Project Management Institute

The Standard for Portfolio Management

The Standard for Portfolio Management
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Contents

List of Figures

Chapters 1–3

Appendices

Foreword

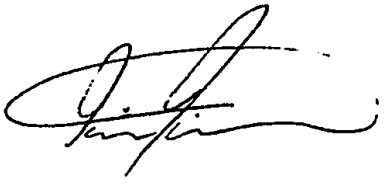
On behalf of the Project Management Institute (PMI®) Board of Directors, I am pleased to present PMI's *Standard for Portfolio Management*.

Project management is one of those terms with multiple meanings. For a long time it was associated only with projects, but some twenty years ago that began to change, and today it is understood to include portfolio management and program management as well.

Today the *PMBOK® Guide* continues to be the *de facto* global standard for the project management of single projects, as well as an American National Standard. This new standard is an important step in PMI's continuing commitment to define the body of knowledge supporting the project management profession, and to develop standards for its application. The *Standard for Portfolio Management* describes a documented set of processes that represent generally recognized good practices in portfolio management. Further, it details the linkage between consistent, predictable and successful project outcomes, which accomplish or further an organization's strategic goals.

I would like to sincerely thank the globally diverse project team that worked so diligently to bring this standard to fruition. The team, which consisted of a group of 416 PMI volunteers representing 36 countries, was led by project manager David W. Ross, PMP, and assisted by deputy project manager Paul E. Shaltry, PMP. Dedicated and competent volunteers continue to be the backbone of PMI's success, and this publication is yet another example.

I trust that each of you will find this latest addition to the PMI library of standards beneficial to yourself as well as to your organization.



Iain Fraser, Fellow PMINZ, PMP
2006 Chair – PMI Board of Directors

Preface

The Standard for Portfolio Management addresses the need for a documented set of processes that represent generally recognized good practices in the discipline of portfolio management. The target audience for this standard includes: senior executives, management staff in charge of organizational strategy, portfolio managers, members of a strategic and/or portfolio management office, managers of program managers and project managers, customers and other stakeholders, functional managers and process owners with resources in a portfolio, educators, consultants, trainers and researchers. It will also be of use to program managers, project managers and other project team members, and members of a project or program management offices. The standard is a companion for *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* – Third Edition and builds on work postulated in the *Organizational Project Management Maturity Model (OPM3®),* and provides a foundational reference for anyone interested in portfolio management of projects and programs. While project and program management have traditionally focused on ''doing work right,'' portfolio management is concerned with ''doing the right work.''

Topics in this standard include:

- Streamlining operations through portfolio management;
- How portfolio management can improve the implementation and maintenance of corporate governance initiatives;
- Portfolio management's role within organizational structure and its relationship to the organization's strategy;
- Designing and implementing metrics to demonstrate and improve return on investment; and
- Portfolio management reporting and how it can help make the most of an organization's programs and projects.

The Standard for Portfolio Management is organized as follows:

Chapter 1 – Introduction to Portfolio Management: Defines key terms associated with portfolio management and provides an overview of the rest of *The Standard for Portfolio Management*.

Chapter 2 – Portfolio Management Process and Organization: The key components of the portfolio management context.

Chapter 3 – Portfolio Management Processes: Identifies those Portfolio Management Processes that have been recognized as generally accepted practices for most project portfolios most of the time.

Appendices A – D—Provides background information on the PMI Standards Program and *The Standard for Portfolio Management* project.

Glossary – Provides clarification of key terms used in developing *The Standard for Portfolio Management*.

Index – Gives alphabetical listings and page numbers of key topics covered in *The Standard for Portfolio Management*.

Section I

The Portfolio Management Framework

Chapter 1

Introduction to Portfolio Management

The Standard for Portfolio Management addresses a gap in the management-by-projects field across all types of organizations (i.e., profit, nonprofit, and government)—that is, the need for a documented set of processes that represent generally recognized good practices in the discipline of portfolio management. While project management and program management have traditionally focused on ''doing work right,'' portfolio management is concerned with ''doing the right work.''

The term ''portfolio'' has been in use for some time and is used throughout many diverse organizations; therefore, the term has come to represent different meanings. It is recognized that there are many types and varieties of portfolios; for example, in the financial industry, a portfolio is a collection of investment instruments (stocks, bonds, mutual funds, commodities, etc.). This standard does not attempt to address those types of portfolios; further, there is no attempt to bridge this standard to those other kinds of portfolios. For the purpose of this standard, the focus is on ''project portfolio'' management. It will be referred to simply as ''portfolio'' management.

This chapter defines key terms associated with portfolio management and provides an overview of the rest of *The Standard for Portfolio Management* in the following sections:

1.1 Purpose of *The Standard for Portfolio Management*
1.2 What is a Portfolio?
1.3 What is Portfolio Management?
1.4 The Link with Organizational Strategy
1.5 The Link between Portfolio Management and Organizational Governance
1.6 The Link between Portfolio Management and Operations Management
1.7 The Links between Portfolio Management and Program and Project Management
1.8 Role of the Portfolio Manager
1.9 Portfolio Management Metrics
1.10 Portfolio Management Reporting

1.1 Purpose of *The Standard for Portfolio Management*

The primary purpose of *The Standard for Portfolio Management* is to describe generally accepted processes associated with portfolio management. This standard is an expansion of information provided in *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*)—Third Edition and the *Organizational Project Management Maturity Model* (*OPM3®*). This standard focuses on portfolio management as it relates to the disciplines of project and program management. Its application is intended for all types of organizations (i.e., profit, nonprofit, and government). When the term ''organization'' is used here, it applies generally to these three types of organizations. If any portion of this standard typically applies to a subset of these three types of organizations, the subset is identified.

1.1.1 Audience for *The Standard for Portfolio Management*

This standard provides a foundational reference for anyone interested in portfolio management of projects and programs. This includes, but is not limited to:

- Senior executives
- Management staff in charge of organization strategy
- Portfolio managers
- Members of a strategic and/or portfolio management office
- Managers of project and program managers
- Program managers
- Project managers and other project team members
- Members of a project or program management office
- Customers and other stakeholders
- Functional managers and process owners with resources in a portfolio
- Educators teaching the management of portfolios and related subjects
- Consultants and other specialists in project, program, and portfolio management and related fields
- Trainers developing portfolio management educational programs
- Researchers analyzing portfolio management.

1.2 What Is a Portfolio?

Defined, a portfolio is a collection of projects (temporary endeavors undertaken to create a unique product, service, or result) and/or programs (a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually) and other work that are grouped together to facilitate the effective management of that work to meet strategic business objectives. The components of a portfolio are quantifiable; that is, they can be measured, ranked, and prioritized.

The projects or programs (hereinafter referred to as ''components'') may not necessarily be interdependent or directly related. At any given moment, the portfolio represents a view of its selected components that both reflect and affect the strategic goals of the organization—that is, the portfolio represents the organization's set of active programs, projects, subportfolios, and other work at a specific point in time.

It is important to understand the relationship of a portfolio and the components of the portfolio. Figure 1-1 illustrates this relationship.

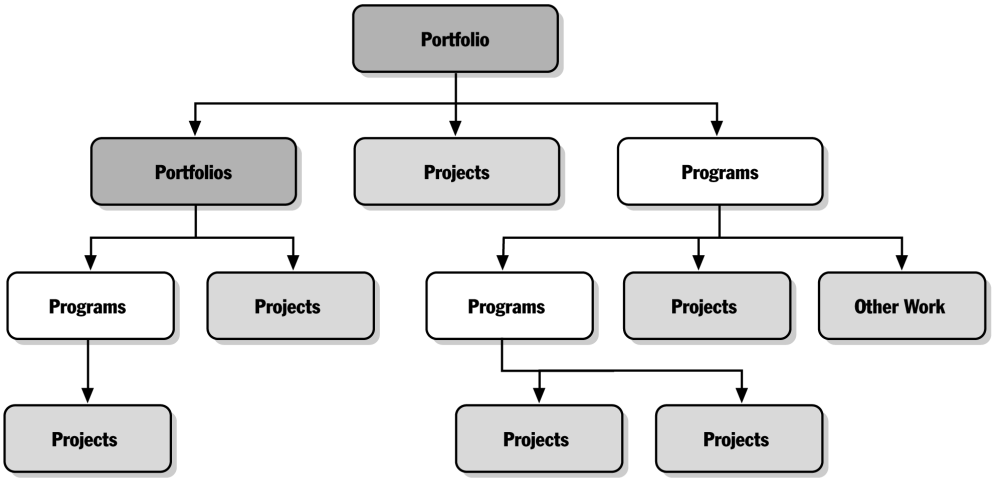


Figure 1-1. Portfolio Relationships—Example

A portfolio reflects investments made or planned by an organization, which are aligned with the organization's strategic goals and objectives. It is where priorities are identified, investment decisions are made, and resources are allocated. If a portfolio's components are not aligned to its organizational strategy, the organization can reasonably question why the work is being undertaken.

All components of a portfolio exhibit certain common features:

- They represent investments made or planned by the organization
- They are aligned with the organization's strategic goals and objectives
- They typically have some distinguishing features that permit the organization to group them for more effective management
- The components of a portfolio are quantifiable; that is, they can be measured, ranked and prioritized.

Conversely, the components of a portfolio are differentiated as identified in Table 1-1:

1.3 What Is Portfolio Management?

Portfolio management is the centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives. There are many types and varieties of portfolio management. This standard does not attempt to address all types of portfolio management; instead, it focuses on ''project portfolio management.'' Since project portfolio management is the focus of this standard, it is denoted throughout this document as simply ''portfolio management.''

Portfolio management is an approach to achieving strategic goals by selecting, prioritizing, assessing, and managing projects, programs and other related work based upon their alignment and contribution to the organization's strategies and objectives. Portfolio management combines (a) the organization's focus of ensuring that projects selected for investment meet the portfolio strategy with (b) the project management focus of delivering projects effectively and within their planned contribution to the portfolio.

PROJECT	PROGRAMS	PORTFOLIOS
Projects have a narrow scope with specific deliverables.	Programs have a wide scope that may have to change to meet the benefit expectations of the organization.	Portfolios have a business scope that changes with the strategic goals of the organization.
The project manager tries to keep change to a minimum.	Program managers have to expect change and even embrace it.	Portfolio managers continually monitor changes in the broad environment.
Success is measured by budget, on time, and products delivered to specification.	Success is measured in terms of Return On Investment (ROI), new capabilities, and benefit delivery.	Success is measured in terms of aggregate performance of portfolio components.
Leadership style focuses on task delivery and directive in order to meet the success criteria.	Leadership style focuses on managing relationships, and conflict resolution. Program manager's need to facilitate and manage the political aspects of the stakeholder management.	Leadership style focuses on adding value to portfolio decision-making.
Project managers manage technicians, specialists, etc.	Program managers manage project managers.	Portfolio managers may manage or coordinate portfolio management staff.
Project managers are team players who motivate using their knowledge and skills.	Program managers are leaders providing vision and leadership.	Portfolio managers are leaders providing insight and synthesis.
Project managers conduct detailed planning to manage the delivery of products of the project.	Program managers create high-level plans providing guidance to projects where detailed plans are created.	Portfolio managers create and maintain necessary process and communication relative to the aggregate portfolio.
Project managers monitor and controls tasks and the work of producing the projects products.	Program managers monitor projects and ongoing work through governance structures.	Portfolio managers monitor aggregate performance and value indicators.

Table 1-1. Comparative Overview of Project, Program, and Portfolio Management

1.4 The Link With Organizational Strategy

Figure 1-2 shows the general relationships among the strategic and tactical processes in the organization. From the vision and mission, the organizational strategy and objectives are developed. Execution of the strategy requires the application of strategic management processes, systems, and tools to define and develop:

- High-level operations planning and management
- Portfolio planning and management.

This leads to tactical implementation of operational and project-related activities.

The top of the triangle (''Vision,'' ''Mission,'' and ''Organizational Strategy and Objectives'') illustrates the components used to set the targets or goals. These components direct all further organizational actions. Please note the arrows in Figure 1-2 provide the general context of influencing relationships among the elements.

The middle of the triangle (''High-level Operations Planning and Management'' and ''Project Portfolio Planning and Management'') represents the processes that establish appropriate actions required to meet the goals. These processes interact with the bottom of the triangle, in which the contribution of all operational activities must be compared to ongoing value creation, and the contribution of all project activities must be compared to the creation of new value.

''Management of On-going Operations'' and ''Management of Authorized Programs and Projects,'' which appear at the bottom of the triangle, correspond to those components that ensure the organization's operations and portfolios are executed effectively and efficiently.

Both the operational and project aspects of an organization must be considered in portfolio management. The operational side of the organization uses recurrent activities and operations management processes that facilitate effective high level planning

Figure 1-2. An Organizational Context of Portfolio Management

and management. The project side of the organization uses program/project management processes that enable efficient project planning and implementation activities. At the tactical management level, the question is: ''Is this operation or project managed efficiently with optimal results, from an optimum use of resources, with optimum effort, and complying with organizational values and standards?''

Organizations rely on projects and programs in order to achieve their strategic intent. The application of portfolio management allows this interconnection by the sharing of goals and the allocation of resources. The flow of control is as follows:

1. Strategic intent and prioritization provide direction for determining the financial resources that should be allocated to the portfolio.
2. The strategic intent is mapped onto a set of portfolio components (i.e., projects and programs), including their resource allocations. These components are managed according to the portfolio management principles outlined in this standard.
3. Each program corresponds to the delegated subset of the overall strategic intent, which it will deliver by means of the allocated resources.
4. Each project is defined by its contribution to the portfolio's strategic intent, and can then be managed according to the principles in the *PMBOK® Guide* and other principles as appropriate.

1.5 The Link Between Portfolio Management and Organizational Governance

Portfolio management is one of several governance methods used within organizations. Governance is the act of creating and using a framework to align, organize, and execute activities in a collectively coherent and intelligible manner in order to meet goals. Organizational governance establishes the limits of power, rules of conduct, and protocols of work that organizations can use effectively to advance strategic goals and objectives and to realize anticipated benefits.

Organizational governance occurs at different decision-making levels of the organization in support of specific goals and objectives. These goals and objectives are defined through the organization's strategic planning process. This process defines the means of attaining the goals through either operations (ongoing organizational activities) or temporary endeavors (projects), and also defines how they are governed. Whether managing operations or managing projects, all governance levels are linked together to ensure that each organizational action is ultimately aligned with organizational strategy. Figure 1-3 illustrates this relationship:

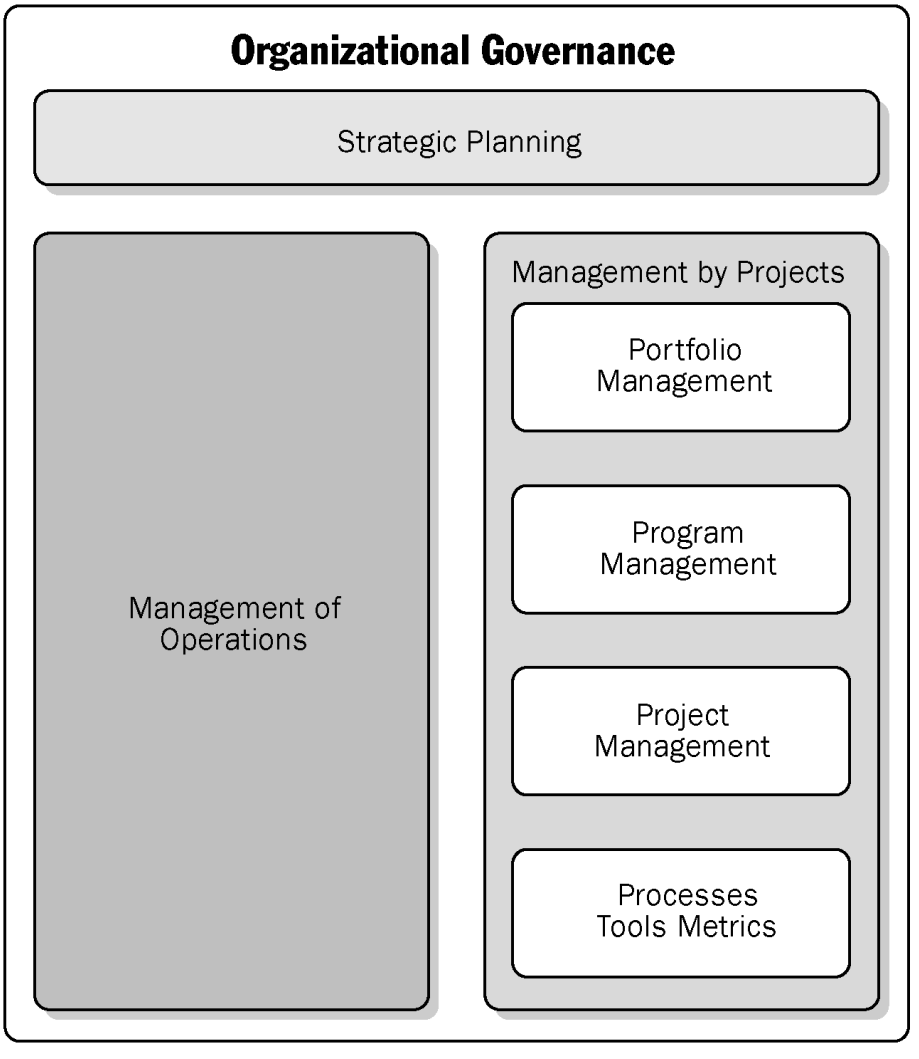


Figure 1-3. Governance Context

Organizational governance involves controls—such as phase gates, meetings, metrics to monitor progress, etc.—and includes the domains of portfolio, program, and project management. The portfolio management domain of governance is the subject of this standard, and its processes are explained in Chapter 3, Portfolio Management Processes.

