Chapter 4: Project Integration Management

Information Technology Project Management, Eighth Edition

Note: See the text itself for full citations.

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 (See opening case for a real example)
- Project integration management is *not* the same thing as software integration

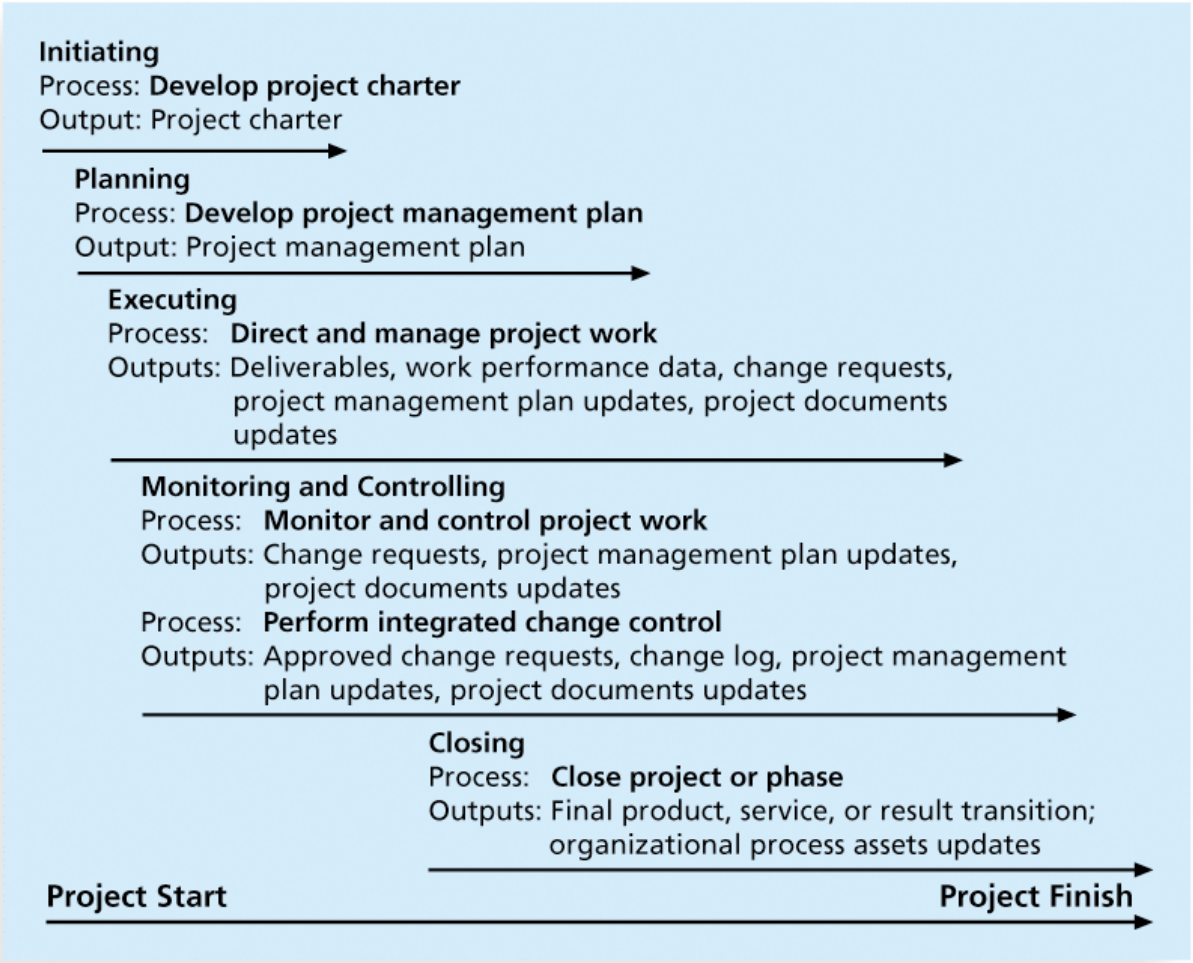
Project Integration Management Processes

- 1. Developing the project charter involves working with stakeholders to create the document that formally authorizes a project—the charter.
- 2. Developing the project management plan involves coordinating all planning efforts to create a consistent, coherent document—the project management plan.
- 3. Directing and managing project work involves carrying out the project management plan by performing the activities included in it.

