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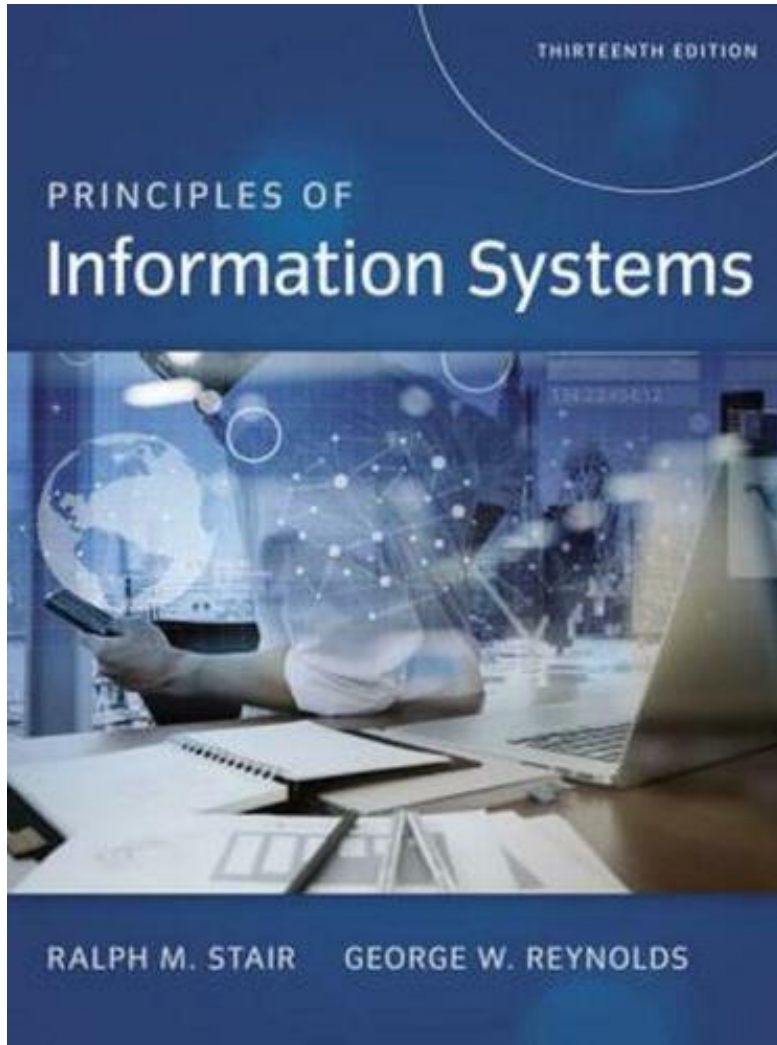
# IS101 Principles of Information Systems

*Strategic Planning and  
Project Management;  
System Acquisition and Development*

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Lecturer: Dr Maya Krayneva

Textbook: Stair, R., & Reynolds, G. (2016).  
*Principles of information systems* (13th ed.).  
Cengage Learning.



# Chapter 11: Strategic Planning and Project Management

## Strategic Planning

1. Issues-based strategic planning
2. Organic strategic planning
3. Goals-based strategic planning:
  - a. Analyze situation
  - b. Set direction
  - c. Define strategies
  - d. Deploy plan

## Project Management

Multiple Dimensions: Scope, Time, Cost, Quality, Human resources, Stakeholders, Communications, Risk, Procurement, Integration

# STRATEGIC PLANNING APPROACHES

## Strategic planning

- A process that helps managers identify desired outcomes and formulate feasible plans to achieve their objectives by using available resources and capabilities

### 1. **Issues-based** strategic planning

- Begins by identifying and analyzing key issues that face the organization, settings strategies to address those issues, and identifying projects and initiatives that are consistent with those strategies

### 2. **Organic** strategic planning

- Defines the organization's vision and values and then identifies projects and initiatives to achieve the vision while adhering to the values

### 3. **Goals-based** strategic planning

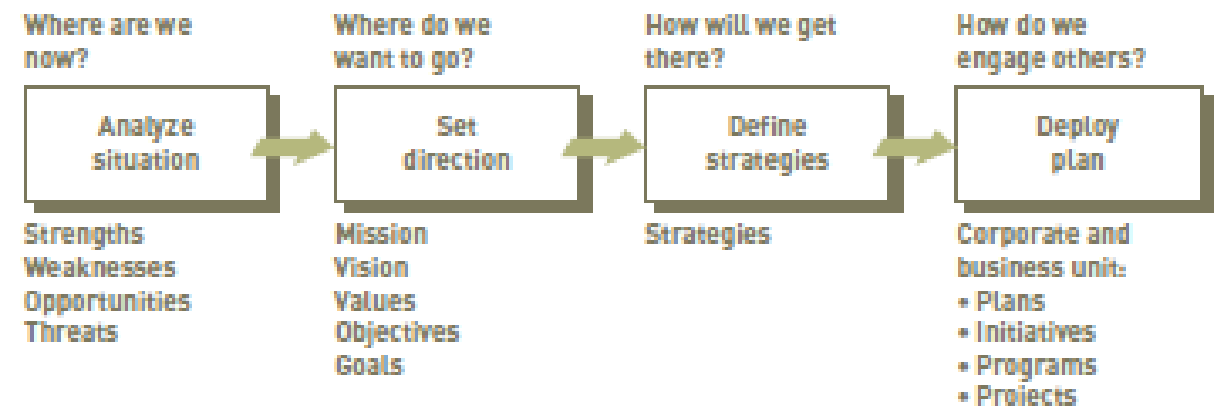
The major phases in goals-based strategic planning are:

- Analyze situation
- Set direction
- Define strategies
- Deploy plan

**FIGURE 11.1**

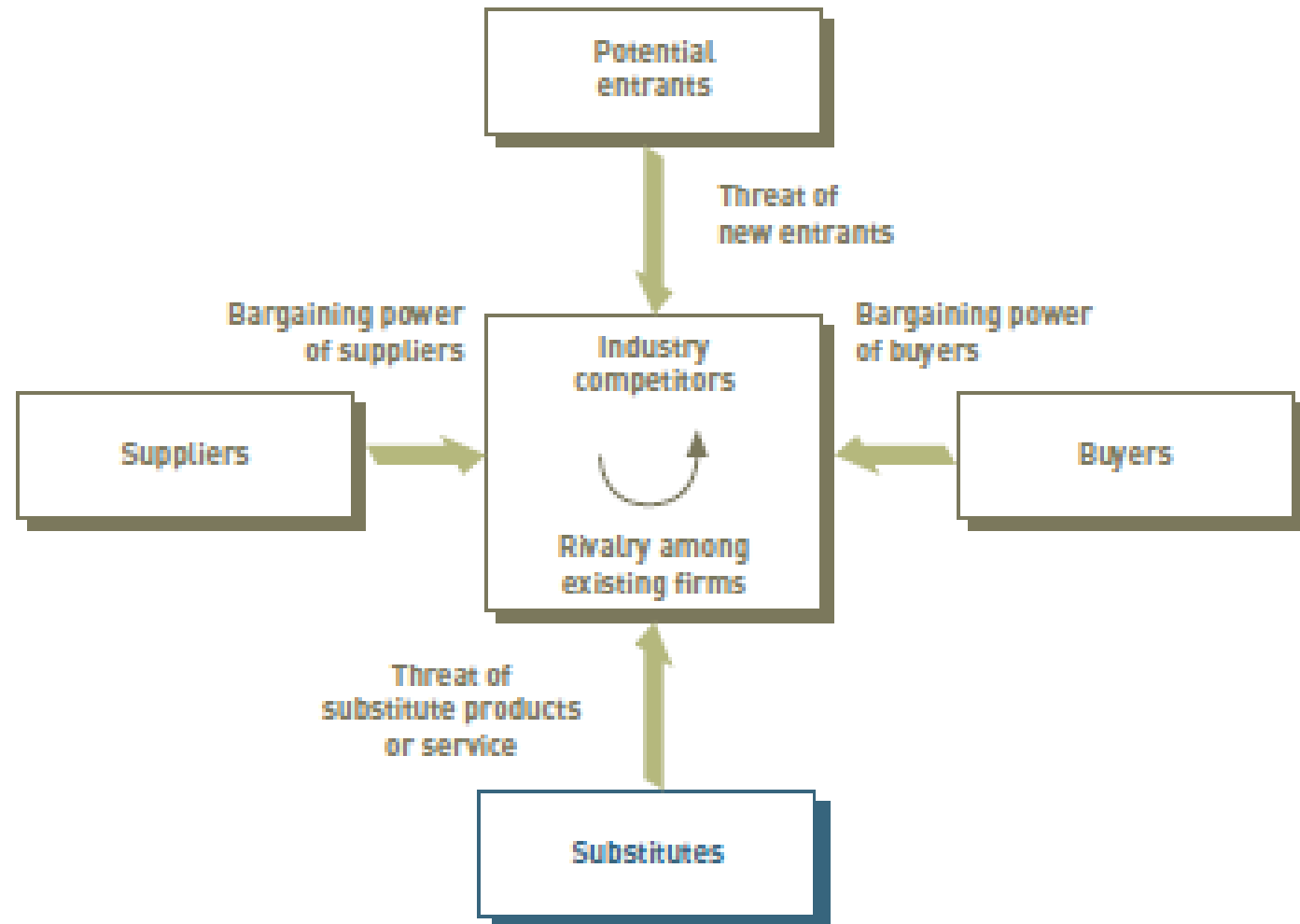
#### The goals-based strategic planning process

