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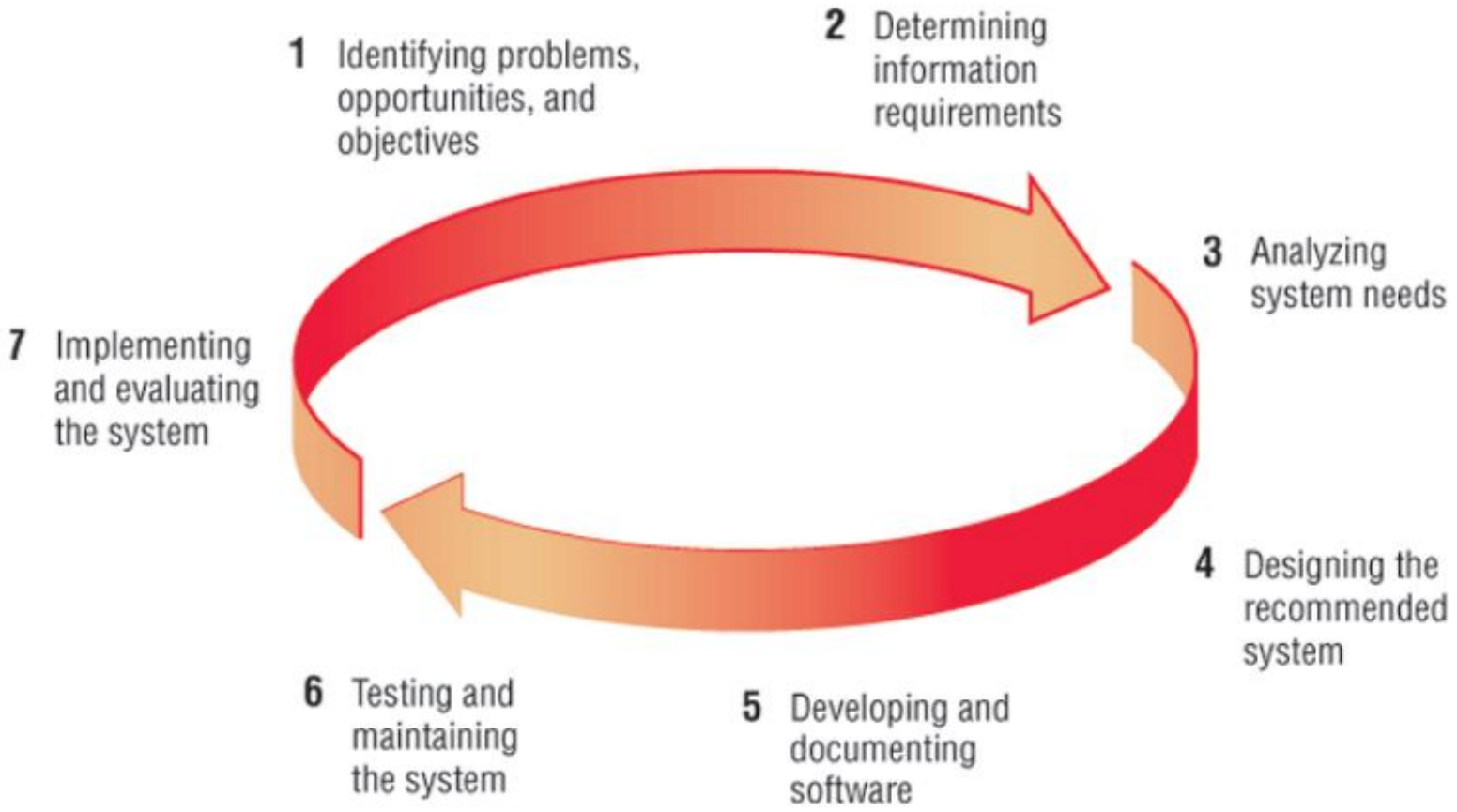
