project managers to develop project management competencies and standards. Principles and issues that contribute to project success and sustainability are briefly discussed.

This briefing note is drawn from the seventh module of the Academy of ICT Essentials for Government Leaders (Academy). The Academy is a comprehen- sive ICT for development training curriculum that aims to equip policy- makers with the essential knowledge and skills to fully leverage opportunities presented by ICT to achieve national development goals and bridge the digital divide. More information on the Academy is available at http://www.unapcict.org/academy.

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Module 7 - ICT Project Management in Theory and Practice
Introduces project management concepts that are relevant to ICTD projects, including the methods, processes and project management disciplines commonly used.

Participants caucusing in a team project session during the workshop on "Academy of ICT Essentials for Government Leaders", Module 7, ICT Project Management in Theory and Practice, co-organized by UN-APCICT/ESCAP and the Information and Communications Public Management School (ICS) of the Ministry of Information and Communications (MIC) in Hanoi, Viet Nam (April 2010)

The APCICT Briefing Note Series aims to provide at-a-glance information on key information and communication technology for development (ICTD) agendas for high-level policymakers and stakeholders. The series includes: 1) highlights of conventional research papers, assessment and survey reports and publications; 2) policy considerations drawn from the Academy modules; and 3) key challenges and lessons learned based on analyses of best practices and case studies.

1 Introduction

Information and communications technology for development (ICTD) projects are often mistakenly thought of as a set of activities requiring only hardware, networking systems, software and applications with the end goal of introducing technological changes. In fact, however, there is a substantial amount of human activity in these projects, and each project is or should be anchored on the larger goals of the organization. In large and complex ICTD programmes, the acquisition of ICT applications is only one of the tasks or sub-projects. ICTD projects are not standalone activities but part of an integrated whole (i.e. a programme, a component, a strategy or a strategic plan).

Studies indicate that managing ICTD projects is quite challenging. A 2005 World Bank study estimates that the majority of public sector ICT applications in least developed countries are either partial or total failures. One of the reasons for failure is poor project design and management. The resources invested in the project, the process, as well as the product (i.e. the outputs or deliverables) should be managed responsibly.

2 ICTD Projects

ICTD projects are similar to conventional projects in that they are transitory undertakings that use resources, incur costs, and are expected to produce deliverables over a period of time. Projects are meant to solve problems and meet challenges. They may also serve as test cases and proofs of concept or take-off points for developing new solutions. In ICTD projects, ICT-based solutions are developed that meet needs or address a problem. These projects

introduce processes and methodologies that are supported by ICT. They introduce technological changes in an organization that are intended to be beneficial to the organization and its target group. Some ICTD projects address and support larger development goals such as the Millennium Development Goals.

Given the constraints of funds, time and resources, policymakers need to be able to manage ICTD projects well, to raise their success rates, provide benefits for people and their organizations, and improve the quality of life of citizens.

3 ICTD Project Management

Various definitions of project management indicate that:

- Project management is a method, a discipline, and a process.
- It has a set of tools for planning, implementing, maintaining, monitoring, and evaluating progress of activities.
- It defines what has to be accomplished in line with larger goals and objectives of the organization.
- The major challenges in project management are managing the project scope and resources, particularly time, cost and people.

Good project management practice observes the different phases of project management, namely: Planning, Implementation, Monitoring and Evaluation. Other terms are sometimes used to refer to these phases, depending on the school of thought or project management reference standards used. In each phase are signals or checkpoints, called 'milestones', that herald the start or finish of each phase.

4 Vital Factors of Project Management

The vital factors of project management are elements or variables that impact on the quality and speed of a project. These are people, process and technology. Defining, balancing, and integrating these elements can result in the project's optimum performance.

People

Projects are developed, managed, and implemented by people. More specifically, projects have component processes and activities that require competent professionals to work together as a team. Project managers have to have a clear understanding of the roles of people in the project, including stakeholders and beneficiaries. They need to manage the expectations of the people involved in the project. A stakeholder analysis should be conducted upon project initiation to determine the participation levels of people in the project. Ownership of the project by beneficiaries must be emphasized because ultimately, they will be the ones using, integrating, and sustaining the products or systems developed by the project.