Goals-based strategic planning is a multiphase process for strategic planning.



# 3a. Analysis tools - Michael Porter's Five Forces Model

Most frequently used model for assessing the nature of industry competition is **Michael Porter's Five Forces Model**



**FIGURE 11.2**

## Michael Porter's Five Forces Model

This model can be used to determine the level of competition and long-term profitability of an industry.

# 3a. Analysis tools - (SWOT) matrix

## Strengths, Weaknesses, Opportunities, Threats (SWOT) matrix

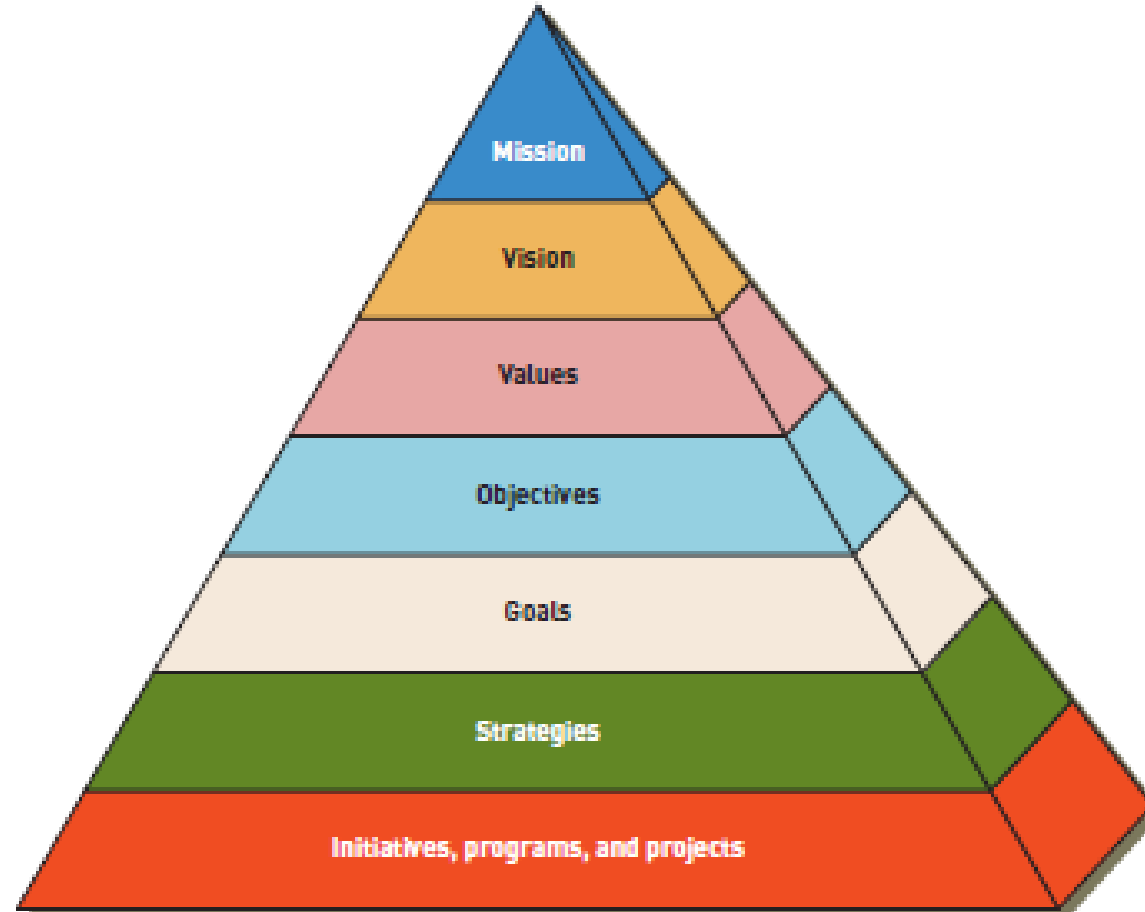
**TABLE 11.1** SWOT analysis for Starbucks

<p><b>Strengths</b></p> <ul style="list-style-type: none"><li>• Strong revenue and profit growth</li><li>• Rapid increase in global store count</li><li>• Strong comparable store sales growth</li></ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"><li>• Uneven international growth</li><li>• Investing lots of money on expansion</li></ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"><li>• Rising incomes in China should fuel higher demand for “premium” Western products such as Starbucks</li><li>• Top premium coffee brand in the K-Cup category, presenting a growth opportunity</li><li>• Experimenting with various concept stores, including tea bars and wine bars</li></ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"><li>• Unstable price of coffee beans</li><li>• Rising competition (e.g., Dunkin’ Donuts and Tim Hortons)</li></ul>

## 3b. Direction-setting phase

Direction-setting phase of strategic planning

- Involves defining the **mission, vision, values, objectives, and goals** of the organization



**FIGURE 11.3**

### **The strategic planning pyramid**

The strategic planning pyramid is a top-down approach to identify initiatives, program, and projects.

# 3c. Define Strategies

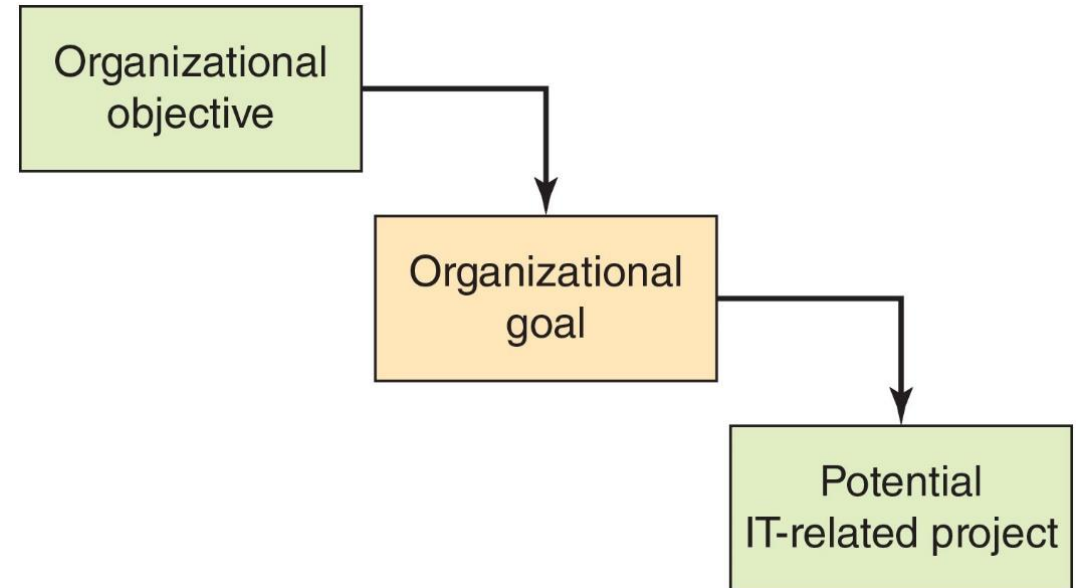
Managers draw on results of the SWOT analysis and consider the following questions:

- How can we best capitalize on our **strengths** and use them to their full potential?
- How do we reduce or eliminate the negative impact of our **weaknesses**?
- Which opportunities represent the best **opportunities** for our organization?
- How can we exploit these opportunities?
- Will our strengths enable us to make the most of this opportunity?
- Will our weaknesses undermine our ability to capitalize on this opportunity?
- How can we defend against **threats** to achieve our vision/mission, objectives, and goals?
- Can we turn this threat into an opportunity?



