United Nations University

UNU-IIST
International Institute for Software Technology

Strategic IT Planning for Public Organizations: A Toolkit

Adegboyega Ojo, Bimal Pratap Shah and Tomasz Janowski

May 2009

$\mathcal{T}$

UNU-IIST and UNU-IIST Reports

UNU-IIST (United Nations University International Institute for Software Technology) is a Research and Training Centre of the United Nations University (UNU). It is based in Macao, and was founded in 1991. It started operations in July 1992. UNU-IIST is jointly funded by the government of Macao and the governments of the People's Republic of China and Portugal through a contribution to the UNU Endowment Fund. As well as providing two thirds of the endowment fund, the Macao authorities also supply UNU-IIST with its office premises and furniture and subsidise fellow accommodation.

The mission of UNU-IIST is to assist developing countries in the application and development of software technology.

UNU-IIST contributes through its programmatic activities:

1. Advanced development projects, in which software techniques supported by tools are applied,

2. Research projects, in which new techniques for software development are investigated,

3. Curriculum development projects, in which courses of software technology for universities in developing countries are developed,

4. University development projects, which complement the curriculum development projects by aiming to strengthen all aspects of computer science teaching in universities in developing countries,

5. Schools and Courses, which typically teach advanced software development techniques,

6. Events, in which conferences and workshops are organised or supported by UNU-IIST, and

7. Dissemination, in which UNU-IIST regularly distributes to developing countries information on international progress of software technology.

Fellows, who are young scientists and engineers from developing countries, are invited to actively participate in all these projects. By doing the projects they are trained.

At present, the technical focus of UNU-IIST is on formal methods for software development. UNU-IIST is an internationally recognised center in the area of formal methods. However, no software technique is universally applicable. We are prepared to choose complementary techniques for our projects, if necessary.

UNU-IIST produces a report series. Reports are either Research $\boxed{\mathcal{R}}$, Technical $\boxed{\mathcal{T}}$, Compendia $\boxed{C}$ or Administrative $\boxed{\mathcal{A}}$. They are records of UNU-IIST activities and research and development achievements. Many of the reports are also published in conference proceedings and journals.

Please write to UNU-IIST at P.O. Box 3058, Macao or visit UNU-IIST's home page: http://www.iist.unu.edu, if you would like to know more about UNU-IIST and its report series.

G. M. Reed, Director

Strategic IT Planning for Public Organizations: A Toolkit

Adegboyega Ojo, Bimal Pratap Shah and Tomasz Janowski

Abstract

This report serves as a toolkit to guide Information Technology (IT) Managers in carrying out strategic IT planning in government organizations. It presents process models and detailed descriptions of the various activities and tasks involved in a typical IT strategy exercise in public institutions. The report begins by explaining the concept of strategic planning and why it is an important exercise in achieving organizational-IT alignment. Next, it reviews different models for strategic planning and subsequently presents a generic process model for Strategic IT Planning guided by a set of principles. Later, the report describes each step or activity of the IT Strategy Process in sequence. For each activity, it provides: overview of the step, required inputs, expected outputs, tasks lists and process diagram, supporting tools, related tasks and general remarks. The strategy development activity is based on the Balanced Scorecard technique. As tool support for the strategy process, a set of templates and a strategy management software system which manages elements of IT strategies resulting from strategy activities have been developed.

Adegboyega Ojo is a Research Fellow at the Center for Electronic Governance - United Nations University - International Institute for Software Technology (UNU-IIST-EGOV) in Macao, on leave from the Department of Computer Sciences, University of Lagos, Nigeria where he is a Senior Lecturer. He has been involved in e-government research and development activities since 2004 at UNU-IIST as a member of the team working on the e-Macao Project. His research interests include Strategic IT Planning, Software Infrastructure for Electronic Government, E-Government Measurement, Ontology, Semantic Interoperability, and Applications of Computational Intelligence. He holds a doctorate degree in Computer Science from the University of Lagos in Nigeria. He is also a member of the Computer Professionals of Nigeria.

Bimal Pratap Shah was a Government Fellow and Researcher at the Center for Electronic Governance, United Nations University - International Institute for Software Technology in Macao from September 2007 to July 2008.

Tomasz Janowski is the Head of the Center for Electronic Governance - United Nations University - International Institute for Software Technology in Macao (UNU-IIST-EGOV) and a Senior Research Fellow of UNU-IIST. Tomasz Janowski is the author or co-author of numerous publications in Computer Science, Software Engineering and Foundations. He has been a Program Committee member at many international conferences, supervised a number of international students and staff, and led several research, development and capacity-building projects. These include the e-Macao Program to build a foundation for Electronic Government in Macao and the UNeGov.net initiative to building a global community of practice for Electronic Governance. As part of the UNeGov.net initiative, he organized many workshops and schools on Electronic Governance in developing countries. His current research interests include foundations of Electronic Governance, tools and applications of formal methods, and rigorous development of enterprise software, particularly software for the public sector. Tomasz Janowski holds a PhD in Computer Science from the University of Warwick, England, and an MSc in Mathematics from the University of Gdansk, Poland.

Contents

1 Introduction

This section contextualizes the IT strategy process in the overall development and application of IT in government organizations. It begins with an explanation of the business of government and nature of public values as a basis for characterizing the use of IT in the public sector. Next, the section discusses why IT requirements for public sector are different from those of private organizations. The importance of strategic planning in general and strategic IT planning in particular is later explained. The section also explains the relationship between IT and organizational strategies, before closing with an explanation of the usage scenarios for the toolkit - by individual government agencies and the whole-of-government.

1.1 IT and Public Organizations

The business of government broadly covers the development of public policies (laws and regulations), delivery of public services and infrastructure (common good) and maintenance of social order and security [6]. The performance or effectiveness of a government organization is linked to how well public values or benefits are delivered in the social, political and economic spheres. It also measured in terms of the degree to which the core mission and organizational goals are met. The production of public value entails the conversion of core resources – human, information (or IT), organizational and financial; to support the internal processes, direct delivery of services to the public and general interactions with stakeholders [1][8]. We expect that appropriate use of resources in carrying out internal processes should produce concrete results for the public (e.g. increased customer satisfaction and fewer complaints from public) and the organization itself (e.g. better control, oversight and planning capabilities). Customer results in particular should lead to the attainment of some strategic or policy outcomes - for instance, improved home security or more responsive government. Figure 1 below outlines the value chain for a typical public organization. Detailed discussion on public value generation can be found in [7].
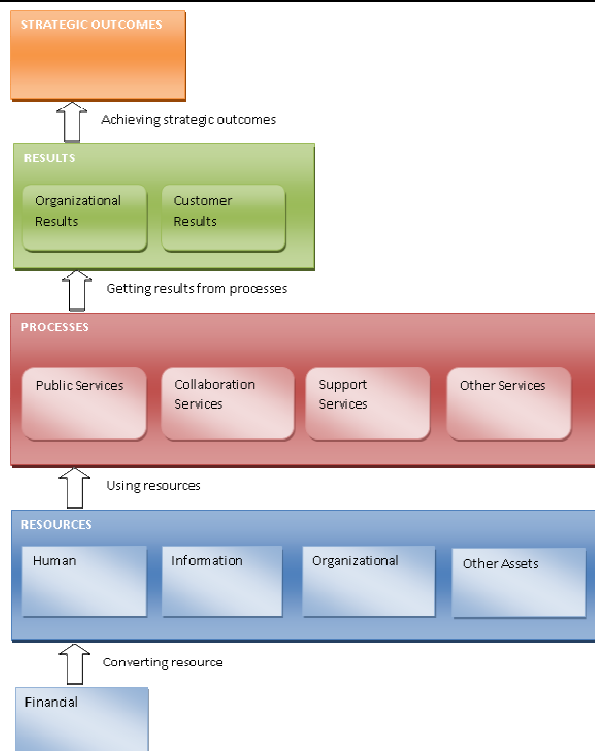

Figure 1: Value Creation Process in Public Organizations

The focus on the strategic value of IT in the public sector has grown with the popular acceptance and adoption of the new public management (NPM) approach, the Internet and particularly electronic governance by governments. Today, IT constitutes a major strategic resource in any modern government enterprise. However, the capabilities in measuring and optimizing concrete public values and benefits from IT investments by government are still limited, unlike in the private sector.

While the private sector provides significant experience and know-how on value creation from IT for strategic purposes, transferring such experiences is generally not straightforward or at least direct. Reasons for this challenge include the differences in the nature of public and private organizations, their IT needs and mechanisms for effecting and managing the necessary organizational changes associated with effective IT exploitation [1]. For instance, public-sector organizations largely remain bureaucratic – vertically organized, with very high need for complex collaborations between its employees across departments and organizational units [2]. However, private organizations largely operate more flexible, horizontal, network-oriented structures empowering employees as decision-makers.

The IT needs of public organizations differ from those of private sector organizations in many aspects, including planning approach, environmental consideration, cross-organizational requirements, political consideration, role of competition, target users and constraints of legislation and supervision. Some of these differences are highlighted below [1]:

1) Planning approach – incremental rather than holistic or rational IT planning processes is required for developing Public Management Information Systems (PMIS).

2) Cross-organizational requirements – PMIS managers need to consider more cross-organizational issues due to the intrinsic and complex interdependence of government organizations, than their counterparts in private sector.

3) ICT resources acquisition – criteria for evaluating and acquiring IT resources for PMIS are different from those used in traditional Information Systems in private organizations.

4) Political considerations – extra organizational and technical factors such as political factors are considered in IT-based solutions in public organizations.

5) Competition – IT capabilities are not typically channeled towards competitiveness in the public sector unlike in the private sector where competition is a primary strategic target.

6) Target Users – IT-enabled services in public organizations are used by a large number of users – possibly the general public. Unlike private organizations, government seldom limits its field of action.

7) Supervision – public agencies are usually supervised by external bodies (oversight agencies), private citizens and peer agencies. This raises specific organizational and functional requirements such as production of specific reports in some fixed formats. These obligations are not typical of private organizations.

In addition, administrative and business processes in public organizations strongly depend on legislations. IT-enabled services implementing these rules in government are affected by changes in regulations. Information systems in private organization are typically not closely tied to government regulations operationally and do not have to evolve their behaviors frequently [6].

The IT environment for public organizations typically includes [3] [4]:

o   ICT infrastructure – hardware and networking infrastructure and system software at the agency

o   Supporting systems – consists of productivity tools and applications supporting core support services (or processes) such as human resource management, knowledge management, planning, project management, help desk management, etc.

o   Back office applications – PMIS supporting business processes and operational activities

o   Electronic service delivery technologies – technologies deployed for the delivery of electronic services to the public through channels such as web, kiosk, phone and mobile devices

1.2   What is Strategic IT Planning?

For any organization to derive strategic values in the short-term, mid-term and long-term from its IT investment, a sound IT strategy is required. Such IT strategies are outputs of strategic IT planning. Unlike tactical or project plans which focus on detailed operational, day-to-day actions; strategic planning in an organization involves making decisions about desired future outcomes, how the outcomes will be achieved and how success will be measured and evaluated [16]. Strategic planning is an overall planning process which essentially provides answers to questions related to: the identity of the organization, the existing capacity, the current situation and the problems to be addressed, the critical issues requiring response and how resources should be prioritized and allocated [13]. Strategic planning horizons are typically between 3 to 5 years, with the possibility of periodic (usually annual) reviews.

Strategic IT planning establishes a clear vision and measurable objectives for the use of IT in an organization, prescribes strategies to achieve this vision with the knowledge of the available IT capabilities and opportunities, provide measures for success and possibly suggests concrete initiatives for implementing the developed strategies. It improves key stakeholders' understanding of IT opportunities and limitations, assesses current performance, identifies human resource requirements, and clarifies the level of investment required. Strategic IT planning generally serves as a mechanism for managing and directing all IT resources in line with organizational strategies and priorities [22].

The need for strategic IT planning in a public organization could be triggered by an anticipation of, or reaction to major strategic initiatives - such as reforms or reorganization programs. It may also be a response to doubts about the return on IT investments, perception of poor IT organization or unclear direction for IT by users and core business units of the public organization.

1.3   IT and Organizational Strategy

Implicit in qualities of an effective strategic IT plan is the direct support it provides for organization's mission, strategies and activities [12]. In general, IT strategies must be aligned with organizational strategies. Strategic IT alignment enables IT to support business strategies, and business strategies to leverage opportunities generated by IT strategies [9]. Strategic IT alignment is an organizational learning process that combines business and IT knowledge to support business objectives [10].

Senior management in private organizations generally considers investment in IT as potentially strategic to business success [21]. This position is supported by research results in Information Systems which suggest that achieving strategic alignment between business and IT is essential to improving organizational performance [15].

Specific results from a strategic IT alignment activity include [18]: direct IT support for the achievement of business objectives; proportional increase in IT expenditure; delivery of IT services at competitive cost; improved business productivity and customer experience with increased IT investment; availability of proper processes; practices and controls; managed business and technology risks; development of professional competence for service delivery and continuous performance improvement by exploiting organizational knowledge.

A sound strategic IT planning process is expected to guarantee strategic IT alignment.

1.4   Using this Toolkit

This toolkit is designed and written for IT practitioners in government or public organizations, as a detailed guide (or reference for experienced IT managers) for planning and implementing strategic IT planning. Secondly, the toolkit provides a framework for developing specific standards for Strategic IT planning in government or public agencies. Thirdly, the toolkit could serve as a courseware for strategic IT planning.
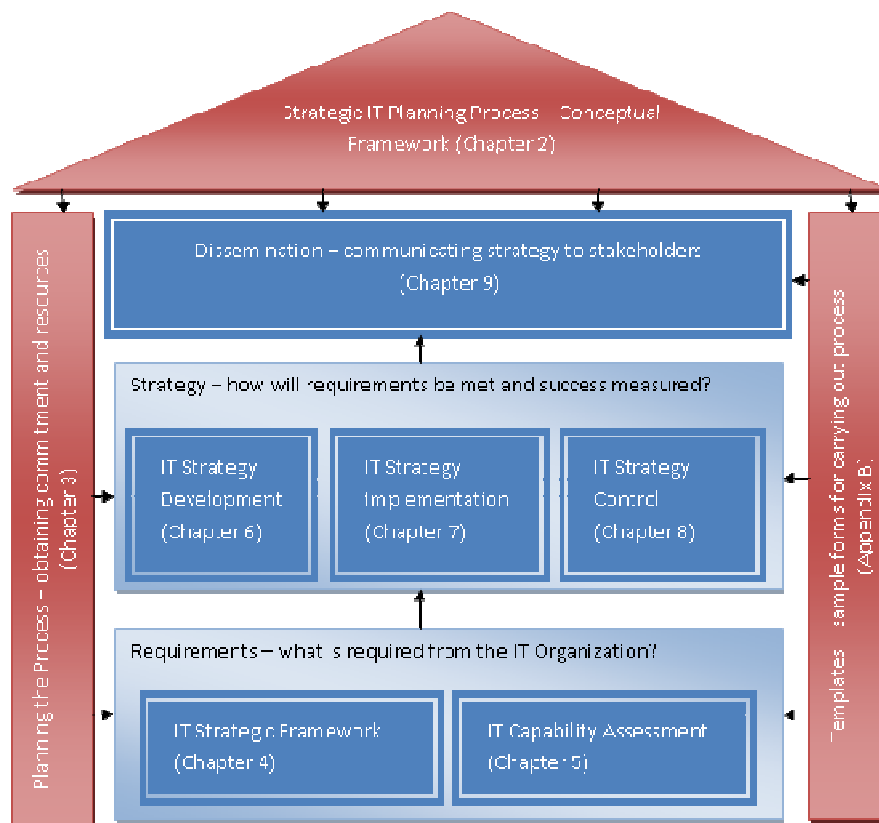
Figure 2: Toolkit Map

As a manual, the toolkit provides detailed information on each step of the strategy processes with clear instructions on implementation of these steps (practice guidelines) and how to use available supporting tools. As a framework for developing specific standards, the toolkit specifies core set as well as optional activities for the IT strategy process. As a courseware, it provides an overall process model for strategic IT planning, and sub-processes for all major process steps with reference to

relevant tools. The discussions on the conceptual framework and specific techniques for process steps also make the toolkit a useful courseware. The overall organization of the toolkit is shown in Figure 2 below.

To support the use of this toolkit, a set of templates have been developed to be used in implementing major steps of the IT strategy process. The templates "Strategic IT Planning for Public Organizations: Templates" is available from the Outputs page at http://egov.iist.unu.edu. A Strategy Management System has also been developed to support the development, management and strategic alignment of IT strategies based on the framework presented in the toolkit, which is also available through the Outputs page at http://egov.iist.unu.edu.

The toolkit is made available publicly under the Creative Commons Attribution-Share Alike 2.0 Generic License Please see http://creativecommons.org/licenses/by-sa/2.0/ for more information on the toolkit license.

2   Strategic IT Planning Process

This section explains the overall IT strategy process or framework. A conceptual framework is first provided to guide the development of the process. The conceptual framework considers generic strategic planning models and identifies the essential steps of a strategic planning activity. Next, a generic IT strategy process model is presented based on a set of guiding principles and requirements. Following this, the overall implementation framework for the generic IT strategy process is explained. Prescriptions for concrete process implementation are guided by – the Control Objectives for Information and related Technologies (COBIT) IT Governance Framework, Balanced Scorecard method, and the Logic Model for planning and evaluation. Available tools for supporting the overall IT strategy process are also identified.

