



Treasury Board of Canada  
Secretariat

Secrétariat du Conseil du Trésor  
du Canada

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An Enhanced Framework for the Management  
of Information Technology Projects

***PROJECT MANAGEMENT CORE COMPETENCIES***

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Project Management Office  
Chief Information Officer Branch  
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Canada<sup>ca</sup>

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## **1. INTRODUCTION**

This document details the core competencies, or basic skills, required by a person managing an information technology (IT) project in the Canadian federal government.

**This section** provides an overview of the complete document, outlines the target groups for project management professional development and their overall roles, and it illustrates how managing an IT project unites three basic knowledge areas: general management, project management and IT management.

**Section 2** details the core competencies required for general management. These are skills that any manager must have and that are required for project management as well.

**Section 3** details the core competencies that any project manager (PM) must have. They are based on the nine knowledge areas in the Project Management Body of Knowledge developed by the Project Management Institute.

**Section 4** details the core competencies — that is, the unique technical skills — required to manage IT projects.

**APPENDIX A** lists the references used to prepare this document.

## 1.1 Summary

Project management requires three areas of knowledge

<b>General Management</b>	To ensure proper management practices.
<b>Project Management</b>	To ensure quality project process and results.
<b>IT Management</b>	To create or acquire quality IT product.

First, the PM must have skills in **general management**. Skills such as leading, negotiating, communicating, team building and so forth are necessary in any management position.

Second, the PM must understand generally accepted **project management** skills, such as managing project scope, time, cost, quality, and so forth.

Third, the PM of an IT project must have the **IT management** skills, such as lifecycle phasing, estimating, constructing software, and so forth.

## General Management Knowledge Areas

The *Profile of Public Service Leaders and Managers* (reference 1) defines the following knowledge areas and objectives:

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Judgment, Integrity, Self-confidence, Flexibility, Initiative, Perseverance</b>	To act with consideration of issues, ethically, confidently, in a style appropriate to the environment, beyond the basic necessities and consistently with the plan of action.
<b>Thinking Skills</b>	To arrive at accurate conclusions and solutions by visualizing new potentials, and by identifying, defining and analyzing problems and situations using rational and intuitive processes.
<b>Organizational Awareness</b>	To get results by understanding, building and using formal and informal systems and contacts in a complex organizational environment.
<b>Knowledge</b>	To perform the appropriate activities by using knowledge of the Public Service environment, government systems and operational policies, and the programs and policies of one's own department.
<b>Leadership</b>	To attract and mobilize energies and talents; to work towards a shared purpose in the best interests of the organization, the people comprising it and the people it serves.
<b>Interpersonal Relations</b>	To advance the work of the organization by interacting with others in ways that develop respect, mutual understanding and productive working relationships.
<b>Communication</b>	To shape others' understanding in ways that capture interest, inform and gain support.
<b>Action Management</b>	To achieve expected results through the successful and timely completion of activities and delivery of products and services.

**Section 2** of this document details the specific skills required for these knowledge areas.

## Project Management

Project management skills are organized around the nine knowledge areas described in the *Project Management Body of Knowledge* (PMBOK) published by the Project Management Institute (reference 3).

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Project Integration Management</b>	To co-ordinate the diverse components of the project by quality project planning, execution and change control to achieve required balance of time, cost and quality.
<b>Project Scope Management</b>	To create quality product by including only the required work and to control scope changes.
<b>Project Time Management</b>	To ensure timely completion of the project.
<b>Project Cost Management</b>	To ensure that the project is completed within allotted budgets.
<b>Project Quality Management</b>	To ensure that the product will satisfy the requirements.
<b>Project Human Resource Management</b>	To employ quality leadership to achieve quality teamwork.
<b>Project Reporting Management (PMBOK Project Communications Management)</b>	To distribute quality project information.
<b>Project Risk Management</b>	To identify and control risk.
<b>Project Procurement Management</b>	To ensure quality service or product acquisition.

**Section 3** of this document details the specific skills required for these knowledge areas.

## IT Management

IT management involves those specific skills needed to manage a hardware or software project typical in the IT industry. Implied is a constant effort to improve these skills so that the IT system development process (maturity) level is as high as possible on the Systems Engineering Capability Maturity Model scale developed by the Software Engineering Institute (reference 4).

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Lifecycle Management</b>	To manage a project according to a standard process by understanding and using a systems development lifecycle.
<b>Tools and Techniques Management</b>	To optimize specific activities in the development of a system by selecting and using the best tools, and by performing the technical activities correctly.
<b>Architecture Management</b>	To manage the implementation of systems so that their design and components fit into the existing (or future) departmental standard infrastructure, software and hardware.

**Section 4** of this document details the specific skills required for these knowledge areas.



## 1.2 Project Management Target Groups

The Treasury Board of Canada Secretariat defines three roles in the management of IT projects: project sponsor, project leader and project manager.

### Roles

Three key officials should be identified for each project. For small projects, these roles could be assumed by two people or even one person; however, all of the responsibilities for the three roles are to be specifically assigned. The Treasury Board Project Management policy defines project leader's and project manager's roles and responsibilities, while the Auditor General recommended the creation of the project sponsor role. These responsibilities are summarized below.

- **The project sponsor** is responsible for ensuring that the department understands the value and importance of the project and, ultimately, for realizing the benefits predicted for the project. The project sponsor is typically a senior official in the organization responsible for the business function that the project will support. The project sponsor should have a major say in the release of funds after a review.
- **The project leader** has overall responsibility for the project and is accountable for all external and internal aspects of it. The project leader is typically a senior departmental official.
- **The project manager** has specific accountability for achieving all of the defined project objectives within the time and resources allocated. The project manager performs the day-to-day management of the project. One or more assistant project managers with the same responsibilities over specific portions of the project may support the overall project manager, without diluting his or her responsibility. Project managers should have demonstrated knowledge, skills and experience commensurate with the size, complexity and risk of the project. Since different levels of competency are required for different levels of project management and project size, the project manager role is divided into three proficiency levels. Depending on the size, complexity and risk of the project, more than one level of project manager may share responsibility for managing the project.

These roles are the basis of the following five target groups for whom training must be developed in the federal government: project sponsor, the project leader, project manager master (PM master), project manager professional (PM professional) and project manager intern (PM intern).

## PM proficiency levels

The **PM master** requires a high level of project management knowledge and experience, attained after managing many projects for a number of years in the federal government.

The **PM professional** requires a moderate level of project management knowledge and experience, attained after managing a few projects for a few years in the federal government.

