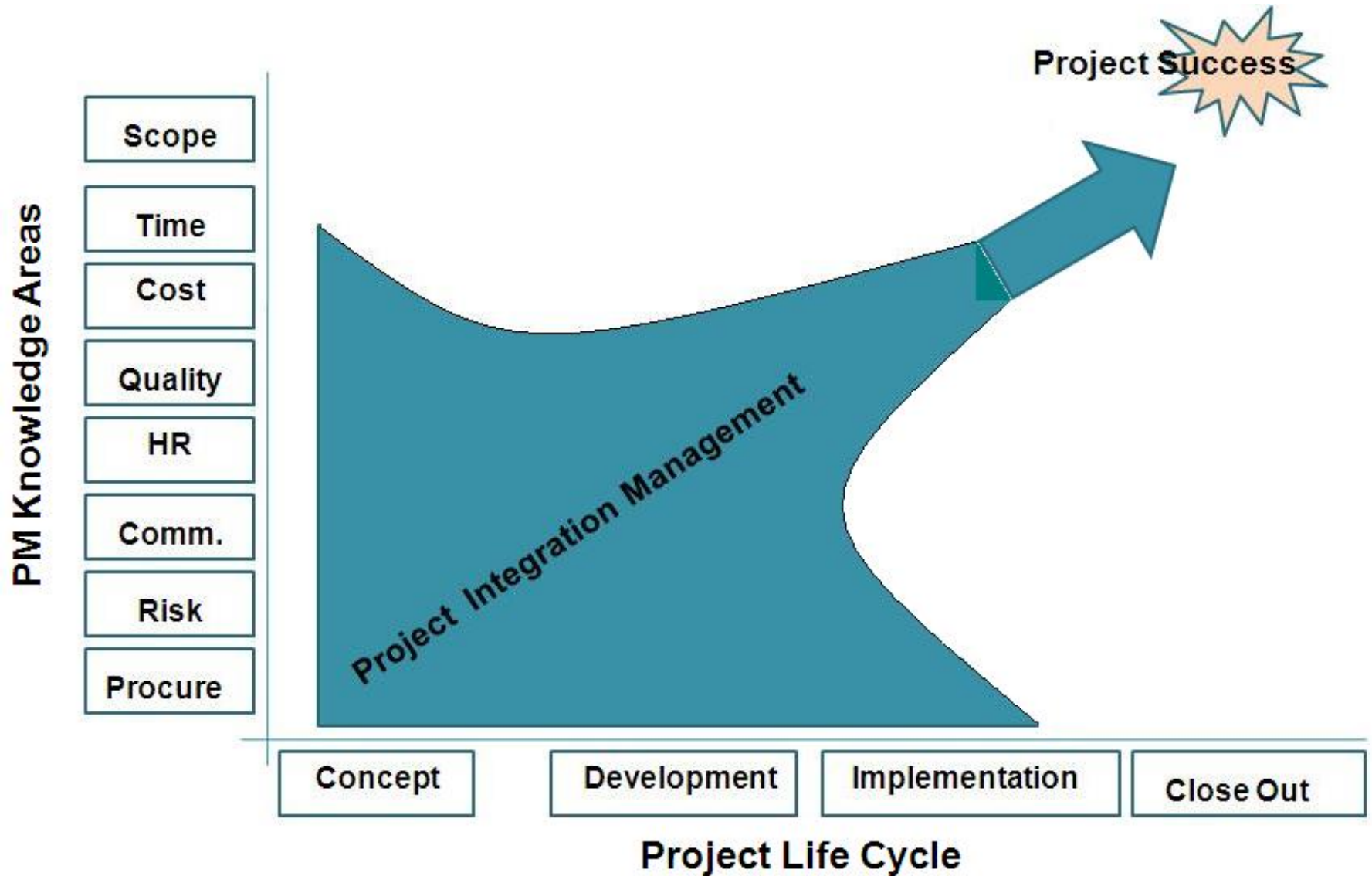




# Project Integration Management

---

# Project Integration Management



# The Key to Overall Project Success: Good Project Integration Management

- Project managers must coordinate all of the other knowledge areas throughout a project's life cycle.
- Many new project managers have trouble looking at the “big picture” and want to focus on too many details.
- Project integration management is *not* the same thing as software integration.

# Project Integration Management Processes

- **Develop the project charter:** Work with stakeholders to create the document that formally authorizes a project—the charter.
- **Develop the preliminary project scope statement:** Work with stakeholders, especially users of the project's products, services, or results, to develop the high-level scope requirements and create a preliminary project scope statement.
- **Develop the project management plan:** Coordinate all planning efforts to create a consistent, coherent document—the project management plan.