# 3d. Deploy Plan

- Managers of various organizational units develop more detailed plans for **initiatives, programs, and projects** that align with the firm's objectives, goals, and strategies
- Alignment ensures that the efforts will:
  - Draw on the **strengths** of the organization
  - Capitalize on new **opportunities**
  - Fix organizational **weaknesses**
  - Minimize the impact of potential **threats**



# PROJECT MANAGEMENT

## Project

- A temporary endeavor undertaken to create a unique product, service or results.

## Project stakeholders

- The people *involved in* the project or those *affected* by its outcome

## Five parameters define a project:

- Scope
- Cost
- Time
- Quality
- User expectations



**FIGURE 11.7**

### Revised project definition

A change in any one of the project variables (cost, time, scope, or expectations) can impact the other variables.

# What is Project Management?

## Project management

- The application of *Knowledge, Skills, and Techniques* to project activities to meet project requirements

(1) Project managers must apply *intuitive skills* that **vary** from project to project

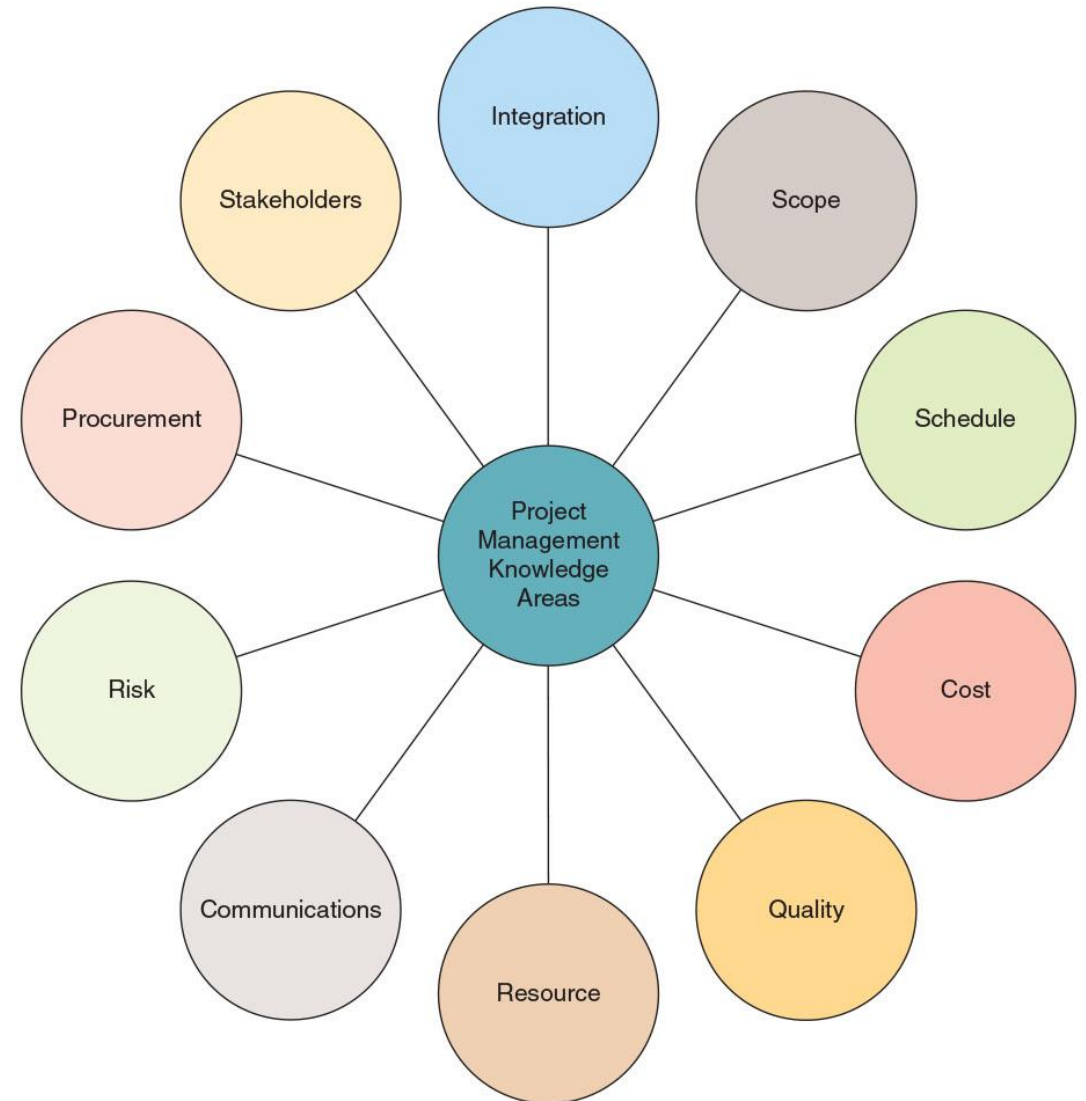
(2) Project management uses time-proven, **repeatable processes** and *techniques* to achieve project goals



# Project Management Knowledge Areas

Project managers coordinate multiple areas of expertise (use a software solution to help with each area):

- Scope
- Time/Schedule
- Cost
- Quality
- Human resources
- Stakeholders
- Communications
- Risk
- Procurement
- Integration



# e.g. Time Management

TABLE 11.8 Work breakdown structure

Task	Duration (in days)	Start Date	End Date	Predecessor Tasks	
1	Implement warehouse network	28	5/06/16	6/14/16	
2	Define warehouse network	25	5/06/16	6/09/16	
3	Conduct survey	3	5/06/16	5/10/16	
4	Order RF equipment	14	5/11/16	5/30/16	3
5	Install RF equipment	6	5/31/16	6/07/16	4
6	Test RF equipment	2	6/06/16	6/08/16	5
7	Configure forklift trucks	19	5/06/16	6/01/16	
8	Order RFID scanners for trucks	12	5/06/16	5/23/16	
9	Install RFID scanners on trucks	5	5/24/16	5/30/16	8
10	Test RFID scanners	2	5/31/16	6/01/16	9
53	Test warehouse network	28	5/06/16	6/14/16	
12	Develop test plan	2	5/06/16	5/09/16	
13	Conduct test	3	6/10/16	6/14/16	6, 10, 12

