

SYSTEMS, ROLES, AND DEVELOPMENT METHODOLOGIES

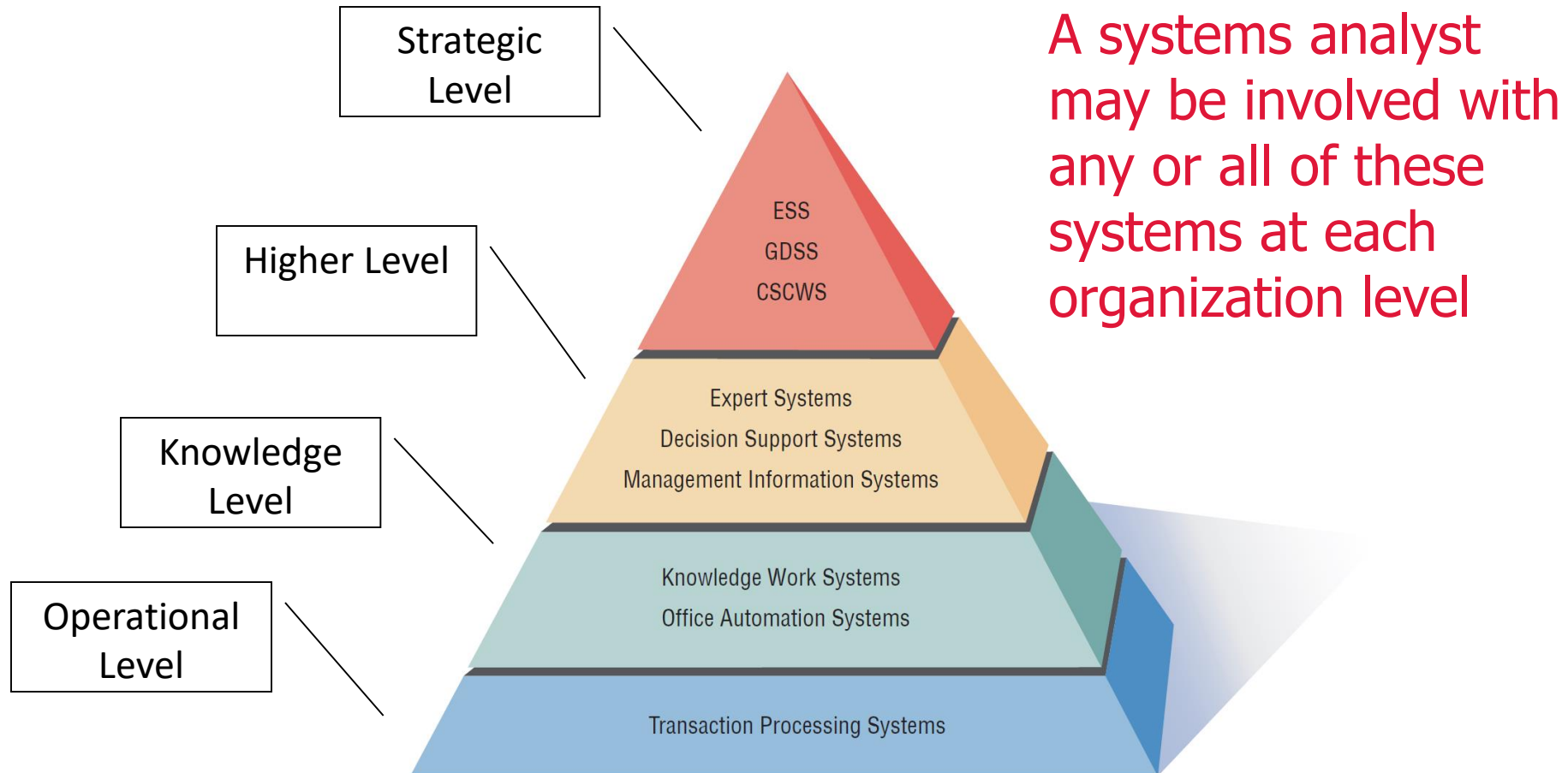
Lecture 01

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Systems Analysts Recommend, Design, and Maintain Many Types of Systems for Users.

