2020 Corporate Strategic Asset Management Plan

Appendix G
CVRD Project Management Handbook

PROJECT MANAGEMENT HANDBOOK

Engineering Services Department

July 2019

Project Management is:

The application of knowledge, skills, tools and techniques to project activities in order to meet (or exceed) sponsors' and external customers' needs and expectations from a project.

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CHAPTER 1 - INTRODUCTION

1.1 Purpose of this Document

This document provides generic guiding concepts for project management within the Cowichan Valley Regional District (CVRD).

1.2 Why Project Management?

We are living in a very competitive and rapidly changing world. Businesses and governments throughout the world are reevaluating operations in an effort to become leaner, more effective and more competitive. CVRD must compete in this world where the efficient use of tax dollars is required due to the limited resources available compared to the infrastructure needs.

Project Management Vision

We deliver services through our infrastructure that meets the public needs.

Project Management Mission

Project teams use project management to deliver quality projects that are timely and cost-effective.

The purpose of project management is to:

- Deliver projects that satisfy public needs.
- Improve project delivery performance related to quality, scope, schedule, and cost.
- Reduce the support cost of producing the project.
- Do the right things right the first time.
- Anticipate and respond to issues before they become problems.
- Effectively communicate with stakeholders.
- Manage change.

CHAPTER 2 - PROJECT MANAGEMENT CONCEPTS

2.1 The Project

Project Definition

A project is a temporary endeavor undertaken to produce a unique outcome. CVRD undertakes several types of projects. This includes capital projects (including maintenance), operation-related projects, planning projects and quality improvement projects.

A capital project is a temporary endeavor undertaken to create a unique physical improvement to the infrastructure system due to changes to the levels of service, demand, new regulations and changes of the use of the infrastructure. The word “project” refers to the work that is performed. Projects produce products also known as deliverables.

The Project Life Cycle

The Project Life Cycle defines the phases through which a project passes. A phase is marked by the completion of a highest-level deliverable in the project Work Breakdown Structure (WBS).

CVRD’s Capital Project life cycle includes the phases illustrated below.

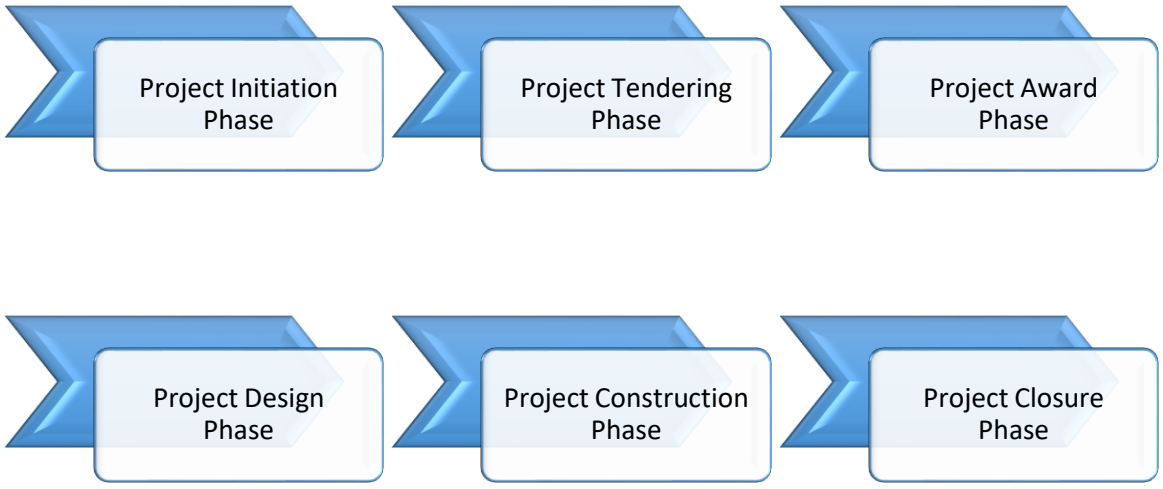

Figure 1- Capital Project Life Cycle

Project Initiation Phase

The highest-level deliverable completed during this phase is the Project Initiation Document. This document contains a defined project scope, a reliable capital and support cost estimate and a project schedule suitable for issuing RFX (See the CVRD’s Purchasing Policy for more information)

Project Tendering Phase

Securing funding in this phase is required and will allow the Project Manager to release the RFx (through Procurement Officer).