Project Integration Management Processes (cont'd)

- Monitoring and controlling project work involves overseeing activities to meet the performance objectives of the project
- Performing integrated change control involves identifying, evaluating, and managing changes throughout the project life cycle.
- Closing the project or phase involves finalizing all activities to formally close the project or phase.

Figure 4-1. Project Integration Management Summary



What Went Wrong?

- The Surrey police force began looking into replacing its criminal intelligence system in 2005, but the project was finally cancelled in 2013, and the old system was replaced with a much less expensive one used by thirteen other forces
- The person in charge of the project would not take responsibility for it
- An audit report said the project was beyond their in-house capabilities and experience
- Organizations must make the right staffing/outsourcing decisions

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

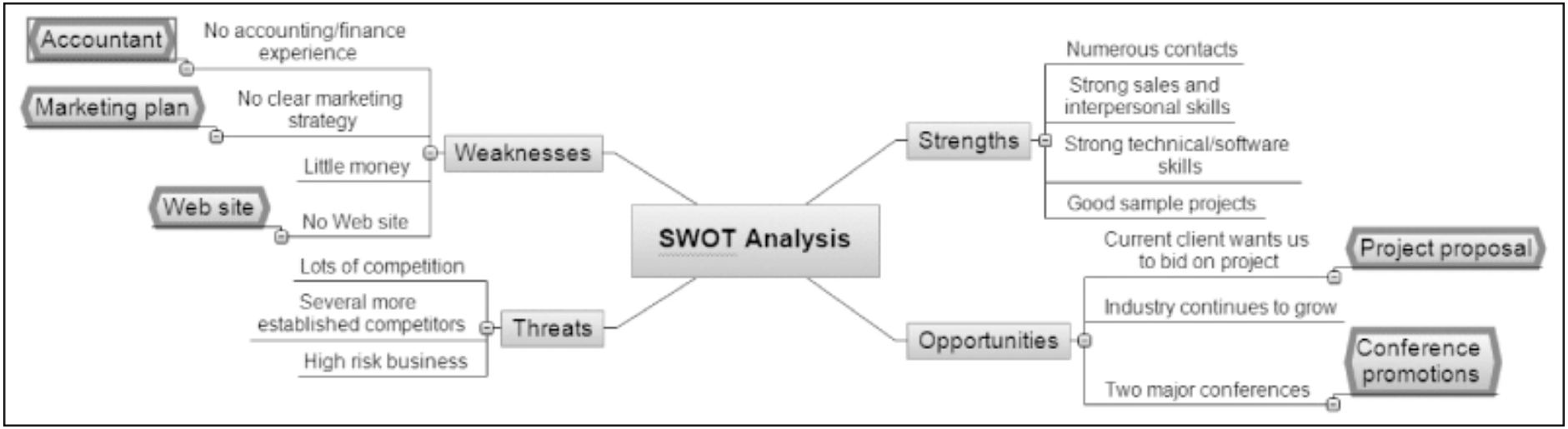
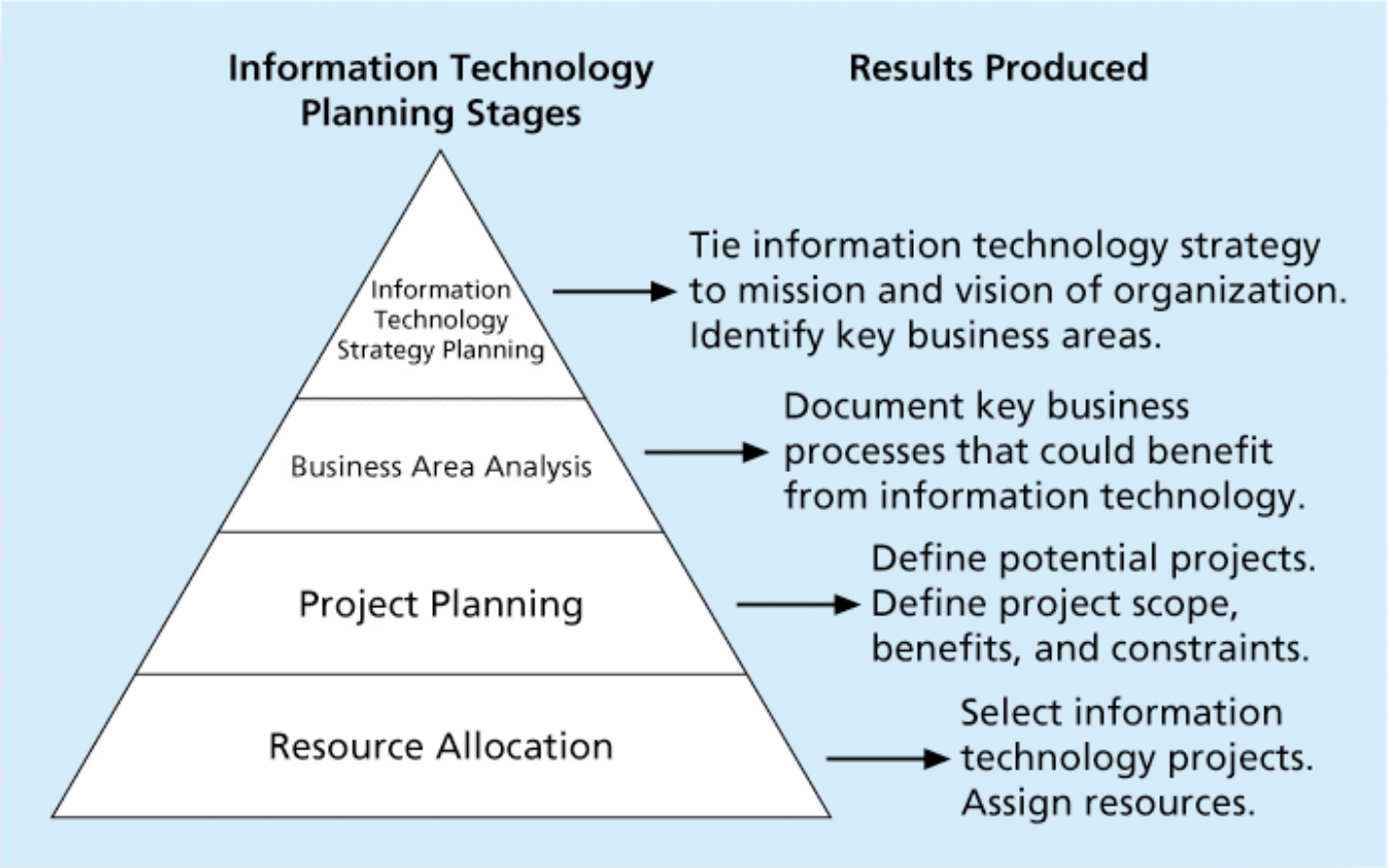


Figure 4-3. Information Technology Planning Process



Best Practice

- A 2013 survey identified companies most admired for their ability to apply IT-related business capabilities for competitive advantage
- Best practices of these companies include:
  - Customer-driven IT is essential
  - IT can enable branding and customer recruitment
  - Keep improving

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
- Another is the 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
- 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

Figure 4-5. JWD Consulting NPV Example

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					

Note: See the template called business_case_financials.xls

NPV Calculations

- Determine estimated costs and benefits for the life of the project and the products it produces
- Determine the discount rate (check with your organization on what to use)
- Calculate the NPV (see text for details)
- Notes: Some organizations consider the investment year as year 0, while others start in year 1. Some people entered costs as negative numbers, while others do not. Check with your organization for their preferences