There are many corresponding roles and responsibilities among governance entities concerning portfolio management. The areas of executive management, portfolio management, program management, project management, and operations management all play critical, interrelated roles. Such relationships are shown in Figure 1-4. In smaller organizations, the roles of the executive management and portfolio management may be within the same area of responsibilities.

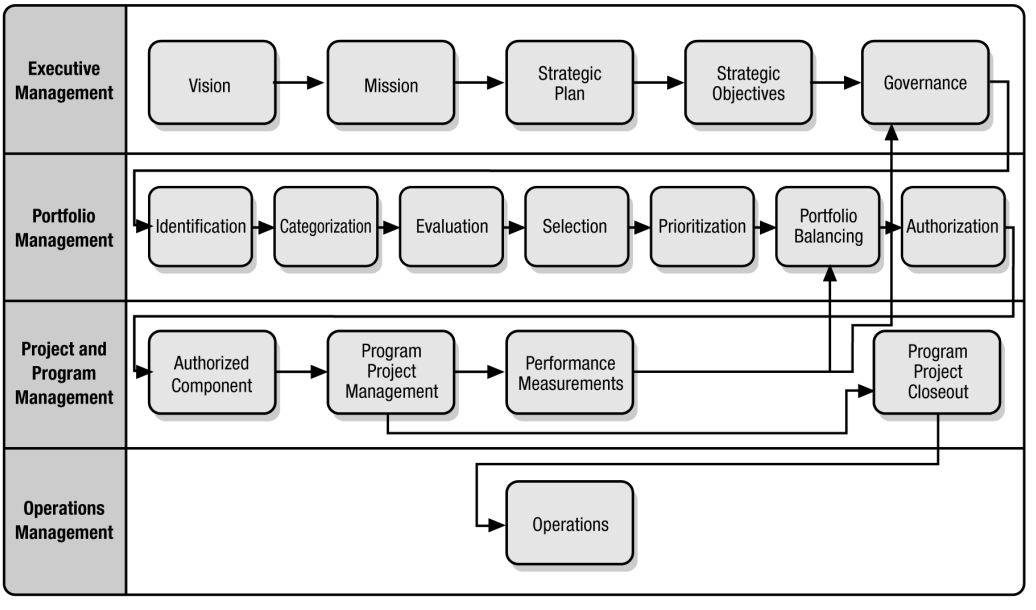


Figure 1-4. Cross-Company Portfolio Management Process Relationships

Figure 1-4 does not show all activities of the four levels, only the relationships to the different organizational activities.

1.6 The Link Between Portfolio Management and Operations Management

Portfolio management interacts with and impacts a number of organizational functions. Functional groups can be stakeholders in the portfolio and can also serve as sponsors of various components. Moreover, an operational budget may be influenced by portfolio management decisions, including allocation of resources to support portfolio components.

''Operations'' is a term used to describe day-to-day organizational activities. This involves processes that are not necessarily project-specific. However, processes used by operational management are often outcomes of the execution of portfolio components. Component outputs or deliverables often result in ongoing work that is required for the organization to realize the portfolio's planned benefits. Unless this work is managed effectively, the expected value in undertaking a particular component will not be

achieved. The portfolio management process must take into account operational issues, processes, and results throughout its management cycle.

The following examples illustrate the relationship of operations management to portfolio management:

1.6.1 Finance

Effective management of the portfolio requires tangible, timely, and accurate financial information. Financial goals and objectives are considered in the management of a portfolio; therefore, a finance function will monitor portfolio budgets, compare project spending with the allocated budget, and examine benefits realized, ensuring that financial plan adjustments are made and projected savings are taken into account.

1.6.2 Marketing

Market analysis, benchmarking, and research play a significant role in the portfolio management process. An organization's portfolio components are driven by such considerations as market opportunity, platform development, support functions, regulatory obligations, or operational requirements. Input from the marketing function is required for some of the strategic decisions that dictate criteria to be used in selecting and managing components. For a nonprofit organization, a similar analysis of value-for-money or value to organizational vision will be needed for component selection and management.

1.6.3 Corporate Communications

Since portfolio management provides key capabilities for achievement of an organization's strategy, there may be a major focus at the executive level both to assemble and to communicate detailed information on the progress of major objectives and impacts of the components, as well as any changes to previously communicated plans. Ongoing and well-targeted communication is a key requirement for maintaining stakeholder confidence in and support for the objectives to be achieved and the approaches being implemented. In addition, in order to ensure coordination and effective teamwork, communication among the teams responsible for the various components need to planned, formalized, and managed in concert with best practices (for example, as defined in the corresponding *PMBOK® Guide* knowledge areas).

Various portfolio events or milestones need to be communicated both inside and outside the organization. This could include achievement of a major objective, elimination of a component, and other matters requiring corporate communications.

1.6.4 Human Resource Management

By looking at the portfolio of components, enterprise resource planning can identify the skills and qualifications needed for success. Skilled resources will then become available ''in the pool'' for placement into programs or projects or for related work. The function responsible for human resource management also needs to address organizational and resource impacts of major changes resulting from portfolio components.

1.7 The Links Between Portfolio Management and Program and Project Management

Program and project management each measure actual-to-planned schedule, effort, and budget for individual components to anticipate potential problems and to ensure corrective action is occurring, and reports this analysis to portfolio management. This information is used in portfolio reviews to determine required actions. Program and project management may work together with portfolio management to determine ''go/no go'' criteria for proposed and current components, including ''termination criteria'' (phase gates). Program and project management may work together with portfolio management in capacity planning by inputting resource requirements (e.g., human resources, financial, and physical assets).

Portfolios rely on projects (either standalone or within programs) in order to achieve their strategic intent. For this reason, they are all interconnected by the sharing and allocation of goals and resources.

Regularly scheduled reviews and planned, continuous communication among project management, program management, or portfolio management ensures that the appropriate resources are allocated to their assigned, authorized portfolio components.

1.8 Role of the Portfolio Manager

The portfolio manager, typically a senior manager or senior management team, is responsible for monitoring and managing assigned portfolios in the following ways:

- Playing a key role in project prioritization, making sure there is a balance of components, and that the components align with strategic goals
- Providing key stakeholders with timely assessment of portfolio and component performance, as well as early identification of (and intervention into) portfolio-level issues and risks that are impacting performance
- Measuring the value to the organization through investment instruments, such as return on investment (ROI), net present value (NPV), payback period (PP), meeting Congressional or legislative mandates, achieving the educational needs of current or future students, etc.
- Ensuring timely and consistent communication to the stakeholders on progress, impacts, and changes associated with the management of the portfolio, in order to maintain stakeholder understanding and support of the objectives and approach
- Participating in program and project reviews to reflect senior level support, leadership, and involvement in important matters.

In order to succeed in this role, the portfolio manager should apply expertise in all of the following areas (with the support of a program/project management office, as needed):

1.8.1 Benefits Realization

Both fiscal and non-fiscal benefits to the organization must be understood. Decisions are made throughout the portfolio management organizational process to optimize the overall contribution of the components to the organization. To optimize benefits realization, a portfolio manager must have a good understanding of the organization's vision, mission, and strategy to aid in optimization of the portfolio. A portfolio manager must understand how to relate the strategic goals, objectives, and priorities with the portfolio component plans to achieve the organization's goals.

1.8.2 Program and Project Management Methods and Techniques

The portfolio manager must have an understanding of project and program management. Furthermore, a portfolio manager must be able to understand not only high-level project management reporting to determine the health of a project, but also its details to determine whether management approaches are lacking or failing.

1.8.3 Process Development and Continuous Improvement

The portfolio manager must understand process development and continuous improvement to develop the most suitable portfolio management process. The portfolio manager, together with other organizational leaders, will have the ability to develop a sound, structured, and well thought-out portfolio management process that best suits the organization and coordinates well with other processes.

1.8.4 General Management Skills

An effective portfolio manager has good leadership and management skills (e.g., communication skills, team building skills, etc.) and is able to interact with senior management. Furthermore, the portfolio manager should have knowledge of relevant markets, customer base, standards, and the regulatory environment. A portfolio manager should also have analytical skills to monitor the portfolio based on portfolio performance reports and metrics.

1.9 Portfolio Management Metrics

The metrics of portfolio management typically include aggregate measures of strategic goal achievement, financial contribution, asset maintenance and development, end-user satisfaction, stakeholder satisfaction, risk profile, and resource capability. Metrics describe the availability and type of resources needed to support the portfolio components as planned and during execution. Metrics describe progress toward established targets, such as financial and milestone achievements and fulfillment of deliverables. Financial measures, for example, may include aggregate return on investment (ROI), net present value (NPV), and distribution of financial support as part of the strategic goals. Milestone measures could include such indicators as budget vs. actual costs, customer satisfaction scores, product release performance, or other organization-specific measure. Metrics describe the value and benefit realization of the portfolio as a whole, as interpreted by the organization. As appropriate, metrics may be made available for individual programs or projects of special interest from a portfolio management perspective.

1.10 Portfolio Management Reporting

Reporting in the portfolio management context refers to several possible forms of measurement pertaining to portfolio content and performance. Such reporting is tightly linked with other types of reporting within the organization that will influence decisions regarding priority, balancing, direction, etc., of the portfolio. Portfolio reporting ensures that there is effective communication between the project managers, portfolio manager, portfolio sponsor, and portfolio stakeholders. The following are common forms of portfolio reporting:

1.10.1 Program/Project Reporting

Many organizations place the responsibility for reporting the effectiveness of a program or project within a program or project management office (PMO). Among other things, the PMO can provide summaries, as well as details of the total investment made in a component, to serve as an input for measuring the component's value. Regardless of the reporting mechanism, component values can be measured in several ways, such as:

- **Enterprise Strategic Goal Achievement**—Reporting the extent to which components will or have contributed to organization strategic goals
- **Enterprise Asset Maintenance and Development**—Reporting the extent to which components will or have contributed to the maintenance and development of particular organization assets
- **Enterprise Risk Profile**—Reporting component risk for the organization
- **Enterprise Resource Capability**—Reporting planned and actual resource usage by components for the organization.

Other forms of measurement may be needed as well, and can be specific to the organization or the portfolio. For example, reporting on key issues such as safety, environmental compliance, staffing issues, etc., may also be necessary.

1.10.2 Financial Reporting

Financial data and perceived value are important criteria used in selecting components that will be included in the portfolio. They may be key indicators that determine the balance and content of the portfolio.

Chapter 2

Portfolio Management Process and Organization

Portfolio management is a process that helps and engages executive management in meeting organizational needs and expectations. Portfolio management enhances transparent and efficient decision-making concerning projects, either directly or under programs. Portfolio management is carried out in an environment broader than the portfolio itself, through its roles and processes that relate across the organization. This chapter describes the key components of the portfolio management context in the following sections:

2.1 Portfolio Management Process Overview
2.2 Portfolio Stakeholder Roles and Responsibilities
2.3 Organizational Influences

2.1 Portfolio Management Process Overview

2.1.1 Links with Strategy

Portfolio management includes processes to collect, identify, categorize, evaluate, select, prioritize, balance, authorize, and review components within the portfolio to evaluate how well they are performing in relation to the key indicators and the strategic plan. During a typical business cycle, components will be reviewed and validated in relation to the following:

- Alignment of the components with corporate strategy
- Viability of the components as part of the portfolio, based on key indicators
- Value and relationship to other portfolio components
- Available resources and portfolio priorities
- Additions and deletions of portfolio components.

The organization's overall strategy is determined at the executive level and drives the definitions of the strategic goals and objectives. These goals are passed to the portfolio management function to ensure that components are aligned to achieve the organization's goals. Based on this, portfolio management will select, prioritize, and approve proposed portfolio components. Portfolio management must also review the

portfolio for balance (short-term versus long-term return, risk to benefit) and negotiate agreement(s) with relevant strategic stakeholders (e.g., executive management, operations and/or program management).

Once a portfolio component is authorized, it becomes the responsibility of the program/project management to take control of the component and apply the correct management processes to ensure that the work is done effectively and efficiently. The responsible project/program managers will monitor planned-to-actual performance (relating to time, budget, resources, quality, and scope) and will communicate consolidated information to the portfolio management. Portfolio management should establish criteria for determining governance actions, such as deciding when projects/programs should be terminated or suspended prior to originally planned completion dates.

Portfolio management also requires updates from the strategic planning process regarding strategic changes, to ensure that components no longer related to the current goals are discontinued. For example, if strategic planning determines that a goal is no longer valid for the organization, portfolio management should review the portfolio and report on any components that are in place to achieve a now obsolete goal.

In addition, portfolio management must report portfolio performance as it relates to achieving the organization's planned strategy.

2.1.2 Portfolio Management Process Cycle

Portfolio management is a continuous business process with certain activities invoked during a given year when deemed appropriate by the organization. Selection and authorization of components, for example, can be part of annual planning, or strategic refreshing, with quarterly or semi-annual updates. Performance monitoring of the portfolio is usually continuous. Revising the portfolio mix may be required when disruptions to the organization occur. Once established, the portfolio management process does not end—except when the organization chooses to abandon the portfolio management approach, or the organization ceases to exist.

2.2 Portfolio Stakeholder Roles and Responsibilities

Portfolio stakeholders are individuals and organizations that are actively involved with the portfolio, or those whose interests may be positively or negatively affected because of portfolio management. They may also exert influence over the portfolio, its components, processes, and decisions. The levels of involvement by stakeholders may vary from organization to organization or from portfolio to portfolio within an organization.

The roles and responsibilities of stakeholders are described in the following sections.

2.2.1 Executive Managers

Executive managers convey the strategic goals to portfolio management. Portfolio management must be able to report to executive management on the achievement of the goals through the performance of the portfolio. In smaller organizations, executive management may assume all or some of the portfolio management responsibilities, including making review board decisions.

2.2.2 Portfolio Review Board

A Portfolio Review Board, when used, dictates the framework, rules, and procedures for making portfolio decisions. The board is comprised of those individuals with the requisite knowledge and experience to discern the degree of alignment of strategy and organizational goals with portfolio components. The board is granted the authority to evaluate the portfolio performance and to make important decisions when needed or requested.

2.2.3 Portfolio Managers

Portfolio managers or portfolio management teams, are responsible for the portfolio management process. The portfolio manager will receive component performance information and convey to the Portfolio Review Board how the components as a whole are aligned with the strategic goals.

2.2.4 Sponsors

Sponsors champion the funding approval of their components (projects, programs, portfolios, and other work). To ensure approval, a sponsor must aid in supplying a viable business case to the Portfolio Review Board or other oversight team. Once the component is approved, the sponsor must help ensure that it performs according to plan and achieves its strategic goals.

2.2.5 Program Managers

Program managers work closely with the sponsors to gain funding approval for their programs. To ensure this, a program manager must aid in supplying a good business case to the portfolio management process. The program manager must help ensure that the components in his or her program perform according to plan and achieve the strategic goals associated with the program.

2.2.6 Project Managers

Project managers are responsible for the effective planning, execution, tracking, and delivery of the projects that are assigned to them, in line with the corresponding objectives and specifications. Project managers provide project performance indicators, directly or indirectly, to the Portfolio Review Board. This information will be used with other criteria to determine which projects will be continued.

The project manager may also supply a recovery plan for projects in jeopardy. The project manager will be responsible for the budget and schedule of his/her projects. Additionally, the project manager's peer group of other project managers is a stakeholder group in the portfolio management process. Both the project manager and portfolio management will benefit from formal or informal networks of project managers in the organization. These networks can help to facilitate a balanced distribution of scarce resources through improved communication and sharing of best practices.

2.2.7 Program/Project Management Office

The program or project management office (PMO) coordinates management of those components under its domain. The responsibilities of a PMO can range from helping with strategic direction, providing project management support functions and day-

to-day operations of the portfolio system to actually being responsible for the resourcing and direct management of a component or category of components.

