

An Example Portfolio Management Process

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Portfolio management is the process of clarifying, prioritizing, and selecting the projects and features an organization wishes to pursue. It includes activities that ensure the development efforts are aligned with the overall business objectives of the company and enables organizations to effectively and efficiently determine which projects and features provide the most significant return on investment. This white paper provides an example portfolio management process and guidance for tailoring it to meet the needs of an adopting organization.

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Overview of Portfolio Management

Portfolio management is the process of clarifying, prioritizing, and selecting the projects an organization wishes to pursue. It evaluates and prioritizes the features targeted for inclusion in specific product releases. It encompasses techniques to ensure the projects and feature sets are aligned with business objectives, that technical impacts are well understood, and that product releases include the highest value features.

A strong portfolio management process enables organizations to effectively and efficiently determine which projects and features provide the most significant return on investment. It aids technology-selection decisions, provides guidance to ongoing architecture work, enables capacity planning, and informs development decisions. The lack of an effective process can reduce the desirability of the end product because guidance on priorities is not shared throughout the organization. It can reduce development productivity because significant time, effort, and money is spent making decisions about priorities in the early or even the mid to late stages of a project.

Example Portfolio Management Process

This best practice paper outlines an example portfolio management process and includes guidance on how to modify it to support the unique needs of individual organizations.

The example is based on an organization in which the business is organized along product lines. The portfolio management process needs to evaluate project ideas to determine the highest value items for each product and for the business as a whole. The organization delivers new releases of each product to its customers once every 12 to 18 months. It actively manages the feature set to hit specific release dates. A three to five year development roadmap is maintained to provide visibility into the themes and marquee features of future releases. The roadmap is actively managed and evolved as the business needs change and evolve.

The tailoring section later in this white paper outlines some considerations for organizations that are modifying the example to work within different types of organizations.

Terminology

Before we describe the phases and activities of the portfolio management process in detail, some key terms and roles of this process need to be described. This process overview uses the following terminology:

Table 1 *Terminology*

Term	Definition
Business Case	A brief summary of the proposed project. It discusses the high-level requirements, identifies the business owners, describes all relevant non-functional requirements, and lists impacted products.
Portfolio Management Team	The Portfolio Management Team (PMT) includes the individuals who drive the overall process and ensure the necessary work is occurring. It includes participants from the technical group, business analysts, business owners, and project management.
Steering Committee	The Steering Committee includes product managers, program managers, and technical representatives. The team represents the needs of the customer base, understands the needs of the business, and evaluates the technical implications of requests.
Steering Committee chair	<p>The Steering Committee chair has the authority to make the final call on allocating specific projects into the roadmaps during the Steering Committee meetings. The Steering Committee chair is responsible for obtaining approval from senior management for the proposed roadmaps. The individual in this role has the following attributes:</p> <ul style="list-style-type: none"> ■ Well-aligned with the company's overall vision ■ Able to distinguish when projects are in or out based on the vision ■ Skilled in conflict resolution ■ Trusted by senior management and given sufficient authority to make the necessary decisions ■ Respected within the organization ■ Knows when and when not to escalate issues to senior management ■ Capable of balancing business and technical value to make the best overall decision for the organization
Authorities	An authority is responsible for funding and championing a release.
Agent	The agent is the person empowered to carry out a release. The agent is responsible for planning and tracking the release activities to ensure they meet the business goals. The agent is typically a project manager.
Stakeholders	Stakeholders include key individuals or organizations that are impacted by the release. Stakeholders often define the completion criteria. The completion criteria include the most important elements the team must meet for the stakeholders to consider the release successful. The stakeholders are often product managers and executives from the product lines.

Process Overview

The following diagram provides an overview of the portfolio management process from idea submission to a complete development of the roadmap and a set of product roadmaps.

