THE UNITED REPUBLIC OF TANZANIA

PRESIDENT'S OFFICE

PUBLIC SERVICE MANAGEMENT

ICT Project Management

A Step-by-step Guidebook for Managing ICT Projects and Risks

Abbreviations

BOM, Bill of Materials
ICT, Information and Communication Technologies
MDA, Ministries, Departments and Agencies
PO-PSM, President Office – Public Service Management
POS, Project Objective Statement
WBS, Work Breakdown Structure

Version Control

Version	Release Date	Prepared By	Approved by	Changes Made (if applicable)
1.0	4 Jan 2010			First Release

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1 Introduction

1.1 Purpose of this Guidebook

The aim of this Guidebook is to provide a step-by-step and practical approach to facilitating Project Management for successful implementation of ICT project and managing implementation risks. It combines the experiences in Project Management in both the public and private sectors in several countries including Singapore. It is intended for use by practitioners performing the role of Project Manager at the various public sector agencies.

1.2 Structure of this Guidebook

This Guidebook documents an integrated project management methodology that has six independent and yet connected Stages. Each Stage is documented as a separate chapter in the Guidebook. This Guidebook is organised to show the readers how to systematically perform the role of Project Manager to successfully implement an ICT project and manage the risk.

The six Stages are:

- Project Definition

- Organising Project

- Formulating Project Plan

- Project Execution and Control

- Project Completion

- Managing Human Resources in Projects

Each phase is documented as follows:

OBJECTIVES :	Outcome to be achieved from performing the TASKS in a Stage
DELIVERABLES :	The major outputs in a Stage.

TASK OVERVIEW :	Overview of all the TASKS in a STAGE, with brief descriptions of each TASK, its inputs, outputs and parties involved.
TASK:	TASK in each STAGE to be performed and the specific inputs required and outputs.
STEPS:	Detailed STEPS in each TASK to be carried out.
GUIDELINES:	Suggestions on what need to be considered, best practices and tools to employ.

Some Steps could be optional and the guidelines provided should not be deemed as the only ways to develop the outputs. The practitioners have to exercise judgement and make use of reasoned decision to perform the steps as deemed necessary.

2 Overview of Strategic Project Management

2.1 What is Project Management?

Project Management is defined as a sequence of activities having one purpose and that must be completed

- by a specific time
- within budget and
- according to expected requirements

Some examples of ICT projects are listed as follow:

a. Information Systems / Portals

- e-Government portals
- City websites
- Core banking information system
- Immigration passport system

b. Network and Infrastructure

- Implementation of network (infrastructure) and equipment (routers, switches, etc)
- Microsoft exchange email system

c. ICT Consultancy and Services

- e-Government ICT HR master plan
- Network design and consultancy study
- ICT master plan and e-Government roadmap.

2.2 Objectives of Project Management

The objectives of Project Management are:

a. To bring about the successful completion of specific project objective

b. To foresee or predict the project risks and manage them actively

c. To plan, organise and control activities

2.3 Project Management Methodology

To ease understanding, this methodology is structured into six distinct STAGES and key TASKS.
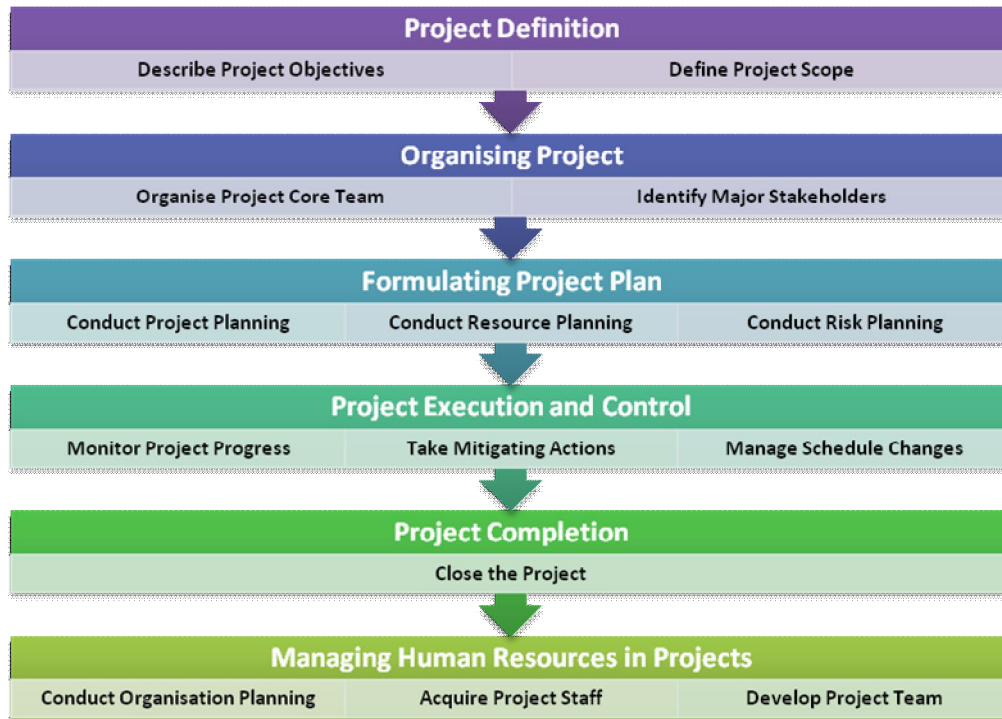
2.4 Scope of Project Management

