

# **Modern Systems Analysis and Design**

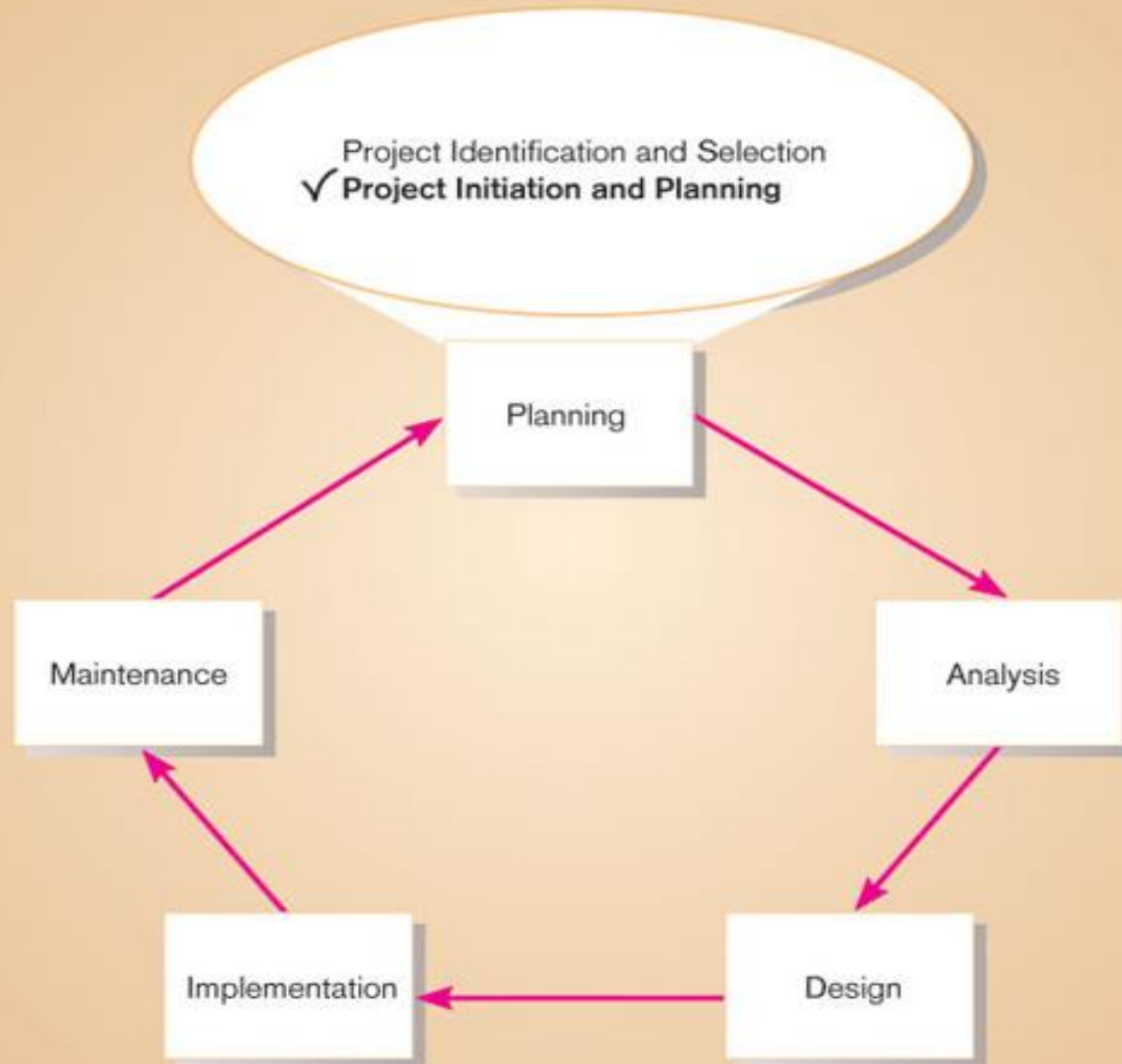
## **Chapter 5**

### **Initiating and Planning Systems Development Projects**

# Learning Objectives

- ✓ Describe steps involved in **project initiation and planning**.
- ✓ Explain the need for and **contents of Statement of Work and Baseline Project Plan**.
- ✓ List and describe methods for **assessing project feasibility**.
- ✓ Describe **tangible vs. intangible costs and benefits, and one-time vs. recurring costs and benefits**.
- ✓ Perform **cost-benefit analysis**, and **understand time value of money, present value, discount rate, return on investment**, and **break-even analysis**.
- ✓ Describe rules for **evaluating technical risk** of systems development projects.
- ✓ Describe activities and roles of **structured walkthroughs**.