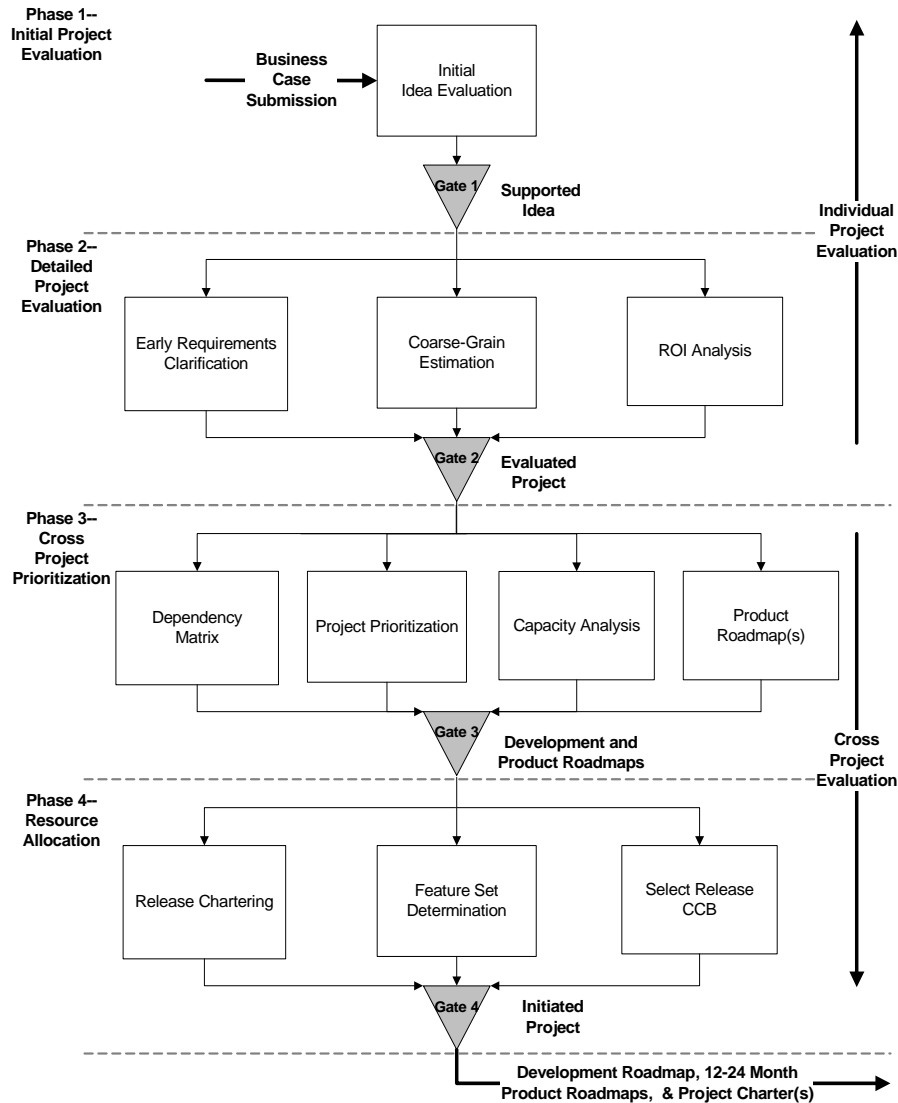


Figure 1 Portfolio Management Process Overview

- **Fuzzy Estimation**—The business owner and technical staff provide a high-level estimate for the project based on its feature list. At this point in time, the estimate ranges are provided using fuzzy estimates of Very Small, Small, Medium, Large, and Very Large.

The organization might need to map the fuzzy estimate ranges to actual effort ranges, such as 0-3 months, 1-5 months, 4-9 months, 6-12 months, and 12 or more months. The fuzzy estimates should overlap to indicate the level of uncertainty at this point in time.

- **Detailed Analysis Estimation**—The technical staff provide an estimate for the effort required to complete the detailed investigation for the project.

This information is used to create a prioritized list of open business cases. At this point, the prioritization is an indication of which projects will be the first ones to receive further investigation. The Portfolio Management Team then submits the prioritized list of business cases to any necessary senior management stakeholders for its approval or modifications.

Timing

The initial reviews of the business cases will occur once a month.

Exit Criteria

This phase is completed when the following are available:

- Each business case has an alignment score, a fuzzy estimate, and an estimate of the effort for detailed analysis.
- The submitting business owner has been notified of the results of the alignment score and the estimate and has requested that the project progress to the detailed evaluation phase.
- The prioritized list of business cases has been updated based on the results of the phase. This list will be used to determine which projects are first in line for the detailed evaluation that occurs in the next phase.
- All necessary senior management stakeholders have approved the prioritization.

Phase 2-Detailed Project Evaluation

Entry Criteria

A current version of the prioritized project list is available.

Phase Activities

During this phase, the high-level business requirements and technical constraints are determined, a preliminary estimate is established, and a return-on-investment (ROI) analysis is completed. This phase provides a more detailed analysis of the business case, so its value and effort are more clearly understood.

