



# SYSTEMS ANALYSIS & DESIGN

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# Introduction

- Systems development can generally be thought of as having two major components: **Systems analysis** and **Systems design**.
- **System design** is the process of planning a new business system or one to replace or complement an existing system

# Introduction

- **System analysis** is the process of gathering and interpreting facts, diagnosing problems, and using the information to recommend improvements to the system. This is the job of the systems analyst.

# Introduction (Cont.)

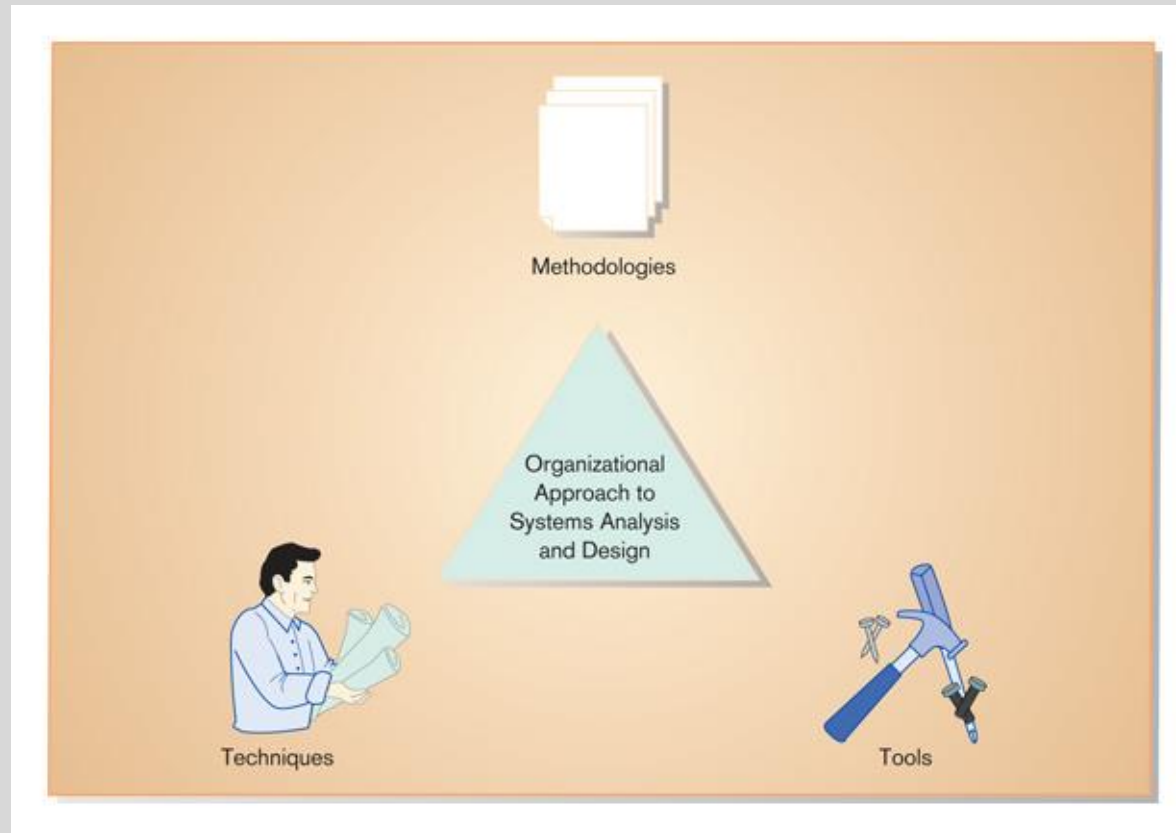


Figure 1-1 An organizational approach to systems analysis and design is driven by methodologies, techniques, and tools

# A Modern Approach to Systems Analysis and Design

- 1950s: focus on efficient automation of existing processes
- 1960s: advent of 3GL, faster and more reliable computers
- 1970s: system development becomes more like an engineering discipline

# A Modern Approach to Systems Analysis and Design (Cont.)

- 1980s: major breakthrough with 4GL, CASE tools, object oriented methods
- 1990s: focus on system integration, client/server platforms, Internet
- The new century: Web application development, wireless PDAs, component-based applications

# A Modern Approach to Systems Analysis and Design (Cont.)

- Application Software
  - Computer software designed to support organizational functions or processes.
- Systems Analyst
  - Organizational role most responsible for analysis and design of information systems.