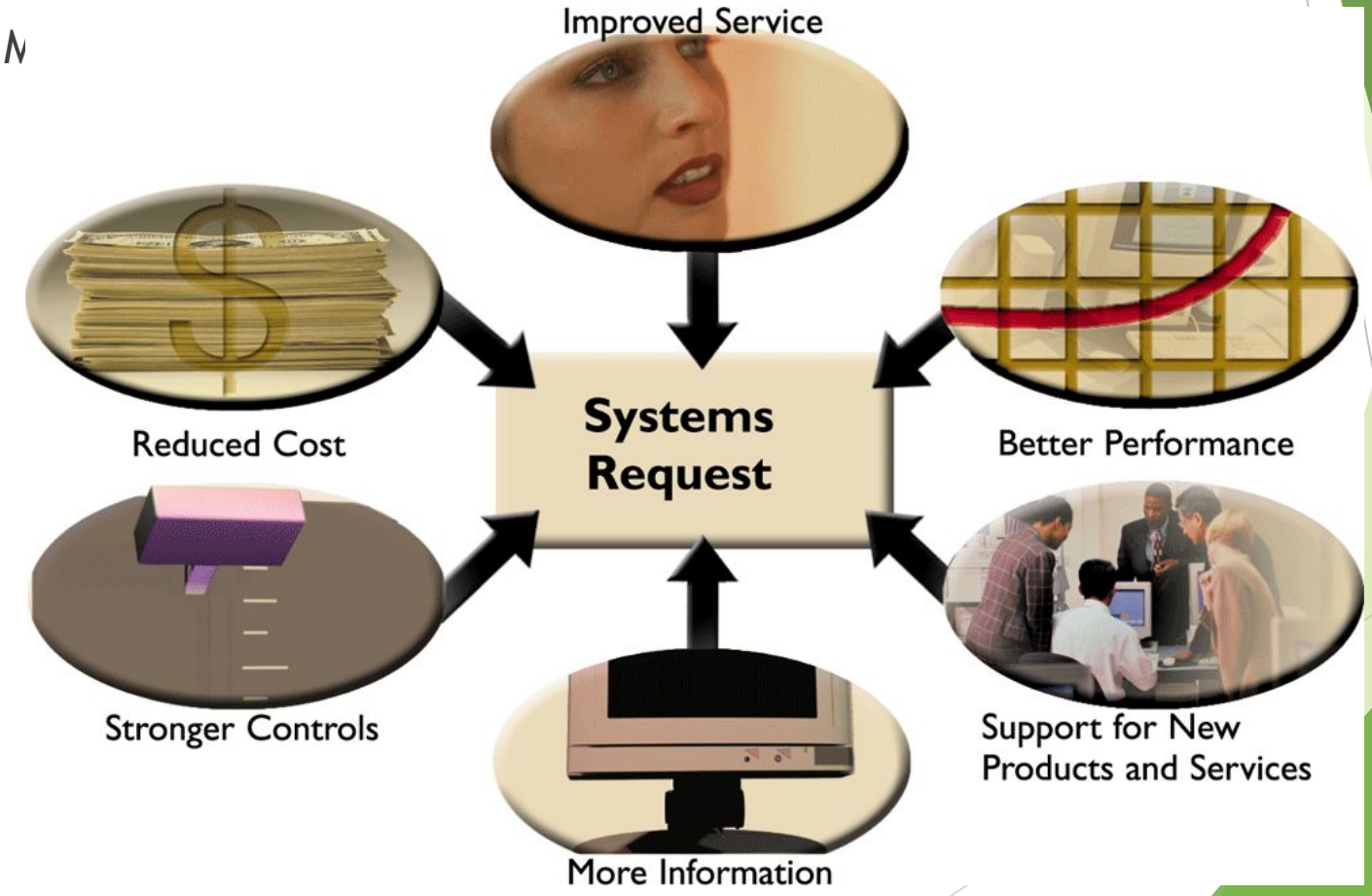
Figure 1.3 The seven phases of the systems development life cycle.