2.1   Conceptual Framework

Planning is a management activity involving the anticipation or specification of some future needs, deciding or selecting strategies and procedures to meet these needs, informed by the analysis of internal and external information on an organization. In essence, planning chooses who, what, how, and where with respect to the attainment of a goal. More formally, planning is a formalized procedure to produce articulated results in the form of an integrated system of decision [16].

A strategy is a long term plan of action affecting the overall direction of an organization. It is a plan from which other plans like detailed operational plans can be developed.

Strategic planning is a disciplined effort to produce fundamental decisions and actions shaping the nature and the direction of an organization. It is a continuous and systematic process in which decisions are made about intended future outcomes (3 - 5 year horizon) how the outcomes are to be accomplished (based on the analysis of internal capabilities and external trends) and how success is measured and evaluated [16].

2.1.1   Strategic Planning Models

Several process models have been proposed and used for strategic planning. Eight of these models are briefly explained below with emphasis on their distinguishing features:

1) Model A - specifies the following four features for a typical strategy process [14]: providing detailed ac-count of the entities in an organization and their interaction with the environment, addressing the allocation of resources (capital, labor and capacity), focusing mainly on long-term issues, but not neglecting short term issues with long-term consequences, involving middle-to-top level management and executive decision makers. This model does not prescribe a particular process, but identifies important properties of strategy processes.

2) Model B – identifies six major phases for a strategy process [13]: planning the process; understanding the context; vision, values, and mission discussion; review of strength, weakness, opportunities and threats, discussion of strategic options and goals; and organizational structure. This model emphasizes the need to plan the strategic planning process, involve the stakeholders in establishing and agreeing on the context – existing problems and issues, for the planning exercise.

3) Model C – describes a seven-step process [11]: mission, vision, critical success factors, assessment of the present, strategic objectives, tactics and action plan. This model is differentiated from most of the other models reviewed here in terms of the inclusion of identification of strategic imperatives or critical success factors and development of tactics from strategic objectives.

4) Model D - specifies the following steps [16]: plan to plan; mission, goals and values; strategic objectives; external analysis; internal analysis; strategic options; strategy selection; strategy implementation and strategy control. This model includes the analysis of external environment and also indicates the need to plan the strategy process.

5) Model E - includes the following as follows [16]: agreement on planning effort; identification and clarification of political and statutory mandates; development and clarification of mission and values; external environmental assessment, internal environmental assessment; strategic issue identification; strategic development; and vision of successes. This model like Models B and D indicates the need to plan the process. It also highlights the need for identification and clarification of political and statutory mandates – a point more relevant to public organizations than private ones.

6) Model F - suggests an eight-step process [16]: plan to plan; mission, goals and values; external needs and trends assessment, strategic objectives; outcome measures; strategic priorities; strategies; and performance feed-forward. This model is very similar to Model D, but indicates a clear specification of the expected outcomes. It also includes a step that allows a comparison of actual organizational performance and planned organizational performance (feed-forward performance) in previous strategic planning cycles in order to reinforce positive strategies and abandon negative ones.

7) Model G - presents a seven-step process [16]: mission of the organization; current demand system; current response system; future demand system; desired future state; action planning; feasibility; cost-effectiveness and consequences of action. This model is a stakeholder-centric planning model which develops strategies by examining the current demand from stakeholders, how the organization is responding to these demands and the projected demand system. Like Model F, it includes a step for clarifying expected outcomes.

8) Model H - consists of the following steps [16]: goal formulation; environmental analysis; strategy formulation; strategy evaluation; strategy implementation, and strategy control. Unlike most models, this model includes a step for specifying how implemented strategies will be monitored and controlled.

Table 1 provides a summary of the eight planning models.

2.1.2   Generic Strategy Process

Almost all process models considered agree on the inclusion of the following steps in a strategy process:

1) Specification of mission, vision, desired future state or outcomes;

2) Assessment of internal and external environment;

3) Development of strategies and

4) Specification of tactics or initiatives to implement strategies.

Establishing a plan for the strategic planning activity to clarify the purpose, constitute the strategy team, obtain commitment from stakeholders on cooperation, participation and resources is essential particularly in the context of public organizations. Clarification of political and statutory mandates would also be a useful task in the preparatory phase of the planning process.

Table 1: Strategic Planning Models

Model A	Model B	Model C	Model D
1) detailed assessment 2) resource allocation 3) long-term issues 4) top manager involvement	1) planning 2) understanding context 3) vision, values and mission 4) SWOT analysis 5) strategic options 6) organizational structure	1) mission 2) vision 3) critical success factors 4) assessment 5) strategic objectives 6) tactics 7) action plan	1) plan to plan 2) mission, goals and values 3) strategic objectives 4) external analysis 5) internal analysis 6) strategic options 7) strategy selection 8) strategy implementation 9) strategy control
Model E	Model F	Model G	Model H
1) agreement on planning effort 2) clarification of political and statutory mandate 3) clarification of mission and value 4) external environmental assessment 5) internal environmental assessment 6) strategic issue identification 7) strategic development 8) vision of success	1) plan to plan 2) mission, goals and values 3) external needs and trends 4) strategic objectives 5) outcome measures 6) strategic priorities 7) strategies 8) performance feed-forward	1) mission of organization 2) current demand system 3) current response system 4) future demand system 5) desired future state 6) action planning 7) feasibility	1) goal formulation 2) environmental analysis 3) strategy formulation 4) strategy evaluation 5) strategy implementation 6) strategy control

The inclusion of tasks that enable the management and control of developed strategies in the planning process should also be useful. In addition, the ability to leverage data generated from previous planning cycles (performance feed-forward) in the process should result in a more intelligent planning process.

We include two basic additional steps to the initial four steps identified above:

1) planning the process

2) strategy control

Consequently, the generic strategy process will include the following six steps: planning the process; specification of mission, vision, desired future state or outcomes; assessment of internal and external environment; development of strategies; development of tactics or initiatives; and strategy control. For simplicity all process models have been enumerated sequentially (e.g. in Figure 3). In practice, these processes seldom proceed in linear or sequential manner due to the need for iterations over some steps and feedback loops.
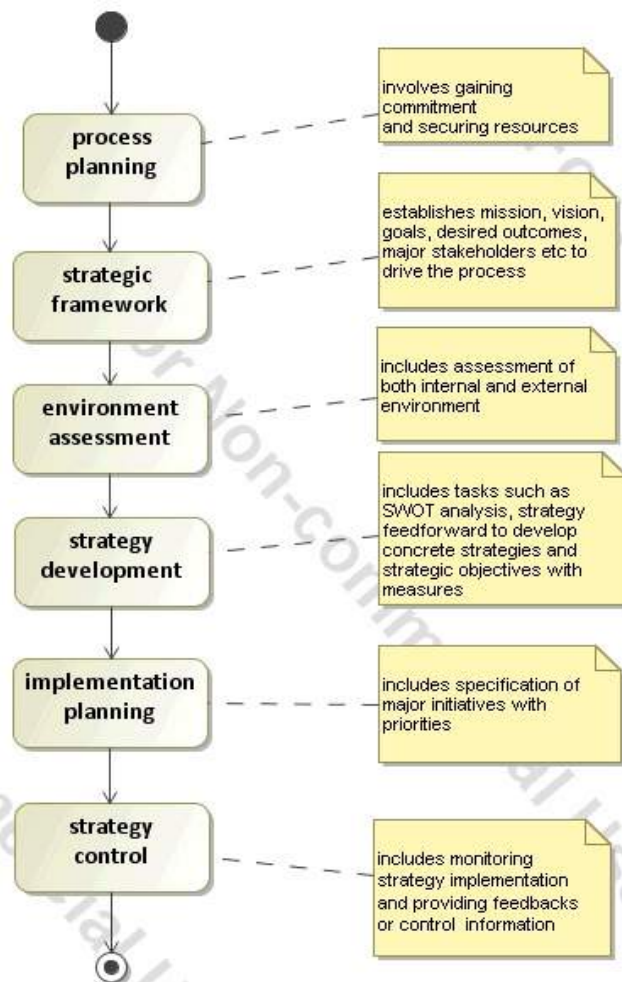

Figure 3: Generic Strategy Process

A simplified but representative process for strategic planning is provided in Figure 3. A comprehensive plan for the whole process and the necessary commitment is first secured by the strategy team. In the strategic framework task, the mission of the organization or project is established or clarified, and the vision, desired future outcomes and goals are specified. Major stakeholders are also identified in the strategic framework phase which drives the whole planning process. While developing the strategic framework, a detailed assessment of the internal and external environment of the organization (with respect to the purpose of the planning exercise and goals) could commence. The outcome of the assessment and strategic framework phase provide input for the strategy development phase. The strategy development phase involves carrying out SWOT analysis, identifying critical success factors, and developing relevant set of concrete strategies to achieve set goals in view of constraints and opportunities.

Concrete initiatives are defined from the developed strategies as an implementation plan. A framework for measuring performance of initiatives and projects (resulting from initiatives) is developed in the strategy control phase to provide necessary feedback information for strategy evolution and management. The output of the strategy control task is one of the inputs to the strategy development process.

We specialize this process for strategic IT planning in the next section.

2.1.3   Strategic IT Planning Process

A strategic IT planning process aims to produce IT strategies, concrete IT initiatives and projects to support organizational needs in order to deliver concrete values to stakeholders. It involves the development of a strategic IT plan that satisfies (or properly aligns with) the business requirements. The strategic IT plan is also required to sustain and extend organizational strategy and governance requirements while being transparent about benefits, costs and risks [22]. Specifically, a strategic IT plan in a public organization is expected to provide answers to following questions:

- o   How will IT deliver value to citizens and business and the public at large?
- o   How will IT support the internal business and administrative processes towards operation excellence?
- o   How will IT enable the collaboration of the public organization with others?
- o   How will IT support compliance with regulations governing the public organization?
- o   How should IT financial be used?
- o   How will the required IT skill and competences be acquired?
- o   How will the IT infrastructure be further developed and more optimally utilized?
- o   How will IT manage operational risk and ensure business continuity?
- o   How will IT maintain the security of information?
- o   How will the contributions of IT to the business be measured?
- o   What structural changes (or organizational changes) are required in the IT organization and the larger organization for value creation and preservation?

In line with the generic process presented in Section 2.1.2, the important features (or underlying principles) for an effective strategic IT planning process is described below:

P1. Strategic alignment – strategies developed through the process should explicitly support organizational strategies. For instance, IT strategies are expected to support any ongoing reform and restructuring activities in government organizations. Therefore, resulting IT strategies should be closely aligned with public sector modernization and reform programs. Alignment necessitates the involvement of stakeholders that are outside the IT organization in the overall planning process, particularly participants from the core business and support units within the organizations as well as other central entities involved in modernization and continuous process improvement. A strategic alignment process would include Business-IT alignment, IT-Business alignment and stakeholder analysis.

P2. Avoiding strategy gaps – process should minimize or eliminate the gaps in the resulting strategy. Strategy gaps created through the absence of supporting or complementary strategies necessary to realize a strategy. For instance, the absence of strategies to ensure the availability of human and financial resources in an IT strategy creates a strategy gap. The inclusion of strategic alignment steps in the overall strategy process significantly reduces strategy gaps. Strategy gaps can also be reduced by ensuring that dependency relationships between the strategies are explicitly specified through mappings.

P3. Clear measurement framework – the IT strategy process should produce measurable strategic objectives with clear specification of measures and targets. The metric allows for the management and control of strategies during implementation. The various targets associated with the objectives provide concrete benchmark for the IT organization and a basis for revision of the strategies.

P4. Support for core areas – process must ensure that developed strategies support all the major aspects of the IT organization, for instance, at least one strategy is expected to be specified for optimizing financial resources keeping up with technology changes and enabling internal business units leverage appropriately, supporting the delivery of public services to customers, satisfying regulatory requirements, improving internal IT processes and developing the structures and processes for IT governance. In addition to these broad categories, a number of specific issues considered critical by Chief Information Officers (CIO) have been identified as follows [24][25][26]:

- o Security and risk management – making provision to determine the current level of security, creating scenarios to deal with uncertainties and mitigating risks. It also includes defining appropriate security standards for the organization and ensuring business continuity planning.

- o Identity management – establishing correct identity of users to enable improved service delivery, public safety, and interoperability.

- o Information management – enable improved management of information and knowledge sharing within the organization to support knowledge-intensive decision processes and activities.

- o Procurement – establishing an efficient process for acquisition of IT assets, products and services.

- o Integration and interoperability – support the seamless exchange of information between the agencies in the delivery of one-stop or integrated services.

- o Shared services – developing generic services in collaboration with other agencies in implementing core business patterns.

P5. Foundations for Enterprise Architecture – the process must provide the necessary input and foundations required to build a comprehensive IT architecture, consisting of specifications of processes; people; technology – network, hardware and software; and strategic objectives and values for the organization.

P6. Support for IT Governance - process should directly support the continuous development of structures and processes towards the development, use, management and control of IT resources in the agency.

P7. Addressing the budgeting constraints – traditional budgeting is a periodic process whereby organizations define their forward operational expenditures and forecasted incomes – a top down process. Several limitations have been identified: budgets constraint responsiveness and flexibility often constitute a barrier to change. Budgets are rarely strategically focused. Most budgeting practices strengthen vertical (command and control) structures and do not support emerging network structures, consequently reinforcing departmental barriers rather than knowledge sharing.

P8. Support for Electronic Governance – we finally constrain an IT strategy process in a public organization to ensure that resulting strategies and IT initiatives directly support the development of e-governance.

The development and implementation of the IT strategy process is expected to satisfy the requirements for the IT Governance Institute's (ITGI) Level 3 (Defined) maturity level for strategic IT planning. The ITGI's five stage maturity model for Strategic IT Planning Process is briefly described below [22]:

0 - Non-existent: Strategic IT planning is not performed. There is poor management awareness that IT strategic planning is needed to support agency goals.

1 – Initial or Ad-hoc: The need for strategic IT planning is known by IT organization and agency management. IT planning is performed on an as-needed basis in response to specific business requirements. Strategic IT planning is occasionally discussed at IT management meetings. The alignment of organizational requirements, applications and technology takes place reactively rather than by an organization-wide strategy. The strategic risk position is identified informally on a project-by-project basis.

2 – Repeatable but intuitive: Strategic IT planning is shared with agency management on an as-needed basis. Updating of the IT plans occurs in response to requests by management. Strategic decisions are driven on a project-by-project basis without consistency with an overall organization strategy. The risks and user benefits of major strategic decisions are recognized in an intuitive way.

3 – Defined: A policy defines when and how to perform IT strategic planning. IT strategic planning follows a structured approach that is documented and known to all staff. The IT planning process is reasonably sound and ensures that appropriate planning is likely to be performed. However, discretion is given to individual managers with respect to implementation of the process, and there are no procedures to examine the process. The overall IT strategy includes a consistent definition of risks that the organization is willing to take as an innovator or follower. The IT financial, technical and human resources strategies increasingly influence the acquisition of new products and technologies. Strategic IT planning is discussed at management meetings.

4 – Managed and Measurable: Strategic IT planning is standard practice and exceptions would be noticed by management. The practice is covered by a defined management function with senior-level responsibilities. Management is able to monitor the IT strategic planning process, make informed decisions based on it and measure its effectiveness. Both short-range and long-range IT planning occurs and is cascaded down into the organization, with updates done as needed. The IT strategy and organization-wide strategy are increasingly becoming more coordinated by addressing business processes and value-added capabilities and leveraging the use of applications and technologies through business process re-engineering. There is a well-defined process for determining the usage of internal and external resources required in system development and operations.

5 – Optimized: Strategic IT planning is a documented, living process; is continuously considered in organizational goal setting; and results in discernible public and organizational value through investments in IT. Risk and value-added considerations are continuously updated in the IT strategic planning process. Realistic long-range IT plans are developed and constantly updated to reflect changing technology and business-related developments. Benchmarking against well-understood and reliable industry norms takes place and is integrated with the strategy formulation process. The strategic plan includes how new technology developments can drive the creation of new organizational capabilities and improve the competitiveness of the agency.

2.1.4   Satisfying Relevant COBIT Control Objectives

COBIT is a best practice IT governance framework – a set of leadership, organizational structures and processes that ensure that the enterprise's IT sustains and extends the organization's strategies and objectives [22]. It prescribes a set of 34 IT processes and 214 control objectives in four domains – Planning and Organization, Acquisition and Implementation, Delivery and Support, and Monitoring and Evaluation. The control objectives for strategic IT planning is specified under the Plan and Organize domain or high-level process - the first activity area. The following six concrete control objectives are specified for the "Define a Strategic IT Plan" (P01.1) sub-process [22]:

O1)   IT Value Management – process should involve management and senior executives to ensure that all projects in Agency IT portfolio have sound business cases.

O2)   Business-IT Alignment – process should align and integrate business strategies and objectives with IT goals including mediating between business and IT imperatives so that priorities can be agreed.

O3)   Assessment of Current Capability and Performance – process must assess the current capability and performance of solutions and service delivery to establish a baseline against which future requirements can be compared.

O4)   Strategic IT Plan – process must create IT strategies that define, in cooperation with relevant stakeholders, how IT goals will contribute to the agency objectives particularly in areas related to public service delivery. The IT Strategic plan should cover investment/operational budget, funding sources, sourcing strategy, acquisition strategy, and legal and regulatory requirements. It should be sufficiently detailed to allow for the definition of tactical IT plans.

