Systems Analysis and Design

Unit 4

SYSTEM PLANNING

4.2
Initiating and Planning
Systems Development Projects

Learning Objectives

- ✓Describe steps involved in the project initiation and planning process (the first two phases of project management)
- ✓Explain the need for and the contents of a Statement of Work and Baseline Project Plan
- ✓List and describe various methods for accessing project feasibility
- ✓Describe the differences between intangible and tangible costs and benefits and between recurring and one-time benefits and costs
- ✓Detail various methods of cost/benefit analysis
- ✓Describe the general rules for evaluating the technical risks associated with a systems development project
- ✓Describe the activities and participant roles within a structured walkthrough

Project Initiation and Planning

- Three important questions that 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?**

Project Initiation and Planning

- **How much effort should be expended on the PIP process?**
  - Difficult to answer
  - Depends on the size and complexity of the project and past experience
  - Rule of thumb: 10 – 20% of entire development effort should be expended.

- **Who is responsible for performing the PIP process?**
  - Most organizations assign an experienced system analyst or team of analysts

- **Why is PIP such a challenging activity?**
  - Because the objective is to transform a vague system request document into a tangible project description
  - Open-ended process
  - Need of effective communication among system analyst, users and managers

Project Initiation and Planning

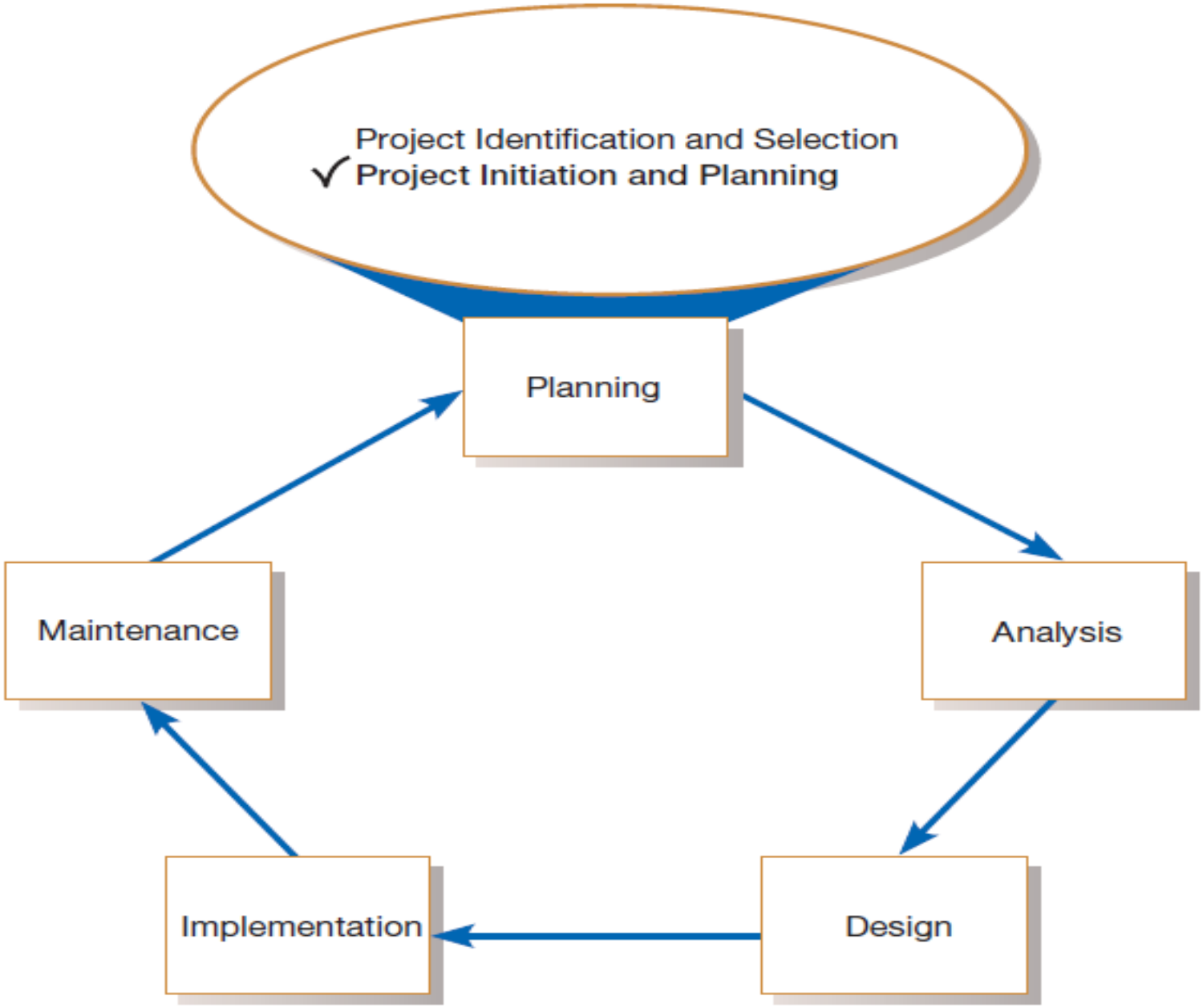


Fig : System Development Life Cycle with Project Initiation and Planning highlighted

Project Initiation and Planning

Project Initiation

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

- **Elements of Project Initiation**
  - Establishment of project Initiating Team
  - Development of relationship with customer
  - Establishing the project Initiation Plan
  - Establishment of Management Procedures
  - Establishment of Project Workbook and Project Management Environment
  - Developing the Project Charter

Project Initiation and Planning

- The key activity of project initiation is the development of the *project charter*.

- **Project Charter**
  - A short document that is prepared for both internal and external stakeholders.
  - Provides a high-level overview of the project.
  - Useful communication tool that helps to assure that the organizations and other stakeholders understand the initiation of a project

Project Initiation and Planning

- A project charter typically contains:
  - Project title and date of authorization
  - Project manager name and contact information
  - Customer name and contact information
  - Projected start and completion dates
  - Key stakeholders, project role, and responsibilities
  - Project objectives and description
  - Key assumptions or approach
  - Signature section for key stakeholders

Project Initiation and Planning

Project Planning

- Project Planning is the process of defining a 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 BPP becomes the foundation for the remainder of the development project. The PSS produced by the team clearly outlines the objectives and constraints of the project for the customer.

Project Initiation and Planning

Project Planning

