Planning:

Initiating and Planning Systems Development Projects

Prepared by:

Hiranya Prasad Bastakoti

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Initiating and Planning Systems Development Projects

- What must be considered when making the decision on the division between project initiation and planning (PIP) and analysis?
- How much effort should be expended on the PIP process?
- Who is responsible for performing the PIP process?
- Why is PIP such a challenging activity?

The Process of Initiating and Planning IS Development Projects

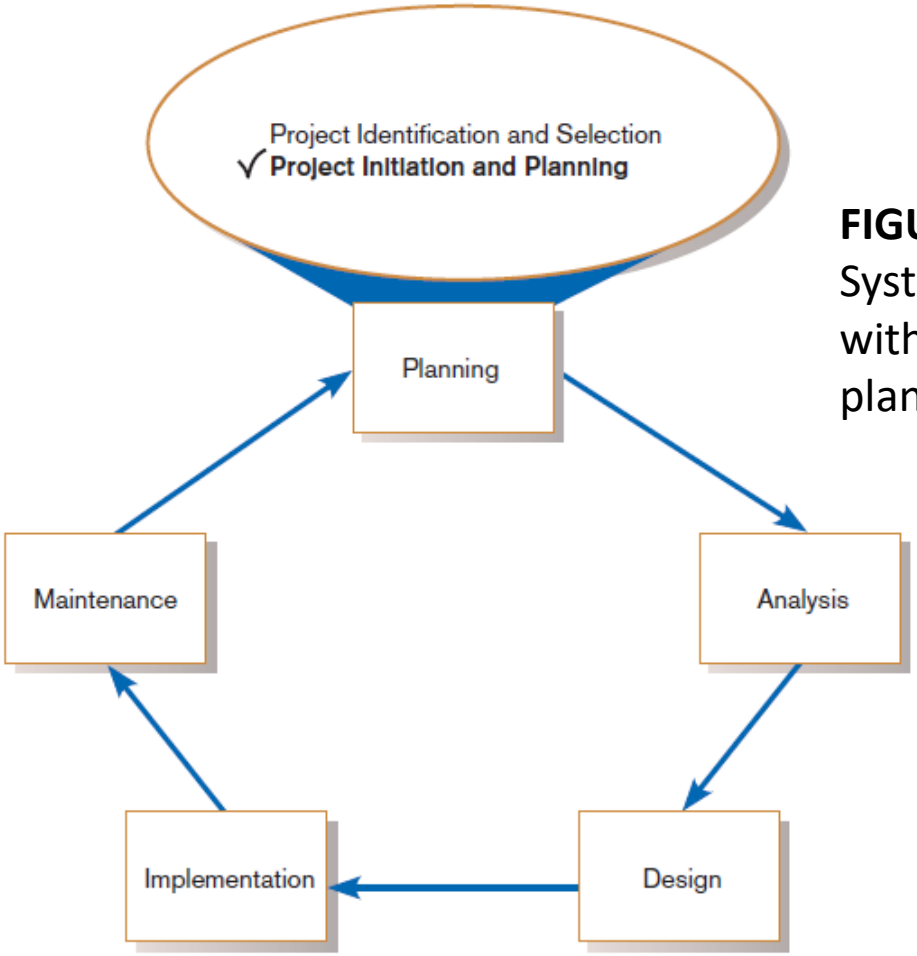


FIGURE 5-1
Systems development life cycle with project initiation and planning highlighted

The Process of Initiating and Planning IS Development Projects (Cont.)

- Project initiation focuses on activities designed to assist in organizing a team to conduct project planning.

The Process of Initiating and Planning IS Development Projects (Cont.)

- *Establishing the Project Initiation Team*
- *Establishing a Relationship with the Customer*
- *Establishing the Project Initiation Plan*
- *Establishing Management Procedures*
- *Establishing the Project Management Environment and Project Workbook*
- *Developing the Project Charter*

The Process of Initiating and Planning IS Development Projects (Cont.)

- The key activity of project planning is the process of defining clear, discrete activities and the work needed to complete each activity within a single project.
- The objective of the project planning process is the development of a *Baseline Project Plan* (*BPP*) and the *Project Scope Statement* (*PSS*).

The Process of Initiating and Planning IS Development Projects (Cont.)

