Session 4:

Project Integration Management

Learning Objectives

- Describe an overall framework for project integration management as it relates to the other project management knowledge areas and the project life cycle
- Discuss the strategic planning process and apply different project selection methods
- Explain the importance of creating a project charter to formally initiate projects
- Describe project management plan development, understand the content of these plans, and describe approaches for creating them
- Explain project execution, its relationship to project planning, the factors related to successful results, and tools and techniques to assist in directing and managing project work

Learning Objectives

- Apply the principles of knowledge management to the various aspects of project integration
- Describe the process of monitoring and controlling a project
- Define the integrated change control process, relate this to the steps for planning for and managing changes on information technology (IT) projects, and create an appropriate change control system for a project that incorporates both
- Explain the importance of developing and following good procedures for closing projects
- Describe how software can assist in project integration management
- Discuss considerations for agile/adaptive environments

What is 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

What is Project Integration Management?

- Main processes
  - ***Developing the project charter***
  - ***Developing the project management plan***
  - ***Directing and managing project work***
  - ***Monitoring and controlling project work***
  - ***Performing integrated change control***
  - ***Closing the project or phase***

Strategic Planning and Project Selection

- Strategic planning involves determining long-term objectives
  - Analyzing the strengths and weaknesses of an organization
  - Studying opportunities and threats in the business environment
  - Predicting future trends
  - Projecting the need for new products and services
- SWOT analysis
  - Strengths, Weaknesses, Opportunities, and Threats
- Identifying potential projects
  - Start of project initiation
- Aligning IT with business strategy
  - Organization must develop a strategy for using IT to define how it will support the organization’s objectives