# Project Initiation and Planning



# Project Initiation Tasks

- ▶ Establish:
  - ▶ Initiation team
  - ▶ Relationship with customer
  - ▶ Project initiation plan
  - ▶ Management procedures
  - ▶ Project management environment
  - ▶ Project workbook

# Project Planning Tasks

- ▶ Describe project **scope, alternatives, feasibility**.
- ▶ Divide project into **tasks**.
- ▶ Estimate **resource requirements** and create **resource plan**.
- ▶ Develop **preliminary schedule**.
- ▶ Develop **communication plan**.
- ▶ Determine **standards** and **procedures**.
- ▶ **Identify** and **assess** risk.
- ▶ Create **preliminary budget**.
- ▶ Develop a **statement of work**.
- ▶ Set **baseline project plan**.

# Deliverables and Outcomes

- ▶ **Business Case**

- ▶ Justification for an information system, expressed as **tangible and intangible costs** and **benefits**, and **technical/organizational feasibility**

- ▶ **Baseline Project Plan (BPP)**

- ▶ **Statement of Work (SOW)**

Pine Valley Furniture  
Statement of Work

Prepared: 0/06/05

Project Name: Customer Tracking Systems  
PVF Project Manager: Jim Woo

Customer: Marketing  
Project Sponsor: Jackie Judson

Project Start/End (projected): 10/1/04–2/1/06

PVF Development Staff Estimates (man-months):

Programmers:	2.0
Jr. Analysts:	1.5
Sr. Analysts:	0.3
Supervisors:	0.1
Consultants:	0.0
Librarian:	0.1

-----  
TOTAL: 4.0

Project Description

Goal

This project will implement a customer tracking system for the marketing department. The purpose of this system is to automate the ... to save employee time, reduce errors, have more timely information, ...

Objective

- minimize data entry errors
- provide more timely information
- ...

Phases of Work

The following tasks and deliverables reflect the current understanding of the project:

In Analysis, ...

In Design, ...

In Implementation, ...

**Statement of Work (SOW)** is a “contract” between the IS staff and the customer regarding deliverables and time estimates for a system development project.



Pine Valley Furniture  
System Service Request

REQUESTED BY Jackie Judson DATE August 22, 2005

DEPARTMENT Marketing

LOCATION Headquarters, 570c

CONTACT Tel: 4-3290 FAX: 4-3270 e-mail: judson

TYPE OF REQUEST		URGENCY
<input checked="" type="checkbox"/> New System	<input type="checkbox"/> Immediate – Operations are impaired or opportunity lost	
<input type="checkbox"/> System Enhancement	<input type="checkbox"/> Problems exist, but can be worked around	
<input type="checkbox"/> System Error Correction	<input checked="" type="checkbox"/> Business losses can be tolerated until new system installed	

PROBLEM STATEMENT

Sales growth at PVF has caused a greater volume of work for the marketing department. This volume of work has greatly increased the volume and complexity of the data we need to deal with and understand. We are currently using manual methods and a complex PC-based electronic spreadsheet to track and forecast customer buying patterns. This method of analysis has many problems: (1) we are slow to catch buying trends as there is often a week or more delay before data can be taken from point-of-sales system and manually enter it into our spreadsheet; (2) the process of manual data entry is prone to errors (which makes the results of our subsequent analysis suspect); and (3) the volume of data and the complexity of analyses conducted in the system seem to be overwhelming our current system—sometimes the program starts recalculating and never returns while for others it returns information that we know cannot be correct.

SERVICE REQUEST

I request a thorough analysis of our current method of tracking and analysis of customer purchasing activity with the intent to design and build a completely new information system. This system should handle all customer purchasing activity, support display and reporting of critical sales information, and assist marketing personnel in understanding the increasingly complex and competitive business environment. I feel that such a system will improve the competitiveness of PVF, particularly in our ability to better serve our customers.