2.2.8 Project Team

Project teams are responsible for completing the component deliverables as planned. A project team will focus on its particular project to ensure the project continues to successful completion.

2.2.9 Operations Management

Operations management is responsible for the ongoing business operations.

2.2.10 Functional Managers

Functional managers ensure that the proper resources are allocated to the portfolio components, and that those resources are performing in accordance with plans.

Functional managers are also responsible for ensuring that the skills and capabilities of their staff are kept current and aligned to the long term as well as the immediate needs of the organization. Functional managers may provide technical backup and coaching as appropriate to their staff.

2.2.11 Finance Managers

Finance managers perform financial analysis on components, review portfolio budget performance and make recommendations to the appropriate oversight entity. They also provide management information needed by program and project managers to assess variances and develop status reports.

2.2.12 Customers

Customers, both internal and external, benefit from successful implementation and delivery of portfolio components. Customer satisfaction may be one of the strategic objectives that determine the mix and priority of the components within the portfolio.

2.2.13 Vendors/Business Partners

Business partners and vendors are also key stakeholders in managing the project portfolio. Most of the time, organizations involve their business partners and/or vendors in executing various programs/projects. Hence it is very important to involve them, to the extent needed, in the overall Portfolio Management Process.

2.3 Organizational Influences

Successful portfolio management means that all management levels must effectively support the effort and communicate clearly and consistently the value of portfolio management to the organization.

When making allocation decisions, organizations are driven by a variety of constraints and dynamics brought to bear by the stakeholders. Balancing stakeholders' interests, both short-term and long term, while staying aligned with strategic goals,

is the essence of portfolio management. Decisions need to be made in the best interest of the overall portfolio performance regardless of the impact to individual components.

The forces influencing portfolio management are identified in the following sections.

2.3.1 Organizational Culture

The organization as a whole must understand the business need for portfolio management and commit the people, processes, and tools to make it successful.

Lack of organizational support for the concept and approach of portfolio management will be a major obstacle to portfolio management success—success that will be directly affected by the level of maturity in the organization.

Another important element is the organization's ability to accept and implement the changes implied by the portfolio. A major obstacle to achieving the full level of improvement expected from the portfolio could be not recognizing and formalizing the organization's ability to handle change. Each component of the portfolio should consistently apply similar techniques to facilitate and handle organizational change.

2.3.2 Economic Impact

Financial conditions may place a premium on or an increased opportunity for portfolio management to assist in decision-making with regard to failing projects or succeeding projects, negative or positive cash flow, time to market, and resource balancing, in order to ensure that a higher percentage of projects will be successful.

2.3.3 Organizational Impacts

Effective portfolio management can have positive impacts across the organization by facilitating local planning in alignment with strategic goals. Lack of efficient and effective processes and procedures in other functional areas of the organization can have a considerable impact on portfolio management. The portfolio manager will have to factor this into the corresponding plans and decisions.

Section II

The Standard for Portfolio Management

Chapter 3

Portfolio Management Processes

Portfolio management is accomplished through processes, using relevant knowledge, skills, tools, and techniques that receive inputs and generate outputs.

In order to be successful, the portfolio management team must:

- Understand the organization's strategic plan.
- Establish determining factors for managing the portfolio based on the strategic plan. These determining factors will support the beginning of the portfolio process.
- Consider all of the organization's projects, programs, and other portfolio components.
- Follow agreed-upon processes.

This standard documents the processes needed to make decisions about components, and identifies those portfolio management processes that have been recognized as generally accepted practices for most project portfolios most of the time. These processes apply globally and across industry groups. Generally accepted practice means there is general agreement that the application of these portfolio management processes enhances the probability of success over time.

This does not mean that the processes described should always be applied uniformly for all portfolios. The portfolio management team is always responsible for determining what process is appropriate—and the appropriate degree of rigor for each process—for any given portfolio.

Portfolio managers and their teams are advised to consider addressing each process and its constituent inputs and outputs. Portfolio managers and their teams should use this chapter as a high-level guide for those processes that they must consider in managing a portfolio.

Portfolio management is a business process that requires each of the portfolio processes to be interrelated in a continuous sequence to facilitate final decision-making and portfolio balancing.

This standard presents and describes the required elements for portfolio management. However, it does not intend to explain how to implement and utilize portfolio management in an organization where none exists. This standard presumes that the organization has a strategic plan, along with customary mission and vision statements, as well as strategic goals and objectives. When reading this standard, the reader must assume that in order to implement the portfolio processes presented here, the following conditions exist:

- The organization—including management—embraces the theory of portfolio management
- A number of projects and programs exist
- Appropriately skilled staff are available to manage the portfolio
- Project management processes exist
- The organizational roles and responsibilities are defined
- A communication plan has been developed to communicate business decisions throughout the organization.

3.1 Portfolio Management Process Groups

This standard describes portfolio management processes in terms of integration, interactions between them, and the purposes they serve. These processes aggregate into two groups, known as the Portfolio Management Process Groups:

- **Aligning Process Group**—This group determines how components will be categorized, evaluated and selected for inclusion, and managed in the portfolio.
- **Monitoring and Controlling Process Group**—This group reviews performance indicators periodically for alignment with strategic objectives.

These groups have clear dependencies and are performed in the management of each portfolio. They are independent of application area or industry focus. Group and individual constituent processes are often iterated during the portfolio management process. Constituent processes also can interact, both within their particular Process Group and with the other Portfolio Management Process Group. Remember that the portfolio management process is ongoing and updated from time to time at the discretion of the organization. The Aligning Process Group depends on subprocesses within the business process cycle's planning and authorizing phase. Similarly, the Monitoring and Controlling Process Group entails subprocesses within the business process cycle's monitoring and controlling phase. This relationship ensures a tight linkage of the portfolio management processes within the overall ongoing business process cycle.

The Aligning Process Group ensures the availability of current information regarding strategic goals that the portfolio is to support, as well as current operational rules for evaluating components and managing the portfolio. In addition, this Process Group establishes a structured, agreed-upon method for keeping the mix of portfolio components aligned to the organizational strategy.

The Aligning Process Group is most active at the time the organization refreshes its strategic goals and lays out near-term budgets and plans for the organization. Traditionally, these activities take place at the annual budgeting time, although some organizations have refresh cycles that are more frequent. Such activities may be scheduled quarterly, for example, or may occur because of changes in the business climate.

The Monitoring and Controlling Process Group is concerned with the activities necessary to ensure that the portfolio as a whole is performing to predefined metrics determined by the organization. These metrics, such as total return on investment or net present value thresholds, may be monitored by category and aggregate performance. In some instances, individual components of the portfolio may be tracked.

Figure 3-1 illustrates an overview of the Portfolio Management Process Groups.

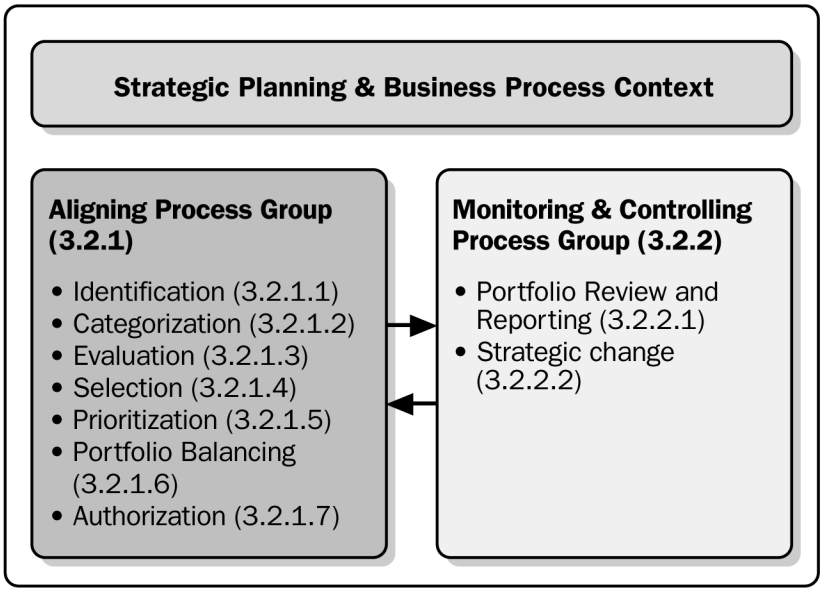


Figure 3-1. Portfolio Management Process Groups

3.2 Portfolio Management Process Interactions

Figure 3-2 provides a summary of the portfolio management processes and their interactions with the strategic plan, the determining factors, and the project management processes.

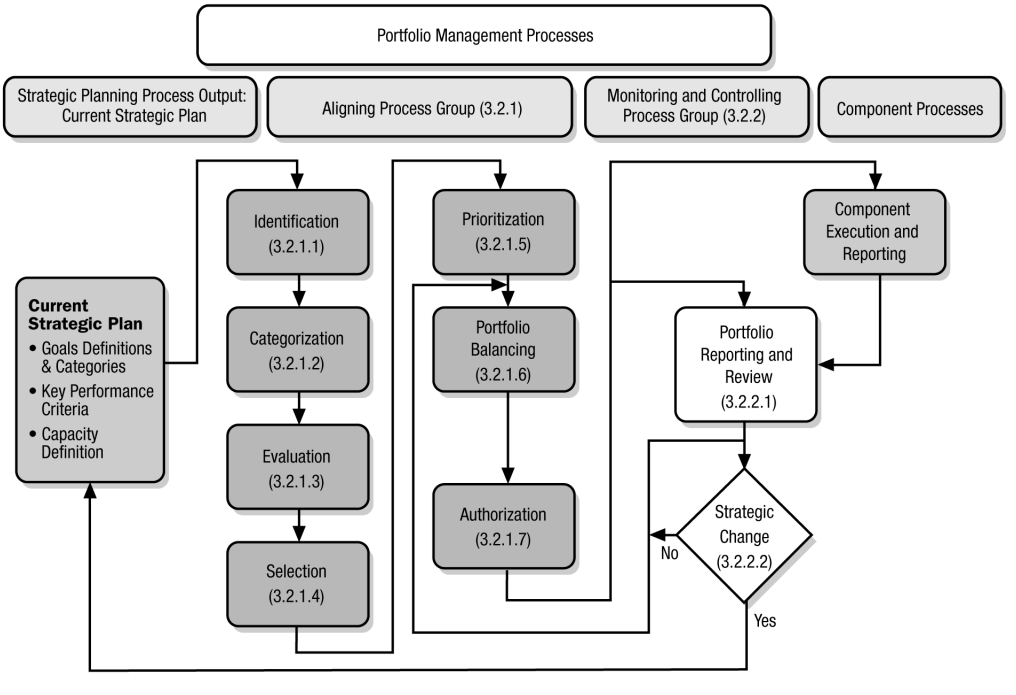


Figure 3-2. Portfolio Management Processes—High Level Illustration

The diagram illustrates:

- **The organization's strategic plan**. It is the decision base for any project portfolio management processes and the basis on which to establish the determining factors that will make each portfolio unique.
- **The portfolio management processes**. These are a series of interrelated processes, from identifying and authorizing portfolio components to reviewing the progress of each individual component, as well as that of the entire portfolio.

Sections 3.2.1 and 3.2.2 describe individual processes highlighted in Figure 3-2 by Process Group. Each process is described in terms of its basic activity along with inputs and outputs. [Related tools and techniques appear in Appendix D.]

3.2.1 Aligning Process Group

3.2.1.1 Identification

The purpose of this process is to create an up-to-date list, with sufficient information, of ongoing and new components that will be managed through portfolio management.

Key activities within this process include:

- Comparing ongoing components and new component proposals with a predetermined component definition and related key descriptors
- Rejecting components that do not fit within the predetermined definition
- Classifying identified components into predefined classes of components, such as project, program, portfolio, and other works.

3.2.1.1.1 Identification: Inputs

.1 Strategic Plan

Strategic plans are used by an organization to align its organization and budget structure with organizational priorities, missions, and objectives. A strategic plan typically includes a vision and a mission statement, a description of the

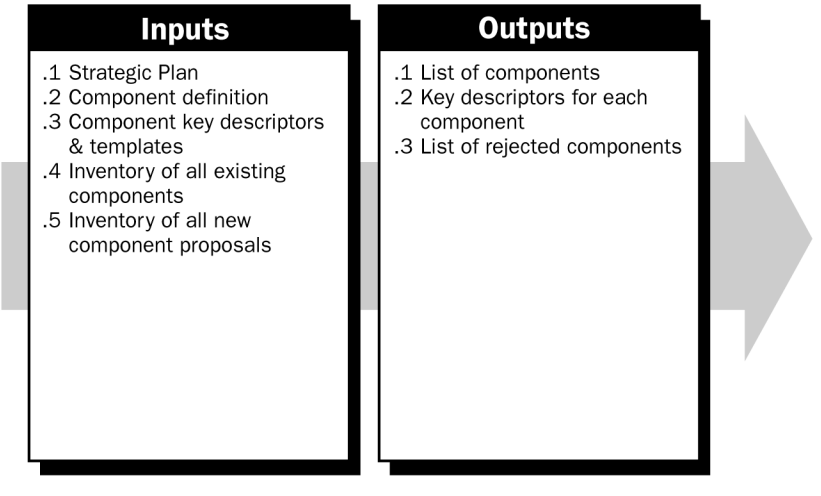


Table 3-1: Identification: Inputs and Outputs

organization's long-term goals, objectives, and means by which the organization plans to use to achieve these general goals and objectives. The strategic plan may also identify external factors that could affect achievement of long-term goals. Strategic planning is a process used by an organization to anticipate and adapt to expected changes. Operational plans are developed by management to support the annual or ongoing operations of the organization. These plans may be loosely or tightly integrated with the organization's strategic plan.

.2 Component Definition

The component definition is based on the strategic and/or operational plan's goals and objectives. The component definition will be useful to make a first screening on the list of components. For example, to be part of the portfolio, a component should be greater than a predetermined minimum size and be in line with the basic strategic objectives.

.3 Component Key Descriptors and Templates

The component key descriptors are used for categorizing, evaluating, and selecting components through the portfolio management process. Each descriptor is defined and the corresponding acceptance levels are predetermined. Key descriptors may include, but are not limited to:

- Component number
- Component description
- Class of component
  - Project
  - Program
  - Business case
  - Subportfolio
  - Other work.
- High-level plan
- Strategic objectives supported
- Quantitative benefits
  - New revenues
  - Cost reduction
  - Return on investment
  - Internal rate of return
  - Net present value
  - Reduced cycle time
  - Quality improvement.
- Qualitative benefits
  - Strategic alignment
  - Risk reduction
  - Legislative requirements
  - Platform development
  - Business opportunity.
- Component customer
- Component sponsor
- Key stakeholders
- Resources required
- Timescale
- Project dependencies
- Key deliverables

- Budget estimates
- Business unit
- Market risk level estimates
- Market definition and impact.

.4 Inventory of All Existing Components
The inventory of all ongoing components is a list of components that have been authorized previously and are being executed through the project or program management process, or that have been put on a waiting list at the end of the previous portfolio cycle.

.5 Inventory of All New Component Proposals
The inventory of all new component proposals is a list of components that have been proposed since the previous portfolio cycle.

3.2.1.1.2 Identification: Outputs

.1 List of Components
The list of components comprises all the qualifying components meeting the definition, complete with appropriate documentation. This may include a list of relationships between various components.

.2 Key Descriptors for Each Component
The key descriptors for each component represent the complete documentation for each qualifying component presented on proper templates.

.3 List of Rejected Components
The list of rejected components comprises all components that do not meet the component definition or that are not correctly and completely documented. These component proposals may be eliminated, rewritten, or regrouped to be resubmitted to the portfolio (or to another) process.

3.2.1.2 Categorization

The purpose of this process is to group identified components into relevant business groups to which a common set of decision filters and criteria can be applied for evaluation, selection, prioritization, and balancing. The categories are defined on the basis of the strategic plan. The components in a given group have a common goal and can be measured on the same basis, regardless of their origin in the organization. The categorization of the components allows the organization to balance its investment and its risks between all strategic categories and strategic goals.

Key activities within this process include:

- Identifying strategic categories based on the strategic plan
- Comparing identified components to the categorization criteria
- Grouping each component into only one category.