Strategic Planning and Project Selection

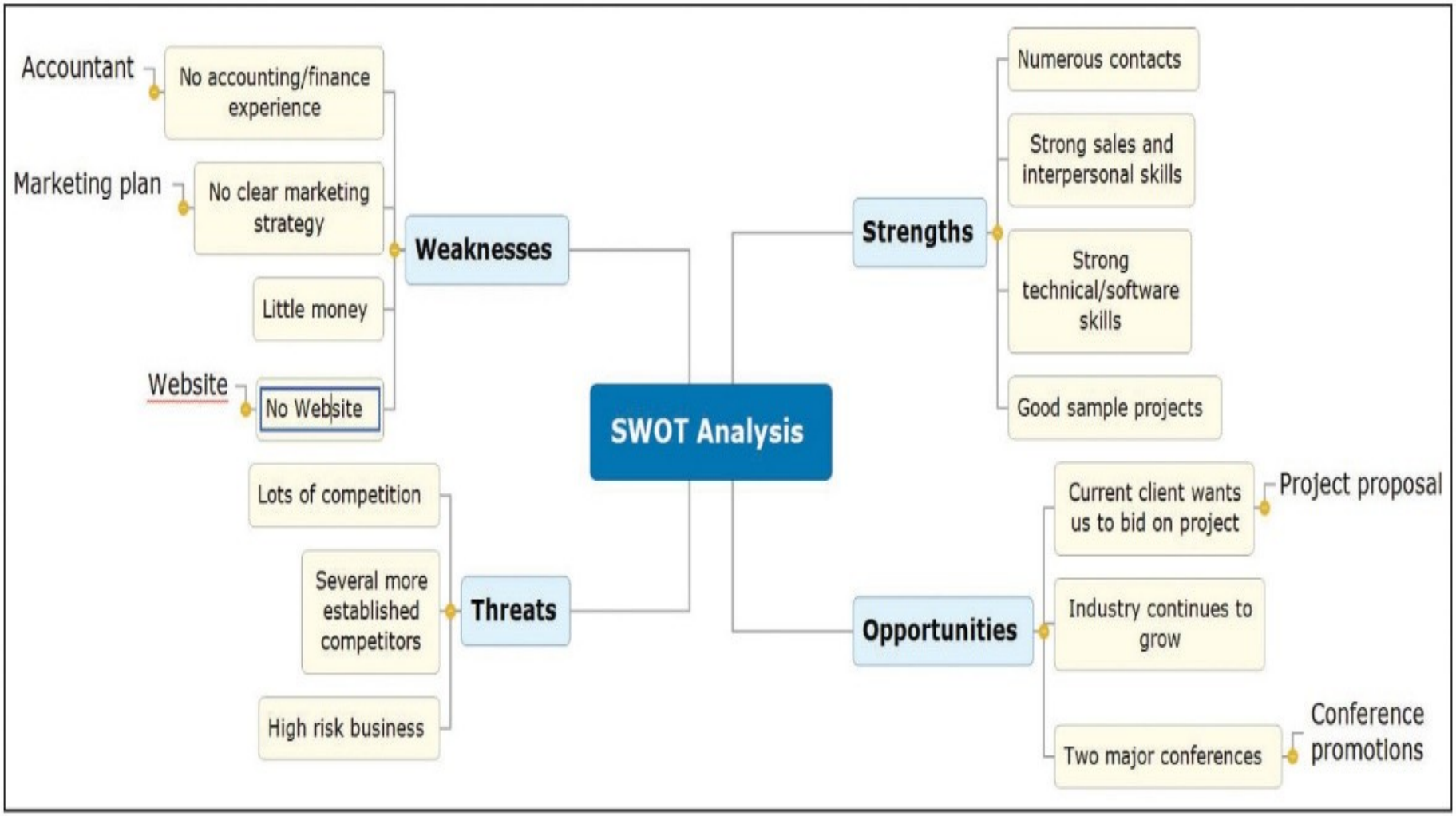

FIGURE 4-2 Mind map of a SWOT analysis to help identify potential projects

Strategic Planning and Project Selection

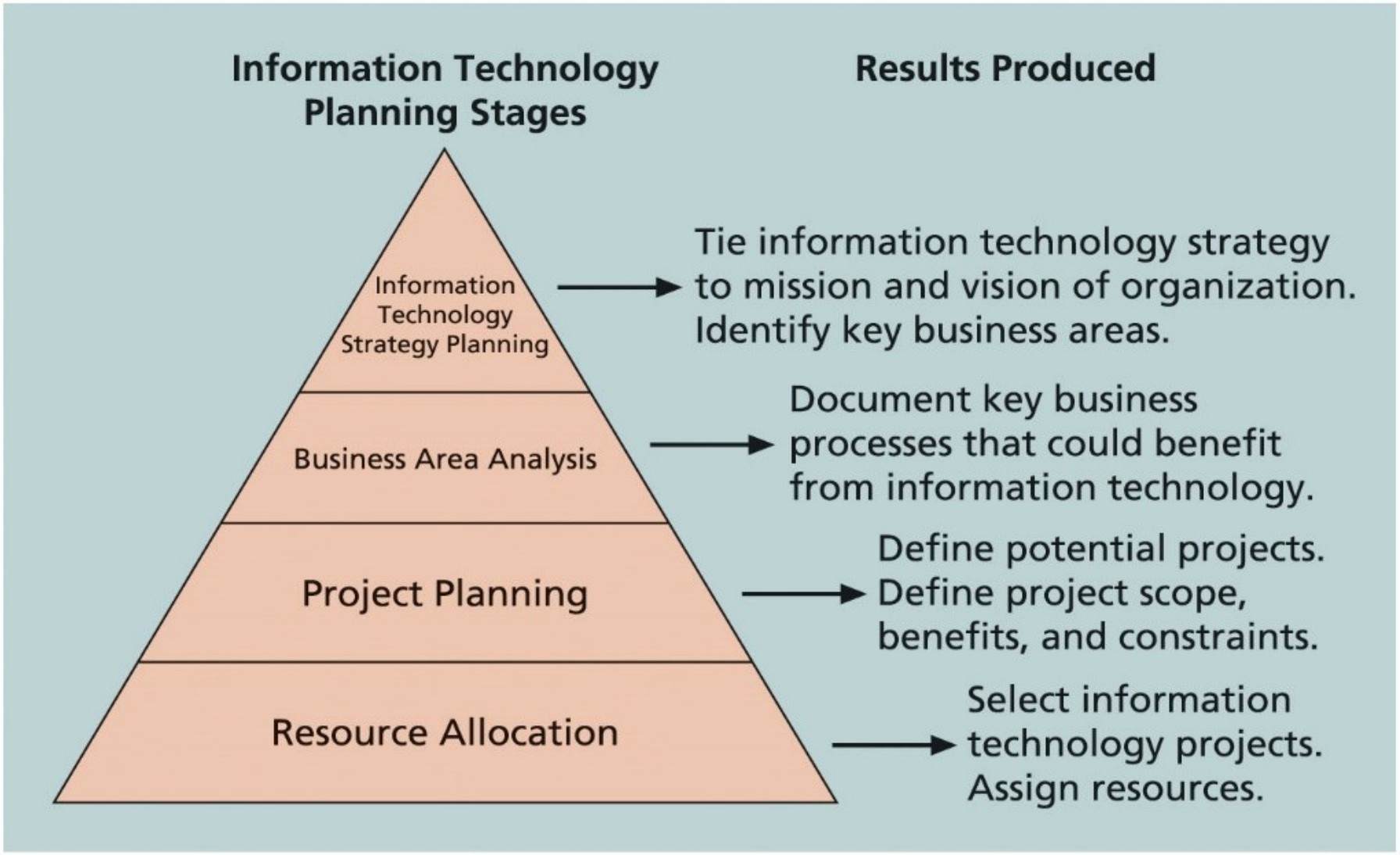

FIGURE 4-3 Planning process for selecting IT projects

Methods for Selecting Projects

- Potential projects must be narrowed down
  - Methods for selecting projects
    - *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

- Projects that address broad organizational needs are much more likely to be successful because they will be important to the organization
  - *Examples: improve safety or increase morale*
- Important criteria for selecting projects
  - *Need*
  - *Funding*
  - *Will*

Categorizing IT Projects

- Categorizations
  - *Respond to a problem, opportunity, or directive*
  - *How long it will take to do and when it is needed*
  - *Overall priority of the project*

Performing Financial Analyses

- Financial considerations are often an important consideration in selecting projects
  - *Regardless of current economics*
- 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

- 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*
  - *Projects with higher NPVs are preferred*

Net Present Value Analysis

	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

FIGURE 4-4 Net present value example

Net Present Value Analysis

Discount rate	**8%**					
Assume the project is completed in Year 0			**Year**			
	0	**1**	**2**	**3**	**Total**	
Costs	140,000	40,000	40,000	40,000		
Discount factor	1	0.93	0.86	0.79		
Discounted costs	**140,000**	**37,200**	**34,400**	**31,600**	**243,200**	
Benefits	0	200,000	200,000	200,000		
Discount factor	1	0.93	0.86	0.79		