IS LIAISON Jim Woo, 4-6207 FAX: 4-6200 e-mail: jwoo

SPONSOR Jackie Judson, Vice-President, Marketing

----- TO BE COMPLETED BY SYSTEMS PRIORITY BOARD -----

<input type="checkbox"/> Request approved	Assigned to _____
	Start date _____
<input type="checkbox"/> Recommend revision	
<input type="checkbox"/> Suggest user development	
<input type="checkbox"/> Reject for reason _____	

**System Service Request (SSR)** is a form requesting **development or maintenance of an information system**. It includes the contact person, a problem statement, a service request statement, and liaison contact information.



# Assessing Project Feasibility

- ▶ Economic feasibility
- ▶ Technical feasibility
- ▶ Operational feasibility
- ▶ Schedule feasibility
- ▶ Legal and contractual feasibility
- ▶ Political feasibility

# Economic Feasibility

- ▶ **Cost-benefit analysis:** identify all the financial benefits and costs associated with a project
- ▶ Tangible vs. intangible benefits
- ▶ Tangible vs. intangible costs
- ▶ One-time vs. recurring costs

# Tangible Benefits

## TANGIBLE BENEFITS WORKSHEET Customer Tracking System Project

Year 1 through 5

A. Cost reduction or avoidance	\$ 4,500
B. Error reduction	2,500
C. Increased flexibility	7,500
D. Increased speed of activity	10,500
E. Improvement in management planning or control	25,000
F. Other _____	0
<b>TOTAL tangible benefits</b>	<b>\$50,000</b>

Benefits that  
can be  
measured in  
dollars and  
with certainty

- Competitive necessity
- More timely information
- Improved organizational planning
- Increased organizational flexibility
- Promotion of organizational learning and understanding
- Availability of new, better, or more information
- Ability to investigate more alternatives
- Faster decision making
- Information processing efficiency
- Improved asset utilization
- Improved resource control
- Increased accuracy in clerical operations
- Improved work process that can improve employee morale
- Positive impacts on society

Intangible Benefits that cannot easily be measured in dollars or with certainty

# Types of Costs

- ▶ **Tangible**: can be measured in dollars and with certainty.
- ▶ **Intangible**: cannot easily be measured in dollars or with certainty.
- ▶ **One-time**: a cost associated with project start-up and development or systems start-up.
- ▶ **Recurring**: a cost associated with ongoing evolution and use of a system.

# Possible IS Project Costs

## ▶ **Procurement**

- ▶ Consulting, equipment, site preparation, capital, management time

## ▶ **Start-up**

- ▶ Operating systems, communications installation, personnel hiring, organizational disruption

## ▶ **Project-related**

- ▶ Application software, software modification, personnel overhead, training, data analysis, documentation

## ▶ **Operating**

- ▶ System maintenance, rental, asset depreciation, operation and planning

# One-time Costs

## ONE-TIME COSTS WORKSHEET Customer Tracking System Project

	Year 0
A. Development costs	\$20,000
B. New hardware	15,000
C. New (purchased) software, if any	
1. Packaged applications software	5,000
2. Other _____	0
D. User training	2,500
E. Site preparation	0
F. Other _____	0
<b>TOTAL one-time cost</b>	<b>\$42,500</b>



# Recurring Costs

## RECURRING COSTS WORKSHEET Customer Tracking System Project

Year 1 through 5

A. Application software maintenance	\$25,000
B. Incremental data storage required: 20 MB × \$50 (estimated cost/MB = \$50)	1,000
C. Incremental communications (lines, messages, . . .)	2,000
D. New software or hardware leases	0
E. Supplies	500
F. Other _____	0
<b>TOTAL recurring costs</b>	<b>\$28,500</b>

# Three Financial Measurements for Economic Feasibility

- ▶ **Net Present Value (NPV)**

- ▶ Use discount rate to determine present value of cash outlays and receipts

- ▶ **Return on Investment (ROI)**

- ▶ Ratio of cash receipts to cash outlays

- ▶ **Break-Even Analysis (BEA)**

- ▶ Amount of time required for cumulative cash flow to equal initial and ongoing investment