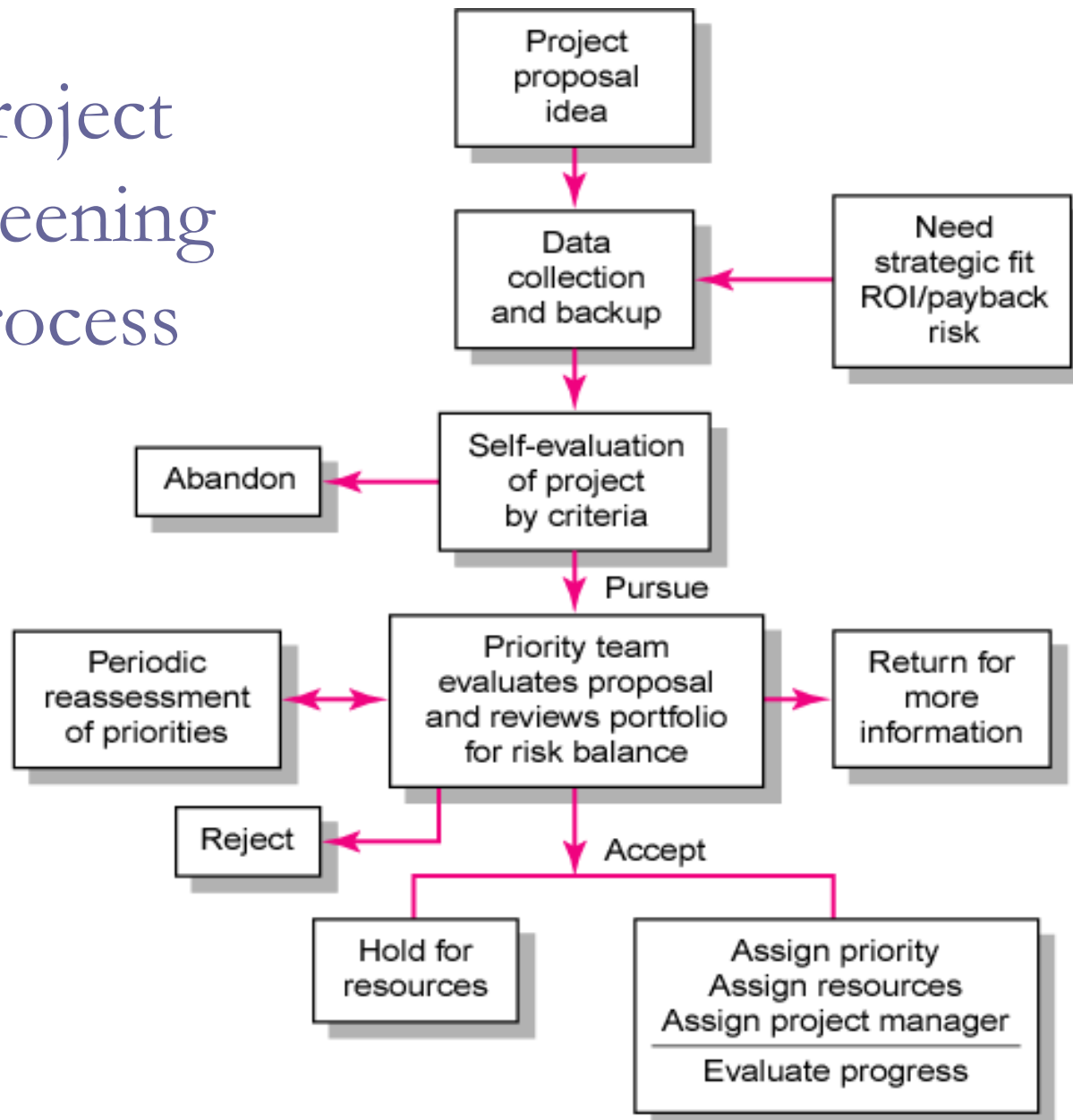
# Project Integration Management Processes (cont'd)

- **Direct and manage project execution:** Carry out the project management plan by performing the activities included in it.
- **Monitor and control the project work:** Oversee project work to meet the performance objectives of the project.
- **Perform integrated change control:** Coordinate changes that affect the project's deliverables and organizational process assets.
- **Close the project:** Finalize all project activities to formally close the project.

# A Portfolio Management System

- Selection Criteria
  - **Financial:** payback, net present value (NPV), internal rate of return (IRR)
  - **Non-financial:** projects of strategic importance to the firm.
- Multi-Weighted Scoring Models
  - Use several weighted selection criteria to evaluate project proposals.

# Project Screening Process



# Strategic Planning and Project Selection

- **Strategic planning** involves determining long-term objectives, predicting future trends, and projecting the need for new products and services.
- Organizations often perform a **SWOT analysis**:
  - Strengths, Weaknesses, Opportunities, and Threats
- As part of strategic planning, organizations should:
  - Identify potential projects.
  - Use realistic methods to select which projects to work on.
  - Formalize project initiation by issuing a project charter.