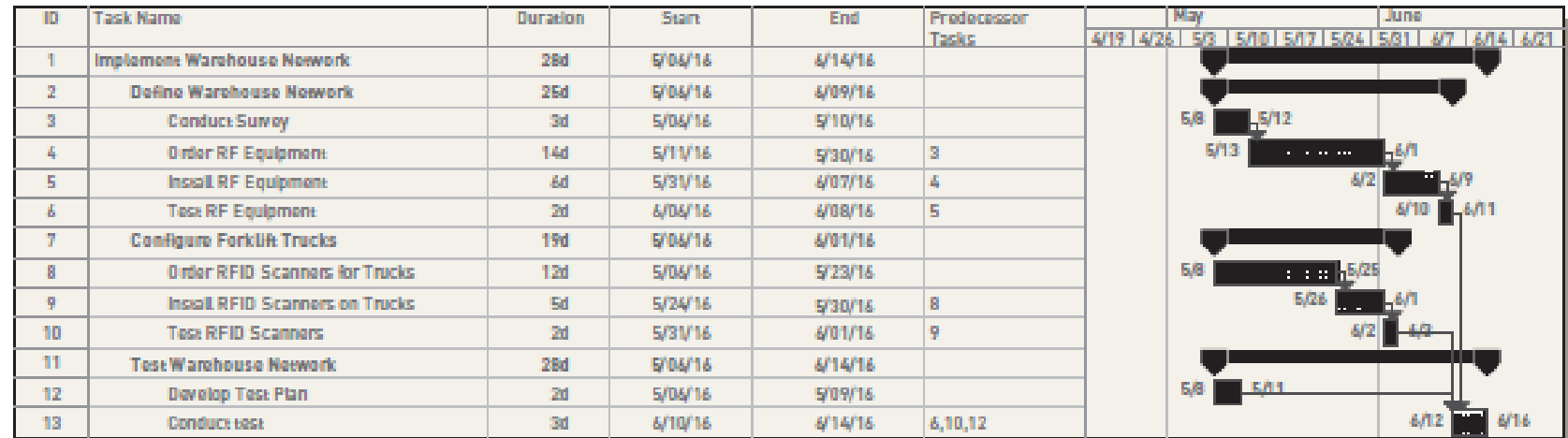
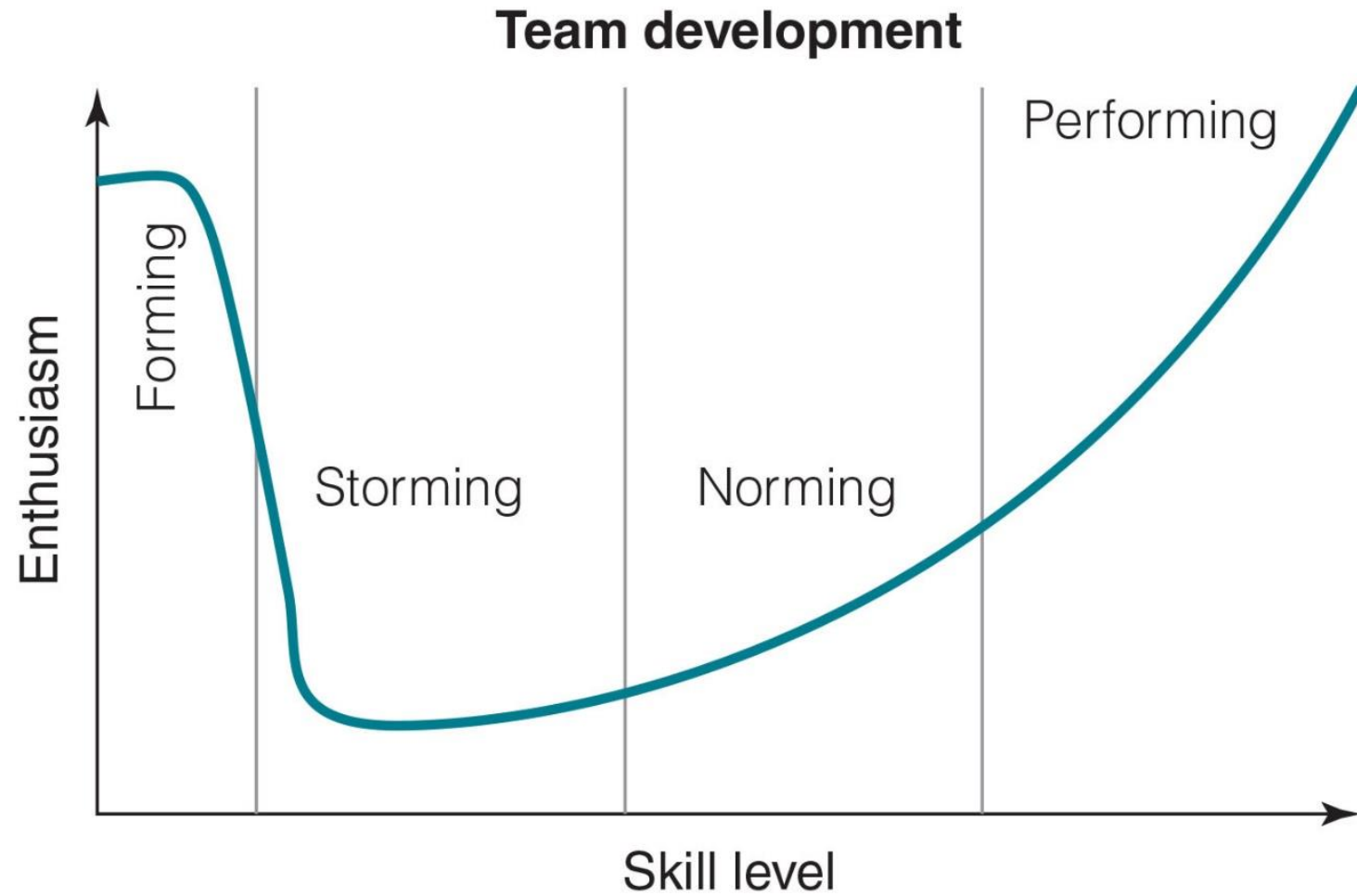


FIGURE 11.10

## Gantt chart

A Gantt chart depicts the start and finish dates for project tasks.



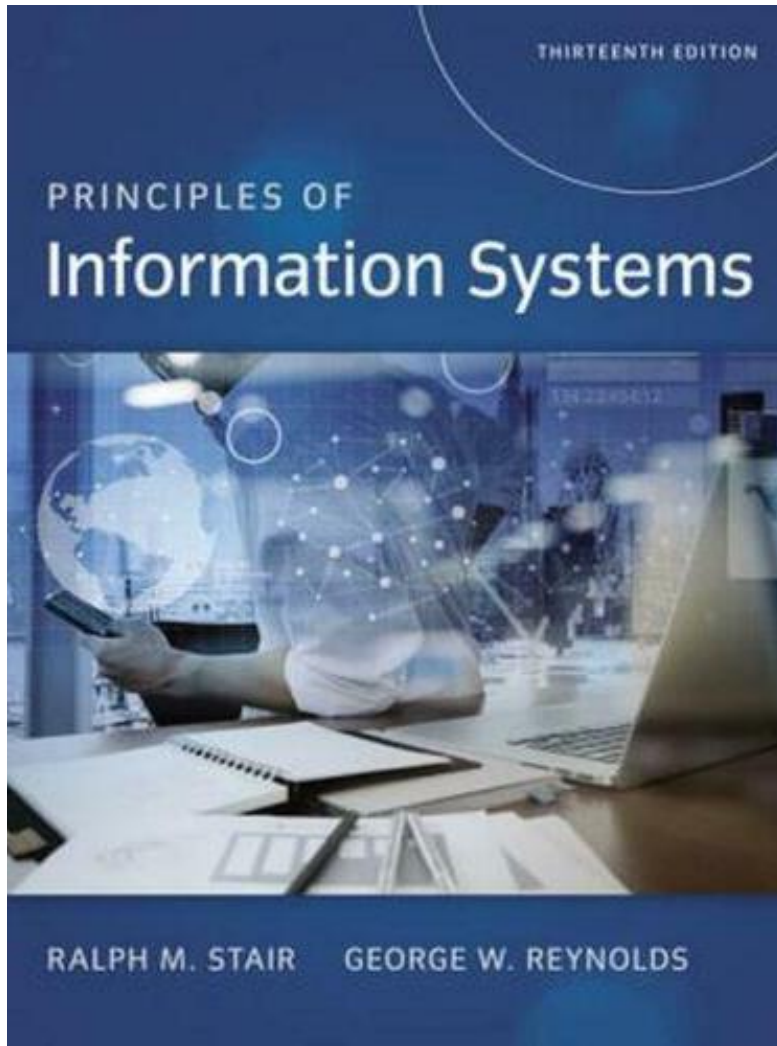
- Tuckman's **forming-storming-norming-performing-...** model
- Forming an effective team is a challenge in itself.