The **PM intern** requires a basic level of project management knowledge and experience, attained through training; no previous project management experience may be required.

The proficiency level required in a project depends on the size of the project. A major Crown project, for example, may have many teams led by PM interns. Some of the teams, especially if they are working on parts of a larger deliverable, may be grouped, and the project management responsibility may be under a PM professional. Similarly, the groups may in turn require a manager with an even higher level of proficiency, such as the PM master.

## Skills required at different levels and the rating scale

Different roles in project management will require different competencies. For example, the project sponsor level will require mainly general management knowledge. The project leader will require mostly general management skills, followed by project management skills and, possibly, cursory IT management skills. The PM master will require some general management skills, many project management skills and some IT management skills. The PM professional may require some general management skills; he or she will require mostly project management skills and many IT management skills. The PM intern will require mainly IT technical skills.

Additionally, each target group will require a unique ‘depth’ of knowledge or skill level in each competency. For this report, 13 project management practitioners evaluated the skill level for each core competency and each target group. They rated the skill level on a scale of 0 through 5, as follows:

- 0 - No knowledge or skill
- 1 - Basic knowledge
- 2 - Full knowledge, no performance
- 3 - Full knowledge, performs under supervision
- 4 - Performs without supervision
- 5 - Performs, teaches, leads, directs, integrates work of others

The number that appears for each target group and competency is the **mode** voted by the 13 practitioners.

### Note:

The project management environment is fluid: responsibilities, and therefore knowledge or skill levels required, migrate up and down the organizational chart depending on the project, the people available and even the phase that the project is in. One of the key skills in project management, therefore, is to be flexible and to adapt to any situation.

## 2. PROJECT MANAGEMENT CORE COMPETENCIES

As shown in Figure 1, project management requires the following three areas of knowledge.

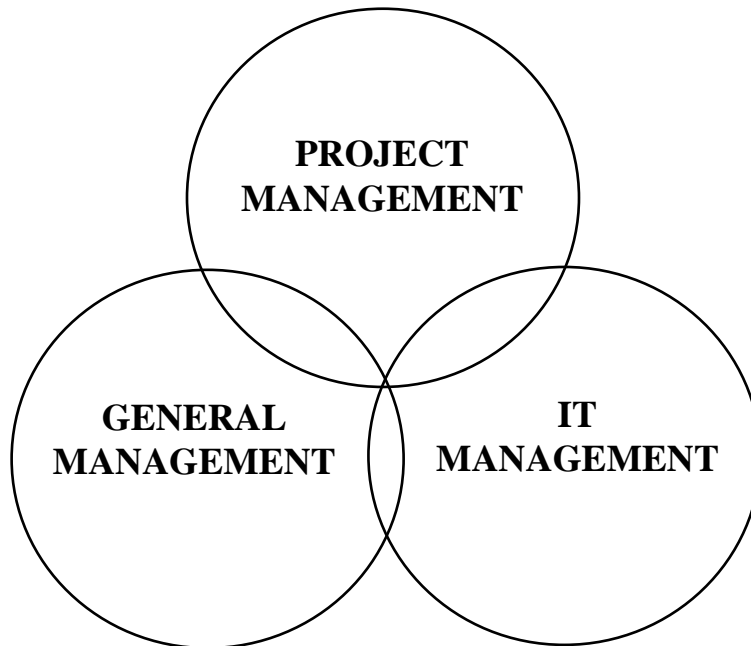
<b>General Management</b>	To ensure proper management practices.
<b>Project Management</b>	To ensure quality project process and results.
<b>IT Management</b>	To create or acquire quality IT product.

First, the PM must have skills in **general management**. Skills such as leadership, negotiation, communication, team building and other human resource management skills are necessary in any management position.

Second, the PM must have knowledge of the generally accepted **project management** areas, such as project scope management using a work breakdown structure; project time management using Gantt and program evaluation and review technique (PERT) methods; and project cost management using budgeting and accounting methods.

Third, the PM of an IT project must have **IT management** skills, such as skills in lifecycle phasing, estimating, constructing of software, reporting progress based on technical milestones and testing.

**Figure 1. Project Management Core Competency Areas**



The three areas illustrated in figure 1 complement and build on each other. For example, the PM of an IT project must plan the scope, time and cost of his or her project using skills detailed in the **Project Management** section. Then the PM may have to form an effective development team to implement the plan. For this, the PM needs basic team building skills, as detailed in the **General Management** section. An IT development team, however, must be formed in a very specific fashion: it must be small; it must have a combination of very specific skills; it must grow and shrink with the phases of the software project; and the appropriate IT tasks should be delegated. The skills required to do this are detailed in the **IT Management** section.