Project Award Phase

The received proposals are evaluated and the winner will be identified. A contract will be formed and a contractor will be hired; a Purchase Order (PO) is issued in this phase.

Project Design Phase

Design details, quantity calculations, and contract specifications are developed and permits are secured in this phase. Tender Package preparation will also be done at this stage if construction is required

Project Construction Phase

Construction contract administration and other activities to construct the project are performed. The highest-level deliverable completed during this phase is the constructed physical improvement.

Project Closure Phase

All remaining project activities are completed in this phase. Deliverables produced during this phase include Final and actual cost, As-Built plans, and the project history file; a post mortem will be conducted as part of the lessons learned. Data provided to GIS/Finance to update asset inventories.

2.2 Project Management

Project management is the application of knowledge, skills, tools and techniques to project activities in order to meet customers' needs and expectations. Project management involves the interaction of three elements:

1. People,
2. Processes, and
3. Tools.

Project Team & Stakeholders - People perform the work and determine the success or failure of a project.

Project Management Processes - Processes specify products or deliverables required for the project and identify who will perform the work and when. They answer the question: "Who does what, when?"

Project Management Tools - Tools and techniques are used by the project team and others to manage the project.

2.3 Program Management

A program is a group of related projects managed in a coordinated way to obtain benefits not available from managing them individually.

Program management is the simultaneous integration, management and control of multiple and diverse projects and differs from project management as shown in the table below.

Project Management is:	**Program Management is:**
The direction and supervision of a project	The integration, coordination, communication and simultaneous control of multiple projects.
A discipline	An operating environment
Project-wide (a tactical issue)	Corporation wide (a strategic issue)

CHAPTER 3 - PROJECT TEAM & STAKEHOLDERS

3.1 Project Stakeholders

Project stakeholders are individuals and organizations who are actively involved in the project, or whose interest may be positively or negatively affected as a result of project execution or successful project completion. A stakeholder is anyone who has a vested interest in the project.

Stakeholder identification is difficult, but necessary. Naming or grouping stakeholders is primarily an aid to identifying which individuals and organizations can facilitate or hinder the delivery of a project.

Stakeholders on any CVRD Capital Project can be grouped into one of the following:

External Project Customers – Are system users who ultimately pay for projects through taxes and other charges.

Internal Project Customers – Are individuals who will use the deliverables or information produced at various stages of the project. They are internal to the project. This could be IT, GIS, Finance, Communications, Operations, Asset Management, or other departments.

Special Interest Groups – These are groups with special interest in the project and its deliverables that can affect the groups' interests. For example, ENGOs or any community-formed groups.

First Nations – It is very important to recognize First Nations and their interests that can be affected by the project deliverables.

Project Sponsor – Is an individual who has the authority to resolve conflicts, in particular with cross-functional project teams. A project sponsor could be the CAO or a General Manager.

Other Stakeholders – These are individuals or organizations that can facilitate or hinder the delivery of a project. Included in this group are permitting agencies, other governmental agencies, environmental groups and unions.

Managing stakeholders' needs and expectations is difficult because stakeholders often have very different objectives that may create conflict. Finding appropriate resolutions to such differences can be one of the major challenges of project management. The project team must identify the stakeholders on a project, determine what their needs and expectations are, and then manage and influence those expectations to ensure a successful project. In general, differences between or among stakeholders should be resolved in favor of the customer. Understanding the customer is key to determining the true requirements of a project.

3.2 Project Teams

The CVRD uses an interdisciplinary team approach to deliver infrastructure improvements that meet stakeholder needs. The project team initiates, plans, executes, controls and closes the various phases of the project life cycle to ensure successful delivery of a project. Successful project delivery hinges on effectively meeting stakeholder needs or communicating why their needs cannot be met.

There is a project team on every project. Depending on the complexity of the project, project teams may be formally or informally organized. Individual team members may be active or inactive as a project progresses through the project life cycle.

Project Team Definition:

The Project Team includes every person who works on a project. This includes staff, consultants and sub-consultants and contractors. Each team member is an internal customer for some deliverables and a supplier of other deliverables.

