

Chapter 4: Project Integration Management

**Information Technology Project
Management, Sixth Edition**

Note: See the text itself for full citations.



Announcements

- ▶ ~~8/25 – Chapter 1, Syllabus and Class Overview~~
- ▶ ~~9/1 – Chapter 2, Term Project Guidance, Team Breakouts~~
- ▶ ~~9/8 – Chapter 3, Team Breakouts~~
- ▶ 9/15 – Chapter 4, Team Breakouts
- ▶ 9/22 – Chapter 5, Team Breakouts
- ▶ 9/29 – No Class, Thursday follows Monday schedule....
- ▶ 10/6 – Chapter 6, Team Breakouts
- ▶ 10/13 – Midterm (chapters 1-6)
- ▶ 10/20 – 1st Team Presentations, due and presented.

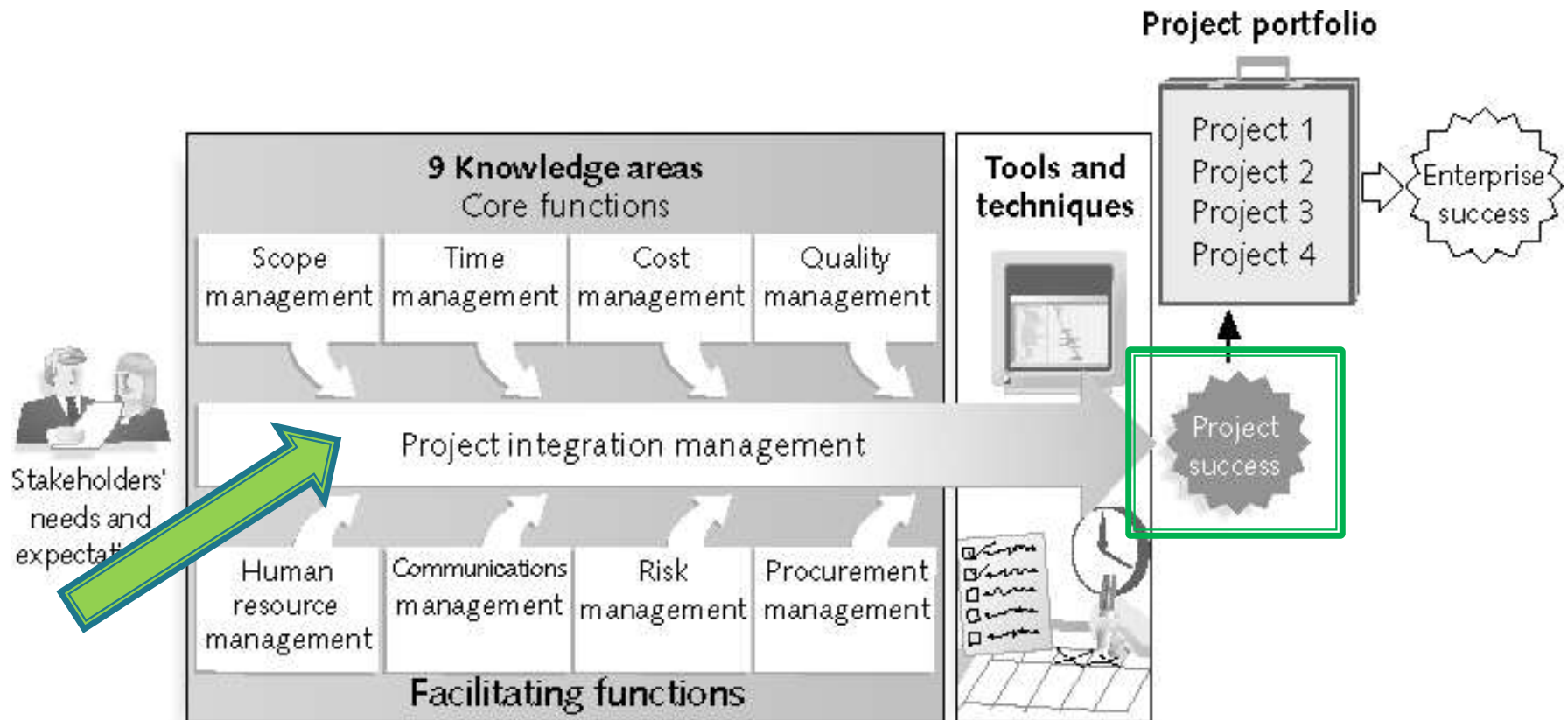
Learning Objectives

- ▶ Describe an overall framework for **project integration management** as it relates to the other PM knowledge areas and the project life cycle
- ▶ Explain the **strategic planning process** and apply different project selection methods
- ▶ Project Financials....

