Universitas Esa Unggul

Smart, Creative and Entrepreneurial

CCA220-Analisis dan Perancangan system Informasi

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Prodi Teknik Informatika dan Sistem Informasi - Fakultas Ilmu Komputer

Chapter 1
Assuming the Role of the Systems Analyst

Systems Analysis and Design

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Sixth Edition

Major Topics

- Information systems
- Phases of analysis and design
- System maintenance
- CASE tools
- Alternate methodologies

Information

- Information is an organizational resource, which must be managed as carefully as other resources.
- Costs are associated with information processing.
- Information processing must be managed to take full advantage of its potential.

Categories

Information systems fall into one of the following eight categories:

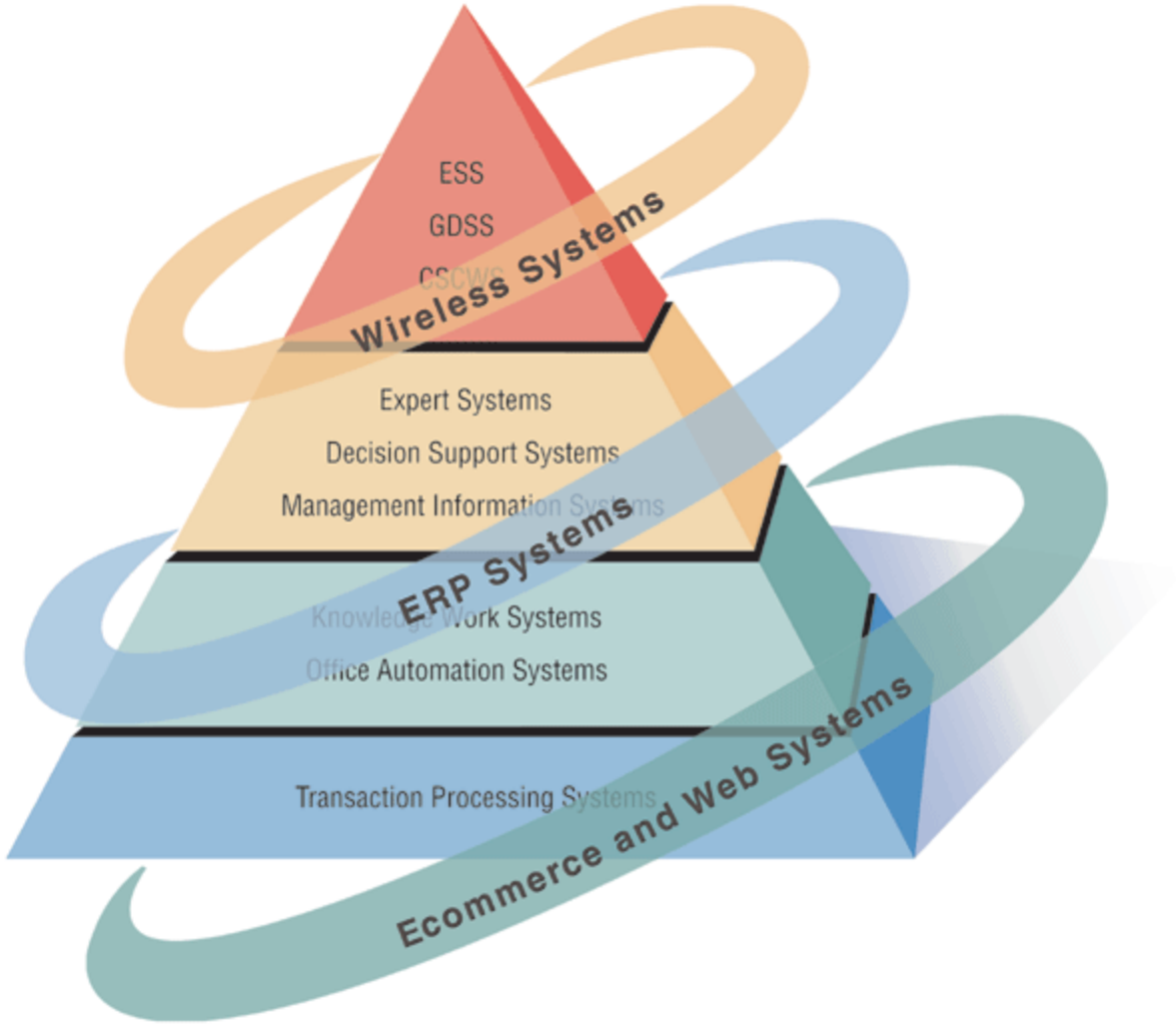
- Transaction processing systems (TPS).
- Office automation systems (OAS).
- Knowledge work systems (KWS).
- Management information systems (MIS).
- Decision support systems (DSS).
- Expert systems (ES) and Artificial Intelligence (AI).
- Group decision support systems (GDSS) and Computer-Supported Collaborative Work Systems.
- Executive support systems (EES).