# e.g. Risk Management

**Risk owner:** Responsible for developing a **risk management strategy** and monitoring the project to determine if the risk is about to occur or has occurred

**TABLE 11.14** Risk management plan

Risk	Description	Risk Owner	Risk Strategy	Current Status
R2	Business pressures make key end users unavailable to develop the user acceptance test by the deadline.	Jon Andersen, manager of end users in the business area	Try to avoid this problem by starting development of the user acceptance test three weeks earlier than originally planned. Monitor progress carefully.	Key users have been identified and have started developing the test.
R3	Business pressures make end users unavailable during the time scheduled for training.	Jon Andersen, manager of end users in the business area	Try to avoid this problem by hiring and training four temporary workers to fill in for end users as they participate in training.	Three of four temporary workers have been hired. Their training is scheduled to begin next week.
R1	The required new servers arrive at the installation site more than two weeks late.	Alice Fields, team member responsible for hardware acquisition	Set a firm delivery deadline with the vendor, with a substantial dollar penalty for each day that the equipment is late.	The contract with the penalty clause has been signed by the vendor, who agrees to provide a shipment status update each Tuesday and Friday.



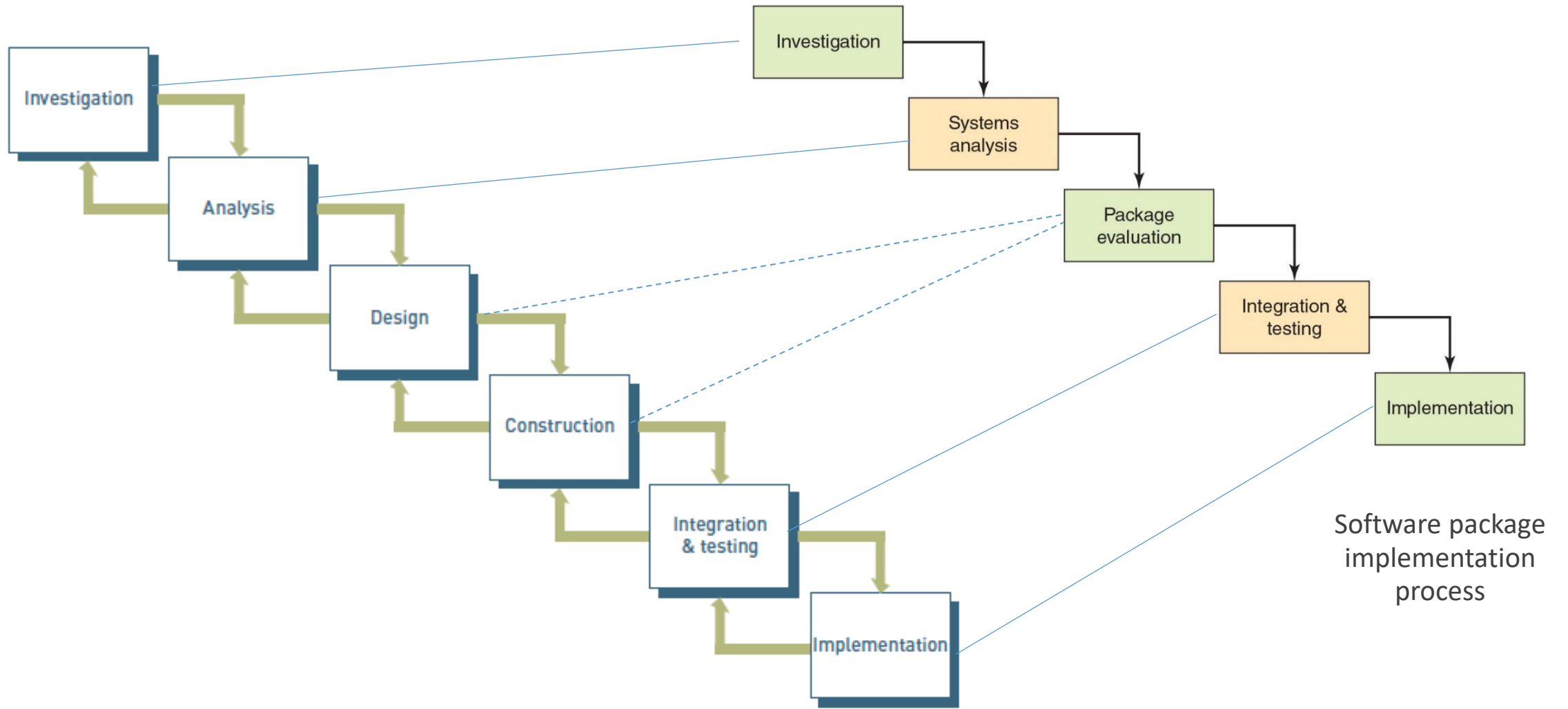
# Chapter 12: System Acquisition and Development

## **Waterfall System Development Process**

1. System Investigation
2. System Analysis
3. System Design
4. Construction
5. Integration and Testing
6. Implementation
7. System Operation and Maintenance

## **Agile System Development Process**

# WATERFALL SYSTEM DEVELOPMENT PROCESS



**FIGURE 12.1**

## Waterfall system development process

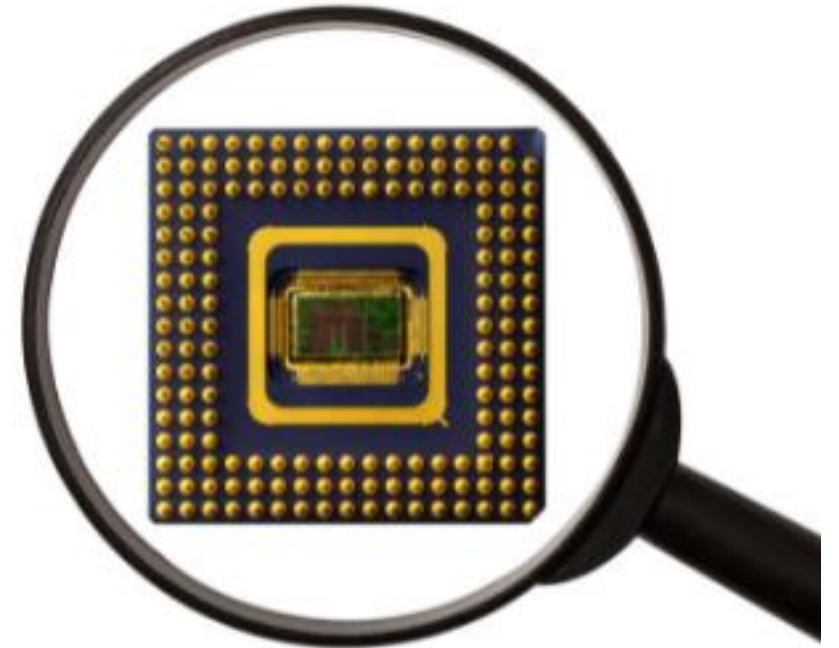
Progress flows steadily downward (like a waterfall) through the various phases of development.