**Figure 2. Sub-core Competency Areas under General Management**

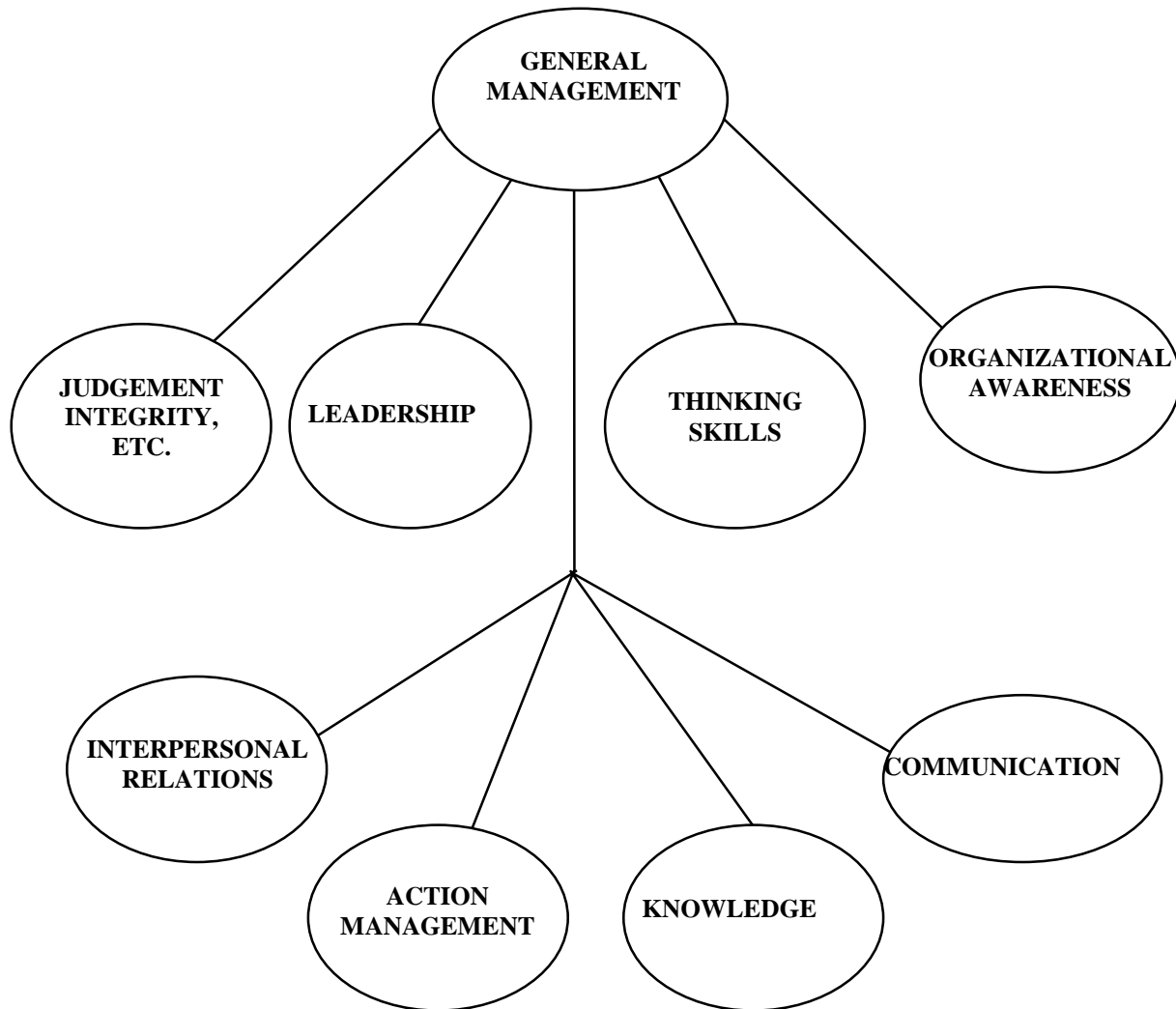


Figure 3. Sub-core Competency Areas under Project Management

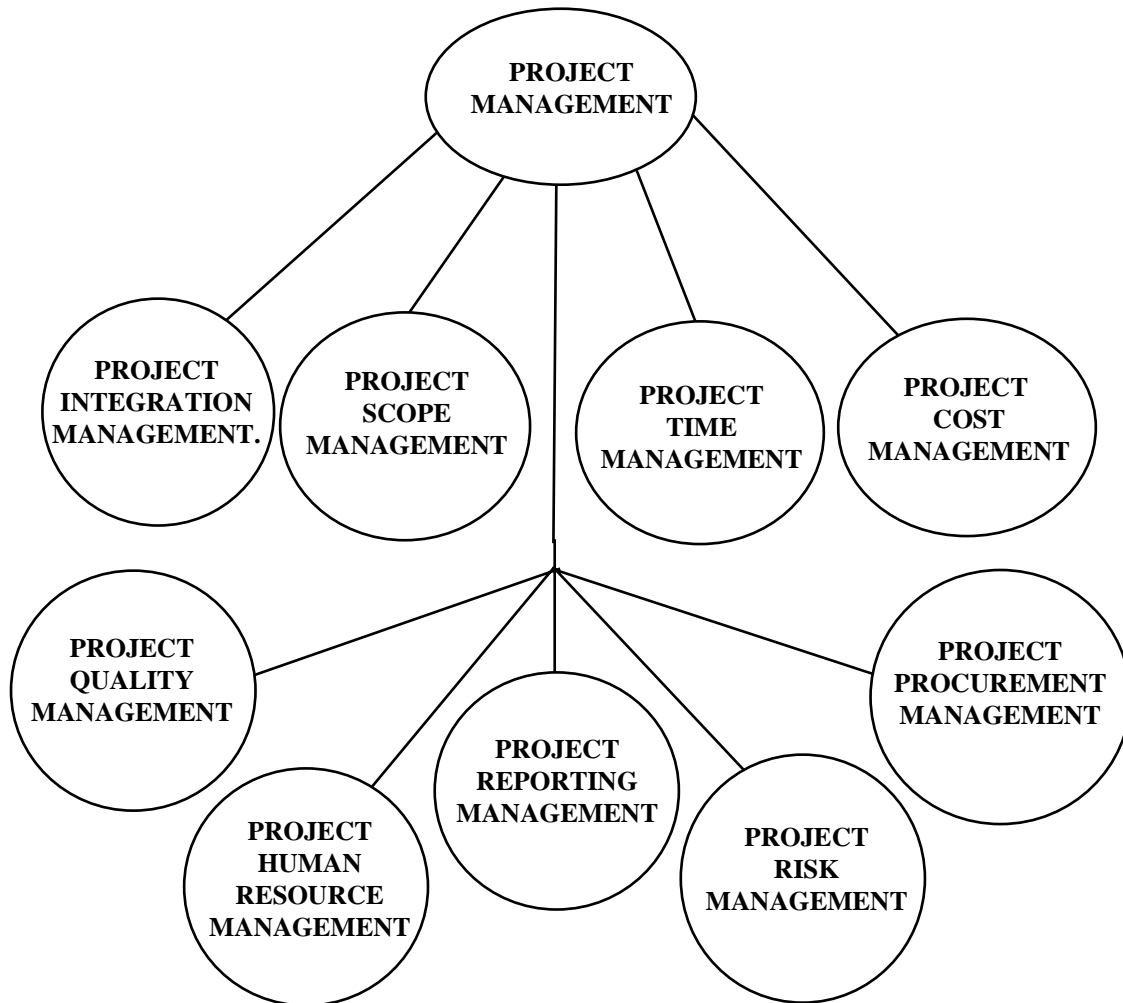
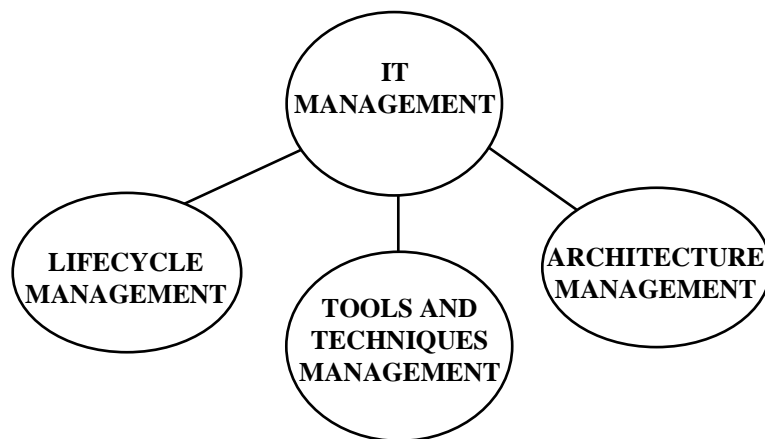


Figure 4. Sub-core Competency Areas under IT Management



### 3. GENERAL MANAGEMENT

*Objective: To ensure proper management practices.*

#### Introduction

General management skills are those a manager requires to manage any enterprise. They are the foundation for building project management skills. The *Profile of Public Service Leaders and Managers* (reference 1) defines the following knowledge areas and objectives.