- Transaction Processing Systems (TPS)
- Office Automation Systems (OAS)
- Knowledge Work Systems (KWS)
- Management Information Systems (MIS)
- Decision Support Systems (DSS)
- Expert Systems (ES)
- Executive Support Systems (ESS)
- Group Decision Support Systems (GDSS)
- Computer-Supported Collaborative Work Systems (CSCWS)

A systems analyst may be involved with any or all of these systems.



Operational Level

- ▶ Transaction Processing System (TPS)
 - ▶ Process large amounts of data for routine business transactions
 - ▶ Boundary-spanning
 - ▶ Support the day-to-day operations of the company
 - ▶ Examples: Payroll Processing, Inventory Management

Knowledge Level

▶ Office Automation System (OAS)

- ▶ Supports data workers who share information, but do not usually create new knowledge
- ▶ Examples: Word processing, Spreadsheets, Desktop publishing, Electronic scheduling, Communication through voice mail, Email, Video conferencing

▶ Knowledge Work System (KWS)

- ▶ Supports professional workers such as scientists, engineers, and doctors
- ▶ Examples: computer-aided design systems, virtual reality systems, investment workstations

Higher Level

- ▶ **Management Information System (MIS)**
 - ▶ Support a broad spectrum of organizational tasks including decision analysis and decision making
 - ▶ Examples: profit margin by sales region, expenses vs. budgets
- ▶ **Decision Support System (DSS)**
 - ▶ Aids decision makers in the making of decisions
 - ▶ Examples: financial planning with what-if analysis, budgeting with modeling
- ▶ **Expert System (ES)**
 - ▶ Captures and uses the knowledge of an expert for solving a particular problem which leads to a conclusion or recommendation
 - ▶ Examples: MYCIN, XCON