O5)   Tactical IT Plan – process should support the creation of a portfolio of Tactical IT Plans from the developed IT Strategic Plan. The tactical plan would describe the IT initiatives, their resource requirements, and how the use of resources and accomplishments of benefits will be managed. Tactical plans should be detailed enough to allow for the definition of projects.

O6)   IT Portfolio Management – process could manage with the business the portfolio of IT-enabled investments programs required to achieve strategic business objectives by identifying, evaluating, prioritizing, selecting, initiating, managing and controlling programmes.

The above control objectives are adopted to constrain the strategic IT planning process. As a minimum, the IT strategy process is expected to satisfy objectives O1 through O5. Control objective O6 may be realized outside the IT strategy process.

2.2   Process Specification

The process for developing a strategic IT plan deriving from the generic process model and supporting the features discussed in section 2.1.3 is specified here. While describing the process features, cross-references to the principles presented in Section 2.1.3 are indicated.

A1.   Planning the process

The activity is aimed at obtaining the required commitment from establishing a business case for the planning project (if it is not already institutionalized), obtaining the necessary commitment from management and stakeholder, putting together the IT Strategy Team, mobilizing the necessary resources, and providing a schedule for the whole exercise.

T1.1. Obtaining Commitment and Approval – The first step of the overall planning process is for the IT organization to establish a sound business case for strategic IT planning to the management of the agency. This is particularly important in public organizations in which the practice of strategic planning in general is seldom carried out. A successful completion of this task entails obtaining management approval and commitment to providing the necessary support to the IT organization; in particular championing the exercise and seen as the owner and sponsor of the project.

T1.2. Stakeholder's Analysis – Once the approval and commitment is obtained, the IT organization needs to determine the important stakeholders and their roles in the overall process. Stakeholders are generally required to participate in some of the planning tasks or supply critical information as input for these tasks. Required information includes organizational strategy, specific business requirements and drivers for IT in the agency and expectations regarding IT services. The output of this task is the identification of the major stakeholders, their specific roles, communication plans for each stakeholder category and notification to these stakeholders explaining the purpose of the exercise and their sought contributions.

T1.3. Strategy Team Formation – The strategy team consists of IT organization head, a senior management officer (preferably the deputy head of the agency), and other persons representing different stakeholders categories such as employees, heads of core business units, representatives of different customer categories (e.g. citizens and businesses). The stakeholder's analysis in Task T1.2 provides a valuable input into the team formation task. Once the composition of the team is determined and team members agree to their participation, the terms of reference (TOR) for the team is established in their inaugural meeting. The output from this task is a team list and the TOR for the strategy team.

T1.4. Scheduling and Resource Mobilization – After team composition with clear TOR, the team needs to draw the schedule for the planning exercise and secure the necessary resources (materials, human and financial) for completing the exercise. This task ends with a clear schedule, specification of the resource requirement and approval by management on providing the resources.
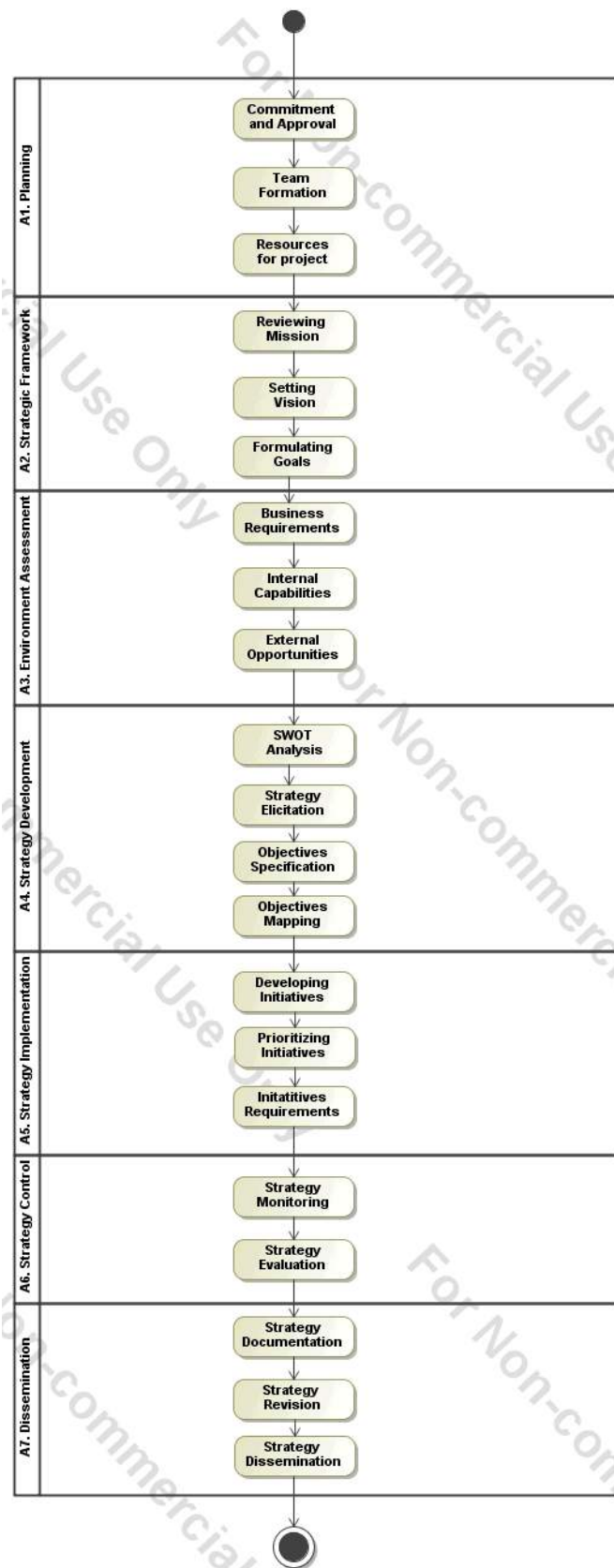
Figure 4: IT Strategy Process

A2.   IT Strategic Framework

The IT strategic framework clarifies the mission of the IT organization, establishes an IT vision and sets some concrete IT goals in line with vision. The strategy team establishes the strategic framework through workshops and brainstorming sessions involving representatives of stakeholders. This activity guides the rest of the planning process by specifying the desirable strategic outcomes for IT organization.

T2.1. Reviewing Organization Goals – The first task in defining the strategic IT framework is gaining an understanding of organizational vision and goals of the agency.   These organizational goals provide concrete business constraints to satisfy or requirements for the IT organization to fulfill. The mission, vision and goals of the IT organization therefore derive from the organizational goals.

T2.2. Reviewing IT Organization Mission – The clarification of the mission for the IT organization is necessary for stakeholders to determine the adequacy or relevance in view of present needs and realities. In most government agencies and departments, IT unit are seldom provided the same level of strategic position in the overall organizational structure as the core business units. In addition, unlike in the core business units (say the Taxation Department in a Ministry of Finance), where the functions are tied to some regulations, IT units as a traditional support unit assume less formal structures with less stringent regulatory constraints. This somehow provides great deal of flexibility in shaping the vision of IT organization, without the fear of official approval for such changes. Even with the increasing emphasis on IT governance which imposes specific responsibilities with the IT organization (e.g. the Sarbanes Oxley Act) in both public and private organizations, the bureaucracy in adjusting the mission of the IT units is far less complex than those of core units. The outcome of this task is an operational mission for the IT organization understood by all stakeholders.

T2.3. Establishing IT Vision – Following the review of the mission, the strategy team articulates an IT vision specifying the expected outcomes of the use of IT in the agency by stakeholders. Through a workshop session, the shared vision is negotiated to reflect the collective views of stakeholders in line with existing organizational strategy and business requirements. The output from this task is an agreed IT vision for the IT organization.

T2.4. Setting Strategic IT Goals – To concretize (or operationalize) the IT vision, the strategy team expounds the vision statement to obtain a coherent set of goals addressing different strategic aspects of the IT organization (Principle 4). For instance, the vision statement is expanded to show the desirable outcomes in the area of internal capabilities and growth of the IT organization, support for core continuous improvement of core administrative and business processes, continuous optimization of IT processes and governance in general (Principle 6), support for the delivery of services to agency customers (e-government – Principle 8), use of IT budget etc. The outcome of this task is a set of goals from which specific IT strategies will be developed.

A3.   IT Capability Assessment

In view of the vision and goals to be achieved by the IT organization, this activity establishes the existing IT capabilities of the agency including the specific requirements and drivers for IT within the agency.   The assessment activity also includes benchmarking the IT organization with similar organizations outside the agency and noting the prevailing technological trends vis-à-vis their potential uses in the agency. The outcome for this activity provides a sound foundation for the development of the Enterprise IT Architecture (Principle 5).

T3.1. Business Requirements and Organizational Strategy – This task aims to determine specific and more operational requirements for IT within the agency (more concrete compared to IT goals set in Task T2.2). These requirements are aligned with the stated goals and are part of the checklist for the

assessment activity. These requirements are supplied by the core business and support units. To properly align technology strategy with organizational strategy, the organizational strategy for the agency must be reviewed and crafted as part of the business requirements (Principle 1). The strategy team employs various kinds of instruments (interview, observation, questionnaires etc.) to produce a clear list of business requirements for IT.

T3.2. Internal capabilities – To satisfy the goals and business requirements, the IT organization must possess some level of capabilities in terms of human, processes, services, and technology base. Therefore, the strategy team is expected to assess the available IT skills and competences, the adequacy of IT processes (particularly considering specific IT governance requirements), quality of IT services to internal users and agency customers (while delivering services), available technology infrastructure in terms of networks, hardware equipments and software (applications, system software, data and knowledge bases etc.). The output of this task is a comprehensive record of each element of the IT capability.

T3.3. External opportunities and Benchmarks – For the competitiveness of the agency and to allow the IT organization leverage emerging technologies opportunities and best practices in similar organizations, it is highly recommended that strategy team carries out an external assessment to complement the internal one. The strategy team is expected to produce as output of this task benchmark reports on IT organizations in similar agencies within the same public administration (PA) or in other PAs. A brief survey of trends in technology relevant to some of the goals and business requirements of the agency could also be produced.

A4. Strategy development

This activity is the heart of the whole strategy process since it involves the development of required strategies to satisfy the goals, organizational strategy and business requirements and at the same time considering best practices and external opportunities. It starts with an analysis of the IT Capability Assessment results in view of the strategic framework to determine the strength, weaknesses, opportunities and threats (SWOT) of the IT organization. Strategies are determined based on the results from SWOT analysis and later refined into more concrete objectives. Finally the objectives are related through dependencies between them.

T4.1. SWOT Analysis – This task analyses the results from IT capability assessment activity (outputs of Tasks T3.1, T3.2 and T3.3) to establish the adequacy of available capability with respect to the IT goals, organizational strategies, business requirements and major strategic areas. The analysis determines for the major IT goals and business requirements, the strengths, weaknesses, opportunities and threats of the IT organization. Strength relates to internal factors which enable the IT organization in achieving desired outcomes while weaknesses are internal factors that reduces the chances of the IT organization in achieving its goals. Opportunities are external factors (corresponding to strengths) which the IT organizations could leverage towards achieving its goal, while threats are external opportunities that the IT organization must mitigate to achieve its goals. The strategy team in collaboration with relevant stakeholders will produce a SWOT analysis table spanning all IT goals and core requirements as the major output for this task.

T4.2. Strategies elicitation – Based on the SWOT analysis results, IT strategies are developed to leverage strengths and weaknesses and address weaknesses and threats, towards the attainment of specific goals. As much as possible, developed strategies are to be associated with one or more goals. The strategy team produces as output of this task a table of strategies to support each strategic goal based on SWOT analysis results.

T4.3. Strategy Refinement into objectives – To make IT strategies more concrete, the team produces specific objectives from the IT strategies in terms of specificity, extent, target, and timeline for action.

Specifically, specific measures and corresponding targets (Principle 3) are defined for each objective. The team is expected to produce a table of strategic IT objectives, with each objective associated with one or more strategies. The task is also expected to produce an IT Scorecard for the agency.

T4.4. Mapping objectives – Finally, to complete the strategy development activity, a set of annotated dependencies must be established between the developed strategic IT objectives. These relationships are provided to reduce strategy gaps (Principle 2) in the developed IT strategy and objectives. IT Strategy maps can be derived automatically from the IT objectives. The strategy team is expected to produce an IT Strategy Map at the end of this task.

A5.   Strategy Implementation

Once IT strategies and objectives are developed, concrete IT initiatives required to implement the strategies and objectives are to be determined. Through this activity, the strategy team develops these initiatives, establishes a rational priority for their implementation considering available resources and specifies the requirements for each of the initiatives.

T5.1. Determining Initiatives – For each of the strategic IT objectives defined in Task 4.3, the strategy team determines the set of initiatives or projects to implement or achieve each objective. Each identified initiative includes a description, the proposed period (immediate or short, medium or long term), the major stakeholders involved (possibly external agencies or stakeholders) and their responsibilities, expected outputs from the initiative, and the resource requirements. The team is expected to produce a table of initiatives from this task.

T5.2. Prioritization of initiatives – Given the dependencies between initiatives (for instance, an initiative may be required to enable or make feasible other initiatives) as well as resource limitations, initiatives need to be prioritized based on their urgency (e.g. infrastructure provisioning and training initiatives), value potentials (e.g. in the area of strategic outcomes, organizational outcomes and service delivery to citizens), technical feasibility and organizational feasibility. A priority table showing quantitative and qualitative measures is to be produced by strategy team as an output of this task.

T5.3. Determining requirements for initiatives implementation – This task provides detailed resource requirements for priority initiatives for planning implementation. Specification of the human and materials resources as well as a high level schedule for the initiatives is developed in this task by the strategy team. The output from this task is a detailed specification of the resources required for implementing each of the priority initiatives. Since this task involves detailed operational planning, it could be deferred and implemented outside the IT strategy process. However, when possible, this information increases the chances for successful implementation of the developed strategies.

A6.   Strategy control

Due to implementation issues, a good and sound IT strategy may fail to produce expected outcomes. A framework to detect such divergence as early as possible is needed to avoid complete failure and waste. This activity develops a monitoring mechanism for the IT initiatives and uses monitoring results for the evaluation of the effectiveness and impact of the strategies in the agency.

T6.1. Strategy monitoring – This task entails specifying input and output parameters for each initiative. These parameters are to be used during implementation in linking the investments on individual initiatives and the results produced from them. The team is required to produce as the output of this task a table describing the major input and output parameters for each initiative and the

expected relationships between these variables. This table should also specify the sources of data for each parameter and if possible the unit or entity responsible for providing the data.

T6.2. Strategic evaluation – The accumulation and effective exploitation of deliverables or outputs from initiatives and projects is expected produce the sought outcomes. This task relates the concrete measures provided for each IT initiatives with the concrete outputs from IT initiatives to establish if the targets are being met. The output from this task is a framework relating the measures specified for each objective to variables associated with all initiatives implementing these objectives.

A7.   Dissemination

The dissemination activity puts together the outputs of the 6 activities above as strategic IT plan, circulates and presents the plan to all stakeholders for comments. After obtaining effecting review comments on the draft, the final draft is published as an official IT Strategy for the agency.

T7.1. Documentation – This task produces the "Strategic IT Plan" document from the outputs of the Activity A1 through A6 including supplemental reports, for instance by detailing the outputs from the IT capability and the implementation planning activities. Once the draft report is completed, the strategy team is expected to present the document to all the major stakeholders of the agency.

T7.2. Comments and Revision on draft – After presenting the draft IT strategy, revision comments are sought from stakeholders. The team through this task obtains and discusses comments from the stakeholders and effects the necessary amendments.

T7.3. Dissemination of final version – Following the revision, the final version of the strategy document is circulated and published publicly a reference to other units. The IT organization is expected to derive annual and short term plans from the IT strategy document.

2.3   Implementing the Process

We describe in this section, some techniques and frameworks prescribed for implementing the IT strategy process discussed in Section 2.2. The Balanced Scorecard technique [27] is prescribed for implementing the strategy development activity, while the Logic Model [19, 20], the World Bank's Monitoring and Evaluation Framework for e-Strategies [28] and the US General Accounting Office, Accounting and Information Division's Guide on IT Performance Measurement [29] are recommended for the implementation of the strategy control activity.   These implementation frameworks are briefly explained below and presented in details in latter sections of the toolkit. These performance frameworks provide a rich set of indicators for starters.

2.3.1   Balanced Scorecard System

A Balanced Scorecard (BSC) is a carefully selected set of quantifiable measures derived from an organization's strategy. The scorecard (or the measures) represents a tool for communicating with employees and external stakeholders the outcomes and performance drivers through which the organization will achieve its mission and strategic objectives. A Balanced Scorecard also serves as a strategic management framework which enables the balanced specification of strategies in the Customer, Internal Processes, Learning and Growth and Financial perspectives. In addition, it allows for the specification of relationships among strategies in the different perspectives (strategy mapping) and enables the alignment of short-term actions with developed strategies for effective strategy implementation.

As an implementation framework for the strategy development activity, the BSC system assures a balanced approach to strategy development. For instance, strategies developed is expected to cover the different complimentary perspectives; including stakeholders, customer, internal processes and financial perspectives. The BSC system also guides the refinement of strategies into strategic objectives, minimizes strategy gaps through strategy mapping and provides a sound basis for performance measurements at strategic and operational levels of the organization.