- **Business Case**
  - Justification for an information system
  - Presented in terms of the tangible and intangible economic benefits and costs
  - The technical and organizational feasibility of the proposed system

Elements of Project Planning

- Describe project scope, alternatives, feasibility.
- Divide project into tasks.
- Estimate resource requirements and create resource plan.
- Develop preliminary schedule.
- Develop communication plan.

Elements of Project Planning (Cont.)

- Determine standards and procedures.
- Identify and assess risk.
- Create preliminary budget.
- Develop a statement of work.
- Set baseline project plan.

Deliverables and Outcomes (Cont.)

- **Baseline Project Plan** (**BPP**)
  - A major outcome and deliverable from the PIP phase
  - Contains the best estimate of a project's scope, benefits, costs, risks, and resource requirements

Deliverables and Outcomes (Cont.)

- **Project Scope Statement** (**PSS**)
  - A document prepared for the customer
  - Describes what the project will deliver
  - Outlines at a high level all work required to complete the project

Feasibility Analysis

- Feasibility: The measure of how beneficial or practical an information system will be to an organization.
- Feasibility analysis: A feasibility analysis is the process by which feasibility is measured
- The scope and complexity of an apparently feasible project can change after the initial problems and opportunities are fully analyzed or after the system has been designed.
- A project that is feasible at one point in time may become infeasible at a later point in time
- A feasibility study assesses the operational, technical, and economic merits of the proposed project

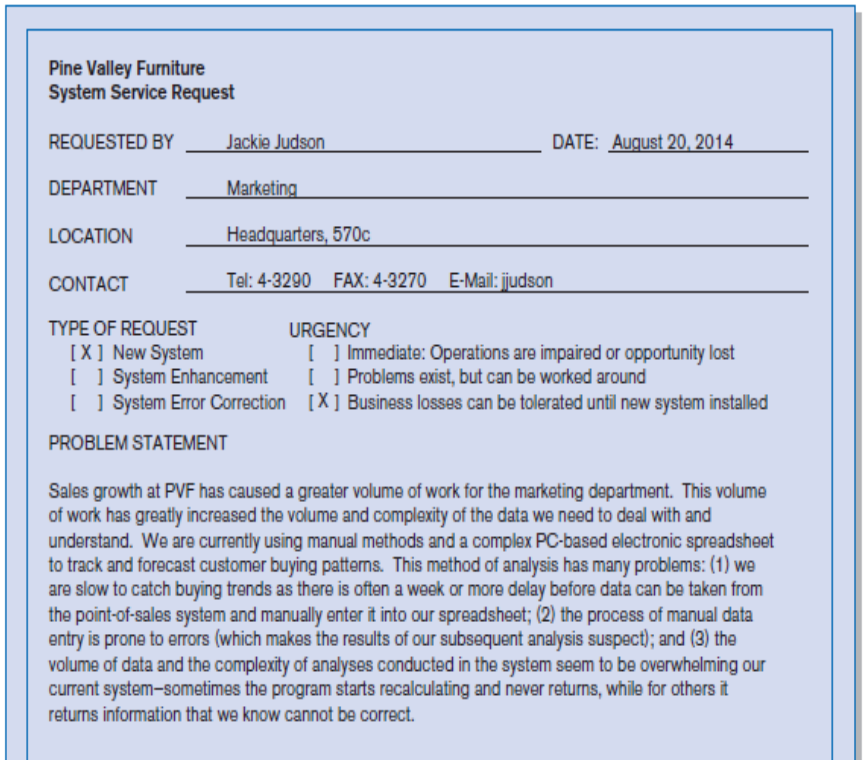
Types of Feasibility Aanlysis

- **Operational feasibility** is a measure of how well the solution of problems or a specific solution will work in the organization. It is also a measure of how people feel about the system/project.
- **Technical feasibility** is a measure of the practicality of a specific technical solution and the availability of technical resources and expertise.
- **Schedule feasibility** is a measure of how reasonable the project timetable is.
- **Economic feasibility** is a measure of the cost-effectiveness of a project or solution. This is often called a *cost-benefit analysis*.

Assessing Project Feasibility

- Economic
- Technical
- Operational
- Scheduling
- Legal and contractual
- Political

Assessing Project Feasibility (Cont.)