3.3 Organizing For Projects

Organizational Structure and Project Management
The structure of the organization affects the way resources become available to a project. The major approaches used by project based organizations to fulfill project commitments include the following organizational structures:

Functional	Weak Matrix
Projectized	Strong Matrix

Projectized Organizational Structure - All of the organization is organized by projects rather than functional teams or departments. The project team members work under the project manager and are assigned for only one project and the project manager has the power and authority.

Strong Matrix Organization Structure - In strong matrix organizations, most of the power and authority is held by the project manager. The project manager has a full-time role, has a full-time project management administrative staff under him and controls the project budget. This structure has a lot of the characteristics of a projectized organization.

Weak Matrix Organization Structure - In weak matrix organizations, the project manager will have limited power and authority. He will have a part-time role, and no administrative staff will report to him. His role will be more like a coordinator or an expediter. Here, the functional manager controls the project budget. A weak matrix organization structure resembles the characteristics of a functional organization structure.

Each of these structures grant differing levels of formal authority to the project manager. The project manager in the functional organizational structure usually has little formal authority, has increased authority in the weak matrix and even greater authority in the strong matrix and projectized organizations.

CVRD as a functional organization needs to change gradually to a predominately strong matrix organization, or one in which project managers must obtain products and services from a number of different units that range across the formal functional structure and are not under the project manager's direct supervision.

In a strong matrix organizational format the project manager is responsible for what, when, and how much it will cost while the divisional manager determines how and by whom the task will be done.

The advantages of a strong matrix organization include:

- Highly visible project objectives.
- Maximum utilization of scarce resources.
- Increased project manager authority.

- Improved coordination across functional lines.
- Effective horizontal and vertical dissemination of information.
- Strong technical base is easier to develop and have available to all projects.
- Excellent training environment for prospective project managers.

To make a strong matrix structure work, the CVRD must define:

- Project roles and responsibilities
- Project management processes

Smaller projects and projects with the majority of the work in one functional area will be assigned to two-hat project managers, resembling a weak matrix organization.