# Definitions of Terms

- ▶ **Present value:** current value of a future cash flow
- ▶ **Discount rate:** rate of return used to calculate the present value of future cash flows
- ▶ **Time value of money (TVM):** comparing present cash outlays to future expected returns

# Net Present Value

$$PV_n = Y \times \frac{1}{(1 + i)^n}$$

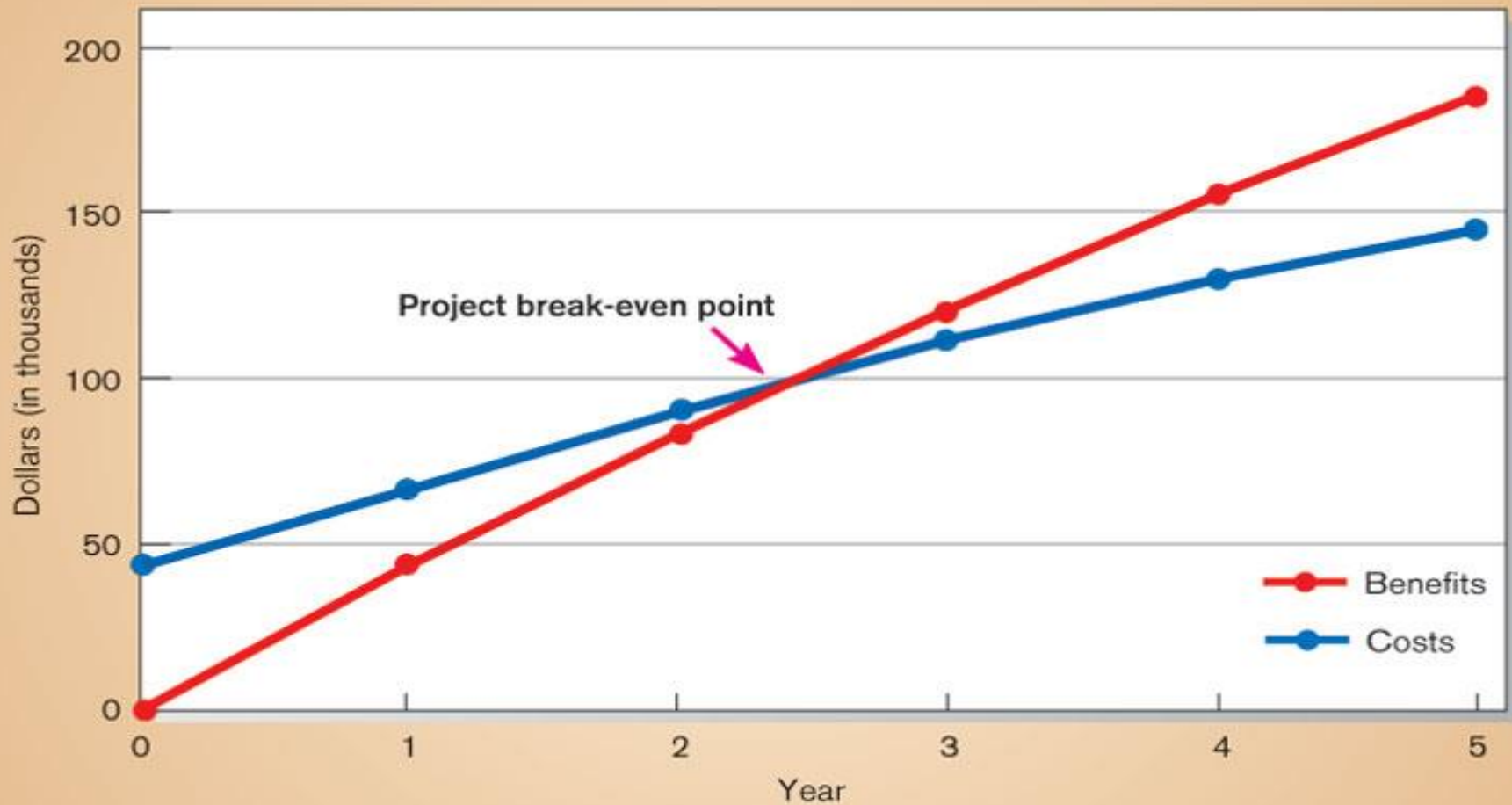
$PV_n$  = *present value* of  $Y$  dollars  $n$  years from now based on a *discount rate* of  $i$ .