Pine Valley Furniture
System Service Request

REQUESTED BY Jackie Judson DATE: August 20, 2014

DEPARTMENT Marketing

LOCATION Headquarters, 570c

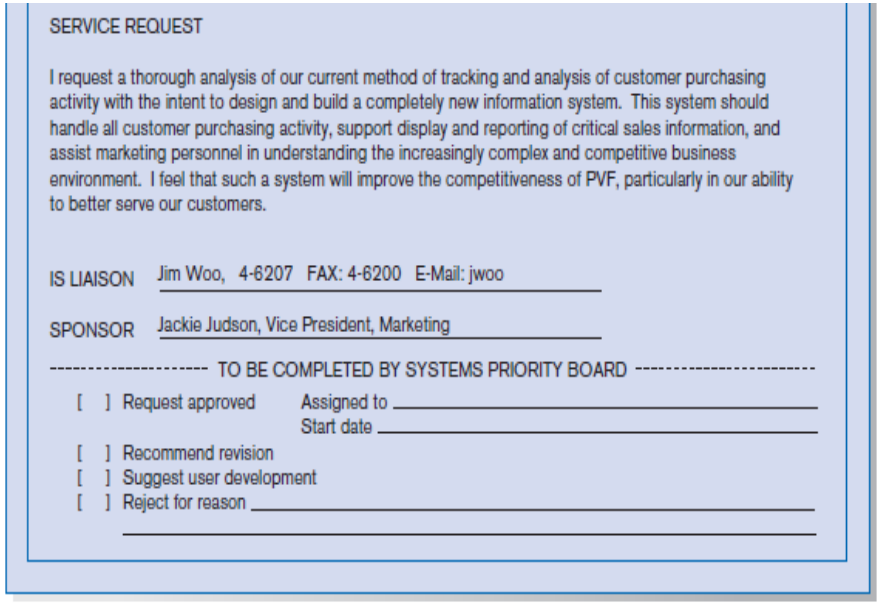
CONTACT Tel: 4-3290 FAX: 4-3270 E-Mail: jjudson

TYPE OF REQUEST
[X] New System
[ ] System Enhancement
[ ] System Error Correction

URGENCY
[ ] Immediate: Operations are impaired or opportunity lost
[ ] Problems exist, but can be worked around
[X] 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 the 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 ----------

[ ] Request approved Assigned to
Start date
[ ] Recommend revision
[ ] Suggest user development
[ ] Reject for reason

FIGURE 5-2
System Service Request for Customer Tracking System (Pine Valley Furniture)

Assessing Project Feasibility (Cont.)

- **Economic feasibility**: a process of identifying the financial benefits and costs associated with a development project
  - Often referred to as a *cost-benefit analysis*
  - Project is reviewed after each SDLC phase in order to decide whether to continue, redirect, or kill a project

Determining Project Benefits

- **Tangible benefits** refer to items that can be measured in dollars and with certainty.
- Examples include:
  - reduced personnel expenses
  - lower transaction costs, or
  - higher profit margins.

Determining Project Benefits (Cont.)

- Most tangible benefits will fit within the following categories:
  - Cost reduction and avoidance
  - Error reduction
  - Increased flexibility
  - Increased speed of activity
  - Improvement of management planning and control
  - Opening new markets and increasing sales opportunities

Determining Project Benefits (Cont.)

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
TOTAL tangible benefits	**$50,000**

Figure 5-3
Tangible benefits for Customer Tracking System (Pine Valley Furniture)

Determining Project Benefits (Cont.)

- **Intangible benefits** are benefits derived from the creation of an information system that cannot be easily measured in dollars or with certainty.
  - May have direct organizational benefits, such as the improvement of employee morale
  - May have broader societal implications, such as the reduction of waste creation or resource consumption

Determining Project Benefits (Cont.)

TABLE 5-3 Intangible Benefits from the Development of an Information System

- 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
- More confidence in decision quality
- Improved processing efficiency
- Improved asset utilization
- Improved resource control
- Increased accuracy in clerical operations
- Improved work process that can improve employee morale or customer satisfaction
- Positive impacts on society
- Improved social responsibility
- Better usage of resources ("greener")

(*Source:* Based on Parker and Benson, 1988; Brynjolfsson and Yang, 1997; Keen, 2003; Cresswell, 2004.)