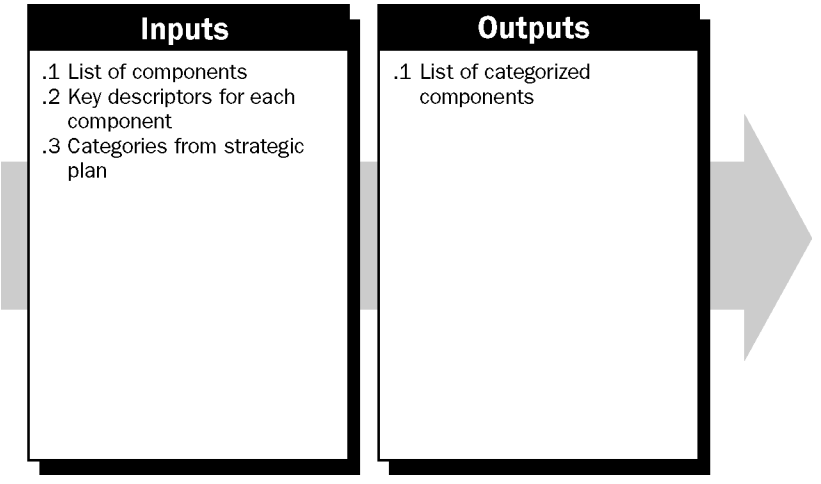


Table 3-2: Categorization: Inputs and Outputs

3.2.1.2.1 Categorization: Inputs

.1 List of Components
Described in Section 3.2.1.1.2.1

.2 Key Descriptors for Each Component
Described in Section 3.2.1.1.2.1

.3 Categories from Strategic Plan
The categories are based on the strategic plan. They are used to group and compare components having a common strategic goal and common measurement criteria. The organization executives and portfolio management team establish the categories jointly. The categories need to be defined and widely understood throughout the organization. The categories may change or evolve if the strategic plan changes or evolves. A category may include components originating from various departments or business units of the organization. The number of categories is usually limited and may include:

- Increased profitability (revenue increase, cost reduction, etc.)
- Risk reduction
- Efficiency improvement
- Legal obligation
- Market share increase
- Process improvement
- Continuous improvement
- Business imperatives (e.g. internal toolkit, IT compatibility or upgrades).

Each category may also include subcategories to generate comparative tables, graphs, or charts such as:

- Size (e.g., effort, budget)
- Duration
- Component type (e.g., projects, programs, other work)
- Phase.

3.2.1.2.2 Categorization: Outputs

.1 List of Categorized Components

The result is a list of components grouped by category, comprising all identified components divided within all the strategic categories. When a component cannot be categorized, it is up to the portfolio management group to decide whether they keep it on the list for further evaluation and selection.

3.2.1.3 Evaluation

This is the process for gathering all pertinent information to evaluate components, with the purpose of comparing them in order to facilitate the selection process. Information is gathered and summarized for each component of the portfolio. The information can be qualitative or quantitative, and comes from a variety of sources across the organization. The data collection is iterated several times, until reaching the required level of accuracy. Graphs, charts, documents, and recommendations are produced to support the subsequent selection process.

Key activities within this process include:

- Evaluating components with a scoring model comprising weighted key criteria
- Producing graphical representations to facilitate decision-making in the selection process
- Making recommendations for the selection process.

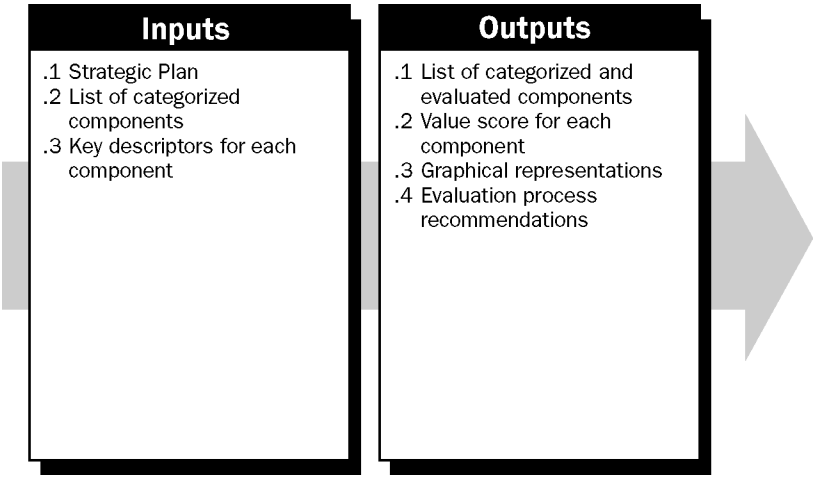


Table 3-3: Evaluation: Inputs and Outputs

3.2.1.3.1 Evaluation: Inputs

.1 Strategic Plan

Described in Section 3.2.1.1.1.1

.2 List of Categorized Components

Described in Section 3.2.1.2.2.1

.3 Key Descriptors for Each Component

Described in Section 3.2.1.1.2.2

3.2.1.3.2 Evaluation: Outputs

.1 List of Categorized and Evaluated Components
A list of evaluated components is produced and approved for each category. Components can be compared by category or for the entire portfolio.

.2 Value Score for Each Component
A total value score is calculated with the scoring model for each component.

.3 Graphical Representations
A number of graphical representations (e.g., scoring matrices and bubble charts) are produced to support decision-making

.4 Evaluation Process Recommendations
Recommendations are made at the end of the evaluation process. The recommendations can be made for a component, a category, or the entire portfolio, based on the value of each component or a group of components.

3.2.1.4 Selection

This is the process necessary to produce a short list of components based on the evaluation process recommendations and the organization's selection criteria. The evaluation determines the value of each component and produces a list of components that are ready for prioritization.

Key activities within this process include selecting components based on the evaluation results and comparison to selection criteria. This process will produce a list of components for prioritization.

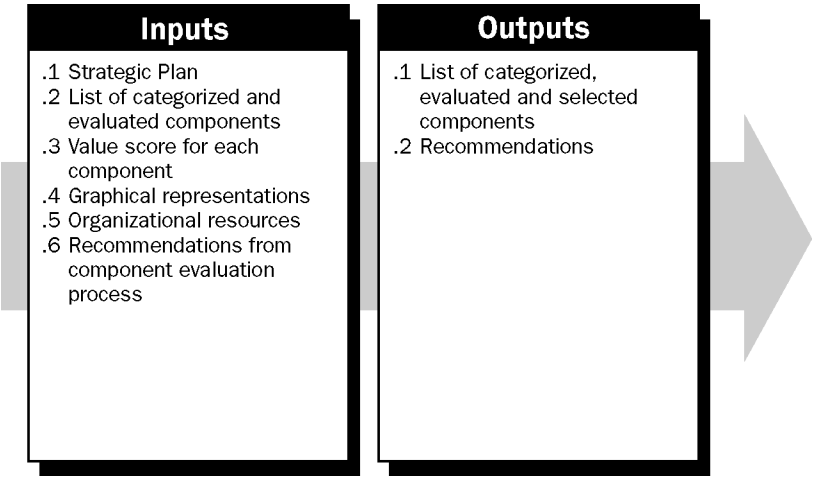


Table 3-4: Selection: Inputs and Outputs

3.2.1.4.1 Selection: Inputs

.1 Strategic Plan
Described in Section 3.2.1.1.1.1

.2 List of Categorized and Evaluated Components
Described in Section 3.2.1.3.2.1

.3 Value Score for Each Component
Described in Section 3.2.1.3.2.2

.4 Graphical Representations
Described in Section 3.2.1.3.2.3

.5 Organizational Resources
Organizational resources may include internal or external human resources, financial resources, equipment, and other assets.

.6 Recommendations from Component Evaluation Process
Described in Section 3.2.1.3.2.4

3.2.1.4.2 Selection: Outputs

.1 List of Categorized, Evaluated, and Selected Components
A list of evaluated and selected components is produced and approved for each category. Components can be compared by category or for the entire portfolio.

.2 Recommendations
Recommendations are made at the end of the selection process. The recommendations can be made for a component, a category, or the entire portfolio. These recommendations can include prioritization, component segmentation, acceptance, or rejection of a component.

3.2.1.5 Prioritization

The purpose of this process is to rank components within each strategic or funding category (e.g., innovation, cost savings, growth, maintenance, and operations), investment time frame (e.g., short, medium, and long-term), risk versus return profile, and organizational focus (e.g., customer, supplier, and internal) according to established criteria. This step ranks the components to support subsequent analysis required to validate and balance the portfolio.

Key activities within this process include:

- Confirming the classification of components in accordance with predetermined strategic categories
- Assigning scoring or weighting criteria for ranking components
- Determining which components should receive highest priority within the portfolio.

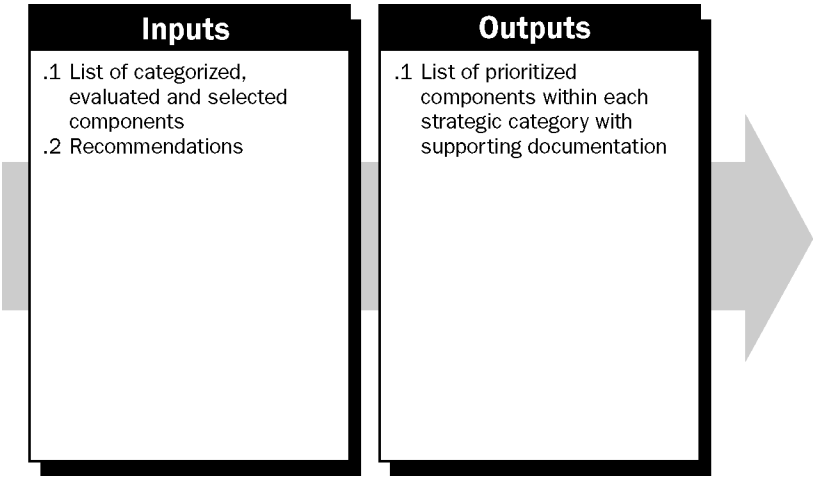


Table 3-5: Prioritization: Inputs and Outputs

3.2.1.5.1 Prioritization: Inputs

.1 List of Categorized, Evaluated, and Selected Components
Described in Section 3.2.1.4.2.1

.2 Recommendations
Described in Section 3.2.1.4.2.2

3.2.1.5.2 Prioritization: Outputs

.1 List of Prioritized Components within Each Strategic Category with Supporting Documentation
The prioritized list of components for portfolio balancing, along with appropriate documentation.

3.2.1.6 Portfolio Balancing

The purpose of this process is to develop the portfolio component mix with the greatest potential, to collectively support the organization's strategic initiatives and achieve strategic objectives. Portfolio balancing supports the primary benefits of portfolio management—the ability to plan and allocate resources (i.e., financial, physical assets, and human resources) according to strategic direction, and the ability to maximize portfolio return within the organization's predefined desired risk profile.

Balancing of activities involves reviewing selected and prioritized portfolio components. The portfolio is then balanced to support established strategic objectives using predefined portfolio management criteria, the organization's desired risk profile, portfolio performance metrics, and capacity constraints. A recommendation for either maintaining the portfolio ''as is'' or adjusting the portfolio is issued at completion of the balancing activities. In essence, this process includes:

- Adding new components that have been selected and prioritized for authorization
- Identifying components that are not authorized based on the review process
- Eliminating components to be suspended, reprioritized, or terminated based on the review process.

The selection of the mix of components in order for the portfolio to achieve a desired return (while still complying with the established portfolio management criteria) should also take into account similarities and synergies that exist between components. This could include dependency relationships with existing portfolio components. Enhancing these interconnections fully leverages all aspects of the portfolio to generate the greatest return with a minimum of investment.

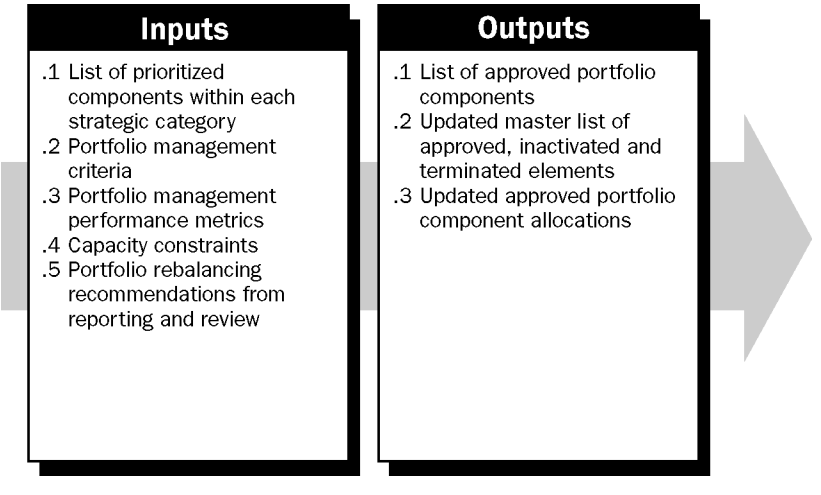


Table 3-6: Balancing: Inputs and Outputs

3.2.1.6.1 Portfolio Balancing: Inputs

.1 List of Prioritized Components within Each Strategic Category
The prioritized list of components for portfolio balancing.

.2 Portfolio Management Criteria
Specific objectives, constraints, and/or guidelines for use by the portfolio manager when creating and managing the portfolio. Examples may include investment diversification objectives, risk tolerance thresholds, and financial return.

.3 Portfolio Management Performance Metrics
Metrics and performance goals established by the organization to measure performance of the portfolio, and to determine whether the portfolio is performing as planned or if portfolio adjustments are needed. Examples of metrics include portfolio return, risk, diversification, etc.

.4 Capacity Constraints
The organization's financial, physical assets, and human resource constraints by category.

.5 Portfolio Rebalancing Recommendations from Reporting and Review
Periodically, an output of the review process may be a recommendation to terminate or realign existing portfolio components. Consequently, the reporting and review process would return to portfolio balancing to ensure that any changes to the portfolio increase support of—and improve the probability of achieving—strategic goals and objectives.

3.2.1.6.2 Portfolio Balancing: Outputs

.1 List of Approved Portfolio Components
The complete list of components that have been approved for execution as planned, or after developing a business case to confirm their feasibility.

.2 Updated Master List of Approved, Inactivated, and Terminated Components
The updated component master list of all components and appropriate status for each. Rationale for the decision to remove a component from the portfolio, or not include a component within, must be added to the master list.

.3 Updated Approved Portfolio Component Allocations
Component budget and resource approvals or exceptions should be updated on the master list.

3.2.1.7 Authorization

The purpose of this process is to formally allocate financial and human resources required to either develop business cases or execute selected components and to formally communicate portfolio-balancing decisions.

Activities within this process include:

- Communicating portfolio balancing decisions to key stakeholders, both for components included and those not included in the portfolio
- Authorizing selected components and inactivating or terminating components of the portfolio

- Reallocating budget and resources for inactive and terminated components
- Allocating financial and human resources to execute selected portfolio components
- Communicating expected results (e.g., review cycles, timeline performance metrics, and required deliverables) for each selected component.

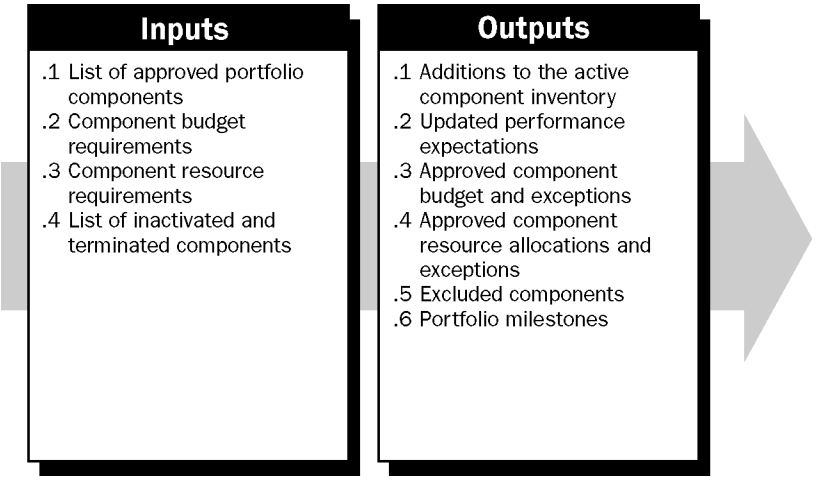


Table 3-7: Authorization: Inputs and Outputs

3.2.1.7.1 Authorization: Inputs

.1 List of Approved Portfolio Components
The complete list of components that have been approved for execution as planned, or after developing a business case to confirm their feasibility.

.2 Component Budget Requirements
Budget requirement information is provided within either the component plan or business case.

.3 Component Resource Requirements
Resource requirement information is provided within either the component plan or business case.

.4 List of Inactivated and Terminated Components
The list of components that have been either inactivated or terminated in favor of pursuing higher priority and/or higher value components.

3.2.1.7.2 Authorization: Outputs

.1 Additions to the Active Component Inventory
The list of all active components included in the portfolio. The list is updated with any changes linked to new component authorizations.

.2 Updated Performance Expectations
Any changes to the performance expectations and required deliverables associated with the total set of components.

.3 Approved Component Budget and Exceptions
Component budget approvals or exceptions must be updated in response to changes in the set of active components.

.4 Approved Component Resource Allocations and Exceptions
Any changes to the component resource approvals or exceptions are described, and the corresponding documents are updated and circulated according to a communications plan to key component stakeholders and other component support functions (e.g., finance).