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Judgment, Integrity, Self-confidence, Flexibility, Initiative, Perseverance</b>	To act with consideration of issues, ethically, confidently, in a style appropriate to the environment, beyond the basic necessities and consistently with the plan of action.
<b>Thinking Skills</b>	To arrive at accurate conclusions and solutions by visualizing new potentials, and by identifying, defining and analyzing problems and situations using rational and intuitive processes.
<b>Organizational Awareness</b>	To get results by understanding, building and using formal and informal systems and contacts in a complex organizational environment.
<b>Knowledge</b>	To perform the appropriate activities by using knowledge of the Public Service environment, government systems and operational policies, and the programs and policies of one's own department.
<b>Leadership</b>	To attract and mobilize energies and talents; to work towards a shared purpose in the best interests of the organization, the people comprising it and the people it serves.
<b>Interpersonal Relations</b>	To advance the work of the organization by interacting with others in ways that develop respect, mutual understanding and productive working relationships.
<b>Communication</b>	To shape others' understanding in ways that capture interest, inform and gain support.
<b>Action Management</b>	To achieve expected results through the successful and timely completion of activities and delivery of products and services.

### 3.1 Judgment, Integrity, Self-confidence, Flexibility, Initiative, Perseverance

*Objective: To act with consideration of issues, ethically, confidently, in a style appropriate to the environment, beyond the basic necessities and consistently with the plan of action.*

<p style="text-align: center;">Core Competencies</p> <p style="text-align: right;">PM Levels</p>	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
<p><b>Judgment:</b> Use appropriate strategies to achieve objectives, considering the situation, issues and persons involved. Reach sound decisions and take wise course of action.</p>	5	5	5	4	3
<p><b>Integrity:</b> Take actions that reflect promises. Reliably deliver on promises and honour commitments. Uphold ethical and social norms of the organization consistently in actions and decisions. Treat people fairly by maintaining consistent values and performance standards.</p>	5	5	5	4	4
<p><b>Self-confidence:</b> Be willing to state and defend ideas and convictions while recognizing other options. Have the confidence required to stand alone when this is the best course. Realistically trust one's own talent.</p>	5	5	5	4	3
<p><b>Flexibility:</b> Demonstrate sensitivity to the organizational environment. Tolerate ambiguity, shift priorities, change style and respond with new approaches as needed to deal with the demands of changed conditions.</p>	5	5	5	5	3
<p><b>Initiative:</b> Actively and enthusiastically attempt to influence events. Seek opportunities to originate action. Take action beyond explicit requests and approach work in an optimistic manner. Be a self-starter.</p>	5	5	5	4	3
<p><b>Perseverance:</b> Stay with a plan of action or position until the desired objective is attained or no longer appropriate. Patiently maintain a steady course and weather setbacks en route. Look for ways to surmount obstacles.</p>	5	5	5	5	3



### 3.2 Thinking Skills

*Objective: To arrive at accurate conclusions and solutions by visualizing new potentials, and by identifying, defining and analyzing problems and situations using rational and intuitive processes.*

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Simplify the information derived from complex events and diverse sources to explain situations and provide strategic direction to team members.	5	5	5	4	2
Provide strategic direction by grasping trends and requirements and setting guiding models.	5	5	5	4	2
Track multiple problems and developments; integrate and disseminate the information quickly and simply.	2	5	5	4	3
Anticipate and formulate problems by noticing symptoms and interrelationships among risk areas, and devise solutions.	2	2	5	4	3
Solve operational problems and assist staff with problem issues.	1	2	5	4	3
Manage one's own time, stress and other factors.	5	5	5	4	3

### 3.3 Organizational Awareness

*Objective: To get results by understanding, building and using formal and informal systems and contacts in a complex organizational environment.*

<p style="text-align: center;"><b>Core Competencies</b></p> <p style="text-align: right;"><b>PM Levels</b></p>	<p style="text-align: center;">Pr o j e c t S p o n s o r</p>	<p style="text-align: center;">Pr o j e c t L e a d e r</p>	<p style="text-align: center;">P M  M a s t e r</p>	<p style="text-align: center;">P M  P r o f e s s i o n a l</p>	<p style="text-align: center;">P M  I n t e r n</p>
<p>Know and use the politics of the organization. Be thoroughly aware of the workings of the federal government. Understand and be sensitive to the needs and responsibilities of other individuals and organizations.</p>	5	5	5	4	1
<p>Build and maintain a network of alliances inside and outside the organization, and use the network to achieve goals.</p>	5	5	5	4	1
<p>Know the organization's individuals and understand its culture. Use that knowledge to gain support and implement objectives.</p>	5	5	5	4	3
<p>Know the services available in the organization and use them to get the work done. Assist staff in dealing with other parts of the organization.</p>	2	5	5	4	3

### 3.4 Knowledge

*Objective: To perform the appropriate activities by using knowledge of the Public Service environment, government systems and operational policies, and the programs and policies of one's own department.*

<p style="text-align: center;"><b>Core Competencies</b></p> <p style="text-align: right;"><b>PM Levels</b></p>	<p style="text-align: center;">Pr o j e c t S p o n s o r</p>	<p style="text-align: center;">Pr o j e c t L e a d e r</p>	<p style="text-align: center;">P M  M a s t e r</p>	<p style="text-align: center;">P M  P r o f e s s i o n a l</p>	<p style="text-align: center;">P M  I n t e r n</p>
<p>Know government priorities and, current issues that affect the organization.</p>	5	5	5	2	1
<p>Understand the role of government in society, public perception and demands, economic factors, and social, cultural and political issues.</p>	5	5	2	1	1
<p>Understand federal and provincial systems of government, laws, policies and procedures.</p>	5	5	3	2	0
<p>Understand government and Public Service structures and responsibilities, and policies governing financial management and administration. Realize how the goals of one's own organization fit into those of other government organizations. Know how to integrate a project into relevant government financial systems.</p>	2	5	5	4	3
<p>Know and be sensitive to government policies on individual rights, official languages, employment equity, access to information, safety, privacy and health.</p>	3	5	5	3	1