Determining Project Costs

- **Tangible cost:** a cost associated with an information system that can be measured in dollars and with certainty
- IS development tangible costs include:
  - Hardware costs
  - Labor costs, or
  - Operational costs, including employee training and building renovations.

Determining Project Costs (Cont.)

- **Intangible cost:** a cost associated with an information system that cannot be easily measured in terms of dollars or with certainty
- Intangible costs can include:
  - Loss of customer goodwill,
  - Employee morale, or
  - Operational inefficiency.

Determining Project Costs (Cont.)

- **One-time cost**: a cost associated with project start-up and development or system start-up
- These costs encompass activities such as:
  - Systems development,
  - New hardware and software purchases,
  - User training,
  - Site preparation, and
  - Data or system conversion.

Determining Project Costs (Cont.)

- **Recurring cost**: a cost resulting from the ongoing evolution and use of a system
- Examples of these costs include:
  - Application software maintenance
  - Incremental data storage expenses
  - Incremental communications
  - New software and hardware leases, and
  - Supplies and other expenses (i.e., paper, forms, data center personnel).

Determining Project Costs (Cont.)

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
TOTAL one-time costs	**$42,500**

Figure 5-4

One-time costs for Customer Tracking System (Pine Valley Furniture)

Determining Project Costs (Cont.)

RECURRING COSTS WORKSHEET
Customer Tracking System Project

	Year 1 through 5
A. Application software maintenance	$25,000
B. Incremental data storage required: 20 GB × $50 (estimated cost/MB = $50)	1000
C. Incremental communications (lines, messages, . . .)	2000
D. New software or hardware leases	0
E. Supplies	500
F. Other _____	0
TOTAL recurring costs	**$28,500**

Figure 5-5
Recurring costs for Customer Tracking System (Pine Valley Furniture)

Determining Project Costs (Cont.)

- Both one-time and recurring costs can consist of items that are fixed or variable in nature.
- *Fixed costs* are billed or incurred at a regular interval and usually at a fixed rate.
  - Example: facility lease payment
- *Variable costs* are items that vary in relation to usage.
  - Example: long-distance charges

Determining Project Costs (Cont.)

TABLE 5-4 Possible Information Systems Costs

Type of Cost	Examples	Type of Cost	Examples
Procurement	Hardware, software, facilities infrastructure	Project	Infrastructure replacement/ improvements
	Management and staff		Project personnel
	Consulting and services		Training
			Development activities
			Services and procurement
			Organizational disruptions
			Management and staff
Start-Up	Initial operating costs	Operating	Infrastructure replacement/ improvements
	Management and staff		System maintenance
	Personnel recruiting		Management and staff
			User training and support

(*Source:* Based on King and Schrems, 1978; Sonje, 2008.)

Determining Project Costs (Cont.)

TABLE 5-5 Guidelines for Better Cost Estimating

1. Have clear guidelines for creating estimates.
2. Use experienced developers and/or project managers for making estimates.
3. Develop a culture where all project participants are responsible for defining accurate estimates.
4. Use historical data to help in establishing better estimates of costs, risks, schedules, and resources.
5. Update estimates as the project progresses.
6. Monitor progress and record discrepancies to improve future estimates.

(*Source*: Based on Lederer and Prasad, 1992; Hubbard, 2007; Sonje, 2008.)

The Time Value of Money

- **Time value of money** (**TVM**): the concept that money available today is worth more than the same amount tomorrow
- **Discount rate**: the rate of return used to compute the present value of future cash flows (*the cost of capital*)
- **Present value**: the current value of a future cash flow

The Time Value of Money

- 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

The Time Value of Money (Cont.)

- **Net Present Value**
  - 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*

$$\mathrm{PV}_n = Y \times \frac{1}{(1+i)^n}$$

The Time Value of Money (Cont.)

- **Break-even analysis**: a type of cost-benefit analysis to identify at what point (if ever) benefits equal costs

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

The Time Value of Money (Cont.)