Process

A process that runs well relies on good procedural design by the management, as well as adherence to the process by the project implementers or staff. A well-designed and precise process can lead to the discovery of potentialities, and enhance the capabilities or competencies of project staff members and make them self-propelling, which is vital to successful internal project management.

In most ICT projects, one of the work components is process re-engineering, which means that the activities and documentation are reviewed to remove redundancies or unnecessary processes. If this review is not done, the old process will produce the same inefficient or ineffective results.

Technology

This refers to the machines and/or software that are available in the market that are used to support the needs and processes of the organization. Technology should not dictate how a project will proceed. Instead, it should be used in support of the needs of the people in the organization. In ICT-enabled community projects, technology should take the back seat until the needs of people and processes are defined. Projects that put technology before the users' needs and process requirements often fail, resulting in a waste of time and other resources. When it is selected well, appropriately used, and built on a stable platform, technology can make project processes efficient and accelerate the project workflow.

UN-APCICT/ESCAP partners and participants come together during the first Regional Training of Trainers (TOT) Workshop for the "Academy of ICT Essentials for Government Leaders" in Incheon, Republic of Korea (June, 2009)

5 Disciplines of Project Management

The project management disciplines described below are critical during the planning and implementation phases.

Critical to project preparation is the selection of the project manager and the team. Qualified and competent managers must be prepared to handle the following disciplines:

- **Scope**-managing all of the work required to complete the project successfully. This also includes the vision, goals, requirements at a high level, and the specific 'commercial' and technical specifications at the lower level.
- **Time**-managing project timelines, including how much time to allot to each task. Tools that can help manage time include Gantt charts schedulers.
- **Cost**-managing the funding allocated to the project and ensuring that it is spent for project resources, activities, tasks, and services. It may also be wise to add time and cost to the risk and change factors identified in the project.
- **Human Resource**-managing people (individuals, teams, professionals) assigned to do the project tasks and activities.
- **Risk**-managing uncertainties that pose threats, limitations, and obstacles to the achievement of project goals and objectives.
- **Quality**-managing the parameters set, standards and forms, and ensuring user focus and reliability of the planned project performance.
- **Procurement**-managing the process of acquiring goods, services, infrastructure, and equipment that are needed by the project to meet its goals, objectives, and deliverables.
- **Communication**-managing information and messages that need to be imparted to address expectations and reactions from people.
- **Integration**-ensuring coordination, coherence, and consistency of tasks, actions, activities, and documentation.
- **Issues and Acceptance**-managing prob-

lems raised by users during the analysis of requirements, during testing, and upon the receipt of project products.

- **Change**-managing change at two levels: change that will impact on parts or the entire sequence and process of the project, and changes that will affect the organization, such as instituting a new system or a new unit.

Documentation and the use of templates will aid project managers and the team to address the requirements and specifications of users, and track project tasks and activities.

6 Standards in Project Management

Through the years, various schools of thoughts and approaches to project management have emerged, and several best practices and reference standards have been offered. Government leaders should be aware of the common reference standards that are used by donors, vendors, and suppliers of outsourced projects. Some of these standards include:

- The Project Management Book of Knowledge (also known as PMBOK) approach, which is presented in a 182-page compendium on project management published by the Project Management Institute (PMI) based in the USA. The institute encourages certification of project managers who will apply their standards (http://www.pmi.org).

- The Projects in Controlled Environments (Prince 2) approach developed in 1989 as a standard for IT project management by the UK government. Organizations are certified through standard examinations administered by the Association for Project Management group. Prince 2 is registered under the UK Office of Government Commerce (http://www.ogc.gov.uk/methods_prince_2.asp).