- As with the project initiation process, the size, scope, and complexity of a project will dictate the comprehensiveness of the project planning process and resulting documents.
- Further, numerous assumptions about resource availability and potential problems will have to be made.
- Analysis of these assumptions and system costs and benefits forms a **business case**

- **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

Project Initiation and Planning

- **Elements of Project Planning**

  - describe the project scope, alternative, and feasibility.
  - Divide project into manageable tasks.
  - Estimate resources, and create resource plan.
  - Developing a preliminary schedule.
  - Developing a communication plan.
  - Determining project standards and procedures.
  - Identifying and assessing risks.
  - Creating a preliminary budget.
  - Developing a Statement Of Work.
  - Setting a Baseline Project Plan.

Project Initiation and Planning

Deliverables and Outcomes of Project Initiation and Planning Phase

- **Baseline Project Plan (BSS)**
  - A major outcome and deliverable from the project initiation and planning phase that contains the best estimate of a project's scope, benefits, costs, risks and resource requirements
  - It specifies detailed project activities for the next life cycle phase - analysis

- **Project Scope Statement** (**PSS**)
  - A document prepared for the customer that describes what the project will deliver and outlines at a high level all work required to complete the project.
  - It ensures that both customer and developer gain a common understanding of the project
  - It is a very useful communication tool

Assessing Project Feasibility / Feasibility Study

- Feasibility is the measure of how beneficial or practical the development of information system will be to an organization.
- Feasibility study is the process by which feasibility is measured.
- Feasibility analysis is appropriate to the systems analysis phase.
- A feasibility study looks at the viability of an idea with an emphasis on identifying potential problems.

Feasibility Study

- Feasibility study attempts to answer two main questions:
  - Can we develop the system?
  - Should we develop the system ?

- It is an evaluation of a proposal designed to determine the difficulty in carrying out a designated task.
- Generally precedes technical development and project implementation.

Importance of Feasibility Study

- List in detail all the things you need to make the business work
- Identify logistical and other business-related problems and solutions
- Develop marketing strategies to convince a bank or investor that your business is worth considering as an investment
- Serve as a solid foundation for developing your business plan.

Six categories for Feasibility Study (TELOSP)

Technical
Economic
Legal and contractual
Operational
Schedule

Political

Assessing Technical Feasibility

- **Technical Feasibility,** is a process of assessing the development organization’s ability to construct a proposed system.
- The purpose of assessing Technical Feasibility is to gain an understanding of the organization's ability to construct the proposed system.
- This analysis should include an assessment of the development group's understanding of the possible target hardware, software, and operating environments to be used, as well as system size, complexity, and the group's experience with the similar systems.

