System Analysis & Design

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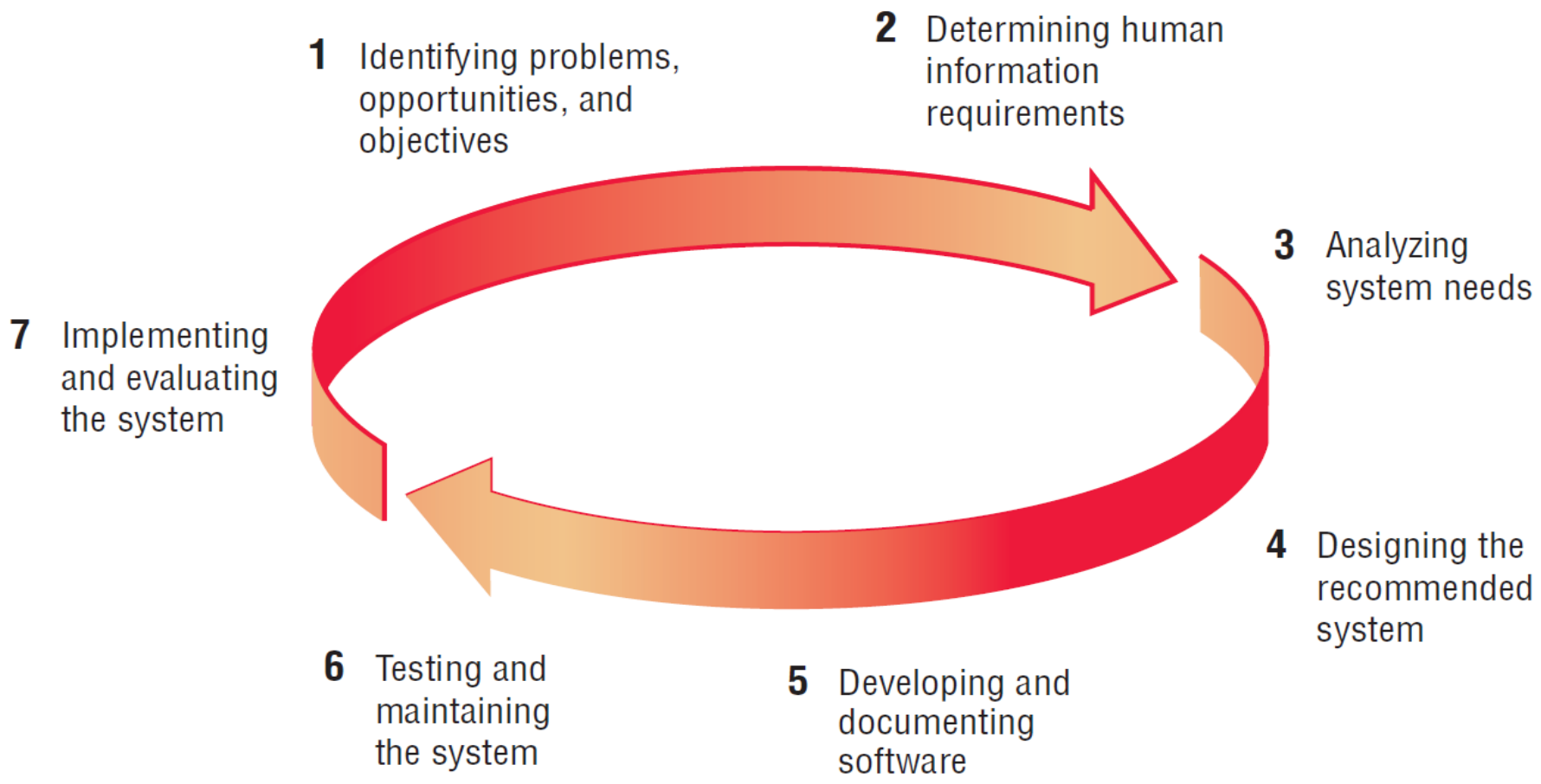
Content

- the Systems Development Life Cycle

The Seven Phases of the Systems Development Life Cycle



Identifying Problems, Opportunities, and Objectives

- **Critical** to the success of the rest of the project, because no one wants to waste time addressing the **wrong problem**.
- **Problems:** generally the **reason** the analyst was called in the first place.
- **Opportunities**: situations that the **analyst** believes can be **improved** through the use of **computerized** information systems.
- **Objectives**: how can the business reach its **objectives** by addressing **specific problems** or opportunities.