The detailed investigation of the project and its major features is initiated based on staff availability and the existence of open business cases that have met the exit criteria for the previous phase. Selection of the projects to investigate further is based on the priority list generated during Phase 1.

Early Requirements Clarification

Business requirements are the “why are we doing this” requirements and capture the fundamental reason for the project’s existence. They describe the high-level objectives of the organization or customer requesting the system. Technical constraints and limitations are identified during this evaluation.

A variety of tools and techniques can be used to elicit business requirements; however, one highly effective tool is facilitated requirements workshops.

Preliminary Estimation

A preliminary estimate of the effort necessary to complete the project and its features is produced. The estimate should be given in ranges such as 3-6, 6-12, 12-18, and 18 or more effort months. The use of ranges at this point in time reflects the inherent uncertainty of early estimates.

The estimate should include all of the work necessary to complete the technical requirements, build the code, and test and release the project.

ROI Analysis

ROI analysis provides a common mechanism to evaluate the expected value to the business from the project. The ROI calculation should include the projected benefit for the project. In this step, the expected ROI for a feature is developed based on the model the organization decides to implement.

A sample ROI model is shown in Figure 3.

Financial Model - PROJECT NAME									
<i>Shows financial and risk analysis for this project</i>									
		Five years useful life (Dollars in 000's)							
		Initial Outlay	Year 1	Year 2	Year 3	Year 4	Year 5	Total	
BENEFITS									
Revenue Increases			\$ 265	\$ 790	\$ 1,500	\$ 2,350	\$ 3,100	\$ 8,005	
Cost Reductions			\$ 58	\$ 125	\$ 345	\$ 456	\$ 680	\$ 1,664	
Productivity Improvements			\$ -	\$ 45	\$ 98	\$ 125	\$ 210	\$ 478	
Total Revenue		\$ -	\$ 323	\$ 960	\$ 1,943	\$ 2,931	\$ 3,990	\$ 10,147	
COSTS									
Purchases		\$ 1,500						\$ 1,500	
Implementation		\$ 1,150	\$ 575					\$ 1,725	
Recurring Costs			\$ 250	\$ 412	\$ 458	\$ 565	\$ 760	\$ 2,445	
Total Costs		\$ 2,650	\$ 825	\$ 412	\$ 458	\$ 565	\$ 760	\$ 5,670	
RISK ADJUSTMENTS									
Revenue Risks	10%	\$ -	\$ 27	\$ 79	\$ 150	\$ 235	\$ 310	\$ 801	
Cost Risks	15%	\$ 398	\$ 124	\$ 62	\$ 69	\$ 85	\$ 114	\$ 851	
Total Risk Reserves		\$ 398	\$ 150	\$ 141	\$ 219	\$ 320	\$ 424	\$ 1,651	
Risk Adjusted Net Cash Flow		\$ (3,048)	\$ (652)	\$ 407	\$ 1,266	\$ 2,046	\$ 2,806	\$ 2,826	
Cumulative Net Cash Flow		\$ (3,048)	\$ (3,700)	\$ (3,293)	\$ (2,026)	\$ 20	\$ 2,826		
								Discount Rate (Cost of Capital) =	10%
								Net Present Value (NPV) =	\$ 716
								Internal Rate of Return (IRR) =	16%
								Payback =	Year 4

Figure 3 Return-on-Investment Model

Communication Requirements

The following information is available to all stakeholders:

- A rolling plan showing which projects are being investigated, the expected completion date, and the participants
- The status of all business cases

Timing

This phase is ongoing. The detailed investigation of business cases occurs throughout the year as technical and business resources are available. Phase 1 ensures that appropriate senior management stakeholders reevaluate the project prioritization on a monthly basis. The work in this phase is driven by that prioritized list.

Exit Criteria

This phase is complete for an individual business case when the following are available:

- Business requirements are complete
- A preliminary estimate is available
- An ROI calculation is available
- The sponsoring stakeholders have approved the project for further evaluation

Phase 3–Cross-Project Prioritization

Entry Criteria

This phase begins when the following has occurred:

- Detailed investigation of the project and at least its high-priority features has been completed and the items have been approved for further consideration
- A current prioritized list of projects is available

Phase Activities

In this phase, the Steering Committee reviews all of the open business cases and determines their priority relative to one another. This phase assigns proposed projects to the all-development roadmap and individual product roadmaps based on their difficulty, interdependencies, and value to the business.

