Chapter 9: Project Resource Management

Information Technology Project Management, Ninth Edition

Note: See the text itself for full citations

Learning Objectives (1 of 2)

- Explain the importance of good resource management on projects, including the current state of the global IT workforce and future implications for IT

- Define project resource management and understand its processes

- Summarize key concepts for managing people by understanding theories of motivation, influence, and power; how people and teams can become more effective; emotional intelligence; and leadership

- Discuss resource management planning and be able to create a human resource plan, project organizational chart, responsibility assignment matrix, and resource histogram

- Describe the process of estimating activity resources

Learning Objectives (2 of 2)

- Discuss issues that are typically involved in resource acquisition, particularly as they involve resource assignments, resource loading, and resource leveling

- Assist in team development with training, team-building activities, and reward systems

- Explain and apply several tools and techniques to help manage a project team and summarize general advice on managing teams

- Summarize the process of controlling resources

- Describe how project management software can assist in project resource management

- Discuss considerations for agile/adaptive environments

The Importance of Resource Management

- People determine the success and failure of organizations and projects
  - Most project managers agree that managing human resources effectively is one of the toughest challenges they face
  - Managing people is a vital component of project resource management

The Global IT Workforce

- Although there have been ups and downs in the IT labor market, there will always be a need for good IT workers
  - By June of 2017, there were almost 4.3 billion mobile-broadband subscriptions
  - By 2020, ICT spending is projected to grow to nearly $5.5 trillion
  - Jobs available to IT professionals are expected to increase by 12 percent by 2024
  - Project management is number three on Computerworld's hottest tech list

Implications for the Future of IT Human Resource Management

- Proactive organizations are addressing human resource needs

  - Improving benefits

  - Redefining work hours and incentives

  - Finding future workers

Global Issues

- In 2013, Yahoo's CEO issued a memo stating that employees could no longer work from home, causing quite a stir throughout the world

- Diebold's CEO took the opposite approach and started recruiting employees who wanted to work from home, luring the best and brightest workers from Yahoo and other companies cutting back on telecommuting

- The *Huffington Post* believes that telecommuting has won, and even Yahoo has softened its stance
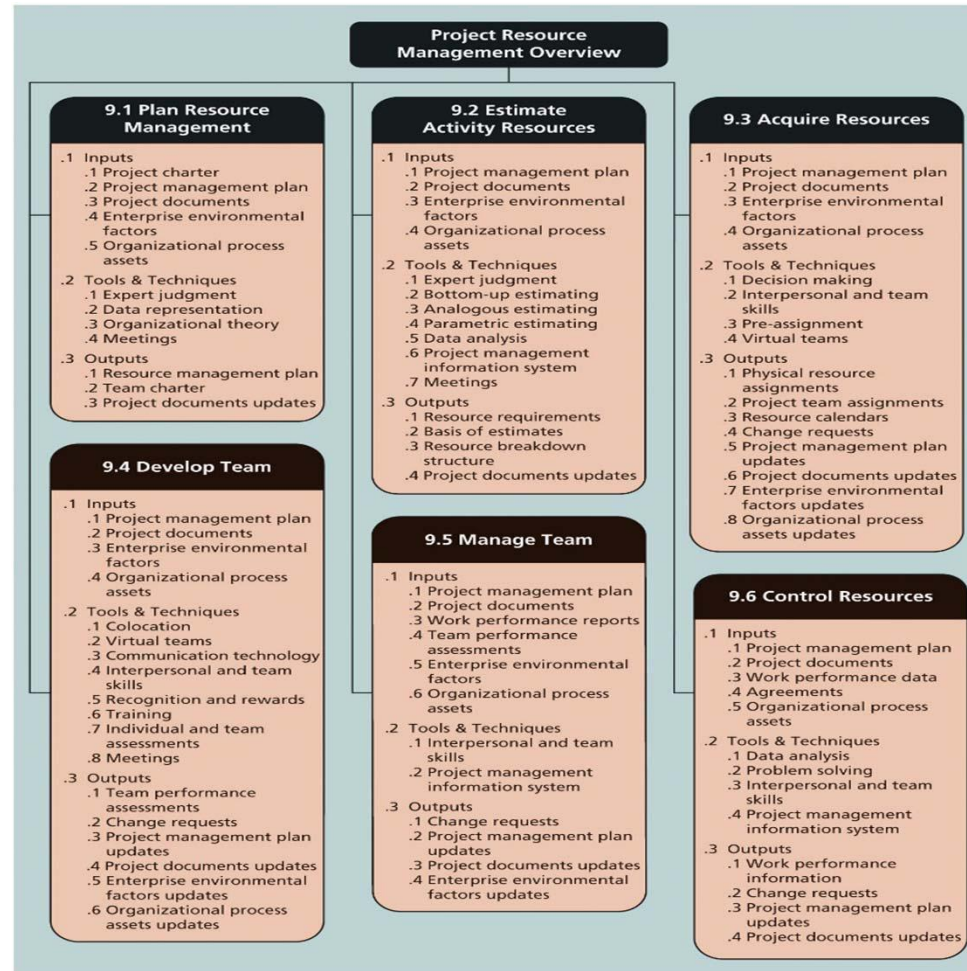
What Went Wrong?