Discounted benefits	**0**	**186,000**	**172,000**	**158,000**	**516,000**	
Discounted benefits - costs	(140,000)	148,800	137,600	126,400	**272,800**	← **NPV**
Cumulative benefits - costs	(140,000)	8,800	146,400	272,800		
ROI →	**112%**					
	Payback in Year 1					

FIGURE 4-5 JWD Consulting net present value and return on investment example

Net Present Value Analysis

- NPV calculations
  - Determine estimated costs and benefits for the life of the project and the products it produces
  - Determine the discount rate
  - Calculate the net present value
- Important considerations
  - Some organizations refer to the investment year or years for project costs as Year 0 and do not discount costs in Year 0
  - Discount rate can vary, often based on the prime rate and other economic considerations
  - Costs can be entered as negative numbers and can be listed first (and then benefits)

Return on Investment

- Calculated by subtracting the project costs from the benefits and then dividing by the costs
  - **ROI = (total discounted benefits - total discounted costs) / discounted costs**
- The higher the ROI, the better
- Many organizations have a required rate of return
  - Minimum acceptable rate of return on investment for projects
- Internal rate of return (IRR) can by calculated by finding the discount rate that makes the NPV equal to zero

Payback Analysis

- 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
  - Determines how much time will elapse before accrued benefits overtake accrued and continuing costs
  - Payback occurs when the net cumulative discounted benefits equals the costs
  - Many organizations have requirements for the length of the payback period of an investment