Specifically, the IT Balanced Scorecard system provides goals, strategies, objectives and measures in terms of (i) how IT meets enterprise needs, including at program and project levels, (ii) how IT satisfies the needs of customers, (iii) fulfilling internal IT processes and (iv) accomplishing IT innovation and learning [29].

Comprehensive information on Balanced Scorecard for the Public Sector is provided in [28].

2.3.2   Logic Model Technique

The Logic model is a general framework for both program planning and evaluation which describes the logical linkages among program resources, activities, outputs, audiences, short-, medium- and long term outcomes related to a specific problem or situation [19]. The models illustrate the sequence of cause-and-effect relationships. The logic model consists of the following major components: situation description, input specification (what is invested), activities (what is done), output specification (what is produced), outcome specification (what is achieved) and external factors specification (what are the external influences and related programs).

In the context of the IT strategy control, the Logic model allows us to: (i) clearly specify desirable outcomes in the short, middle and long terms, (ii) specify IT-related measures at the input, output and outcome levels, and (iii) link these measures. Input covers time, money, partners, equipment and facilities. Output covers
Though, the logic model is largely applied to program level assessment, there are clear correspondences between the Balanced Scorecard System and logic model framework. For instance, the Financial and Organizational learning and growth perspectives of the BSC are classified as inputs in the logic model, while the internal processes in the BSC are activities and outputs. The customer, stakeholder of the BSC can be mapped to the outcomes component of the logic model (long term).

Detailed information on the logic model is provided in [19] and [30].

2.3.3   Monitoring and Evaluation Tool for E-Strategy

The Monitoring and Evaluation Framework for e-Strategy presents a simple framework to identity, track, monitor and evaluate various policy goals, strategic priorities, key initiatives and actions constituting an e-strategy or IT strategies in general. The framework tracks and measures deliverables, outputs, outcomes and impacts for actions, initiatives, strategic priorities and policy goals respectively. The framework also suggests exemplar indicators and probable data sources for specific policy goals (in areas including ICT infrastructure, ICT Sector and Electronic Government) and corresponding strategies, initiatives and actions.

Detailed information on the monitoring and evaluation framework is presented in [27].

2.3.4   IT Investment Performance Measurement Guide

The executive guide for Measuring Performance and Demonstrating Results of Information Technology Investments was developed by the Accounts and Information Management Division of the General Accounting office, United States. The Guide explains how to carry out IT Performance Management in public organizations.   It prescribes the following five major steps in developing an IT performance system – following an IT "Results Chain"; following a balanced scorecard approach, targeting measures at decision-making levels, building data collection/analysis capability and improving IT processes.

The guide provides example measures for each generic strategic IT goals such as achieving the strategic needs of the enterprise, satisfying the need of individual customers, addressing internal IT business performance and addressing innovation and learning.

More information on the guide is provided in [30].

2.4   Summary

This section provides an over-arching framework and context for the remaining sections of the toolkit. It discusses the generic strategy processes and explains some principles underpinning the strategic IT planning process prescribed in the toolkit. The chapter also explains some major implementation frameworks such as Balanced Scorecard for strategy development [28], Logic Model [19], e-Strategy Performance Monitoring and evaluation framework [27] and the GAO's AIMD Performance Management Framework for IT investments [29].

3   Planning the Strategy Process

This section explains how to plan for the overall IT strategy process. It describes the four steps involved in this activity - from getting management commitment and approval through stakeholders' analysis to formation of the strategy team and provision of schedule for the exercise as well as obtaining the requisite resources to complete the process.

3.1   Getting Commitment and Approval

Description: The task commences the overall planning process. It is usually undertaken by the management of the IT organization as a response to some needs, pressures, inadequacies or emerging opportunities. The objectives for this step include: providing a business case and justification for engaging in the exercise; explaining the scope of exercise and expected benefits to management; clarifying the required support from management and obtaining the approval to proceed with the exercise. A short proposal or concept note explaining the objectives and expected benefits of the exercise are required as input for this task. Two major outputs are expected from the process: (i) explicit written approval by management to proceed with the IT strategy process and (ii) directives to all units of the agency for cooperation.

Process: The following steps are involved in obtaining the sought approval:

T1)   submission of proposal to agency management team

T2)   presentation and clarification of proposal (say during management meeting)

T3)   evaluation of proposal by top management

T4)   issuing approval (or declining support) for exercise

T5)   communicating decision to IT organization and heads of core organizational units within the agency
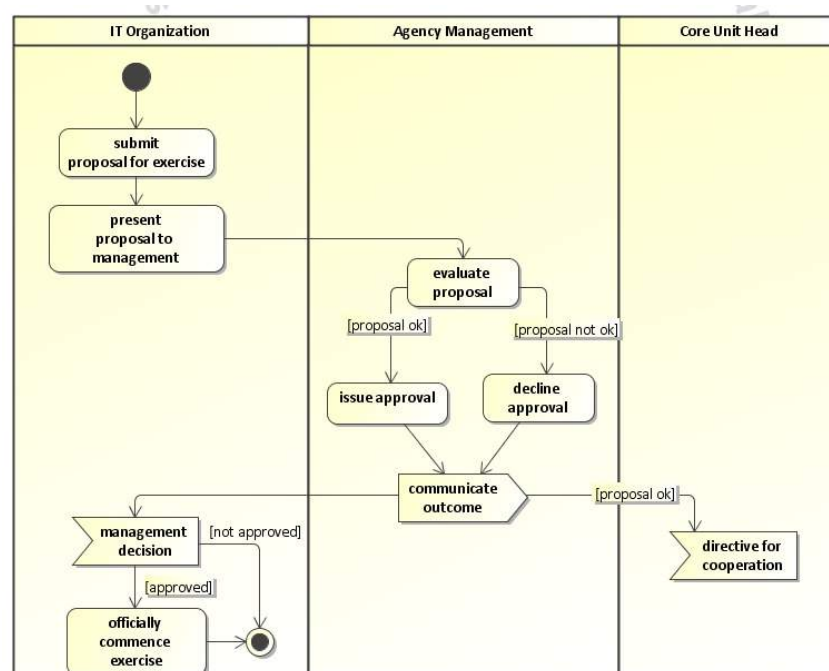

Figure 5: Commitment and Approval Process

Figure 5 shows that on approval of the project, explicit directive is issued to all other units of the agency for cooperation with the IT organization and the strategy team in the execution of the project.

Tools: A template for the preparing a Strategic IT Planning proposal or initiation document is provided in Section 1 of [33]. The template combines the key components of PRINCE 2 Project Initiation Document and Business Case Document. Also see the PRINCE 2 Templates and Manual for more information.

Related Tasks: The output from task will serve as a basis for developing a detailed time and resource schedule for the exercise (Scheduling and Getting Resources Task).

Comments: For various reasons, management may decline to support or approve the exercise, for instance due to lack of resources or time. In this case, the exercise is discontinued (at least momentarily) pending representation or re-evaluation. In the case where strategic IT planning is a core component of the overall performance management framework for the agency, providing justification and business case may not be required. However, the resource availability could still constrain the scope of the exercise.

3.2   Analyzing Stakeholders

Description: Stakeholders for the IT Strategy exercise are actors (persons and organizations) that will be affected by the Strategic IT Planning exercise or affect (positively or negatively) the attainment of the goals for the planning exercise. They include the management of the agency, core business units, major support units, representatives of customers (citizens, businesses and other agencies), intermediaries, suppliers, employees of the agency, etc. The purpose of this task is at least three fold: (i) to establish the scope of the strategic planning exercise, (ii) gather and analyze information on stakeholders to determine whose interest should be prioritized in the IT strategy to be developed, (iii) to ensure that the planning exercise covers the interest of all major stakeholders - both internal and external stakeholders. The input to the process is a complete list of stakeholders for the IT organization. The output consists of (i) a profile of each stakeholder, (ii) specification of roles for the stakeholders in the exercise and (iii) an initial communication plan for the stakeholder.

Process: the following steps are involved in the stakeholder analysis process:

T1)   reviewing stakeholders list

T2)   determining required information for profiling stakeholders

T3)   designing instruments for data collection

T4)   planning data collection on stakeholders

T5)   collecting data on stakeholders

T6)   analysis collected data

T7)   determining roles and priorities for stakeholders interest

T8)   drafting an initial communication plan

Figure 6 provides the sequence of the tasks for caring out stakeholders' analysis. Implicit between "collect data from stakeholders" and "analyze collected data" is the consolidation of the data gathered through different information gathering instrument.

Tools: A template for carrying out the above the stakeholder analysis process is provided in Section 2 of [33]. The template provides checklist for stakeholders, information on possible elements of the

stakeholder's profile and indicates important criteria to consider when prioritizing stakeholders interests for the IT strategy process. It also specifies important aspects of a communication plan suitable for IT strategy process.

Related Tasks: The output from task will guide the composition of the IT strategy team and determine the sources of information for the rest of the IT Strategy exercise from IT Strategic Framework activity through *IT Capability Assessment* to *Strategy Development*, *Strategy Implementation*, *Strategy Control* activities and *Strategy Dissemination* activities.
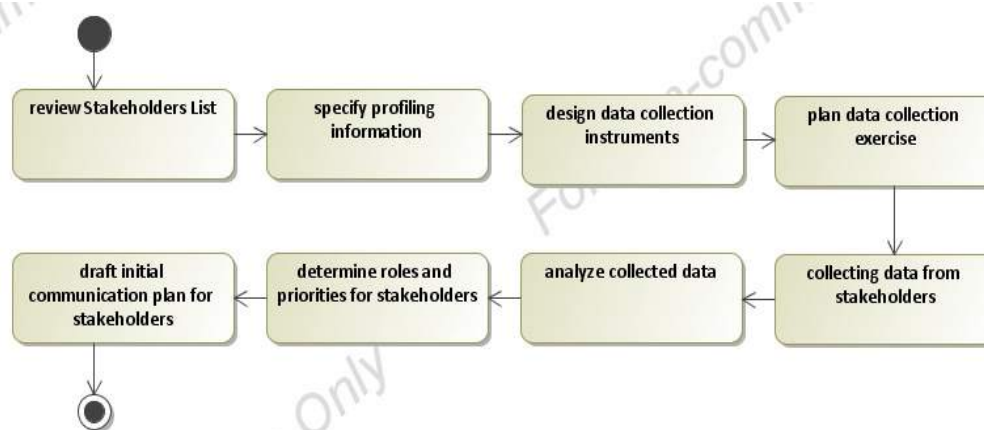
Figure 6: Stakeholder Analysis Process

Comments: The complexity and scope of the IT Strategy exercise plays an important role on the depth and formality of the implementation process. For instance, in a case where business units are large and distributed, online questionnaires could be provided for capturing required profile information. However, in a small agency, direct interaction with stakeholders would definitely be preferred to obtain such information. Also in communication will be more fluid and easy in small agencies thus requiring less formal communication plans than in big distributed agencies. Nevertheless, the stakeholder analysis process is very important in mitigating possible risks arising from conflicts of interest with respect to stakeholders.

3.3   Forming the Strategy Team

Description: This task constitutes the strategy management team for carrying out the IT strategy exercise. The team is typically composed of: senior management representative, individuals that represent the core business units and management of the IT organization. The team's main responsibility is to carry out strategy development tasks – collecting and organizing all necessary information from stakeholders and business units, engaging agency management in strategy sessions, carrying the necessary environmental assessment tasks, developing concrete strategies and presenting developed strategies to agency management. The main inputs for forming the strategy team are the stakeholders' profile and role produced by the Stakeholder Analysis task. The major output from the task is a list of IT strategy team members and their respective roles.

Process: This task could be executed with the following sequence of tasks:

T1)   short listing team members using stakeholders' profile and role information

T2)   assigning roles to stakeholders within team

T3)   discussing assigned roles with shortlisted stakeholders

T4)   dropping unwilling stakeholders and identifying replacements

T5)   re-assigning roles as necessary

T6)   compiling a list of team members with responsibilities

T7)   Review Terms of Reference (TOR) for team with members

T8)   Revise and freeze TOR for team

Related Tasks: Once the strategy team is formed and the term of reference agreed, the team can scope the planning exercise, develop the detailed schedule and secure the required resources for project execution.

Comments: It is recommended that the size of the team be compact - say between 3 and 10, depending on the size and scope of the agency. The team leader (possibly with the support of another member) is expected to facilitate the working of the team. Team members are expected to have deep understanding of the business of the agency with knowledge and working relationship with major external stakeholders. In some cases the core team may be expanded (extended team) for data gathering and processing.
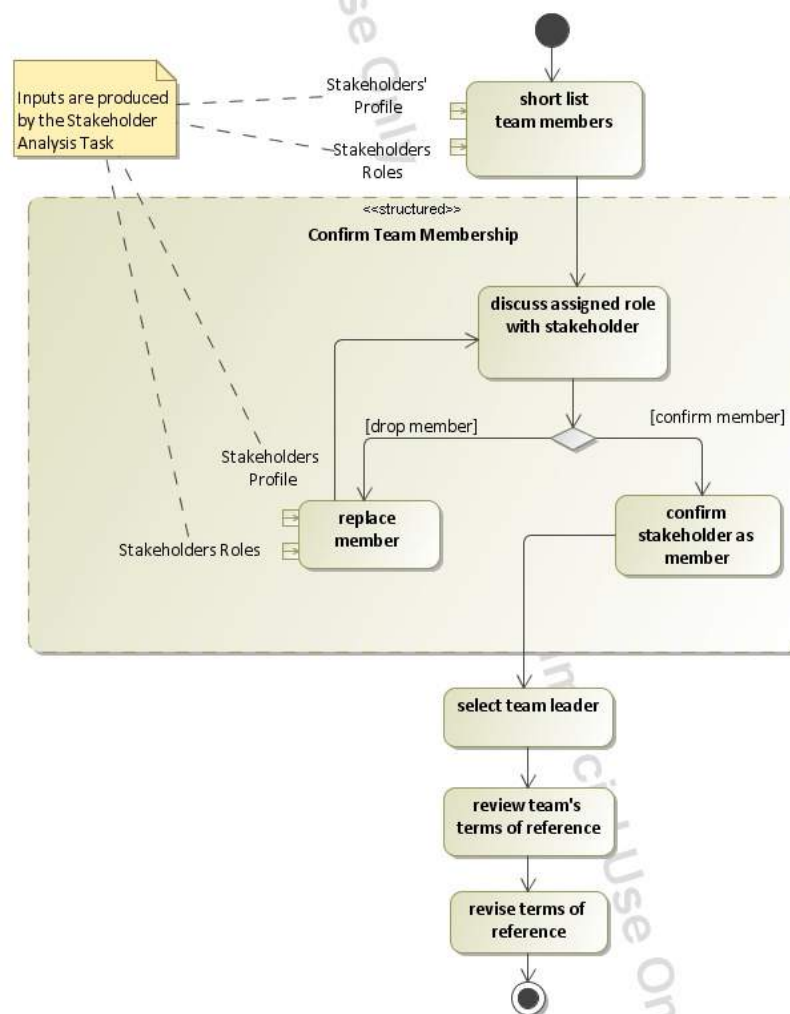
Figure 7: Strategy Team Formation Process

Figure 7 shows that each stakeholder is consulted in turn to agree on role, while unwilling stakeholders are substituted using the information provided in the stakeholders table.

3.4 Scheduling and Mobilizing Resources

Description: A detailed schedule for the strategy exercise has to be established before its commencement. The constituted strategy team is required to secure the required resources for the activity from various stakeholders and management. The major inputs for this task are (i) the project initiation document developed by the IT organization which already provides a high level plan and (ii) information from stakeholder analysis produced during the stakeholder analysis task. The output is a detailed project schedule (with resource schedule).

Process: The task could be executed through the following steps:

T1)   determine degree of involvement of business units

T2)   review approach to planning exercise

T3)   determine timing for major project activities

T4)   draft and communicate plan to concerned units

T5)   obtain feedback from units on suitability of plan

T6)   review and conclude plan

T7)   circulate final project schedule to all stakeholders

Related Tasks: The task provides a schedule that governs the rest of the planning activities. It also relies heavily on others tasks of the planning exercise, e.g. the commitment and approval and stakeholder analysis tasks.

Comments: In line with general good project management practices, project risks should be identified, tracked and managed (for instance poor cooperation or participation from core business units), project dependencies and tolerances should be determined. In fact, the whole planning exercise is expected to be carried out within.
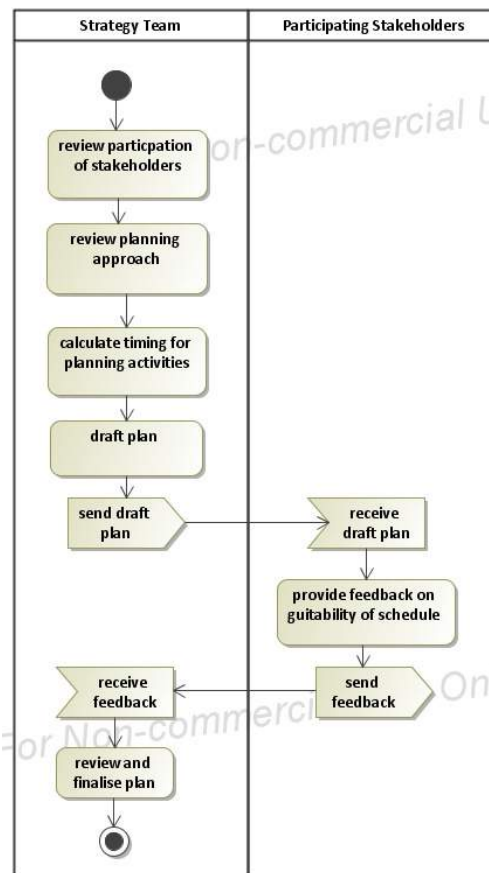
Figure 8: Strategy Team Formation Process

3.5 Summary

This section describes the various steps involved in planning activity of the overall strategic IT planning exercise from getting the necessary approval and commitment for commencement through determination of major stakeholders to formation of the strategy team and establishment of concrete project and resource schedule. This step significantly reduces the risk involved in the whole process. It also identifies the major aspects of the agency to focus when developing the IT strategy. Two templates are provided in Sections 1 and 2 of the Templates document [33] for supporting project initiation and stakeholder analysis tasks.