- CompTIA found a gap between skills that employers wanted and what they actually found in the IT workforce
    - 68 percent of IT firms report having a very challenging time finding new staff
    - 52 percent of organizations report having job openings, and 33 percent say they are understaffed, while 42 percent say they are fully staffed but want to hire more people in order to expand
    - 58 percent of businesses are concerned about the quality and quantity of IT talent available for hire
    - Top technology priorities in this survey included security, data storage, and network infrastructure
    - The number one strategy to handle understaffing is requiring workers to put in more hours
    - 94 percent of IT professionals plan to pursue more training

- Making the most effective use of the human and physical resources involved with a project
  - Planning resource management
  - Estimating activity resources
  - Acquiring resources
  - Developing the project team
  - Managing the project team
  - Controlling resources

What is Project Resource Management? (2 of 2)

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FIGURE 9-1 Project resource management overview

Keys to Managing and Leading People

- Psychologists and management theorists have devoted much research and thought to the field leading people at work
  - Motivation theories
  - Influence and power
  - Effectiveness
  - Emotional intelligence
  - Leadership

Motivation Theories

- Intrinsic motivation causes people to participate in an activity for their own enjoyment
  - Example: some people love to read, write, or play an instrument because it makes them feel good

- Extrinsic motivation causes people to do something for a reward or to avoid a penalty
  - Example: some young children would prefer not to play an instrument, but they do because they receive a reward or avoid a punishment for doing so

Maslow's Hierarchy of Needs (1 of 2)

- Abraham Maslow argued that humans possess unique qualities that enable them to make independent choices, thus giving them control of their destiny
  - Developed a hierarchy of needs; states that people's behaviors are guided or motivated by a sequence of needs
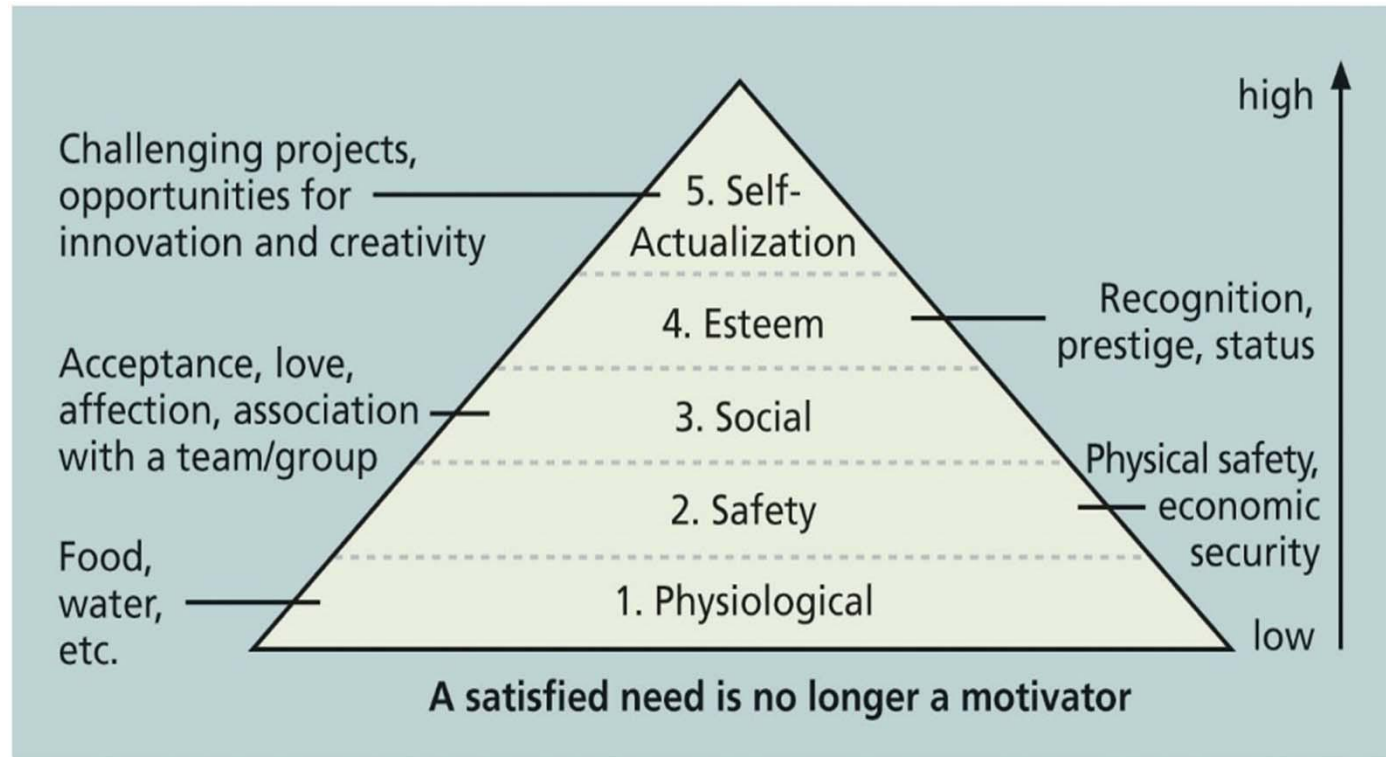
Maslow's Hierarchy of Needs (2 of 2)

FIGURE 9-2 Maslow's hierarchy of needs

Herzberg's Motivational-Hygiene Theory (1 of 2)

- Frederick Herzberg distinguished between motivational factors and hygiene factors
  - Motivational factors: factors that cause job satisfaction
  - Hygiene factors: could cause job dissatisfaction

Herzberg's Motivational-Hygiene Theory (2 of 2)

Hygiene Factors	Motivators
Larger salaries	Achievement
More supervision	Recognition
More attractive work environment	Work itself
Computer or other required equipment	Responsibility
Health benefits	Advancement
Training	Growth

Table 9-1 Examples of Herzberg's hygiene factors and motivators

Media Snapshot

- RSA Animate used a whiteboard drawing technique to summarize key points from Pink's book in a YouTube video called "Drive: The surprising truth about what motivates us"
  - Pink suggests that managers focus on motivators
    - Autonomy
    - Mastery
    - Purpose