New Technologies

New technologies are being integrated into traditional systems:

- Ecommerce uses the Web to perform business activities.
- Enterprise Resource Planning (ERP) has the goal of integrating many different information systems within the corporation.
- Wireless and handheld devices, including mobile commerce (mcommerce).
- Open source software.

Figure 1.2 Systems analysts need to be aware that integrating technologies affect all types of systems.



Advantages of Using the Web

- The benefits of using the Web are:
- Increasing awareness of the availability of the service, product, industry, person, or group.
- 24-hour access for users.
- Standard interface design.
- Creating a global system.

Nature of Analysis and Design

Systems analysis and design is a systematic approach to:

- Identifying problems, opportunities, and objectives.
- Analyzing the information flows in organizations.
- Designing computerized information systems to solve a problem.

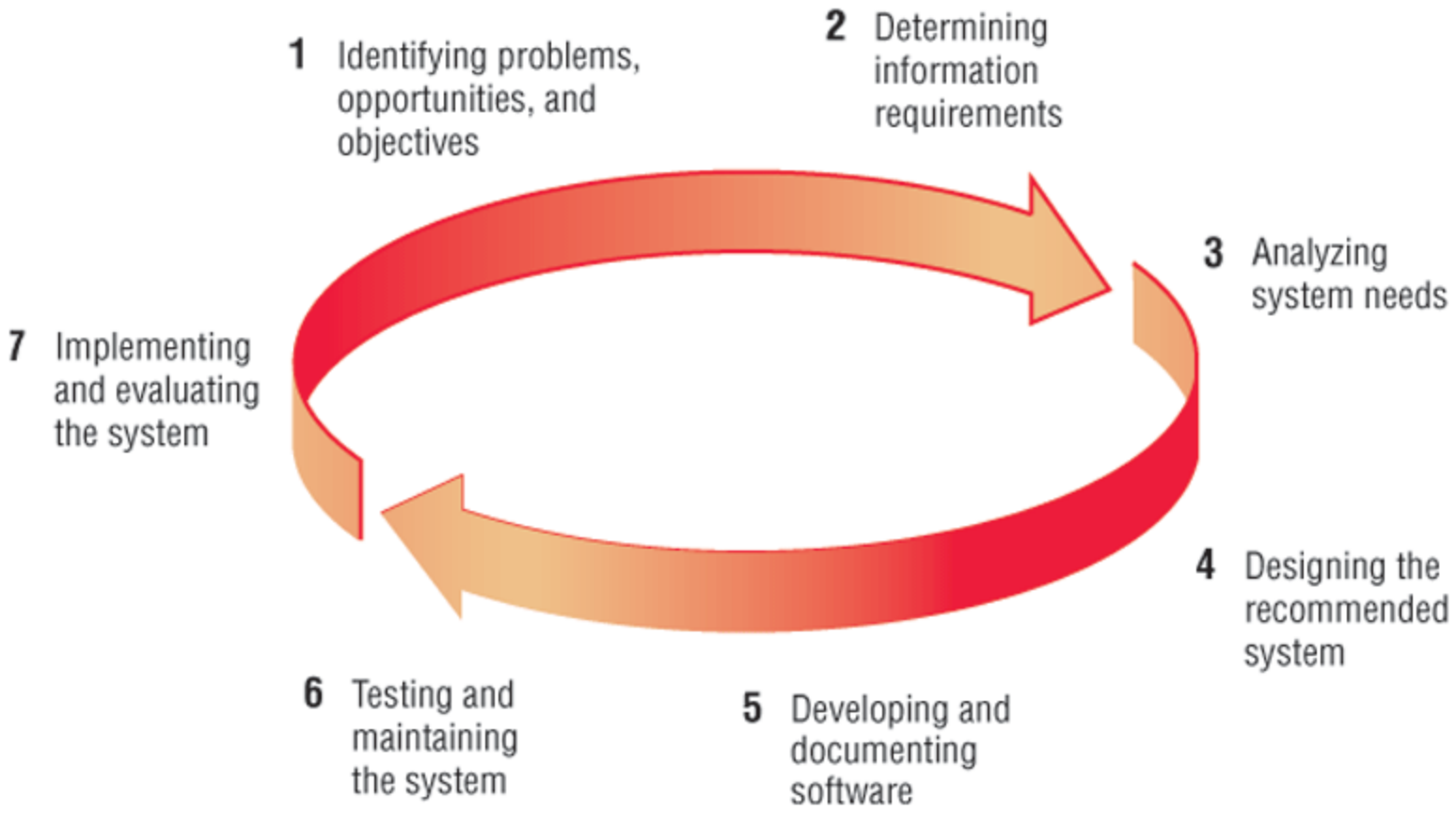
Systems Analyst

- Systems analysts act as:
  - Outside consultants to businesses.
  - Supporting experts within a business.
  - As change agents.
- Analysts are problem solvers, and require communication skills.
- Analysts must be ethical with users and customers.

Systems Development Life Cycle

- The systems development life cycle is a systematic approach to solving business problems.
- It is divided into seven phases.
- Each phase has unique activities.

Figure 1.3 The seven phases of the systems development life cycle.



Phase 1

- Identifying:
  - Problems.
  - Opportunities.
  - Objectives.
- Personnel involved:
  - Analyst.
  - User management.
  - Systems management.

Phase 2

- Determining information requirements:
  - Interview management, operations personnel.
  - Gather systems/operating documents.
  - Use questionnaires.
  - Observe the system and personnel involved.
- Learn the who, what, where, when, and how, and the why for each of these.