### 3.5 Leadership

*Objective: To attract and mobilize energies and talents; to work towards a shared purpose in the best interests of the organization, the people comprising it and the people it serves.*

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Assemble a technical team of appropriate size and composition.	0	1	5	4	3
Create vision and values by setting an organizational climate in which goals can be achieved. Encourage innovation and ensure that employees are trained to meet the needs of the organization.	5	5	5	4	3
Foster an environment of creativity, openness, collaboration and morale among team members and stakeholders.	5	5	5	4	3
Exercise influence on the organization when needed, even without direct authority.	5	5	5	4	3
Develop employees by involving them in decisions, and through motivation and promotions.	5	5	5	5	3
Help to advance the careers of project team members by doing timely and accurate performance appraisals, and by providing training, opportunities for advancement and work that stimulates learning.	2	3	5	4	3
Negotiate goals and expectations with each team member to achieve mutually acceptable solutions.	2	5	5	4	3
Provide challenge by setting realistic goals, delegating and encouraging employees to take responsibility.	2	5	5	4	3
Motivate employees and increase productivity by promoting teamwork and commitment, recognizing contributions and advancing employees.	3	5	5	5	3

Serve as a mentor to team members and new project managers.	2	5	5	4	3
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### 3.6 Interpersonal Relations

*Objective: To advance the work of the organization by interacting with others in ways that develop respect, mutual understanding and productive working relationships.*

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Display versatility in dealing with others by showing sincere interest; adapt interpersonal style to the situation.	5	5	5	4	3
Practice diplomacy by creating a favourable first impression, tolerating different backgrounds, developing long-term relationships and avoiding hostility when views conflict.	5	5	5	4	3
Manage sensitive interpersonal situations with delicate negotiation and appropriate, caring decisions.	5	5	5	4	3
Handle group situations by encouraging participation and promoting co-operation.	5	5	5	4	3
Be sensitive to the feelings of others by perceiving their needs, being aware of the effect of one's own behaviour, and taking into account different values, personalities and cultures.	5	5	5	4	3

### 3.7 Communications

*Objective: To shape others' understanding in ways that capture interest, inform and gain support.*

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Instill commitment by promoting open dialogue. Promote enthusiasm by using one's personal example.	5	5	5	5	4
Present complex issues clearly, credibly and effectively by using a communication style appropriate to the situation. Handle media and public inquiries appropriately. Answer questions with awareness and sensitivity.	5	5	5	4	3
Brief listeners well by collecting appropriate information, organizing it and presenting the level of detail needed to convince the receiver.	2	5	5	5	4
Instruct staff after gaining a clear understanding of the issue. Use appropriate media and answer questions clearly.	2	3	5	4	3
Select and use the appropriate communication tools, such as the telephone, e-mail, fax, paper reports and meetings.	5	5	5	5	3
Run a good meeting.	5	5	5	4	3

### 3.8 Action Management

*Objective: To achieve expected results through the successful and timely completion of activities and delivery of products and services.*

Core Competencies	PM Levels	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Sustain action by directing the organization according to government priorities and by establishing accountability systems, which review activities against strategies.	5	5	5	4	3	
Ensure that all employees are used effectively and redeployed at the end of a phase or project. Keep activities on track by clarifying objectives and providing feedback.	1	5	5	4	3	
Direct and delegate as appropriate. Act decisively and assemble required resources.	2	5	5	4	3	
Using project plans, create a staff management plan to identify, document and assign project roles, responsibilities and reporting relationships.	1	2	5	4	3	
Co-ordinate projects by assigning work to appropriate people, monitoring their activities and ensuring timely completion.	0	2	5	5	3	



## 4. PROJECT MANAGEMENT

*Objective: To ensure that the project is managed correctly.*

### Introduction

Project Management skills are organized around the nine knowledge areas described in the *Project Management Body of Knowledge (PMBOK)* published by the Project Management Institute (reference 3). The core competencies in the Project Human Resources Management area are covered in **Section 3 - General Management**. The PMBOK area called Project Communications Management has been renamed Project Reporting Management to avoid confusion with **Section 3 - General Management: Communications**.

The following table summarizes the nine knowledge areas and their objectives.

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Project Integration Management</b>	To co-ordinate the diverse components of the project by quality project planning, execution and change control to achieve required balance of time, cost and quality.
<b>Project Scope Management</b>	To create quality product by including only the required work, and to control scope changes.
<b>Project Time Management</b>	To ensure timely completion of the project.
<b>Project Cost Management</b>	To ensure that the project is completed within allotted budgets.
<b>Project Quality Management</b>	To ensure that the product will satisfy the requirements.
<b>Project Human Resource Management</b>	To employ quality leadership to achieve quality teamwork.
<b>Project Reporting Management (PMBOK Project Communications Management)</b>	To distribute quality project information.
<b>Project Risk Management</b>	To identify and control risk.
<b>Project Procurement Management</b>	To ensure quality service or product acquisition.

## 4.1 Project Integration Management

*Objective: To co-ordinate the diverse components of the project by quality project planning, execution and change control to achieve required balance of time, cost and quality.*

Project integration management ensures the effective integration of a project into the organization's total business and co-ordination of the diverse components of the project. This includes setting up the planning and control systems for project selection, planning the total project and co-ordinating the activities in the other eight knowledge areas. It also includes working with everyone in the organization who is involved in the project, not only the immediate stakeholders.