.5 Excluded Components
Decisions to either remove components from the portfolio, or not include specific components within, are documented with the rationale for the decisions.

.6 Portfolio Milestones
The list of key deliverables and decision points for all components is consolidated to show the outcomes expected by the portfolio over time.

3.2.2 Monitoring and Controlling Process Group

3.2.2.1 Portfolio Reporting and Review

The purpose of this process is to gather performance indicators, provide reporting on them, and review the portfolio at an appropriate predetermined frequency, to ensure both alignment with the organizational strategy and effective resource utilization. The review cycle examines all components and is executed on a timeline that is specified by the organization. Each cycle may contain several reviews with a different focus and depth of analysis applied in each. The key performance indicators also vary for each since the purpose of each review varies. Figure 3-3 illustrates the relationships between strategic planning, portfolio management, operations, and project/program management, along with the flow of reporting data.

Ultimately, the purpose of the reviews is to ensure that the portfolio contains only components that support achievement of the strategic goals. To ensure this, components must be added, reprioritized, or excluded, based on their performance and ongoing alignment with the defined strategy in order to ensure effective management of the portfolio.

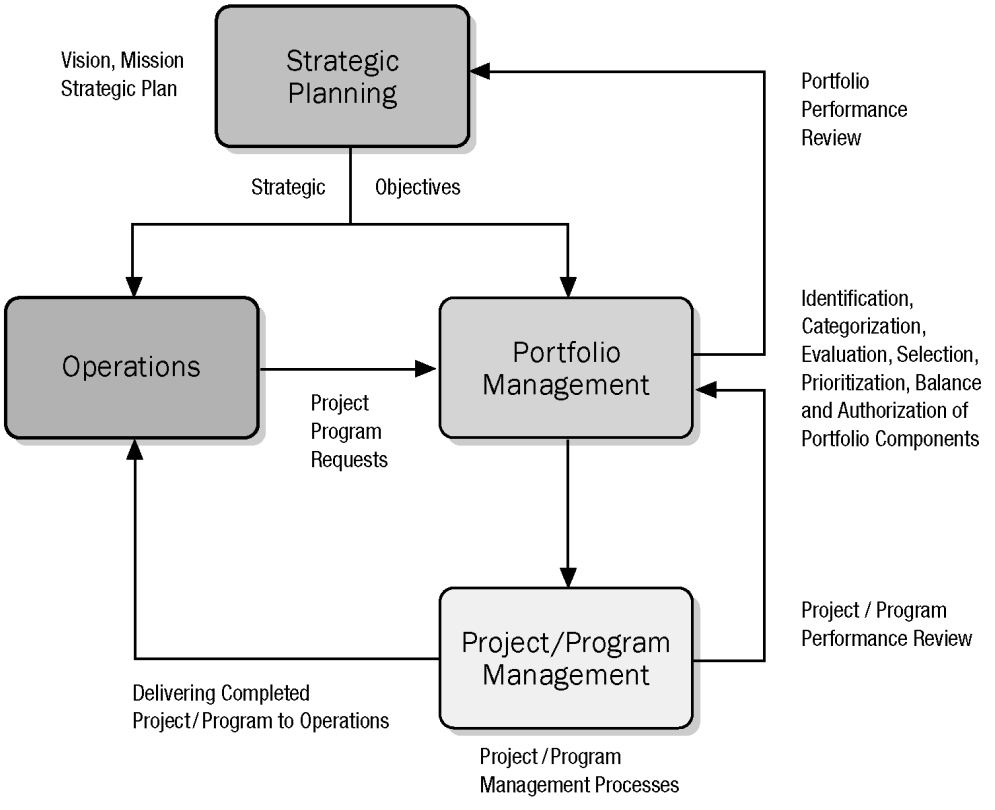


Figure 3-3. Reporting & Review Process Summary

Activities in this process include:

- Reviewing component sponsorship, accountability, and other ownership criteria against organizational governance standards
- Reviewing component priority, dependencies, scope, expected return, risks, and financial performance against portfolio control criteria and organizational perceived value and investment criteria
- Reviewing expected impact of business forecasts, resource utilization, and capacity constraints on portfolio performance
- Determining whether to continue with, add to, or terminate specific components; or to reprioritize and realign them with strategic goals
- Making recommendations and/or providing direction to component management
- Proposing changes to how the portfolio is managed (as needed).

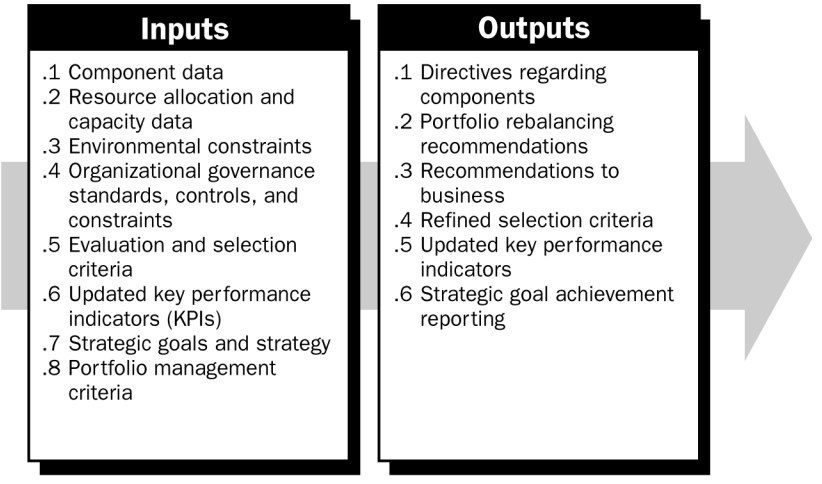


Table 3-8: Portfolio Reporting and Review: Inputs and Outputs

3.2.2.1.1 Portfolio Reporting and Review: Inputs

.1 Component Data
Data related to the components are updated regularly during their life cycles, and provided to management for assessment. The information includes, but is not limited to: progress against plan, budget, expected return, priority, etc.

.2 Resource Allocation and Capacity Data
Resources in this context include, for example, financial capacity, human resources, and production capacity. Capacity for all resource classes is examined so that managers can make prioritization and allocation decisions when selecting and evaluating components.

.3 Environmental Constraints
External constraints are imposed as either a directive or an influence beyond the control of the organization. Portfolio managers generally have no control over environmental constraints, and have limited influence at best. Examples of environmental constraints include government regulations, interest rates, and seasonal weather.

.4 Organizational Governance Standards, Controls, and Constraints
Governance standards are the organizational rules applied to managing portfolios and making decisions, such as human resource policies or the organization's strategy. Controls are checkpoints in the normal course of business, such as financial controls or the budgeting and allocation process. Constraints may include the organizational structure. Portfolio managers generally cannot control organizational constraints, but they may be able to exert influence upon them.

.5 Evaluation and Selection Criteria
Portfolio reviews use the evaluation and selection criteria to determine whether a particular component should remain part of the portfolio or be replaced by a component more likely to move the organization toward its goals.

.6 Updated Key Performance Indicators (KPIs)
KPIs are the metrics used to determine whether a component is progressing as expected and whether the results are in line with what the organization expected.

.7 Strategic Goals and Strategy
Ultimately, every component should be aligned to the organization's strategic goals. Without such alignment, management should question why scarce resources are being allocated and why the component is being funded. Strategy is so fundamental to constructing the portfolio that any change in strategy will trigger an ad hoc review to ensure that all components continue to be aligned. When a major change occurs, such as results from an acquisition or market reorganization, the organization may also review its selection criteria and priorities, along with the full set of components.

.8 Portfolio Management Criteria
These are specific objectives, constraints, and/or guidelines for use by the portfolio manager when managing the portfolio. Examples may include: investment diversification objectives and risk tolerance thresholds.

3.2.2.1.2 Portfolio Reporting and Review: Outputs

.1 Directives Regarding Components
Based on the review, the portfolio management team provides direction to the owners of the affected components. This may take the form of continuation, realignment of priorities or dependencies, resource reallocation, suspension, or termination.

.2 Portfolio Rebalancing Recommendations
The purpose of reviews is to ensure that the organization continues to invest in only those portfolio components that support stated strategic goals and objectives, and to verify that those investments remain on-track to achieve stated strategic goals and objectives. Periodically, an output of the review process may be a recommendation to realign or discontinue funding of existing portfolio components. When the portfolio management team recommends that portfolio rebalancing may be necessary, these recommendations are input to the Strategic Change process. The Strategic Change process then determines if a significant change in strategy has occurred, or if the recommended portfolio rebalancing described above is the extent of needed portfolio rebalancing.

.3 Recommendations to Business
Whereas directives to components flow downward in the organization, recommendations to business flow upward. Based on feedback from the components and insights gained from review, the portfolio management team may recognize new or altered dynamics that deserve attention from senior leadership. These recommendations may include changes to the strategic plan, to the component selection criteria, or to the portfolio review process itself.

.4 Refined Selection Criteria
Selection, evaluation, and prioritization criteria change as the organization evolves, and the portfolio review process is where the effectiveness of these criteria is evaluated. If the chosen criteria lead to components that do not

generate desired outcomes, the organization should refine the component criteria in order to increase the value added due to the portfolio management process.

.5 Updated Key Indicators
As with the component selection criteria, the organization must determine whether it is using the correct metrics to make decisions. As appropriate, the portfolio management team must determine whether component results are being driven by the selected metrics, and apply new or refined measurements when needed.

.6 Strategic Goal Achievement Reporting
The portfolio management team reports periodically, or as needed, on achievement of organizational goals by the portfolio.

3.2.2.2 Strategic Change

The purpose of this process is to enable the portfolio management process to respond to changes in strategy. Small changes to the strategic plan often do not require changes to the portfolio. However, significant strategy changes often result in a new strategic direction, thereby impacting the portfolio. A change in strategic direction can impact component categorization or prioritization and this will require the portfolio to be rebalanced.

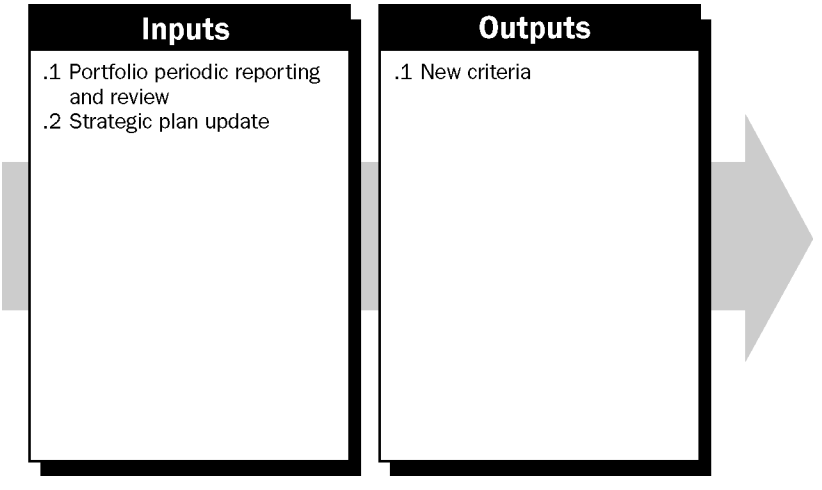


Table 3-9: Strategic Change: Inputs and Outputs

3.2.2.2.1 Strategic Change: Inputs

.1 Portfolio Periodic Reporting and Review
Information about portfolio and component performance, as well as recommendations to the organization is provided by outputs from the Portfolio Periodic Reporting and Review process.

.2 Strategic Plan Update
Described in Section 3.2.1.1.1.1.

3.2.2.2.2 Strategic Change: Outputs

.1 New Criteria
As environments inside and outside the organization change, criteria for determin-

ing the composition and direction of the portfolio may also change. New leadership may want to adjust strategy according to different goals. Market maturation or sector focus change may require different financial profit thresholds. When the need for new criteria becomes evident, the portfolio management team will examine criteria in the current strategic plan and move ahead with appropriate changes, usually focusing first on categorization (Section 3.2). If strategic change is not occurring, then there is default to portfolio balancing (Section 3.6).

Section III

Appendices

Appendix A

(Reserved for documenting future updates)

Appendix B

Initial Development of *The Standard for Portfolio Management*

B.1 Introduction

Since 1996, project managers and organizations have recognized the standard for one project: PMI's *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*). Then in 2003, PMI introduced its first standard for organizations called the *Organizational Project Management Maturity Model* (*OPM3®*).

Early in 2003, recognizing that the project management profession encompasses a much broader field, including managing multiple projects through programs and portfolios, PMI's Standards Program Team (SPT—which includes the PMI Manager of Standards plus the Member Advisory Group) chartered the development of ''a standard, or standards,'' for program management and portfolio management processes.

Like the *PMBOK® Guide* standard for ''most projects most of the time,'' the charter for the PPMS Program was to focus on processes that are generally recognized as good practice most of the time. Moreover, the new standard or standards were to emulate the *PMBOK® Guide*—Third Edition, specifically excluding knowledge areas as well as tools and techniques. The new standard or standards, however, were to map content relationships to processes and Knowledge Areas lined in the *PMBOK® Guide*—Third Edition.

B.2 Preliminary Work

In the summer of 2003, the PPMS Team formed, eventually including 416 PMI volunteers representing 36 countries under the leadership of David Ross, Project Manager, and Paul Shaltry, Deputy Project Manager.

One of the first challenges was the need to establish common agreement on the key definitions, in this case, ''program,'' ''program management,'' ''portfolio,'' and ''portfolio management.'' The PMI Standards Manager brought together all of the active standards teams to achieve consensus on these definitions. The involved team

leaders agreed in time for common definitions to be included in the *PMBOK® Guide*—Third Edition and form the foundation for the program and portfolio management standards.

Next, the PPMS Team looked at whether the two subjects should be combined as one standard or treated separately. A sub-team was formed to perform a literature survey and poll the PM community to determine the differences and similarities between program and portfolio management processes. The research confirmed that while program management processes provide for the management of a group of interdependent projects, portfolio management comprises continuous, repeatable, and sustainable processes designed to map business requirements and objectives to projects and programs. As a result of this investigation, the PPMS Team concluded that the profession would be best served with two standards.

Despite the differences in these processes, the PPMS Team believed that because of the relationships between the two subjects and that these were first time standards, it would be best to manage them both under one program. The PPMS Core Team proposed this approach to the SPT, which approved the recommendation. In kind, the PPMS Team developed detailed requirements for each standard that the SPT also approved. The Core Team developed a program plan and general team orientation, which was mandatory, to help volunteers engage effectively. Development of both standards began in early 2004.

B.3 Drafting *The Standard for Portfolio Management*

The Portfolio Management Architecture Team (PortMAT), which comprised 13 participants, led first by Larry Goldsmith and then jointly by Beth Ouellette and Claude Emond, organized into three sub-teams: Content, Process, and Governance. While most of the work was done virtually, the team gathered for a breakthrough meeting in Montreal in July 2004. There, the team was able to focus on the processes of portfolio management and how they interconnect.

The group had much debate as to whether the proposed standard should include the introduction of a portfolio management system to an organization or whether it should focus purely on the ongoing processes of portfolio management. The team agreed that the proposed processes had to assume that the portfolio had already been established within the organization.

Between July and September, the PortMAT did a series of team reviews and feedback sessions to connect the related processes. The team met again in Montreal to put the finishing touches on the first complete draft prior to handing it off to the Edit and Quality Teams in late September.

In the last quarter of 2004, the PortMAT's draft standard underwent separate reviews by the PPMS Edit and Quality Teams in preparation for a broader review by, potentially, the whole PPMS Team. This broader review emulated the eventual global exposure draft review that PMI would conduct. The ''mini-exposure draft'' process generated 950 comments from PPMS volunteers around the worlds.

The PortMAT's work benefited from these comments and recommendation in the improvement or confirmation of content, even though a significant number of comments received were editorial. In general, this internal exposure draft process validated that the PortMAT's draft was on target, as reviewers did not identify any major gaps.

B.4 Delivering the First *Standard for Portfolio Management*

The PPMS Core Team guided the final revisions and submitted the revised version to the general PPMS Team for a consensus vote. The overwhelming majority of those voting indicated acceptance of the proposed standard without reservation. The Core Team approved the proposed standard before turning it over to the SPT for review and approval in February 2005. The SPT engaged independent subject matter experts to augment the review process. From there, minor refinements were made and the proposed standard went on to a 90-day Exposure Draft process starting in May.

The exposure draft period for *The Standard for Portfolio Management* ended July 9. PMI received 455 comments that the PPMS Adjudication Team reviewed. More than half of these comments were accepted, accepted with modification, or identified for review in the next version of the standard. The PPMS Core Team approved the actions of the Adjudication Team and directed the final edit and approval of the proposed. Only one adjudication action was appealed, and PMI's Adjudication Appeals Team subsequently resolved it.

In October 2005, the PPMS Core Team transferred the final draft for approval by the PMI Standards Consensus Team and subsequent publication.