A Key to **Overall Project Success**: Project Integration Management

- ▶ Project managers (the good ones) **coordinate all knowledge areas** throughout a project's life cycle
- ▶ Many new and seasoned project managers have trouble looking at the “big picture” and want to focus on
 - There are too many details at times, time, scope, cost, resources etc... remember not to get too focused on one as your project can fail if you neglect the other KA's
- ▶ *Note: Project integration management is not the same thing as software integration*

Project Management Framework – 9 Knowledge Areas



Project Management Process Groups and Knowledge Area Mapping*

Knowledge Area	Project Management Process Groups				
	Initiating	Planning	Executing	Monitoring and Controlling	Closing
<i>Project Integration Management</i>	Develop project charter	Develop project management plan	Direct and manage project execution	Monitor and control project work, Perform integrated change control	Close project or phase
<i>Project Scope Management</i>		Collect requirements, Define scope, Create WBS		Verify scope, Control scope	
<i>Project Time Management</i>		Define activities, Sequence activities,		Control schedule	

Project Integration Management Processes *(6 of them)*

- ▶ **Develop the project charter**
- ▶ **Develop the project management plan**
- ▶ **Direct and manage project execution**
- ▶ **Monitor and control the project work**
- ▶ ***Perform integrated change control***
- ▶ **Close the project or phase**

Project Integration Management Processes

- ▶ **Develop the project charter:** working with stakeholders to create the document that formally **authorizes a project** : *the charter*
- ▶ **Develop the project management plan:** **coordinating all planning** efforts to create a consistent, coherent document
 - Note: the project management plan is different from a Gantt Chart
- ▶ **Direct and manage project execution:** **carrying out the project management plan** by performing the activities included in it

Project Integration Management Processes (continued)

- ▶ **Monitor and control the project work:** overseeing project work to **meet the OVERALL performance** objectives of the project
- ▶ **Perform integrated change control:** **coordinating changes** that affect the project's deliverables and organizational process assets
- ▶ **Close the project or phase:** **finalizing all project activities** to formally close the project or phase

Figure 4-1. Project Integration Management Summary

Initiating

Process: **Develop project charter**

Output: Project charter

Planning

Process: **Develop project management plan**

Output: Project management plan

Executing

Process: **Direct and manage project execution**

Outputs: Deliverables, work performance information, change requests, project management plan updates, project document updates

Monitoring and Controlling

Process: **Monitor and control project work**

Outputs: Change requests, project management plan updates, project document updates

Process: **Perform integrated change control**

Outputs: Change request status updates, project management plan updates, project document updates

Closing

Process: **Close project or phase**

Outputs: Final product, service, or result transition; organizational process assets updates

Project Start

Project Finish

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

Table 4-1. Project Charter for the DNA-Sequencing Instrument Completion Project

Project Title: DNA-Sequencing Instrument Completion Project

Date of Authorization: February 1

Project Start Date: February 1

Projected Finish Date: November 1

Key Schedule Milestones:

- Complete first version of the software by June 1
- Complete production version of the software by November 1

Budget Information: The firm has allocated \$1.5 million for this project, and more funds are available if needed. The majority of costs for this project will be internal labor. All hardware will be outsourced.

Project Manager: Nick Carson, (650) 949-0707, ncarson@dnaconsulting.com

Project Objectives: The DNA-sequencing instrument project has been underway for three years. It is a crucial project for our company. This is the first charter for the project, and the objective is to complete the first version of the software for the instrument in four months and a production version in nine months.

Main Project Success Criteria: The software must meet all written specifications, be thoroughly tested, and be completed on time. The CEO will formally approve the project with advice from other key stakeholders.

Table 4-1. Charter (continued)

Approach:

- Hire a technical replacement for Nick Carson and a part-time assistant as soon as possible.
- Within one month, develop a clear work breakdown structure, scope statement, and Gantt chart detailing the work required to complete the DNA sequencing instrument.
- Purchase all required hardware upgrades within two months.
- Hold weekly progress review meetings with the core project team and the sponsor.
- Conduct thorough software testing per the approved test plans.