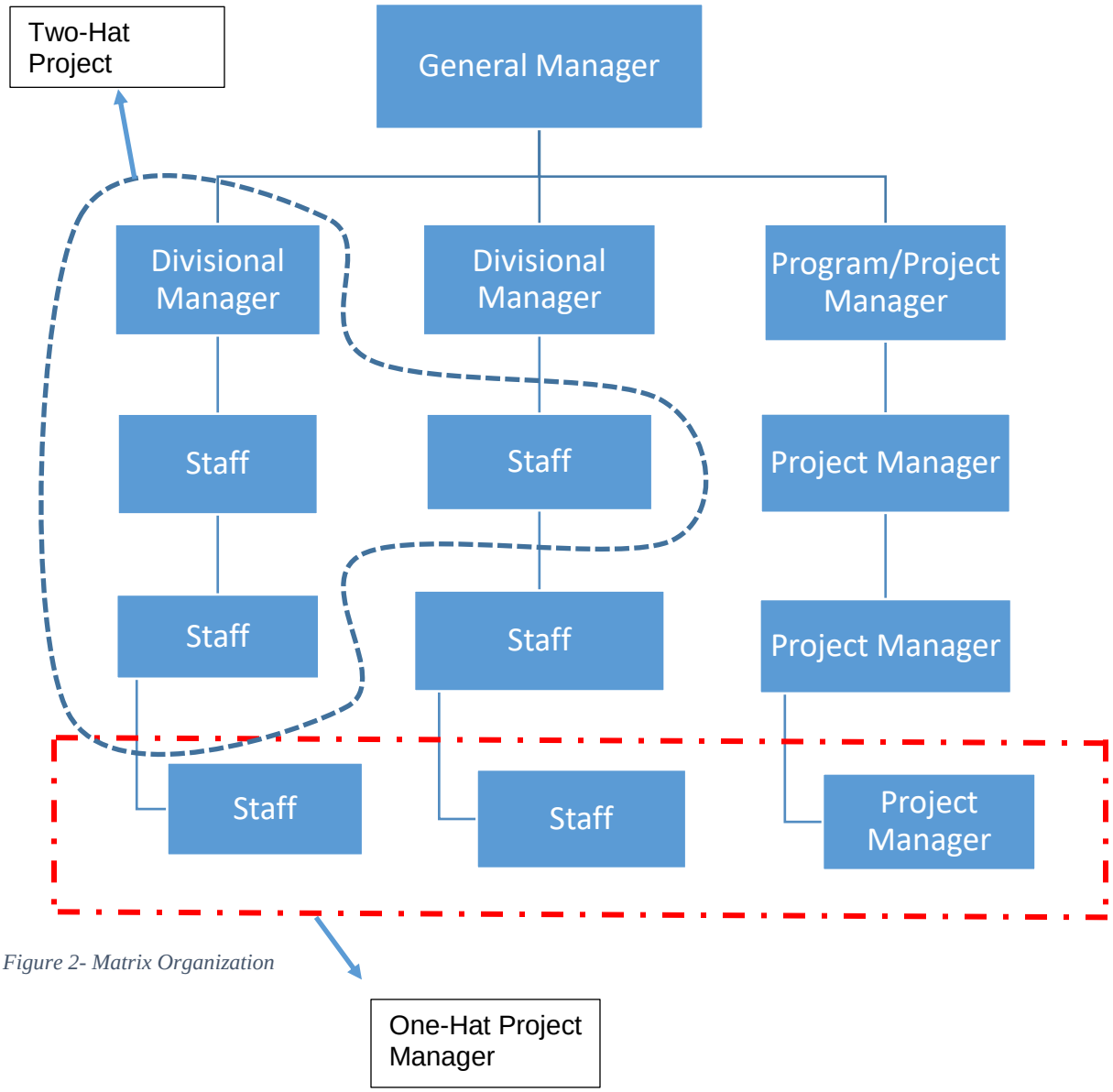

Figure 2- Matrix Organization

The above schematic shows how the strong matrix (one hat project manager) overlays the formal functional organization. The weak matrix overlay is represented by the two hat project manager.

One-hat project managers - Are those whose duties consist solely of project management and do not include supervision. One-hat project managers are generally assigned to all major capital projects including the following:

- Projects with multiple divisions involvement and coordination
- Projects with significant amount of local & private entities (stakeholders) involvement.
- The CVRD encourages that most project managers be one-hat.

Two-hat project managers - Are those whose duties consist of both project management and supervision of a functional unit. Two-hat project managers may be used for projects where a single division can deliver 80-90 percent of the project deliverables. The other type of projects for two-hat project managers could be small projects such as operational-related.

3.4 Responsibility, Authority and Accountability

Responsibility
Responsibility is the ethical commitment to accomplish the work with the quality promised in a timely and cost effective manner. Specific responsibilities are discussed in the following pages.

Authority
Authority is the power (formal authority) granted to individuals so they can make decisions that others are expected to follow. It is also acquired through knowledge, skills, abilities, and personal effectiveness (informal or earned authority).

The project manager has formal authority derived from his or her organizational assignment of being responsible for project delivery. Project managers can also acquire informal or earned authority on the basis of their knowledge and reputation, which includes the ability to influence others and solve problems. It is important to note that no project manager whose project activities cut across functional lines in a matrix organization can have complete authority.

The divisional manager has authority derived from his or her supervisory position in the organization. Divisional managers can also acquire informal or earned authority on the basis of their knowledge and reputation, which includes the ability to influence others and solve problems.

Accountability
Accountability is being answerable for meeting or for failing to meet a commitment.

3.5 Empowerment

The high complexity associated with today's projects, combined with the customer's demand for responsiveness, requires management to empower the project team to meet customer needs. Empowerment does not mean that managers abdicate their leadership role. It simply means that managers need to define the boundaries for, or delegate the level of authority to, each project team member that is commensurate with the individual's capability. Project team members are then free to carry out their assignments using their own judgment, skills and methods; make

unilateral decisions affecting how they do work; and accept responsibility for the outcome of their efforts.

3.6 Project Management Responsibilities

Project Sponsor

- Identifies and prioritizes projects.
- Serves as advocates for their projects.
- Establishes performance measures for measuring the quality of capital improvements.