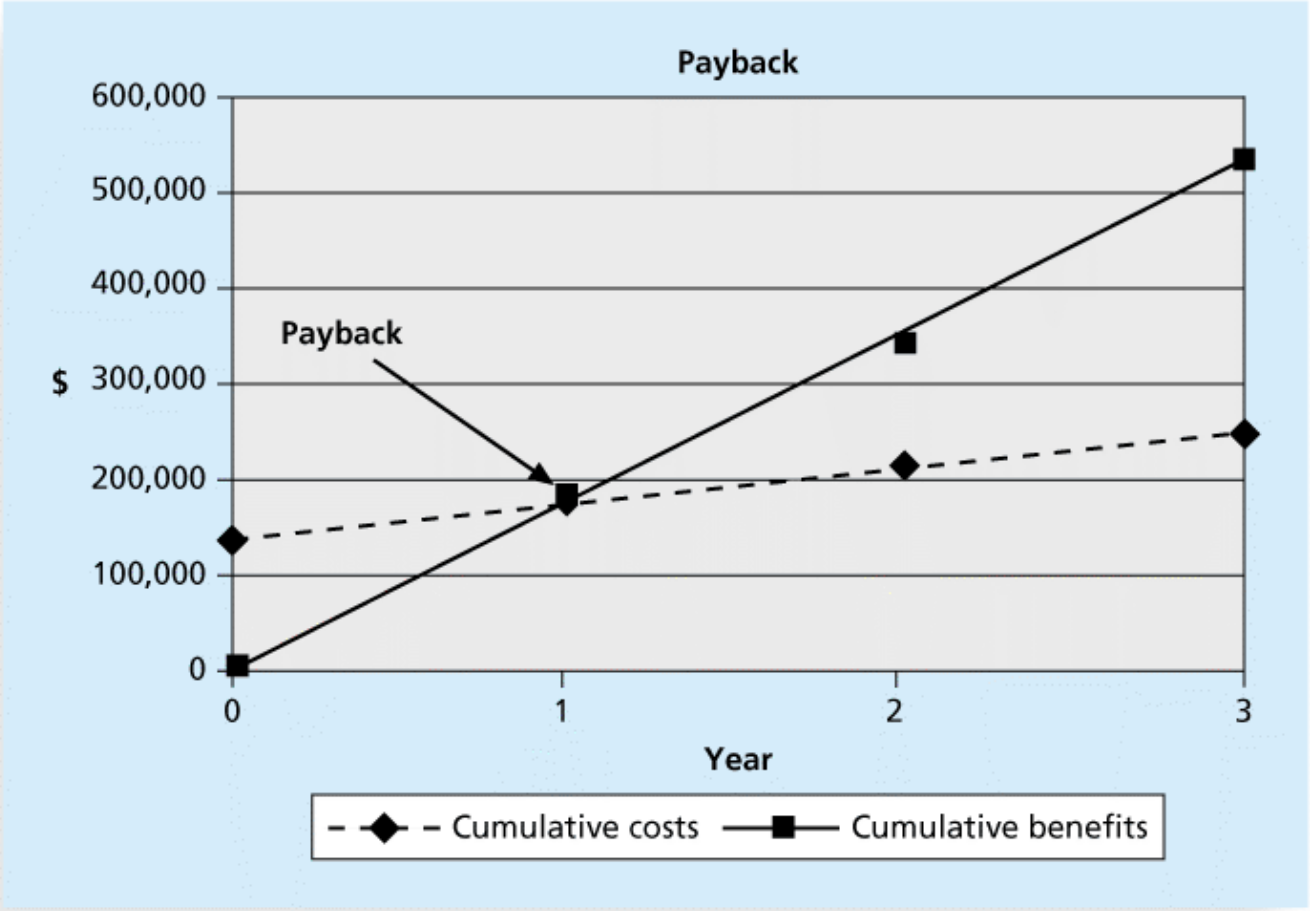
Return on Investment

- **Return on investment** (ROI) is 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** or 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