# Methods for Selecting Projects

- There is usually not enough time or resources to implement all projects.
- Methods for selecting projects include:
  - Focusing on broad organizational needs.
  - Categorizing information technology projects.
  - Performing net present value or other financial analyses.
  - Using a weighted scoring model.
  - Implementing a balanced scorecard.

# Focusing on Broad Organizational Needs

- It is often difficult to provide strong justification for many IT projects, but everyone agrees they have a high value.
- Three important criteria for projects:
  - There is a **need** for the project.
  - There are **funds** available for the project.
  - There is a strong **will** to make the project succeed.

# Financial Analysis of Projects

- Financial considerations are often an important aspect of the project selection process.
- Three primary methods for determining the projected financial value of projects:
  - Net present value (NPV) analysis
  - Return on investment (ROI)
  - Payback analysis

# Net Present Value Analysis

- **Net present value (NPV)** analysis is a method of calculating the expected net monetary gain or loss from a project by discounting all expected future cash inflows and outflows to the present point in time.
- Projects with a positive NPV should be considered if financial value is a key criterion.
- The higher the NPV, the better.

# Net Present Value Example

|    | A                | B                        | C             | D             | E             | F             | G            |
|----|------------------|--------------------------|---------------|---------------|---------------|---------------|--------------|
| 1  | Discount rate    | 10%                      |               |               |               |               |              |
| 2  |                  |                          |               |               |               |               |              |
| 3  | <b>PROJECT 1</b> | <b>YEAR 1</b>            | <b>YEAR 2</b> | <b>YEAR 3</b> | <b>YEAR 4</b> | <b>YEAR 5</b> | <b>TOTAL</b> |
| 4  | Benefits         | \$0                      | \$2,000       | \$3,000       | \$4,000       | \$5,000       | \$14,000     |
| 5  | Costs            | \$5,000                  | \$1,000       | \$1,000       | \$1,000       | \$1,000       | \$9,000      |
| 6  | Cash flow        | (\$5,000)                | \$1,000       | \$2,000       | \$3,000       | \$4,000       | \$5,000      |
| 7  | NPV —————→       | \$2,316                  |               |               |               |               |              |
| 8  |                  | Formula =npv(b1,b6:f6)   |               |               |               |               |              |
| 9  |                  |                          |               |               |               |               |              |
| 10 | <b>PROJECT 2</b> | <b>YEAR 1</b>            | <b>YEAR 2</b> | <b>YEAR 3</b> | <b>YEAR 4</b> | <b>YEAR 5</b> | <b>TOTAL</b> |
| 11 | Benefits         | \$1,000                  | \$2,000       | \$4,000       | \$4,000       | \$4,000       | \$15,000     |
| 12 | Costs            | \$2,000                  | \$2,000       | \$2,000       | \$2,000       | \$2,000       | \$10,000     |
| 13 | Cash flow        | (\$1,000)                | \$0           | \$2,000       | \$2,000       | \$2,000       | \$5,000      |
| 14 | NPV —————→       | \$3,201                  |               |               |               |               |              |
| 15 |                  | Formula =npv(b1,b13:f13) |               |               |               |               |              |
| 16 |                  |                          |               |               |               |               |              |

Note that totals are equal, but NPVs are not because of the time value of money.

# Financial Models (cont'd)

- The Net Present Value (NPV) model
  - Uses management's minimum desired rate-of-return (discount rate) to compute the present value of all net cash inflows.
  - Positive NPV: the project meets the minimum desired rate of return and is eligible for further consideration.

$$\text{Project NPV} = I_0 + \sum_{t=1}^n \frac{F_t}{(1 + k)^t} \quad \text{where}$$

$I_0$  = Initial investment (since it is an outflow, the number will be negative)

$F_t$  = net cash inflow for period  $t$

$k$  = required rate of return

# Return on Investment

- **Return on investment (ROI)** is calculated by subtracting the project costs from the benefits and then dividing by the costs.  
$$\text{ROI} = (\text{total discounted benefits} - \text{total discounted costs}) / \text{discounted costs}$$
- The higher the ROI, the better.
- Many organizations have a required rate of return or minimum acceptable rate of return on investment for projects.
- Internal rate of return (IRR) can be calculated by setting the NPV to zero.

# Payback Analysis

- Another important financial consideration is payback analysis.
- The **payback period** is the amount of time it will take to recoup, in the form of net cash inflows, the total dollars invested in a project.
- Payback occurs when the cumulative discounted benefits and costs are greater than zero.
- Many organizations want IT projects to have a fairly short payback period.