Project Manager

The Project Manager has full authority, delegated from the Divisional Manager for Program/Project Management, to produce the results that were intended, meet schedules, stay within budget and keep the sponsors and customers satisfied. The Project Manager retains these responsibilities over the entire life of the project and is the primary point of contact for the project sponsor. The Project Manager:

A. Initiates.

- Identifies the needs and expectations of the project sponsor.

B. Plans.

- Leads the project team in the development of a management plan that defines the project scope, schedule, cost, resource needs, risk and communication needs.
- Ensures that the project management plan includes all the work required, and only the work required to produce the deliverables.

C. Controls.

- Monitors project performance and takes corrective action if necessary.
- Communicates sensitive issues and project progress to sponsor and the project team.
- Is the single point of contact for the project on matters involving overall project scope, cost or schedule.
- Resolves problems that affect project scope, cost or schedule.
- Controls change to the project scope, cost or schedule throughout the project life-cycle, including construction.
- Coordinates the efforts of the overall team, including chairing project team meetings.
- Controls the project budget.

D. Closes.

- Is responsible for timely project completion.
- Is responsible for ensuring that the final product meets the needs of the project customers.
- Discusses final product with sponsor to gauge their level of satisfaction.
- Prepares a final report on the project, with recommendations for improvement.
- Provides feedback to the team on lessons learned.

Divisional Manager

Divisional Managers are responsible for ensuring that the assigned staff have the necessary skills and that *deliverables* comply with all applicable standards, regulations and policies. They are involved in the project lifecycle. They ensure that deliverables meet the needs of customers. Project team members produce intermediate products for use by

other team members. Deliverables include reports, environmental documents, plans, specifications, estimates, permits, bid documents, as-built plans, etc. Divisional Managers:

A. Plan.
- Assign Project Manager.
- Participates in the development of the Project Initiation Document, project work plan and project tendering and award.

B. Execute.
- Direct project team members in the delivery of products within the timeframe agreed in the project management plan.
- Empower staff to do their jobs with the minimum supervision that is consistent with the individual's capability.
- Provide technical and procedural direction to staff performing the work.
- Approve staff and other project expenditures.

C. Control.
- Monitor and provide feedback to staff working on particular work packages.

D. Close.
- Ensure that deliverables have the required features.

Project Team
Project team members are responsible for delivering timely and cost-effective deliverables with the quality promised. They:

A. Plan.
- Provide input into the development of the project management plan.

B. Execute.
- Deliver deliverables within the timeframe agreed in the project management plan.
- Work together in a team environment.
- Monitor work packages and progress.

C. Control.
- Communicate sensitive issues and project progress to project manager.
- Control change to activities.

D. *Close*.
- Provide feedback to divisional managers on how work can be done more effectively and efficiently.

3.7 Overlapping Responsibilities

On many projects there may be overlapping responsibilities. It is critical to the success of the project that agreement is reached on who will assume what responsibilities prior to the initiation of the project or a particular project phase. This should be at the initiation phase, where the roles and responsibility matrix is developed.

CHAPTER 4 - PROJECT MANAGEMENT PROCESSES

4.1 Project Management Processes

Project Management Processes are concerned with describing and organizing the work of a project. They consist of five interconnected process groups; Initiate, Plan, Execute, Control and Close-out as illustrated in the following Figure.