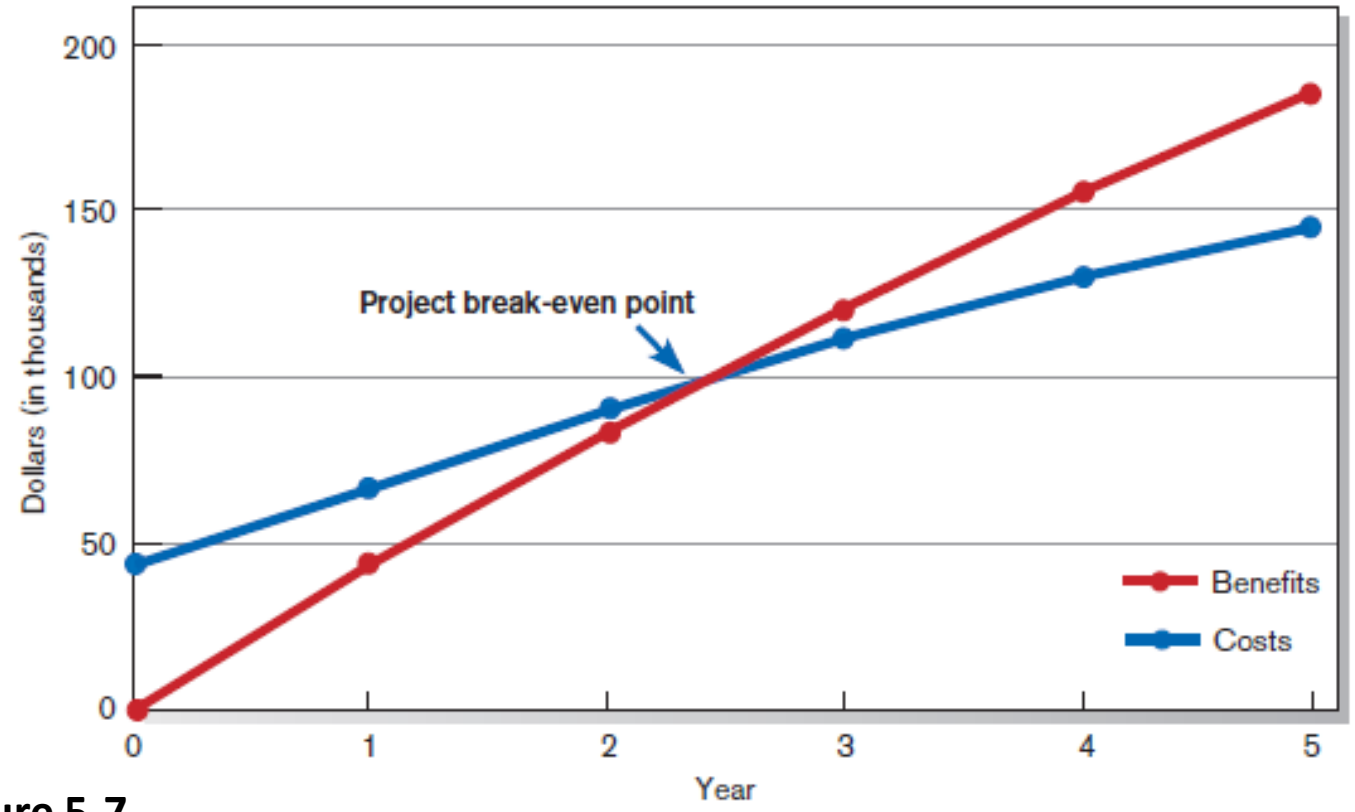


Figure 5-7
Break-even analysis for Customer Tracking System (Pine Valley Furniture)

Assessing Technical Feasibility

- **Technical feasibility**: a process of assessing the development organization's ability to construct a proposed system
- Technical feasibility assesses whether the current technical resources are sufficient for the new system
- Technical feasibility can only be evaluated after those phases during which technical issues are resolved — namely, after the evaluation and design phases of our life cycle have been completed

Assessing Technical Feasibility (Cont.)

- The potential consequences of not assessing and managing risks can include:
  - Failure to attain expected benefits from the project
  - Inaccurate project cost estimates.
  - Inaccurate project duration estimates.
  - Failure to achieve adequate system performance levels.
  - Failure to adequately integrate the new system with existing hardware, software, or organizational procedures.

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

Assessing Technical Feasibility (Cont.)

