

Q1 – What is systems development?

- The process of creating and maintaining information systems is called systems development or systems analysis and design. This diagram shows that it involves all five components of an information system. In addition to technical knowledge, it requires business knowledge and management skill.

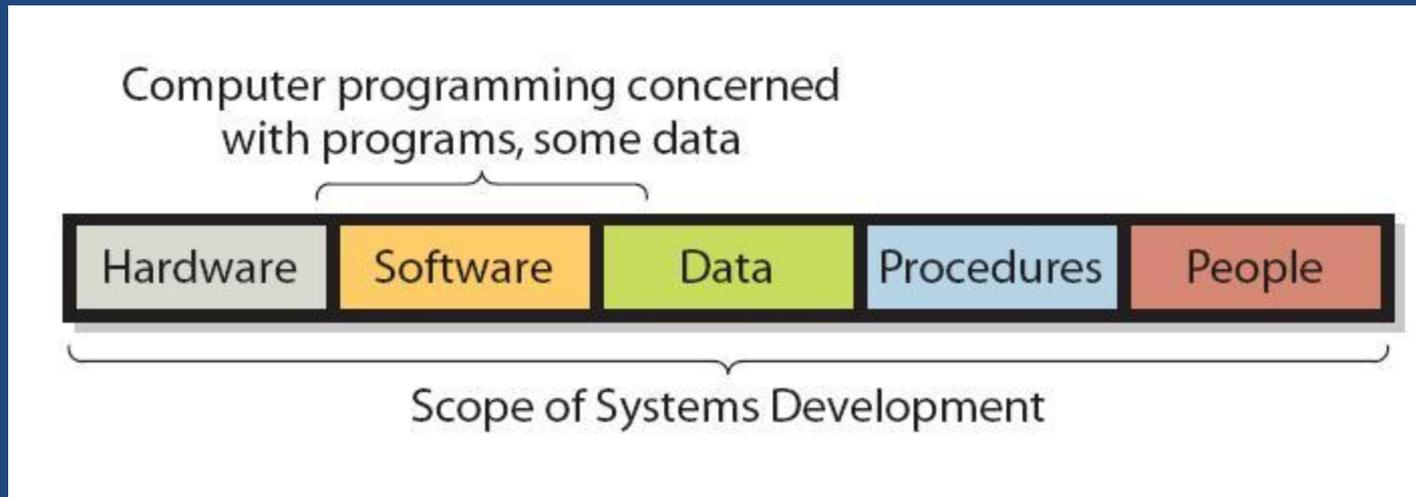


Fig 10-1 Systems Development vs. Program Development

Q1 – What is systems development?

- While you may be able to purchase an off-the-shelf software program, you won't be able to do that with information systems. Here are some of the reasons why:
 - You must construct or adapt procedures to fit the business and the people who will be using the system. You can't buy procedures.
 - People must be trained to use the information system effectively. You can't buy that.
 - Users must take ownership of their system. That's the single most important criterion for the success of an information system.
- Information system maintenance involves two things:
 - Fixing a system to make it do what it should have done in the first place, or
 - Adapting it to changing requirements.

Q2 – Why is systems development difficult and risky?

- Many system development projects are never finished. If they are finished, some are 200 or 300 percent over budget. Some projects never satisfactorily accomplish their goals. Here are some of the challenges you might face in a system development project:
 - It's very difficult to determine the requirements of a system which include data, procedures, communications, and processing requirements.
 - The requirements are always changing, even as the system is being developed. The bigger the system, the longer the project, the more requirements change.
 - Scheduling and budgeting are difficult to determine. In order to forecast labor costs, you must forecast labor hours.
 - Technology will change throughout the system development process. Should you stop the project and incorporate new technology or continue on without it?
 - As development teams become larger, the average contribution per worker decreases and causes diseconomies of scale. According to Brook's Law, adding more people to a late project only makes the project later.

Q2 – Why is systems development difficult and risky?

- Is systems development really so bleak? The answer is yes and no. These are **four system development** processes that help make projects more likely to succeed.
 - Systems development life cycle (**SDLC**)
 - Rapid application development (**RAD**)
 - Object-oriented systems development (**OOD**)
 - Extreme programming (**XP**)
- Each of these development methods offers advantages based on the scope and complexity of the system being built. No single process works for all projects because the scale of systems varies widely and different processes are appropriate for different types of systems.

Q3 – How do businesses use the systems development life cycle (SDLC) process?