McClelland's Acquired-Needs Theory

- Specific needs are acquired or learned over time and shaped by life experiences
  - Achievement (nAch): achievers like challenging projects with achievable goals and regular feedback
  - Affiliation (nAff): people with high nAff desire harmonious relationships and need to feel accepted by others, so managers should try to create a cooperative work environment for them
  - Power: (nPow): people with a need for power desire either personal power (not good) or institutional power (good for the organization)

McGregor's Theory X and Y

- Douglas McGregor popularized the human relations approach to management in the 1960s
  - Theory X: assumes workers dislike and avoid work, so managers must use coercion, threats and various control schemes to get workers to meet objectives
  - Theory Y: assumes individuals consider work as natural as play or rest and enjoy the satisfaction of esteem and self-actualization needs
  - Theory Z: introduced in 1981 by William Ouchi and is based on the Japanese approach to motivating workers, emphasizing trust, quality, collective decision making, and cultural values

Influence and Power (1 of 3)

- Thamhain and Wilemon: ways to have influence on projects
  - Authority: legitimate hierarchical right to issue orders
  - Assignment: ability to influence a worker's later work assignments
  - Budget: ability to authorize others' use of discretionary funds
  - Promotion: ability to improve a worker's position
  - Money: ability to increase a worker's pay and benefits
  - Penalty: ability to cause punishment
  - Work challenge: ability to assign work that capitalizes on a worker's enjoyment of doing a particular task
  - Expertise: perceived special knowledge that others deem important
  - Friendship: ability to establish friendly personal relationships between the project manager and others

Influence and Power (2 of 3)

- Ways to influence
  - Project managers who use work challenges and expertise to influence people projects are more likely to succeed
  - Projects are more likely to fail when project managers rely too heavily on authority, money, or penalty

Influence and Power (3 of 3)

- Power is the potential ability to influence behavior to get people to do things they would not otherwise do
    - Power is much stronger than influence, because it is often used to force people to change their behavior
- Types of power
    - Coercive
    - Legitimate
    - Expert
    - Reward
    - Referent

- Project managers can apply Covey's seven habits to improve effectiveness on projects
  - Be proactive
  - Begin with the end in mind
  - Put first things first
  - Think win/win
  - Seek first to understand, then to be understood
  - Synergize
  - Sharpen the saw

Covey and Improving Effectiveness (2 of 2)

- Good project managers are empathic listeners
  - They listen with the intent to understand

- Before you can communicate with others, you have to have rapport
  - Relation of harmony, conformity, accord, or affinity

- Mirroring is the matching of certain behaviors of the other person
  - A technique to help establish rapport

- IT professionals need to develop empathic listening and other people skills to improve relationships with users and other stakeholders

Advice for Young Professionals

- Start using empathy more effectively

  - Put aside your viewpoint

  - Validate the other person's perspective

  - Examine your attitude

  - Listen to the entire message that the other person is trying to communicate

  - Ask what the other person would do

Emotional Intelligence

- Howard Gardner's book *Frames of Mind: The Theory of Multiple Intelligences* introduced the concept of using more than one way to think of and measure human intelligence
    - Gardner suggested the need to develop both interpersonal intelligence (capacity to understand the motivations, intentions, and desires of others) and intrapersonal intelligence (capacity to understand oneself, one's feelings, and motivations)
    - Emotional intelligence (EI) is knowing and managing one's own emotions and understanding the emotions of others for improved performance

Leadership

- There is no one best way to be a leader

  - Most experts agree that the best leaders are able to adapt their style to needs of the situation

  - It is important to understand and pay attention to concepts of motivation, influence, power, effectiveness, emotional intelligence, and leadership in all project processes

What Went Right?

- PMI introduced the PMI Talent Triangle® in 2015 to emphasize the need for more than technical skills for project managers
  - The Talent Triangle® includes:
    - Technical project management
    - Strategic and business management
    - Leadership

Developing the Resource Management Plan and Team Charter (1 of 6)

- Involves identifying and documenting project resources, roles, responsibilities, skills, and reporting relationships
  - Can be separated into a human resource management plan and a physical resource management plan

- Contents include:
  - Project organizational charts
  - Responsibility assignment matrixes
  - Staffing management plan and resource histograms
  - Team charters