**NPV** = sum of PVs across years.

Calculates *time value of money*.

# Break-Even Analysis

$$\text{Break-Even Ratio} = \frac{\text{Yearly NPV Cash Flow} - \text{Overall NPV Cash Flow}}{\text{Yearly NPV Cash Flow}}$$



# Technical Feasibility

- ▶ Assessing the organization's ability to construct the proposed system
- ▶ Takes into account various **project risk factors**

# Project Risk Factors

## ▶ **Project size**

- ▶ Team size, organizational departments, project duration, programming effort

## ▶ **Project structure**

- ▶ New vs. renovated system, resulting organizational changes, management commitment, user perceptions

## ▶ **Development group**

- ▶ Familiarity with platform, software, development method, application area, development of similar systems

## ▶ **User group**

- ▶ Familiarity with IS development process, application area, use of similar systems



		Low Structure	High Structure
High Familiarity with Technology or Application Area	Large Project	(1) Low risk (very susceptible to mismanagement)	(2) Low risk
	Small Project	(3) Very low risk (very susceptible to mismanagement)	(4) Very low risk
Low Familiarity with Technology or Application Area	Large Project	(5) Very high risk	(6) Medium risk
	Small Project	(7) High risk	(8) Medium-low risk

High technical familiarity mitigates risk due to project size and structure. Low familiarity increases risk.

# Other Feasibility Concerns

## ► Operational

- Does the proposed system solve problems or take advantage of opportunities?

## ► Schedule

- Can the project time frame and completion dates meet organizational deadlines?

## ► Legal and Contractual

- What are legal and contractual ramifications of the proposed system development project?

## ► Political

- How do key stakeholders view the proposed system?

## **BASELINE PROJECT PLAN REPORT**

### **1.0 Introduction**

- A. Project Overview—Provides an executive summary that specifies the project's scope, feasibility, justification, resource requirements, and schedules. Additionally, a brief statement of the problem, the environment in which the system is to be implemented, and constraints that affect the project are provided.
- B. Recommendation—Provides a summary of important findings from the planning process and recommendations for subsequent activities.

### **2.0 System Description**

- A. Alternatives—Provides a brief presentation of alternative system configurations.
- B. System Description—Provides a description of the selected configuration and a narrative of input information, tasks performed, and resultant information.

### **3.0 Feasibility Assessment**

- A. Economic Analysis—Provides an economic justification for the system using cost-benefit analysis.
- B. Technical Analysis—Provides a discussion of relevant technical risk factors and an overall risk rating of the project.
- C. Operational Analysis—Provides an analysis of how the proposed system solves business problems or takes advantage of business opportunities in addition to an assessment of how current day-to-day activities will be changed by the system.
- D. Legal and Contractual Analysis—Provides a description of any legal or contractual risks related to the project (e.g., copyright or nondisclosure issues, data capture or transferring, and so on).
- E. Political Analysis—Provides a description of how key stakeholders within the organization view the proposed system.
- F. Schedules, Time Line, and Resource Analysis—Provides a description of potential time frame and completion date scenarios using various resource allocation schemes.

### **4.0 Management Issues**

- A. Team Configuration and Management—Provides a description of the team member roles and reporting relationships.
- B. Communication Plan—Provides a description of the communication procedures to be followed by management, team members, and the customer.
- C. Project Standards and Procedures—Provides a description of how deliverables will be evaluated and accepted by the customer.
- D. Other Project-Specific Topics—Provides a description of any other relevant issues related to the project uncovered during planning.