- The classical systems development life cycle (SDLC) process includes five phases as this diagram points out:
 - ❑ System definition
 - ❑ Requirements analysis
 - ❑ Component design
 - ❑ Implementation
 - ❑ System maintenance (fix or enhance)

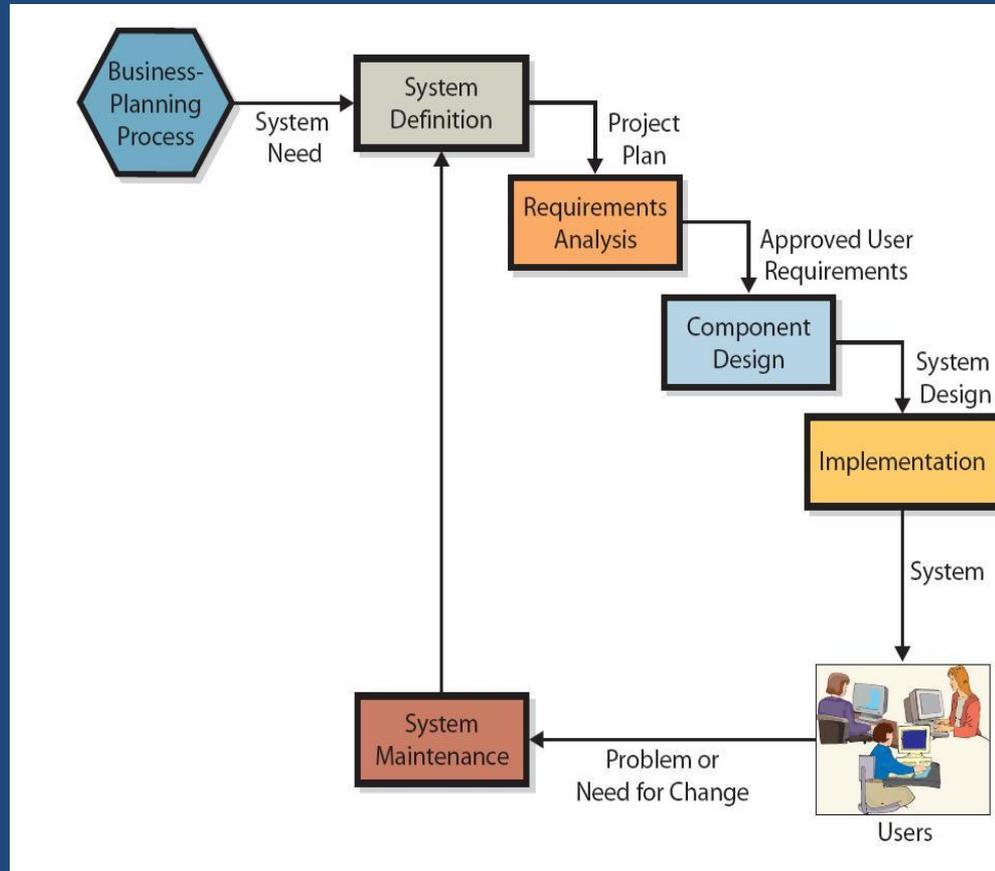


Fig 10-2 Phases in the SDLC

Q3 – How do businesses use the systems development life cycle (SDLC) process?

Phase One: System Definition

- Once the business-planning process determines the need for a new system, there are **four steps** to defining the system:
 - **Define** the system's **goals** and scope. Will you use it to facilitate collaboration, aid in decision-making, problem-solving, or project management, or help the organization gain a competitive advantage?
 - **Assess** the **feasibility** of the project using four criteria: cost, schedule, technical, and organizational.
 - **Form** a project **team** that includes systems analysts and users.
 - **Prepare** a project **plan**.