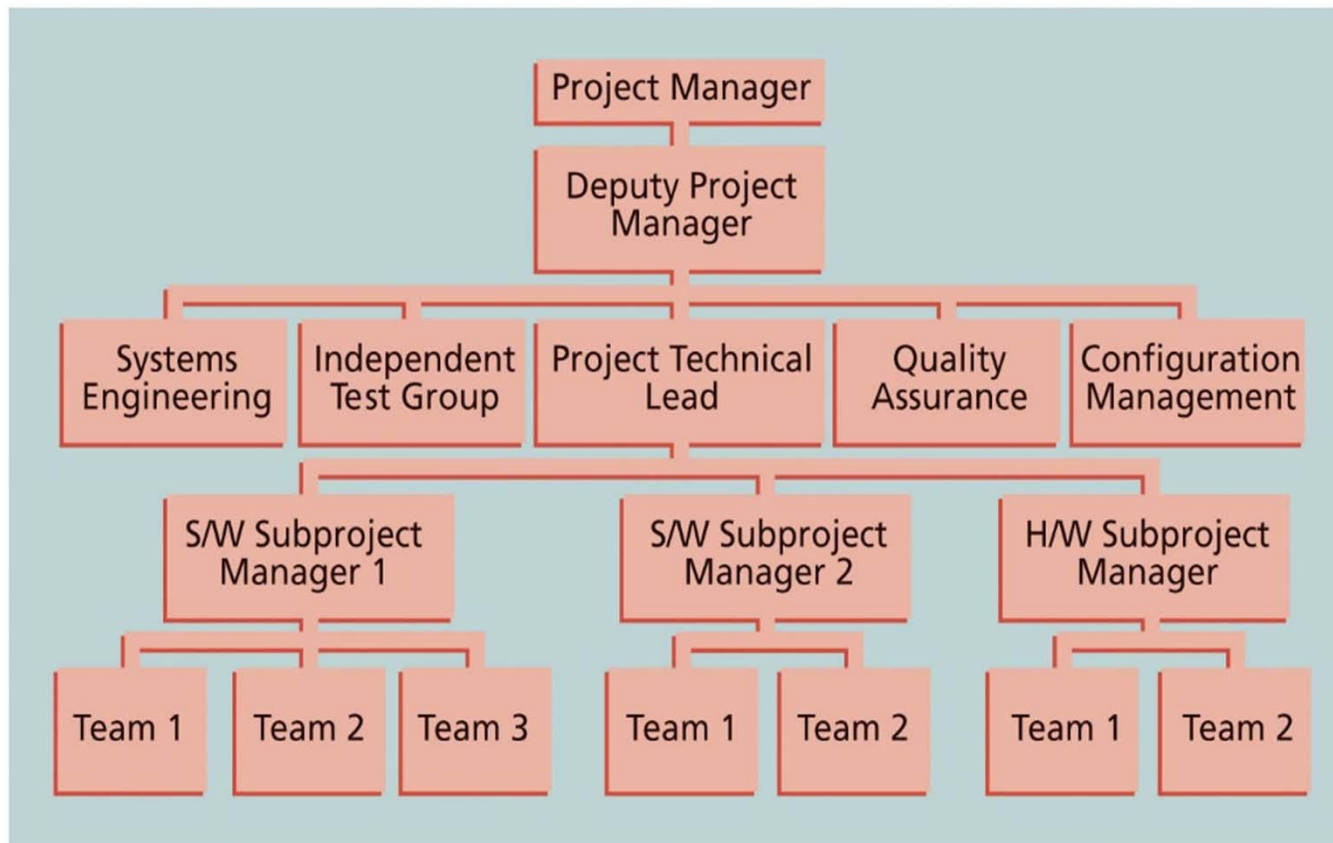# Developing the Resource Management Plan and Team Charter (2 of 6)

FIGURE 9-3 Sample organizational chart for a large IT project

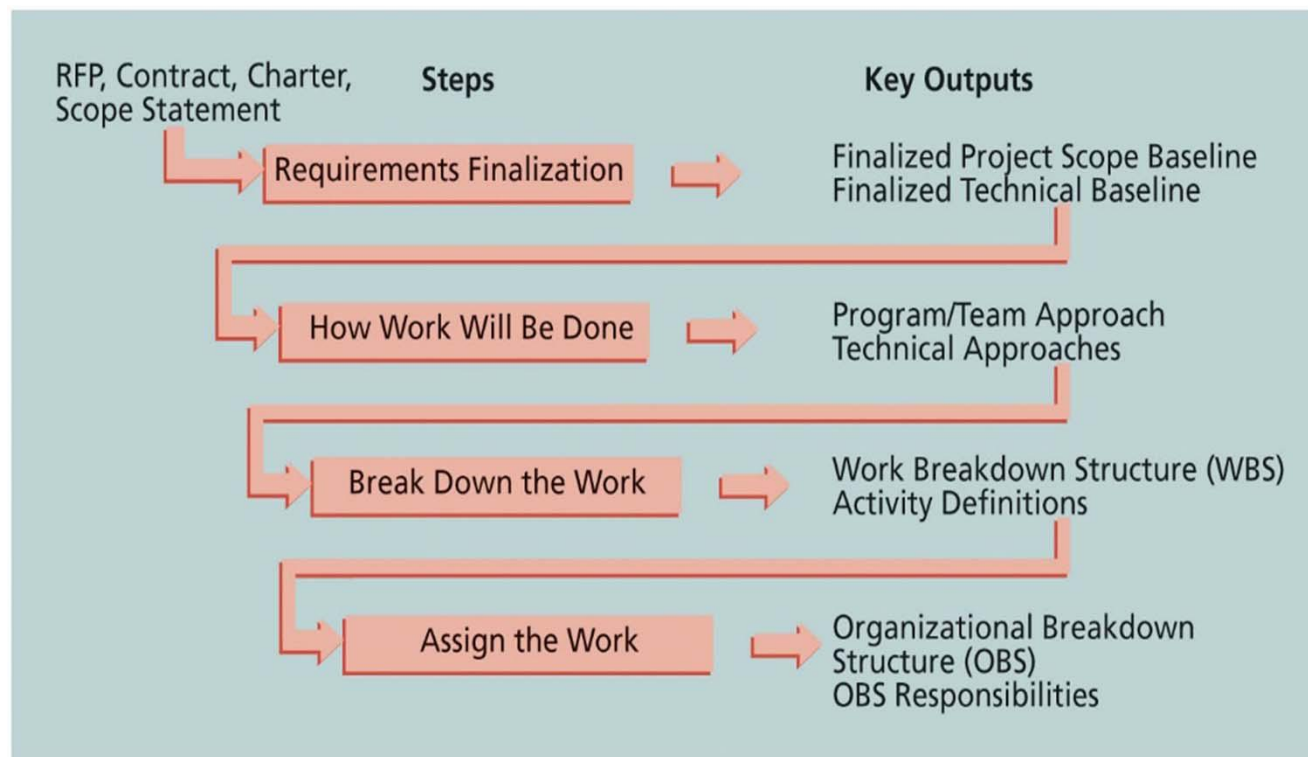# Developing the Resource Management Plan and Team Charter (3 of 6)

FIGURE 9-4 Work definition and assignment process

OBS units / WBS activities	1.1.1	1.1.2	1.1.3	1.1.4	1.1.5	1.1.6	1.1.7	1.1.8
Systems Engineering	R	R P					R	
Software Development			R P					
Hardware Development				R P				
Test Engineering	P							
Quality Assurance					R P			
Configuration Management						R P		
Integrated Logistics Support							P	
Training								R P