This Guidebook applies to MDAs' project management efforts related to ICT projects. It presents an easy to follow step-by-step guide to effective project management. It covers the project management processes, defining project scoping and key project metrics, schedule and resource planning, managing risks and managing human resources.

However, it does not cover:

- Management of non-ICT projects

- Maintenance of the project after completion

2.5   Key Responsibilities

The composition required to carry out the project management shall consist of the following parties:

- Project Steering Committee

- Project Manager

- Project Team

Composition	Organisation Function	Main Responsibilities
Project Steering Committee	Management group chaired by a senior executive as the Project Sponsor	Responsibilities of members of Project Steering Committee include: • Provide management guidance and feedback • Provide access to resources (personnel, information etc.) • Review all recommendations on opportunities, approach and resources • Maintain focus on business needs • Ensure adequate funding is available to support the project • Make decisions concerning resource conflicts. • Ensure risk assessment is regularly reviewed and the risks are managed
Project Manager	A person assigned by the Project Steering Committee for day to day management on their behalf	Responsibilities of Project Manager include: • Select the project team, together with the sponsor • Maintaining a close working relationship with the sponsor • Identify and manage the project stakeholders • Identify and manage the risks • Allocate and secure resource commitments • Monitoring and tracking the project progress • Solving problem that interfere with progress • Controlling cost • Leading the project team • Informing stakeholder of progress • Delivering the project deliverables on time • Manage the performance of the project team
Project Team	Individuals selected to achieve the deliverables	Responsibilities of members of Project Team include: • Helping the Project Manager to deliver the objectives

Composition	Organisation Function	Main Responsibilities
		• Participate in the team meetings, visits and workshops • Use their competencies to carry out the tasks they have been given • Alerting the Project Manager to any risks that appear • Provide information for project documentation as needed

2.6 Summary of the Project Management Methodology

Stage	Performed By	Inputs	Outputs
1. Project Definition	Project Steering Committee Project Manager	• Project Case or Project Charter document • Business needs	• Project Objectives Statement (POS) • Project scope, assumptions, constraints, acceptance criteria
2. Organising Project	Project Manager Project Team	• POS • Project scope	• Roles and Responsibilities • Stakeholder Analysis
3. Formulating Project Plan	Project Manager Project Team	• POS • Project scope • Resource Pool • Resource requirements	• WBS • Project Plan • Bill of Materials (BOM)
4. Project Execution and Control	Project Steering Committee Project Manager Project Team	• Project Plan outputs • Resource requirements	• Project Metrics • Project progress reports • Project Risk Register • Project Issue Log • Schedule Management Plan
5. Project Completion	Project Steering Committee Project Manager	• Project Execution and Control outputs	• Project deliverables
6. Managing Human Resources in Project	Project Manager Project Team	• Resource requirements	• Staff Management Plan • Staffing Requirement Plan • Project Staff Assignment • Project Team Directory • Training Plan

3   STAGE 1 – Project Definition

3.1   TASK 1.1 – Describe Project Objective

3.1.1 Applicable Concepts

Project Objective Statement – The Project Objective Statement (POS) describes in concrete terms what the project aims to achieve. It articulates the final outcome of the project and how the success of the project will be measured.

3.1.2 Key Steps

Step 1. Based on the business case or project charter document, derive a good understanding of the results in which the project will help to accomplish.