Phase 2 (Continued)

- Personnel involved:
  - Analyst.
  - User management.
  - User operations workers.
  - Systems management.

Phase 3

- Analyzing system needs:
  - Create data flow diagrams.
  - Document procedural logic for data flow diagram processes.
  - Complete the data dictionary.
  - Make semistructured decisions.
  - Prepare and present the system proposal.
  - Recommend the optimal solution to management.

Phase 3 (Continued)

- Personnel involved:
  - Analyst.
  - User management.
  - Systems management.

Phase 4

- Designing the recommended system:
  - Design the user interface.
    - Design output.
    - Design input.
  - Design system controls.
  - Design files and/or database.
  - Produce program specifications.
  - Produce decision trees or tables.

Phase 4 (Continued)

- Personnel involved:
  - Analyst.
  - System designer.
  - User management.
  - User operations workers.
  - Systems management.

Phase 5

- Developing and documenting software:
  - Design computer programs using structure charts, Nassi-Schneiderman charts, and pseudocode.
  - Walkthrough program design.
  - Write computer programs.
  - Document software with help files, procedure manuals, and Web sites with Frequently Asked Questions.

Phase 5 (Continued)

- Personnel involved:
  - Analyst.
  - System designer.
  - Programmers.
  - Systems management.

Phase 6

- Testing and maintaining the system:
  - Test and debug computer programs.
  - Test the computer system.
  - Enhance system.

Phase 6 (Continued)

- Personnel involved:
  - Analyst.
  - System designer.
  - Programmers.
  - Systems management.

Phase 7

- Implementing and evaluating the system:
  - Plan conversion.
  - Train users.
  - Purchase and install new equipment.
  - Convert files.
  - Install system.
  - Review and evaluate system.

Phase 7 (Continued)

- Personnel involved:
  - Analyst.
  - System designer.
  - Programmers.
  - User management.
  - User operations workers.
  - Systems management.