# 1. System Investigation

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## Steps of the investigation phase

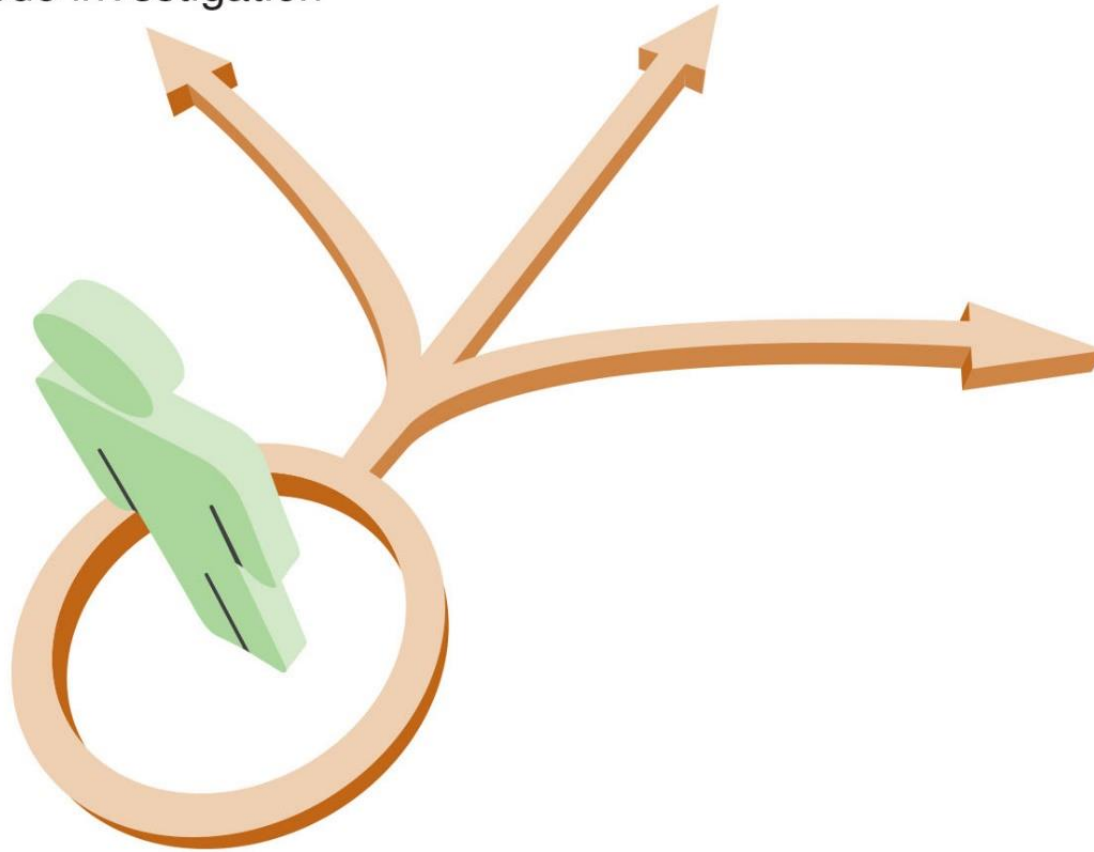
1. Review systems investigation request
2. Identify and recruit team leader and team members
3. Develop budget and schedule for investigation
4. Perform **investigation**
5. Perform preliminary feasibility analysis
6. Prepare draft of investigation report
7. Review results of investigation with steering team



Redefine project and  
redo investigation

Continue

Drop project



System investigation recommendation

## 2. System Analysis

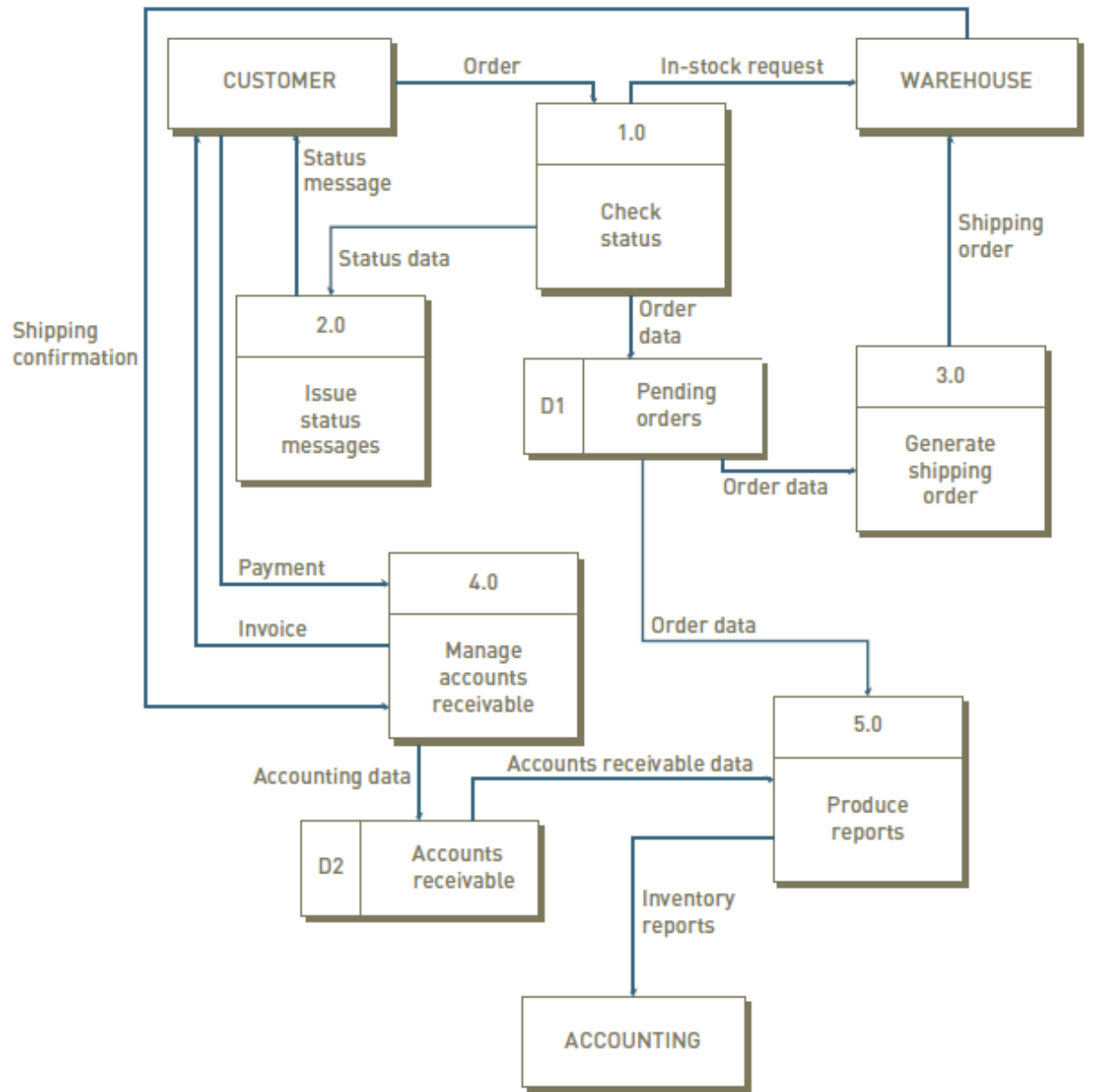
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Steps in the systems analysis phase

1. Identify and recruit team leader and team members
2. Develop budget and schedule for systems analysis activities
3. **Study existing system**
4. Develop prioritized set of **requirements**
5. Identify and evaluate **alternative solutions**
6. Perform feasibility analysis
7. Prepare draft of systems analysis report
8. Review results of systems analysis with steering team