R = Responsible organizational unit
P = Performing organizational unit

FIGURE 9-5 Sample responsibility assignment matrix (RAM)

Developing the Resource Management Plan and Team Charter (5 of 6)

	Car Owner	Shop Owner	Mechanic	Parts Supplier
Pay for parts and services	A, R	C		
Determine parts and services needed	C		A, R	C
Supply parts		C	C	A, R
Install parts	I	A	R	

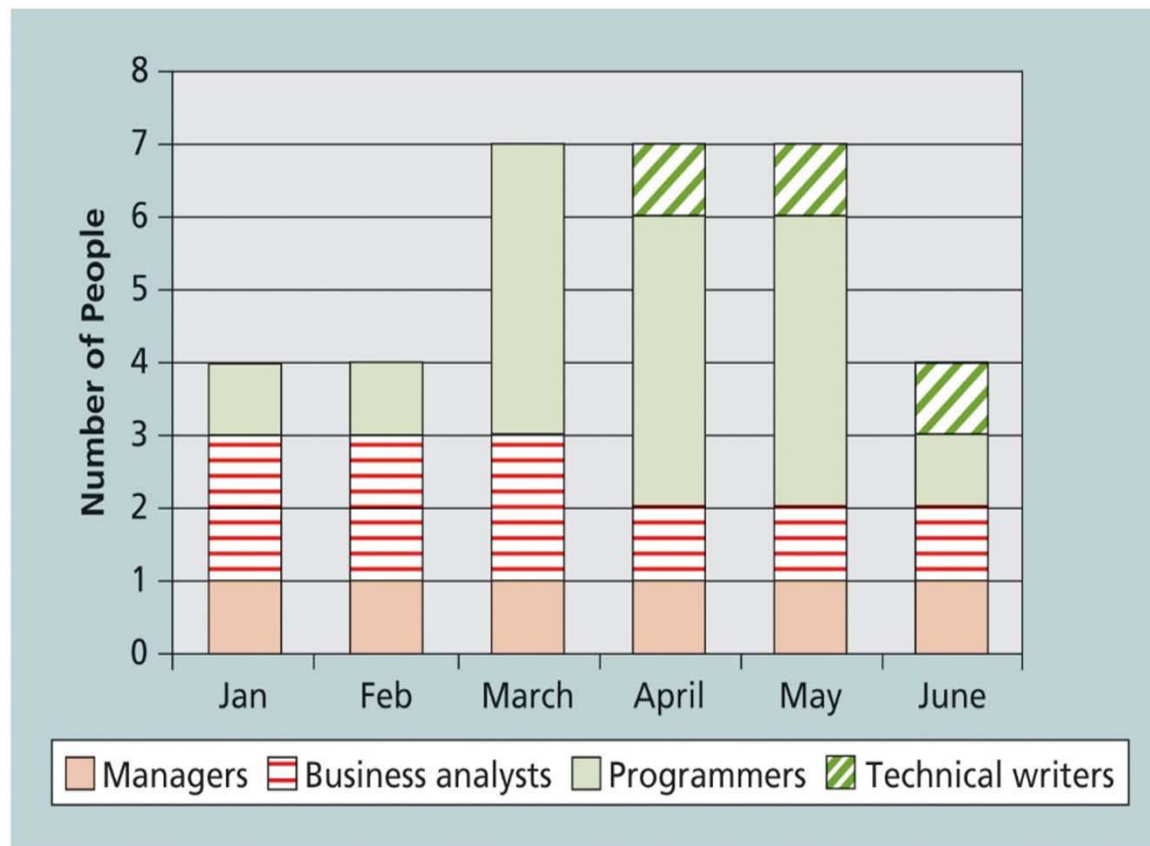Table 9-2 Sample RACI chart

FIGURE 9-6 Sample resource histogram

Estimating Activity Resources

- Tools that can assist in resource estimating

    - Expert judgment

    - Various estimating approaches

    - Data analysis

    - Project management software

    - Meetings

Acquiring Resources

- During the late 1990s, the IT job market became extremely competitive

  - Today, many organizations again face a shortage of IT staff

- Regardless of the current job market, acquiring qualified IT professionals is critical

Resource Assignment

- After developing resource requirements, project managers must work with other people in their organizations to assign them to their projects or to acquire additional human or physical resources needed for the project
  - Organizations that do a good job of staff acquisition have good staffing plans
  - It is very important to consider the needs of individuals and the organization when making recruiting and retention decisions

Best Practice

- Best practices can be applied to include the best places for people to work
  - *Fortune Magazine* lists the "100 Best Companies to Work For" in the United States every year, with Google taking the honors for the eighth time in 2017
  - *Working Mothers* Magazine lists the best companies in the U.S. for women based on benefits for working families
  - The *Times online* provides the Sunday Times list of the "100 Best Companies to Work For," a key benchmark against which U.K. companies can judge their performance as employers

Resource Loading (1 of 2)

- Resource loading refers to the amount of individual resources an existing schedule requires during specific time periods
  - Helps project managers develop a general understanding of the demands a project will make on the organization's resources and individual people's schedules