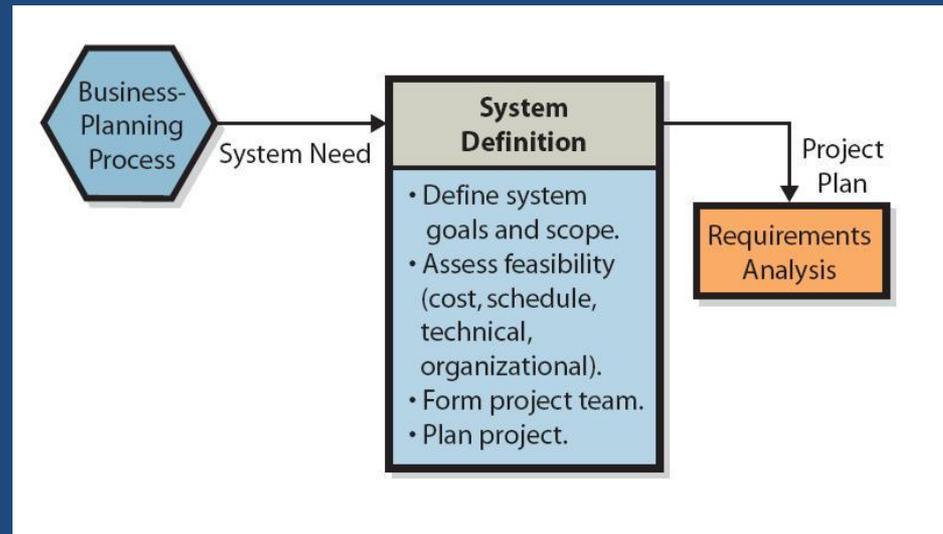


Fig 10-3 SDLC: System Definition Phase

Q3 – How do businesses use the systems development life cycle (SDLC) process?

Phase Two: Requirements Analysis

- The most important phase in the SDLC process is to determine **system requirements**. If the requirements are wrong, the system will be wrong. Seven activities occur in this phase as the diagram shows.
- **Users** are a critical part of this phase. They **must approve the requirements** before moving to the next phase.

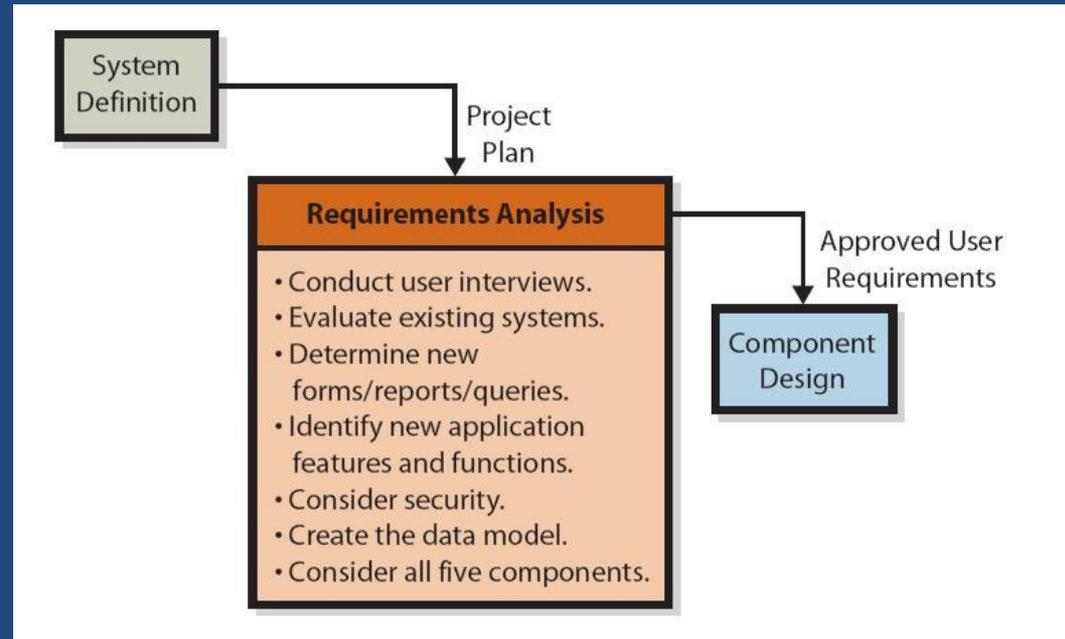


Fig 10-4 SDLC: Requirements Analysis Phase

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Phase Three: Component Design

- All five components require attention in the design phase:
 - **Hardware** —Determine the specifications and evaluate alternatives against the requirements.
 - **Programs** —Decide whether to use off-the-shelf software, off-the-shelf with alterations, or custom-developed software.
 - **Database** —Convert the data model to a database design.
 - **Procedures** —Design procedures for users, operations personnel, and for normal, backup, and failure recovery tasks.
 - **People** —Design job descriptions for users and operations personnel. You may have to add new jobs or alter existing jobs.