ROLES AND RESPONSIBILITIES

Name	Role	Position	Contact Information
Ahmed Abrams	Sponsor	CEO	aabrams@dnaconsulting.com
Nick Carson	Project Manager	Manager	ncarson@dnaconsulting.com
Susan Johnson	Team Member	DNA expert	sjohnson@dnaconsulting.com
Renyong Chi	Team Member	Testing expert	rchi@dnaconsulting.com
Erik Haus	Team Member	Programmer	ehaus@dnaconsulting.com
Bill Strom	Team Member	Programmer	bstrom@dnaconsulting.com
Maggie Elliot	Team Member	Programmer	melliot@dnaconsulting.com

Sign-off: (Signatures of all the above stakeholders)

Ahmed Abrams
Susan Johnson
Erik Haus
Maggie Elliot

Nick Carson
Renyong Chi
Bill Strom

Comments: (Handwritten or typed comments from above stakeholders, if applicable)

"I want to be heavily involved in this project. It is crucial to our company's success, and I expect everyone to help make it succeed." —Ahmed Abrams

"The software test plans are complete and well documented. If anyone has questions, do not hesitate to contact me." —Renyong Chi

Project Management Plans

- ▶ A **project management plan** is a document used to coordinate **all the project planning** documents and help guide execution and control
 - *Think of it as the master plan, taking all 9-knowledge area plans into account and having a master document, cost plan, time plan, risk plans etc...*
- ▶ Plans created in the other knowledge areas are subsidiary parts of the overall project management plan

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 4-2. Sample Contents for a Software Project Management Plan (SPMP)

MAJOR SECTION HEADINGS	SECTION TOPICS
Overview	Purpose, scope, and objectives; assumptions and constraints; project deliverables; schedule and budget summary; evolution of the plan
Project Organization	External interfaces; internal structure; roles and responsibilities
Managerial Process Plan	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
Technical Process Plans	Process model; methods, tools, and techniques; infrastructure plan; product acceptance plan
Supporting Process Plans	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.

Project Execution

- ▶ Project execution involves managing and performing the work described in the project management plan
- ▶ The majority of time and money is usually spent on execution

Coordinating Planning and Execution

- ▶ Project planning and execution are intertwined and inseparable activities
- ▶ **Key:** Those who will do the work should help to plan the work
- ▶ **Key:** Project managers must solicit input from the team to develop realistic plans

Important Skills for Project Execution

- ▶ General management skills like leadership, communication, and political skills
- ▶ Product, organization, and business area skills and knowledge are needed
- ▶ Use of specialized tools and techniques can be helpful to move work/execution along

Project Execution Tools and Techniques

- ▶ **Expert judgment:** experts can help project managers and their teams make many decisions related to project execution

- ▶ **Project management information systems:**
 - there are hundreds of project management software products available on the market today
 - many organizations are moving toward powerful enterprise project management systems that are accessible via the Internet and mobile
 - They aim to give centralized view of a project (all project artifacts in one place)
 - And a portfolio view of all your programs/projects (in the same place etc...)

Monitoring and Controlling Project Work

- ▶ Changes are inevitable on most projects, so it's important to develop and follow a process to monitor and control changes
- ▶ Monitoring project work includes collecting, measuring, and disseminating performance information
- ▶ A **baseline** is the initial approved project management plan

Integrated Change Control

- ▶ Three main objectives are:
 - 1) Identify and validate the change, and if the change is needed
 - If so
 - 2) Manage the actual changes as they occur (plan, notify, execute, close it out)
 - 3) Determine if the change has occurred and report on if it made the impact or fix as intended

Change Control on Information Technology Projects

- ▶ **Former view:** the project team should strive to do exactly what was planned on time and within budget
 - *Problem: stakeholders rarely agreed up-front on the project scope, and time and cost estimates were inaccurate*
- ▶ **Modern view:** project management is a process of constant communication, negotiation and flexibility
 - *Solution: changes are often beneficial, and the project team should plan and control them and most of all communicate them early / often*

Table 4-3. Suggestions for Performing Integrated Change Control

View project management as a process of constant communication and negotiation.

Plan for change.

Establish a formal change control system, including a change control board (CCB).

Use effective configuration management.

Define procedures for making timely decisions on smaller changes.

Use written and oral performance reports to help identify and manage change.

Use project management and other software to help manage and communicate changes.

Focus on leading the project team and meeting overall project goals and expectations.