- Overallocation means more resources than available are assigned to perform work at a given time
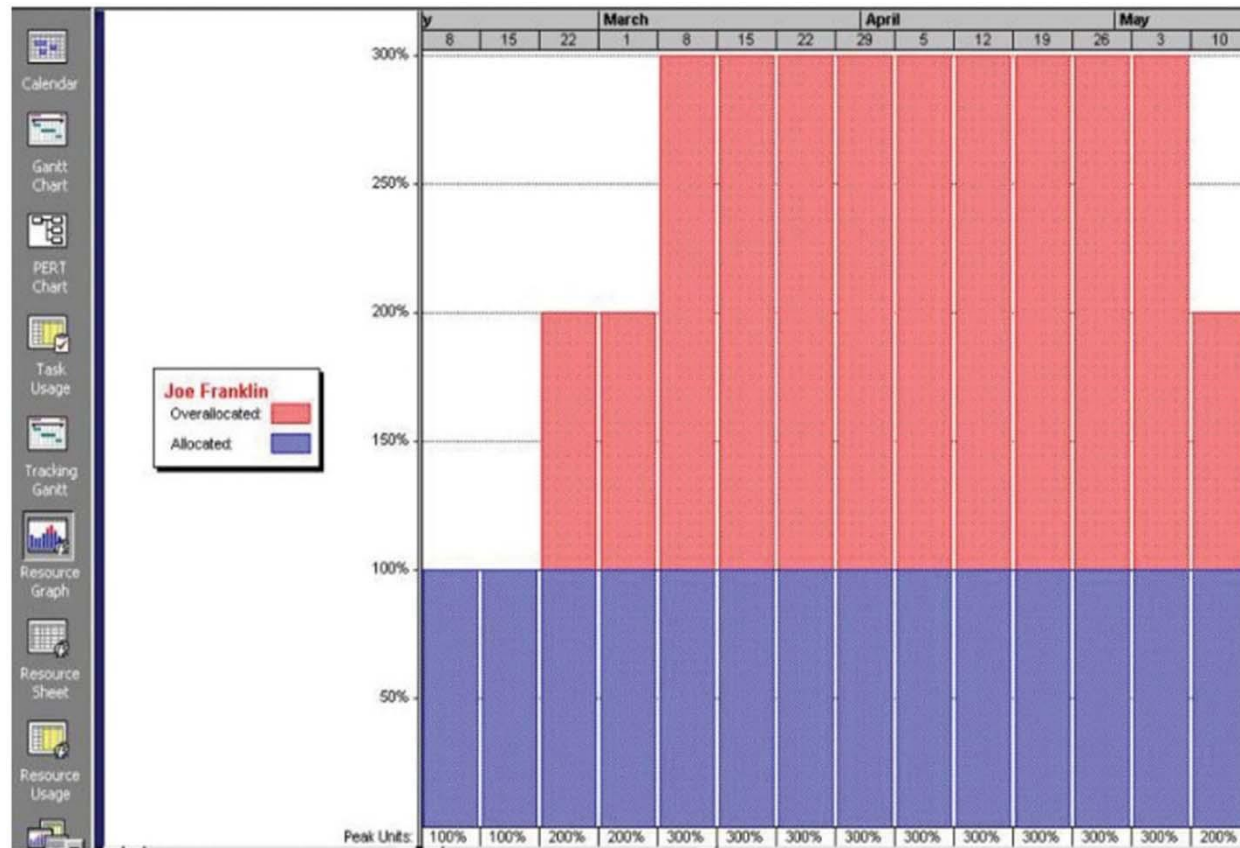
Resource Loading (2 of 2)

FIGURE 9-7 Sample histogram showing an overallocated person

Resource Leveling (1 of 2)

- Resource leveling is a technique for resolving resource conflicts by delaying tasks
  - Main purpose is to create a smoother distribution of resource usage

- Benefits of resource leveling
  - When resources are used on a more constant basis, they require less management
  - May enable project managers to use a just-in-time inventory type of policy for using subcontractors or other expensive resources
  - Results in fewer problems for project personnel and accounting department
  - Often improves morale

Resource Leveling (2 of 2)

Project network with Activities A, B, and C and durations as shown. Activity A has 3 days of slack, and Activity C has 2 days of slack. Assume Activity A has 2 workers, B has 4 workers, and C has 2 workers.

Resource usage if all activities start on day one

Resource usage if Activity C is delayed 2 days, its total slack
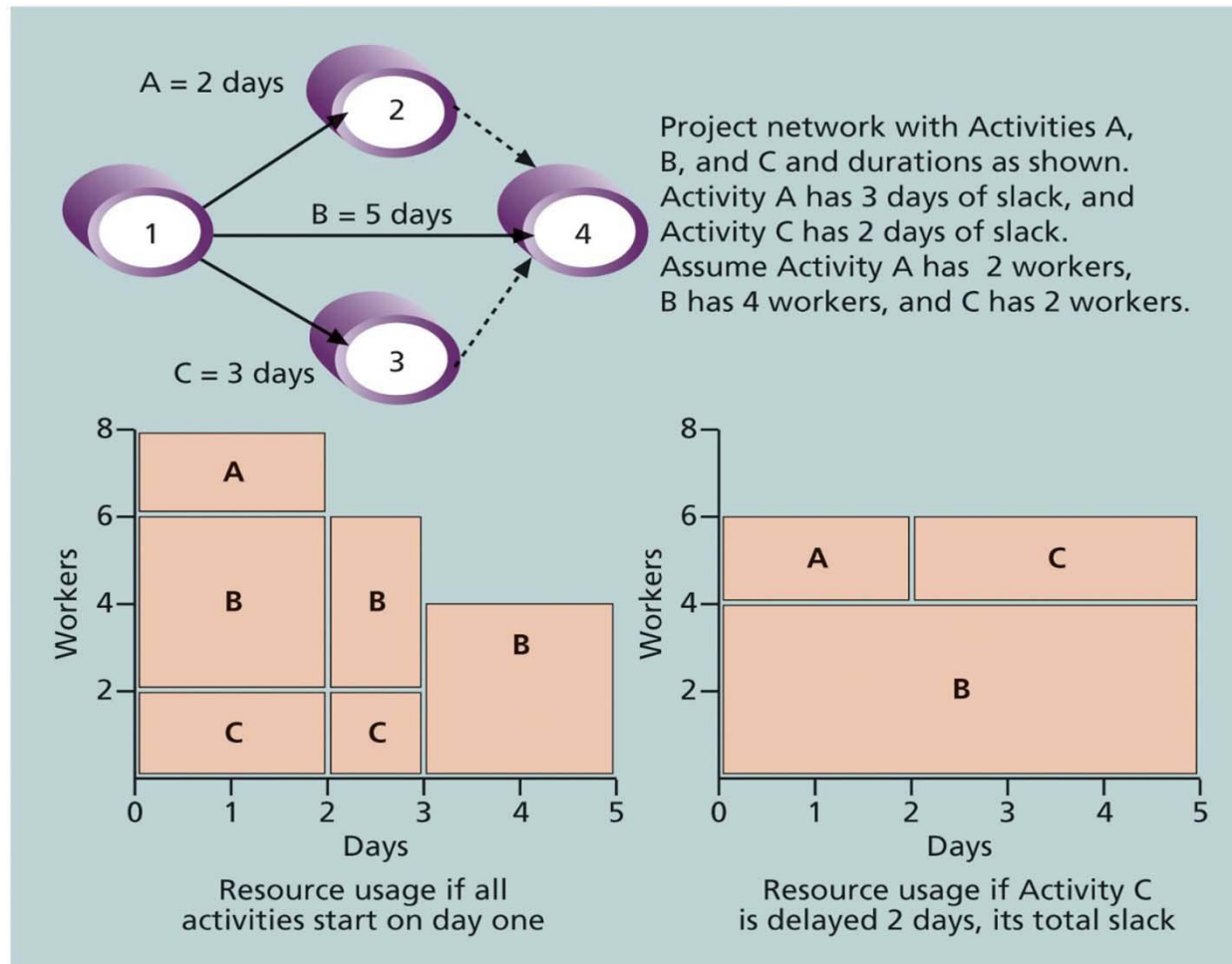
FIGURE 9-8   Resource leveling example

