On the Line (3/04)

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by Carol Ann Quinsey, RHIA

Q: What is meant by the term "system life cycle?"

A: The term "system life cycle" generally comes up in conversations about software development with our IT colleagues. However, it may also be used when assessing your organizational needs for computer systems.

The systems development life cycle (SDLC) is a popular model for mapping a software development project. The cycle typically begins after a project has been approved for investigation. There are several different versions of the SDLC. However, all models include four general phases:

- Planning and analysis
- Design
- Implementation
- Maintenance and evaluation[1]

Planning and Analysis

This phase begins by gathering system requirements from a business perspective, remaining technologically neutral.[2] The emphasis at this stage should be focused on what the system must do to address the business needs.

Members of functional areas throughout the facility must be included in discussions and interviews soliciting the system requirements. It is rare today that any system affects only one department in an organization. Compiling system requirements is intense work and usually takes a long time.

Design

System design begins after requirements have been identified. The focus at this time is how the system will address the requirements. A decision can usually be made at this point about whether to modify an existing system or to build or buy a new system.

If a decision is made to purchase a system, the project moves into a selection process for both vendor and product that proceeds along a path that may parallel the SDLC. This topic is not covered in this article.

If software development is decided on, a decision as to whether the system will be built with existing organizational resources or contracted to an outside firm will be required. For most organizations, concerns related to time and money dictate the purchase of a system available on the market rather than the development of a new system.

If the decision is to develop a new system or modify an existing system, more detailed design is undertaken at this point. Stringent specifications, from which application programmers write code, will be written. Rigorous code testing must be undertaken as development proceeds until the code performs in a way that meets the user's requirements.

Implementation

Implementation planning should begin when the development contract is signed. An interdisciplinary team led by a project manager plans the work required to implement the new or upgraded system. Planning includes implementation of all required hardware and software, testing, populating data sets or tables, data migration from old or existing systems, interfaces, staffing, technical and user training, go-live activities, budget, and reporting for the project.

Plans for fall-back if the implementation does not go as planned should be identified. Evaluation of a phased versus "big bang" approach to implementation must be part of the planning. Both approaches carry advantages and risks, so each should be carefully considered.

Acceptance testing of the system must be part of implementation. This step is often ignored or taken lightly to meet the implementation schedule. The result can be a system that does not meet user requirements, leaving a painful wake following implementation.

Maintenance and Evaluation

Following successful implementation, the organization enters the phase of ongoing maintenance. This phase includes system backups, periodic upgrades, equipment maintenance and replacement, user training and assistance, and system recovery in the event of disaster.[3] Periodic evaluations should be undertaken to determine in advance when a system needs replacing or upgrading.

The term "system life cycle" may also be used when considering replacement of existing systems. Systems need upgrading or replacing as they reach the end of their technological life. When talking with IT colleagues, you may hear the term "system life cycle" used in this context.

When organizations determine it is necessary to upgrade or replace an existing system, a system life cycle begins again. SDLC represents a tool that can be used to advantage; the process provides an opportunity to reevaluate the system's requirements (which may have changed since the system was originally implemented), examining design options available, implementation considerations, and maintenance.

Notes

1. Johns, Merida L., ed. *Health Information Management Technology: An Applied Approach*. Chicago: AHIMA, 2002.
2. *Ibid.*
3. *Ibid.*

References

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