Appendix C

Contributors and Reviewers of *The Standard for Portfolio Management*

This appendix lists, alphabetically within groupings, those individuals who have contributed to the development and production of *The Standard for Portfolio Management*. No simple list or even multiple lists can adequately portray all the contributions of those who have volunteered to develop the *The Standard for Portfolio Management*. Appendix B describes specific contributions of many of the individuals listed below and should be consulted for further information about individual contributions to the project.

The Project Management Institute is grateful to all of these individuals for their support and acknowledges their contributions to the project management profession.

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Appendix D

Project Portfolio Management Tools and Techniques

1.0 Introduction

This appendix presents a summary description of the tools and techniques that are typically used by organizations to manage their project portfolios. It does not contain an all-inclusive list of tools and techniques used; instead it focuses on the main requirements of portfolio management and on how they can be addressed.

The typical tools listed and presented are thus illustrated in a generic manner to indicate their intent and workings, while leaving to the reader the latitude required to adapt them to a specific situation and the project portfolio management requirements of upper management.

Part 2.0 of this appendix discusses the main requirements of portfolio management and the corresponding characteristics that selection tools and techniques must exhibit to support the portfolio management process in highlighting and tackling these requirements.

Part 3.0 is a process-by-process presentation of the tools and techniques. Many of the tools presented are pertinent to more than one process and/or Process Group, their use and utility being enriched by new available data while the portfolio evolves. Therefore, some of those tools and techniques will be illustrated more than once to reflect the new value added by the acquisition of portfolio realization data.

2.0 Overview of Tools and Techniques for Project Portfolio Management

The main issues of portfolio management are reflected by its two Process Groups, namely:

- **Aligning Process Group.** This group identifies what will be managed in the portfolio, in which categories, as well as how elements will be evaluated and chosen for inclusion or not in a given portfolio of projects. This group is highlighted in Table 1.
- **Monitoring Process Group.** This group is involved with reviewing pre-selected performance indicators periodically to ensure/confirm the alignment of portfolio components with the organization's strategic objectives. This group is highlighted in Table 2.

CHARACTERISTICS	SECTION IN CHAPTER 3
Identification	(3.2.1.1)
Categorization	(3.2.1.2)
Evaluation	(3.2.1.3)
Selection	(3.2.1.4)
Prioritization	(3.2.1.5)
Portfolio Balancing	(3.2.1.6)
Authorization	(3.2.1.7)

Table 1. Aligning Process Group (3.2.1)

CHARACTERISTICS	SECTION IN CHAPTER 3
Portfolio Review and Reporting	(3.2.2.1)
Strategic Change	(3.2.2.2)

Table 2. Monitoring & Controlling Process Group (3.2.2)

Subsequently, the first tools and techniques that must be used are those that can provide to the organization, based on predetermined key selection criteria, the information required to categorize, evaluate, select, and prioritize and authorize components.

When all the components of the portfolio are selected, properly aligned with strategic objectives, prioritized and authorized for realization, some other tools and techniques are required to ensure the proper monitoring of their evolution, both as individual components as well as a whole. This is to ensure that the components are still aligned, that the portfolio and its individual elements are evolving in the desired direction, and that eventually the benefits anticipated from deploying those components (projects, programs and others) are still achievable and/or have been effectively materialized. Such tools and techniques will thus have to provide indicators to permit comparison between expectations, planned objectives, and past, current, and evolving situations, as well as forecasts and recommendations for future action.

3.0 Tools and Techniques to use for Each of the Portfolio Management Subprocesses

What follows is a step-by-step presentation of some typical tools and techniques that address the issues of portfolio management through each of its processes. Note that the heading numbers correspond with those in Chapter 3, Portfolio Management Processes.

3.2.1 Aligning Process Group

3.2.1.1 Identification

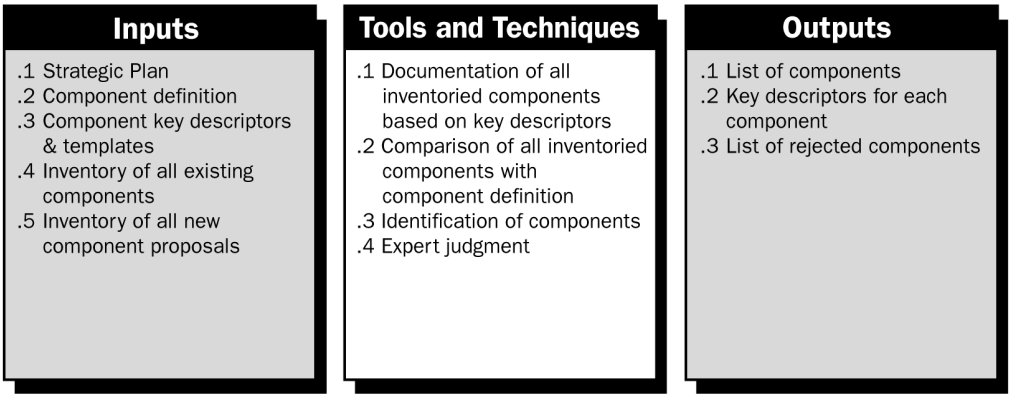

Figure 1. Identification Process Tools and Techniques

Tools and techniques for component identification aim at helping the organization to produce a list of components characterized by a common set of ''key descriptors'' for further comparison, evaluation, and selection. Some of those key descriptors could also be used as preliminary ''filters,'' permitting the acceptance or not of components for further evaluation and implementation.

As indicated in Chapter 3 of the standard, key descriptors may include, but are not limited to:

- Component number
- Component description
- Class of component
  - Project
  - Program
  - Business case
  - Subportfolio
  - Other work.
- High-level plan
- Strategic objectives supported
- Quantitative benefits
  - New revenues
  - Cost reduction
  - Return on investment
  - Internal rate of return
  - Net present value
  - Reduced cycle time
  - Quality improvement.
- Qualitative benefits
  - Strategic alignment
  - Risk reduction
  - Legislative requirements
  - Platform development
  - Business opportunity.
- Component customer
- Component sponsor

- Key stakeholders
- Resources required
- Timescale
- Project dependencies
- Key deliverables
- Budget estimates
- Business unit
- Market risk level estimates
- Market definition and impact.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Documentation of All Inventoried Components Based on Key Descriptors
The documentation of all inventoried components based on key descriptors is provided by the promoter of the component and is presented to ensure a common base of comparison. Acceptance levels, if and whenever required to filter/eliminate components, might be predetermined for some of the descriptors.

.2 Comparisons of All Inventoried Components with Component Definition
A preliminary comparison of all inventoried components with the component definition might be used to eliminate all components that do not or should not qualify to be part of the portfolio.

.3 Identification of Components
The identification of components is to list all components that qualify to be part of the portfolio.

.4 Expert Judgment
Expert judgment is often used to assess the inputs needed to identify the components. Such judgment and expertise can be applied to any technical and management details during this process.

3.2.1.2 Categorization

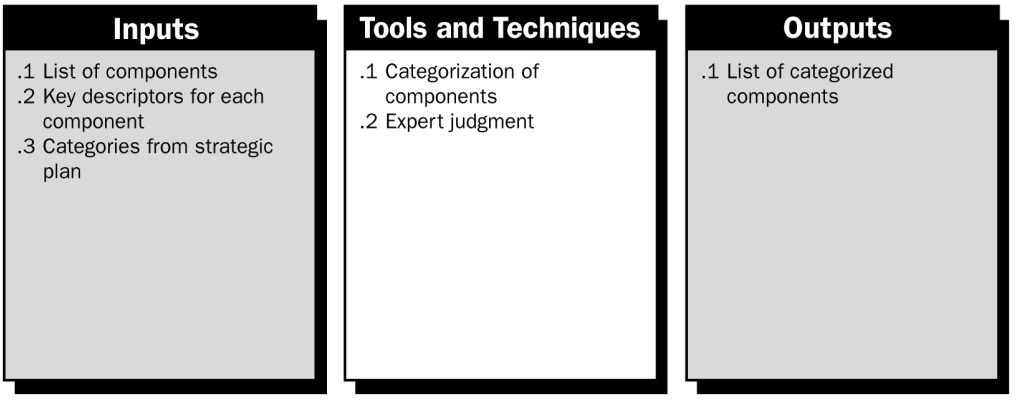

Figure 2. Tools and Techniques for Categorization Process

Tools and techniques for component categorization aim at helping the organization to facilitate component evaluation by assigning them to predetermined categories. This helps to compare components that address similar organizational needs and/or strategic concerns. It also facilitates portfolio balancing later on, by ensuring that components are selected and managed within a set of categories addressing all of the strategic objectives of the organization.

As noted in Chapter 3, these categories need to be defined and widely understood throughout the organization. The categories may change or evolve if the strategic plan changes or evolves. A category may include components originating from various departments or business units of the organization. The number of categories is usually limited and may include:

- Increased profitability (revenue increase, cost reductions, etc.)
- Risk reduction
- Efficiency improvement
- Legal obligation
- Market share increase
- Process improvement
- Continuous improvement
- Business imperatives (e.g., internal tool kit, IT compatibility or upgrades).

Each category may also include subcategories to generate comparative tables, graphs or charts such as:

- Size (e.g., effort, budget)
- Duration
- Component type (e.g., projects, programs, other work)
- Phase.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Categorization of Components
Each identified component along with the key descriptors is compared to the categorization criteria and is integrated to a given category for the purpose of comparing, evaluating, measuring and selecting between similar components.

.2 Expert Judgment
Expert judgment is often used to assess the inputs needed to categorize the components. Such judgment and expertise is applied to any technical and management details during this process.

3.2.1.3 Evaluation

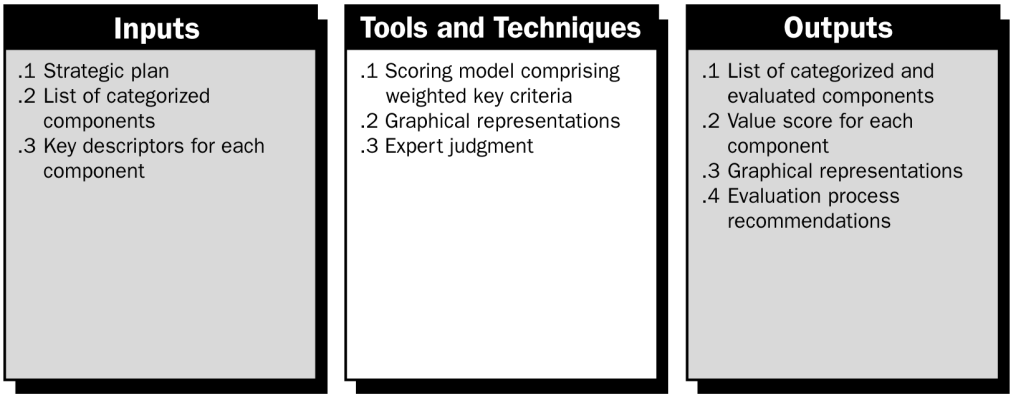

Figure 3. Tools and Techniques for Evaluation Process

Tools and techniques for evaluation aim at helping the organization to effectively evaluate and compare the categorized components under consideration, in order to eventually recommend those that should be selected for further prioritization and inclusion in a balanced portfolio. This is done by using a series of preset criteria associated to various business concerns. Typical criteria may include, but are not limited to:

- Business criteria
  - Strategic alignment
  - Productivity
  - Process improvement
  - Competitive advantage
  - Business impact
  - Employee satisfaction
  - Customer satisfaction
  - Intellectual property
  - Impact of not undertaking the project.
- Financial benefits criteria
  - Revenue growth
  - Cost savings
  - Cost avoidance
  - Internal Rate of Return (IRR)
  - Net Present Value (NPV)
  - Return on Investment (ROI)
  - Payback period
  - Cost
  - Cash flow generation.
- Risk-related criteria
  - Business risks
  - Technology risks
  - Project management risks
  - Implementation risks
  - Market acceptance risks
  - Public relation risks
  - Brand image risks.
- Legal/Regulatory compliance criteria

- Human Resource (HR)-related criteria
  - Specific competency
  - Employee satisfaction
  - Resources availability
  - HR capacity
  - HR capacity to integrate the solution
  - Impact on working condition.
- Marketing criteria
  - Market impact
  - Probability of success
  - Time to market
  - Impact on existing product lines
  - Estimated product life.
- Technical criteria
  - Architectural alignment
  - Information delivery
  - Success probability (inverse of risk)
  - System RAS
    - Reliability
    - Availability
    - Supportability
  - Conformity to standards.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Scoring Model Comprising Weighted Key Criteria
Scoring models are used to evaluate each component. As illustrated in Figure 4, a scoring model comprises a series of evaluation criteria having a weight expressed as a percentage and a score. The evaluation criteria may comprise

SCORING MODEL		Evaluation					
List of Criteria	**Weight**	**Low**	**Medium**	**High**	**Score**	**Total**	
Criteria 1	20%	0	5	10	10	2	Indicator "Y"
Criteria 2	20%	0	5	10	10	2	
Criteria 3	10%	0	5	10	5	0.5	
Criteria 4	15%	0	5	10	10	1.5	
Criteria 5	5%	0	5	10	5	0.25	
Criteria 6	5%	0	5	10	0	0	
Criteria 7	5%	0	5	10	10	0.5	Indicator "X"
Criteria 8	5%	0	5	10	5	0.25	
Criteria 9	10%	0	5	10	0	0	
Criteria 10	5%	0	5	10	5	0.25	
					TOTAL SCORE	7.25	
					Indicator "Y" (0 to 1)	0.83	
					Indicator "X" (0 to 1)	0.4	

Figure 4. Multi-Criteria Scoring Model

items such as strategic alignment, business unit priorities alignment, contractual requirement, financial benefits, soft benefits, risks, etc. The weight for each criterion is expressed in percentage and determines the relative importance of each criterion in the component evaluation. The score applies to each criterion and should be discriminating (such as 0, 5, 10). The score measures if each criterion is met or not. Each score level must be clearly defined to ensure consistent evaluation from project to project. The score multiplied by the weight provides a value for each criterion and the total of all these criteria values is the total value of the component.

A typical scoring model can be effectively designed and used by going through the following simple implementation steps:

- Establish a list of criteria
- Define groups of criteria, if and whenever possible, to build specific key indicators that need more than one criterion to be properly evaluated (ex. criteria 1 to 6 = Indicator ''Y'')
- Establish a relative weight between the criteria
- Determine the evaluation scoring model to be used, for example:
  - 0, 5, 10
  - 1 to 10
  - 1 to 5
- Evaluate the project(s) under consideration for each criterion
- Multiply the evaluation by the weight to get a total per criterion
- Add the totals for each criterion to get the total score for the project(s)
- Compare project results.

.2 Graphical Representations

Various graphical representations may also be used to illustrate the relationship between the components being evaluated. Graphical representations include

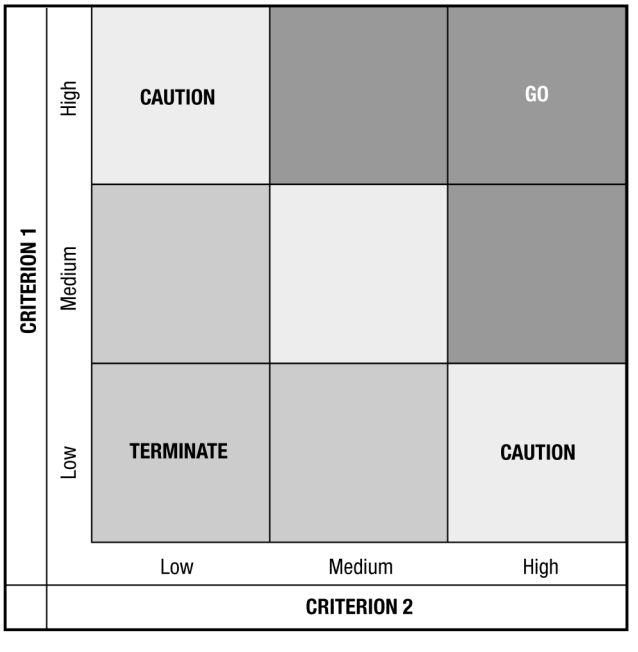

Figure 5. Graphical Comparison Based on Two Criteria

such things as histograms, pie charts, line charts, and bubble charts. Two-criteria comparison grids, like the example illustrated in Figure 5, are among the most utilized and effective graphical tools to compare components that must meet more that one selection criterion. A typical pair of criteria used by organizations is benefits (criterion. 1) vs. strategic alignment (criterion 2).