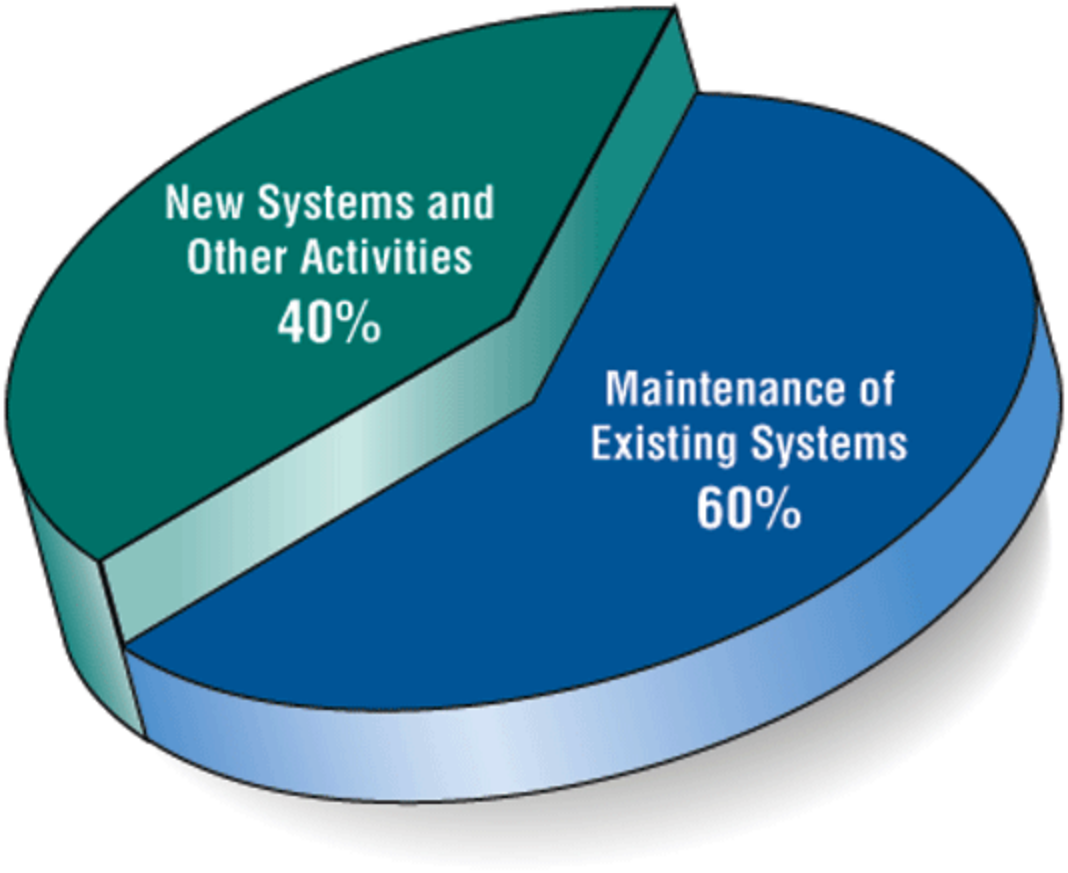
Rapid Application Development

Rapid Application development (RAD) is an object-oriented approach to systems development.

System Maintenance

- System maintenance is:
  - Removing undetected errors, and
  - Enhancing existing software.
- Time spent on maintenance typically ranges from 48-60 percent of total time.

Figure 1.4 Some researchers estimate that the amount of time spent on system maintenance may be as much as 60 percent of the total time spent on systems projects.