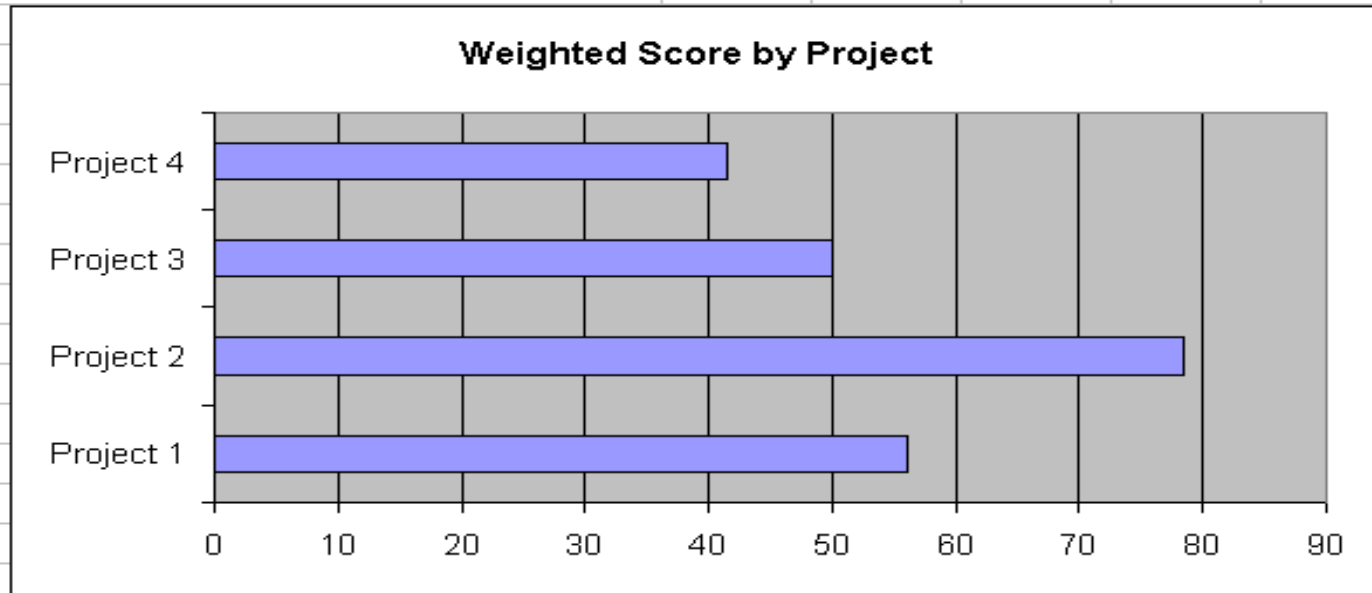


# Weighted Scoring Model

- A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria.
- Steps in identifying a weighted scoring model:
  1. Identify criteria important to the project selection process.
  2. Assign weights (percentages) to each criterion so they add up to 100 percent.
  3. Assign scores to each criterion for each project.
  4. Multiply the scores by the weights to get the total weighted scores.
- The higher the weighted score, the better.

# Figure 4-5. Sample Weighted Scoring Model for Project Selection

|    | A   | B             | C                | D                | E                | F                |
|----|---|---------------|------------------|------------------|------------------|------------------|
| 1  | <b>Criteria</b>                                     | <b>Weight</b> | <b>Project 1</b> | <b>Project 2</b> | <b>Project 3</b> | <b>Project 4</b> |
| 2  | Supports key business objectives                    | 25%           | 90               | 90               | 50               | 20               |
| 3  | Has strong internal sponsor                         | 15%           | 70               | 90               | 50               | 20               |
| 4  | Has strong customer support                         | 15%           | 50               | 90               | 50               | 20               |
| 5  | Realistic level of technology                       | 10%           | 25               | 90               | 50               | 70               |
| 6  | Can be implemented in one year or less              | 5%            | 20               | 20               | 50               | 90               |
| 7  | Provides positive NPV                               | 20%           | 50               | 70               | 50               | 50               |
| 8  | Has low risk in meeting scope, time, and cost goals | 10%           | 20               | 50               | 50               | 90               |
| 9  | <b>Weighted Project Scores</b>                      | <b>100%</b>   | <b>56</b>        | <b>78.5</b>      | <b>50</b>        | <b>41.5</b>      |
| 10 |   |               |                  |                  |                  |                  |