Payback Analysis

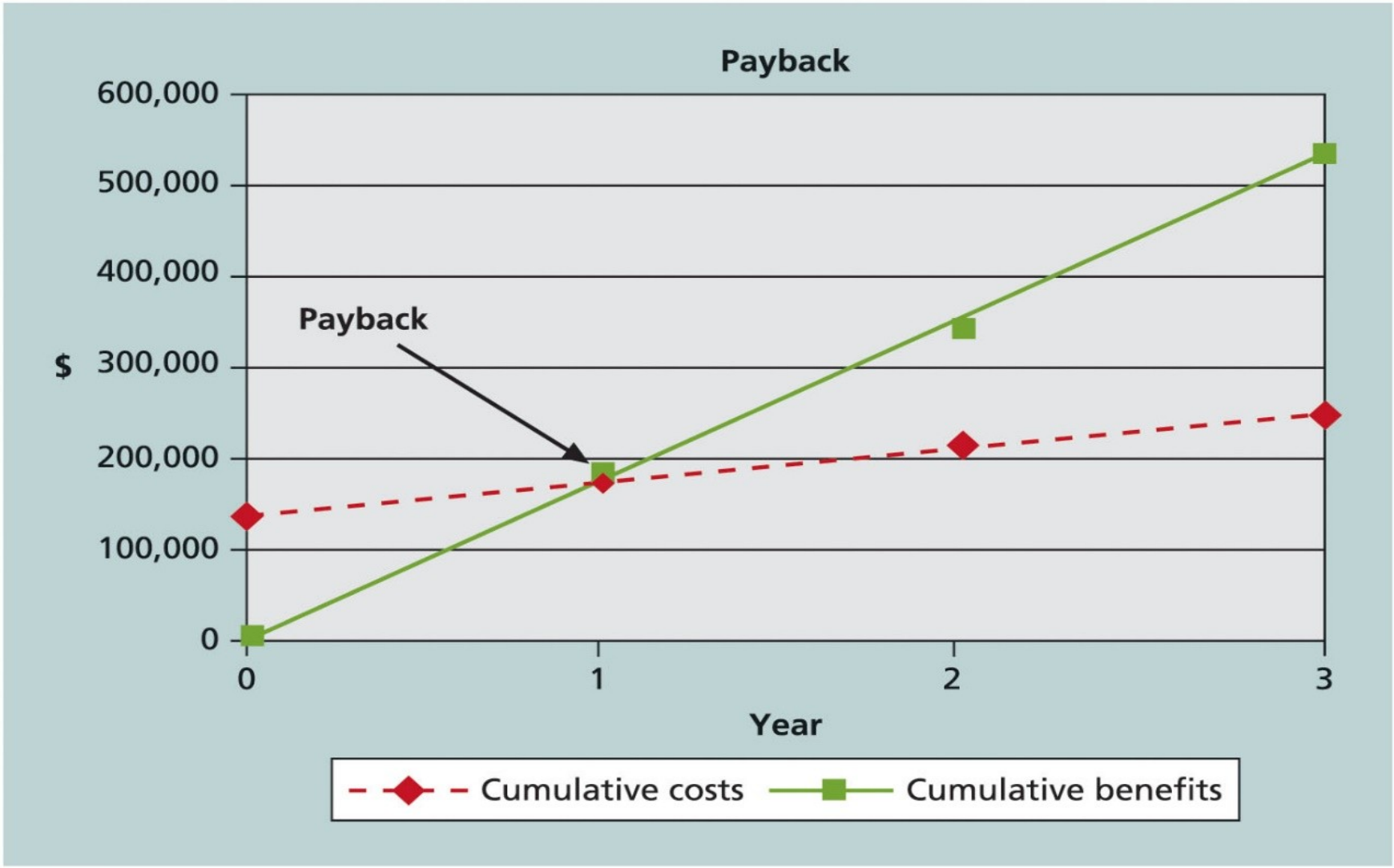

FIGURE 4-6 Charting the payback period for the JWD Consulting project

Using a Weighted Scoring Model

- 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

Using a Weighted Scoring Model