One can effectively design and use a two-criteria comparison grid by using the following simple implementation steps:

- Choose two criteria
- Measure each project under each criterion
- Position each project in the grid, for example:
  - For Project XYZ: criterion 1 = medium and criterion 2 = medium
- Projects evaluated HIGH have a high score
- Project evaluated LOW have a low score
- The grid can be color-coded to indicate which combinations of criteria values are privileged by the organization and which are to be avoided, for example:
  - Projects positioned in the ''red zone'' have low value for the organization
  - Projects positioned in the ''green zone'' have high value for the organization

Graphical representations are usually done to compare projects within a category, in order to prevent comparing components that do not address similar organizational concerns and/or objectives.

.3 Expert Judgment

Expert judgment is often used to assess the inputs needed to compare the components. Such judgment and expertise are applied to any technical and management details during this process.

3.2.1.4 Selection

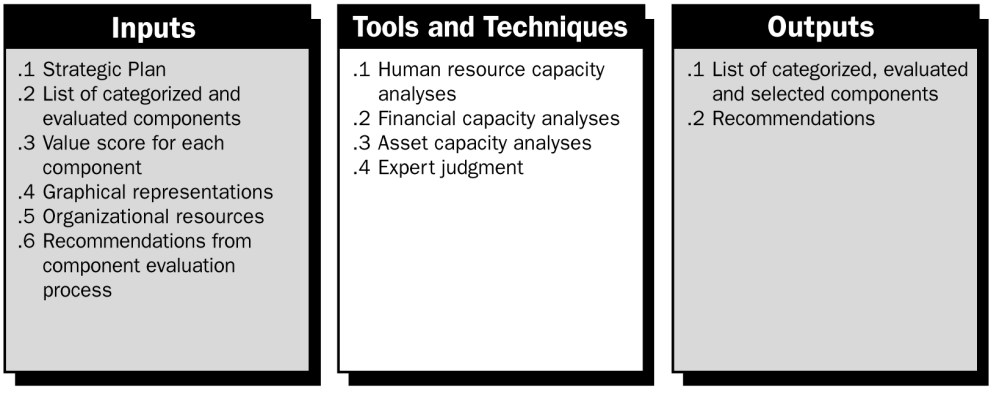

Figure 6. Tools and Techniques for Component Selection

Tools and techniques for component selection aim at helping the organization to effectively reduce, if and whenever possible, the number of components that will be considered for further prioritization and inclusion in a balanced portfolio. This might be done by using the results of the scoring model to eliminate those components not meeting ''acceptance threshold scores'' with respect to one or several predetermined criteria and/or indicators.

At this stage of the portfolio management process, available tools and techniques to complement and/or validate, if and whenever required, the results of the scoring

model to ensure the most desirable components are selected for inclusion in the portfolio, include, among others:

.1 Human Resource Capacity Analyses
A human resource capacity analysis must be conducted to understand the capacity of the organization to source and execute the selected projects. The analysis must be done by skill sets to understand the constraint generated by certain skill-set limitations. Internal resource capacity must be measured and external resource availability must be established to have a complete capacity picture. The human resource capacity will be a limiting factor for the number a projects that the organization can execute.

.2 Financial Capacity Analyses
A financial resource capacity analysis must be conducted to understand the capacity of the organization to finance the selected projects. The analysis must be done through the financial and/or budget process of the organization. Internal financial capacity must be measured and external financial capacity availability must be established to have a complete capacity picture. The financial resource capacity will be a limiting factor for the number of projects that the organization can execute.

.3 Asset Capacity Analyses
An asset resource capacity analysis must be conducted to understand the physical needs of the organization to support the selected projects. The analysis must be done by type of assets (equipment, building, etc.) to understand the constraint generated by certain asset limitations. The asset capacity will be a limiting factor for the number of projects that the organization can execute.

.4 Expert Judgment
Expert judgment is often used to assess the inputs needed to select the components. Such judgment and expertise is applied to any technical and management details during this process.

3.2.1.5 Prioritization

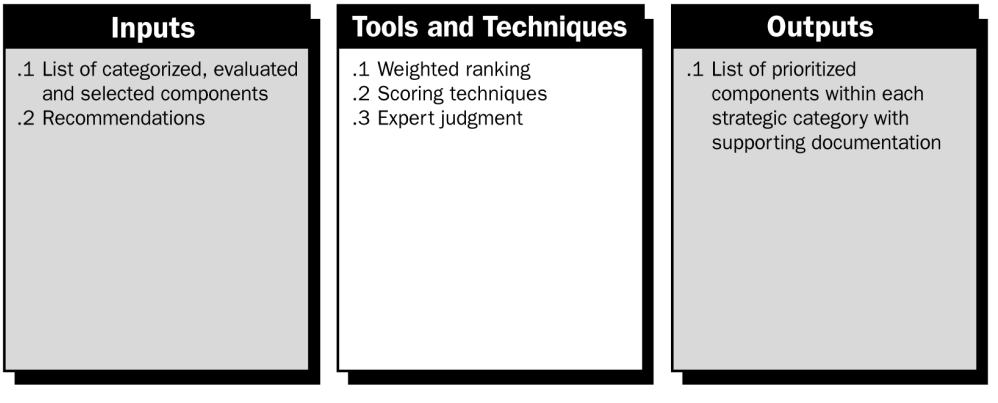

Figure 7. Tools and Techniques for Component Prioritization

Tools and techniques for component prioritization aim at helping the organization to effectively choose, if and wherever possible, which components will be prioritized over others to be programmed in a timely fashion for inclusion in a balanced portfolio. This might be done by using the same criteria and indicators used in the scoring model to evaluate and select components. In this case, however, the components will be compared as being part of a whole with many criteria to be met both as separated and combined entities, in an effort to prioritize them in a coherent way, ensuring the best alignment possible with the strategic plan.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Weighted Ranking

In this case, prioritization usually involves the simple ranking of components within each category based on values assigned. Components are ranked from high to low (or low to high depending upon the organization's preference) according to pre-established criteria.

	PROJECT A	PROJECT B	PROJECT C	PROJECT D	PROJECT E	PROJECT F	RANK	
PROJECT A		1	1	1	1	1	5	First Priority
PROJECT B	0		0	1	1	0	2	
PROJECT C	0	1		1	1	0	3	
PROJECT D	0	0	0		1	0	1	
PROJECT E	0	0	0	0		0	0	Last Priority
PROJECT F	0	1	1	1	1		4	

Figure 8. Single Criterion Prioritization Model

PROJECTS	Criteria 1		Criteria 2 * Probability of Success		Criteria 3		Criteria 4		PRIORITY	
	Measure	Rank	Result	Rank	Level of Importance	Rank	Measure	Rank	Score	Priority
Project 1	16.0	2	8.8 ($11M X 80%)	2	5 (++)	1	2M$	1	1.50	1
Project 3	14.0	4	18.9 ($21M X 90%)	1	4	2	2.5M$	2	2.25	2
Project 4	15.5	3	8.45 ($13M X 65%)	3	2	4	3M$	3	3.25	3
Project 2	19.0	1	5.95 ($7M X 85%)	4	1 (--)	6	4.3M$	4	3.75	4
Project 5	10.0	6	5.4 ($6M X 90%)	5	3	3	5.2M$	6	5.00	5
Project 6	12.0	5	2.1 ($3 MX 70%)	6	1.5	5	4.6M$	5	5.25	6

Figure 9. Multiple Criteria Weighted Ranking

Ranking can be done using one or more criteria, as illustrated in Figures 8 and 9. The single criterion approach, as illustrated above, is usually a pair comparison

of different projects with one another, to rank them hierarchically from the one that should be given the highest priority to the one(s) that should not be undertaken within a given portfolio cycle. In the example presented in Figure 8, each project is compared to each of the others, then scored and prioritized using the following steps:

- If project A has more value than project B, score 1
- If project B has less value than project C, score 0
- Add scores horizontally for each project
- The project with the highest score becomes the first priority.

A multiple criterion model for weighted ranking, as the one illustrated in Figure 9, can be designed and used effectively by going through the following simple implementation steps:

- Choose a series of evaluation criteria
- Measure each project for each criterion
- Rank projects for each criterion
- For each project, add the rank number and divide by the number of criteria measured to produce the score
- Determine the priority based on the score (the lowest score giving the highest priority).

.2 Scoring Techniques
The numerical methods that are used to consolidate ranked components within each category, as illustrated in Figure 9.

.3 Expert Judgment
Expert judgment is often used to assess the inputs needed to determine how to prioritize components. Such judgment and expertise is applied to any technical and management details during this process.

3.2.1.6 Portfolio Balancing

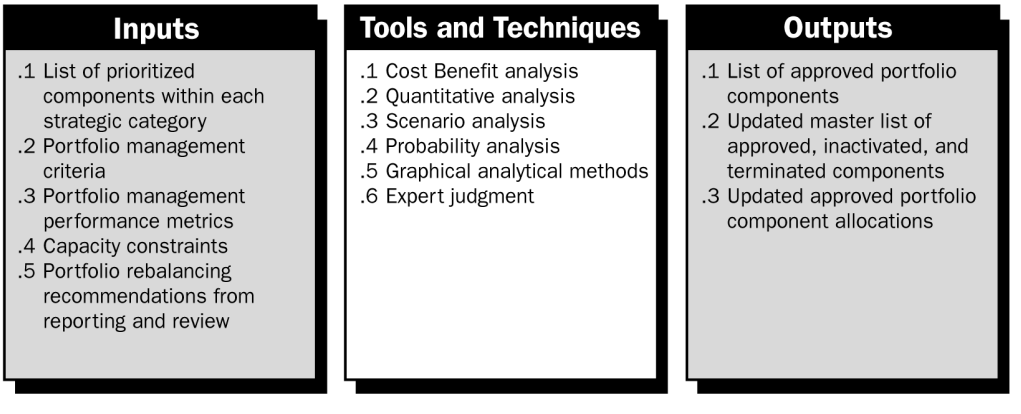

Figure 10. Tools and Techniques for Portfolio Balancing

Tools and techniques for portfolio balancing aim at helping the organization to effectively select and implement a portfolio ensuring the best overall alignment possible with the strategic plan. Portfolio components can be balanced with one another, usually within the same category (categorization also being an attempt to balance components to address all of the diverse concerns and objectives of the organization),

using a variety of qualitative and quantitative methods and software tools to support the decision-making process and allocate budget.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Cost Benefit Analysis
Any financial analytical method preferred by the organization. These methods may include: Net Present Value (NPV), Discounted Cash Flow (DCF), Internal Rate of Return (IRR), cost benefit ratio, payback, and options analysis.

.2 Quantitative Analysis
Quantitative analysis may include the use of spreadsheets or other tools to examine factors of interest such as resource loading requirements over time or cash flow, for example.

.3 Scenario Analysis
This analytical method enables decision makers to create a variety of portfolio scenarios using different combinations of both potential components and current components. The analysis can be further enhanced by incorporating numerous baselines.

.4 Probability Analysis
These methods may include decision trees, flowcharts, and Monte Carlo simulation. Components are evaluated using success and failure probabilities for estimated cost, anticipated revenues, risk, and other desired criteria.

.5 Graphical Analytical Methods
These are graphical methods such as risk vs. return charts, histograms, pie charts, and other methods to evaluate the portfolio. The next two figures present some of the graphical representations most often used by organizations to balance and monitor their portfolios.

Figure 11 presents a typical bubble graph that help compare and balance portfolio components according to some pre-established ''balancing and monitoring'' criteria. A bubble graph uses indicators from the scoring model or new indicators concerned with portfolio balance:

- Each bubble is a project
- Bubble size often represents an additional variable such as cost or net present value
- Bubble color might refer to a specific category or any other qualitative criterion required to measure balance.

Figure 12 illustrates another variance of the bubble graph, displaying portfolio components according to the category they belong to as well as according to the business unit impacted/targeted by the component to be implemented. The bubble graph also uses other indicators from the scoring model or new indicators concerned with portfolio balance:

- Each bubble is a project
- Bubble size often represents an additional variable such as cost or net present value
- Bubble color might refer to a specific qualitative criteria required to measure balance.

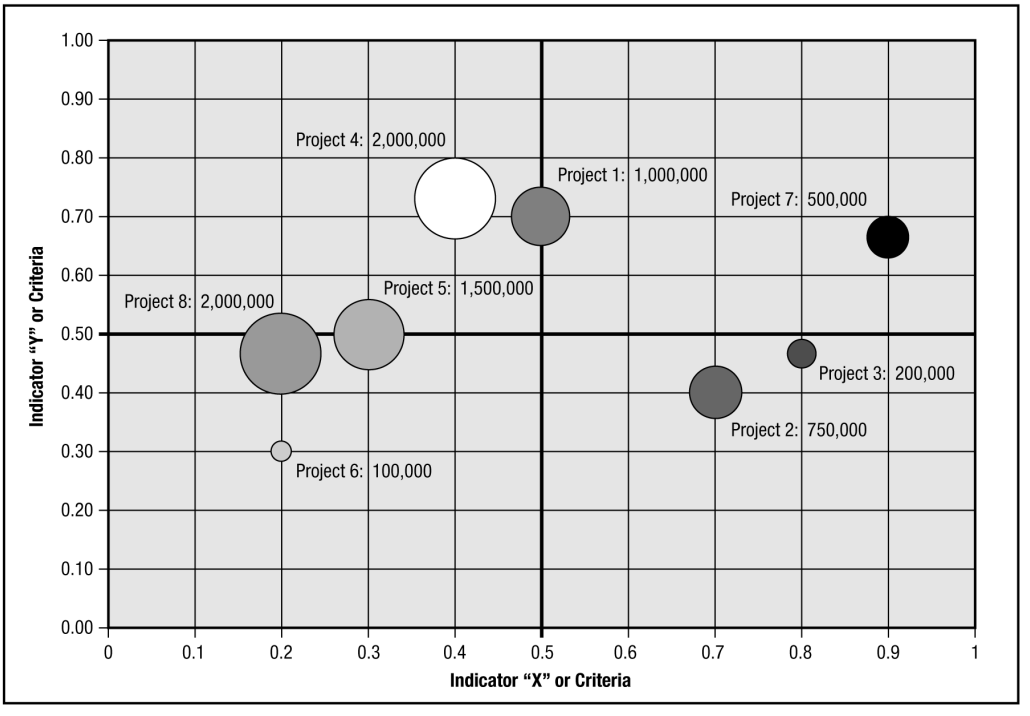

Figure 11. Portfolio Balancing Using Indicators or Criteria

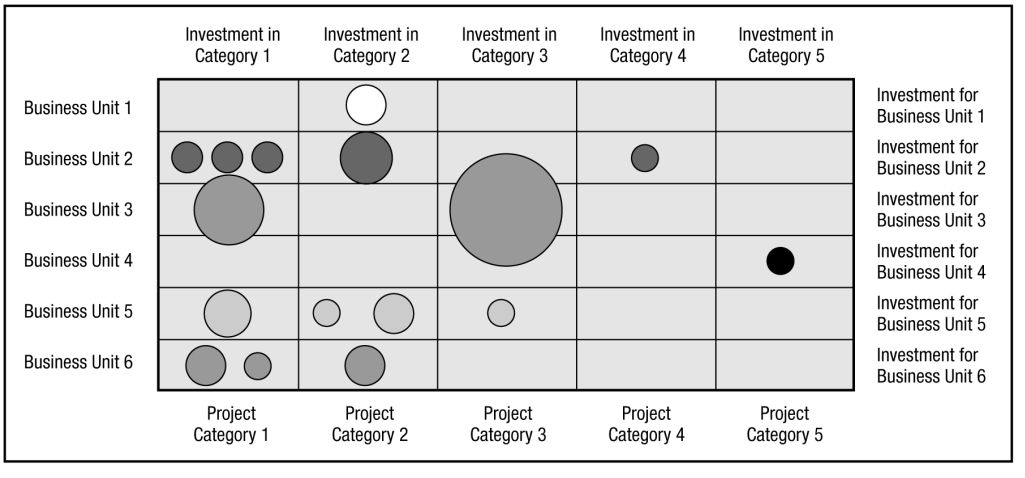

Figure 12. Portfolio Balancing Using Strategic Categories and Targeted Business Units

.6 Expert Judgment

Expert judgment is often used to assess the inputs needed to determine how to balance the portfolio. Such judgment and expertise are applied to any technical and management details during this process.