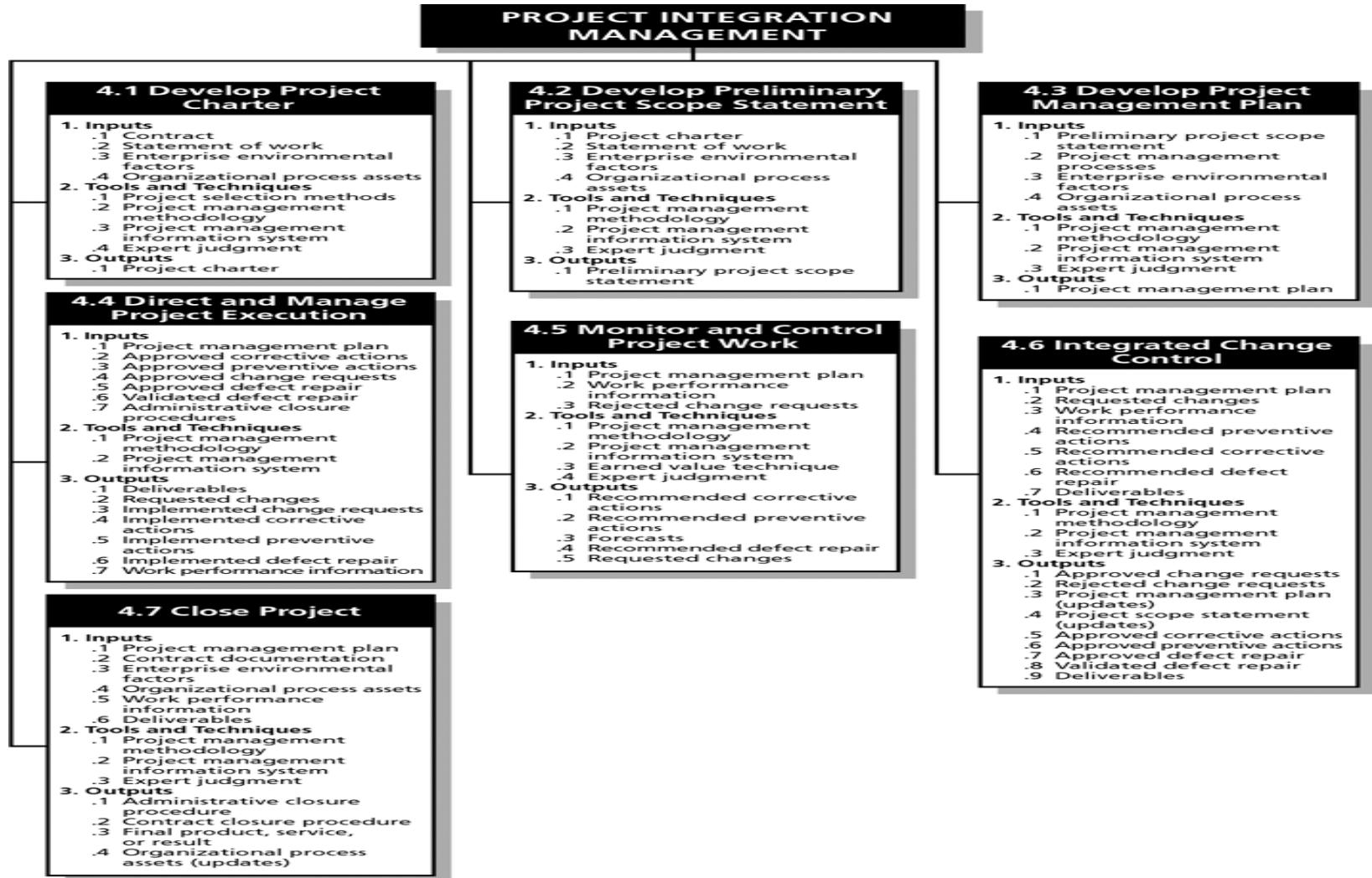
# Implementing a Balanced Scorecard

- Drs. Robert Kaplan and David Norton developed this approach to help select and manage projects that align with business strategy.
- A **balanced scorecard** is a methodology that converts an organization's value drivers, such as customer service, innovation, operational efficiency, and financial performance, to a series of defined metrics.
- See **[www.balancedscorecard.org](http://www.balancedscorecard.org)** for more information.

# Project Charters

- After deciding what project to work on, it is important to let the rest of the organization know.
- A **project charter** is a document that formally recognizes the existence of a project and provides direction on the project's objectives and management.
- Key project stakeholders should sign a project charter to acknowledge agreement on the need and intent of the project; a signed charter is a key output of project integration management.

# Figure 4-6. Project Integration Management Overview



# Preliminary Scope Statements

- A **scope statement** is a document used to develop and confirm a common understanding of the project scope.
- It is an important tool for preventing **scope creep**:
  - The tendency for project scope to keep getting bigger.
- A good practice is to develop a preliminary or initial scope statement during project initiation and a more detailed scope statement as the project progresses.

# Contents of a Preliminary Scope Statement

- Project objectives
- Product or service requirements and characteristics
- Project boundaries
- Deliverables
- Product acceptance criteria
- Project assumptions and constraints
- Organizational structure for the project
- Initial list of defined risks
- Summary of schedule milestones
- Rough order of magnitude cost estimate
- Configuration management requirements
- Description of approval requirements

# Project Management Plans

- A **project management plan** is a document used to coordinate all project planning documents and help guide a project's execution and control.
- Plans created in the other knowledge areas are subsidiary parts of the overall project management plan.