Dependency Matrix

The technical group evaluates the open business cases to determine if there are interdependent projects or features within a specific project. The output of this effort is a matrix that visually displays the interrelationships.

An example of a dependency structure matrix for the features in a project is shown in Figure 4.

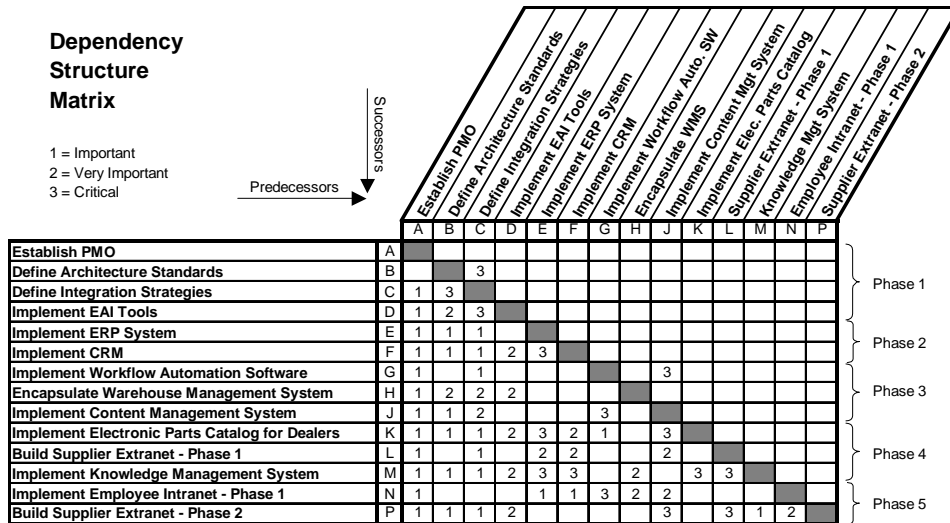


Figure 4 Dependency Structure Matrix

Project Feature Set Prioritization

The set of open features for the project are evaluated to determine which subset provides the best return on the investment. An approach like the following can be used to perform this prioritization:

1. **Initial Evaluation.** The Portfolio Management Team reviews and creates, as appropriate, an alignment score, ROI estimate, and dependencies for the features. This work can also be delegated to the product team, with the final output reviewed by the Portfolio Management Team. At the conclusion of this phase, the group should have information along the lines of Figure 2 (shown earlier).
2. **Group Discussion and Formation of a Time Line.** The Steering Committee discusses the projects and feature sets in further detail. During this step, individuals advocate for the projects or features they wish to have incorporated into the next releases.

With the help of the technical staff, the Steering Committee runs scenarios of what it would look like to have different sets of projects approved at different points in time. The group will iterate between the scenarios and participate in additional discussion to provide input from different perspectives on the best set of projects to allocate to the product lines for the upcoming releases.

The adopting organization might wish to consider developing a tool or set of tools to support the analysis and discussion that needs to occur in this phase.

Capacity Analysis

The proposed projects must be balanced with the organization's capacity to produce the software. This includes balancing realistic initial project estimates for new projects with the skills and availability of the existing internal and external resources, the amount of estimated work remaining to complete ongoing projects, as well as well any plans and budgets for increasing capacity through hiring, training, and/or outsourcing. New projects should be launched only when there is sufficient capacity and any necessary key staff are available. Overcommitment to new projects will simply delay all projects currently occurring in the organization.

Roadmap Creation

After the discussion and timing evaluations are complete, the chair of the Steering Committee makes the final call about which projects occur when on the all-development roadmap. When a draft roadmap is completed, the chair reviews it with appropriate senior management stakeholders. This group can approve the roadmap, modify the roadmap, or return the roadmap to the Steering Committee for additional work.

Timing

The development roadmap and product roadmaps are reviewed and updated every quarter. The development roadmap shows how the overall projects have been allocated to the product lines and any dependencies at that level. The product roadmaps show the marquee requirements and major themes for each release.

Exit Criteria

This phase is complete when the appropriate business stakeholders have approved an updated 2-5 year development roadmap and 12-24 month product roadmaps.

Phase 4-Resource Allocation and Project Initiation

Entry Criteria

This phase can begin any time after the previous phase has been completed.