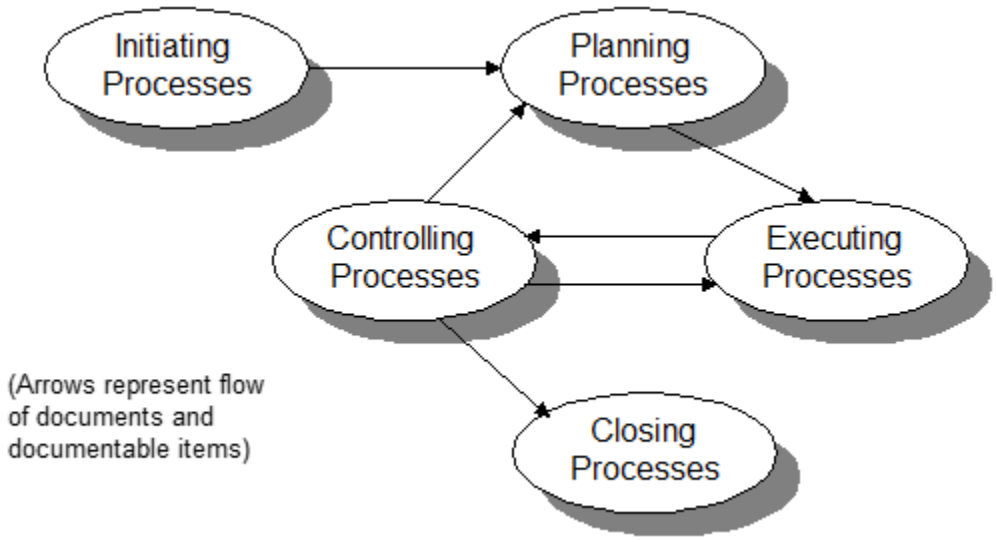

Figure 3- Project Management Processes

These process groups are defined as:

Initiating Processes - Recognizing that a project or phase should begin and commit to do so. The assignment of a project manager is an initiating process for both the start of a project and Project Initiation Document Phase of the project life cycle.

Planning Processes - Devising and maintaining a workable scheme to accomplish the business need that the project was undertaken to address. Workplan development and maintenance is a planning process that occurs in each phase of the project life cycle.

Executing Processes - Coordinating people and other resources to carry out the project plan. Reporting staff work hours by work breakdown activity is an executing process that occurs in each phase of the project life cycle.

Controlling Processes - Monitoring and measuring progress to ensure project objectives are being met and taking corrective actions when necessary. The Project Change Request process is a controlling process that can occur at various phases of the project life cycle.

Closing Processes - Formal conclusion of the project or phase, bringing it to an orderly end.

Project management processes are linked by the results they produce-the outcome of one usually becomes an input of another. These groups are not discrete, one-time events. They are overlapping activities that occur at varying levels of intensity throughout each phase of the project. Finally process group interactions also cross project life cycle phases such that the closing of one phase provides input to initiating the next phase

4.2 Project Management Process Components

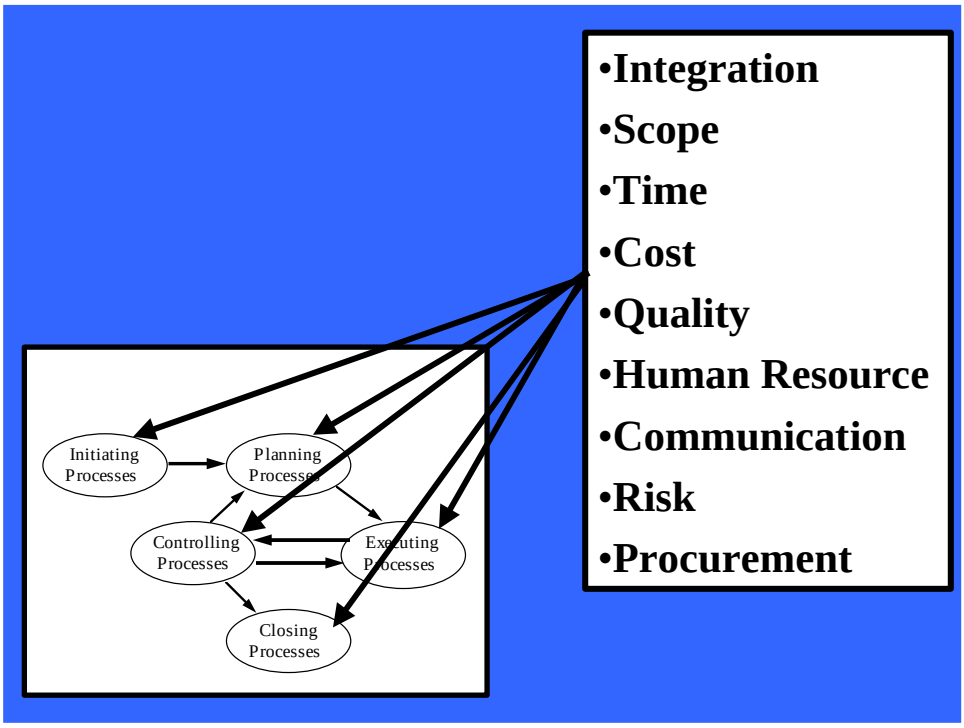

Figure 4- Project Management Process Components

Project management processes can be subdivided into one or more of the nine project management components. These components describe project management processes in terms of project management knowledge areas. Understanding and applying these knowledge areas to a project is crucial to successful project delivery. They include:

1. **Project Integration Management** - The application of the processes required to ensure that the various elements of the project are properly coordinated. To achieve this, we need:
   a. To track the history of project scope, cost, and schedule from inception to completion.
   b. Multi-year project workplans and work agreements to guide the execution and control of project work and resources.
   c. To form the project team early in the project life cycle. Individual members' level of involvement will vary as appropriate with the current phase of the work.
   d. To define how to share responsibilities among project team members to define and carry out project objectives.
   e. To balance scope, cost and schedule with a focus on customer needs (quality).
   f. To follow documented project management policies and procedures that define department-wide standards.

g. To provide flexibility in processes to recognize district or project specific uniqueness.

2. **Project Scope Management** - The application of the processes required to ensure that the project includes all the work required and only the work required to complete the project. To achieve this, we need to:

   a. Initiate projects that address our documented needs; this could be in support of the strategic/tactical plan, operational needs or Asset Management Plans.

   b. Involve stakeholders in defining and controlling project scope and throughout project life-cycle to verify scope (customer acceptance during close-out).

3. **Project Time Management** - The application of the processes required to ensure timely completion of the project. To achieve this, we need:
   a. To develop a detailed project schedule (at least to level 2 of work breakdown structure); the schedule should be reviewed by the internal project stakeholders and reflect all of the hard logics (restrictions).
   b. The ability to track progress and percentage of completion (project activities, percent of milestone complete).
   c. Methods to define typical activities, sequence, and durations.

4. **Project Cost Management** - The application of the processes required to ensure the project is completed within the approved budget. To achieve this, CVRD needs:
   a. Methods to establish typical support resource needs.
   b. The ability to establish project budgets (support and capital).
   c. To provide project managers with the ability to control support resources.
   d. The ability to estimate and track project-direct operating expenses.
   e. The ability to track planned versus actual expenditures (including consultant and non-labor costs).
   f. The ability to relate projects to their funding authorization and expenditure authorization.

5. **Project Quality Management** - The application of the processes required to ensure that the project will satisfy the needs for which it was undertaken. To achieve this, CVRD needs:
   a. Quality standards, established by the project team, as appropriate, for specific project characteristics.
   b. To obtain stakeholder input early in order to develop project strategy.
   c. Measurement systems to gauge customer satisfaction.
   d. To obtain customer acceptance (internal and external) at delivery (defined as “construction completion”).

   e. To focus on lessons learned for continuous project process and product delivery improvements.

6. **Project Human Resources** - The application of the processes required to make the most effective use of the people involved with the project. To achieve this, CVRD needs:
   a. Well-defined organization structure, roles, responsibilities, accountability, and authority.
   b. Provide regular (annual) training to establish project manager core competencies.
   c. To define project manager workloads.
   d. The ability of Divisional Managers to track assignment of resources (people) to tasks.
   e. To define processes and implement tools to balance functional workload.

f. Project managers should meet regularly to determine their needs and review improve templates and processes.

7. **Project Communications Management** - The application of the processes required to ensure timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information. To achieve this, CVRD needs:

   a. To develop communication plans to inform project stakeholders.
   b. Sufficient information to make decisions (i.e., project level costs and schedule, status, earned value, history of changes, etc.).
   c. To utilize new technology (Intranet/Internet, e-mail, etc.) to facilitate project communication.

8. **Project Risk Management** - The application of the processes concerned with identifying, analyzing and responding to project risk. To achieve this, CVRD needs:
   a. Proactive methods to identify potential project risks.
   b. Methods to develop response plan to identify risks.
   c. Methods to evaluate the uncertainties of project costs and schedule.

9. **Project Procurement Management** - The application of the processes required to acquire goods and services from outside the performing organization. To achieve this, CVRD needs:
   a. Methods for project managers and divisional managers to obtain flexible resources when CVRD resources are unavailable.
   b. Methods to effectively obtain construction contractors.
   c. Methods to effectively procure and clear required real estate.
   d. Methods to obtain other goods and services, including equipment and material.