Step 2. Formulate a POS to capture this understanding. The POS must be specific, measurable, and worded in simple terms. An example of POS could be:

"To develop and implement a high-quality, customer service support system in 18 months at a cost not exceeding $350,000."

Step 3. Review the POS with the Project Sponsor and clarify the intended outcome.

3.1.3 Guidelines

Engaging the Project Sponsor early in the project cycle ensures that expectations are clarified before any real works begin. Management commitments on the project is demonstrated when the Project Sponsor is willing to devote time, funds and resources to the project to ensure its success.

When articulating the POS, ensure that the project is bounded with a realistic timeline and budget. No project will ever be considered successful if it overruns

its deadline or budget.

3.2 TASK 1.2 – Define Project Scope

3.2.1 Applicable Concepts

Project Scope – Project Scope is the boundary that defines where the project begins and where it ends.

Project Trade-off Triangle – Project Trade-off Triangle displays the relationship among the three components of a project that describe the components of work (scope, schedule and resources).

3.2.2 Key Steps

Step 1. Define project scope in terms of the following:

- Business needs or user requirements

- Critical assumptions and constraints

- Key deliverables

- Acceptance Criteria

Step 2. Identify any critical assumptions and constraints that the project will operate under. Some examples include:

- All project personnel will be trained on the tools and techniques needed to support this project (assumption)

- Deliverables will be reviewed by users within 5 working days (assumption)

- Application testing activities can only be carried out after office hours or during week ends (constraint)

- Procurement of technical resources will take 2 months from the date of submission of the requisition request (constraint)

Step 3. For each deliverable identified, articulate the criteria for it to be accepted. For example, for the acceptance of the functional specifications, the following criteria could be use:

- All user requirements have been taken into account and verified by the user representatives.

- All feedbacks by the reviewers have discussed and follow-up actions are closed.

- The functional specifications document has been signed off by the Project Sponsor.

Step 4. Seek endorsement from the Project Sponsor on the scope of the project.

3.2.3 Guidelines

To manage the project effectively, any changes in scope will necessitate an assessment of impact to the schedule or the resources. The Project Sponsor's expectations in the schedule and scope changes can be better handled if the concept of Project Trade-off Triangle is discussed early in the project.

4   STAGE 2 – Organising Project

4.1   TASK 2.1 – Organise Project Core Team

4.1.1 Applicable Concepts

Nil

4.1.2 Key Steps

Step 1. Assemble the Project Core Team by identifying the people with the appropriate competencies and interpersonal skills so that they can work well together and require a minimum level of supervision.

Step 2. Hold a meeting with the Core Team to explain the objective and scope of the project, and clarify their roles and responsibilities clearly.

Step 3. Explain how the Core Team would communicate on a regular basis. For example, there shall be a weekly project update meeting to be held on every Monday morning at 9am.

Step 4. Ask the project team members for their commitment and ensure concerns from the members of the Core Team are addressed.

4.1.3 Guidelines

One of the key responsibilities of the Project Manager is to ensure that all team members are involved to achieve successful implementation of the project. Sometimes, certain individual project member is uncomfortable with the scope and pace of the project, or has other competing priority. Make sure that these concerns are addressed so that the individual can focus on the project. Otherwise, it may be better to select another alternative member who is able to focus on the project.

4.2   TASK 2.2 – Identify Major Stakeholders

4.2.1 Applicable Concepts

Stakeholder – A stakeholder is any party or institution which has an interest in the organisation. Stakeholder interacts with the organisation and is thus affected by the workings and success of the organisation.

4.2.2 Key Steps

Step 1. Gather the Project Core Team to identify the stakeholders of the organisation. These may include anyone who:

- is affected by activities or results of the project

- can influence, support or resist the outcome

- has a personal, financial or professional interest in the outcome

Step 2. Determine the major stakeholders by understanding how their support will impact the outcome of the projects. For examples, the users base of the ICT system, other government agencies need to be involved etc.

Step 3. Identify the objectives with the relevant major stakeholders. Based on the goal defined, specify the deliverables to meet the project needs and targeted delivery deadline.

Step 4. Ensure sufficient information about the project is documented to support planning.

4.2.3 Guidelines

When identifying the stakeholders, the following should be borne in mind:

- As many as possible groups of stakeholder should be identified. It is better to be more comprehensive than to miss out some important stakeholders.

