

The background features a vibrant blue field with large, expressive yellow brushstrokes in the top-left, top-right, and bottom-right corners, creating a modern, artistic feel.

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

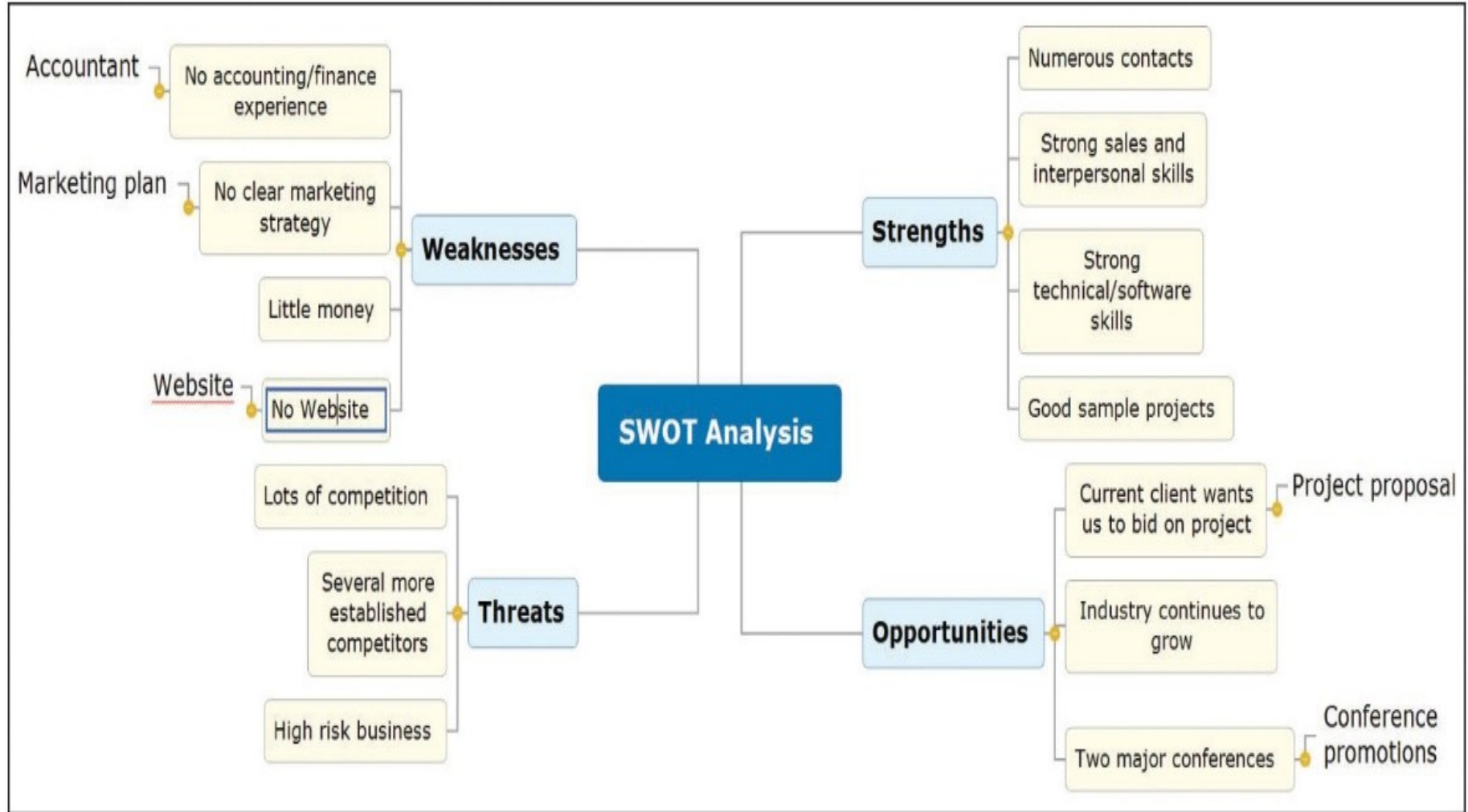