# Attributes of Project Plans

- Just as projects are unique, so are project plans.
- Plans should be:
  - Dynamic
  - Flexible
  - Updated as changes occur
- Plans should first and foremost guide project execution by helping the project manager lead the project team and assess project status.

# Common Elements of a Project Management Plan

- Introduction or overview of the project.
- Description of how the project is organized.
- Management and technical processes used on the project.
- Work to be done, schedule, and budget information.

# Table 4-1. Sample Contents for a Software Project Management Plan (SPMP)

## MAJOR PROJECT MANAGEMENT PLAN SECTIONS

|                       | <b>OVERVIEW</b>   | <b>PROJECT ORGANIZATION</b>   | <b>MANAGERIAL PROCESS PLANS</b>  | <b>TECHNICAL PROCESS PLANS</b>  | <b>SUPPORTING PROCESS PLANS</b>   |
|-----------------------|---|---|--|---|---|
| <b>Section Topics</b> | Purpose, scope, and objectives; assumptions and constraints; project deliverables; schedule and budget summary; evolution of the plan | External interfaces; internal structure; roles and responsibilities | Start-up plans (estimation, staffing, resource acquisition, and project staff training plans); work plan (work activities, schedule, resource, and budget allocation); control plan; risk management plan; closeout plan | Process model; methods, tools, and techniques; infrastructure plan; product acceptance plan | Configuration management plan; verification and validation plan; documentation plan; quality assurance plan; reviews and audits; problem resolution plan; subcontractor management plan; process improvement plan |

IEEE Standard 1058-1998.

# Stakeholder Analysis

- A **stakeholder analysis** documents important (often sensitive) information about stakeholders such as:
  - Stakeholders' names and organizations.
  - Their roles on the project.
  - Unique facts about each stakeholder.
  - Their level of influence on and interest in the project.
  - Suggestions for managing relationships with each stakeholder.

# Table 4-2. Sample Stakeholder Analysis

|   | KEY STAKEHOLDERS   |  |   |   |  |
|---|--|--|---|---|--|
|   | AHMED  | SUSAN  | ERIK  | MARK  | DAVID  |
| <i>Organization</i>                         | Internal senior management   | Project team   | Project team  | Hardware vendor   | Project manager for other internal projects                                  |
| <i>Role on project</i>                      | Project sponsor and one of the company's founders                    | DNA sequencing expert  | Lead programmer   | Supplier of some instrument hardware                                    | Competitor for company resources   |
| <i>Unique facts</i>                         | Quiet, demanding, likes details, business-focused, Stanford MBA      | Ph.D. in biology, easy to work with, has toddler                                   | Very smart, best programmer I know, weird sense of humor                | Head of a start-up company, he knows we can make him rich if this works | Nice guy, one of the oldest people at company, has three kids in college     |
| <i>Level of interest</i>                    | Very high  | Very high  | High  | Very high   | Low to medium  |
| <i>Level of influence</i>                   | Very high; can call the shots  | Subject matter expert; critical to success   | High; hard to replace   | Low; other vendors available  | Low to medium  |
| <i>Suggestions on managing relationship</i> | Keep informed, let him lead conversations, do as he says and quickly | Make sure she reviews specifications and leads testing; can do some work from home | Keep him happy so he stays; emphasize stock options; likes Mexican food | Give him enough lead time to deliver hardware                           | He knows his project takes a back seat to this one, but I can learn from him |

# Subsidiary Plans

- Scope management plan
- Change management plan
- Requirement management plan
- Schedule management plan
- Cost management plan
- Quality management plan
- Human resource plan
- Communication management plan
- Risk management plan
- Procurement management plan

# Scope management plan

## Objectives

The purpose of Scope Management is to ensure the project includes all the work required, and only the work required, for completing the project successfully. In scope management the emphasis is on identifying and controlling what is or is not included in the project.

Consequently, the objective of this scope management process is to provide a methodology for:

- Describing the process and tools used to define the project scope;
- Developing a project scope statement;
- Defining and developing the Work Breakdown Structure;
- Describing the scope verification activities; and
- Describing how the project scope will be controlled.

# Contd.

Scope is defined and then refined during an iterative process that begins in the Project Identification Stage and continues into the Delivery Stage. The process is conducted in consultation with subject matter experts (SMEs) and stakeholders, becoming increasingly detailed as the project progresses. The fully defined project scope will contain the following elements:

- Project goals, business outcomes and objectives;
- Product scope description;
- Project boundaries;
- Specifically excluded activities;
- Deliverables and associated acceptance criteria;
- Project constraints; and
- Project assumptions.