- Four general rules emerged as technical risk assessments:
  - *Larger projects are riskier than smaller projects.*
  - *A system in which the requirements are easily obtained and highly structured will be less risky than one in which requirements are messy, ill structured, ill defined, or subject to the judgment of an individual.*

Assessing Technical Feasibility (Cont.)

- *The development of a system employing commonly used or standard technology will be less risky than one employing novel or nonstandard technology.*
- *A project is less risky when the user group is familiar with the systems development process and application area than if unfamiliar.*

Assessing Technical Feasibility (Cont.)

		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

FIGURE 5-8
Effects of degree of project structure, project size, and familiarity with application area on project implementation risk *(Source: Based on 7th Applegate, Austin,* and McFarlan. 2007; Tech Republic, 2005.)

Assessing Other Feasibility Concerns

- **Operational**
  - Does the proposed system solve problems or take advantage of opportunities?
- **Scheduling**
  - Can the project time frame and completion dates meet organizational deadlines?
- **Legal and Contractual**
  - What are the legal and contractual ramifications of the proposed system development project?
- **Political**
  - How do key stakeholders view the proposed system?

Operational Feasibility

- Operational feasibility determines if the human resources are available to operate the system once it has been installed
- Operational feasibility criteria measure the urgency of the problem (survey and study phases) or the acceptability of a solution (definition, selection, acquisition, and design phases).
- There are two aspects of operational feasibility to be considered:
  - Is the problem worth solving, or will the solution to the problem work?
  - How do the end-users and management feel about the problem (solution)?

Schedule Feasibility

- Given our technical expertise, are the project deadlines reasonable?
  - Some projects are initiated with specific deadlines.
    - You need to determine whether the deadlines are mandatory or desirable.
    - If the deadlines are desirable rather than mandatory, the analyst can propose alternative schedules.
- It is preferable (unless the deadline is absolutely mandatory) to deliver a properly functioning information system two months late than to deliver an error-prone, useless information system on time!
  - Missed schedules are bad.
  - Inadequate systems are worse!

Building the Baseline Project Plan

- A **Baseline Project Plan (BPP)** is a document intended primarily to guide the development team.
- Sections:
  - Introduction
  - System description
  - Feasibility assessment
  - Management issues

Building the Baseline Project Plan (Cont.)

- Project Scope statement is part of the BPP introduction.
- Sections:
  - Problem statement
  - Project objectives
  - Project description
  - Business benefits
  - Deliverables
  - 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