	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**
10						
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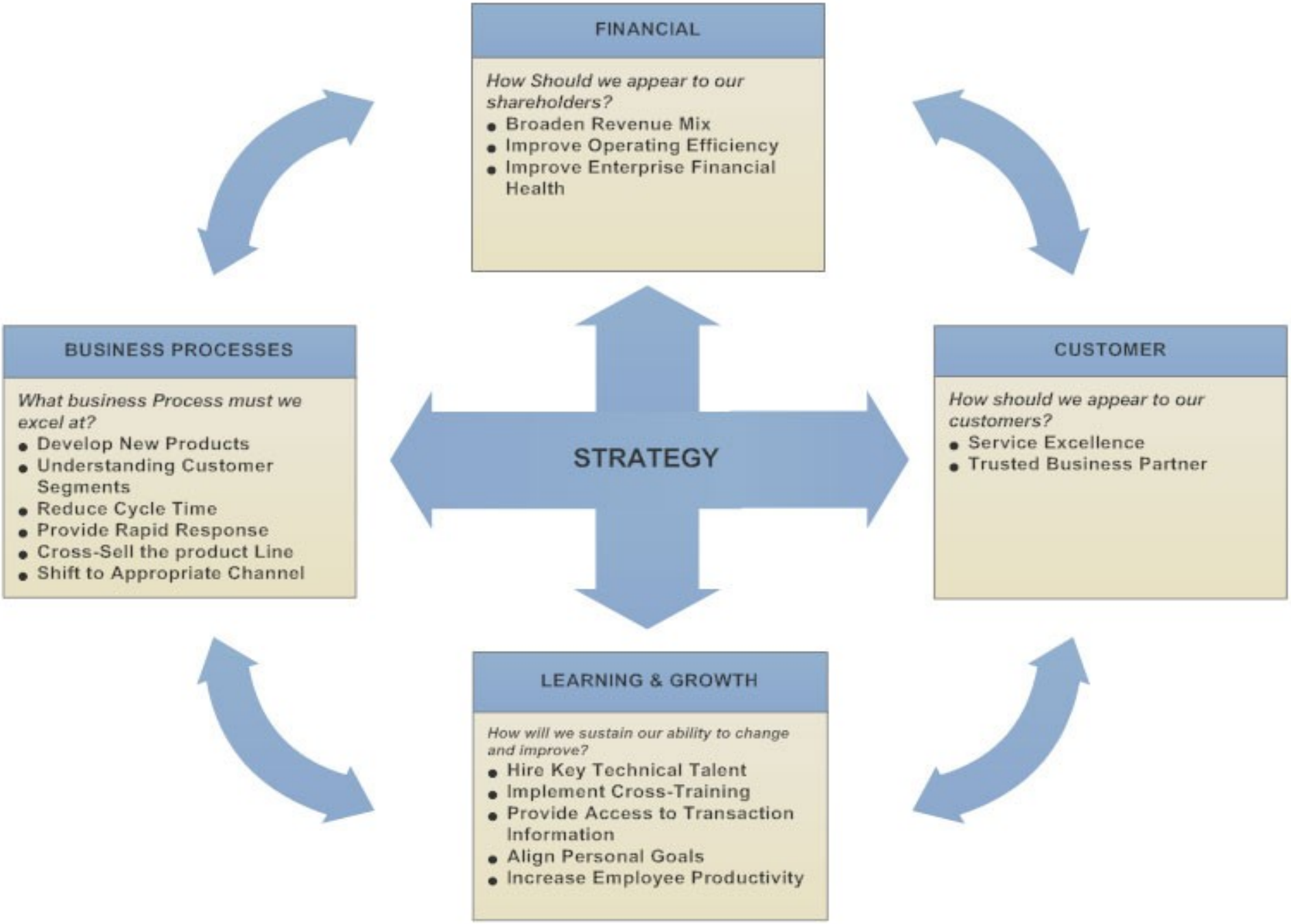
FIGURE 4-7 Sample weighted scoring model for project selection