CHAPTER 5 - TOOLS

5.1 Project Management Plan

A Project Management Plan is a group of files used to guide project execution and control throughout the lifecycle of a project. It addresses the problem and need (why?), goals and objectives (what?), schedule (when?) and roles (who?). The project management plan includes, but is not limited to:

- The project charter.
- The workplan (resourced schedule).
- The quality management plan.
- The communication management plan.
- The risk management plan.
- The procurement management plan.

The single point of contact for the Project Management Plan is the project manager. The purpose for this is to ensure that the documents exist and are current; not to create an additional set of files and plans.

5.2 Project Management Standards

Project Management requires effective and precise exchange of information between all project team members. To provide for consistency of this information, the following three standards are used together when developing and monitoring a workplan. For any task in the workplan there will be a Work Breakdown Structure (WBS) element with a Resource Breakdown Structure (RBS) element and an Organizational Breakdown Structure (OBS) element assigned.

Work Breakdown Structure (WBS)

The Work Breakdown Structure (WBS) is simply a formal and systematic way of defining and identifying the component parts of a project and the work to be done on them. It is a deliverable oriented hierarchy that organizes and defines the total scope of work. This structure defines the work activities to produce deliverables, not the staff or other resources who will complete the work.

Resource Breakdown Structure (RBS)

The Resource Breakdown Structure is a standardized list of personnel resources related by function and arranged in a hierarchical fashion. Each subsequent level of resources is a subset of the resource category above it. The RBS is used to assign resources to the scheduled WBS activities in the project schedule.

Organizational Breakdown Structure (OBS)

The final element of project management standards is the Organizational Breakdown Structure that is a hierarchical description of the organization. It is used to identify responsible units or persons within the organization based on the organization chart. It allows the breakout of personnel into successively lower levels in the organization such as divisions and units. The OBS allows resources to "roll up" (summarize) according to the organizational structure.

Summary

The three management standards are used together when developing a workplan. For any task in the workplan you will have a WBS, RBS and OBS assigned:

- The WBS provides the standard description of the work to be performed and the expected deliverables.
- The RBS identifies the type (functional expertise) of resource assigned to perform the work.
- The OBS identifies organizationally who will be performing the work.

The same holds true for the expenditure history of the project. Review of expenditure records will provide information on what type of resources, how much of each (hours) was used and which organizational unit was involved in accomplishing each activity. This information then can be used to plan future projects.

5.3 Project Scheduling Tools

CVRD does not have a standard project scheduling tool to assist in project schedule development and maintenance. The commonly used tool is the Excel Spreadsheet; it provides limited flexibility in scheduling and reporting the project activities. The recommended software package is MS Project; it has been used by some divisions. CVRD needs to make it as a standard tool.

Information System

Information systems will contain required information for monitoring and managing the project elements such as:

- Project management control – this contains cost, scope, and schedule data
- Project accounting and management – this includes expenditure information, and
- Project status report – this includes project progress data.

At present the Information Technology (IT) division is working on the filing structure; in a near future the proposed structure will be provided to each division for implementation.

5.4 Communications

Frequent, understandable and concise communications are essential to successful progress toward completion of the project. A communications management plan for each project should be developed detailing:

- who will receive information (status reports, data, schedule, technical documentation, etc.),
- what methods (meetings, written reports, etc.,) will be used to distribute various types of information,
- a description of the information to be distributed (format, content, level of detail),
- a schedule for production and distribution,
- how the information will be updated, and
- how it can be accessed between scheduled communications.

The most common forms of communications include meetings, telephone and conference calls, formal letters and memos. Other forms of electronic communication include:

Electronic mail or E-Mail is a very fast, inexpensive and efficient way of distributing information and communicating. Electronic mail capabilities are available in all CVRD departments.

Video conferences should be considered when a large number of widely dispersed persons need to interact or visual displays are needed. Video conferencing equipment is available in almost all CVRD departments.

The Internet and Intranet can also be used to send electronic mail to organizations outside the Department and to access a wealth of information

In all cases, any significant communication should be documented and preserved in the project files.