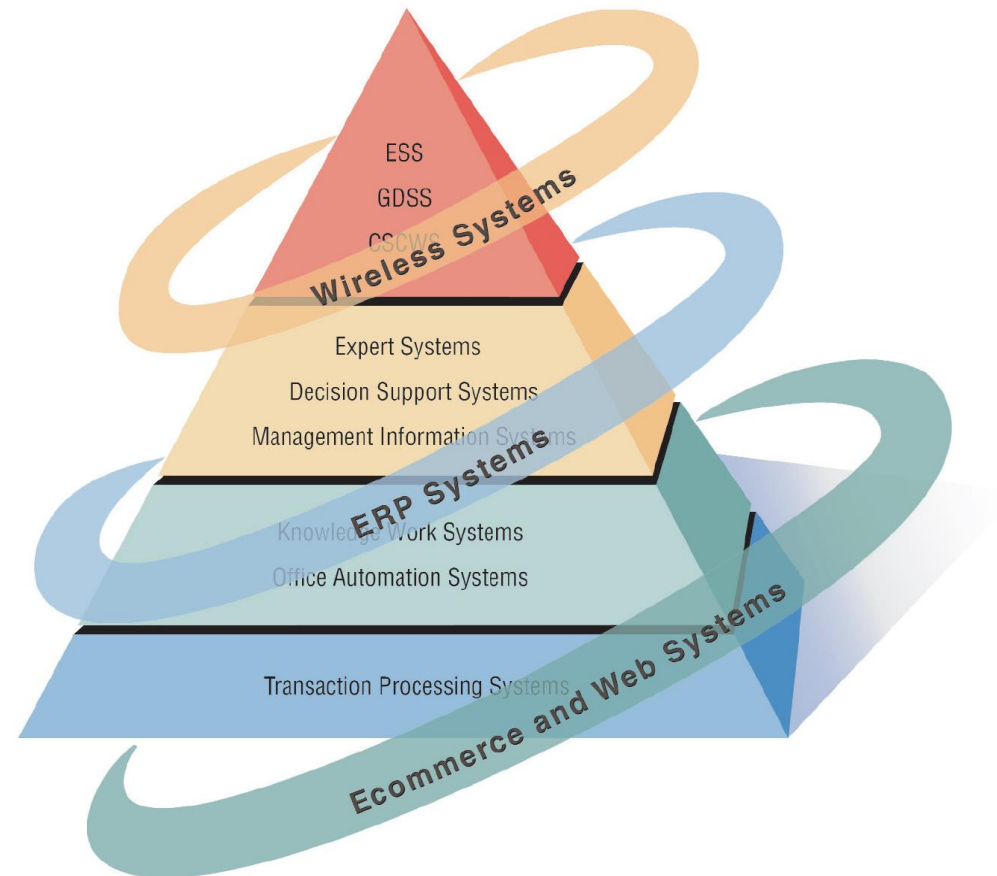
Strategic Level

- ▶ Executive Support System (ESS)
 - ▶ Helps executives to make unstructured strategic decisions in an informed way
 - ▶ Examples: drill-down analysis, status access
- ▶ Group Decision Support System (GDSS)
 - ▶ Permit group members to interact with electronic support
 - ▶ Examples: email, Lotus Notes
- ▶ Computer-Supported Collaborative Work System (CSCWS)
 - ▶ CSCWS is a more general term of GDSS
 - ▶ May include software support called “*groupware*” for team collaboration via network computers
 - ▶ Example: video conferencing, Web survey system

Integrating New Technologies into Traditional Systems

- ▶ Ecommerce and Web Systems
- ▶ Enterprise Resource Planning Systems
- ▶ Wireless Systems
- ▶ Open Source Software
- ▶ Need for Systems Analysis and Design

Systems analysts need to be aware that integrating technologies affects all types of systems



Ecommerce and Web Systems

▶ Benefits

- ▶ Increasing user awareness of the availability of a service, product, industry, person, or group
- ▶ The possibility of 24-hour access for users
- ▶ Improving the usefulness and usability of interface design
- ▶ Creating a system that can extend globally rather than remain local, thus reaching people in remote locations without worry of the time zone in which they are located

Enterprise Resource Planning Systems (ERP)

- ▶ Performs integration of many information systems existing on different management levels and within different functions
- ▶ Example: SAP, Oracle

Wireless Systems

- ▶ System analyst may be asked to design standard or wireless communication networks that integrate voice, video and email into organizational intranets or industry extranets
- ▶ System analyst may also be asked to develop intelligent agents
- ▶ Example: Microsoft's new software based on Bayesian statistics
- ▶ Wireless communication is referred as m-commerce (mobile commerce)

Open Source Software

- ▶ An alternative of traditional software development where proprietary code is hidden from the users
- ▶ Open source software is free to distribute, share and modify
- ▶ Characterized as a philosophy rather than simply the process of creating new software
- ▶ Example: Linux Operating System, Apache Web Server, Mozilla Firefox Web browser

Roles of the Systems Analyst

- ▶ The analyst must be able to work with people of all descriptions and be experienced in working with computers
- ▶ Three primary roles:
 - ▶ Consultant
 - ▶ Supporting Expert
 - ▶ Agent of change