Implementing a Balanced Scorecard

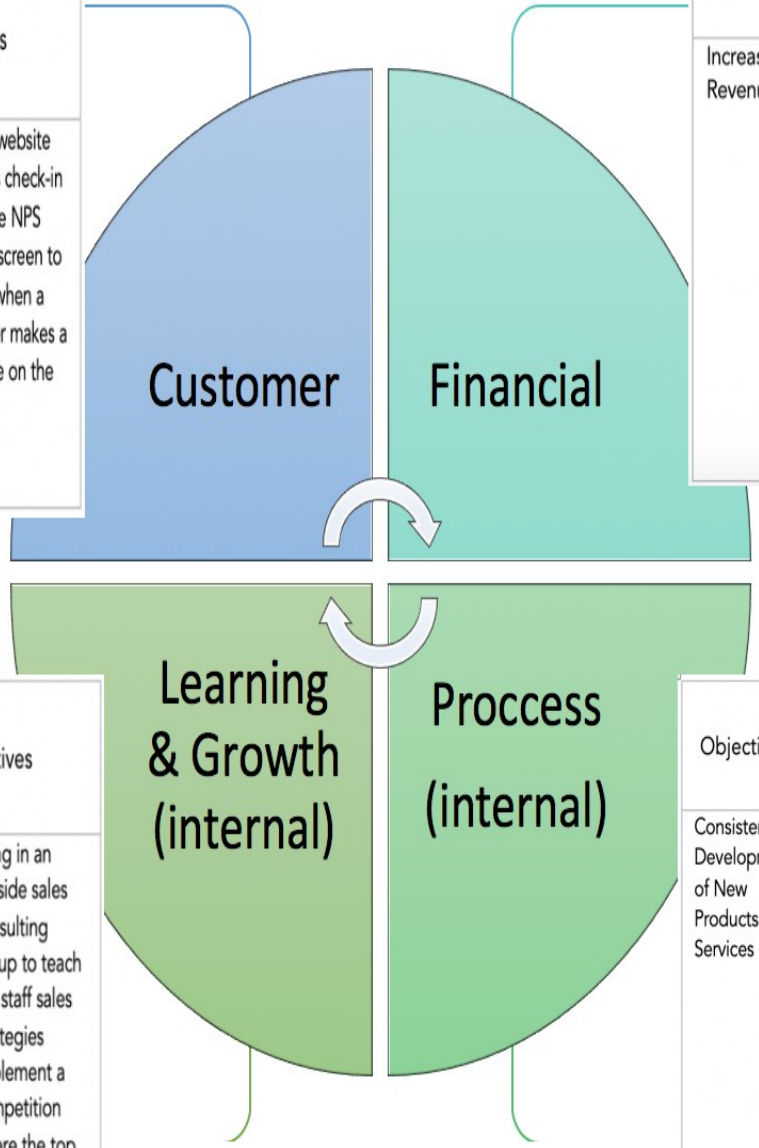
- Drs. Robert Kaplan and David Norton developed this approach to help select and manage projects that align with business strategy
  - A balanced scorecard is a strategic planning and management system that helps organizations
    - *align business activities to strategy,*
    - *improve communications, and*
    - *monitor performance against strategic goals*



Adapted from the Balanced Scorecard by Robert S. Kaplan and Dave P. Norton. Harvard Business School Press. 1996.

Objectives	Measures	Target	Initiatives
Improve customer net promoter score (NPS) rating *NPS = "on a scale from 1 – 10 likely are you to recommend our product/ service to a friend?	Success = better NPS this month than last month Failure = worse NPS this month than last month	Average NPS greater than or equal to 6	- Weekly website analytics check-in - Code the NPS pop-up screen to display when a customer makes a purchase on the website

Objectives	Measures	Target	Initiatives
Increase Revenue	Success = increased revenue this quarter as compared to last quarter Failure = decreased revenue this quarter as compared to last quarter	Increase net revenue by 10%	- Hire 3 additional consultants - Increase marketing efforts - Implement a customer referral bonus



Objectives	Measures	Target	Initiatives
To have everyone on the consulting team confident in their ability to sell products	Success = 100% of the consulting team staff being able to sell a product/ service and close a deal Failure = even one person on the consulting team staff is not confident in their ability to close a deal	Each consulting team staff member closes 2 deals per month	- Bring in an outside sales consulting group to teach the staff sales strategies - Implement a competition where the top sales person is awarded a prize each month