# Types of Information Systems and Systems Development

- Transaction Processing Systems (TPS)
  - Automate handling of data about business activities (transactions)
  - Process orientation
- Management Information Systems (MIS)
  - Converts raw data from transaction processing system into meaningful form
  - Data orientation



# Types of Information Systems and Systems Development (Cont.)

- Decision Support Systems (DSS)
  - Designed to help decision makers
  - Provides interactive environment for decision making
  - Involves data warehouses, executive information systems (EIS)
  - DSS Components: Database, model base, user dialogue

# Summary of Information Systems Types

**Table 1-1** Systems Development for Different IS Types

<i>IS Type</i>	<i>IS Characteristics</i>	<i>Systems Development Methods</i>
Transaction processing system	High-volume, data capture focus; goal is efficiency of data movement and processing and interfacing different TPSs	Process orientation; concern with capturing, validating, and storing data and with moving data between each required step
Management information system	Draws on diverse yet predictable data resources to aggregate and summarize data; may involve forecasting future data from historical trends and business knowledge	Data orientation; concern with understanding relationships among data so data can be accessed and summarized in a variety of ways; builds a model of data that supports a variety of uses
Decision support system	Provides guidance in identifying problems, finding and evaluating alternative solutions, and selecting or comparing alternatives; potentially involves groups of decision makers; often involves semi-structured problems and the need to access data at different levels of detail	Data and decision logic orientations; design of user dialogue; group communication may also be key, and access to unpredictable data may be necessary; nature of systems requires iterative development and almost constant updating

# Developing Information Systems

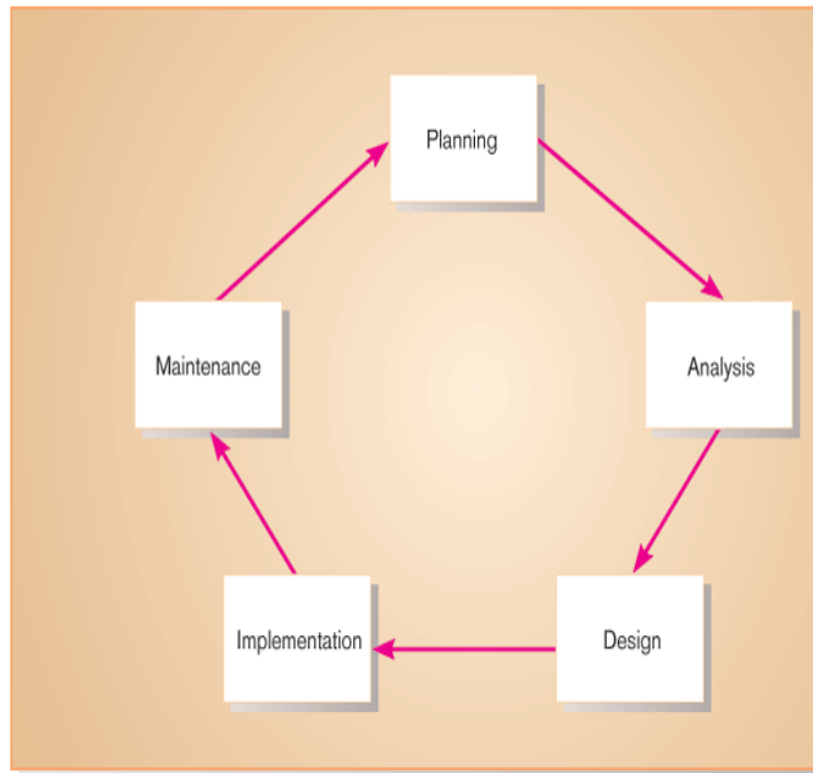
- System Development Methodology is a standard process followed in an organization to conduct all the steps necessary to analyze, design, implement, and maintain information systems.