**Baseline Project Plan (BPP)** is a document intended primarily to guide the development team.

### **Sections:**

- 1) Introduction**
- 2) System description**
- 3) Feasibility assessment**
- 4) Management issues**

**Figure 5-11** Statement of project scope (Pine Valley Furniture)

<b>Pine Valley Furniture Statement of Project Scope</b>		<b>Prepared by:</b> Jim Woo <b>Date:</b> September 12, 2005
<b>General Project Information</b>		
<b>Project Name:</b>	Customer Tracking System	
<b>Sponsor:</b>	Jackie Judson, VP Marketing	
<b>Project Manager:</b>	Jim Woo	
<b>Problem/Opportunity Statement:</b> Sales growth has outpaced the Marketing department's ability to accurately track and forecast customer buying trends. An improved method for performing this process must be found in order to reach company objectives.		
<b>Project Objectives:</b> To enable the Marketing department to accurately track and forecast customer buying patterns in order to better serve customers with the best mix of products. This will also enable PVF to identify the proper application of production and material resources.		
<b>Project Description:</b> A new information system will be constructed that will collect all customer purchasing activity, support display and reporting of sales information, aggregate data, and show trends in order to assist marketing personnel in understanding dynamic market conditions. The project will follow PVF's systems development life cycle.		
<b>Business Benefits:</b> Improved understanding of customer buying patterns Improved utilization of marketing and sales personnel Improved utilization of production and materials		
<b>Project Deliverables:</b> Customer tracking system analysis and design Customer tracking system programs Customer tracking documentation Training procedures		
<b>Estimated Project Duration:</b> 5 months		

**Project Scope  
statement is part  
of the BPP  
introduction.**

**Sections:**

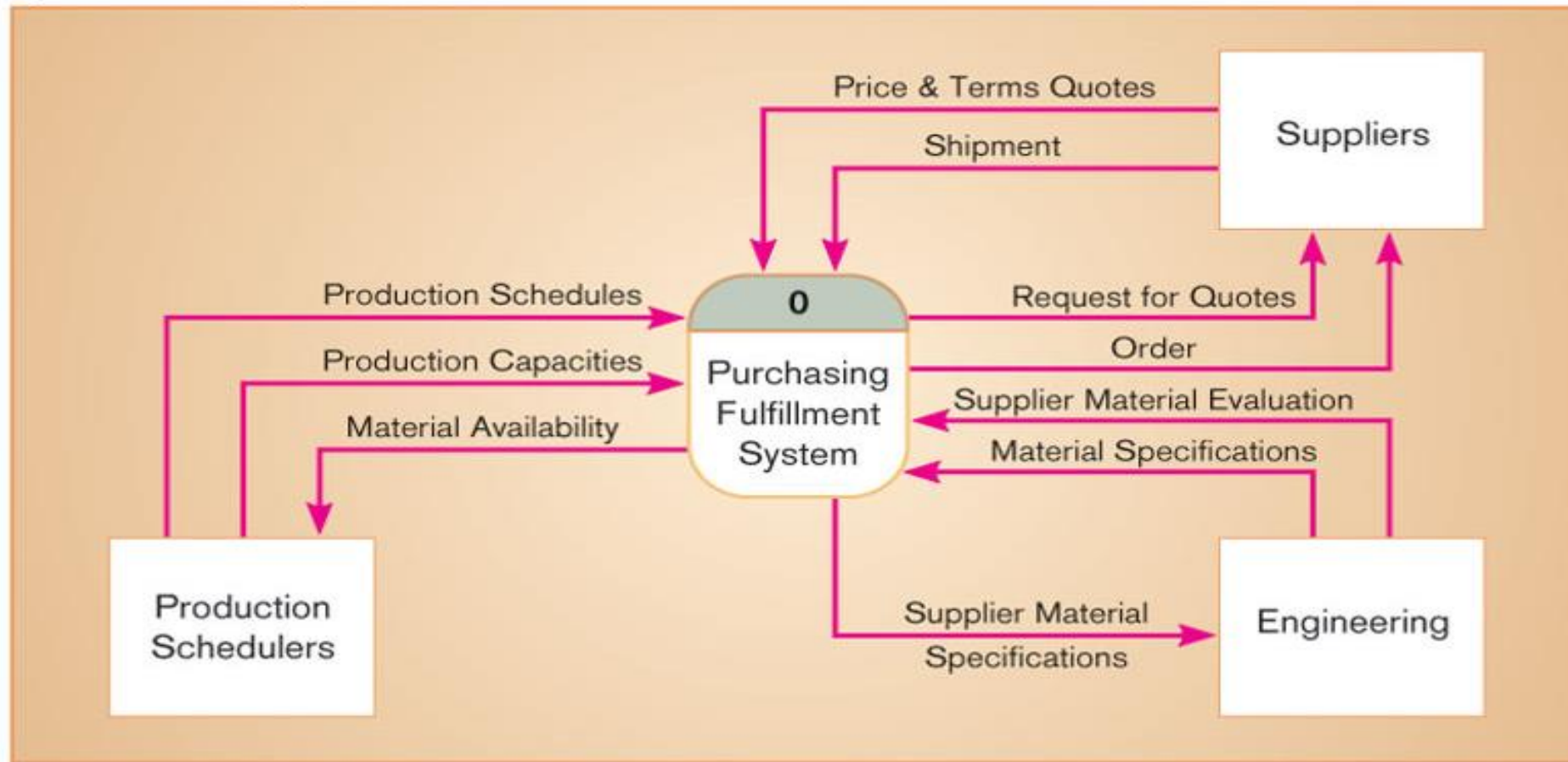
- 1) Problem statement**
- 2) Project objectives**
- 3) Project description**
- 4) Business benefits**
- 5) Deliverables**
- 6) Expected duration**