- 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 net cumulative discounted benefits equals the costs
- Many organizations want IT projects to have a fairly short payback period

Figure 4-6. Charting the Payback Period

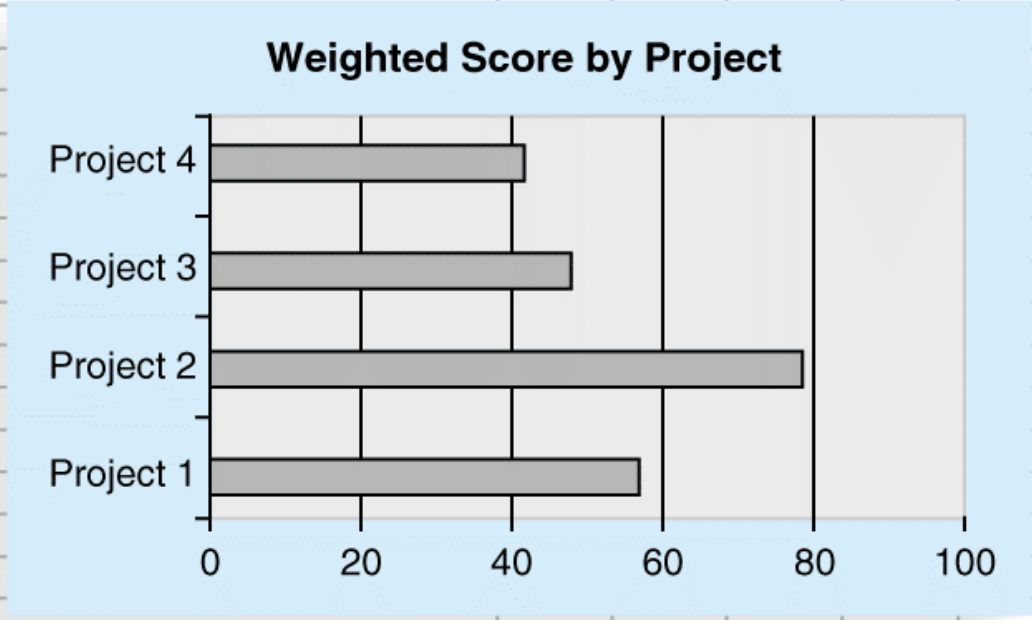


Weighted Scoring Model

- 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**



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 for more information

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 signed charter is a key output of project integration management

Inputs for Developing a Project Charter

- A project statement of work
- A business case
- Agreements
- Enterprise environmental factors
- **Organizational process assets**, which include formal and informal plans, policies, procedures, guidelines, information systems, financial systems, management systems, lessons learned, and historical information

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. Project Charter (cont.)

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 *Nick Carson*
Susan Johnson *Renyong Chi*
Erik Haus *Bill Strom*
Maggie Elliot

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

Developing a Project Management Plan

- 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

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.

What the Winners Do

"The winners clearly spell out what needs to be done in a project, by whom, when, and how. For this they use an integrated toolbox, including PM tools, methods, and techniques…If a scheduling template is developed and used over and over, it becomes a repeatable action that leads to higher productivity and lower uncertainty. Sure, using scheduling templates is neither a breakthrough nor a feat. But laggards exhibited almost no use of the templates. Rather, in constructing schedules their project managers started with a clean sheet, a clear waste of time.“*

*Milosevic, Dragan and And Ozbay. “Delivering Projects: What the Winners Do.” Proceedings of the Project Management Institute Annual Seminars & Symposium (November 2001).

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 because the products of the project are produced during execution

Coordinating Planning and Execution

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

Providing Leadership and a Supportive Culture

- Project managers must lead by example to demonstrate the importance of creating and then following good project plans
- Organizational culture can help project execution by
  - providing guidelines and templates
  - tracking performance based on plans
- Project managers may still need to break the rules to meet project goals, and senior managers must support those actions

What Went Right?