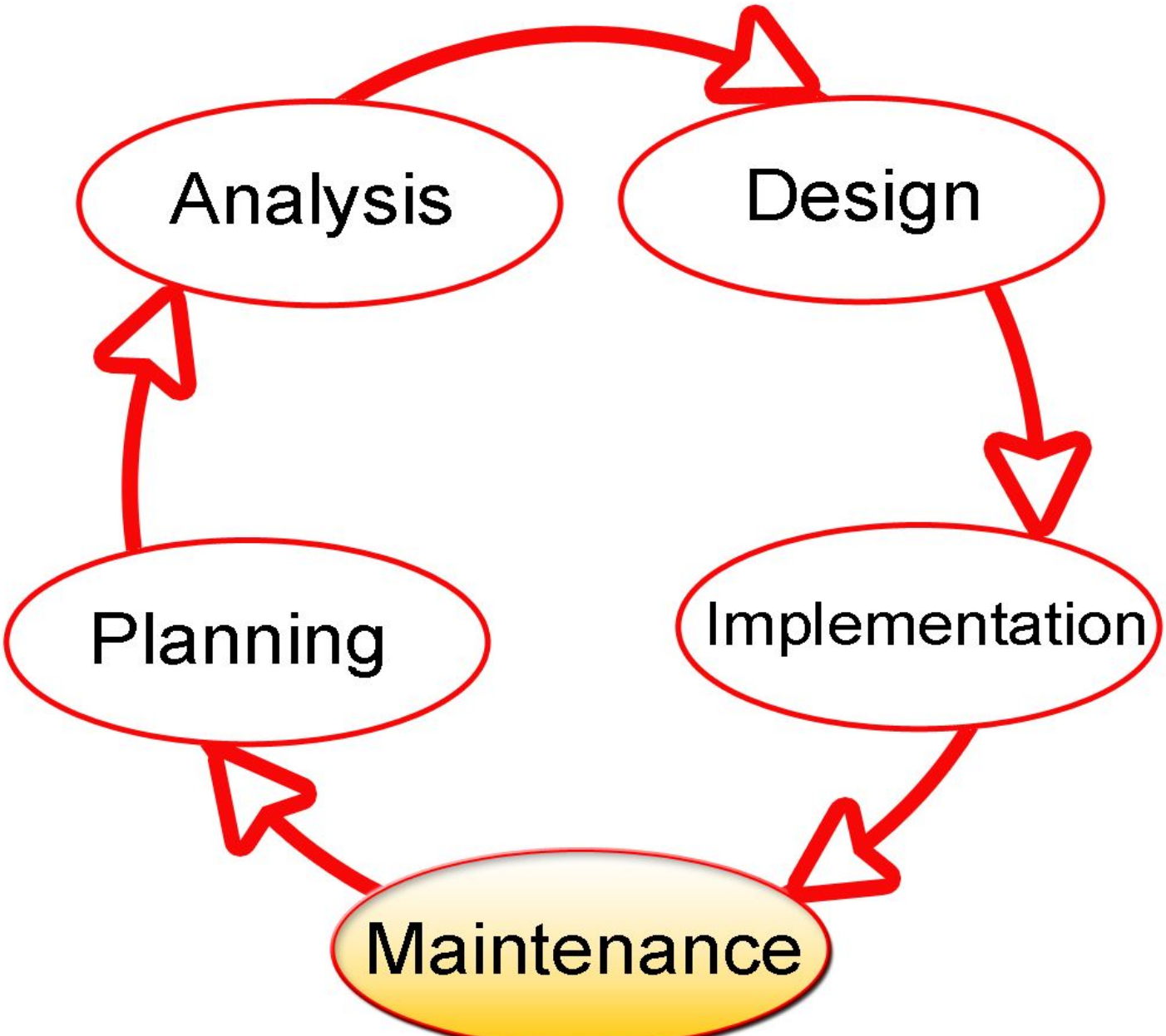


Information Systems Projects

- N



Information Systems Projects


Analysis
Design
Implementation
Maintenance
Planning

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Phase 1

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

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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.

