

Chapter 7

System Life Cycle Methodologies

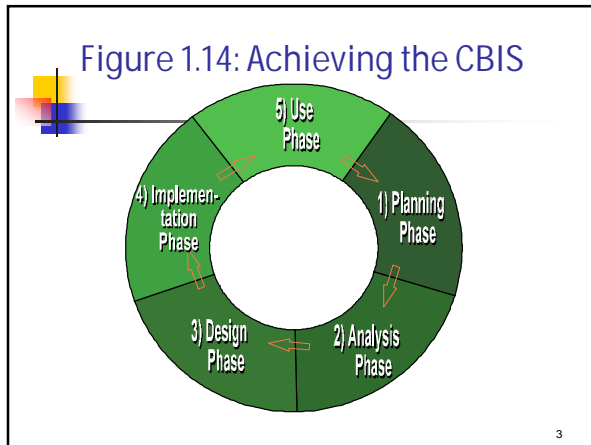
- Learn Methodology
- Learn roles played by management
- Approaches to cutting over a new system
- Prototyping

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The Systems Life Cycle (SLC)

- An application of the systems approach to the task of developing and using a computer-based system
- Evolutionary Process
- Waterfall Approach refers to the series of steps

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The System Development Life Cycle (SDLC)

- SDLC is the phrase that encompasses the planning, analysis, design, and implementation phases of the system life cycle
- Who participates
 - IS personnel
 - End Users
 - Information specialists can consult
- Traditional
 - Information specialists working with users.
 - A new strategy: Outsourcing

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Who Manages the System Life Cycle Work?

- There has been an upward migration
- Executive responsibility
- MIS steering committee
 - Functions
 - Set policy
 - Fiscal Control
 - Resolve conflicts
 - Permanent Members = Executives
 - Temporary Members = Consultants

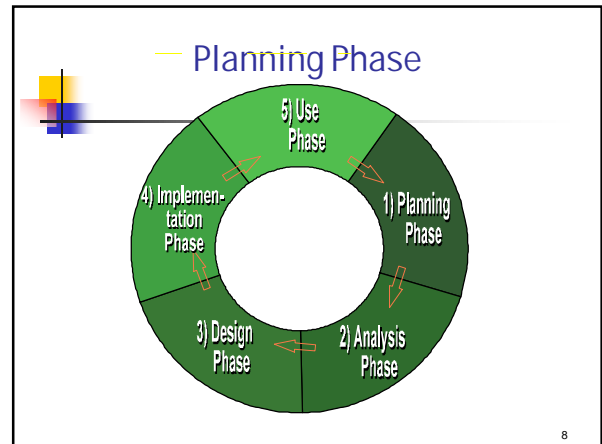
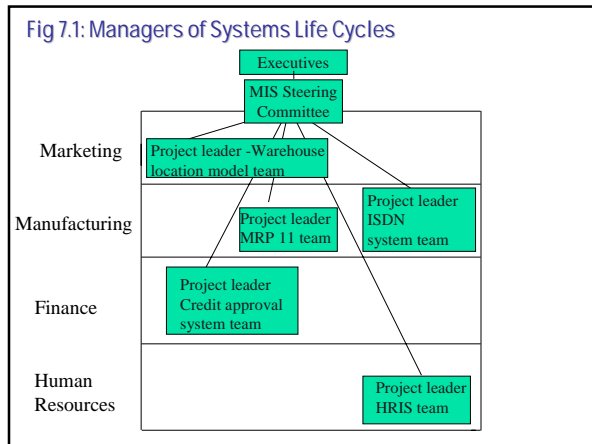
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Two Main Advantages of the Steering Committee

- Total firm support
- Projects will be characterized by good planning and control

Also, since the steering committee will probably not get involved with the details of the work, a project team is usually appointed.

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Planning Phase

- **Benefits**
 - Define scope of the project
 - Spot potential problems
 - Arrange tasks in sequence
 - Provide basis for control

Steps

1. Recognize problem (the trigger)
2. Define problem Systems analyst consults
3. Set objectives Systems analyst consults
4. Set constraints Systems analyst consults

■ Recall that objectives, standards, and constraints are problem-solving elements.

Steps (cont.)

5. Conduct feasibility study (TENLOS)
 - Technical
 - Economic return
 - Noneconomic return
 - Legal and ethical
 - Operational
 - Schedule

Steps (cont.)