FIGURE 4-2 Mind map of a SWOT analysis to help identify potential projects

Strategic Planning and Project Selection

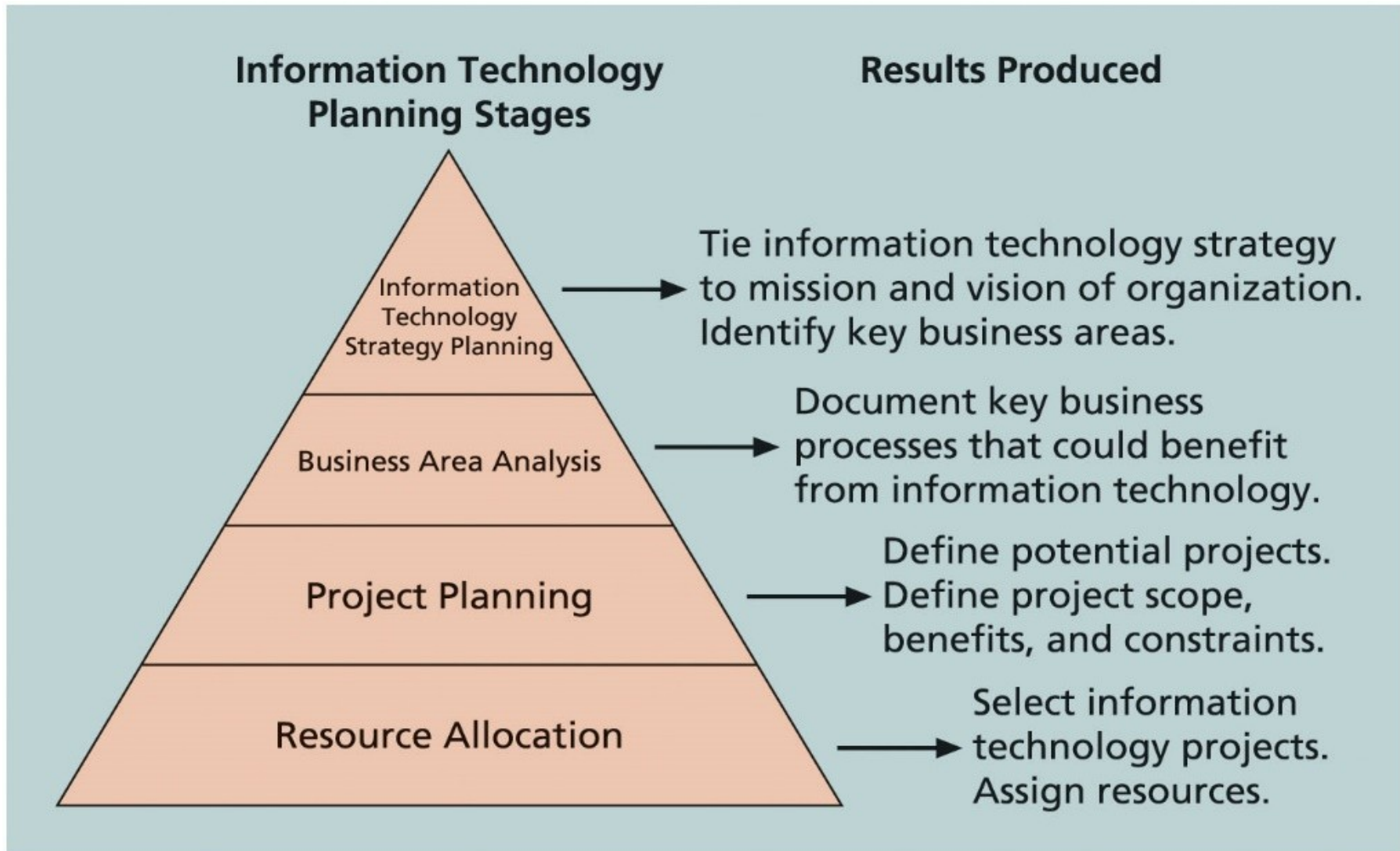


FIGURE 4-3 Planning process for selecting IT projects

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 be 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