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Phase 2 (Continued)

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

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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.

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Phase 3 (Continued)

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

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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.

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Phase 4 (Continued)

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

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Phase 4 (Continued)

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

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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.

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Phase 5 (Continued)

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

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Phase 6

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

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Phase 6 (Continued)

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

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Phase 7

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

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Phase 7 (Continued)

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

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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.

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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.

Systems Analyst

- An IT professional involved in the development of a computerized solution to a business problem
- Requires extensive technical, business and people knowledge, communication, business and technical skills
- Is fundamentally *curious* to explore how things are done with a desire to make them work better

Systems Analyst

- Focuses on understanding the business problem
- Focuses on the approach to be taken to solve the business problem

Problem Solving Approach

1. Research and understand the problem
2. Verify that the benefits of solving the problem outweigh the costs
3. Develop a set of possible solutions (alternatives)
4. Decide which solution is best and make a recommendation
5. Define the details of the chosen solution
6. Implement the solution
7. Monitor to make sure that you obtain the desired results

Systems Analyst

"Must thoroughly understand the problem the system will solve"

Systems Analyst Skills

- Technical Knowledge and Skills
- Business Knowledge and Skills
- People Knowledge and Skills
- Integrity & Ethics

Systems Analyst Skills

- Technical Knowledge and Skills
  - Computers and how they work
  - Devices that interact with computers, including input devices, storage devices, and output devices
  - Communications networks that connect computers
  - Databases and database management systems
  - Programming languages
  - Operating systems and utilities
  - Tools and techniques for developing systems

Systems Analyst Skills

- Technical Knowledge and Skills
  - Tools for developing systems
    - Tools are software products that help develop analysis or design specifications and completed system components
      - **Databases for developing systems**
      - **Integrated development environments (IDE's) for specific programming languages (Java, C++)**
      - **Distributed processing, Cloud computing**
      - **CASE tools to store information about system specifications, e.g. Rational Rose**
      - **Program code generators, testing tools, (Rational suite) project management tools (MS Project)**

Systems Analyst Skills

- Technical Knowledge and Skills
  - Techniques for developing systems
    - Techniques are used to complete specific system development activities
      - Project planning techniques
      - Systems analysis techniques
      - Systems design techniques
      - System construction and implementation techniques
      - System support techniques

Systems Analyst Skills

- Business Knowledge and Skills
  - What the specific organization does
  - What makes it successful
  - What its strategies and plans are
  - What its traditions and values are

Systems Analyst Skills

- People Knowledge and Skills
  - How people think
  - How people learn
  - How people react to change
  - How people communicate
  - How people work (in a variety of jobs and levels)
  - Must be able to listen well

Typical Job Titles for Analysts

- Computer consultant;
- computer systems analyst;
- informatics consultant;
- informatics security analyst
- information systems business analyst;
- information systems quality assurance analyst;
- IT (information technology) consultant
- management information systems (MIS) analyst;
- systems auditor;
- systems consultant;
- systems security analyst.

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).