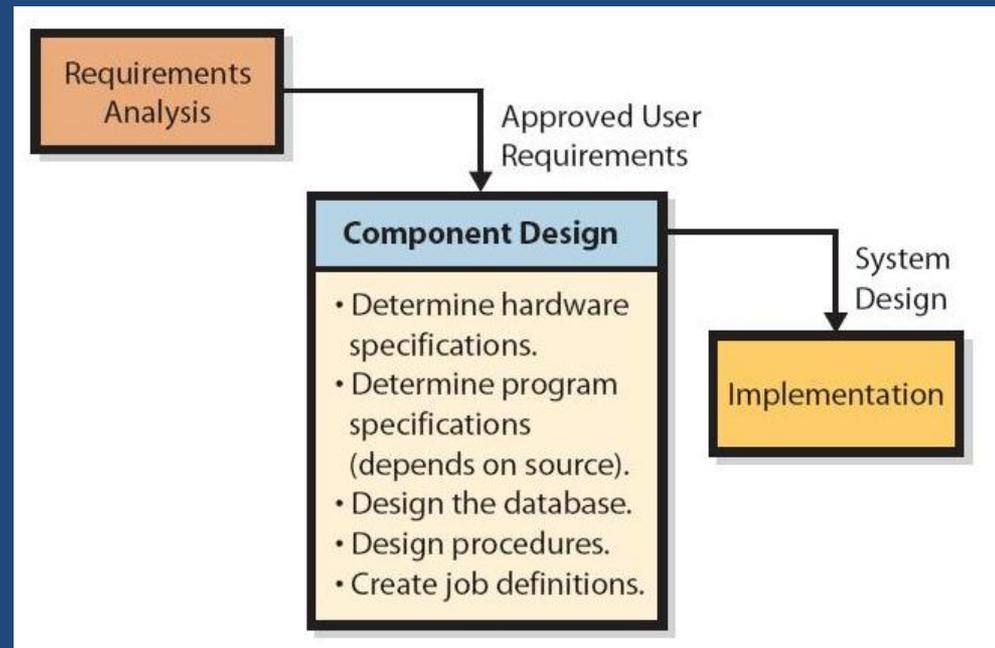


Fig 10-5 SDLC: Component Design Phase

Q3 – How do businesses use the systems development life cycle (SDLC) process?

Phase Four: Implementation

- Focuses on implementing the system and includes the tasks of
 - building each of the five system components
 - testing the system and
 - converting users to the new system.

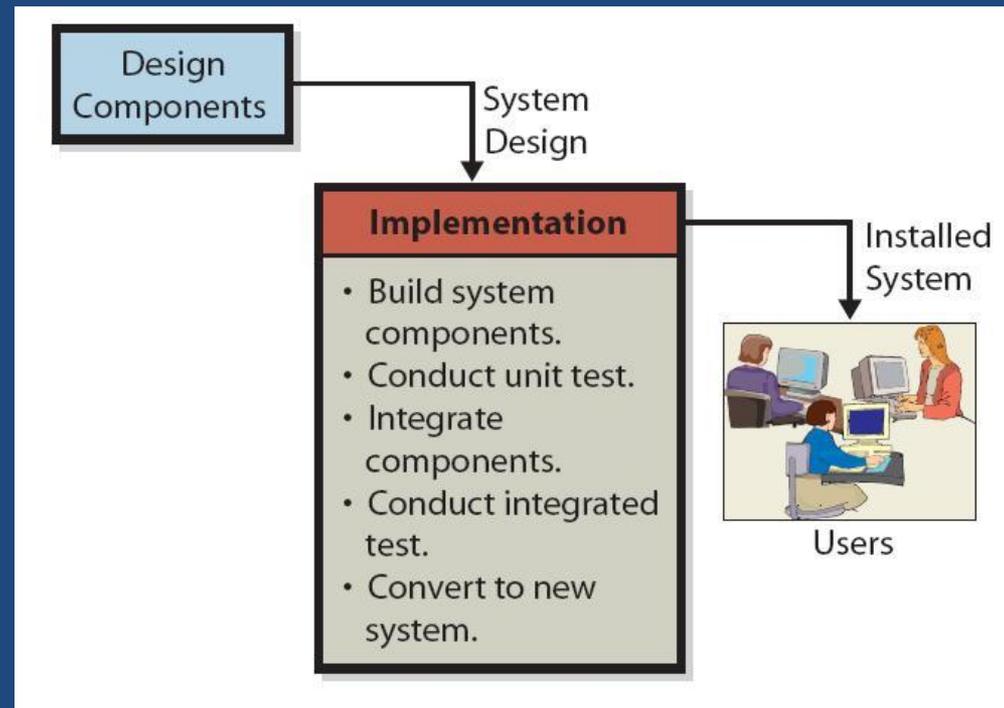


Fig 10-7 SDLC: Implementation Phase

Q3 – How do businesses use the systems development life cycle (SDLC) process?