Developing the Project Team (1 of 2)

- The main goal of team development is to help people work together more effectively to improve project performance
  - It takes teamwork to successfully complete most projects
- Tuckman model describes five stages of team development
  - Forming
  - Storming
  - Norming
  - Performing
  - Adjourning

Developing the Project Team (2 of 2)

- Training
  - Project managers often recommend that people take specific training courses to improve individual and team development
- Team-building activities
  - Physical challenges
  - Psychological preference indicator tools

The Meyers-Briggs Type Indicator

- Popular tool for determining personality preferences and helping teammates understand each other

- Four dimensions
  - Extrovert/Introvert (E/I)
  - Sensation/Intuition (S/N)
  - Thinking/Feeling (T/F)
  - Judgment/Perception (J/P)

- Intuitive/Thinking types (i.e., NTs or rationals) are attracted to technology fields

The Social Styles Profile

- People are perceived as behaving primarily in one of four zones, based on their assertiveness and responsiveness
  - Drivers
  - Expressives
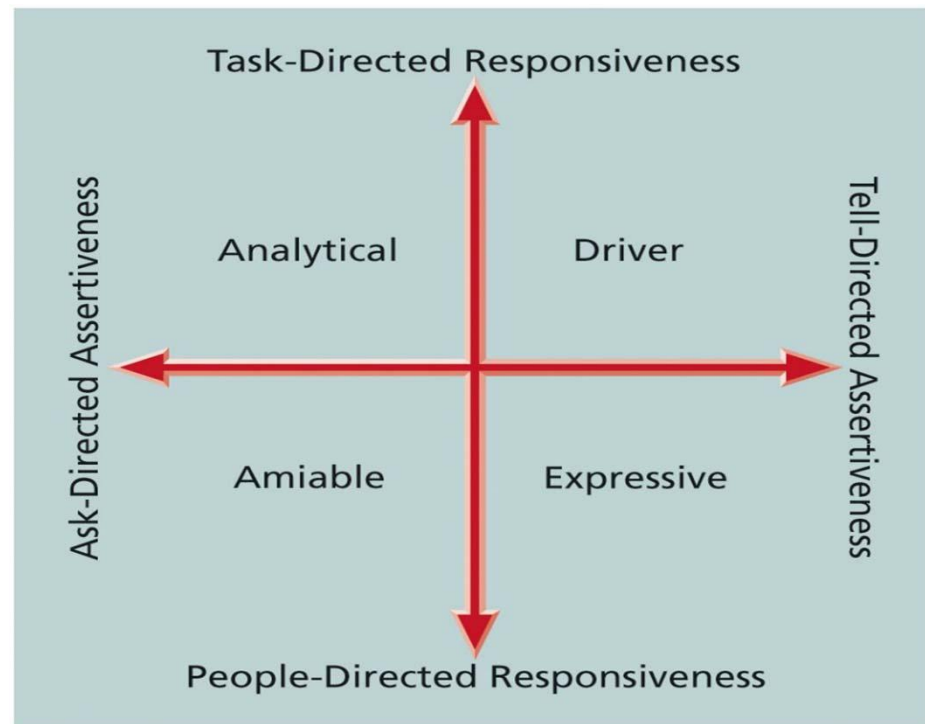 - Analyticals
  - Amiables

FIGURE 9-9   Social styles

DISC Profile

- Four-dimensional model of normal behavior
  - Dominance
  - Influence
  - Steadiness
  - Compliance