Systems Analyst

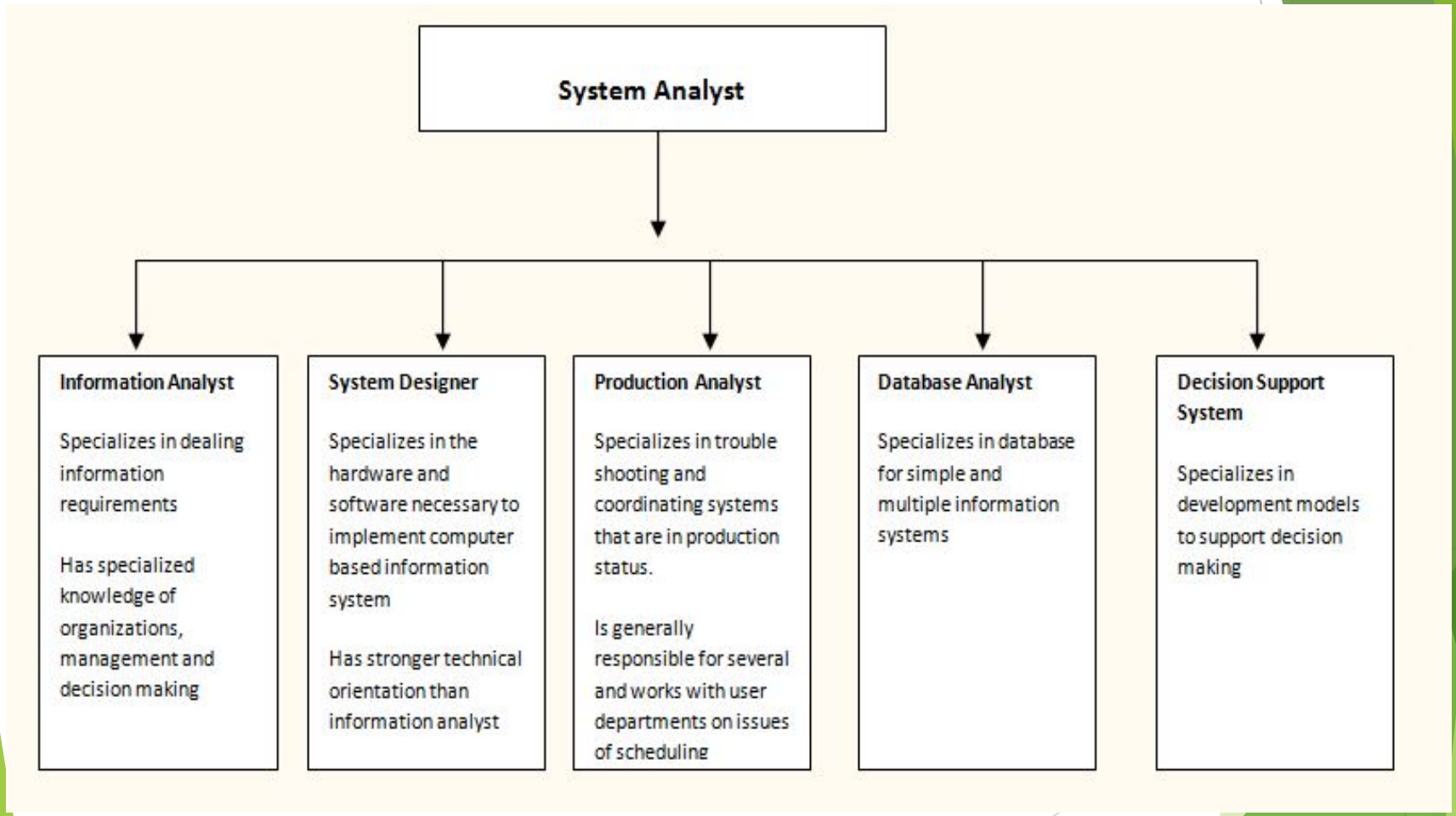
- Systems analysts act as:
  - Outside consultants to businesses.
  - Supporting experts within a business.
  - As change agents.
- Analysts are problem solvers, and require communication skills.
- Analysts must be ethical with users and customers.