-       Some stakeholders have very high influence over the project and should be consulted and brought on board if their expectations are not well understood.

5 STAGE 3 – Formulating Project Plan

5.1 TASK 3.1 – Conduct Project Planning

5.1.1 Applicable Concepts

Work Breakdown Structure – Work Breakdown Structure (WBS) decomposes the project into its component elements and is used to define the project as a whole.

5.1.2 Key Steps

Step 1. Invite any relevant stakeholders who could contribute to the project success and together, assemble the Project Core Team for a project planning exercise. Circulate the project POS and scope document to the participants before the exercise.

Step 2. During the planning, review the project POS, scope and major stakeholders' expectation. Take note of the key assumptions and constraints as defined in the scope.

Step 3. Define clearly the outputs for the project and state what the project is targeting to achieve.

Step 4. Create a WBS which is a pre-requisite for developing high level schedule. For ICT system development, a System Development Methodology should be used. A WBS example of such a methodology is included in the following page.

Step 5. The WBS should capture the work of the project that needs to be done and the objectives to meet. This would include:

- Milestones
- Deliverables
- Tasks

- Activities

Definition	System Design	System Development	System Implementation	Transition to Steady State
Start up and Orientation	Define Technical Architecture	Develop and Test Software Modules	Establish Acceptance Environment	Train Users
Determine Business Requirements	Define System Standards	Produce User Training Materials	Data Initialization and Conversion Test Results	Convert Data
Create Future Process Model	Create Physical Environment	Produce Technical Documentation	Acceptance Results	Deploy System
Reconcile Business Requirements	Produce Technical Specification	Unit, Integration and System Test Results	Update Supporting Materials	
Functional Specification	System Component Prototype	Conduct Performance Testing		
	Create Test Cases	Conduct User Acceptance Testing		

5.1.3 Guidelines

The single biggest issue in a failing project lies in the inability to manage scope and having ambiguous project requirements, hence the Project Manager must be careful to manage the expectation of the stakeholders.

Both the budget cost and the ICT human resources should be planned meticulously to support the implementation at different phases. The ICT human resource planning will need to take into consideration of training to prepare the staff for the ICT implementation and operation.

5.2   TASK 3.2 – Conduct Resource Planning

5.2.1 Applicable Concepts

Resource Pools – Resource Pools are groups of identical competent human resources. Resources are acquired from each pool independently from other resources in other pools.

Bill of Materials – Bill of Materials (BOM) is a detailed list of all parts and the required quantity for each part that are required to build a specific product.

5.2.2 Key Steps

Step 1.   Review the WBS to identify the resources needed in details.

Step 2. Analyse historical information, if any, to help to determine the resources needed.

Step 3. Review the Resource Pool to identify the available resources. Secure the potential members and ensure the availability of these members for the duration of the project.

Step 4. Perform cost estimation for the resources need. This is dependent on the resource requirement and the rate of services charged. Use the duration of activities as a reference for the cost estimate.

Step 5. Review any procurement needs for equipment and ICT resources required to support the project. Put together a Bill of Materials (BOM) to support the procurement.

Step 6. Review overall cost estimates. If necessary, adjust the resources or review the budget allocated. Negotiate with the Project sponsor for additional budget if the planning shows that the outcome cannot be attained with the allocated budget.

5.2.3 Guidelines

Normally in a life cycle of a project, the cost and staffing level required will rise until to a peak in the intermediate phases of the project and taper off towards finishing of the project.
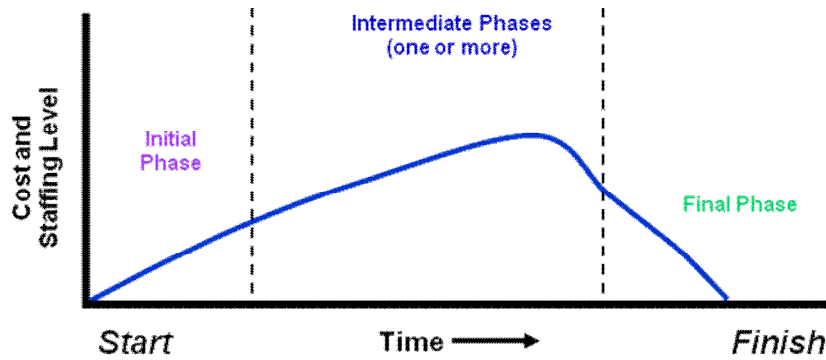
Adapted from PMBOK® Guide 2000

The Project Manager must schedule and plan the resources accordingly to meet the needs at different phases of the project. The implementation planning will need to include resources allocation.