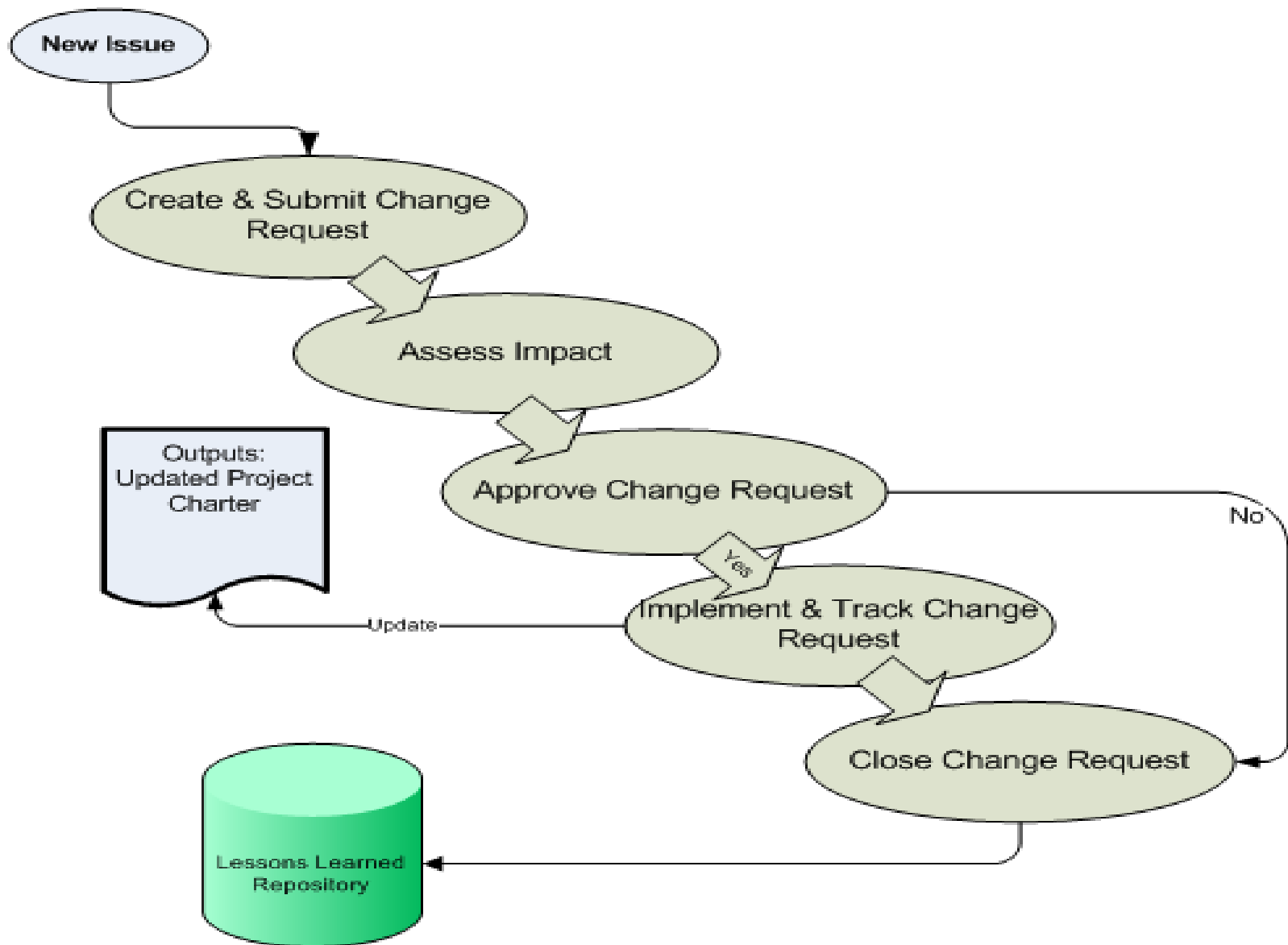


# Change Management Process

## Objectives

The key objectives of the Change Management Process are:

- to manage each request for change, in order to keep the scope of the project under control with full traceability;
- to allow the impact of all changes to be understood, documented and managed;
- to make sure each request for change is assessed by key project stakeholders;
- to make sure each assessed change request is accepted, rejected, or deferred by the appropriate authority; and
- to enable the orderly implementation of each accepted change.



**Figure 1 - Change Management Process**

# Requirement management plan

The Requirements Management plan is used to document the necessary information required to effectively manage project requirements from definition, through traceability, to delivery.

The Requirements Management Plan is created during the Planning Phase of the project. Its intended audience is the project manager, project team, project sponsor and any senior leaders whose support is needed to carry out the plan.