3.2.1.7 Authorization

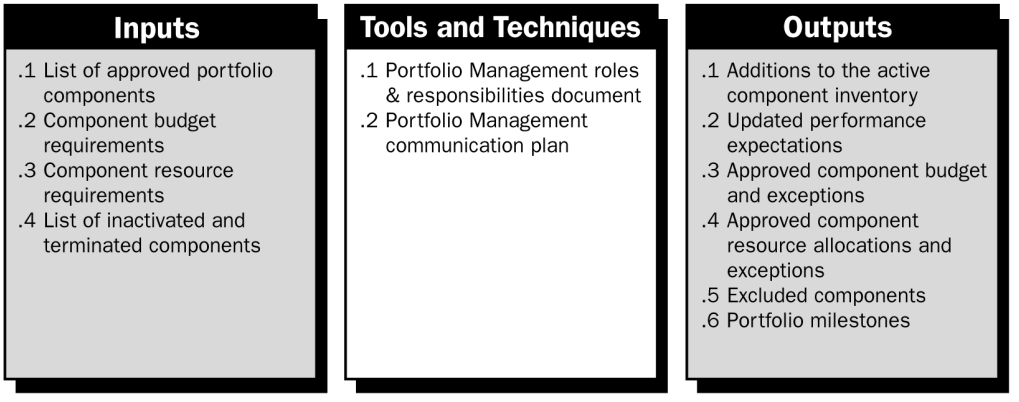

Figure 13. Tools and Techniques for Component Authorization

Tools and techniques for component authorization are mainly concerned with helping the organization to effectively communicate the decisions with respect to components included in the balanced portfolio and to assign roles, responsibilities, and performance milestones for their implementation and monitoring.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Portfolio Management Roles & Responsibilities Document
The portfolio management roles & responsibilities document identifies stakeholders, defines roles, and specifies responsibilities for all participants in the portfolio management process.

.2 Portfolio Management Communication Plan
The portfolio management communication plan defines all communication needs, establishes communication requirements, specifies frequency, and identifies recipients for information associated with the portfolio management process.

3.2.2 Monitoring Process Group

3.2.2.1 Portfolio Reporting and Review

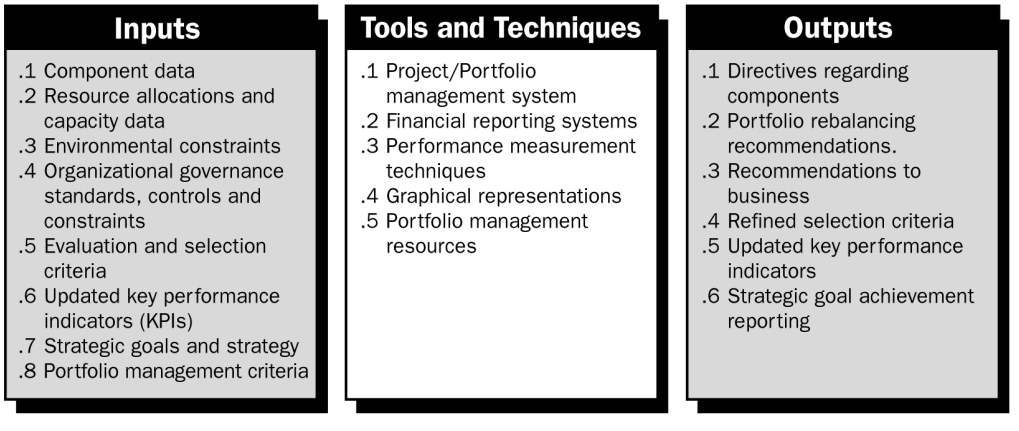

Figure 14. Tools and Techniques for Portfolio Reporting and Review

Tools and techniques for periodic reporting and review are mainly concerned with helping the organization to effectively monitor its portfolio to ensure that it is still balanced as a whole and that its individual components stay aligned and perform as expected.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Project/Portfolio Management System
The portfolio management system is the central, typically electronic, repository for component-level information that can be rolled up for management analysis and decisions. It can exchange information with the systems and applications used by components.

.2 Financial Reporting Systems
Like the portfolio management system, the financial systems provide data that managers use to determine whether components should be removed, reprioritized or realigned within the portfolio.

.3 Performance Measurement Techniques
Progress measurement techniques. The tools and techniques used at the portfolio level are similar to those used in a component, such as earned value.
Value measurement techniques. The portfolio is also interested in the value resulting from the component's progress, and how the component is contributing to the strategic goals. This is where management applies performance indicators and models which the organization may be using to measure strategic performance.

.4 Graphical Representations
Progress measurement techniques can also use graphical representations to help compare desired and/or planned situations with actual situations.

A typical graphical tool used is the ''traffic light'' analogy. Performance results are compared to planned/desired values for different indicators using a three-color coding representation:

- GREEN—evolution/forecast situation in line with desired results
- YELLOW—some difficulty encountered/perceived but effective corrective action possible or being implemented
- RED—critical situation calling for replanning, an urgent intervention, that might even include postponing implementation or terminating the component
- With an identified scale acceptable by all which needs to be defined in the graph.

''Radar'' graphs can also be used to compare a project evolution with its desired performance and/or global portfolio performance criteria, as illustrated in Figure 15.

The same type of graphical tool can also be used to compare several components as they evolve either between themselves or with preset global portfolio performance indicators, in order, for example, to see global tendencies towards the respect of specific criteria and uncover a possible systemic issue affecting the portfolio as a whole.

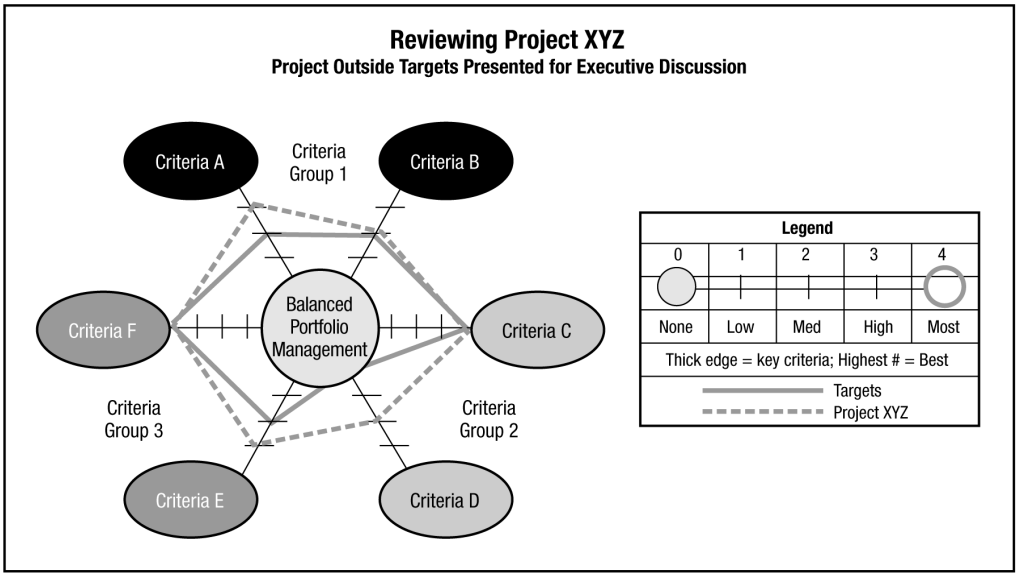

Figure 15. Graphical Representation of a Project and How It Performs Compared to Preset Performance Criteria

Bubble graphs similar to Figures 11 and 12 can also be redrawn using new current components' performance results and other characteristics, and compared to the results of the prior balancing step to see the evolution of the portfolio and its components over time and ensure that the desired overall balance and alignment are being maintained.

.5 Portfolio Management Resources
Depending on the organization's size and complexity, the portfolio may be managed by a single person or a team, and decisions regarding components may be made by senior management or a specially chartered ''review board.''

3.2.2.2 Strategic Change

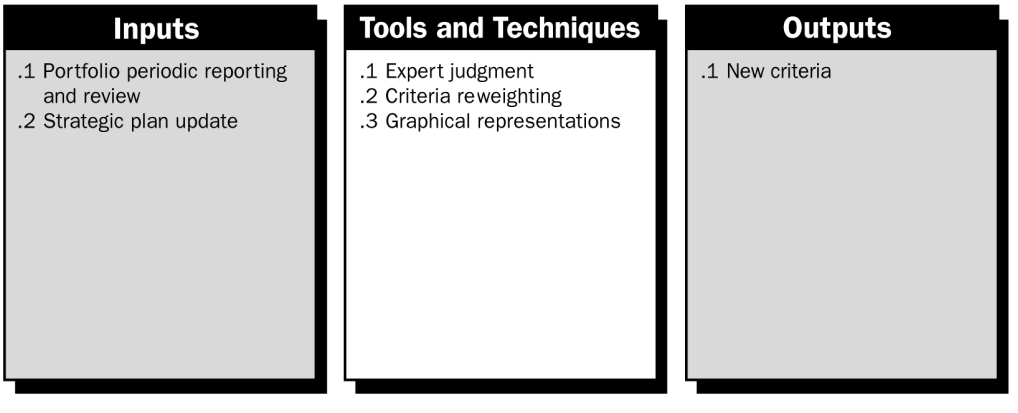

Figure 16. Tools and Techniques for Tracking Strategic Change

Tools and techniques for tracking and taking into account strategic changes aim at helping the organization to effectively take into account new business conditions arising over time. These should help measure the effect of these new conditions on the organization's current strategy, as well as to determine what has to be done. This might include putting into place new criteria/indicators and/or new criteria weights to re-evaluate the portfolio and realign and balance its current components or newly required components to respond to those strategic changes.

At this stage of the portfolio management process, available tools and techniques include, among others:

.1 Expert Judgment
Expert judgment is often used to assess the inputs needed to determine whether a strategic change will occur and what will be its effect on the current portfolio.

.2 Criteria Reweighting
Changing business conditions might necessitate reconsideration of the original criteria used for both aligning and monitoring the project portfolio and its components. This will result in a change in the weights assigned to key indicators and criteria and/or the inclusion of new criteria for the subsequent realignment of the components to address new business conditions.

.3 Graphical Representations
Graphical representations can also be used to illustrate required changes to portfolio management criteria, following a change in business conditions. The example illustrated in Figure 17, shows that strategic changes due to some new business conditions call for the reweighting of two of the six criteria used for portfolio management by the impacted organization

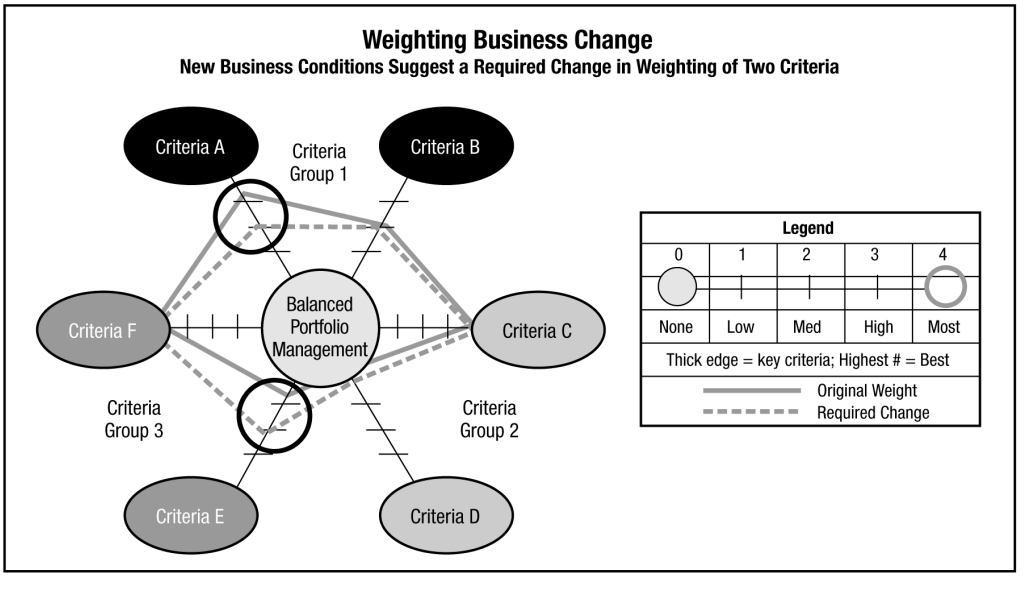

Figure 17. Graphical Representation of a Required Change in the Weighting to Use for Two Criteria

Section IV

Glossary and Index

Glossary

Index by Keyword

Glossary

Authorization. The process of approving, funding, and communicating the authorization for initiating work on a component included in the ''balanced portfolio.''

Business Case. A documented economic feasibility study used to establish validity of the benefits of a selected component lacking sufficient definition and that is used as a basis for the authorization of further project management activities.

Capacity. The resources (human resources, financial, physical assets) which an organization puts at the disposal of portfolio management to select, fund, and execute its components.

Categorization. The process of grouping potential components into categories to facilitate further decision-making.

Category. A predetermined key description used to group potential and authorized components to facilitate further decision-making. Categories usually link their components with a common set of strategic goals.

Class. A key descriptor telling if a (potential) component is a business case, a project, a program, a portfolio or other work.

Component (Portfolio). An activity or set of activities which is managed using the project portfolio management process, namely a business case, a project, a program, a portfolio, or other work that fits into the ''component definition'' used by an organization.

Determining Factors. Key descriptors of the portfolio such as component definition, category definition, key criteria definition, and resources capacity to support the portfolio management process. The determining factors are agreed upon by the executive group and are based on the organization strategic plan.

Evaluation. The process of scoring specific potential components using key indicators and their related weighted criteria for comparison purpose for further decision-making.

Filter. Criteria used to evaluate and select a potential component or decide whether a component meets the ''go/no go'' conditions.

Identification. The process of documenting and assembling, for further decision-making, the inventory of ongoing and proposed new components as potential components for categorization.

Inventory. A set of components, comprising all active components as well as proposals for new components, properly documented using key descriptors, use as a basis for portfolio management decision-making.

Key Criteria. Predetermined measures, values or conditions used in a scoring model to measure alignment with strategic goals.

Key Descriptors. A set of characteristics used to categorize and document a component for further decision-making. It might include among others, specifics about scope, schedule, budget, actual performance (using key performance indicators), class, category, evaluation scores, priority, and approval status.

Key Indicators. A set of parameters that permits visibility into how a component measures up to a given criterion.

Key Performance Indicators. A set of parameters that permits measurement and reporting on the performance of the portfolio or of one of its components for further decision-making.

Management-by-Projects. The application of the project management discipline to achieve or extend an organization's strategic goals.

New Component. A component that is being added to an existing project portfolio.

Organizational Governance. The process by which an organization directs and controls its operational and strategic activities, and by which the organization responds to the legitimate rights, expectations, and desires of its stakeholders.

Other Work. Anything that fits into the ''component definition'' used by an organization and that cannot be classified as a business case, a project, a program, or a portfolio.

Phase Gates. Decision points for ''go/no go'' control decisions for projects, programs, and portfolios.

Portfolio. A collection of projects or programs and other work that are grouped together to facilitate effective management of that work to meet strategic business objectives. The projects or programs of the portfolio may not necessarily be interdependent or directly related.

Portfolio Balancing. The process of organizing the prioritized components into a component mix that has the best potential to collectively support and achieve strategic goals.

Portfolio Management. The centralized management of one or more portfolios, which includes identifying, prioritizing, authorizing, managing, and controlling projects, programs, and other related work, to achieve specific strategic business objectives.

Portfolio Management Communication Plan. A plan defining all communication needs, establishing communication requirements, specifying frequency, and identifying recipients for information associated with the portfolio management process.

Portfolio Management Life Cycle. A life cycle of processes used to collect, identify, categorize, evaluate, select, prioritize, balance, authorize, and review components within the project portfolio to ensure that they are performing compared with the key indicators and the strategic plan.

Portfolio Periodic Reporting and Review. The process of reporting on the portfolio components as a whole using key indicators and reviewing the performance of the component mix by comparing actual with anticipated evolution, value, risk level, spending, and strategic alignment.

Potential Component. A component that fits the predetermined ''component definition,'' but has not yet been authorized to be part of the project portfolio.

Prioritization. The process of ranking the selected components based on their evaluation scores and other management considerations.

Program. A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually. Programs may include elements of related work outside of the scope of the discrete projects in the program.

Program Management. The centralized coordinated management of a program to achieve the program's strategic objectives and benefits.

Program Management Office. The centralized management of a particular program or programs such that corporate benefit is realized by the sharing of resources, methodologies, tools, and techniques, and related high-level project management focus.

Project. A temporary endeavor undertaken to create a unique product, service, or result.

Project Management. The application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

Scoring Model. A set of weighted criteria and corresponding key indicators to measure and score components for comparison and prioritization purposes.

Selection. The process of deciding on the components to be put forward from evaluation to prioritization based on their evaluation scores.

Strategic Change. Any change in the strategic intentions and plans of the organization that can impact the contents of component definition, categories, filters, key indicators, and other decision-making parameters used for portfolio management.

Strategic Goals. The definition of an organization's intended achievements in terms of business and cultural results, within a specified timeframe, and usually associated with specific metrics.

Strategic Plan. A high-level document that explains the organization's vision and mission, plus the approach that will be adopted to achieve this mission and vision, including the specific goals and objectives to be achieved during the period covered by the document.

Subportfolio. A collection of components which includes programs, projects, portfolios, and other work grouped together within a larger portfolio.

Weight. A multiplication factor used to convey the relative importance of key criteria used in a scoring model.

Index by Keyword