Introduction To Information System

Lecture 2

Systems Development

- The SDLC provides a *structured* and *standardized process* for activities of system development effort.

- The SDLC is composed of the following fundamental phases:

1. Systems analysis
2. Systems design
3. Implementation
4. Testing
5. Conversion
6. Maintenance

System Development Life Cycle (SDLC)

Building a system can be broken down into six core activities.

System Analysis

- Analysis of problem to be solved by new system
  - Gather data about the existing system
  - Define the problem and identifying causes
  - Specify solutions
- Includes feasibility study
  - Is solution feasible and good investment?
  - Is required technology and skills available?

System Analysis

- Establishing information requirements
  - Who needs information, where, when, and how
  - Define objectives of new/modified system
  - Details of the functions the new system must perform
- Generates requirements documents

Faulty requirements analysis is leading cause of systems failure and high systems development cost

System Design

- Describes system specifications that will deliver functions identified during systems analysis
- Should address all components of system solution
  - **Architecture Design:** describes the hardware, software, and network infrastructure that will be used
  - **Database Design:** defines what and where the data will be stored
  - **Program Design:** defines what programs need to be written and what they will do
- Insufficient user involvement in design effort is major cause of system failure
- Generates design diagrams and documents

System Implementation

- Implementation
  - System specifications from design stage are translated into software program code
  - Generates operational system

System Testing

- Testing
  - Ensures system produces right results
  - Even thorough testing processes do not guarantee error-free system
  - Types:
    - *Unit testing*: Tests each component in system separately
    - *System testing*: Test functioning of system as a whole
    - *Acceptance testing*: Makes sure system is ready to be used in production setting, carried out by customers

System Testing

Assessing the functionality of SW program
Two main categories: Dynamic and static

Static Testing
Manual or automated review for
- Code (static code reviews)
- Requirements and design documents (technical reviews)

Dynamic Testing
Check the functional behavior of a SW unit by entering test data and comparing results to the expected results

Dynamic Testing Opacity

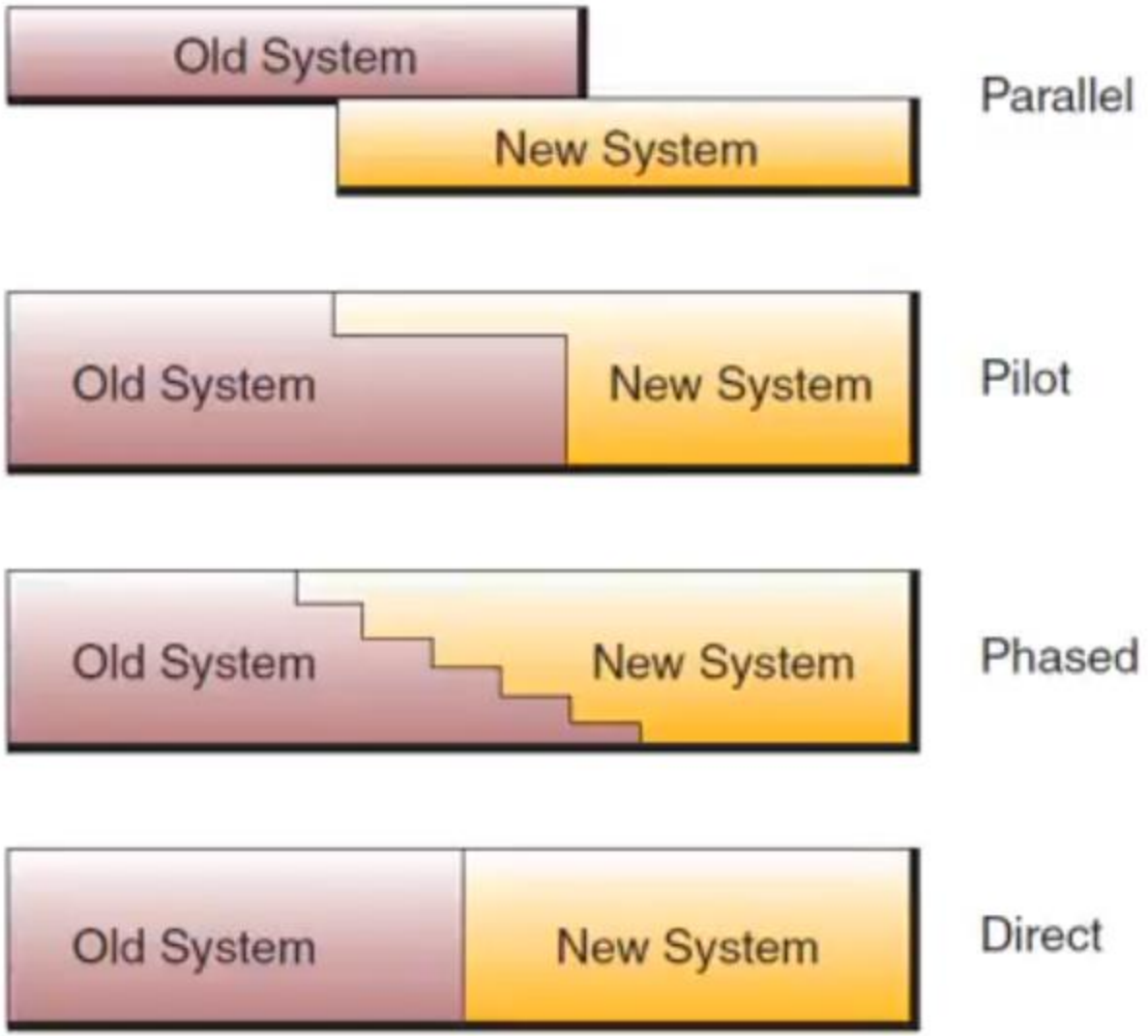
Opacity (view of code)

- Black-box testing
  - Tester has no knowledge of code
  - Often done by someone other than the coder
- White-box testing
  - Testing all possible logic paths in the software unit
  - Deep knowledge of the logic
  - Makes each program statement execute at least once

System Conversion

- Process of changing from **old** system to **new** system
- Finalization of **detailed documentation** showing how system works from technical and end-user standpoint
- **Train** end-users

System Conversion Forms



1. Direct Conversion

- Old system turned off, new system is turned on.
- Least expensive.
- May be the only viable solution in situations where activating the new system is an emergency or when the two systems cannot coexist under any conditions.
- Poses the greatest risk of failure.
- Disruptive to the organization.

2. Parallel Conversion

- Old and new systems are run simultaneously until the end users and project coordinators are fully satisfied that the new system is functioning correctly and the old system is no longer necessary.
- Low risk.
- Highest cost (End users must perform all daily functions with both systems, thus a massive redundancy in activities and literally double the work. All outputs from both systems are compared for accuracy).

3. Pilot Conversion

- This approach allows for the conversion to new system, using either direct or parallel method, at a single location.
- The advantage to this approach is that a location can be selected that best represents the conditions across organization but also may be less risky in terms of any loss of time or delays in processing.
- Once the installation is complete at the pilot site, the process can be evaluated and any changes to the system made to prevent problems encountered at the pilot site from reoccurring at remaining installations.

4. Phased Conversion

- Allows for the new system to be brought online as a series of functional components that are logically ordered to minimize disruption to the end users and the flow of business.
- low risk.
- Long time.

System Maintenance

- System reviewed to determine if revisions are needed
- May include post-implementation audit documents
- Maintenance
  - Changes in hardware, software, documentation, or procedures to a production system to correct errors, meet new requirements, or improve processing efficiency