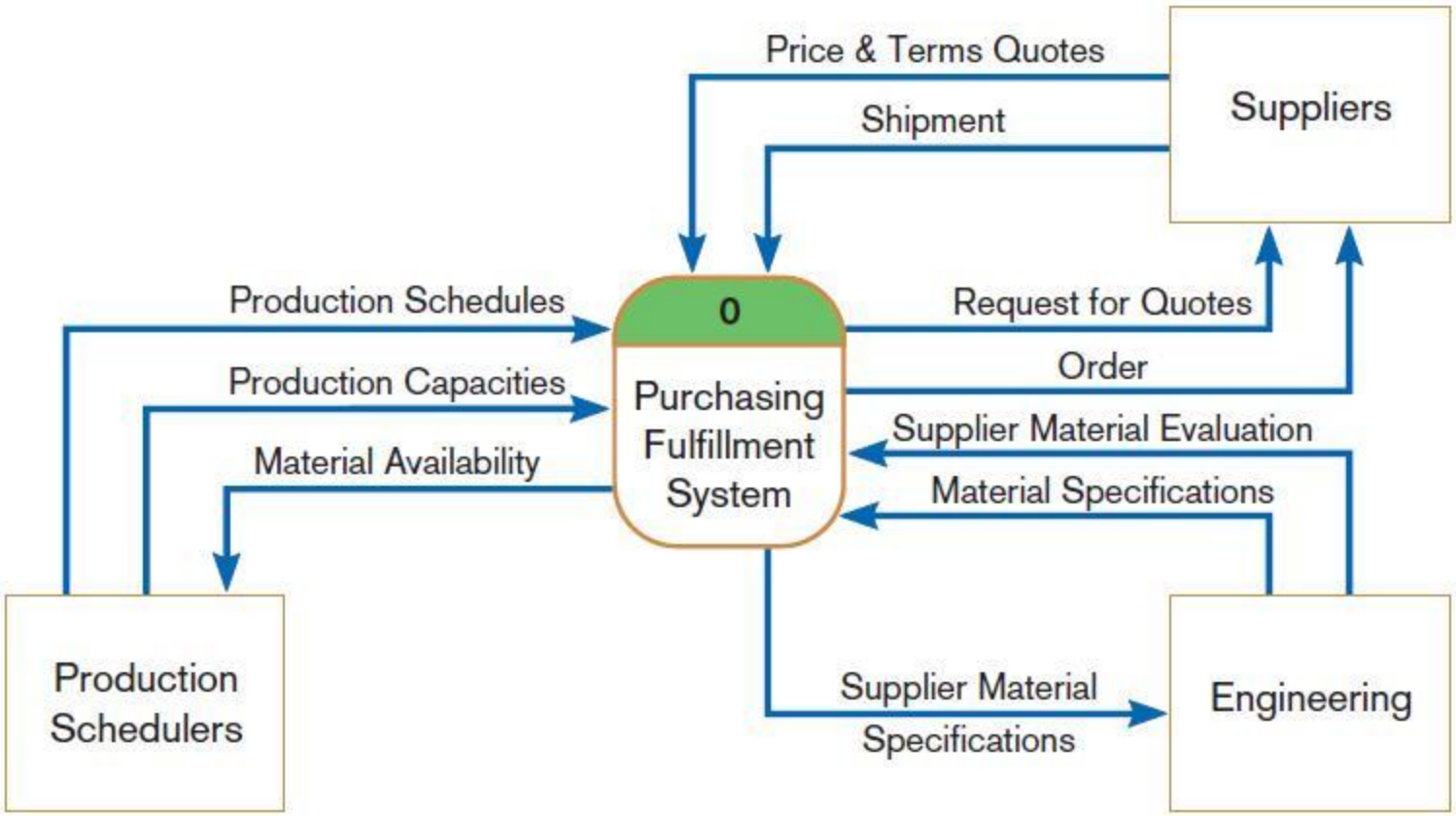


FIGURE 5-11
Context-level data flow diagram showing project scope for Purchasing Fulfillment System (Pine Valley Furniture)

Building the Baseline Project Plan (Cont.)

- *System description* section outlines possible alternative solutions.
- *Feasibility assessment* section outlines issues related to project costs and benefits, technical difficulties, and other such concerns.
- *Management issues* section outlines a number of managerial concerns related to the project.

Reviewing the Baseline Project Plan

- **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

Review Questions

1.Contrast the following terms:

a. Break-even analysis; present value; net present value; return on investment

b. Economic feasibility; legal and contractual feasibility; operational feasibility; political feasibility; schedule feasibility

c. Intangible benefit; tangible benefit

d. Intangible cost; tangible cost

2.List and describe the steps in the project initiation and planning process.

3. What is contained in a BPP? Are the content and format of all baseline plans the same? Why or why not?

4. Describe three commonly used methods for performing economic cost–benefit analysis.

5. List and discuss the different types of project feasibility factors. Is any factor most important? Why or why not?

In what ways could you identify that one IS project is riskier than another?

6. What are the types or categories of benefits of an IS project?

7. What intangible benefits might an organization obtain from the development of an information system?

8. Assuming monetary benefits of an information system at $85,000 per year, one-time costs of $75,000, recurring costs of $35,000 per year, a discount rate of 12 percent, and a five-year time horizon, calculate the net present value of these costs and benefits of an information system. Also calculate the overall return on investment of the project and then present a break-even analysis. At what point does breakeven occur?

9. Assume monetary benefits of an information system of $40,000 the first year and increasing benefits of $10,000 a year for the next five years (year 1 = $50,000, year 2 = $60,000, year 3 = $70,000, year 4 = $80,000, year 5 = $90,000). Onetime development costs were $80,000 and recurring costs were $45,000 over the duration of the system's life. The discount rate for the company was 11 percent. Using a six-year time horizon, calculate the net present value of these costs and benefits. Also calculate the overall return on investment and then present a break-even analysis. At what point does breakeven occur?