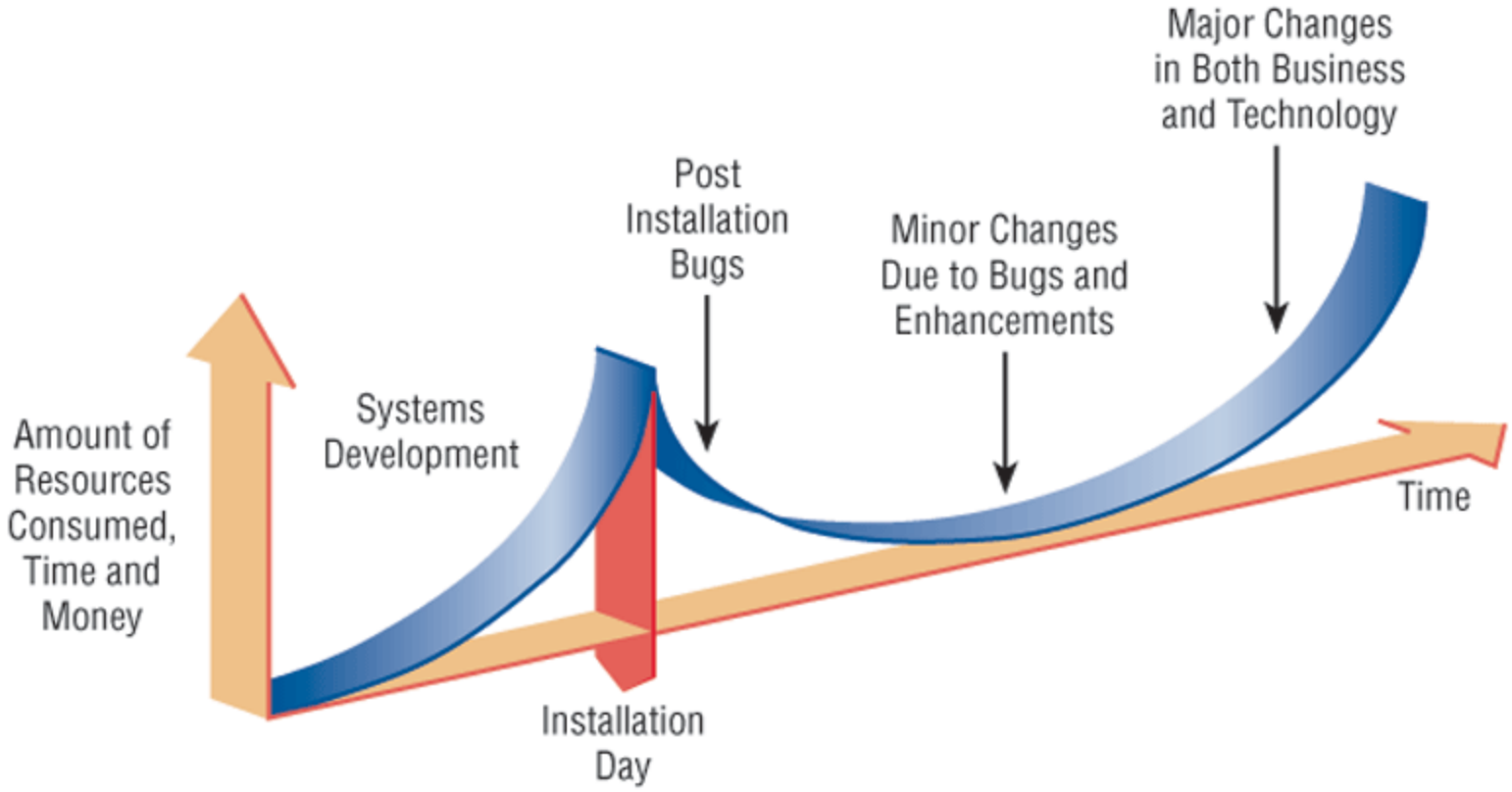


System Enhancements

Systems are enhanced for the following reasons:

- Adding additional features to the system.
- Business and governmental requirements change over time.
- Technology, hardware, and software are rapidly changing.

Figure 1.5 Resource consumption over the system life.



CASE Tools

- CASE tools are automated, microcomputer-based software packages for systems analysis and design.
- Four reasons for using CASE tools are:
  - To increase analyst productivity.
  - Facilitate communication among analysts and users.
  - Providing continuity between life cycle phases.
  - To assess the impact of maintenance.

CASE Tool Categories

CASE tools may be divided into several categories

- Upper CASE (also called front-end CASE) tools, used to perform analysis and design.
- Lower CASE (also called back-end CASE). These tools generate computer language source code from CASE design.
- Integrated CASE, performing both upper and lower CASE functions.

Upper CASE

Upper CASE tools:

- Create and modify the system design.
- Store data in a project repository.
- The repository is a collection of records, elements, diagrams, screens, reports, and other project information.
- These CASE tools model organizational requirements and define system boundaries.