5.3   TASK 3.3 – Conduct Risk Planning

5.3.1 Applicable Concepts

Project Risk – Project risk is anything that will have a negative impact on the project scope, resources or schedule.

5.3.2 Key Steps

Step 1. Identify the risks to the project. There are several sources of inputs to risk identification such as Project Planning outputs:

- Project plan

- Scope

- WBS

- Procurement needs

- Product Description

- Schedule and Cost Estimates

- Resource Plan

Step 2. Categorise the risk so that it can be managed more systematically. Possible categories are:

- Technical, quality or performance risks

- Project management risks

- Organisation risks

- External risks such as nature disaster, etc.

Step 3. Develop a Project Risk Register. The plan will contain information such as:

- Identified risks

- Analysis of risks

- Response to risks

- Monitoring and control procedures

- Rules and responsibilities

- Budget and timing for managing the risks

- Reporting and tracking of risks

Step 4. Develop a risk monitoring and control process to track identified risks as well as to monitor residual risks and identify any new risks that may arise. This will include carrying out the following:

- Creating workaround solutions

- Corrective actions to handle risks

- Update to Project Risk Register due to new risks and prioritisation

5.3.3 Guidelines

There are many challenges that may manifest itself during the course of the project. Some possible challenges are:

- Political changes where the direction of the strategy is no longer the same resulting in different needs and goals.

- Project requirement changes when previously agreed requirement is altered or scope is changed. Sometimes the requirement changes because the customers may not be clear about their needs in the initial planning.

- Changes in stakeholders and project owners are a big challenge especially if the new stakeholders and project owners do not share the original vision to accomplish the project.

- New technology environment posed a threat to current design due to performance risk, quality or technical compatibility.

To manage the project risks, the Project Manager should ensure a systematic way of handling the situations.

6   STAGE 4 – Project Execution and Control

6.1   TASK 4.1 – Monitor Project Progress

6.1.1 Applicable Concepts

Project Metrics – Project Metrics are measures used to indicate progress or achievement of a project.

6.1.2 Key Steps

Step 1. As the project progress, monitor it carefully to check whether it is progressing well, having warning signs or in trouble.

Step 2. Track the project using project metrics such as:

- Project is within budget and scope

- Project is meeting schedule and milestones

Step 3. Prepare regular project progress report to Project Steering Committee to keep the Steering Committee members informed. Highlight any variances which may need attention or intervention by the Steering Committee.

Step 4. Conduct status review meeting at each of the project milestones to ensure Project Steering Committee is kept in the loop of the overall progress and any changes to the project scope, timeline and resource needs.

Step 5. When a project is not going well, typically there are signs to warn of impending trouble. Look out for the following warning signs:

- Scope creep is not put under control where customers are gradually increasing the scope

- Team spirits is declining and increase absenteeism

- Key personnel leaving the project along with knowledge

- Variances start to get bigger, especially early in the project

- Frequent overtime especially over the weekends to meet the deadlines

- Deteriorating quality in outputs and service

- Cut-back on quality activities such as testing and reviews

Step 6. If there is trouble brewing, administer remedy as quickly as possible. The purpose of tracking a project is to control it to ensure that it is on track to meet project objective.

6.1.3 Guidelines

When a project fails, usually the major cause of the failure is found to be bad communications between relevant parties. Hence, the Project Manager must actively communicate with relevant parties to seek project progress through means such as email, walkabout, phone call, progress report or status review meeting.

6.2 TASK 4.2 – Take Mitigating Actions

6.2.1 Applicable Concepts

Mitigation Actions – Mitigation actions are responses to project issues to lessen the severity or intensity of the negative impact.

6.2.2 Key Steps

Step 1. Recognise the issue encountered and register the issue in the issue log.

Step 2. Verify the accuracy of the status to obtain understanding of the detailed information of the issue that need to be resolved.

Step 3. Investigate to determine the cause of the issue and the impact it had on the project progress. Review the Project Risk Register to verify if it is an identified risk to the project.

Step 4. Make an assessment on the need to trigger the risk response action based on the Project Risk Register.

Step 5. Work with the Project Core Team to determine the best approach to carry out the actions. Sometime it may require seeking advice from external parties, relevant stakeholder or subject matter expert to derive a workable solution.