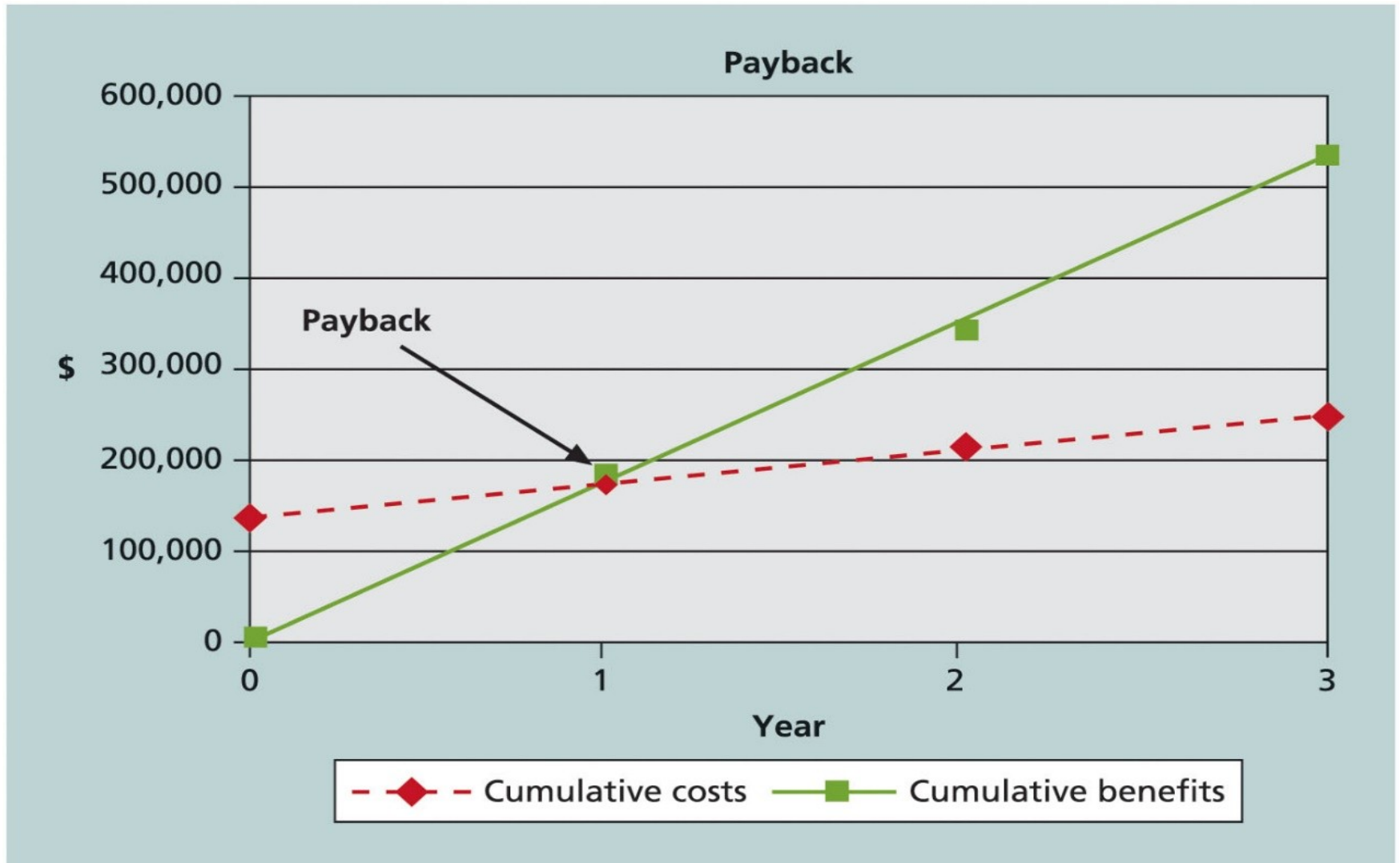


FIGURE 4-6 Charting the payback period for