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Select the appropriate mix of projects for the time period to fit in with business and organizational needs.	4	4	5	3	0
Create a coherent, consistent project plan that takes into account all aspects of the project.	2	2	5	5	2
Execute the activities in the project plan.	1	2	5	5	3
Co-ordinate and manage business, organizational, technological and resource changes that affect the entire project.	1	2	5	4	3
Define a baseline plan for the project's scope, time and cost plan. Devise monitoring systems that compare progress against the baseline plan. Recognize when the project is seriously deviating from the baseline.	1	2	5	4	3
Redefine the scope, time and cost plan for the project when one factor must be traded off against the other — when, for example, one must spend additional money to speed up the project.	1	2	5	4	3
Shut down the project at appropriate review points if it seems headed for disaster.	5	5	5	4	1

Determine the usefulness of project management software tools to the project, and acquire those deemed suitable.	0	0	5	4	3
Use project management software tools to help plan and control the project.	0	0	5	5	3

## 4.2 Project Scope Management

*Objective: To create quality product by including only the required work, and to control scope changes.*

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Develop a business case for the project that identifies and analyzes costs, benefits and risks of possible alternative solutions and that fits in with departmental, branch and group objectives.	2	5	5	4	1
Investigate the availability of similar products in the government or in private industry. Include build/buy/enhance alternatives in the business case. Make the build/buy decisions as appropriate.	1	1	5	4	2
Develop an opportunity analysis based on the client's business drivers, future orientation requirements and technology enablers.	2	2	5	4	1
Define client needs and, from this, the scope of the project, in order to correctly and effectively determine specifications and allocate resources.	1	2	5	4	3
Identify project objectives, desired benefits, and results and risks to be managed.	2	5	5	4	1
Determine whether the scope is too large, and subdivide major deliverables into smaller, more manageable projects.	1	2	5	4	3
Use tools such as work breakdown structures to subdivide the project into components and tasks, and to define all the project work.	0	0	5	5	4
Scope out and define project roles and responsibilities, deliverables, time estimates and resources (including personnel, technology and equipment).	0	2	5	4	3

Ensure that all project activities are aligned with client, departmental and government plans.	3	3	5	4	1
Develop a written scope statement outlining the extents and limits of the project.	1	1	5	4	3

<p style="text-align: center;"><b>PM Levels</b></p> <p style="text-align: center;"><b>Core Competencies (cont'd)</b></p>	<p style="text-align: center;">Pr o j e c t S p o n s o r</p>	<p style="text-align: center;">Pr o j e c t L e a d e r</p>	<p style="text-align: center;">P M M a s t e r</p>	<p style="text-align: center;">P M P r o f e s s i o n a l</p>	<p style="text-align: center;">P M I n t e r n</p>
<p>Develop a project charter that brings together the business need, the proposed solution, and the preliminary plan for scope, time and cost. The project charter will serve as a proposal or contract document, which is used to get project approval.</p>	2	5	5	4	3
<p>Identify and manage changes to project requirements as they affect scope, and ensure congruence with and relevance to the established or revised business case.</p>	1	2	5	4	3
<p>Control scope changes that affect the project schedule. React to changes as appropriate.</p>	1	2	5	4	3
<p>Monitor project scope progress against the plan. Recognize problems.</p>	1	2	5	5	3
<p>Conclude the project when all requirements have been met.</p>	1	1	5	4	3

### 4.3 Project Time Management

*Objective: To ensure timely completion of the project.*

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Prepare a project schedule baseline plan that accurately reflects tasks, time estimates and resources (including personnel, technology and equipment) associated with each task.	1	1	5	4	3
Estimate the effort, resources and time required to complete individual activities.	0	0	5	5	3
Identify internal and external dependencies, as well as lead times and lag times, in order to calculate the shortest realistic schedule.	0	1	5	4	3
Identify resource skills and availability and apply them to the non-resource-levelled schedule.	0	0	5	4	3
Use manual and automated tools, such as PERT and Gantt charts, to schedule the work.	0	2	5	4	3
Use statistical tools to calculate the probabilities of meeting the project dates.	0	0	5	4	3
From the schedule, determine key dates, such as milestones and gates, and devise project control methods around them.	1	2	5	4	3
From the schedule, determine the critical path tasks and their resources and devise project control methods around them.	0	2	5	5	3
Control project schedule progress using schedule performance reporting tools, such as earned value and cost/schedule project monitoring systems (C/SPMS). Determine which tasks are on or off the baseline schedule at the moment, and which future tasks are affected.	1	1	5	4	3

Control scope changes that affect the project schedule; revise the schedule as necessary. React to changes as appropriate.	0	1	5	5	3
Control the amount of time spent on individual activities. Control resource usage. Revise the schedule and reassign activities as appropriate.	0	0	5	5	3



## 4.4 Project Cost Management

*Objective: To ensure that the project is completed within allotted budgets.*

<p style="text-align: center;"><b>Core Competencies</b></p> <p style="text-align: right;"><b>PM Levels</b></p>	<p style="text-align: center;">Pr o j e c t S p o n s o r</p>	<p style="text-align: center;">Pr o j e c t L e a d e r</p>	<p style="text-align: center;">P M M a s t e r</p>	<p style="text-align: center;">P M P r o f e s s i o n a l</p>	<p style="text-align: center;">P M I n t e r n</p>
<p>Prepare an annual baseline plan budget, broken down by time period, task and cost account, as appropriate, to reflect business practices and achieve business objectives.</p>	1	2	5	4	3
<p>Determine what type and quantity of resources — such as people and equipment — are needed to complete the project activities.</p>	0	2	5	4	3
<p>Use the quantity and cost of each resource needed to complete the project activities to develop an estimate of the cost of each task.</p>	0	0	5	5	3
<p>Use the schedule to prepare a cash flow forecast for the project.</p>	1	2	5	4	3
<p>Use tools such as project management systems, spreadsheets and other manual and automated financial systems to control the budget and expenses.</p>	1	2	5	5	3
<p>Use statistical tools to calculate the probabilities of meeting the project costs and devise risk management methods to handle variances.</p>	0	1	5	4	3
<p>Control changes to the project budget. React to changes as appropriate.</p>	1	5	5	4	3
<p>Control scope changes that affect the project cost; revise the budget as necessary.</p>	2	5	5	4	3

Control project expenditures by item and cost account as appropriate, using cost performance reporting tools such as earned value and C/SPMS. Determine which tasks are on or off the baseline budget at the moment, and whether future cash flows are affected.	0	2	5	4	3
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## 4.5 Project Quality Management

*Objective: To ensure that the product will satisfy the requirements.*

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Identify which quality control standards — for example, ISO 9000 and ISO 10000 — are relevant to the project, and determine how to satisfy them.	0	1	5	4	3
Produce a quality management plan that quantifies and co-ordinates the activities that will accurately assess the effectiveness, efficiency and quality of the system.	1	2	5	4	3
Conduct quality assurance activities regularly to ensure that the project will satisfy the relevant quality standards.	0	0	5	5	3
Prevent defects by monitoring specific project results to determine whether they comply with relevant quality control standards. Manage the technical quality of the system by using walkthroughs, reviews, testing, defect removal, and independent validation and verification.	0	1	5	5	3
Make progress towards quality goals by acting on negative results detected during quality control activities.	0	0	5	4	3

## **4.6 Project Human Resource Management**

See **Section 2 - General Management**

**Sections 3.5 Leadership, 3.6 Interpersonal Relations and 3.7 Communications**

## 4.7 Project Reporting Management

*Objective: To Distribute quality project information.*

Project reporting management ensures timely and appropriate generation, dissemination, storage and ultimate disposal of project information.