4 IT Strategic Framework

This section explains how the strategic framework for the IT strategy exercise is developed through - revision of the organizational goals and the mission of the IT organization, obtaining agreement on the IT vision for the agency and elaboration of the IT vision into concrete goals. This activity is usually held as a workshop or series of brainstorming sessions involving the strategy team and the other stakeholders possibly outside the agency.

4.1 Reviewing Organization Goals

Description: The organizational goals for the agency provide a context for the overall IT strategic framework, since a primary function for the IT organization is to support the major agency objectives. However, it is not unusual that internal stakeholders, including the IT organization lack a clear understanding of the organizational goals. Through this task, the strategy team aims to explain the organizational goals of the agency to all stakeholders as a basis for examining the mission of the IT organization. The input to this task is the organization strategy for the agency while the output is a list of priority goals to consider in the IT strategy task.

Process: The following steps could be executed to review the organizational goals:

T1)   Identifying and explaining the core aspects of mission statement

T2)   reviewing organization vision

T3)   reviewing the major goals of the agency in different perspectives (stakeholder, customers, and public; internal processes and operations; organizational learning; and finance and budget)

T4)   Identifying goal elements amenable to IT support

Figure 9: Organizational Goals Review Process

Tools: Section 3.2 of Templates [33] provides tables for capturing information related to the review of the organizational mission, vision and goals of the agency. Goals are classified under the classical four balanced scorecard perspectives (Customers or stakeholders, internal processes, learning and growth and financial).

Related Tasks: This task is closely tied to the IT vision and Goal setting activities, which immediately follows. Identified priority goals are considered are input into the IT visioning and goal setting exercise.

Comments: The prescribed process assumes that organizational goals exist for the agency. However, it is not uncommon that public agencies do not have explicit organizational goals or strategies in place except their mission and vision. In such cases, the management team with the IT strategy team must articulate some operational goals to guide the development of the IT strategic framework.

4.2   Reviewing IT Mission

Description: In addition to the traditional support role of IT organizations in agency, and the increasing strategic role of IT in modern government agencies (enabling the realization of strategic outcomes), there are cases in which the mission of the IT organization extends beyond the boundary of the agency. Through this task the strategy team clarifies and reviews the mission or purpose of the IT organization. The input to this task is the mission statement (if it exists) or functions of the IT organization. The output from the task is an operational mission statement for the IT organization.

Process: The following simple steps are involved in the review of the IT mission:

T1)   discussing clarity and adequacy of IT mission statement and functions

T2)   modifying statement or functions as required

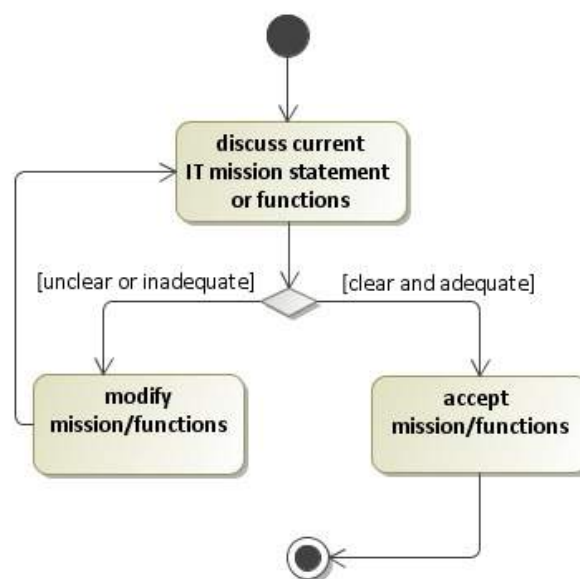T3)   agreeing on revised IT mission statement and functions

Figure 10: IT Mission Review Process

Tools: Section 3.3 of the Template document [33] provides a table for capturing the IT mission elements and specific functions for validating the IT vision.
Related Tasks: The IT vision is constrained by the mission of the IT organization. For instance, the IT vision must be achievable within the agreed mission for the IT organization.

Comments: Revision of mission and functions of internal units of agencies may be subject to approval by higher authorities such as Secretaries and could be time consuming. To avoid this constraint, it is important that any revision made must not exceed the granted competences of the unit. Thus, a pragmatic approach to revision of the mission or functions of units is to take such revisions as "operational" or "administrative" and not formal. Thus, the official or approved mission or functions still holds while the modified or revised version is used for the exercise.

4.3   Establishing IT Vision

Description: The IT Vision sets the desirable outcomes for the use of IT in the agency to support organizational vision and goals. Guided by the IT mission, the strategy team and stakeholders brainstorm in a workshop-style session to articulate a vision for IT. The input to this task is the IT mission, organizational goals and major business information requirements from business units. The output from the task is a set of agreed IT vision statements. It is important that the resultant vision is shared amongst stakeholders.

Process: The following steps are involved in this process:

T1)   organizing workshop participants into brainstorming groups

T2)   getting individual contributions within teams

T3)   consolidating individual contributions within teams

T4)   presenting vision statements from teams

T5)   agreeing on major IT vision elements across teams

T6)   drafting final IT vision statement

Process described in Figure 11 shows that a team leader is selected to facilitate the workings of each discussion or brainstorming group.

Tools: Section 3.4 of Template document [33] contains a table to document the major elements of the IT vision under five areas: Organizational mission and programs, Core business processes, IT processes, IT enabled innovation and learning, IT resources.

Related Tasks: The vision statement produced in task is the major input for the IT Goal Setting Task.

Comments: The IT visioning process must be designed to be participatory and should ensure that resultant vision is agreed or shared among all participating stakeholders. Team composition should include members from different backgrounds within the agency to have a near complete perspective of the entire agency within each of the teams. A few common principles could also be adopted to guide the overall visioning exercise. For instance, the IT vision should consider issues relating to: strong partnerships and alliances with other agencies and vendors; leveraging resources and information; customer-oriented and continuing service process improvements; cost-effectiveness; return on investment, and business process improvements and consistent policies and standards, using commonly accepted professional tools and practices to improve quality and efficiency; and attracting and retaining the most qualified professional staff.

Figure 11: IT Vision Process

4.4 Setting IT Goals

Description: This task is one of the most important tasks in the development of the strategic IT framework since it is the first step in the elaboration of the IT vision. The development of concrete IT goals from the vision follows a balanced approach in which the IT organization or the strategy team specifies how IT capabilities will be developed within the agency in different perspectives. These perspectives include (i) support for organizational mission (corporate contributions), (ii) stakeholder or customer orientation, particularly in the area of service delivery, (iii) learning and growth (or innovation), (iv) internal processes (operational excellence) and (v) IT resources (finance and budget). The major input for the task is the IT vision statement and the major IT needs from core business units. The output from the task is a list of IT goals in the different perspectives.

Process: The tasks could be carried out as a sequence of the following major steps:

T1)   organizing workshop participants into brainstorming groups

T2)   getting individuals within groups to identify goals

T3)   consolidating individual contributions within teams

T4)   presenting IT goals statements for different teams

T5)   consolidating and agreeing on IT goals for each perspective

T6)   drafting final list of IT goal statement for each perspective

Figure 12 shows that the goals for each of the perspectives must be elaborated and agreed by the team.

Tools: Section 3.4 of the Template documents [33] provides a table for specifying the outcome of the process.

Related Tasks: The major output from this task is the most concrete information to guide the development of IT strategies.

Comments: In addition to the IT vision elements, information generated from the capability assessment exercise (next Section) is also useful in developing or elaborating on each of the strategic areas. Although five strategic perspectives have been proposed and used in this toolkit, agencies could suitably select other perspective as suitable for their IT needs. What is important is to ensure that the selected perspectives are complimentary (and possibly balanced).
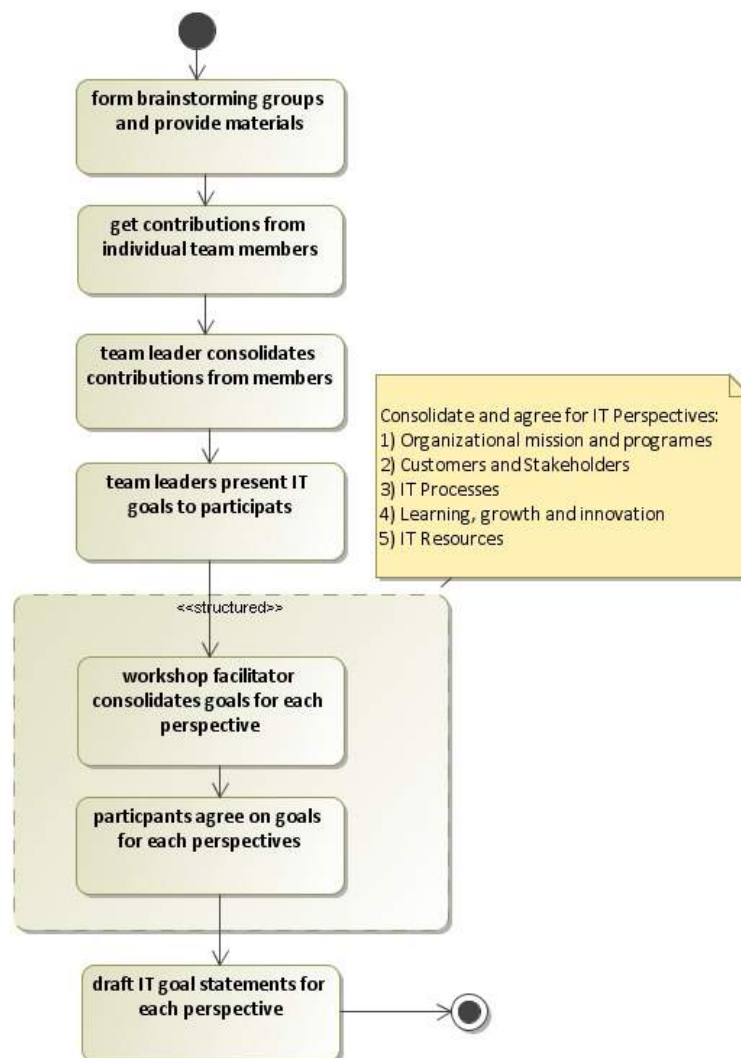
Figure 12: IT Goals Development Process

4.5   Summary

This section presents how the strategy team and other core stakeholders can collectively establish the IT strategic framework based on the existing organizational strategy (for strategic IT alignment). This activity must be inclusive as much as possible to result in shared vision and goals. It is also important that a good knowledge of the existing capability is available to guide the development of feasible or relatively realistic goals. This implies that the Strategic IT Framework and the IT Capability Assessment activity could be executed in parallel. Concrete IT goals also enable the assessment exercise to focus more on areas of interest. The feedback loops from these two activities could be exploited for more effective results.

5   IT Capability Assessment

The section shows how to assess the available IT capability within the agency. It covers three broad classes of assessment (i) business and organizational requirements, (ii) internal IT capabilities, and (iii) external factors affecting IT development in the agency. The details of the information to be obtained under each category are discussed below. Figure 13 presents a generic process for the exercise.
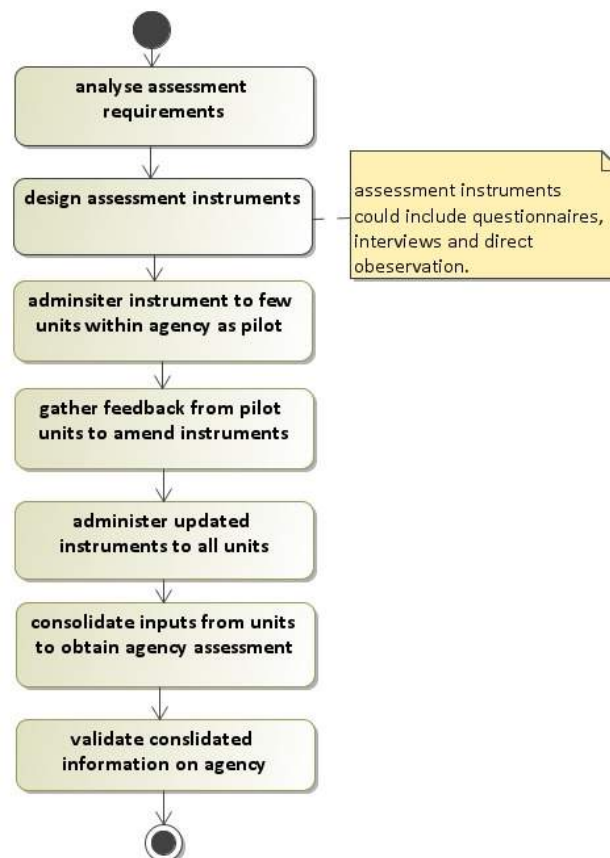
Figure 13: Generic IT Capability Assessment Process

The three categories of assessment information are to be obtained through a single instrument (preferably a questionnaire) organized into sections. In addition, as shown in Figure 13, the assessment proceeds in two major phases, (i) assessment of individual units, and (ii) consolidation of information about organizational units to obtain agency information. The output from this activity is a major input for the development of the agency IT Architecture.

5.1   Business and Organizational Requirements

Description: This assessment task examines the business and organizational requirements that the major units of the agency present for the IT organization. At the unit level, the task documents the functions, reporting requirements, organizational and services of the unit. Information on services spans those provided by the unit to third party entities (citizens, business and other government agencies) and services received from these parties. At the agency level, information on the mission

and organizational strategy of the agency are included. The IT strategic Framework activity provides significant input into obtaining this category of information. The assessment components below indicate the specific outputs from this assessment task.

Assessment Components: The outputs from this task include detailed information on the following items:

C1)   mission of the agency

C2)   specific functions of the agency (or unit)

C3)   reporting requirements for the agency (or unit)

C4)   IT strategy for the agency

C5)   services provided to third party entities (citizens, businesses, visitors and the public in general)

C6)   core services and underlying business processes for the agency (or unit)

C7)   services received from third-party entities for the agency (or unit)

Tools: Sections 4.2 through 4.4 of the template document [33] covers the assessment of the business and organizational aspects of IT in the agency (or unit).

Related Tasks: The outputs from the IT strategic Framework activity could be useful in responding to some of the sought information (for instance mission and specific functions of the agency or unit).

Comments: The task fundamentally reveals elements of the IT strategic framework, the existing organizational framework and the extent to which IT-enabled services are delivered by agency (or unit). Noting the interdependency between the IT strategic framework activity and the IT capability assessment, a concurrent execution of these two activities is recommended (at least partial).

5.2   Internal Capabilities

Description: This task assesses the available IT resources to support the business and organizational requirements of units and the agency at large. The resources include hardware, software, network, telecommunication, human and financial resources. The online presence of agency is also reviewed as part of this task. For infrastructure related elements, the number (e.g. number of PCs or servers) and specification of the elements are requested, while the various kinds of software (system, databases, servers, directory, web, user application, etc.) are assessed. In the area of human resource assessment, the number of IT personnel and their technical competences are determined. In terms of financial resources, the distribution of the IT budget among recurrent and fixed expenditure and the major IT resources (human development, infrastructure development) are recorded. The IT officers and the members of the units provide the required information.

Assessment Components: The outputs from this task include detailed information on the following items:

C1)   hardware resources, including PCs and servers

C2)   communication resources, including broadband Internet access, leased lines, VSAT, video conferencing

C3)   software resources, including operating systems, in-house, bespoke and server applications

C4)   human resources, including IT personnel/staff ratio, staff/PC ratio, ICT skill inventory

C5)   financial resources, including recurrent and fixed expenditures, budget

C6)   websites, including agency websites, program websites, online information and services

C7)   IT Management capabilities, including IT processes, policies and standards, business continuity and risk

Tools: Sections 4.5 through 4.7 of the template document [33] provides forms for capturing the seven categories of information listed above.

Related Tasks: The output from this task will be used in developing strategies. These information are also useful for developing the IT architecture for the agency.

Comments: Strategic IT framework would generally guide the depth of information required in each of the components of the assessment. For instance, if there are strategic IT goals in the area of training and capacity building, then the assessment could be required to provide in-depth knowledge of the ICT skill inventory, existing IT human resources, current spending on IT related training etc.

5.3   External Factors

Description: This task aims to capture information about IT resources and programs outside the agency which presents both opportunities and challenges to the agency. These include existing government-wide infrastructure, opinion on public administration reform initiatives and e-government development projects. In addition, the task could also consider the needs and perception of users or customers in the delivery of IT-enabled services. The information for assessment may be obtained by reviewing the technical or IT related services received from external agencies. Additional information can be obtained by reviewing appropriate IT policy documents.