- The Microsoft Solutions Framework (MSF) evolved out of best practices in software development. Microsoft claims that it has been successfully applied to infrastructure deployment projects as it is designed "to provide value in today's Internet era of computing" (http://www.microsoft.com/technet/solutionaccelerators/msf/default.mspx).

- The Rational Unified Process (RUP), which provides an amalgamation of constructs developed after the Rational Corporation. It is an iterative framework for software development that is now available as a product from IBM. It is a cousin of the Unified Modelling Language, which is widely adopted in tools for object-oriented software design and development (http://en.wikipedia.org/wiki/Rational_Unified_Process).

- Agile Project Management describes the management activities and decision-making procedures used during the life cycle of a project (including key tasks, roles and responsibilities, key documents, and decision options). In systems development, the cycle approach refers to the breakdown of the whole project into a number of main stages, which implies that transition from one stage to the next. There are different models considered most often: the spiral model, the cascade (waterfall) model, and task model, as well as their modified and combined versions. (http://www.ambysoft.com/essays/agileLifecycle.html; http://en.wikipedia.org/wiki/Systems_Development_Life_Cycle)

- The Logical Framework Approach (LFA), an analytic, presentational and management tool developed by the US Agency for International Development and other donor groups. It establishes a logical hierarchy of means by which goals and objectives are reached, with the indicators, risks and assumptions, and inputs and outputs identified (http://www.ausaid.gov.au/ausguide/pdf/ausguideline3.3.pdf).

These international project management reference standards offer tools and templates that will aid project managers in tracking project tasks and activities. Using templates in project documentation is an efficient way of following the progress of each project management phase and its disciplines.

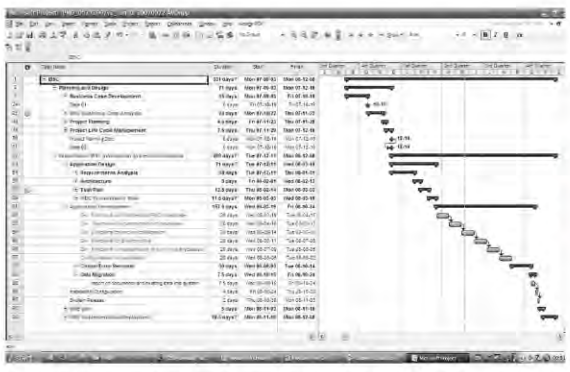

Table 1. Sample of a Gantt Chart for a production phase Module 7: ICT Project Management in Theory and Practice p. 80 (Source: Nick Jenkins, A Project Management Primer or a guide to making projects work (v.02, 2006) http://www.exinfm.com/training/pdfiles/projectPrimer.pdf)

7 Post-Project: Putting ICT Systems into Operation and Issues of Sustainability

Technically, a project ends with the project closure and product handover. However, the project results or product will take on a new life in the user environment. The processes undertaken to ensure the usability and effectiveness of the product in that context will determine the product's future life.

Policy environment

Countries that are embarking on e-governance and ICTD projects need to consider national ICT policy needs and requirements. Without policy support, new initiatives could end up as 'white elephants', unable to yield their promised benefits. It is also important to take into account the telecommunications policies that will support or hinder ICT-supported development in the country, as well as the organizational policies that will support or hinder the development of any ICTD or e-governance initiative at the local or organizational level.

Capacity for maintenance and improvement

Aside from policies, there are resources required to ensure the continuity, maintenance and improvement of the product or system. A product sponsor (for example, a Ministry at the country level, a local government unit at the local government unit level, or an ICT or Management Information System Unit at the organizational level) that will continue to support the development and maintenance of the product or system should be designated.

Continuous advocacy

Especially in ICTD projects, it is essential to ensure that the product or system developed works for the intended users. Government should invest in making the new product or system as widely known as possible. The support of the business sector, which has the capacity to invest and embark on ICTD and e-governance initiatives, should be sought.

8 Conclusion

In general, for ICTD projects to be successful, the following principles should be observed:

- **Participation** - People who are part of the project should be involved at every stage,

from the initial needs assessment through to monitoring. A participatory and demand-driven approach increases the impact of ICTD activities.