Assessing Technical Feasibility …

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

Assessing Technical Feasibility

- Risk can be managed on a project by:
  - Changing the project plan to avoid risky factors,
  - Assigning project team members to carefully manage the risky aspects,
  - Setting up monitoring methods to determine whether or not potential risk is materializing.

Assessing Technical Feasibility

The amount of technical risk associated with a given project is contingent on four primary factors :

- **Project size**
  - →Team size, organizational departments, project duration, programming effort, outsourcing partners
- **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

- 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.*
  - *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 familiar with the systems development process and application area than if unfamiliar.*

Assessing Technical Feasibility

		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

Fig: Effects of degree of project structure, project size, and familiarity with application area on project implementation risk

Assessing Economic Feasibility

- A process of identifying the financial benefits and costs associated with a development project.
- Economic analysis is the most frequently used method for evaluating the effectiveness of a new system.
- Often referred to as *cost-benefit analysis*. the procedure is to determine the benefits and savings that are expected from a candidate system and compare them with costs.
- If benefits outweigh costs, then the decision is made to design and implement the system.
- Project is reviewed after each SDLC phase in order to decide whether to continue, redirect, or kill a project.

Assessing Economic Feasibility

Determine Benefits

- **Tangible Benefits**
  - Refer to items that **Can be measured easily**
  - **Examples**
    - **Cost reduction and avoidance**
    - **Error reduction**
    - **Increased flexibility**
    - **Increased speed of activity**
    - **Improved management planning and control**
    - **Opening new markets and increasing sales opportunities**

Assessing Economic Feasibility

Determine Benefits (continued)

- **Intangible Benefits**
  - are benefits derived from the creation of an information system that cannot be easily measured in dollars or with certainty.
  - **Cannot be measured easily**
  - **Examples**
    - **Increased employee morale**
    - **Competitive necessity**
    - **More timely information**
    - **Promotion of organizational learning and understanding**

Assessing Economic Feasibility

Determine Costs

- **Tangible Costs**
  - 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.

Assessing Economic Feasibility

- **Determine Costs (Continued)**
  - **Intangible Costs**
    - 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.

Assessing Economic Feasibility

- **Determine Costs** (Continued)
  - One-Time Costs
    - Associated with project startup, initiation and development
    - Includes
      - System Development
      - New hardware and software purchases
      - User training
      - Site preparation
      - Data or system conversion

Assessing Economic Feasibility

- **Determine Costs (Continued)**
  - **Recurring Costs**
    - 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

- 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.
- *Variable costs* are items that vary in relation to usage

Determining 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

The Time Value of Money

- The Concept that money available today is more than the same amount tomorrow

The Time Value of Money

- Net Present Value (NPV)
  - Use discount rate to determine present value of cash outlays and receipts
  - Discount rate is the rate of return used to compute the present value of the future cash inflows
  - Present value is the current value of the future cash flow

$PV_n = Y * 1 / (1+i)^n$

Where PV is the Present value of Y dollars n years from now when I is the discount rate

The Time Value of Money

- 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

- **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**
  - 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*.

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

Assessing Other Project Feasibility Concerns

- **Operational**
  - Does the proposed system solve problems or take advantage of opportunities?
  - The process of assessing the degree to which a proposed system solves business problems or take advantage of business opportunities

Assessing Other Project Feasibility Concerns

- **Scheduling**
  - Can the project time frame and completion dates meet organizational deadlines?
  - The process of assessing the degree to which the potential time frame and completion dates for all major activities within a project meet organizational deadlines and constraints for affecting change

Assessing Other Project Feasibility Concerns

- **Legal and Contractual**
  - What are legal and contractual ramifications of the proposed system development project?
  - The process of assessing potential legal and contractual ramifications due to the construction of a system

Assessing Other Project Feasibility Concerns

- **Political**
  - How do key stakeholders view the proposed system?
  - The process of evaluating how key stakeholders within the organization view the proposed system.

Building the Baseline Project Plan

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

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.

Building the Baseline Project Plan

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

Pine Valley Furniture
Project Scope Statement

Prepared by: Jim Woo
Date: September 10, 2017

General Project Information

Project Name:	Customer Tracking System
Sponsor:	Jackie Judson, VP Marketing
Project Manager:	Jim Woo

Problem/Opportunity Statement:

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.