# Systems Development Life Cycle (SDLC)

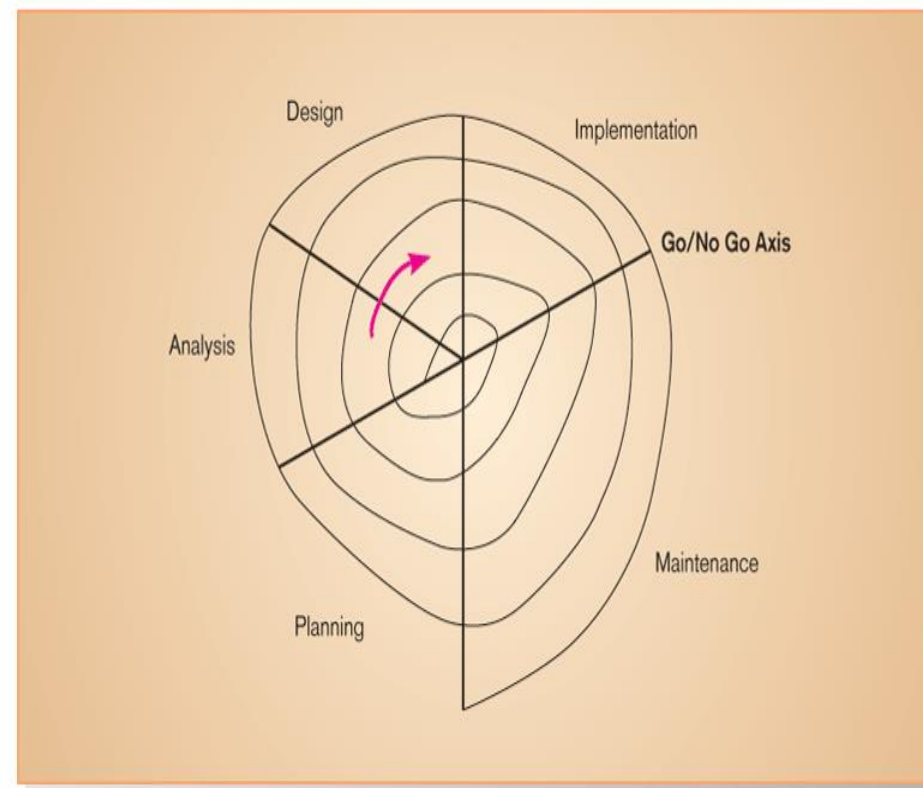
- Traditional methodology used to develop, maintain, and replace information systems.
- Phases in SDLC:
  - Planning
  - Analysis
  - Design
  - Implementation
  - Maintenance

# Standard and Evolutionary Views of SDLC

**Figure 1-3** The systems development life cycle



**Figure 1-4** Evolutionary model SDLC



# Systems Development Life Cycle (SDLC) (Cont.)

- Planning – an organization's total information system needs are identified, analyzed, prioritized, and arranged.
- Analysis – system requirements are studied and structured.

# Systems Development Life Cycle (SDLC) (Cont.)

- Design – a description of the recommended solution is converted into logical and then physical system specifications.
- Logical design – all functional features of the system chosen for development in analysis are described independently of any computer platform.

# Systems Development Life Cycle (SDLC) (Cont.)

- Physical design – the logical specifications of the system from logical design are transformed into the technology-specific details from which all programming and system construction can be accomplished.



# Systems Development Life Cycle (SDLC) (Cont.)

- Implementation – the information system is coded, tested, installed and supported in the organization.
- Maintenance – an information system is systematically repaired and improved.

**Table 1-2** Products of SDLC Phases

<i>Phase</i>	<i>Products, Outputs, or Deliverables</i>
Planning	Priorities for systems and projects; an architecture for data, networks, and selection hardware, and IS management are the result of associated systems; Detailed steps, or work plan, for project; Specification of system scope and planning and high-level system requirements or features; Assignment of team members and other resources; System justification or business case
Analysis	Description of current system and where problems or opportunities are with a general recommendation on how to fix, enhance, or replace current system; Explanation of alternative systems and justification for chosen alternative
Design	Functional, detailed specifications of all system elements (data, processes, inputs, and outputs); Technical, detailed specifications of all system elements (programs, files, network, system software, etc.); Acquisition plan for new technology
Implementation	Code, documentation, training procedures, and support capabilities
Maintenance	New versions or releases of software with associated updates to documentation, training, and support