# Example 1: Data Flow Diagrams to represent proposed ideas



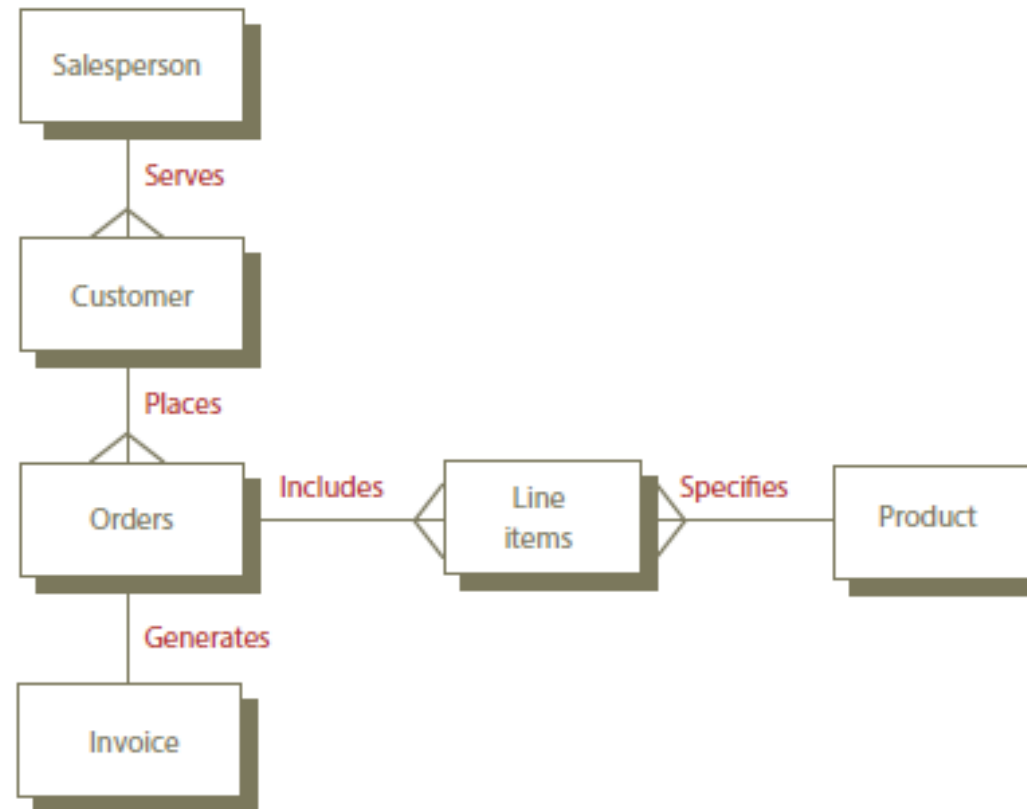
**FIGURE 12.8**  
Data-flow diagram

A data-flow diagram documents the processes of the current system or provides a model of a proposed new system.

# Example 2: Entity – Relationships Diagrams to represent proposed ideas

**FIGURE 12.9**  
**Entity-relationship (ER) diagram for a customer order database**

Development of ER diagrams helps ensure that the logical structure of application programs is consistent with the data relationships in the database.



# 3. System Design

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## Steps in the systems design phase

1. Identify and recruit team leader and team members
2. Develop schedule and budget for systems design activities
3. Design **user interface**
4. Design system **security and controls**
5. Design **disaster recovery plan**
6. Design **database**
7. Perform feasibility analysis
8. Prepare draft of systems design report
9. Review results of systems design with steering team



# 4. Construction

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- System construction **converts** the system **design into** an **operational** system
- Steps of the system construction phase
  - **Code** software components
  - Create and load **data**
  - Perform unit **testing**



## 5. Integration and Testing – different types of testing

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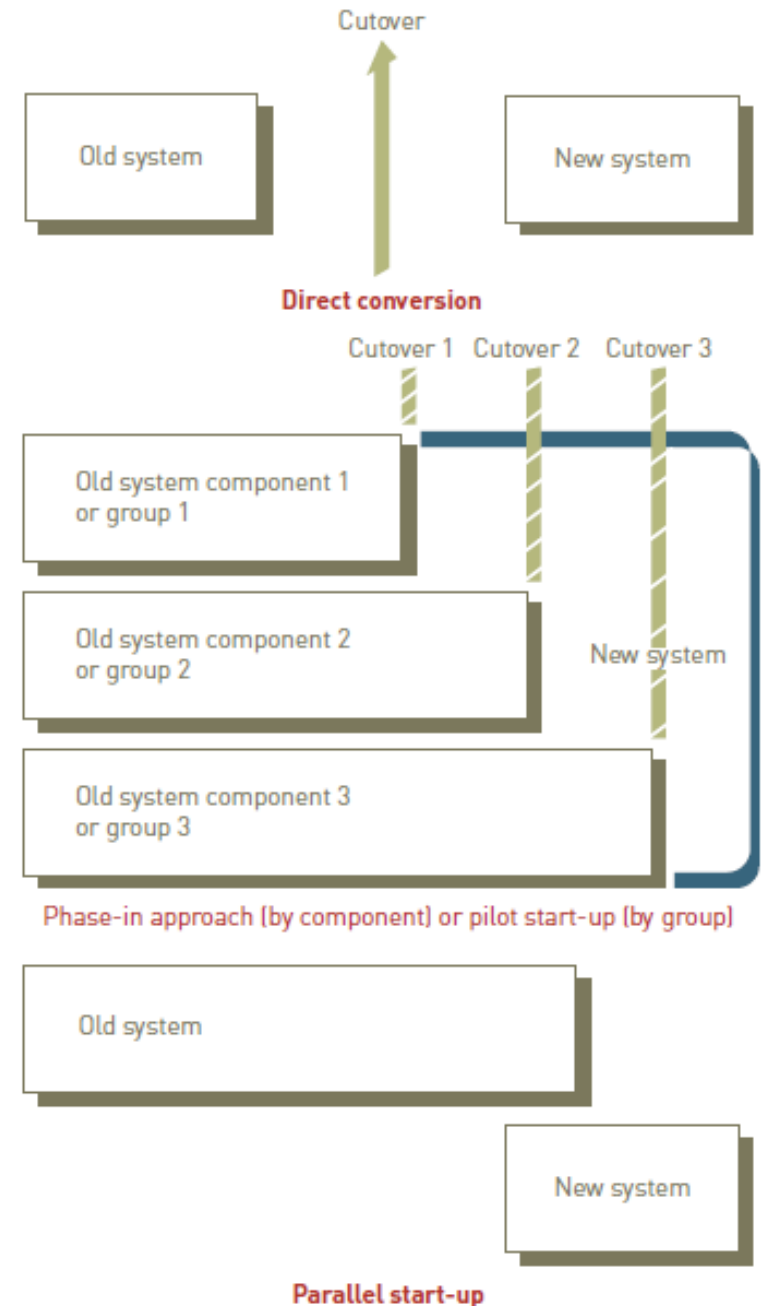
**TABLE 12.9** Tests conducted on an information system

Form of Test	What Is Tested	Purpose of Test	Who Does It
Unit	Test individual units of the system.	Verify that each unit performs as designed.	Software developers
Integration	Test all of the individual units of the information system linked together.	Uncover any defects between individual components of the information system.	Software developers or independent software testers, using black box testing measures
System	Test the complete, integrated system (hardware, software, databases, people, and procedures).	Validate that the information system meets all specified requirements.	Independent test team, separate from the software development team
Volume	Evaluate the performance of the information system under realistic and varying work volume and operating conditions.	Determine the work load at which system performance begins to degrade and identify and eliminate any issues that prevent the system from performing at the required service level.	System development team and members of the operations organization
User acceptance	Test the complete, integrated system (hardware, software, databases, people, and procedures).	Verify the information system can complete required tasks in a real-world operating environment and do this according to the system design specifications.	Trained users of the system

# 6. Implementation

Steps involved in implementation

- **User** preparation
- **Site** preparation
- **Installation**
- **Cutover** (switching from old to a new system)



**FIGURE 12.15**  
**System cutover strategies**  
Cutover can be through direct conversion, phase-in approach, pilot start-up, or parallel start-up.

# Waterfall System Development Process : advantages and disadvantages

**TABLE 12.2** Advantages and disadvantages of waterfall system development process

Advantages	Disadvantages
Formal review at the end of each phase allows maximum management control.	Users get a system that meets the needs as understood by the developers; however, this might not be what the users really needed.
This approach requires creation of considerable system documentation so that system requirements can be traced back to stated business needs.	Often, user needs go unstated or are miscommunicated or misunderstood.
Approach produces many intermediate products that can be reviewed to measure progress toward developing the system.	Users can't easily review intermediate products and evaluate whether a particular product (e.g., a data-flow diagram) will lead to a system that meets their business requirements.