Phase Activities

Project Chartering

A primary activity in this phase is shifting responsibility for the project from the business to the designated agent. The project charter identifies the authorities, agent, key stakeholders, and completion criteria. The charter lays the foundation for management for the remainder of the release and describes how it will be run.

Feature Set Determination

Prior to the development of the detailed technical requirements, the estimate for each feature is subject to significant uncertainty. The first phase of the project will focus on expanding the business requirements into functional and technical requirements that support more precise estimation.

To ensure business visibility while embracing the inherent uncertainty in early estimates, each release is chartered with a list of features that will be included and another set that might be included. This list might appear as outlined in Table 3.

Table 3 *Release Cut List*

Prioritized Feature List	Status
Feature #1	In
Feature #2	In
Feature #3	In
Feature #4	In
Feature #5	In
Feature #6	Tentative
Feature #7	Tentative
Feature #8	Tentative
Feature #9	Tentative

The main items to consider when reviewing the prioritized feature list are whether the most important features are highest in the list and whether or not the product will have sufficient value if the project can only deliver the features that are marked as “In” in the Release Cut List. If the project cannot deliver sufficient value with these features, the organization might wish to consider pursuing a different project.

Select Release CCB

Each product release has a change control board (CCB) that provides systematic identification and analysis of requested changes to the product scope. During this phase, the Steering Committee determines the stakeholders who need to participate on the CCB for the particular release. The CCB includes representatives from all material functions of the business, project managers, requirements analysts, and technology representatives.

Timing

The resource allocation step should occur on an as-needed basis. This step occurs when the organization is ready to officially begin the project.

Exit Criteria

This phase is completed when the following are available:

- A project charter
- A release plan including the project and its proposed feature set
- A release CCB

Tailoring Guidance

Construx recommends that organizations adopting the example portfolio management process define the overall process, including the steps involved, roles that participate, information needed, decisions that need to be made, and timing of those decisions. Specific areas that organizations should consider when tailoring the portfolio management process include

- Identify the major products or groups that need to participate in the decision-making process regarding which projects the organization should pursue and which features should be allocated to specific projects.
- Determine any specific constraints, such as a regular release cycle, that will impact the portfolio management process.
- Determine the frequency at which the organization will release products to its customers.
- Define the organizational specific roles, responsibilities, and authorities that are involved in the process.
- Create a set of specific decision criteria that will be used for project prioritization and selection. This will ensure that tactical decisions are aligned with strategic objectives and key initiatives.
- Determine how decisions will be made for selecting new technology and using third-party products.
- Establish a large-grain, fuzzy estimation process that will be used early in the process to make tradeoff decisions between projects.
- Determine the frequency, timing, and staff needed to evaluate projects and features early in the process. Understanding the users and the stakeholders and developing a solid business case for each project is critical to making decisions about the final feature set and timing. It is also critical that time be allocated for this to occur as early as possible. A quick analysis of whether the idea or a portion of the idea should even be considered further supports organizational efficiency.
- Create a mechanism to balance the planned set of projects with the organization's capacity to produce them.
- Determine the frequency of occurrence for each step in the process.
- Establish a communication path to ensure the appropriate people are notified if important decisions such as delivery date or feature set changes need to be discussed.
- Create a process overview outline for the proposed portfolio management process, publish the outline, and use it as a baseline for ongoing evolution. This outline should include an overview of the process and roles so that the steps, timing, and participants are understood throughout the organization.

Beyond establishing the baseline portfolio management process, it is important to monitor the performance of the portfolio management process to ensure it continually meets the needs of the business. When you begin using the portfolio management process, it is useful to conduct a retrospective or review after using each phase for the first time and at the conclusion of the first project. After that, an ongoing mechanism to revisit the process and continually improve it over time should be established.

About Construx

This white paper was created by Construx Software Builders, Inc. Construx Software is the market leader in software development best practices training and consulting. Construx was founded in 1996 by Steve McConnell, respected author and thought leader on software development best practices. Steve's books *Code Complete*, *Rapid Development*, and other titles are some of the most accessible books on software development, with more than a million copies in print in 20 languages. Steve's passion for advancing the art and science of software engineering is shared by Construx's team of seasoned consultants. Their depth of knowledge and expertise has helped hundreds of companies solve their software challenges by identifying and adopting practices that have been proven to produce high-quality software—faster, and with greater predictability.



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