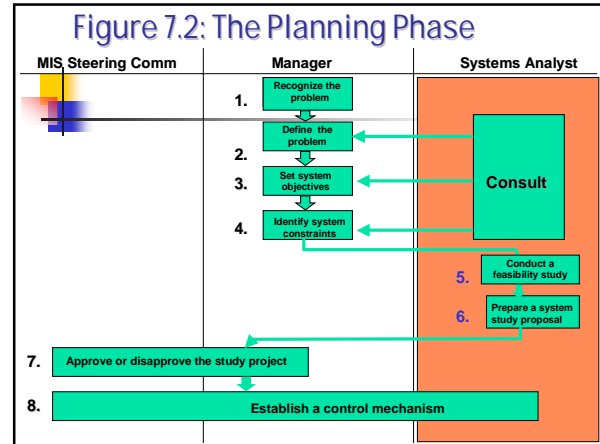
6. Prepare System study project proposal
 - Goes to MIS steering committee
7. Approve or disapprove (go/no go)
 - Key questions?
 1. Will the system accomplish its goals?
 2. Is this the best way to go about it?

Steps (cont.)

8. Establish a control mechanism

- Think in terms of:
 - 1. What
 - 2. Who
 - 3. When (Person months versus calendar months)
- Gantt and CPM network diagrams
 - Project Management Software can help

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- Figure 7.3: Outline of a System Study Proposal**
1. Executive summary
 2. Introduction
 3. System objectives and constraints
 4. Possible system alternatives
 5. Expected impact of the system
 - 6.1 Impact on the firm's organization structure
 - 6.2 Impact on the firm's operations
 - 6.3 Impact on the firm's resources
 6. The recommended system study project
 - 5.1 Tasks to be performed
 - 5.2 Human resource requirements
 - 5.3 Schedule of work
 - 5.4 Estimated cost
 7. General development plan
(analysis, design, and implementation phase)
 8. Summary

Table 7.1: A Project Schedule

Subtask	Responsibility	Time Estimate (Person Months)
1. Identify deletion criteria	Systems analyst Product manager	0.75
2. Identify output information requirements	Systems analyst Network specialist Product manager	0.25

3. Identify input data requirements	Systems analyst DBA	0.50
4. Prepare new system documentation	Systems analyst	2.00
5. Design network	Network specialist	1.50
6. Design database	DBA	0.50
7. Review design	Product manager Systems analyst	0.25
8. Prepare program documentation	Programmer	1.00
9. Code program	Programmer	1.25
10. Test program	Programmer Operations staff	0.75
11. Approve program	Product manager VP of marketing	0.50
12. Prepare database	DBA	2.00
13. Educate users	Systems analyst	0.50
14. Cutover to model	Operations staff	0.75

Analysis Phase

- Steps
 1. Announce
 - Reasons for project
 - Purpose: To inform so as to counteract fear
 2. Organize project team
 - User(s)
 - Specialists
 - Define Roles

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Steps (cont.)

3. Define information needs

- **Methods**
 - Personal interview (the preferred method)
 - Observation
 - Record search (includes review of existing documentation)
 - Surveys
- a *project directory* can be maintained as an encompassing set of documentation to describe the system

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Steps (cont.)

- 4. Define system performance criteria**
- 5. Prepare design proposal (Compare to system study proposal)**
- 6. Approve or disapprove**

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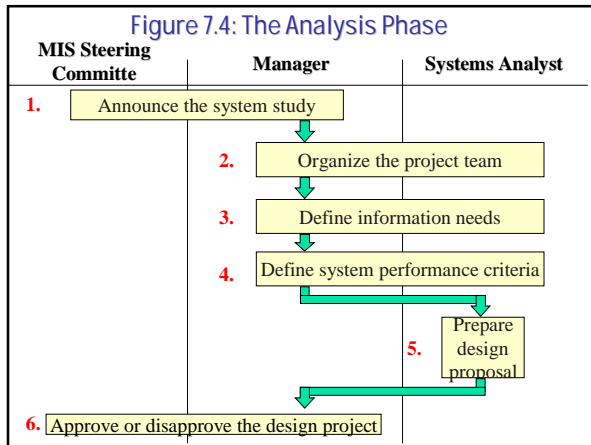