Change Control Board (CCB)

- ▶ A formal group of people responsible for reviewing and approving or rejecting changes to a project
- ▶ CCBs provide guidelines for preparing change requests, evaluate change requests, and manage the implementation of approved changes
- ▶ Can include stakeholders from the entire organization
- ▶ Also sometimes called a CAB – *Change Advisory Board*

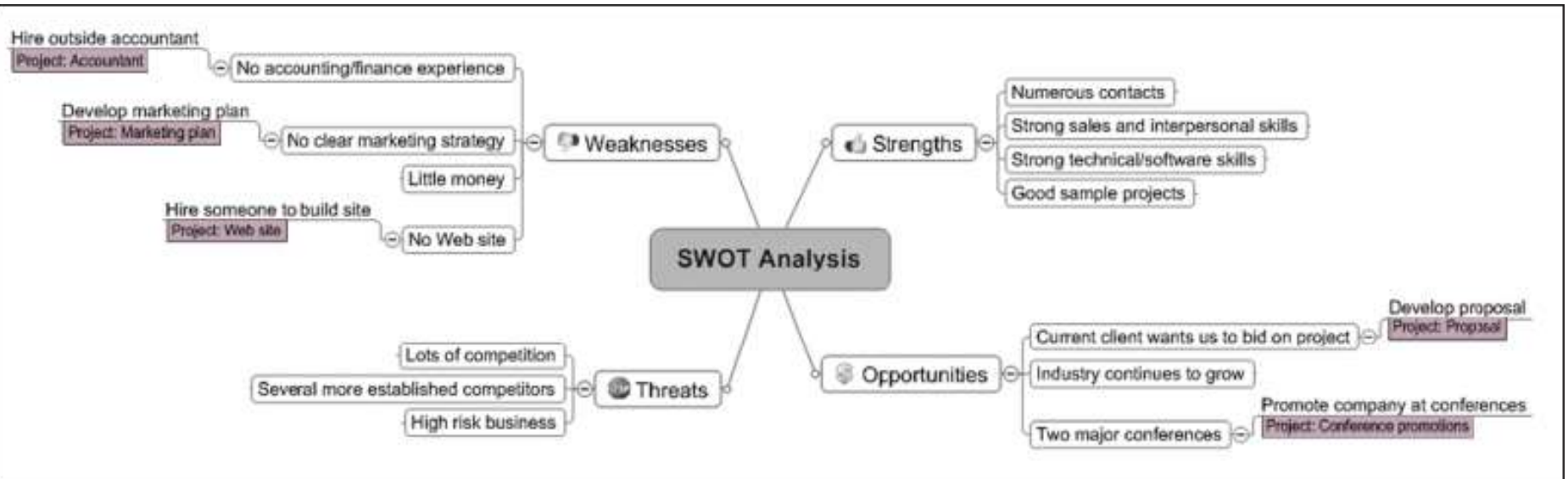
Closing Projects and Phases

- ▶ To close a project or phase, you must finalize all activities and transfer the completed or cancelled work to the appropriate people
- ▶ Main outputs include:
 - Final product, service, or result transition
 - Organizational process asset updates

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**
 - Analyzing **S**trengths, **W**eaknesses, **O**pportunities, and **T**hreats
- ▶ As part of strategic planning, organizations:
 - Identify potential projects
 - Use realistic methods to select which projects to work on
 - Formalize project initiation by issuing a project charter

Figure 4-2. Mind Map of a SWOT Analysis to Help Identify Potential Projects



Methods for Selecting Projects

- ▶ There are **usually more projects than available time and resources** to implement them
- ▶ 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
- ▶ “It is better to measure gold roughly than to count pennies precisely”
- ▶ Three important criteria for projects:
 - There is a **need** for the project
 - There are **funds** available
 - There’s a strong **will** to make the project succeed

Categorizing IT Projects

- ▶ One categorization is whether the project addresses:
 - *A problem*
 - *An opportunity, or*
 - *A directive*
- ▶ Another categorization is **how long it will take** to do and when it is needed
- ▶ Complex
- ▶ And overall priority of the project

Financial Analysis of Projects

- ▶ Financial considerations are often an important consideration in selecting projects
- ▶ 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
 - *Simply put would I rather spend money today vs in the future, what's the time value of money worth to a company....*
- ▶ Projects with a positive NPV should be considered if financial value is a key criterion,
 - The higher the NPV, the better

Figure 4-4. Net Present Value Example

	A	B	C	D	E	F	G
1	Discount rate	10%					
2							
3	PROJECT 1	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
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	PROJECT 2	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL
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							
17							

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

Return on Investment

- ▶ **Return on investment (ROI)** is calculated by subtracting the project costs from the benefits and then dividing by the costs