- 2015 PMI report found that only 12 percent of organizations were considered to be high performers
- Percentage remained unchanged in past few years
- Organizations must make major cultural changes to improve

Capitalizing on Product, Business, and Application Area Knowledge

- It is often helpful for IT project managers to have prior technical experience
- On small projects, the project manager may be required to perform some of the technical work or mentor team members to complete the projects
- On large projects, the project manager must understand the business and application area of the project

Project Execution Tools and Techniques

- **Expert judgment**: Experts can help project managers and their teams make many decisions related to project execution
- **Meetings:** Meetings allow people to develop relationships, pick up on important body language or tone of voice, and have a dialogue to help resolve problems.
- **Project management information systems**: There are hundreds of project management software products available on the market today, and many organizations are moving toward powerful enterprise project management systems that are accessible via the Internet
- See the What Went Right? example of Kuala Lumpur's Integrated Transport Information System on p. 169

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 approved project management plan plus approved changes

Media Snapshot

- The 2002 Olympic Winter Games and Paralympics took five years to plan and cost more than $1.9 billion. PMI awarded the Salt Lake Organizing Committee (SLOC) the Project of the Year award for delivering world-class games.
- Four years before the Games began, the SLOC used a Primavera software-based system with a cascading color-coded WBS to integrate planning…The SLOC also used an Executive Roadmap, a one-page list of the top 100 Games-wide activities, to keep executives apprised of progress. Activities were tied to detailed project information within each department's schedule. A 90-day highlighter showed which managers were accountable for each integrated activity.
- Fraser Bullock, SLOC Chief Operating Officer and Chief, said, "We knew when we were on and off schedule and where we had to apply additional resources. The interrelation of the functions meant they could not run in isolation—it was a smoothly running machine."*

*Foti, Ross, "The Best Winter Olympics, Period," PM Network (January 2004) 23.

Performing Integrated Change Control

- Three main objectives are:
  - 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 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 and negotiation
- Solution: Changes are often beneficial, and the project team should plan for them

Change Control System

- A **change control system** is a formal, documented process that describes when and how official project documents and work may be changed
- Describes who is authorized to make changes and how to make them

Change Control Board (CCB)

- A **change control board** is a formal group of people responsible for approving or rejecting changes on a project
- CCBs provide guidelines for preparing change requests, evaluate change requests, and manage the implementation of approved changes
- Includes stakeholders from the entire organization

Making Timely Changes

- Some CCBs only meet occasionally, so it may take too long for changes to occur
- Some organizations have policies in place for time-sensitive changes
  - "48-hour policy" allows project team members to make decisions, then they have 48 hours to reverse the decision pending senior management approval
  - Delegate changes to the lowest level possible, but keep everyone informed of changes

Global Issues

- Rapid changes in technology, such as the increased use of mobile roaming for communications, often cause governments around the world to take action.
- Incompatible hardware, software, and networks can make communications difficult in some regions, and a lack of competition can cause prices to soar.
- Fortunately, a group called the Organisation for Economic Co-operation and Development (OECD) promotes policies that will improve the economic and social well-being of people around the world.
- In February 2012, the OECD called upon its members' governments to boost competition in international mobile roaming markets.
- By the end of 2013, wireless broadband penetration grew to 72.4% in the OECD area

Configuration Management

- **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
- See www.icmhq.com for more information

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.

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 outputs include
  - Final product, service, or result transition
  - Organizational process asset updates

Using Software to Assist in Project Integration Management

- Several types of software can be used to assist in project integration management
  - Documents can be created with word processing software
  - Presentations are created with presentation software
  - Tracking can be done with spreadsheets or databases
  - Communication software can facilitate communications
  - Project management software can pull everything together and show detailed and summarized information

Figure 4-8. Sample Portfolio Management Software Screen

Source: www.projectmanager.com

Chapter Summary

- Project integration management involves coordinating all of the other knowledge areas throughout a project's life cycle
- Main processes include
  - Develop the project charter
  - Develop the project management plan
  - Direct and manage project execution
  - Monitor and control project work
  - Perform integrated change control
  - Close the project or phase