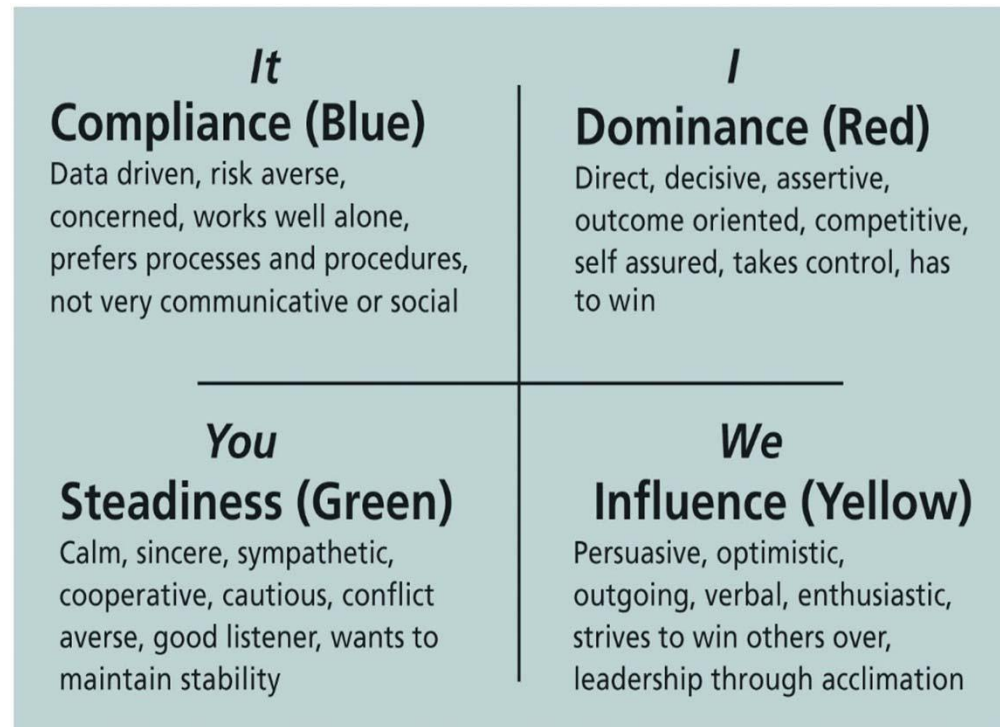| *It* **Compliance (Blue)** Data driven, risk averse, concerned, works well alone, prefers processes and procedures, not very communicative or social	*I* **Dominance (Red)** Direct, decisive, assertive, outcome oriented, competitive, self assured, takes control, has to win
You **Steadiness (Green)** Calm, sincere, sympathetic, cooperative, cautious, conflict averse, good listener, wants to maintain stability	*We* **Influence (Yellow)** Persuasive, optimistic, outgoing, verbal, enthusiastic, strives to win others over, leadership through acclimation

FIGURE 9-10   The DISC profile

Reward and Recognition Systems

- Team-based reward and recognition systems can promote teamwork
  - Focus on rewarding teams for achieving specific goals
    - If management rewards teamwork, they will promote or reinforce the philosophy that people work more effectively in teams

- Project managers must continually assess their team's performance
  - When they find areas in which individuals or the entire team can improve, it's their job to find the best way to develop their people and improve performance

Managing the Project Team

- Project managers must lead their teams in performing various project activities

- After assessing team performance and related information, the project manager must make several decisions
  - Changes to be requested
  - Corrective or preventive actions
  - Updates needed

- Several tools and techniques are available to assist in managing project teams
  - Interpersonal and team skills
  - Project management information systems
  - Conflict management

Tools and Techniques for Managing Project Teams (2 of 4)

- Conflict handling modes
  - Confrontation: directly face a conflict using a problem-solving approach
  - Compromise: use a give-and-take approach
  - Smoothing: de-emphasize areas of difference and emphasize areas of agreement
  - Forcing: win-lose approach
  - Withdrawal: retreat or withdraw from an actual or potential disagreement
  - Collaborating: decision makers incorporate different viewpoints and insights to develop consensus and commitment

Tools and Techniques for Managing Project Teams (3 of 4)

Source: *Kathy Schwalbe, An Introduction to Project Management, Sixth Edition* (September 2017)

FIGURE 9-11 Conflict handling modes

- Conflict can be good
  - Conflict often produces important results, such as new ideas, better alternatives, and motivation to work harder and more collaboratively
  - Groupthink: conformance to the values or ethical standards of a group; can develop if there are no conflicting viewpoints
  - Research suggests that task-related conflict often improves team performance, but emotional conflict often depresses team performance

General Advice on Managing Teams (1 of 2)

- Five dysfunctions of teams
  - Absence of trust
  - Fear of conflict
  - Lack of commitment
  - Avoidance of accountability
  - Inattention to results

General Advice on Managing Teams (2 of 2)

- General advice
  - Be patient and kind with your team
  - Fix the problem instead of blaming people
  - Establish regular, effective meetings
  - Allow time for teams to go through the basic team-building stages
  - Limit the size of work teams to three to seven members
  - Plan some social activities to help project team members and other stakeholders get to know each other better
  - Stress team identity
  - Nurture team members and encourage them to help each other
  - Acknowledge individual and group accomplishments
  - Take additional actions to work with virtual team members

Controlling Resources

- Ensuring physical resources assigned to the project are available as planned
  - Also involves monitoring the planned versus actual resources utilization and taking corrective actions as needed

Using Software to Assist in Resource Management

- Software can help in producing a simple responsibility assignment matrix or resource histograms

- Software includes several features related to human resource management
  - Assigning and tracking resources
  - Leveling resources
  - Resource usage reports
  - Overallocated resource reports
  - To-do lists

Considerations for Agile/Adaptive Environments

- Teams are important on all types of projects, as is collaboration, problem solving, and knowledge sharing
  - On agile projects, team members are usually fully dedicated to a single team
    - Relationships are based on trust, and collaboration is continuously improved using regular feedback

Chapter Summary

- Project resource management includes the processes required to make the most effective use of the people involved with a project
  - Planning resources
  - Estimating activity resources
  - Acquiring resources
  - Developing the team
  - Managing the team
  - Controlling resources