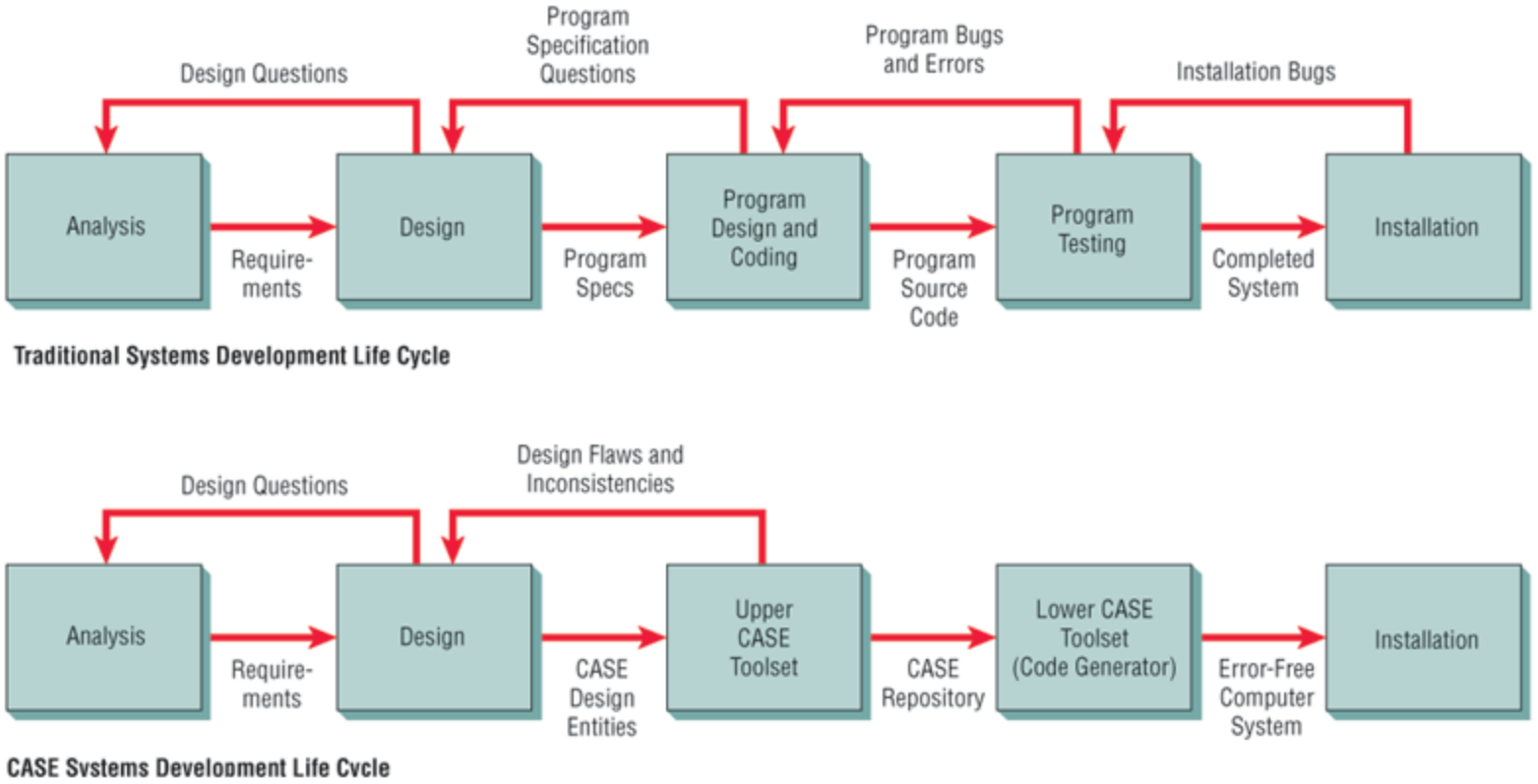
Lower CASE

- Lower CASE tools generate computer source code from the CASE design.
- Source code may usually be generated in several languages.

Advantages of Generating Code

- Time to develop new systems decreases.
- The time to maintain generated code is less than to maintain traditional systems.
- Computer programs may be generated in more than one language.
- CASE design may be purchased from third-party vendors and tailored to organizational needs.
- Generated code is free from program coding errors.

Figure 1.7 Traditional versus CASE systems development life cycles.



Reverse Engineering

- Reverse engineering is generating the CASE design from computer program code.
- Source code is examined, analyzed, and converted into repository entities.

Reverse Engineering (Continued)

- Reverse engineering produces (depending on the tool set used):
  - Data structures and elements, describing the files, records, and field.
  - Screen designs, if the program is online.
  - Report layouts for batch programs.
  - A structure chart showing the hierarchy of the modules in the program.
  - Database design and relationships.

Advantages of Reverse Engineering

Reverse Engineering has the following advantages:

- Reduced system maintenance time.
- Program documentation is produced for loosely documented programs.
- Structured programs may be generated from unstructured, older programs.
- Future system maintenance is easier to implement.
- Unused portions of programs may be eliminated.

Object-Oriented Analysis and Design

- Object-oriented (O-O) analysis and design is used to build object-oriented programs.
- O-O programming examines the objects of a system.
- Objects are grouped into classes for optimal reuse and maintainability.

The Unified Modeling Language

- The Unified Modeling Language (UML) is an industry standard for modeling object-oriented systems.
- It breaks down a system into a use case model.

Extreme Programming (XP)

- Extreme programming takes good software development practices and pushes them to the limit.
- It is based on:
  - Values.
  - Principles.
  - Core practices.

Extreme Programming (XP) (Continued)

- Extreme programming values are:
  - Communication.
  - Simplicity.
  - Feedback.
  - Courage.

Alternate Methodologies

- Alternate methodologies are available for analyzing systems.
- These include:
  - Prototyping.
  - ETHICS.
  - Project Champions.
  - Soft Systems Methodology.
  - Multi-view.