Identifying Problems, Opportunities, and Objectives

Activity:

- **Interviewing** user management
- **Summarizing** the knowledge obtained
- **Estimating** the scope of the project
- **Documenting** the results

Output:

- Feasibility report containing **problem definition** and **objective summaries** from which management can make a **decision** on whether to proceed with the proposed project.

Determining Human Information Requirements

- Determining human needs of the users involved.

- Trying to understand what information users need to perform their jobs.
  - Who: the people who are involved
  - What: the business activity
  - Where: the environment in which the work takes place
  - When: the timing
  - How: how the current procedures are performed
  - Why: why the system uses the current system

Determining Human Information Requirements

- **Activity:**
  - Interviewing
  - Sampling and investing hard data
  - Questionnaires
  - Observe the decision maker's behavior and environment
  - Prototyping
  - Learn the who, what, where, when, how, and why of the current system

Determining Human Information Requirements

- **Output:**
  - The analyst understands how users achieve their work when interacting with a computer
  - Begin to know how to make the new system more useful and usable.
  - Know the business functions.
  - Have complete information on the:
    - People
    - Goals
    - Data
    - Procedure involved

Analyzing System Needs

Activity:

- Create data flow, entity relationship Diagram ERD
- Complete the data dictionary
- Analyze the structured decisions made
- Prepare and present the system proposal

Output:

- Recommendation on what, if anything, should be done

Analyzing System Needs

- **Data flow diagrams**: chart the input, processes, and output of the business's functions in a structured graphical form.
- **Data dictionary:** lists all the **data items** used in the system, as well as their **specifications**.
- **Structured decisions made:** those for which the **conditions**, condition **alternatives**, **actions**, and **action rules** can be determined.
- There are **three major methods** for analysis of structure decision :
  - Structures English
  - Decision tables
  - Decision trees

Analyzing System Needs

- **System proposal**: summarizes what has been found
  - About users
  - Usability and usefulness of current system
  - Provides cost/benefit analysis of alternatives
  - Makes recommendations on what (if anything) should be done

- **The recommendation** or solution is **based on** the analysts individual **qualities** and professional training and their interaction with users.

Designing the Recommended System

- Uses the information collected earlier to complete the logical design of the information system:
  - Designs procedures for users to help them accurately enter data
  - Provides for users to complete effective input to the information system
  - Creates the human-computer interface
  - Designs files or databases that will store the data needed by decision makers
  - Designs output (onscreen or printed)
  - Designs controls and backup procedures

Designing the Recommended System

- **Activity:**
  - Design procedures for data entry
  - Design the human-computer interface
  - Design system controls
  - Design database and/or files
  - Design backup procedures
- **Output**
  - Model of the actual system

Developing and Documenting Software

- The analyst uses structure charts and pseudocode to communicate to the programmer what needs to be programmed.
- Documentation includes:
  - Procedure manuals
  - Online help
  - Websites
  - “Read Me” files
- Because users are involved from the beginning, the documentation should address the questions they have raised and solved jointly with the analyst.

Developing and Documenting Software

- **Activity:**
  - System analyst works with programmers to develop any original software
  - Works with users to develop effective documentation.
  - Programmers design, code, and remove syntactical errors from computer programs
  - Document software with help files, procedure manuals, and Web sites with Frequently Asked Questions (FAQ)
- **Output:**
  - Computer programs
  - System documentation

Testing and Maintaining the System

- Testing should take place first with sample data and then with actual data.
- Testing is done by both the programmers and the analyst.
- The maintenance started here is carried out routinely through the life of the system.
  - updates may be performed via a seller site on the Web.