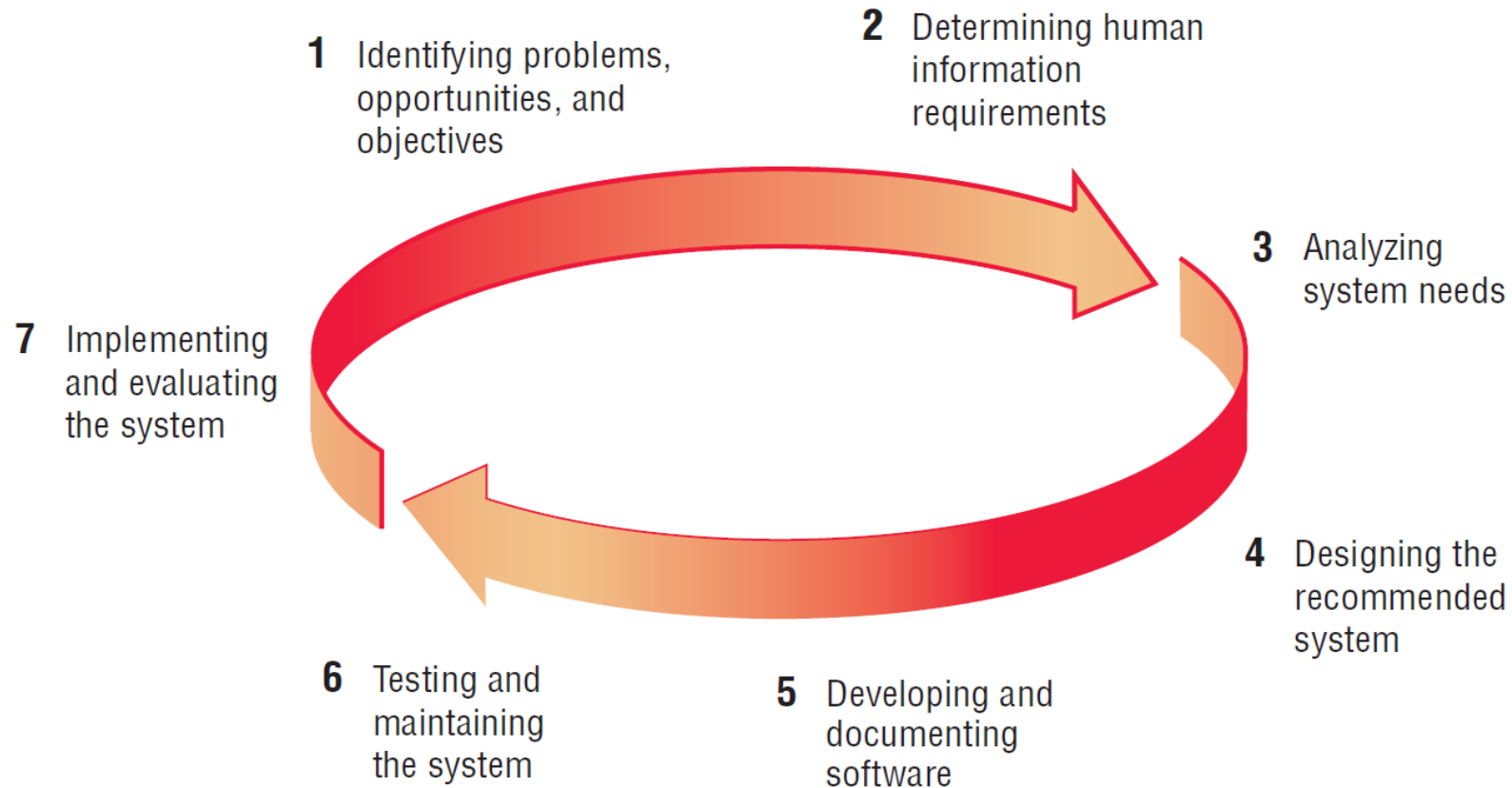
Qualities of the Systems Analyst

- ▶ Problem solver
- ▶ Communicator
- ▶ Strong personal and professional ethics
- ▶ Self-disciplined and self-motivated

Systems Development Life Cycle (SDLC)

- ▶ The systems development life cycle is a phased approach to solving business problems
- ▶ Developed through the use of a specific cycle of analyst and user activities
- ▶ Each phase has unique user activities

The seven phases of the systems development life cycle



Incorporating Human-Computer Interaction (HCI) Considerations

- ▶ The demand for analysts who are capable of incorporating HCI into the systems development process keeps increasing, as companies begin to realize that the quality of systems and the quality of work life can be improved by taking a human-centered approach at the outset of a project

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

▶ Activity:

- ▶ Interviewing
- ▶ Sampling and investigating 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

▶ Output:

- ▶ Analyst understands how users accomplish their work when interacting with a computer; and begin to know how to make the new system more useful and usable. The analyst should also know the business functions and have complete information on the people, goals, data and procedure involved

Analyzing System Needs

▶ Activity:

- ▶ Create data flow diagrams
- ▶ Complete the data dictionary
- ▶ Analyze the structured decisions made
- ▶ Prepare and present the system proposal

▶ Output:

- ▶ Recommendation on what, if anything, should be done

Designing the Recommended System

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

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

▶ Output:

- ▶ Computer programs
- ▶ System documentation

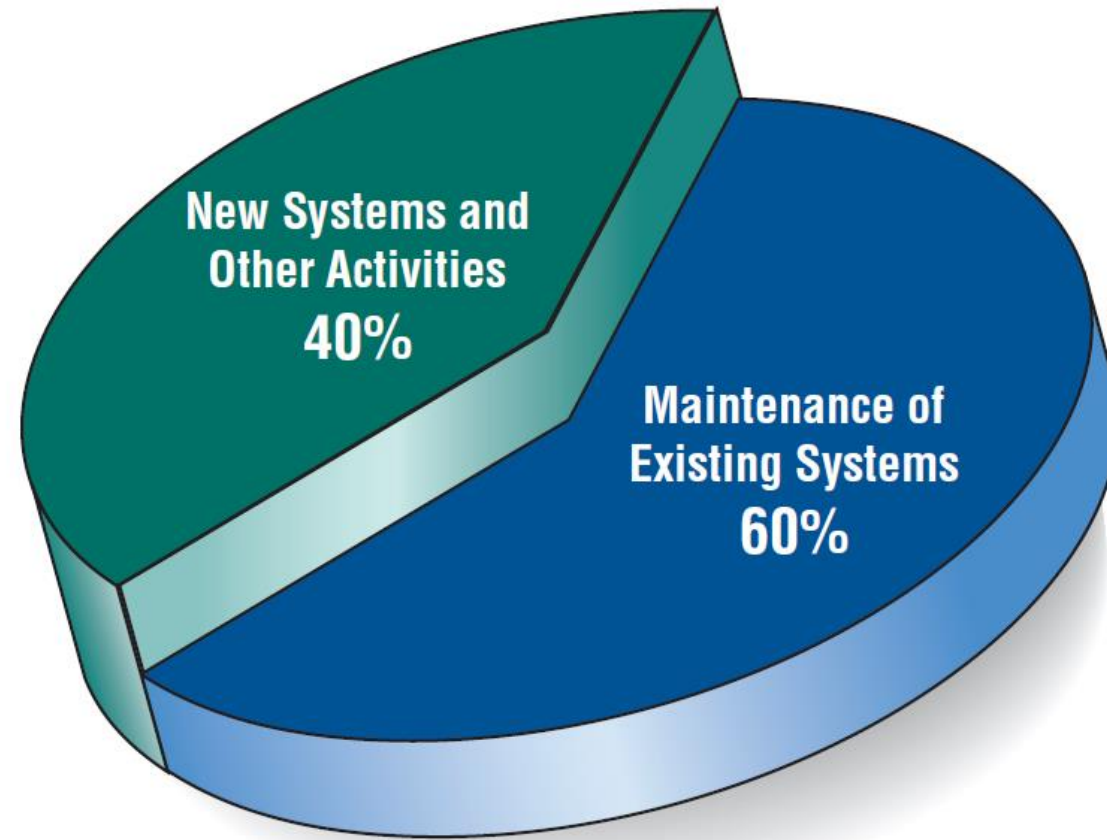
Testing and Maintaining the System

- ▶ Activity:
 - ▶ Test the information system
 - ▶ System maintenance
 - ▶ Maintenance documentation
- ▶ Output:
 - ▶ Problems, if any
 - ▶ Updated programs
 - ▶ Documentation

Implementing and Evaluating the System

- ▶ Activity:
 - ▶ Train users
 - ▶ Analyst plans smooth conversion from old system to new system
 - ▶ Review and evaluate system
- ▶ Output:
 - ▶ Trained personnel
 - ▶ Installed system