Step 6. Carry out the actions for mitigation and update the issue log and the Project Risk Register.

6.2.3 Guidelines

When an issue occurs or risk becomes a reality, change in project strategy may be required. In such cases, the following should be done:

- Re-validate with the Project Sponsor to ensure that they are kept informed and that they are agreeable to the actions taken to minimise the impact.

- Re-plan the project especially if the impact is too great. This action will require careful consultation with the Project Steering Committee.

6.3   TASK 4.3 – Manage Schedule Changes

6.3.1 Applicable Concepts

Schedule Management Plan - A document that specifies the criteria for developing and maintaining the actual project schedule. It establishes how schedule management will be carried out in the project. It serves as a guide for

the scheduling process and defines the roles and responsibilities for stakeholders in those processes.

6.3.2 Key Steps

Step 1. Adopt a schedule management plan to manage schedule change.

Step 2. When the schedule needs to be changed, conduct a resource requirements update to identify the resource changes due to the change in schedule.

Step 3. Perform a variance analysis to determine the cause of a variance and identify the factors that affect each element.

Step 4. In order to maintain control of the changes that may occur to a schedule, implement schedule control such as clear schedule updates, taking corrective actions and drawn lessons from the events that cause delay.

6.3.3 Guidelines

Nil

7   STAGE 5 – Project Completion

7.1   TASK 5.1 – Close the Project

7.1.1   Applicable Concepts

Nil

7.1.2   Key Steps

Step 1. Upon completion of the project, the Project Manager formally ends the project by conducting a meeting to brief the Project Steering Committee on the outcome of the project.

Step 2. State the deliverables that have done.

Step 3. Conclude on any outstanding issues.

Step 4. Handover all necessary materials related to the project.

7.1.3   Guidelines

It is a good practice for the Project Manager to document lessons learnt so that similar projects in the future can be enhanced.

8   STAGE 6 – Managing Human Resources in Projects

8.1   TASK 6.1 – Conduct Organisation Planning

8.1.1 Applicable Concepts

Staff Management Plan – A Staff Management Plan describes when and how human resources will be brought onto and taken off the project team.

8.1.2 Key Steps

Step 1. Define clearly the roles and responsibilities which include Project Manager, Sponsor and Project Team comprising of both core and extended team.

Step 2. Develop the Staff Management Plan. The staffing plan may be formal or informal, highly detailed or broadly framed, based on the needs of the project. The plan should include appropriate reassignment procedure which helps to improve morale by reducing or eliminating uncertainty about future employment opportunities.

Step 3. Create an organisation chart for defining reporting relationships. This will also help to specify the department roles and responsibilities.

Step 4. Include other supporting details such as organisation impact, job description and training needs in the organisation planning.

8.1.3 Guidelines

Nil

8.2   TASK 6.2 – Acquire Project Staff

8.2.1 Applicable Concepts

Nil

8.2.2 Key Steps

Step 1. Develop the staffing requirement plan. The plan should describe the potential of available staff based on their experience, availability, competencies and proficiency.

Step 2. Establish hiring practices based on government policies, guidelines and procedures.

Step 3. Initiate recruitment drive if the needed resources are not available.

Step 4. Create the Project Staff assignment which comprises of full time, part time and project needs staffing.

Step 5. Create the Project team directory for formal and informal team.

8.2.3 Guidelines

This task shall be performed if the Resource Pools are not established in the organisation. In such a situation, lead time for staff acquisition has to be managed carefully in order to ensure hiring of the right staff can occurred in a timely manner.

During project execution, it is critical to ensure that key project staffs are backed up by other competent staffs. This will minimise project disruption when a key project staff exits the project suddenly.

8.3 TASK 6.3 – Develop Project Team

8.3.1 Applicable Concepts

Nil

8.3.2 Key Steps

Step 1. Foster a strong cohesive team such as through team building activities.

Step 2. Develop the skills and competencies of the team. This include general management skills such as:

- Operation planning

- Staff management

- Personal development such as time management, stress management, etc.

- Domain specific functions such as Finance, Sales, Marketing, etc.

Step 3. Implement rewards and recognition systems to facilitate work attitude and performance.

Step 4. Place many or all of the most active team members in the same physical location as it enhance people's ability to perform as a team. During the project, team members can be collocated temporarily at strategically important times or for the entire project.

8.3.3 Guidelines

Nil