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Determine the information and communication needs of stakeholders: who needs what information, when they need it and how it should be provided.	2	3	5	4	2
Develop a communications plan detailing who will receive information, what information they will receive, and when and in what format they will receive it. Also, decide how the information will be gathered and stored.	1	2	5	4	3
Implement methods to monitor project progress, such as status meetings and reports.	2	2	5	5	3
Make necessary information available to project stakeholders in a concise and timely fashion, using verbal, textual and graphical reporting tools.	2	2	5	5	3
Set and, if necessary, reset stakeholder expectations.	5	5	5	4	3
Manage client and stakeholder relationships to ensure commitment and involvement, and to encourage effective collaboration.	2	5	5	3	2
Report on the progress of project schedule, cost and scope. Compare present status to the baseline and forecast future trends using earned value analysis. Warn stakeholders if changes will affect them.	1	3	5	4	3
Manage business process changes as necessary.	2	5	5	4	3
Generate, gather and disseminate information to formalize	0	2	5	4	3

phase and project completion.					
Do a post-project audit and ensure that the actuals, risks, general findings and 'lessons learned' are documented and disseminated to support a continuous learning culture.	1	2	5	4	3

## 4.8 Project Risk Management

*Objective: To identify and control risk.*

The core competencies in this section are based on the processes documented in the *Continuous Risk Management Guidebook*, published by the Software Engineering Institute (SEI) (reference 5). Although the activities described are very similar to those documented in the PMBOK, the SEI processes are used because they are tailored to IT projects.

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
	•				
Use standard risk management techniques to write a risk management plan to document the process, activities, milestones and responsibilities.	1	1	5	4	3
Assign resources for managing risk.	0	2	5	4	3
Use personal history, or a risk database along with the project plan, to identify internal risks (those under the control of the project, such as technology used and staff hired) and external risks (those not under the control of the project, such as the economy and the political climate).	0	1	5	4	3
Integrate risks from different sources. Evaluate risk interactions to assess the range of possible project outcomes.	0	2	5	4	3
Use risk management charts, spreadsheets and other tools to evaluate and prioritize risks. Determine which ones are most likely to affect the project.	1	2	5	4	3
Plan how to eliminate or mitigate risks by assigning responsibility to develop contingency plans.	1	1	5	5	3
Use statistical methods to develop a project cost and time estimate range quantified by risk probability and confidence level.	0	2	5	4	3
Communicate risks and their possible results to stakeholders.	3	5	5	4	3

Monitor risk warnings and events; respond as early as possible.	0	2	5	5	3
Track risks and change the risk items over the course of the project according to the risk management plan.	1	2	5	5	3
Document all actual risk events. Feed this information back into the risk database and subsequent risk management processes.	0	0	5	4	3



## 4.9 Project Procurement Management

*Objective: To ensure quality service or product acquisition.*

Project procurement management ensures effective acquisition of goods and services from outside the organization. (Note: ‘outside the organization’ does not necessarily mean outside the federal government; in the same vein, the contract may be a memorandum of understanding, a specific service agreement or other type of agreement.)

The core competencies in this section are based on the processes documented by the SEI (reference 4) and in ISO 12207, *Information Technology Life-cycle Processes* (reference 6). Although the activities described are very similar to those documented in the PMBOK, the SEI and ISO processes are used since they are tailored to IT projects.

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Use the project plan and input from the procurement authorities to develop a procurement strategy that details what to procure, how to procure it (type of contract), when to prevent it and at what cost, as well as the procurement strategy.	2	2	5	4	3
Develop and manage, through early liaison with the procurement authorities, agreements with external vendors and contractors.	1	1	5	4	3
Identify and use the internal and external organizational processes needed to acquire goods and services through contracts.	0	0	5	4	3
In liaison with the procurement authorities, prepare procurement support documentation such as specifications, statement of work, request for information, request for proposal, evaluation criteria and vendor lists.	0	2	5	5	3
Obtain proposals as appropriate.	0	0	5	4	3
Select a proposal by systematically applying evaluation criteria and researching supplier background information.	1	2	5	4	3

In concert with the procurement authorities, establish the contract and ensure that all contractual parties satisfy the terms and conditions of the contract.	0	2	5	4	3
Be aware of and approve any subcontracts entered into by the contractor; however, the prime contractor manages the subcontractors.	0	2	5	4	1

Core Competencies ( <i>cont'd</i> )	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Systematically control changes to the contract; amend the contract as necessary if the requirements change.	1	1	5	4	2
Manage the vendor relationship to ensure open lines of communication and to make it easier to resolve problems.	1	2	5	4	3
Monitor the contractor's performance in relation to cost, schedule, scope and quality by applying appropriate project quality management processes, such as validation, verification and acceptance. As a corollary, terminate the contract if non-performance warrants it.	1	1	5	4	3
Integrate the outputs of the contract into the overall management of the project.	0	0	5	4	3
Ensure prompt payments based on factors such as deliverables, milestones, time or other accomplishments, as per the agreement.	0	2	5	4	2
When finished, close out the contract; resolve open items and ensure payment.	1	2	5	4	2

## 5. IT MANAGEMENT

*Objective: To create or acquire quality IT product.*

### Introduction

IT management involves those specific skills needed to manage a hardware/software project typical in the IT industry. All of the competencies imply a constant endeavor to improve these skills so that the IT system development process (maturity) level becomes as high as possible on the Systems Engineering Capability Maturity Model (SE-CMM) scale developed by the SEI (reference 4).

<b>KNOWLEDGE AREA</b>	<b>OBJECTIVE</b>
<b>Lifecycle Management</b>	To manage a project according to a standard process by understanding and using a systems development lifecycle.
<b>Tools and Techniques Management</b>	To optimize specific activities in the development of a system by selecting and using the best tools, and by performing the technical activities correctly.
<b>Architecture Management</b>	To manage the implementation of systems so that their design and components fit into the existing (or future) departmental standard infrastructure, software and hardware.