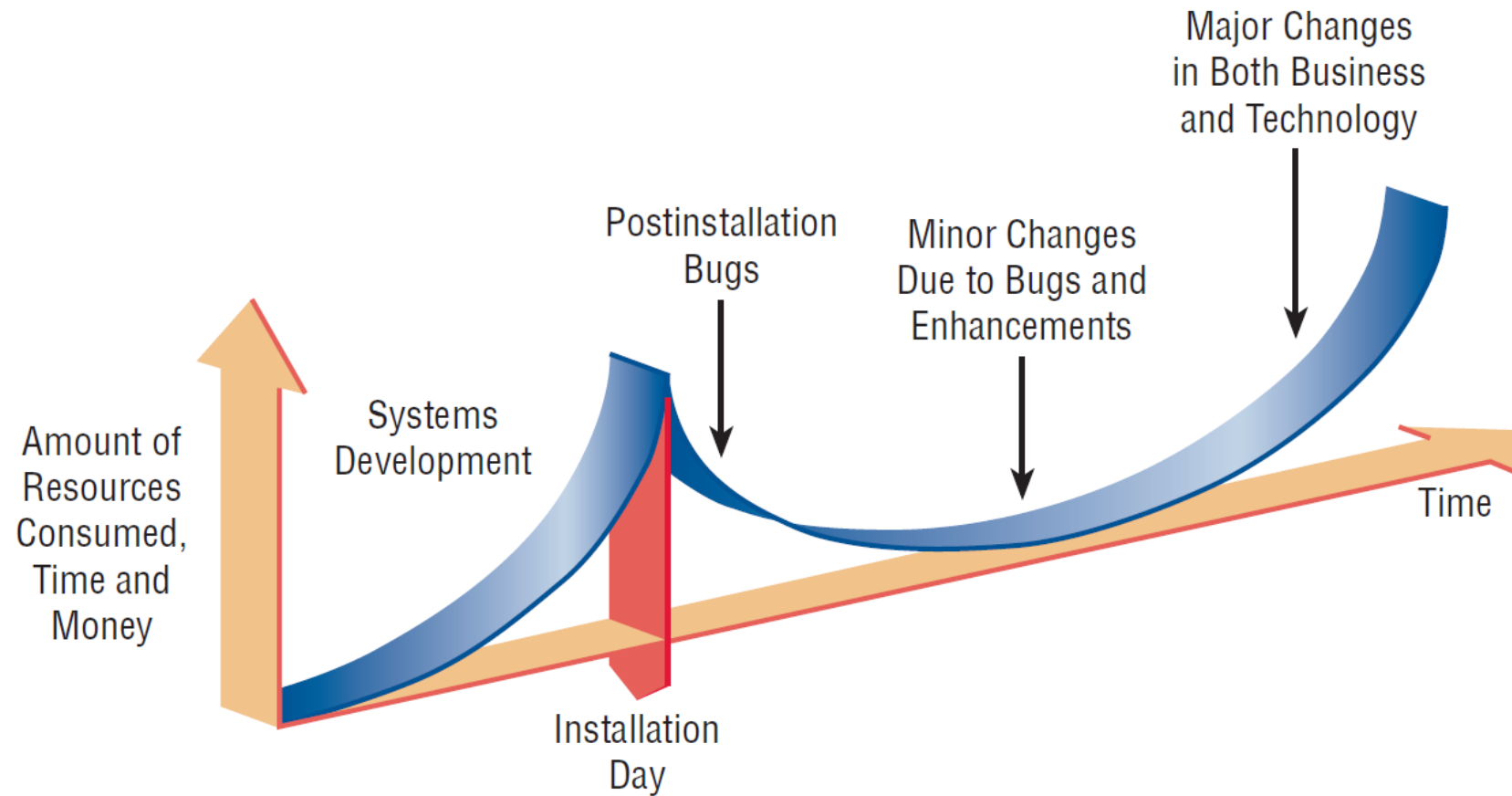
Some researchers estimate that the amount of time spent on systems maintenance may be as much as 60 percent of the total time spent on systems projects



The Impact of Maintenance

- ▶ Maintenance is performed for two reasons
 - ▶ Removing software errors, and
 - ▶ 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

Resource consumption over the system life



Approaches to Structured Analysis and Design and to the Systems Development Life Cycle

- ▶ Traditional systems development life cycle
- ▶ CASE systems development life cycle
- ▶ Object-Oriented Systems Analysis and Design