Course Name: System Analysis and Design

Course No: 239ج

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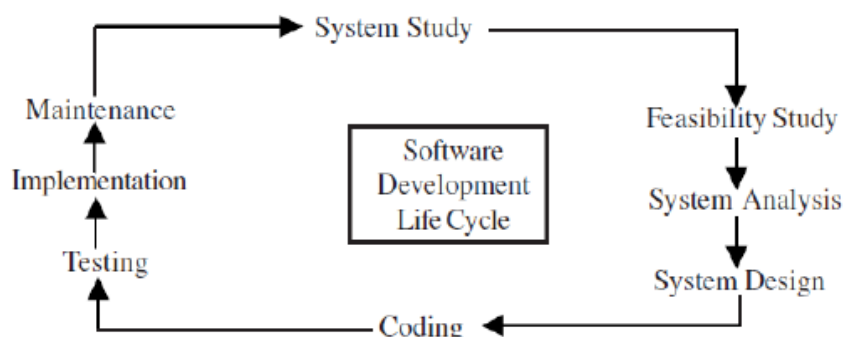Lecture No: 3 System Development Life Cycle

Introduction

The system analyst gives a system development project meaning & direction. A candidate system is approached after the analyst has a thorough understanding of user needs & problems. A viable solution is worked out and then communicates the same.

Systems Development Life Cycle

The Systems development life cycle is a methodology that also forms the framework for planning and controlling the creation, testing, and delivery of an information system. The Systems development life-cycle concept acts as the foundation for multiple different development and delivery methodologies, such as the Hardware development life cycle and Software development life cycle. While Hardware development life-cycles deal specifically with hardware and Software development life-cycles deal specifically with software, a Systems development life-cycle differs from each in that it can deal with any combination of hardware and software, as a system can be composed of hardware only, software only, or a combination of both.

The System Development Life Cycle framework provides a sequence of activities for system designers and developers to follow. It consists of a set of steps or phases in which each phase of the SDLC uses the results of the previous one.

A number of system development life cycle (SDLC) models have been created: waterfall, and spiral, build and fix, prototyping, incremental, and synchronize. The oldest of these, and the best known, is the: waterfall model a sequence of stages in which the output of each stage becomes the input for the next. These stages can be characterized and divided up in different ways.

Stages of system development Life cycle

1. **Project Selection**

     One must know what the problem is before it can be solved. The basis for a candidate system is recognition of a need for improving an information system or a procedure. For example, a supervisor may want to investigate the system flow in purchasing, or a bank president has been getting complaints about the long lines in the drive – in. This need leads to a preliminary survey or an initial investigation to determine whether an alternative system can solve the problem. It entails looking into the duplication of effort, bottlenecks, inefficient existing procedures, or whether parts of the existing system would be candidates for computerization. If the problem is serious enough, management may want to have an analyst look at it.

2. **Feasibility Study**

     Depending on the results of the initial investigation, the survey is expanded to a more detailed feasibility study. A feasibility study is a test of a system proposal according to its workability. Impact on the organization, ability to
     meet user needs, and effective use of resources. It focuses on three major questions:

     1. What are the user's demonstrable needs and how does a candidate system meet them?
     2. What resources are available for given candidate systems? Is the problem worth solving?
     3. What is the likely impact of the candidate system on the organization? How well does it fit within the organization's master MIS plan?
     Each of these questions must be answered carefully. They revolve around investigation and evaluation of the problem, identification and description of candidate systems, specification or performance and the cost of each system and final selection of the best system.
     The objective of feasibility study is **<u>not to solve</u>** the problem but to acquire a sense of its scope. During the study the problem definition is crystallized and aspects of the problem to be included in the system are determined. Consequently, costs and benefits are estimated with greater accuracy at this stage.

The result of the feasibility study is a formal proposal. This is simply a report- a formal document detailing the nature and scope of the proposed solution. The proposal summarizes what is known and what is going to be done. It consists of the following:

1- Statement of the problem
2- Summary of findings and recommendations- a list of the major findings and recommendations of the study.
3- Recommendations and conclusions- specific recommendations regarding the candidate system including personnel assignments, costs, project schedules, and target dates.

After management reviews the proposal, it becomes a formal agreement that paves the way for actual design and implementations.

3-System Analysis

Analysis is a detailed study of the various operations performed by a system and their relationships within and outside of the system. A key question is, what must be done to solve the problem?

One aspect of analysis is defining the boundaries of the system and determining whether or not a candidate system should consider other related systems. During analysis, data are collected on the available files, decision points, and transactions handled by the present system. Data flow diagrams interviews, on – site observations, and questionnaires are examples of the analysis tools. The interviews is a commonly used tool in analysis, it requires special skills and sensitivity to the subjects being interviewed. Bias in data collection and interpretation can be a problem. Training, experience, and common sense are required for collection of the information needed to do the analysis. Once analysis is completed the analyst has a firm understanding of what is to be done. The next step is to decide how the problem might be solved. Thus, in systems, design we move from the logical to the physical aspects of the life cycle. In this step we will established system requirement and the most traditional ways to determined requirement is:

- Interview and listening: Collect the fact and opinion about the system by meeting the users , employs and manager that will used the system.
- Questionnaires: By using set of questions, we can collect more information about the system in very short time so it is very important to consider this way as way to

determined requirement. In addition, it is economic way compare with interview and listening.

- Group meeting: In this conversation, we can collect all-important information and all-important opinion, listen to all, and share all details, but in this way, we cannot determine meeting time exactly.
- Watch and note: We used this way as finial way to collect information, and it is good way all most we collect real information.

4-System design

Based on the user requirements and the detailed analysis of the existing system, the new system must be designed. This is the phase of system designing. It is the most crucial phase in the developments of a system. The logical system design arrived at as a result of systems analysis is converted into physical system design. Normally,

The design proceeds in two stages:

- Preliminary or General Design
- Structured or Detailed Design

Preliminary or General Design: In the preliminary or general design, the features of the new system are specified. The costs of implementing these features and the benefits to be derived are estimated. If the project is still considered to be feasible, we move to the detailed design stage.

Structured or Detailed Design: In the detailed design stage, computer oriented work begins in earnest. At this stage, the design of the system becomes more structured. Structure design is a blue print of a computer system solution to a given problem having the same components and inter-relationships among the same components as the original problem. Input, output, databases, forms, codification schemes and processing specifications are drawn up in detail. In the design stage, the programming language and the hardware and software platform in which the new system will run are also decided.

There are several tools and techniques used for describing the system design of the system. These tools and techniques are:

- Flowchart
- Data flow diagram (DFD)
- Decision table
- Decision tree