## 5.1 Lifecycle Management

*Objective: To manage a project according to a standard process by understanding and using a systems development lifecycle.* The recommended lifecycle is described in ISO 12207 (reference 6).

The core competencies in this section conform to the Process Areas (PAs) defined in the SE-CMM (reference 4). The PAs detailed in the other sections are not repeated here.

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
<b>Derive and Allocate Requirements</b>					
Determine a baseline for the agreed-upon requirements and control changes using the baseline.	0	2	5	4	3
Produce realistic, short-term written requirements that are as firm as possible and acceptable to all stakeholders.	1	2	5	5	3
Keep all plans, products and activities consistent with the requirements.	0	2	5	4	3
<b>Integrate Disciplines</b>					
Ensure that everyone affected agrees to the client's requirements and the commitments among the engineering groups.	0	2	5	4	3
Ensure that the engineering groups identify, track and resolve intergroup issues.	0	0	5	4	3
Inform affected groups of the status and content of baselines.	1	2	5	4	3
<b>Understand Customer Needs and Expectations</b>					
Analyze requirements to determine realistic client needs.	0	2	5	4	3
<b>Ensure Quality</b>					
Adapt the standards as necessary; for example, simplify them	0	0	5	4	3

for a smaller project.					
Manage all projects according to defined standards.	0	1	5	4	3
Plan and perform peer review activities.	0	5	5	4	3

Core Competencies ( <i>cont'd</i> )	PM Levels				
	Pr o j e c t S p o n s o r	Pr o j e c t L e a d e r	P M M a s t e r	P M P r o f e s s i o n a l	P M I n t e r n
<b>Manage Configurations</b>					
Write a configuration management plan that lists which configuration items will be managed, the required configuration management (CM) processes, activities, timeframes and responsibilities.	0	0	5	4	3
Identify, control and make available work products under CM control, according to the plan.	0	0	3	5	3
Control changes systematically.	0	1	5	4	3
<b>Define Organization's System Engineering Processes</b>					
Describe the processes and the purpose of each in a standard lifecycle, either one's own or one of the processes described in documents such as ISO 12207.	0	2	5	5	3
Choose an appropriate lifecycle standard. Define and maintain the standard processes.	0	1	5	5	3
Collect, review and make available information about the standards.	0	1	5	5	4
Disseminate any 'lessons learned' to optimize the processes.	0	2	5	5	4
<b>Improve Organization's Systems Engineering Processes</b>					
Co-ordinate process development and improvement across the organization.	2	5	5	4	3

Plan organization-level process development and improvement.	0	5	5	4	3
Identify the strengths and weaknesses of each process relative to a standard.	0	2	5	4	3
<b>Provide Ongoing Skills and Knowledge</b>					
Develop training on lifecycle management and make the training available.	0	1	5	5	3
Ensure that everyone who needs this knowledge takes the training.	0	0	5	5	4
Make sure that the processes are repeatable by making process documentation and training available.	0	1	5	5	3

For more information, see Section 3 - **Project Management: Project Quality Management.**

## 5.2 Tools and Techniques Management

*Objective: To optimize specific activities in the development of a system by selecting and using the best tools, and by performing the technical activities correctly.*

The specific activities should be based on standards such as ISO 12207.

Core Competencies	PM Levels				
	Project Sponsor	Project Leader	PM Master	PM Professional	PM Intern
Be aware of tools such as those available in a tools workbench. Select, implement and manage the use of system development support tools, such as CASE, prototyping, estimating, design, testing, verification, documentation, security and project management tools.	0	1	5	4	3
Design appropriate security into the system.	0	2	5	4	3
Manage the definition of requirements for the new system and technology. Manage the acquisition, design, development, testing, integration, installation, acceptance and subsequent support of the new system and technology. Ensure that they satisfy performance criteria.	0	1	5	4	3
Manage the production and configuration control of all appropriate project and user documentation.	0	0	5	4	3
Use function point analysis (FPA) to determine software project size and to help estimate the length and cost of the project.	0	1	2	5	3
Divide the software project into manageable pieces, as determined by standard formulas for maximum recommended FPA size. Take the organization's size, maturity, development methods and so forth into account.	0	1	5	4	3
Control the size of the software project during development and react as necessary.	0	0	5	4	3

### 5.3 Architecture Management

*Objective: To manage the implementation of systems so that their design and components fit into the existing (or future) departmental standard infrastructure, software and hardware.*

Core Competencies	Project Sponsor	Project Leader	P M Master	P M Professional	P M Intern
Understand architecture principles, which state preferred architectural direction and practice. Expanding on IT policies to support the business, they include the fundamental structures of technology, information, telecommunications and applications.	0	1	5	5	3
Understand business architecture, which is the set of policies and rules that govern an organization's planned arrangement of computers, data, human resources, communication facilities, software and management responsibilities.	1	5	5	4	3
Understand work architecture, which outlines ways to link a system (work flow and processes), people and technology to optimize productivity.	0	2	5	4	3
Understand information architecture, which outlines how and why computers, data, human resources, communication facilities and software fit together; where they are located; when they are needed; and how and why changes will be implemented.	0	2	5	5	3
Understand applications architecture, which refers to the design of an application and the way its components are connected to, and operate with, each other.	0	0	5	5	3



Understand technology architecture, which refers to the design of fundamental hardware, software and telecommunications systems that provide the infrastructure on which business applications are developed and on which they run. Manage the production of a technical design that satisfies the project objectives and that complements the department's and government's strategic architectural directions, as well as their information and telecommunications investments.	0	0	5	5	3
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## **APPENDIX — References**

### **General Management**

1. *Profile of Public Service Leaders and Managers*, Treasury Board of Canada Secretariat and Public Service Commission of Canada, 1994.
2. *The Wholistic Competency Profile: A Model*, Public Service Commission, 1996.

### **Project Management**

3. *A Guide to the Project Management Body of Knowledge*, Project Management Institute, 1996.

### **IT Management**

4. *A Systems Engineering Capability Maturity Model (SE-CMM)*, Version 1.1, Software Engineering Institute, 1995.
5. *Continuous Risk Management Guidebook*, Software Engineering Institute, 1996.
6. *Information Technology Life-cycle Processes*, International Standard 12207, ISO/IEC JTC1/SC7, (Project Editor: Raghu Singh), 1993.
7. *An Enhanced Framework for the Management of Information Technology Projects*, Project Management Office, Information Management, Systems and Technology, Treasury Board of Canada Secretariat, May 28, 1996.