- **Local ownership and capacity development** - For projects to be sustainable, they must be locally owned and accompanied by human and organizational capacity development. Physical access is just one element of effective ICT access and use. Local ownership and capacity development will ensure that individuals, communities and organizations can use and maintain ICT systems and gain the full benefits from their use.

- **Mix of technology** - The choice of technology will depend largely on the context of use. The relationship between the user or audience and the specific media type also needs further exploration. The potential pro-poor impact of any ICT is determined by appropriate choice of technology.

- **Multi-stakeholder partnerships** - ICT use will have spill over effects beyond individual sectors and programmes and can considerably improve outreach and resource allocation. Multi-stakeholder partnerships are an appropriate response to the complexity of ICTD project management given the need for increased resources and the fact that development is the responsibility of all sectors of society with multi-level linkages.

- **Alignment** - The potential benefits for the poor are more likely to be realized when ICTD activities are aligned with the larger demand-driven development efforts of partners, particularly those related to poverty reduction.

- **Institutional ownership and leadership** - It is important for partner institutions to have a sense of ownership and leadership. Although successful ICT pilot programmes are often driven by individuals, there must also be an institutional base to extend the project's reach and increase the number of people involved.

- **Competitive enabling environment** - An enabling ICT policy environment includes respect for freedom of expression, diversity and the free flow of information, completion of ICT infrastructure provisions, including in the last mile, and investment in service development, including local content and the adoption of open source solutions.

- **Financial and social sustainability** - In order for projects to be financially sustainable, all potential costs and revenue generation should be included in the planning process from the start. The issue of social sustainability is of equal importance and is secured through local ownership and capacity building. It is essential for both social and financial sustainability to be considered.

- **Risk considerations** - Possible and unforeseeable negative impacts need to be taken into account and carefully monitored, including watching out for how the benefits of ICT-supported interventions may be unequally distributed or even have the opposite of their desired effect-i.e. deepening economic, social, and cultural divides instead of reducing poverty.

UN- APCICT / ESCAP

APCICT, a regional institute of the United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), was established and inaugurated on 16 June 2006 in Incheon, Republic of Korea. The role and mission of APCICT is to strengthen the efforts of the 62 ESCAP member and associate member countries to use ICTs in their socio-economic development through building the human and institutional capacity for ICT. In pursuance of this mandate, APCICT's work is focused on three inter-related pillars - Training, Advisory Services and Research. The Briefing Note Series is part of the research pillar. Also under the research pillar is a Case Study Series that provides analyses and compilations of best practices and case studies on different aspects of ICTD and capacity building in the Asia Pacific region.

http://www.unapcict.org

ESCAP

ESCAP is the regional development arm of the United Nations and serves as the main economic and social development centre for the United Nations in Asia and the Pacific. Its mandate is to foster cooperation between its 53 members and 9 associate members. ESCAP provides the strategic link between global and country-level programmes and issues. It supports Governments of countries in the region in consolidating regional positions and advocates regional approaches to meeting the region's unique socio-economic challenges in a globalizing world. The ESCAP office is located at Bangkok, Thailand.

http://www.unescap.org

The Academy of ICT Essentials for Government Leaders

(http://www.unapcict.org/academy)

The Academy is a comprehensive ICT for development training curriculum with eight initial modules that aims to equip policymakers with the essential knowledge and skills to fully leverage opportunities presented by ICTs to achieve national development goals and bridge the digital divide.

Module 1 - The Linkage between ICT Applications and Meaningful Development

Module 2 - ICT for Development Policy, Process and Governance

Module 3 - e-Government Applications

Module 4 - ICT Trends for Government Leaders

Module 5 - Internet Governance

Module 6 - Information Security and Privacy

Module 7 - ICT Project Management in Theory and Practice

Module 8 - Options for Funding ICT for Development

Module 9 - ICT for Disaster Risk Management

Module 10 - Climate change and ICT (to be launched in 2012)

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