the JWD Consulting project

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

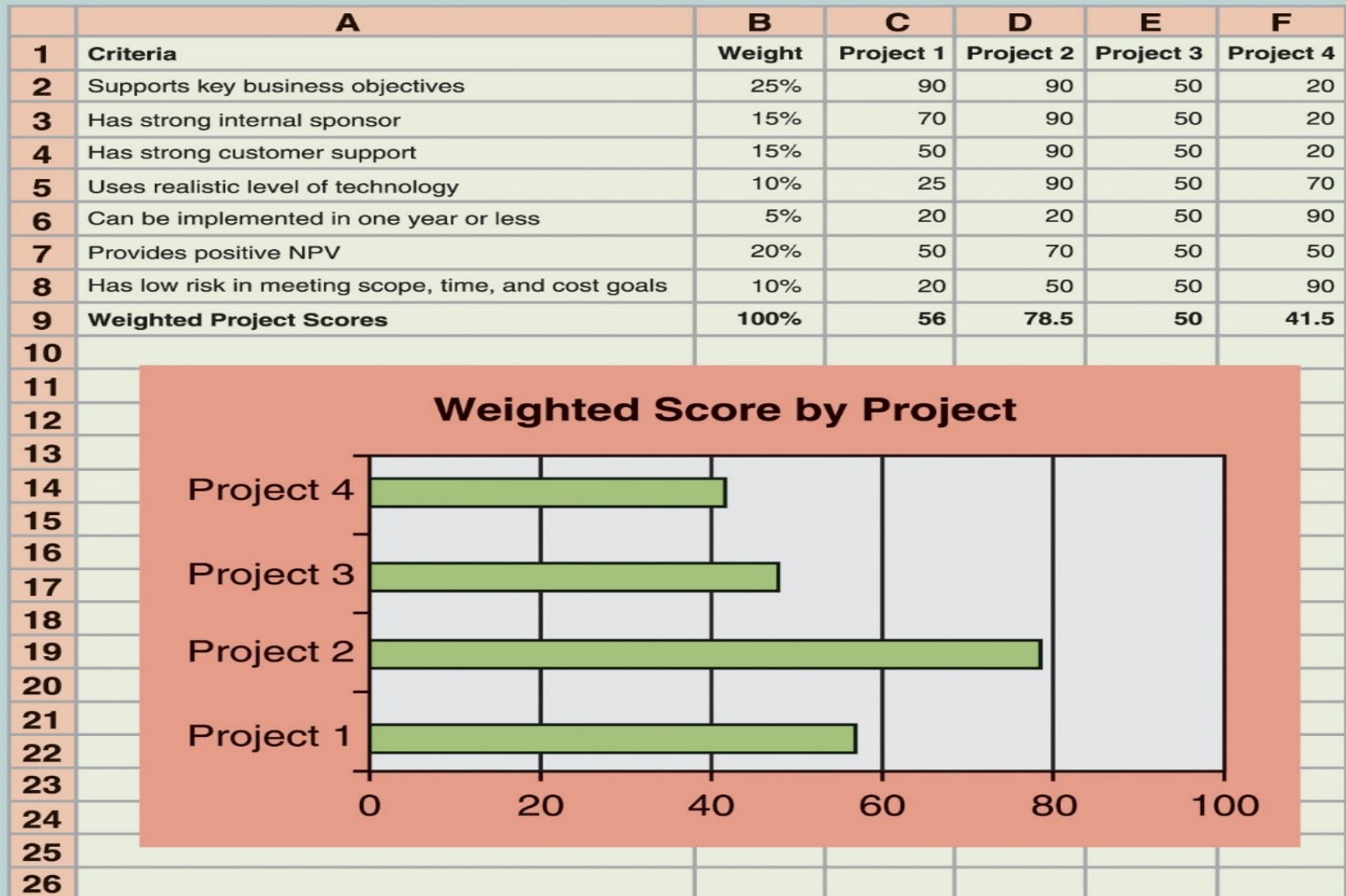
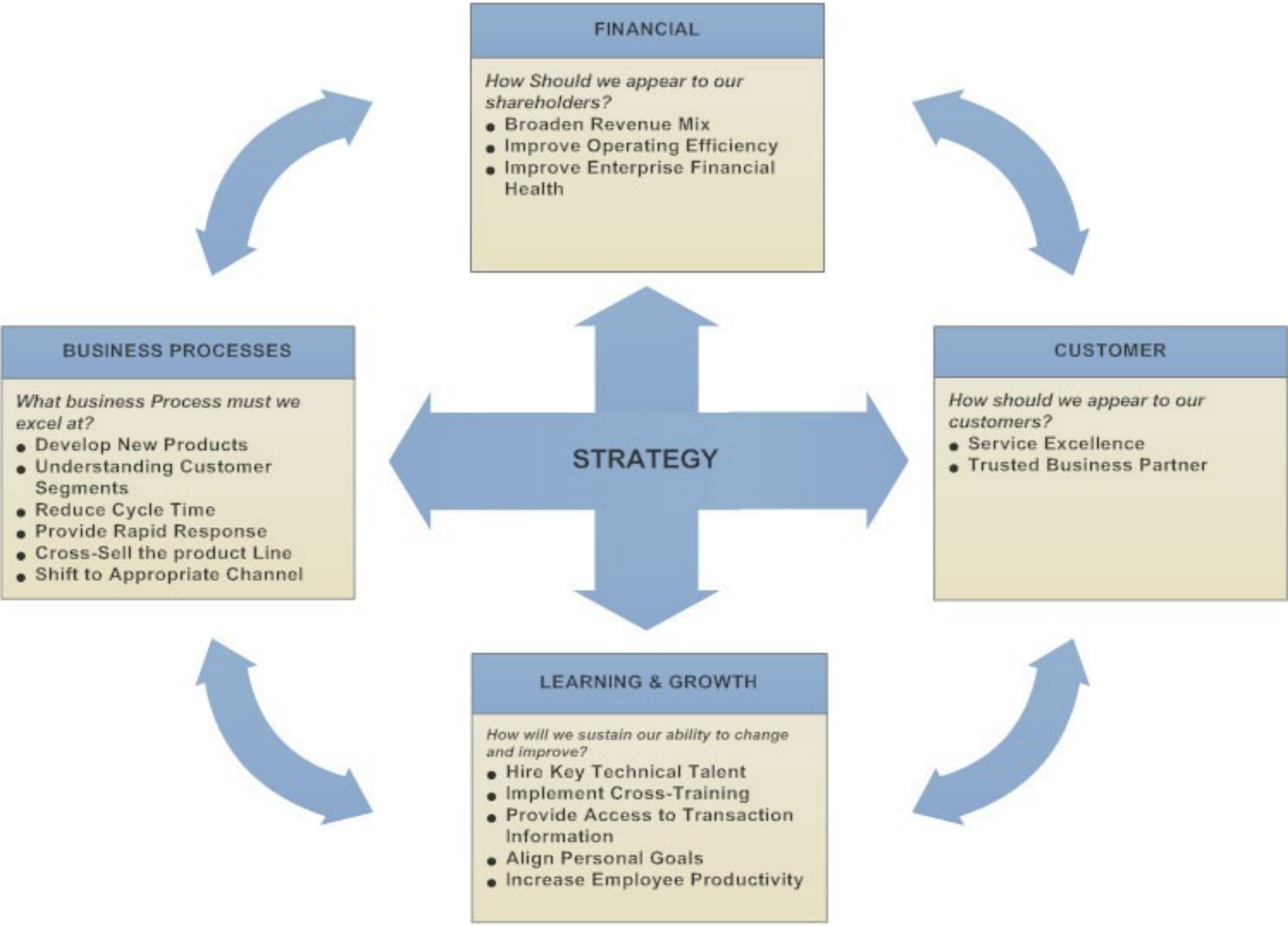