Assessment Components: The following information items are produced from this assessment task:

C1)   IT services received from other agencies

C2)   existing government-wide IT infrastructure (e.g. PKI and Identity management services)

C3)   IT-enabled public administration reform initiatives

C4)   e-government initiatives

C5)   perceptions on IT-enabled public services

C6)   IT needs of users or agency customers

Tools: Part of Section 4.4 of the template document [33] captures information on C1. Document review and interview sessions could be used to gather information related to C2 through C6. It is also possible to have a dedicated questionnaire for capturing user opinions or perceptions on IT services provided by the agency.

Related tasks: The outcome of this task is essential for the SWOT analysis to be performed as part of the Strategy development activity.

Comments: This category of assessment could easily be considered less important than other two categories since it is external to the agency. However, alignment of the IT strategy of the agency with related government-wide programs could be missing if this task is skipped. In addition, information on opportunities would also be unavailable without carrying out this assessment.

5.4 Summary

Comprehensive assessment of IT capability requires a thorough study of the IT drivers and requirements within the agency, available IT resources and external factors related to IT development in the agency. While IT assessment activities in general tend to focus mainly on internal capabilities, IT requirements and external factors provide the context for analyzing the adequacy of existing resources. The availability of information on the IT strategic framework for the agency could help in scoping or determining the areas of emphasis in the assessment. This implies that bi-directional feedback loop is required between the strategic IT framework and the IT capability assessment activities.

6   Strategy Development

This section shows how IT strategies and more concrete objectives can be developed for the various elaborated goals during the Strategic IT Framework activity. This activity starts with an analysis of the strength, weaknesses, opportunities and strength of the agency with respect to each of the goals characterizing the strategic perspectives. Next it develops strategies to implement these goals, leverage opportunities and strength while addressing weaknesses and threats. IT strategies are refined into more specific objectives with measurable outcomes and with the relationship between the objectives specified.

6.1   SWOT Analysis

Description: Based on the information gathered from the Strategic IT Framework and IT capability assessment exercises, this task aims to analyze the IT situation at the agency. It identifies the strengths, weaknesses, opportunities and threats related to the attainment of the IT goals for the agency. Strengths are factors (positive) that can support the agency in achieving its goals, for instance experienced and motivated staff, possession of advanced skill, availability of resources. Weaknesses are factors that could prevent the agency in achieving its goal, for instance, poor leadership, shortage of funds, ill motivated staff. Strength and weaknesses correspond to opportunities and threats when extraneous factors are considered. For instance, an opportunity for achieving an IT goal could result from the availability of a government-wide PKI infrastructure. An example of a possible threat to IT goal such as provision of e-services could be poor e-literacy level of the society. In addition to eliciting SWOT factors for each of the goals (across all perspectives), possible interaction among these factors are analyzed (say strength and opportunities or weaknesses and threats) is also carried out. The main inputs for this task are the IT assessment results and the IT strategic framework. Output is a clear specification of the SWOT items for goals and (ii) result of the analysis of the SWOT factors.

Process: The following steps could be carried out to elicit and analyze the SWOT factors:

T1)   organizing participants into groups

T2)   enumerating SWOT factors for goals over all strategic perspectives

T3)   consolidating SWOT factors for each perspective

T4)   analyzing SWOT factors

Figure 14 shows the process model for this task. Tasks T2 and T3 are repeated over the strategic IT perspectives identified earlier.

Tools: Section 5.6 through 5.8 of the Template document [33] provides forms to support the enumeration of general SWOT factors for the strategic perspectives and specific SWOT factors for selected IT goals.

Related Tasks: This task relies on the outcomes of the IT assessment and strategic IT framework activities. Its output provides the basis for the strategy development task.

Comments: The depth of the analysis of the SWOT factors determines the effectiveness of the emerging strategy. A commonly neglected aspect of analysis is the study of the interaction between counterpart positive and negative factors (i.e. strength and opportunities versus weaknesses and threats).
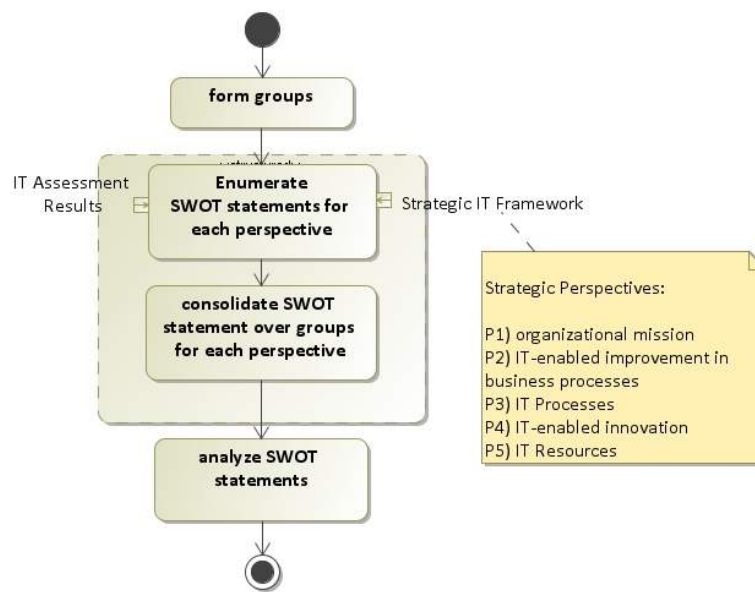
Figure 14: Balanced SWOT Analysis Process

6.2 Eliciting Strategy

Description: Strategy development follows immediately the SWOT analysis task. Strategies generally specify what should be done to achieve the major IT goals in view of the available IT capability and result of the SWOT factors (challenges and opportunities). Each strategy must be associated with a specific goal or generally with at least one strategic perspective. The major inputs required for carrying out this task include (i) outcome of the SWOT analysis and (ii) IT capability assessment exercise. The major output is a set of IT strategies to implement the strategic IT goals.

Process: The following steps are prescribed for developing strategies based on the required available inputs:

T1)   develop strategies to achieve each IT goal

T2)   develop strategies to leverage the positive SWOT factors (strength and opportunities)

T3)   develop strategies to mitigate the negative SWOT factors (weaknesses and threats)

T4)   consolidate strategies for each strategic perspective

Tools: Section 5.9 of the Template document [33] provides tables for recording the IT strategies associated with specific goals and those generally aligned with strategic perspective.

Related Tasks: This task depends significantly on the IT strategic framework and IT assessment activities. Its output is refined through the next task in producing concrete IT objectives.
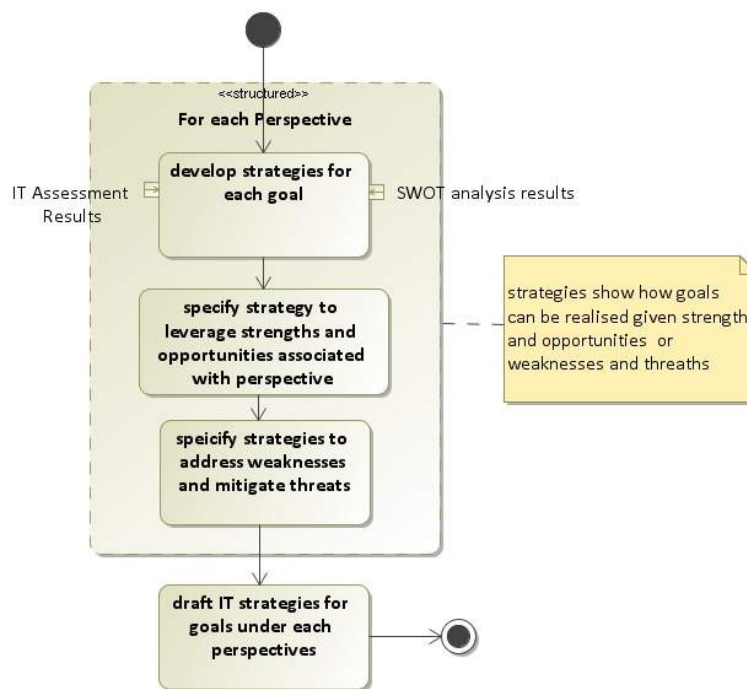
Figure 15: Strategy Development Process

Comments: The task is the kernel of the strategy development exercise. However, as the process specifies, the visioning and goal setting sessions as well as the capability assessment exercise provide foundation for this task. The strategy development process is iterative and incremental as the introduction of a strategy may necessitate the inclusion of other required or supporting strategies. Thus, for completeness, the consequences of the strategies should be checked. Strategy development in general is a complex process which requires sophisticated and subtle human thinking [28]. As discussed in Section 2, there are other approaches to strategy development than SWOT analysis. However SWOT analysis remains one of the most popular techniques.

6.3 Specifying Objectives

Description: This tasks aims to operationalize the developed strategies. To operationalize the strategies effectively, there is the need to refine or further break down the high level strategies and specify performance measures and possibly the target to attain. Specifically, objectives translate strategic priorities (which are often vague) into directional and action-oriented statements of what must be done to execute strategy. Objectives are translated into performance measures. The major input for this is the developed IT strategy while the output consists of (i) concrete objectives for major strategies under the different strategic perspectives, and (ii) performance measures for each objective.

Process: the following steps are prescribed for refining strategies into concrete objectives:

T1) prioritize the IT strategies

T2) determine specific actions for each priority strategy across perspectives

T3) specify performance measures for each objective

T4) compile objectives with corresponding performance measures under each perspective
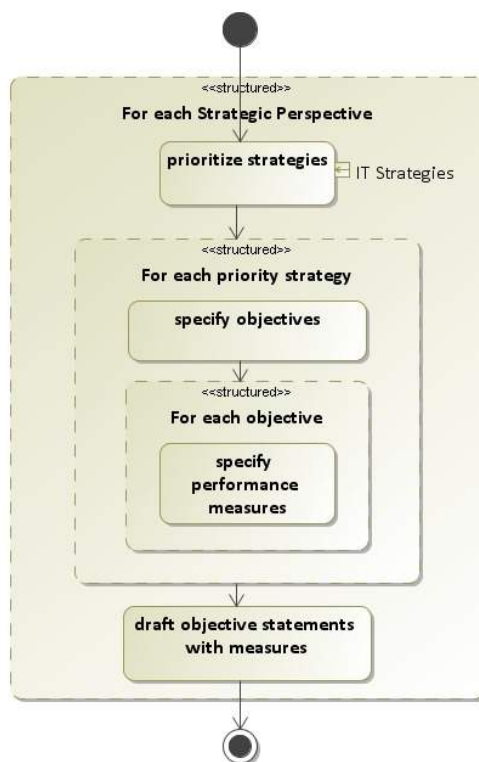
Figure 16: Strategy Refinement Process

Tools: Section 6 of the template document provides forms for documenting objectives statements with corresponding measures and target.

Related Tasks: The task is completely dependent on the strategy elicitation task. The output of the task also is the only required input for the Mapping task described in the next section. This task also provides the major input (performance measures) for the Monitoring and Evaluation activity.

Comments: Objectives are crafted using action verbs such as: create, initiate, maintain, develop, devise, excel, build, improve, achieve and identify [28], while strategies are broad statements – with many possible realizations or implementations. Performance measures provide the mechanism for tracking the objectives. The target for each performance measure could also be specified, if possible, to aid the development of initiatives in later stages of the process.

6.4 Mapping Objectives

Description: This task aims to establish cause-and-effect relationships or more generally, dependences among the strategic objectives developed from the priority strategies. Since the number of objectives could be large, a set of priority objectives is usually selected as a basis for mapping. Relating the objectives involve specifying the set of required and supported objectives for a particular reference objective. The exact nature of dependency between the objectives can be specified on the link. The major input to this process is the set of objectives while the main output from the task is a set of priority objectives with labeled cause-and-effect references among the objectives (so-called Strategy Map).

Process: The steps involved in mapping the strategic objectives are listed below while Figure 17 provides a more formal description of the process:

T1)   prioritize strategic IT objectives across the perspectives

T2)   specify for each objective the set of required and supported strategies

T3)   produce a strategy map based on information produced in step T2
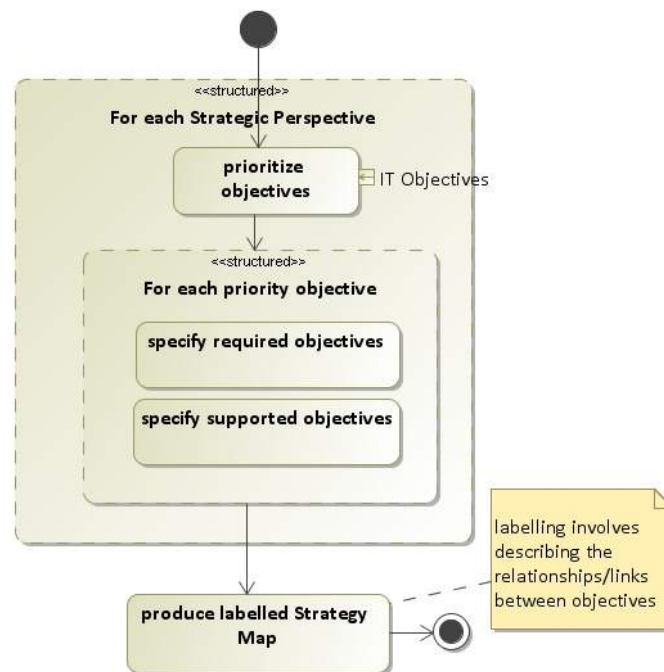

Figure 17: Objective Mapping Process

Tools: Section 6.2 of the Template document [33] provides tables for prioritizing objectives across the strategic perspectives. In the same table, columns are provided for specifying the set of supported and required objectives (i.e. dependencies between the reference objectives and others).

Related Tasks: This task supports the Strategy Control activity by showing how the effectiveness of objectives can be evaluated through the cause-and-effect relationships.

Comments: The output of this task is one of the most important outputs from the overall strategy process. The strategy map provides a snapshot of the major IT objectives and how each supports the other. Generally, the relationships between objectives are specialized form of the relationships between the perspectives. For instance, the IT resource perspective supports almost all the other perspectives and the innovation and learning perspective will directly support the organizational mission and program perspective. However, these relationships are may be too general for diagnostic or non-trivial analysis of the IT strategy.

6.5   Summary

This section describes the heart of the whole IT strategy process. It demonstrates how IT strategies can be developed through the analysis of SWOT factors, guided by the IT strategic framework and the IT capability readiness results. It also shows how the IT strategies can be refined into actionable statements called IT objectives. Through the specification of performance measures for objectives, general strategy control is achievable through the measures. Finally, by mapping objectives, evaluation of the effectiveness of strategies or objectives can be tracked. Analysis of the strategy map is also feasible by exploring the cause-and-effect links between the objectives.

7 Strategic Implementation

This section explains how concrete IT initiatives can be identified and prioritized using the information produced in the Strategy development activity. The initiatives are specific program, activities and projects or actions that will be carried out to ensure that the targets associated with performance measures for strategic objectives are realized.

7.1 Developing Initiatives

Description: This task aims to identify IT initiatives to implement the strategic IT objectives to meet performance targets. Generating initiatives requires the specification of performance targets (if not already specified) associated with the performance measures for each priority objective. Since a single initiative may support more than one objective, opportunities for streamlining initiatives could be sought to reduce duplication or avoid unnecessary excessively large IT portfolio. The main input to this task is the strategic objectives list produced in the Strategy Development activity. The output from the task is a list of initiatives.

Process: The major steps involved in the development of initiatives from priority IT objectives include:

T1)   specifying performance target (if not specified) for measures

T2)   defining initiative for objectives to satisfy performance target

T3)   compiling initiatives for each perspective

T4)   streamlining initiative list across all perspectives
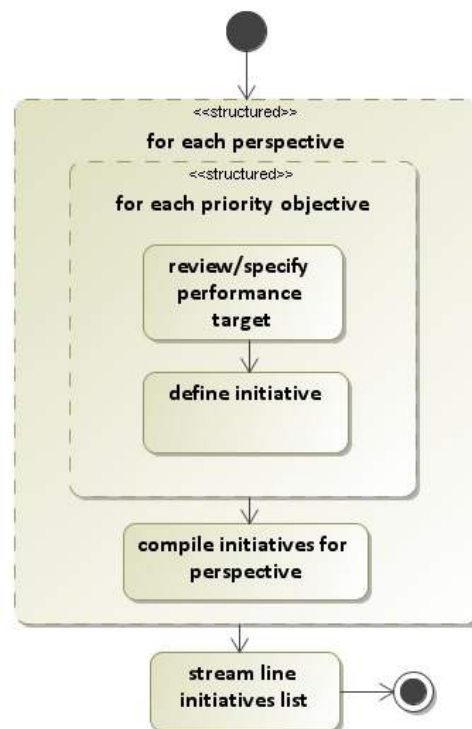
Figure 18: Initiative Definition Process

Tools: The current version of the template document does not support the definition of initiative. In [28], a table format is provided for mapping organizational initiatives to strategic perspectives.

Related Tasks: The task is one of the terminal tasks for the overall IT strategy process. It relies largely on the Strategy development activity and produces a major input for the Strategy Control activity.

Comments: This task is optional for the IT strategy process as it deals with implementation issues. However, by assigning this task to the strategy team, alignment between initiatives is guaranteed. Parsimony is also important to consider when generating initiatives in view of resource requirements.

7.2   Prioritizing Initiatives

Description: The final task in the implementation of strategic IT objectives is the prioritization of developed initiatives. Initiatives are prioritized based on available resources, value potentials – support for high priority organizational goals or programs, and sustainability. The most important step in this task is the development of a prioritization framework which must be agreed by the strategy team and advisably by internal stakeholders. The framework would typically consist of a set of features (both quantitative and qualitative) to be uniformly applied to each initiative. With the major input into this task as the initiative list, the task produces an agreed priority list of initiatives.