Fig 7.5: Outline of a Design Proposal

1. Executive summary
2. Introduction
3. Problem definition
4. System objectives and constraints
5. Performance criteria
6. Possible system alternatives
7. The recommended design project
 - 7.1 Tasks to be performed
 - 7.2 Human resource requirements
 - 7.3 Schedule of work
 - 7.4 Estimated cost
8. Expected impact of the system
 - 8.1 Impact on the firm's organization structure
 - 8.2 Impact on the firm's operations
 - 8.3 Impact on the firms resources
9. General development plan (analysis, design, and implementation)
10. Summary

Design Phase

- 1. Prepare detailed design**
 - Structured design (top down)
 - System level
 - Subsystem level
 - Documentation tools
- 2. Identify alternate system configurations**
 - Refine to a manageable set

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Design Phase (cont.)

- 3. Evaluate configurations**
- 4. Select best**
- 5. Prepare implementation proposal**
- 6. Approve or disapprove**

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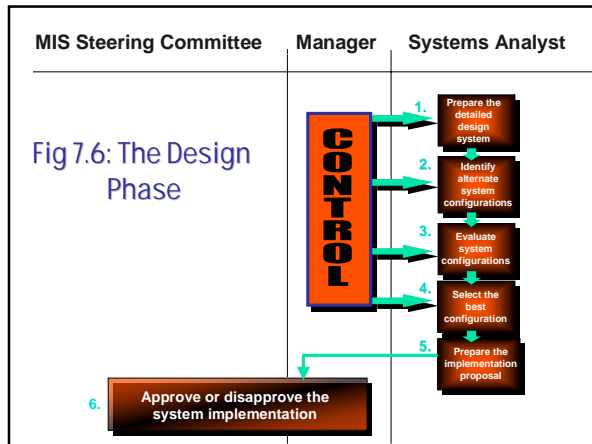


Table 8.2: Popular Documentation Tools

Data Modeling	Entity-relationship diagram Data dictionary Screen/printer layout form
Process Modeling	System flowchart Program flowchart Data flow diagram (Appendix B) Structured English
Object Modeling	Object relationship model Class specification

Outline of an Implementation Proposal

1. Executive summary
2. Introduction
3. Problem definition
4. System objectives and constraints
5. Performance criteria
6. System design
 - 6.1 Summary description
 - 6.2 Equipment configuration
7. Expected impact of the system
 - 8.1 Impact on the firm's organization structure
 - 8.2 Impact on the firm's operations
 - 8.3 Impact on the firm's resources
8. The recommended implementation project
 - 7.1 Tasks to be performed
 - 7.2 Human resource requirements
 - 7.3 Schedule of work
 - 7.4 Estimated cost
9. General implementation plan
10. Summary

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Implementation Phase

The Task:

- *Acquire and integrate the physical and conceptual resources to produce a working system*

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Steps for the Implementation Phase

1. Plan implementation
2. Announce implementation
3. Obtain hardware resources, RFP
4. Obtain software resources
5. Prepare database
6. Prepare physical facilities
7. Educate participants and users
8. Prepare cutover proposal
9. Approve or disapprove cutover proposal
10. Cutover to new system

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Fig 7.10: The Implementation Phase

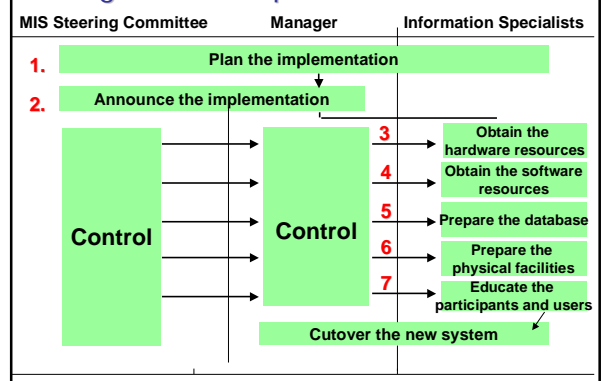
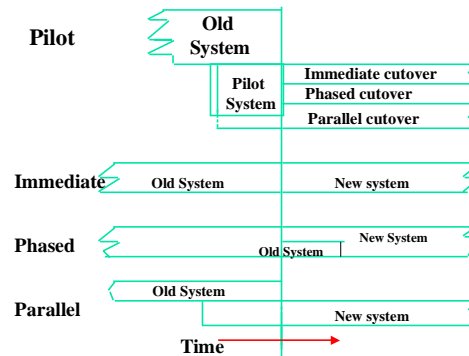