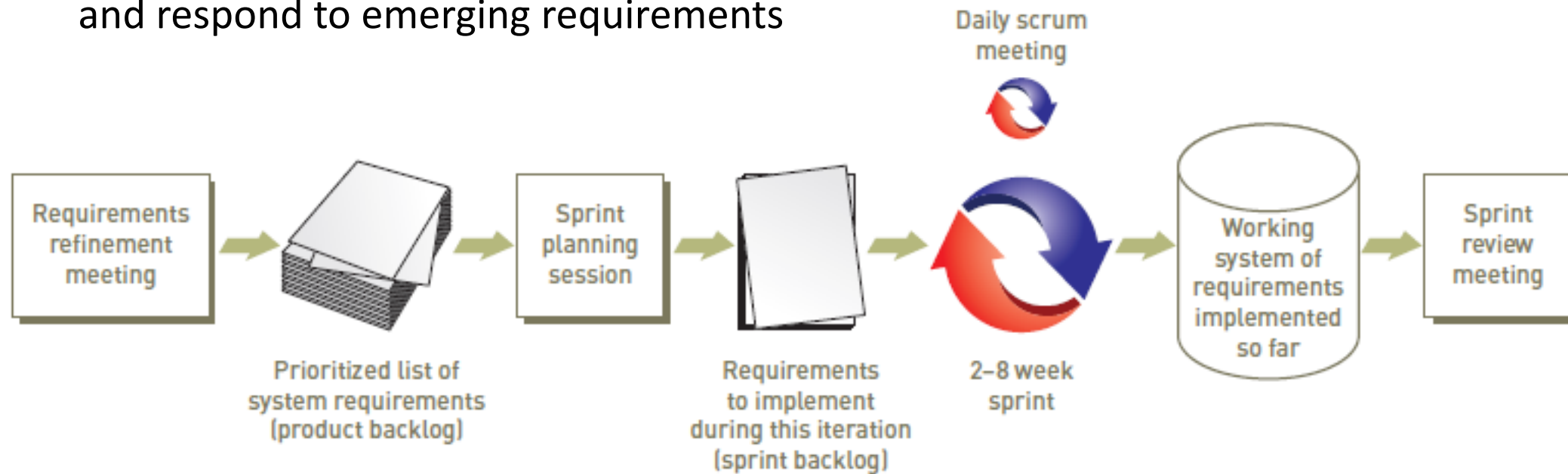
# AGILE SYSTEM DEVELOPMENT PROCESS

An **iterative** system development **process** that

**develops the system in “sprint” increments**

lasting from **two weeks to two months**

- Concentrates on maximizing the team’s ability to deliver quickly and respond to emerging requirements



**FIGURE 12.17**

## The Scrum agile software development process

The Scrum agile approach develops a system in sprint increments lasting from two weeks to two months.

# DevOps

The **practice** of blending the tasks performed by the development staff and the IT operations groups to enable **faster and more reliable software releases**

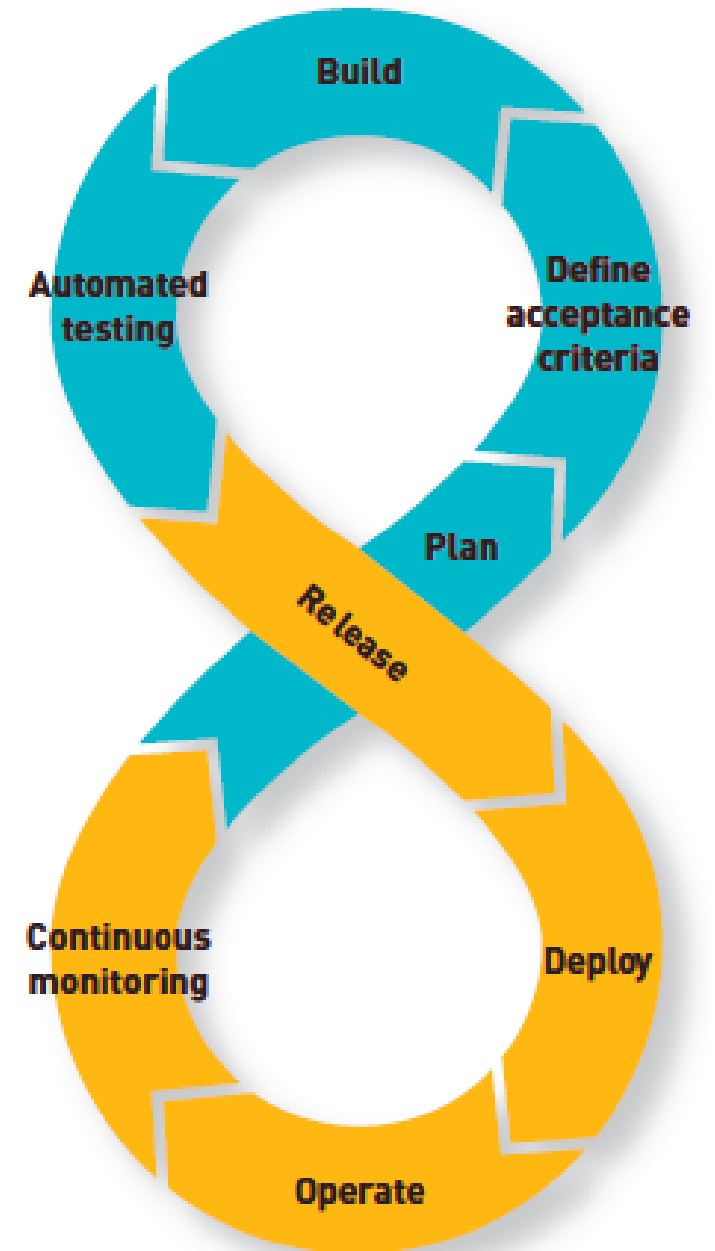
- Being used as part of a continuous development strategy, in which releases are launched daily

**FIGURE 12.18**

**DevOps is part of a continuous deployment strategy in which releases can be launched daily**

DevOps blends tasks performed by development staff and IT operations groups.

Source: Chris Haddad, "Overcome DevOps Adoption Barriers to Accelerate Software Delivery," Tech Well Insights, May 8, 2015, [www.techwell.com/techwell-insights/2015/05/overcome-devops-adoption-barriers-accelerate-software-delivery](http://www.techwell.com/techwell-insights/2015/05/overcome-devops-adoption-barriers-accelerate-software-delivery).



# Agile Development: advantages and disadvantages

**TABLE 12.10** Advantages and disadvantages of agile development

Advantages	Disadvantages
For appropriate projects, this approach puts an application into production sooner than any other approach.	It is an intense process that can burn out system developers and other project participants.
Documentation is produced as a by-product of completing project tasks.	This approach requires system analysts and users to be skilled in agile system development tools and agile techniques.
Agile forces teamwork and lots of interaction between users and stakeholders.	Agile requires a larger percentage of stakeholders' and users' time than other approaches.

# Comparison Agile versus Waterfall Development

**TABLE 12.11** Comparison of approaches to system development

Characteristic	Software Development Approach	
	Agile	Waterfall
Description	An iterative process that develops the system in sprint increments lasting 2–8 weeks; each increment focuses on implementing the highest priority requirements that can be completed in the allotted time	A sequential multistage process where work on the next stage cannot begin until the results of the previous stage are reviewed and approved or modified as necessary
Basic assumption	System requirements cannot be fully defined at start of project	All critical system requirements must be fully defined before any coding begins
How requirements and design are defined	Users interacting with system analysts and working software	Users interacting with system analysts and system documentation and/or models
Associated processes	Scrum	Structured system analysis and design



Business Liaison Role, pp. 470-471

Reluctant Project Sponsor, pp. 490-491

User Acceptance Testing for New Accounting System, p. 538

Hospital Switches Electronic Health Record Software, pp. 546-547