Process: The following steps are involved in the prioritization of initiatives (see Figure 19):

T1)   developing prioritization framework

T2)   validating prioritization framework

T3)   applying framework on initiatives

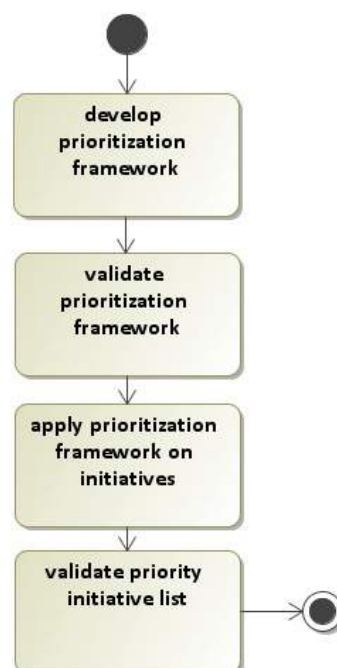T4)   validating initiative priority list with stakeholders

Figure 19: Initiative Prioritization Process

Tools: The template document does not provide any guide for this task. See resources in Appendix A for tools to support the implementation of this task.

Related Tasks: This requires an initial list of requirements, produced from the Initiative development task.

Comments: Varying degree of formality can be employed in the definition of the prioritization framework. For projects involving high level of cost and risks, there must be a rational basis for deciding on the priorities. It must also be noted for the eventual implementation of the initiatives sound business cases must be established for them. The involvement of stakeholders in the validation steps is essential to obtain support for the initiatives during execution. A very important consideration in the prioritization of initiatives is the availability of resources and specifically budgets for initiatives. It would be more pragmatic to focus on initiatives with ready budget and other resources than those requiring substantial proposal for securing requisite resources.

7.3   Summary

This section shows how the initiatives are developed from first priority objectives and later prioritized based on agreed prioritization framework. These two tasks are often considered outside the scope of a strategic planning process. There are arguments that a comprehensive implementation plan should be developed as a separate project outside the planning activity. However, even in cases where the development of the initiatives list has been done by the strategy team, the implementation team could use the outcomes as input for their own processes. There are growing pressures in linking resource allocation to performance in the public administration. Without an alignment of the budgetary and performance system, good innovations could be denied required resources due to the prevalent budget arrangement. Therefore, there is a need for an organizational intervention to ensure that initiatives are fairly considered largely on merit or performance history.

8   Strategy Control

This section describes how effectiveness or performance of the developed IT strategy can be monitored and evaluated. The ability to measure and evaluate performance of IT initiatives and consequently strategic IT objectives (or IT strategies) determine the degree to which IT strategy can be effectively managed. Defining monitoring and evaluation framework provides an early warning indicator to correct problems related to IT enabled programs or initiatives, and to examine if corrective action is having any effect. It also provides input to resource allocation and planning. The use of measures can give the IT organization and in fact the organization at large) some lead time for adjustment if these conditions are known in advance. A monitoring and evaluation framework generally provides mechanism for data collection on measures defined for initiatives and how to process these measures to determine IT performance - degree to which the measures or more appropriately indicators associated with strategic IT objectives are met, including monitoring and evaluation framework as part of the strategy process improves the chances for attaining the desired results from plans.

8.1   Strategy Monitoring

Description: The task aims to determine the necessary measures for tracking the progress of IT initiatives - programs and project towards the attainment of higher level performance objectives. These measures may relate to the inputs committed to the initiatives, outputs produced from them and the relationship between the input and output measures. The selected measures are expected to be linked to higher level performance objectives or measures defined in the strategy development activity. The input into the process is the set of IT priority initiatives and the output is a table defining measures and their associated performance objectives.

Process: The steps involved in the execution of this task follow (see also Figure 20):

T1)   selecting initiatives to be tracked

T2)   defining measures for each initiative

T3)   associating defined measures with higher level performance measures

T4)   specifying details of measures, e.g. responsible entity, data source, frequency

T5)   consolidating measures

T6)   collecting data on measures during implementation of initiatives

Related Tasks: The input from this task is supplied by the Strategy Implementation activity. Its execution is included as part of the program and project management functions during the implementation of initiatives.

Tools: Several tools are available for developing, monitoring and evaluating systems, with examples of measures and indicators for different levels of strategies. Please refer to [27], [29] and [31] for such tools.

Comments: Measures are defined at the different hierarchy of strategies - from individual project, program or initiatives to IT objectives, strategies and possibly goal. Typical areas of measurements include customer commitments and satisfaction, cycle and delivery time, quality, cost, financial, management, IT infrastructure availability, internal IT operations, IT skill availability, and customer business process support (typical elements of the different perspectives of the IT scorecard). At the monitoring stage, there is a need for some alignment or association of this hierarchy of measures.

This link is elaborated at the evaluation phase. The Logic Model [30] provides a concrete framework for relating measures for initiatives. Since the cost of tracking or monitoring could be high, a minimal or core set measures should be selected for tracking initially. IT organizations with advanced Performance Management capability could, however, embark on a more extensive and involving monitoring exercise.
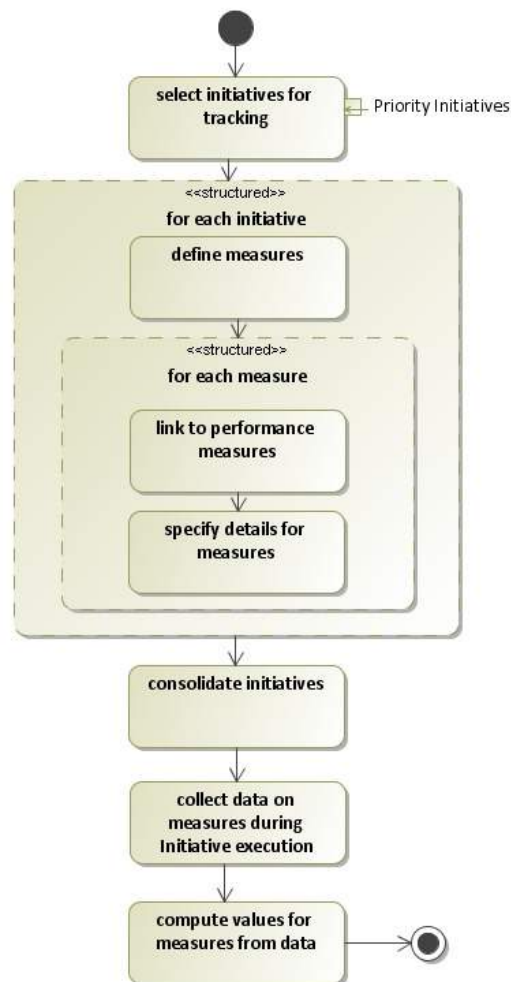

Figure 20: Strategy Monitoring Process

8.2   Strategy Evaluation

Description: The strategy evaluation activity involves elaborating on the associations defined between input, process and output (operational) measures of initiatives and measures associated with strategic objectives or those at higher level of the pyramid. In general, evaluation examines the measures produced from monitoring and verifies whether expected results, outcomes and impacts are obtained. While the monitoring measures inputs and outputs of initiatives or IT-enabled services, evaluation measures the benefits or outcomes resulting from several related initiatives for the organization as a whole and its stakeholders. Outcome measures are expressed at higher levels of the strategy pyramid (strategic objectives, strategic priorities or IT Goals). The major input to evaluation task is the set of measures and their corresponding values for initiatives while the output is the degree to which selected outcome measures are met.

Process: The steps involved in the process are listed below (also see Figure 21):

T1)   selecting strategic outcomes measures to evaluate

T2)   elaborating relationships between the selected outcome measures and related operational measures

T3)   computing outcome measures from operational measures

T4)   comparing actual outcome with expected or target outcome

T5)   diagnosing cause if actual outcome does not meet expected outcome

T6)   prescribing necessary strategic adjustments

T7)   effecting the required adjustments to strategy hierarchy (from strategy through objectives to initiatives)

Related Tasks: This evaluation of outcome measures is closely related to Strategy Development and Strategy Implementation activities. It connects these two activities by explaining how operational measures determine outcome or strategic measures.

Tools: See [27], [29] and [31] for examples of useful tools for designing evaluation frameworks.

Comments: A number of different approaches can be taken in evaluation. The approach explained in this section is the goal-based, in which achievement of performance goals and objectives are evaluated. It is also possible to conduct evaluation for (i) reaching decision on the continuity of specific initiatives, (ii) examining the full effects of initiatives (goal-free) or (iii) obtaining judgment from experts on the initiatives. A combination of these approaches could in principle be used depending on the evaluation goal.
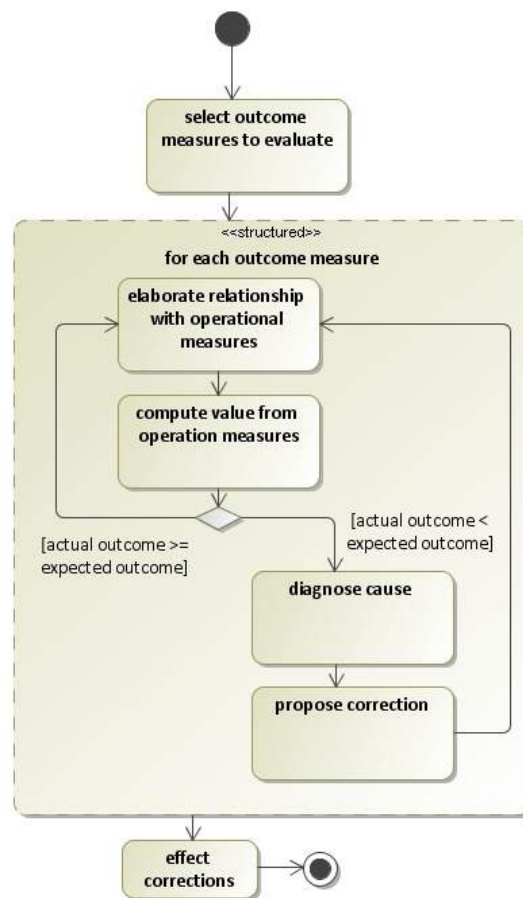
Figure 21: Strategy Evaluation Process

8.3   Summary

This section discusses how monitoring and evaluation can be carried out as part of the strategic planning process. Plans developed with monitoring and evaluation components are likely to meet their goal than those developed without these components. The selection of measures across the strategy hierarchy is one of the most important steps in the strategy control activity. The next important step is the ability to relate these measures (i.e. relating operational to strategic measures). Once the relationship is established available data can be used to compute values for the dependent outcome measures. Diagnostic steps (if necessary) can be initiated once measures are computed for deeper insight into issues. Due to the cost of obtaining required data for measures, a minimal set of evaluation measures is recommended.

9   Strategy Documentation

This final activity of the IT strategy process is the documentation of the developed strategy for the purpose of dissemination. Three basic steps are proposed under this activity. First, the Strategic IT Plan document must be drafted. Next, the plan is circulated among stakeholders for comments and feedback. In the third task, the strategy team attends to the comments and feedback to produce the final version of the plan.

9.1   Drafting IT Strategy Document

The IT strategy document is a logical compilation of the various outputs from the major activities of the IT strategy process. In line with the process, the following sections are prescribed for IT strategy document.

Table 2: Outline for Strategic IT Plan Document

NO	SECTIONS	DESCRIPION
1	Executive Summary	a summary or synopsis of the whole IT Plan document, highlighting the major planning elements (or sections of the document)
2	Contents	table of contents, figures, definitions etc.
3	Background	context for the strategic IT planning exercise (see Section 3)
4	IT Strategic Framework	documentation of the mission, vision and goals of the IT organization (see Section 4)
5	IT Capability Assessment	outcome of the extensive assessment of the business requirements of the agency and the governance, technical and managerial aspects of the IT organization (see Section 5)
	Benchmarking	comparative assessment of IT organizations in similar agencies within the same or other public administration systems
6	IT Strategies	documentation of the developed IT strategy (see Sections 6.1. and 6.2)
7	IT Objectives and Measures	documentation of the strategic IT objectives (see sections 6.3 and 6.4)
8	IT Initiatives	documentation of IT initiatives
9	IT Performance Framework	description of the monitoring and evaluation framework
10	Bibliography	list of publications used during the development of the plan
11	Appendices	Includes assessment details, and other major inputs into the strategy development process

9.2 Obtaining Feedback on Strategy

Once the IT plan is drafted by the strategy team, it should be circulated among the major stakeholders for feedback. The information specified in the communication plan (Section 3.2) is useful in determining a dissemination strategy. Members of the core business units and the IT organization are expected to be deeply involved in the revision. It is important for the strategy team to obtain feedbacks from particularly influential stakeholders that were less involved in the whole planning process. All feedbacks are to be collected and analyzed before effecting changes to the plan.

Process: This task consists of the following three steps:

T1) determining stakeholders to review plan

T2) circulating draft plan among stakeholders

T3) collecting comments and feedback for plan revision

9.3 Revision and Dissemination

The final task of the documentation activity involves analyzing the received comments, determining required changes and effecting the changes. After effecting the comments, the final version of the plan is to be submitted to top management for final approval followed by adoption. The IT plan could be disseminated as required. It is important that all levels of management staff (operation, tactical, and strategic) have access to the major elements of the plan. It is also important for specific business unit to plan for the implementation of initiatives related to them. Seminars and workshops could be organized to explain the details of the plan to the agency staff with discussions on issues related to the implementation of major initiatives.

Process: The task consists of the following steps:

T1) analyzing received comments

T2) revising plan based on comments

T3) obtaining official approval for plan

T4) dissemination of IT strategy (through agency Intranet, seminars or workshops)

T5) follow-up of business units on implementation of initiatives

9.4 Summary

The documentation activity of the IT strategy process consolidates the major outputs from the other activities of the IT strategy process from the strategic context and assessment through strategy development and implementation to strategy monitoring and evaluation. The documentation allows the strategy team to obtain feedback on the developed strategy as a basis for revision before official adoption and dissemination. The approved IT plan provides a sound basis for the development of tactical or annual IT plans and implementation of IT initiatives by core business units of the agency.

10   Conclusions

This toolkit was developed to assist public or government organizations in building their IT strategies through a rigorous but practical process. A major goal of the toolkit is to facilitate the development of a balanced IT strategy well aligned to agency organizational goals. The toolkit does not presume any specific technical capability and therefore subsumes technicalities of the underlying methodology elements – for instance the use of balanced scorecard. It presented the processes for implementing the major planning activities: Planning, Strategic Framework, Assessment, Strategy Development, Strategy Implementation, Strategy Control and Documentation. Cross references are provided in the toolkit to the appropriate sections of a companion Template Document [33] that could be used by the strategy team to execute specific planning tasks.

While the government as a whole could adopt the prescribed processes as standards for Strategic IT Planning, individual agencies could customize the processes based on size and need. As a government standard, agencies could submit their IT strategies developed based on the standard in some fixed format for consolidation by government. A government-wide view on IT development enables effective coordination, identification of cross-agency initiatives, opportunities for economies of scale and standardization of the IT environment across government. For instance, if 50% of government agencies indicate document management as priority initiative, a cross-agency project team could be setup to facilitate the implementation of the initiatives at the different agencies with additional benefits of experience and expertise sharing, as well as economies of scale.

By standardizing the strategic IT planning process, government is better able to track the alignment of initiatives to its critical programs such as those related to public service reform and electronic government development. By design, the prescribed process models guarantee the development of e-government through explicit IT support for the delivery of public services.

The toolkit does not provide exhaustive information on strategic IT planning for public organizations. However, it provides detailed enough information to guarantee the development of a balanced IT strategy for government agencies. Information on other IT strategy development tools is provided in Appendix A.

Bibliography

[1] Maddalena Sorrentino, The Implementation of ICT in Public Sector Organizations - Analysing Selection Criteria for e-Government Projects, 17th Bled e-Commerce, Bled, Slovania, June 21-23, 2004

[2] Francisco J. Proenza, ICT-Enabled Networks, Public Sector Performance and the Development of Information and Communication Technologies, Connected for Development: Information Kiosks and Sustainability, UNICT Task Force and Digital Partners, October 2003, available at http://www.e-forall.org/pdf/ ICTEnabledNetworks.pdf

[3] Prime Minister's Department, The Malaysian Public Sector ICT Strategic Plan, August 2003, available at
http://unpan1.un.org/intradoc/groups/public/documents/APCITY/UNPAN016394.pdf

[4] New South Wales Government, People First – A new direction for ICT in NSW – NSW Government ICT Strategic Plan, July 2006, available at
http://www.gcio.nsw.gov.au/library/strategies/nsw-government-ict-strategic-plan-people-first/

[5] Nordic Council of Ministers, ICT Usage in the Public Sector –a Nordic model questionnaire, January 2003, available at http://www.dst.dk/upload/ictusagepublic.pdf

[6] Jim Davies, Tomasz Janowski, Adegboyega Ojo and Aadya Shukla, Technological Foundations of Electronic Governance, International Conference on the Theory and Practice of Electronic Governance – ICEGOV2007, Macao, December 2007, pp 5 – 11.