# Factors in Determining Scope

- ▶ Organizational units affected by new system
- ▶ Current systems that will interact with or change because of new system
- ▶ People who are affected by new system
- ▶ Range of potential system capabilities



# Diagram Depiction of Project Scope



Context level is a top level data flow diagram. Data flow diagrams are covered in Lecture 7.

# Structured Walkthroughs

- ▶ A peer-group review of any product created during the system development process
- ▶ **Roles:** coordinator, presenter, user, secretary, standard-bearer, maintenance oracle
- ▶ Can be applied to BPP, system specifications, logical and physical designs, program code, test procedures, manuals and documentation



**Pine Valley Furniture  
Walkthrough Review Form**

**Session Coordinator:** \_\_\_\_\_

**Project/Segment:** \_\_\_\_\_

**Coordinator's Checklist:**

1. Confirmation with producer(s) that material is ready and stable: \_\_\_\_\_
2. Issue invitations, assign responsibilities, distribute materials: ☐ Y ☐ N
3. Set date, time, and location for meeting:

Date: \_\_\_\_ / \_\_\_\_ / \_\_\_\_ Time: \_\_\_\_\_ A.M. / P.M. (circle one)

Location: \_\_\_\_\_

Responsibilities	Participants	Can Attend	Received Materials
Coordinator	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
Presenter	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
User	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
Secretary	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
Standards	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N
Maintenance	_____	<input type="checkbox"/> Y <input type="checkbox"/> N	<input type="checkbox"/> Y <input type="checkbox"/> N

**Agenda:**

- \_\_\_\_ 1. All participants agree to follow PVF's Rules of a Walkthrough
- \_\_\_\_ 2. New material: walkthrough of all material
- \_\_\_\_ 3. Old material: item-by-item checkoff of previous action list
- \_\_\_\_ 4. Creation of new action list (contribution by each participant)
- \_\_\_\_ 5. Group decision (see below)
- \_\_\_\_ 6. Deliver copy of this form to the project control manager

**Group Decision:**

- \_\_\_\_ Accept product as-is  
 \_\_\_\_ Revise (no further walkthrough)  
 \_\_\_\_ Review and schedule another walkthrough

Signatures	_____	_____
_____	_____	_____

**Structured  
walkthrough form**

all

# Summary

- ▶ In this chapter you learned how to:
  - ✓ Describe steps involved in project initiation and planning.
  - ✓ Explain the need for and contents of Statement of Work and Baseline Project Plan.
  - ✓ List and describe methods for assessing project feasibility.
  - ✓ Describe tangible vs. intangible costs and benefits, and one-time vs. recurring costs and benefits.
  - ✓ Perform cost-benefit analysis, and understand time value of money, present value, discount rate, return on investment, and break-even analysis.
  - ✓ Describe rules for evaluating technical risk of systems development projects.
  - ✓ Describe activities and roles of structured walkthroughs.