Testing and Maintaining the System

Activity:

- Test the information system
- System maintenance
- Maintenance documentation

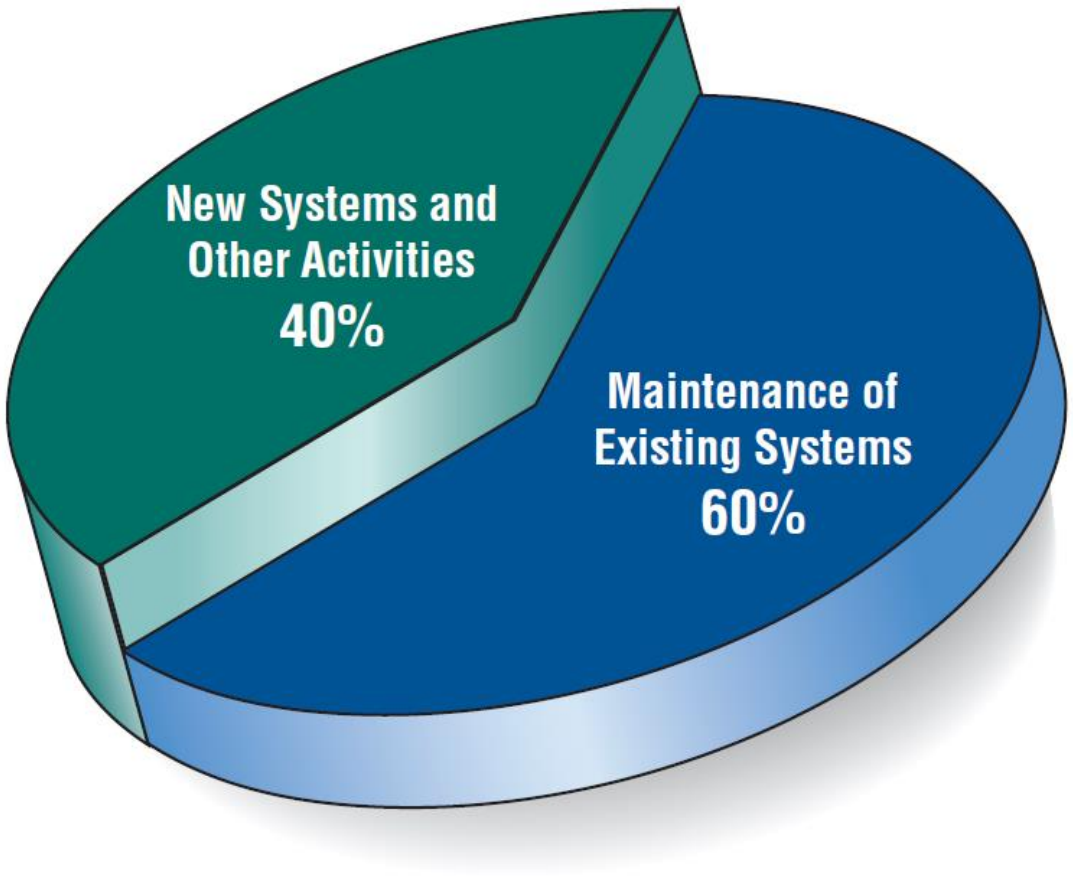
Output:

- Problems, if any
- Updated programs
- Documentation

Implementing and Evaluating the System

- **Training** users to handle the system.
- **System transformation: converting** files from old **formats** to new ones, or building a database, installing equipment, and bringing the new system into production.
- Actual **evaluation** takes place during every phase.
- **Activity:**
  - Train users
  - Analyst plans smooth conversion from old system to new system
  - Review and evaluate system
- **Output:**
  - Trained personnel
  - Installed system

Some Researchers Estimate that the Amount of Time Spent on Systems Maintenance May Be as Much as 60 Percent of the Total Time Spent on Systems Projects



The Impact of Maintenance

- Maintenance is performed for two reasons:
  - Removing software errors.
  - Enhancing existing software.
- Over time the cost of continued maintenance will be greater than that of creating an entirely new system. At that point it becomes more feasible to perform a new systems study.
- Computer programs must be modified and kept up to date.
- Reasons for enhancing existing software:
  - Users request additional features
  - Business changes over time
  - Hardware and software change

Thanks

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