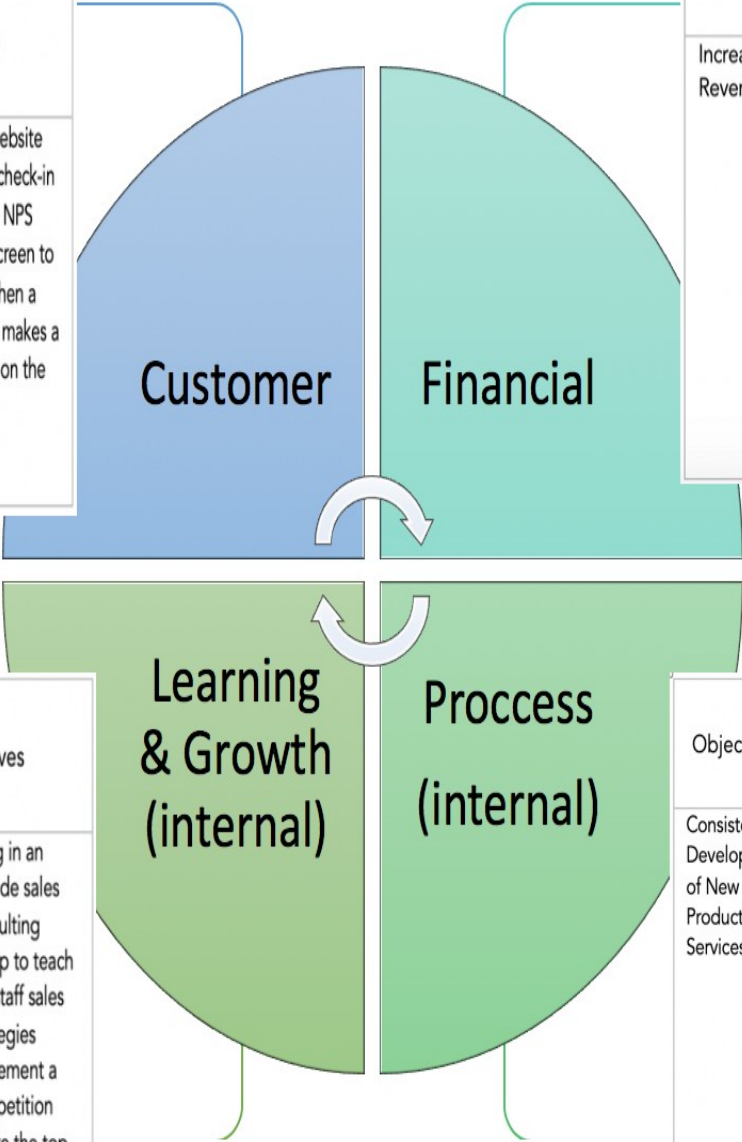
FIGURE 4-7 Sample weighted scoring model for project selection

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*



| Objectives | Measures | Target | Initiatives |
|--|---|--|--|
| Improve customer net promoter score (NPS) rating <i>*NPS = "on a scale from 1 - 10 likely are you to recommend our product/ service to a friend?"</i> | Success = better NPS this month than last month Failure = worse NPS this month than last month | Average NPS greater than or equal to 6 | <ul style="list-style-type: none"> - 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% | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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 | <ul style="list-style-type: none"> - 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 |

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