- **System testing** begins by creating a test plan that spells out what actions users will take when using the new system. It includes testing normal actions and incorrect actions. Every line of program code should be executed to test error messages.
 - Product quality assurance (PQA) personnel can construct a test plan with user advice and assistance. They can perform some of the testing and supervise users as they test the system.
 - Users must be part of the test team and help develop test plans and test cases. Users must have the final say.
 - Beta testing allows future system users to try the new system on their own in the last stage of testing.

Q3 – How do businesses use the systems development life cycle (SDLC) process?

- There are **four methods** you can use to convert to a new system.
 1. **Pilot** —Implement the entire system on a limited portion of the business.
 - Failures are contained within a limited boundary.
 - It reduces the exposure of the business.
 - It protects the new system from developing a negative reputation.
 2. **Phased** —Install it in phases across the organization.
 - Only a portion of the system is installed at a time.
 - Once it works, another portion is installed.
 - Tightly integrated systems cannot use this method.

Q3 – How do businesses use the systems development life cycle (SDLC) process?

3. Parallel —The new system runs in parallel with the old system until the new one is tested and fully operational.

- It's very expensive to use this method because you must operate two systems at the same time.
- Users' work doubles because they must use both systems for all their tasks.
- Considerable work is required to determine if the results of both systems match each other.

4. Plunge (direct) —The old system is shut off one day and the new system is turned on the next day.

- If the new system fails, the organization is in trouble.
- This is an extremely risky conversion method because you're putting a lot of faith in the new system working correctly the first time.
- Organizations should avoid using this method.

Q3 – How do businesses use the systems development life cycle (SDLC) process? Phase Five: System Maintenance

- The last phase of the SDLC process includes three tasks:
 - Recording requests for changes as a result of failures or enhancements
 - Prioritizing the requests into high- or low-priority and
 - Fixing failures by issuing patches (high-priority), service packs (low-priority), or new releases.
- Deciding to enhance a system requires that you start the SDLC process all over, from the beginning.

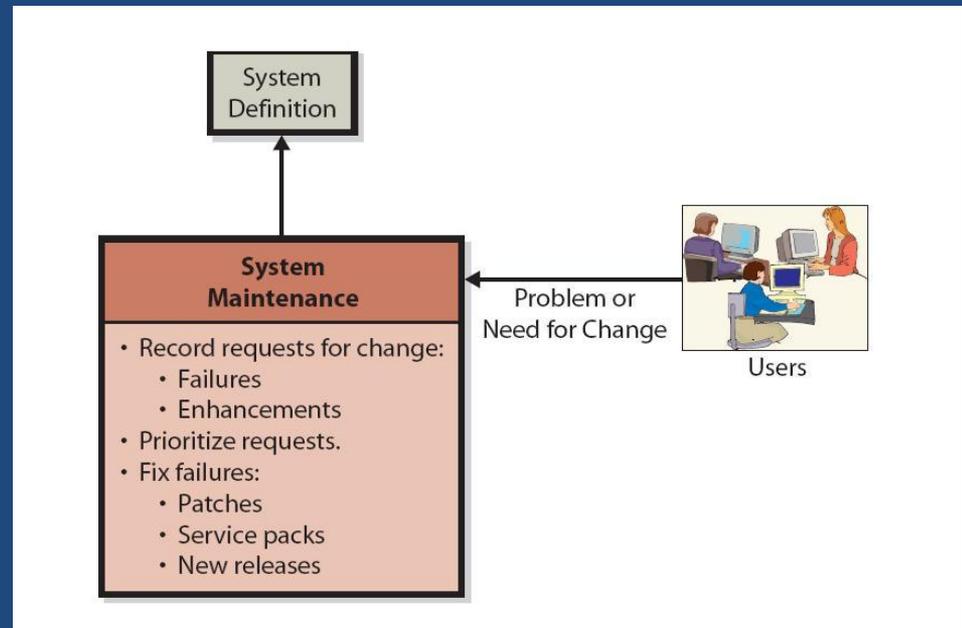


Fig 10-9 SDLC: System Maintenance Phase