[7] Anthony Cresswell, G. Brian Burke, Theresa A. Pardo, Advancing Return on Investment for Government IT – A Public Value Framework, Center for Technology in Government, University at Albany, SUNY, Sept. 2006, available at
http://www.ctg.albany.edu/publications/reports/advancing_roi/advancing_roi.pdf

[8] Office of Management and Budget's (OMB), FEA Consolidated Reference Model Document Version 2.3, Available at http://www.egov.gov, October 2007

[9] Paul P. Tallon and Kenneth L. Kraemer, Investigating the Relationship between Strategic Alignment and IT Business Value: The Discovery of a Paradox, Creating business value with information technology: challenges and solutions, IGI Publishing Hershey, PA, USA, 2003, pp 1-22

[10] Grover S. Kearns and Albert L. Lederer, Strategic IT Alignment: A Model for Competitive Advantage, 22nd Internal Conference on Information Systems, 2001, pp. 1-12

[11] Berwyne E. Jones, Strategic Planning in Government – The Key to reinventing ourselves, PM: January – February 1996, available at http://www.dau.mil/pubs/pm/pmpdf96/jones.pdf

[12] Ungana-Afrika, Strategic Technology Planning Guide – A toolkit for development practitioner, October 2005, available at http://www.ungana-afrika.org/resources/techplanning/tech_planning_guide.pdf

[13] Janet Shapiro, Strategic Planning Toolkit, available at
http://www.civicus.org/new/media/Strategic% 20Planning.pdf

[14] National Human services IT Resource Center, Strategic IT Planning and Management Guide, Administration for Children and Families, September 2004, available at
http://www.acf.hhs.gov/nhsitrc/it_ planning/full_pdf.html

[15] Grover S. Kearns and Rajiv Sabherwal, Strategic Alignment Between Business and Information Technology: A Knowledge-based View of Behaviors, Outcome and Consequences, Journal of Management Information Systems, Winter 2006-7, 2007, Vol. 23, No. 3, pp. 129-162

[16] Rocky J. Dowyer, Strategic Planning – The Concept, available at http://www.iqpc.co.uk/binary-data/IQPC_CONFEVENT/pdf_file/2825.pdf

[17] Marc Osten, Strategic Technology Planning and Outcome Measurement – The Use of Logic Models to Enhance Strategic Technology Planning, Summit Consulting Collaborative, available at http://www.summitcollaborative.com/outcomeppr.PDF

[18] IT Today, Aligning IT to Organizational Strategy, available at http://www.ism-journal.com/ITToday/ AU2621_CH04.pdf

[19] Paul F. MacCawley, The Logic Model for Program Planning and Evaluation, University of Idaho Extension, available at http://www.uidaho.edu/extension/LogicModel.pdf

[20] Community Anti-drug Coalition of America, CADCA, Planning Primer: Developing a Theory of Change, Logic Models, and Strategic and Action Plans, available at http://www.uidaho.edu/extension/LogicModel.pdf

[21] Joseph W. Weiss and Don Anderson, Aligning Technology and Business Strategy: Issues & Frameworks, A Field Study of 15 Companies, Proceedings of the 37th Hawaii International Conference on System Sciences, 2004, pp. 1-9

[22] IT Governance Institute, COBIT – Framework, Control Objectives, Management Guidelines and Maturity Models, 2007

[23] IT Governance Institute, IT Governance Implementation Guide – using COBIT and VAL IT, 2007

[24] Deliotte, CIO 2.0 – The Changing role of the Chief Information Officer (CIO) in government – and why it matters to leaders in the public sector, Deloitte Development LLC., 2004

[25] Jose Manuel Ortegta, Delivering IT's contribution: the 2005 CIO agenda public sector perspective, Gartner, 2007, available at http://ciapem.chihuahua.gob.mx/atach2/ciapemweb/uploads/Jose%20 Manuel%20Ortega.pdf

[26] Ken Cochrane, Role of the Chief Information Officer, Presentation to the Public Sector Business Committee Information Technology Association of Canada, Treasury Board of Canada Secretariat, available at http://www.tbs-sct.gc.ca/cio-dpi/2007/cio-dpi/rcio-rdpi/rcio-rdpi_e.pdf

[27] World Bank, Monitoring and Evaluation Toolkit for E-Strategies Results, Global Information and Communication Technologies Department (GITC), The World Bank, January 2005, available at http://siteresources.worldbank.org/INTEDEVELOPMENT/Resources/estrategiesToolkit_Jan2005.pdf

[28] Paul R. Niven, Balanced Scorecard for Government and Non-profits Agencies, John Wiley and Sons, Unit-ed States, January 2003

[29] GAO-Accounting and Information Management Division, Measuring Performance and Demonstrating Results of Information Technology Investments, United States General Accounting Office, Report # GAO/AIMD-97-163, 1997, available at http://www.gao.gov/archive/1997/ai97163.pdf

[30] W.K. Kellogg Foundation, Logic Model Development Guide – Using Logic Models to bring together Planning, Evaluation and Action, January 2004, available at http://www.wkkf.org/Pubs/Tools/Evaluation/ Pub3669.pdf

[31] Janet Shapiro, Monitoring and Evaluation, Civicus, available at http://www.civicus.org/new/media/ Monitoring%20and%20Evaluation.pdf

[32] Khoi Nguyen, Adegboyega Ojo, Tomasz Janowski, Strategic IT Planning for Public Organization – Strategy Management Software, Deliverable D5, e-Macao Program, UNU-IIST Center for Electronic Governance, April 2008.

[33] Adegboyega Ojo, Bimal Pratap Shah, Tomasz Janowski, Strategic IT Planning for Public Organizations – Templates, Deliverable D2, e-Macao Program, UNU-IIST Center for Electronic Governance, April 2008.

Appendix A: Tools for Strategic IT Planning

There are a number of tools available to support strategic planning in general and Strategic IT planning in particular. These tools include toolkits, templates and software. Some of the tools are listed in the table below.

	TITLE	DESCRIPTION	URL	AUTHOR
1	Strategic Planning Tool	Provides guidelines for carrying out some strategic planning tasks including readiness assessment, creation of shared vision, setting goals and objectives and development of communication plans.	http://www.nsba.org/sbot/toolkit/spt.html	Education for Leadership Toolkit, National School Boards Foundation implemented by NSBA's Institute for the Transfer of Technology to Education (NSF Grant).
2	Technology Planning Tools	A guideline for carrying out technology planning in the area of visioning, stock taking, development of actions or initiatives and periodic evaluation.	http://www.nsba.org/sbot/toolkit/tpt.html	Education for Leadership Toolkit, National School Boards Foundation implemented by NSBA's Institute for the Transfer of Technology to Education (NSF Grant).
3	Strategic Planning Resources	Provides an annotated list of resources for strategic planning.	http://www.ptv-agc.org/AGC%20Planning%20Report%20Tools%20Summary_11_06.pdf	Affinity Group Coalition, Public Television Planning Project
4	Online Resources for Strategic Planning	An annotated bibliography of online resource to support strategic planning	http://www.actew.org/projects/current/ACTEW_Strategic_Planning_Bibliography.pdf	ACTEW
5	Free Online Strategic Planner	A free online strategic planning system. System allows for the generation of simple reports.	http://www.planware.org/strategicplanner.htm	Planware
6	IT Strategy and Alignment System	A comprehensive strategy development and alignment System allows for generation of core strategic planning reports like IT scorecard and strategy card for public organizations.	http://www.egov.iist.unu.edu/cegov/projects/planning	Center for Electronic Governance at United Nations University - IIST
7	Strategy	A free (non-professional version) strategy map Balanced Scorecard software	http://www.strategymap.com.au/	Applied PC Systems Pty Ltd
8	Strategic IT Planning and Management Resources	Set of resources for strategic IT planning and management activities.	http://www.acf.hhs.gov/nhsitrc/it_planning/strategic_planning/resour.html	US Department for Health and Human Services

Appendix B: Definitions

	DESCRIPTION
Back Office Application	Software that does not interact directly with the customer. It provides functionality for internal operations such as enterprise resource planning (ERP), inventory control, manufacturing and all of the supply chain activities associated with procuring goods, services and raw materials. If an ERP system includes order entry and customer service capabilities, it would bridge both back office and front office http://www.techweb.com/encyclopedia/defineterm.jhtml?term=back+office+appli cation
Balance Scorecard	A management instrument that translates an organization's mission and strategy into a comprehensive set of performance measures to provide a framework for strategic measures and management. The scorecard measures organizational performance across several perspectives: financial, customers, internal business processes, and learning and growth. http://rru.worldbank.org/Documents/Toolkits/Labor/Toolkit/glossary.html
Benchmark	A standard or point of reference used in measuring and/or judging quality or value. http://rru.worldbank.org/Documents/Toolkits/Labor/Toolkit/glossary.html
Business Objectives	The measurable targets designed to help an organization achieve its overall business strategy. http://www.etpconsulting.co.uk/Business%20Continuity/business-continuity-glossary.htm
Business Process Re-engineering	Fundamental analysis and radical redesign of business processes and management systems to achieve dramatic change or performance improvement. BPR uses objective, quantitative methods and tools to analyze, redesign and transform business processes including their supporting organization structures, information systems, job responsibilities and performance standards. http://www.ic.gc.ca/sc_mangb/ecomevnt/engdoc/glossary.html
Business Processes	On the one hand, business processes refer to the workflows within a company and, on the other hand, to the processes involved in inter-company transactions – in other words: offers, price negotiations, purchasing agreements, and orders. Software that reproduces these business processes, therefore, can be both ERP system as well as e-commerce software. http://www.x-solutions.poet.com/eu/newsevents/glossar/#BusinessProcesses
Change Management	The concept of change management encompasses three basic definitions: (1) the task of managing change, referring to (a) making changes in an organization in a planned and systematic way, or (b) "responding to changes over which the organization exercises little or no control", such as legislation, social and political upheaval, changing economic situations, etc; (2) "an area of professional practice," referring to experts or firms engaged in planning and managing change for their clients; (3) a body of knowledge, consisting of " models, methods and techniques, tools, skills and other forms of knowledge that go into making up any practice." (Nickols,2002) http://home.att.net/~nickols/change.htm
COBIT	Control Objectives for Information and related Technology, Technology, first released by the Information Systems Audit and Control Foundation (ISACF) in

	1996 and now published by the IT Governance Institute. (COBIT definition) http://www.datagovernance.com/glossary_c.html
COBIT Level – 3	The maturity models (MMs) in COBIT were first created in 2000 and at that time were designed based on the original CMM scale with the addition of an extra level (0) as shown below: Level 0: Non-existent Level 1: Initial/ad hoc Level 2: Repeatable but Intuitive **Level 3: Defined Process** Level 4: Managed and Measurable Level 5: Optimized Source: http://www.isaca.org/Content/NavigationMenu/Members_and_Leaders1/COBIT6/FAQ6/COBIT_FAQ.htm#24
Conceptual Framework	This is a consistent and comprehensive theoretical framework emerging from an inductive integration of previous literature, theories, and other pertinent information. Conceptual framework is usually the basis for reframing the research questions and for formulating hypotheses or making informal tentative predictions about the possible outcome of the study. http://www.fiu.edu/~bridges/glossary.htm#Conceptual_Framework
Courseware	Software designed specifically for use in a classroom or other educational setting, containing instructional material, educational software, or audiovisual materials. "Courseware" is a term used to describe software resources which are used for Computer-Assisted Learning (CAL). to mediate or support a course or module. http://www.e-learningguru.com/gloss.htm
Desired Future State	Declaring how you want the process to work once it is redesigned leads to describing the desired future state, which may address the customer requirements and how the process will meet those requirements. http://web.mit.edu/hr/oed/bpi/glossary.html
Electronic Governance	E-governance is the use of ICT by different actors of the society with the aim to improve their access to information and to build their capacities. http://portal.unesco.org/ci/en/ev.php-URL_ID=3038&URL_DO=DO_TOPIC&URL_SECTION=201.html
Enterprise Architecture	The holistic expression of an organization's key business, information, application and technology strategies. Integral components of enterprise architecture are standards and guidelines that direct how technology will be used. http://cpr.ca.gov/report/refapp/glos.htm
e-Strategy	Business strategy applied to develop an online presence. http://www-agecon.ag.ohio-state.edu/programs/e-agbiz/pageglossary/main.html
Evaluation	Analysis of various measures to determine of specific performance objectives are met. It is also an analysis undertaken at a fixed point in time to determine the degree to which stated objectives have been reached. This is generally used as a basis for decision making, including updating plans. http://www.unisa.edu.au/pas/qap/planning/glossary.asp
External Factors	A factor that may enhance or nullify underlying program assumptions and thus the likelihood of goal achievement. Goal achievement may also be predicated on

	certain conditions (events) not happening. They are introduced by external forces or parties, and are not of the agency's own making. The factors may be economic, demographic, social, or environmental, and they may remain stable, change within predicted rates, or vary to an unexpected degree. http://www1.eere.energy.gov/ba/pba/program_evaluation/glossary.html
Framework	A framework is a set of guidelines for use in a larger (less specific) context than would be considered for a method or process. A framework provides flexibility in the form of general characteristics and guidelines which allow the engineer or analyst to choose whatever method or technique is best suited for a particular situation; whereas, in general, a methodology, method, or technique prescribes a specific set of actions, rules, or processes; therefore, a methodology tends to be less. http://www.mikehalblander.com/RE_Glossary.html
ICT Infrastructure	Refers to physical telecommunications systems and networks (cellar, broadcast, cable, satellite, postal) and the services that utilize them (Internet, voice, mail, radio, and television). http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTINFORMATION ANDCOMMUNICATIONANDTECHNOLOGIES/0,,contentMDK:21035032~pa gePK:210058~piPK:210062~theSitePK:282823,00.html
ICT Sector	In New Zealand, the ICT sector is an agglomeration of the communications sector, including telecommunications providers, and the information technology sector, which ranges from small software development firms to multi-national hardware and software producers. http://www.digitalstrategy.govt.nz/Media-Centre/Glossary-of-Key-Terms/
IT Governance	IT Governance is a subset discipline of Corporate Governance focused on information technology (IT) systems and their performance and risk management. Some disciplines that make up IT governance are change management, problem management, release management, availability management, and service-level management. http://en.wikipedia.org/wiki/IT_governance
Measure	A value quantified against a standard, such as time and cost.
Mission	The part of a goal or endeavor assigned as a specific responsibility of a particular organizational unit. It includes the task, together with the purpose, which clearly indicates the action to be taken and the reasons. www.ojp.usdoj.gov/BJA/evaluation/glossary/glossary_m.htm
Monitoring	The ability to track the defined measures through data collection. It can also be defined as a continuous process of collecting and analyzing data to compare how well a project, programme or policy is being implemented against expected results. www.undg.org/archive_docs/2485-Results-Based_Management_Terminology_-_Final_version.doc
New Public Management	This is a slippery label. Generally, it is used to describe a management culture that emphasizes the centrality of the citizen or customer, as well as accountability for results. It also suggests structural or organizational choices that promote decentralized control through a wide variety of alternative service delivery mechanisms, including quasi-markets with public and private service providers competing for resources from policymakers and donors. NPM tends to include a greater reliance on contracts and contracting out, and places more emphasis on managerialism than formal rules and procedural standards, while de-emphasizing a

	career civil service. NPM does not claim that government should stop performing certain tasks -- although the New Public Management often is associated with this policy perspective. NPM is not about whether tasks should be undertaken or not. It is about getting things done better. http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTPUBLICSECTOR ANDGOVERNANCE/0,,contentMDK:20201644~pagePK:210058~piPK:210062 ~theSitePK:286305,00.html
Organizational Strategy	An organization's strategy deals with how to make management's strategic vision for the company a reality-it represents the game plan for moving the company into an attractive business position and building a sustainable competitive advantage. http://highered.mcgraw-hill.com/sites/0072443715/student_view0/glossary.html
PKI Infrastructure	Also known as an asymmetrical key encryption. With this type of encryption, a pair of encryption keys are used—a public key and a private key. The public key is made available to anyone who wants to send an encrypted message to the holder of the private key. The only way to decrypt the message is with the private key. http://www.e-future.ca/alberta/pdf/efc_e-business_glossary.pdf
MIS	Short for management information system or management information services, and pronounced as separate letters, MIS refers broadly to a computer-based system that provides managers with the tools for organizing, evaluating and efficiently running their departments. In order to provide past, present and prediction information, an MIS can include software that helps in decision making, data resources such as databases, the hardware resources of a system, decision support systems, people management and project management applications, and any computerized processes that enable the department to run efficiently http://www.webopedia.com/TERM/M/MIS.html
Public Policies	Public policy refers to actions taken by a government body http://www.worldbank.org/html/aftsr/sfi23.htm
Strategic Objectives	Strategic objectives relate to outcomes that strengthen an organization's overall business position and competitive vitality; Financial objectives relate to the financial performance targets management has established for the organization to achieve. http://highered.mcgraw-hill.com/sites/0072443715/student_view0/glossary.html
SWOT	SWOT is a method of reviewing the current situation of your business or service. The idea is that you identify the strengths and weaknesses of your service, pinpoint opportunities and note threats. www.plymouth.gov.uk/text/homepage/transportandstreets/transportplanning/ltp20 01-2006/ltpglossary.htm
Terms of Reference	Detailed description of the tasks that consultants will be required to undertake, the range of deliverables, and the timetable. http://rru.worldbank.org/Documents/Toolkits/Labor/Toolkit/glossary.html
Vision	An overarching statement of the way an organization wants to be; an ideal state of being at a future point. www.asq.org/glossary/v.html