Objectives	Measures	Target	Initiatives
Consistent Development of New Products / Services	Success = at least as much, if not more, product development happening this month than the month prior Failure = less project development activities happening this month than last month	At least 5 new product development projects happening at any given time	- Implement bi-weekly reoccurring meeting to address new product development - Assign a team member to be responsible for the researching new potential products

Developing a Project Charter

- 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 project charter is a key output of the initiation process*

Developing a Project Charter

- Inputs for developing a project charter
  - Business case
  - Benefits management plan
  - Agreements
  - Enterprise environmental factors
  - Organizational process assets

Developing a Project Management Plan

- 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
- Common elements of a project management plan
  - Introduction/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

Using Guidelines to Create Project Management Plans

Sample contents for the IEEE 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

Source: IEEE Standard 1058–1998.

Directing and Managing Project Work

- Involves managing and performing the work described in the project management plan
  - The majority of time and money is usually spent on execution
- The application area of the project directly affects project execution
  - Products of the project are produced during the execution phase
- The project manager needs to focus on leading the project team and managing stakeholder relationships to execute the project management plan successfully
  - Project resource management, communications management, and stakeholder management are crucial to a project's success

Coordinating Planning and Execution

- Project planning and execution are intertwined and inseparable activities
  - The main function of creating a project management plan is to guide project execution
- Those who will do the work should help to plan the work
  - All project personnel need to develop both planning and executing skills, and they need experience in these areas

Project Execution Tools and Techniques

- Project managers can use specific tools and techniques to perform activities that are part of execution processes
  - Expert judgment
  - Meetings
  - Project management information systems

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
- The project management plan provides the baseline for identifying and controlling project changes
  - A baseline is a starting point, a measurement, or an observation that is documented so that it can be used for future comparison.

Performing Integrated Change Control

- Main objectives
  - Influencing the factors that create changes to ensure that changes are beneficial
  - Determining that a change has occurred
  - Managing actual changes as they occur

Change Control on IT Projects

- ***Former view***: the project team should strive to do exactly what was planned on time and within budget
- ***Problem***: project teams could rarely meet original project goals

- ***Modern view***: project management is a process of constant communication and negotiation
- ***Solution:*** changes are often beneficial and the project team should plan for them

Change Control System

- Formal, documented process that describes when and how official project documents and work may be changed
  - Describes who is authorized to make changes, paperwork required for these changes, and any automated or manual tracking systems the project will use
- Change control board (CCB) is a formal group of people responsible for approving or rejecting changes on a project
  - Provide guidelines for preparing change requests, evaluate change requests, and manage the implementation of approved changes
- Some CCBs only meet occasionally, so it may take too long for changes to occur
  - Some organizations have policies in place for

Change Control System

- ***Configuration management*** ensures that the descriptions of the project's products are correct and complete
  - Involves identifying and controlling the functional and physical design characteristics of products and their support documentation
  - Configuration management specialists identify and document configuration requirements, control changes, record and report changes, and audit the products to verify conformance to requirements

Closing Projects or Phases

- To close a project or phase, you must finalize all activities and transfer the completed or cancelled work to the appropriate people
  - Main inputs are the project charter, project management plan, project documents, accepted deliverables, business documents, agreements, procurement documentation, and organizational process assets
  - Main tools and techniques are expert judgment, data analysis, and meetings

Considerations for Agile/Adaptive Environments

- Iterative and agile approaches promote the engagement of team members
- Expectations of the project manager do not change in an adaptive environment, but control of the detailed product planning and delivery is delegated to the team
- Project managers using any product life cycle should focus on creating a collaborative decision-making environment and providing opportunities for team members to develop additional skills

Chapter Summary

- Project integration management ties together all the other areas of project management
  - Primary focus should be on project integration management
- Main processes
  - Develop the project charter
  - Create an assumption log
  - Develop the project management plan
  - Direct and manage project execution
  - Manage project knowledge
  - Monitor and control project work
  - Perform integrated change control
  - Close the project or phase