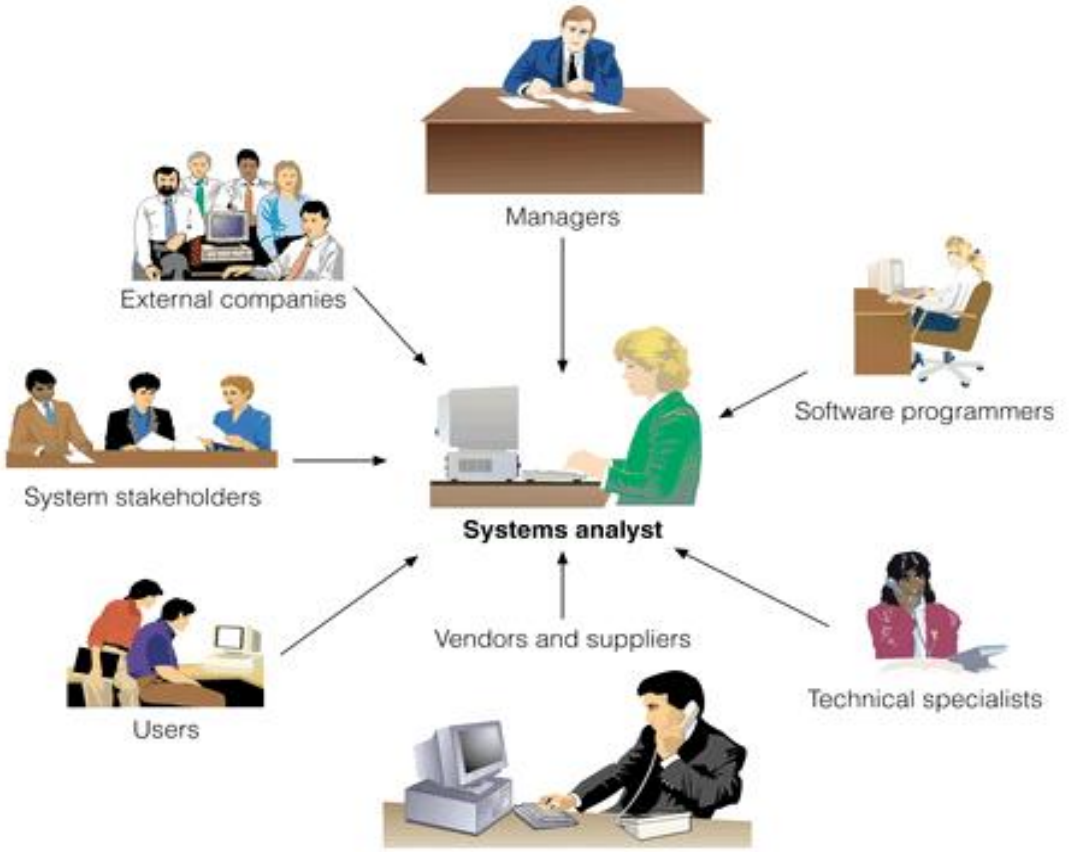
systems analyst :

- A **systems analyst** is a person who uses analysis and design techniques to solve business problems using information technology. **Systems analysts** may serve as change agents who identify the organizational improvements needed, design **systems** to implement those changes, and train and motivate others to use the **systems**.

Role of a system analyst

- What is the problem?
- Why is it important to solve the problem?
- What are the possible solutions to the problem?
- What exactly are the data input to the system and what exactly are the data output by the system?
- What are the likely complexities that might arise while solving the problem?
- If there are external software or hardware with which the developed software has to interface, then what exactly would the data interchange formats with the external system be?


System Analyst
Information Analyst
Specializes in dealing information requirements
Has specialized knowledge of organizations, management and decision making
System Designer
Specializes in the hardware and software necessary to implement computer based information system
Has stronger technical orientation than information analyst
Production Analyst
Specializes in trouble shooting and coordinating systems that are in production status.
Is generally responsible for several and works with user departments on issues of scheduling
Database Analyst
Specializes in database for simple and multiple information systems
Decision Support System
Specializes in development models to support decision making


Managers
External companies
Software programmers
System stakeholders
Systems analyst
Vendors and suppliers
Technical specialists
Users

A **systems analyst** is a person who uses analysis and design techniques to solve business problems using information technology. **Systems analysts** may serve as change agents who identify the organizational improvements needed, design **systems** to implement those changes, and train and motivate others to use the **system.**