Fig 7.11: Outline of a Request for Proposal

1. Letter of transmittal
2. System objective and applicable constraints
3. System design
 - 3.1 Summary description
 - 3.2 Performance criteria
 - 3.3 Equipment configuration
 - 3.4 Summary system documentation
 - 3.5 Estimated transaction volume
 - 3.6 Estimated file size
4. Installation schedule

Fig 7.13: Cutover Approaches



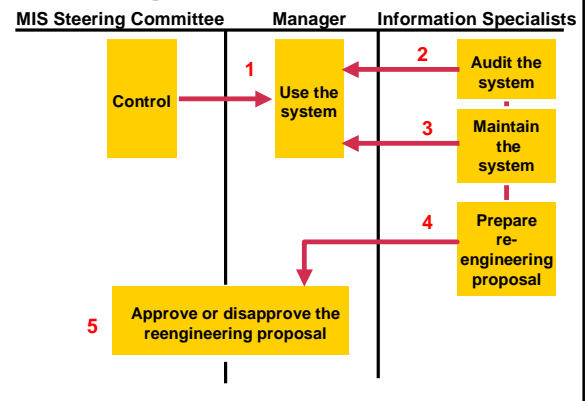
Use Phase

Activities (not steps)

1. Use
2. Audit (post implementation review)
 - By information specialist(s)
 - By internal auditor (a different one from the project team member)
3. Maintain the system
 - Correct errors
 - Keep current
 - Improve
4. Prepare reengineering proposal
5. Approve or disapprove reengineering

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Fig 7.14: The Use Phase

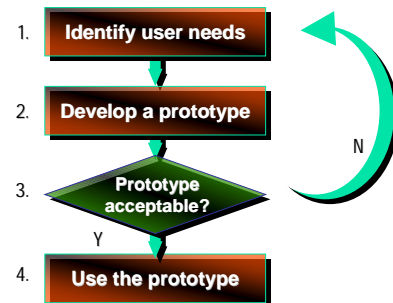


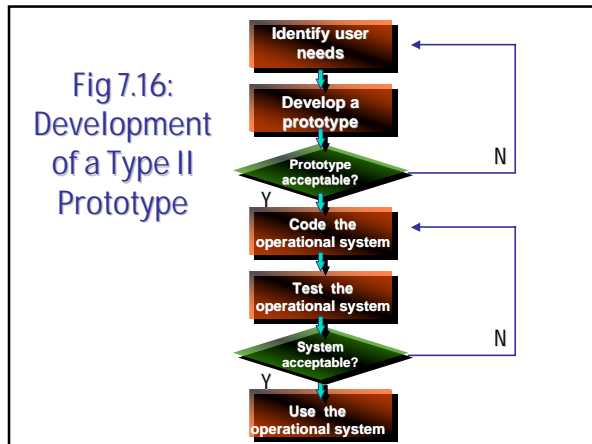
Prototyping

- Type I -- Becomes operational system
- Type II -- Serves as a blueprint. Only for testing concepts and appearance.

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Fig 7.15: Development of a Type I Prototype





The Attraction of Prototyping

- Communications between the systems analyst and user are improved.
- The analyst can do a better job of determining the user's needs.
- The user plays a more active role in system development.
- The information specialists and the user spend less time and effort in developing the system.
- Implementation is much easier because the user knows what to expect.

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Potential Pitfalls of Prototyping

- The haste to deliver the prototype may produce shortcuts in problem definition, alternative evaluation, and documentation.
- The users may get so excited about the prototype that they have unrealistic expectations of the operational system.
- Type I prototypes might not be as efficient as systems coded in a programming language.
- The computer-human interface provided by certain prototyping tools may not reflect good design techniques.

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Applications That Are Good Prospects for Prototyping

- High risk
- Considerable user interaction
- Large number of users
- A need for quick delivery
- An expected short use phase of the system
- An innovative system
- Unpredictable user behavior

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Rapid Application Development (RAD)

- RAD is application of the feed back systems approach for quick results
 - 4th generation languages
 - CASE tools (Computer Aided Software Engineering)
 - Visual Basic >> Visual C++

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Business Process Redesign (BPR)

- Often used to react to systems that can no longer function adequately in the current business environment of the firm (legacy systems fall into this category)
- Three techniques for business process redesign are
 - 1) reverse engineering
 - 2) restructuring
 - 3) reengineering

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