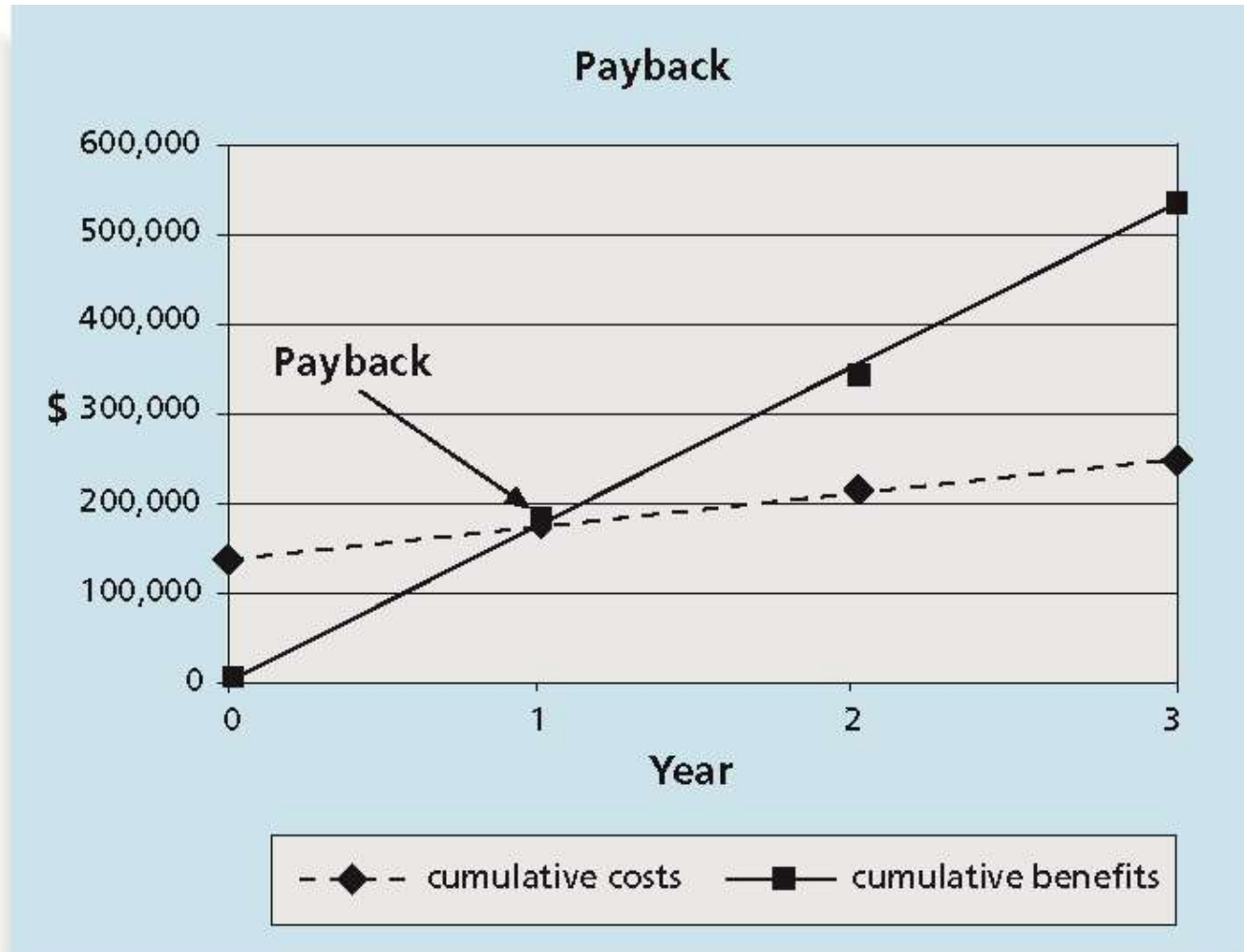
$$\text{ROI} = (\text{total discounted benefits} - \text{total discounted costs}) / \text{discounted costs}$$

- ▶ The higher the ROI, the better
- ▶ Many organizations have a **required rate of return** or minimum acceptable rate of return on investment for projects

Payback Analysis

- ▶ Another important financial consideration is payback analysis
- ▶ This is the **payback period** or the amount of time it will take to recoup invested money.
- ▶ Payback occurs when the net cumulative discounted benefits equals the costs
- ▶ Many organizations want IT projects to have a fairly short payback period, **WHY?**

Figure 4-6. Charting the Payback Period



Weighted Scoring Model

- ▶ A weighted scoring model is a tool that provides a systematic process for selecting projects based on many criteria
 - Identify criteria important to the project selection process
 - Assign weights (percentages) to each criterion so they add up to 100%
 - Assign scores to each criterion for each project
 - Multiply the scores by the weights and get the total weighted scores

- ▶ The higher the weighted score, the better

Figure 4-7. Sample Weighted Scoring Model for Project Selection

	A	B	C	D	E	F
1	Criteria	Weight	Project 1	Project 2	Project 3	Project 4
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	Uses 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	Weighted Project Scores	100%	56	78.5	50	41.5

