SDLC Phases

An SDLC approach is traditionally made up of a number of distinct phases, each with a defined set of activities and outcomes. Each phase has defined goals and activities to perform with assigned responsibilities, expected outcomes and target completion dates. There are other interpretations that use a slightly different number of phases with different names.

The actual phases for each project may vary depending on whether a developed or acquired solution is chosen. For example, system maintenance efforts may not require the same level of detail or number of phases as new applications. The phases and deliverables should be decided during the early planning stages of the project.

Over the years, business application development has occurred largely using traditional SDLC phases. With purchased packages having become more common, the design and development phases of the traditional life cycle are being replaced with selection and configuration phases.

Click the links below to read more about each phase.

Auditor's Involvement in SDLC

Throughout the SDLC project management process an IT auditor should analyze the associated risk and exposures inherent in each phase of the SDLC and ensure that appropriate control mechanisms are in place to minimize risk in a cost-effective manner. Caution should be exercised to avoid recommending controls that cost more to administer than the associated risk they are designed to minimize.

When reviewing the SDLC process, an IT auditor should obtain documentation from the various phases and attend project team meetings, offering advice to the project team throughout the system development process. An IT auditor should also assess the project team's ability to produce key deliverables by the promised dates.

Typically, an IT auditor should review the adequacy of the following project management activities:

- Levels of oversight by project committee/board
- Risk management methods within the project
- Issue management
- Cost management
- Processes for planning and dependency management
- Reporting processes to senior management
- Change control processes
- Stakeholder management involvement
- Sign-off process (at a minimum, signed approvals from systems development and user management responsible for the cost of the project and/or use of the system)

Additionally, adequate and complete documentation of all phases of the SDLC process should be evident. Typical types of documentation include, but should not be limited to, the following:

- Objectives defining what is to be accomplished during that phase
- Key deliverables by phases with project personnel assigned direct responsibilities for these deliverables
- A project schedule with highlighted dates for the completion of key deliverables
- An economic forecast for that phase, defining resources and the cost of the resources required to complete the phase

Phase 1—Feasibility Study

Determine the strategic benefits of implementing the system either in productivity gains or in future cost avoidance, identify and quantify the cost savings of a new system, and estimate a payback schedule for costs incurred in implementing the system. Further, intangible factors such as readiness of the business users and maturity of the business processes will also be considered and assessed. This business case provides the justification for proceeding to the next phase.

Phase 2—Requirements Definition

Define the problem or need that requires resolution and define the functional and quality requirements of the solution system. This can be either a customized approach or vendor- supplied software package, which would entail following a defined and documented acquisition process. In either case, the user needs to be actively involved.

Phase 3A—Software Selection and Acquisition

This iteration refers to software purchase. Based on requirements defined, prepare a request for proposal outlining the entity requirements to invite bids from prospective suppliers, in respect of those systems that are intended to be procured from vendors or solution providers.

Phase 3B—Design (in-house development)

Based on the requirements defined, establish a baseline of system and subsystem specifications that describe the parts of the system, how they interface, and how the system will be implemented using the chosen hardware, software and network facilities. Generally, the design also includes program and database specifications and will address any security considerations. Additionally, a formal change control process is established to prevent uncontrolled entry of new requirements into the development process.

Phase 4A—Configuration (purchased systems)

Configure the system, if it is a packaged system, to tailor it to organization requirements. This is best done through the configuration of system control parameters, rather than changing program code. Modern software packages are extremely flexible, making it possible for one package to suit many organizations simply by switching functionality on or off and setting parameters in tables. There may be a need to build interface programs that will connect the acquired system with existing programs and databases.

Phase 4B—Development (in- house development)

Use the design specifications to begin programming and formalizing supporting operational processes of the system. Various levels of testing also occur in this phase to verify and validate what has been developed. This generally includes all unit and system testing and several iterations of user acceptance testing.

Phase 5—Final Testing and Implementation

Establish the actual operation of the new information system, with the final iteration of user acceptance testing and user sign-off conducted in this phase. The system also may go through a certification and accreditation process to assess the effectiveness of the business application in mitigating risk to an appropriate level and providing management accountability over the effectiveness of the system in meeting its intended objectives and in establishing an appropriate level of internal control.

Phase 6—Post- implementation

Following the successful implementation of a new or extensively modified system, implement a formal process that assesses the adequacy of the system and projected cost- benefit or ROI measurements vis-à-vis the feasibility stage findings and deviations. In so doing, IS project and end-user management can provide lessons learned and/or plans for addressing system deficiencies as well as recommendations for future projects regarding system development and project management processes followed.