- **ORGANIZATION, RESPONSIBILITIES, AND INTERFACES**

*[Describe here who is going to be responsible for performing the various activities described in the requirements workflows defined later in this document.]*

- **TOOLS, ENVIRONMENT, AND INFRASTRUCTURE**

*[Describe the computing environment and software tools to be used in fulfilling the Requirements Management functions throughout the project or product lifecycle.]*

- *Describe the tools and procedures that will be used to control the versioning of the Requirements items generated throughout the project or product lifecycle.]*

- **ASSUMPTIONS/CONSTRAINTS**

*[Define any assumptions and/or constraints taken into account when defining requirement for this section of this document.]*

# Schedule management plan

## Objectives

The main objective of the Time Management Plan is to provide a methodology for:

- determining the amount of time and effort required for a project to complete its deliverables;
- defining a structure to organize the project work;
- arranging the work in a logical, traceable structure;
- assigning resources to complete the work;
- defining the critical path; and
- managing the schedule and work effort so as to ensure the project completes its deliverables and hands over its product in the most optimal time period.

# Cost management plan

- Cost Management includes the processes involved in planning, estimating, budgeting and controlling costs so that a project can be completed within the approved budget.
- Cost Management procedures are used to create a budget, and to monitor performance relative to that budget. Effective monitoring requires a focus on the actual and forecast consumption of elements such as people's time, materials, equipment, facilities, and transportation, among others.
- The Cost Management Plan is the document that sets out the format and establishes activities and criteria for planning, structuring, and controlling project costs. The Cost Management Plan is typically incorporated within the Project Management Plan.

## Objectives

The objective of a Cost Management Plan is to provide a methodology for:

- deriving the project baseline budget and associated tracking tools;
- defining how cost reporting will occur; and
- describing how cost variances will be managed for the project.

# Quality management plan

## Objectives

The purpose of the Project Quality Management process is to ensure that:

- quality planning activities are conducted and result in the required metrics, tools, standards and processes that will be used by the project to attain its quality objectives;
- products are built to agreed-upon standards and requirements;
- products and processes are built in accordance with all relevant client, project, product development, and branch, departmental, GC governance review and approval gating criteria;
- work processes are performed efficiently and are documented;
- non-conformances are identified and appropriate corrective action is taken;
- necessary quality documentation is prepared and retained as part of the project record; and
- project delivery program and NPMS Business Project-IT-Enabled deliverables and processes are subject to continuous quality improvement.

# Human resource plan

The purpose of project Human Resource Management is to ensure that the project has sufficient human resources, with the correct skill sets and experience, for the project to be successfully completed.

A project Human Resource Management Plan document describes the end-to-end processes that a project will use to meet its human resource requirements. The key objective of this plan is to describe:

- which resources are required;
- what core skills and experience they need to have;
- how resources will be acquired;
- how long resources will be needed;
- when resources will be needed;
- how resources will be developed;
- how day-to-day management will be formed; and
- how resources will be transitioned into and out of the project following the completion of their project assignments.

# Communication management plan

The Communications Management Plan is an output of the Communications Management process that details the specific communications products, events, recipients, timelines, frequency and other pertinent communications information. Project management deliverables can also be considered principal communications tools.

## **Objectives**

The objectives of the Communications Management process are as follows:

- define the communications needs of a project;
- conduct a stakeholder analysis to identify stakeholders, their roles, interests, how they will impact or will be impacted by the project, and develop a stakeholder management plan;
- define required messages, appropriate media and channels, task assignments and timings for communications delivery that will enable the project to meet these needs; and
- ensure that the right people receive the right information at the right time to meet their needs and to achieve project objectives.



# Risk management plan

Risk management is a systematic approach to setting the best course of action under uncertainty by identifying, assessing, analyzing, evaluating, controlling, and communicating risks. Risk management involves the review and evaluation of strategies, policies and practices.

Risks derive from project constraints, sources of funding, fixed timelines, assumptions and other sources of uncertainty and vulnerability in the project and operational environment.

## **Risk Approach**

- The overall approach to risk management on Business Projects-IT-Enabled is based on the following activities:
  - Risk assessment;
  - Risk identification;
  - Risk analysis;
  - Risk evaluation,
  - Risk treatment;
  - Monitor and review; and
  - Communication/consultation.

# Procurement management plan

## Objectives

The objective of a Procurement Management Plan is to describe the end-to-end procurement process that the project will use to acquire its goods and services. The plan will be completed in the Project Management Plan document.

The key objectives of this document are to describe:

- the procurement planning process;
- the key procurement activities;
- the procurement constraints and assumptions;
- the departmental procurement organizations;
- the bid evaluation process; and
- to define the roles and responsibilities of those involved.

# Conclusion

- Mostly the job of project manager
- Use the cross-reference chart of knowledge areas and process groups as a study aid.
- Follow the flow of outputs that become inputs, etc.
- Focus on the big picture
- Think about integration as the core part of Project Management.