Project Objectives:

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.

Project Description:

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.

Business Benefits:

Improved understanding of customer buying patterns
Improved utilization of marketing and sales personnel
Improved utilization of production and materials

Project Deliverables:

Customer tracking system analysis and design
Customer tracking system programs
Customer tracking documentation
Training procedures

Estimated Project Duration:

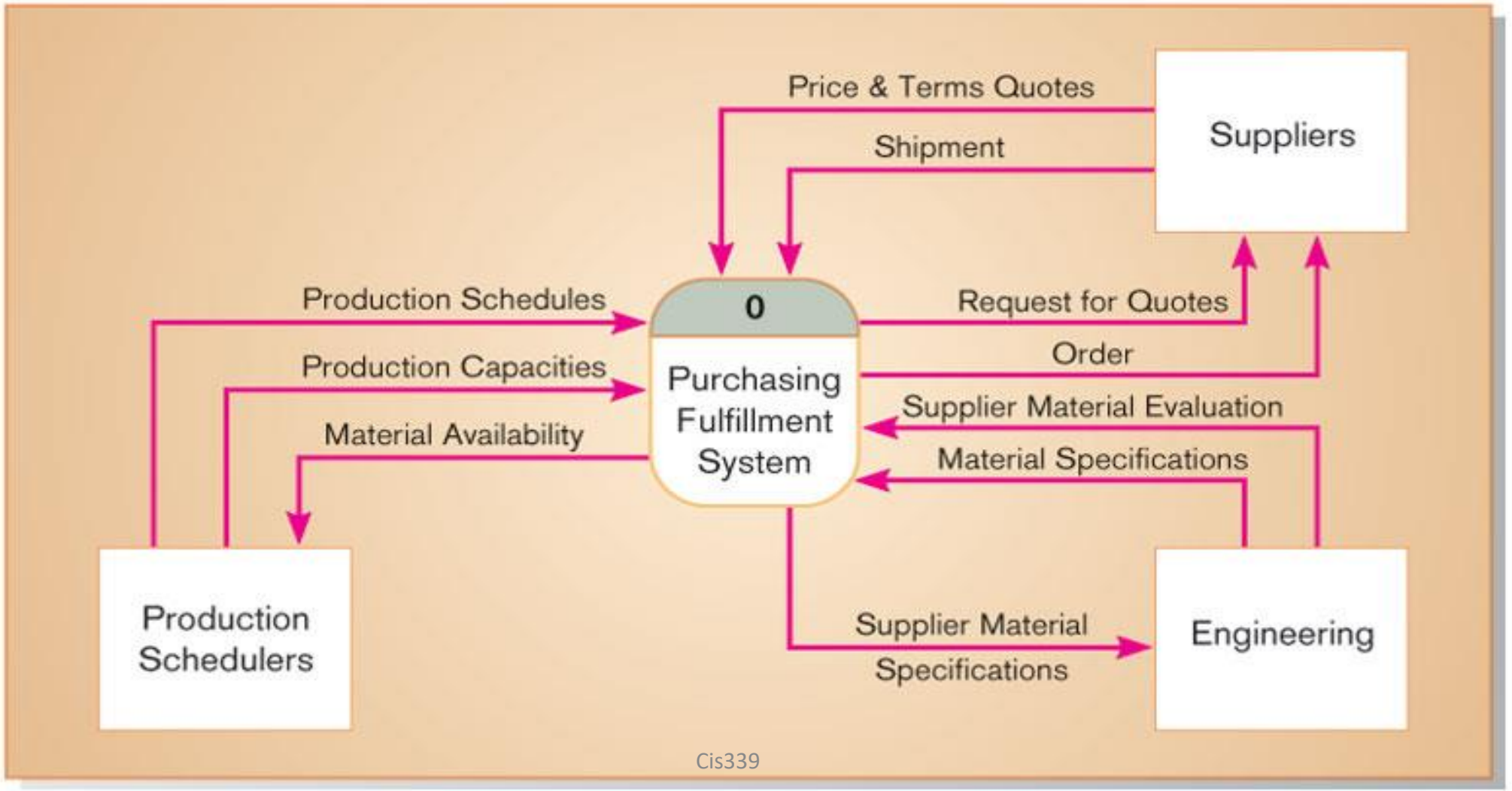
5 months

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 5-12 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
- **Objectives**
  - **Assure conformity to organizational standards**
  - **All parties agree to continue with project**