A comparative study between 7 Stage and 4 Stage

Systems Development Life Cycle (SDLC) Models

1. Kali charan Sabat

Assistant Professor

NMIMS Global Access School for Continuing Education

V. L. Mehta Road, Vile Parle (W),

Mumbai-400056, India

`kalicharan330@gmail.com`

2. Brinda Sampat

Assistant Professor

NMIMS Global Access School for Continuing Education

V. L. Mehta Road, Vile Parle (W),

Mumbai-400056, India

Brinda.Sampat@nmims.edu

Abstract— **The paper describes the commonly used 7 stage Systems Development Life Cycle (SDLC) model and a different compressed 4 stage SDLC model. It also compares and contrast the 7 Step Model with the selected 4 stage model.**

Keywords— **Planning, Analysis, Maintenance, Initiation.**

1. INTRODUCTION

Just like any product that a firm manufacture and sells follows a life cycle, so do the different organizational information systems. For example, a new type of mobile phone follows a life cycle of being developed and introduced to the market, being accepted by the customers in the market, then maturity and decline in the popularity, and finally being retired. Similarly, the term "System Development Life Cycle" describes the life of an information system from formation to retirement (Hoffer, George, and Valacich, 2005).

2. SEVEN STAGE SYSTEMS DEVELOPMENT LIFE CYCLE (SDLC) MODEL

The SDLC has seven primary phases:

1. System Identification, Selection and Planning phase

2. System Analysis

3. System Design

4. System Development

5. Testing

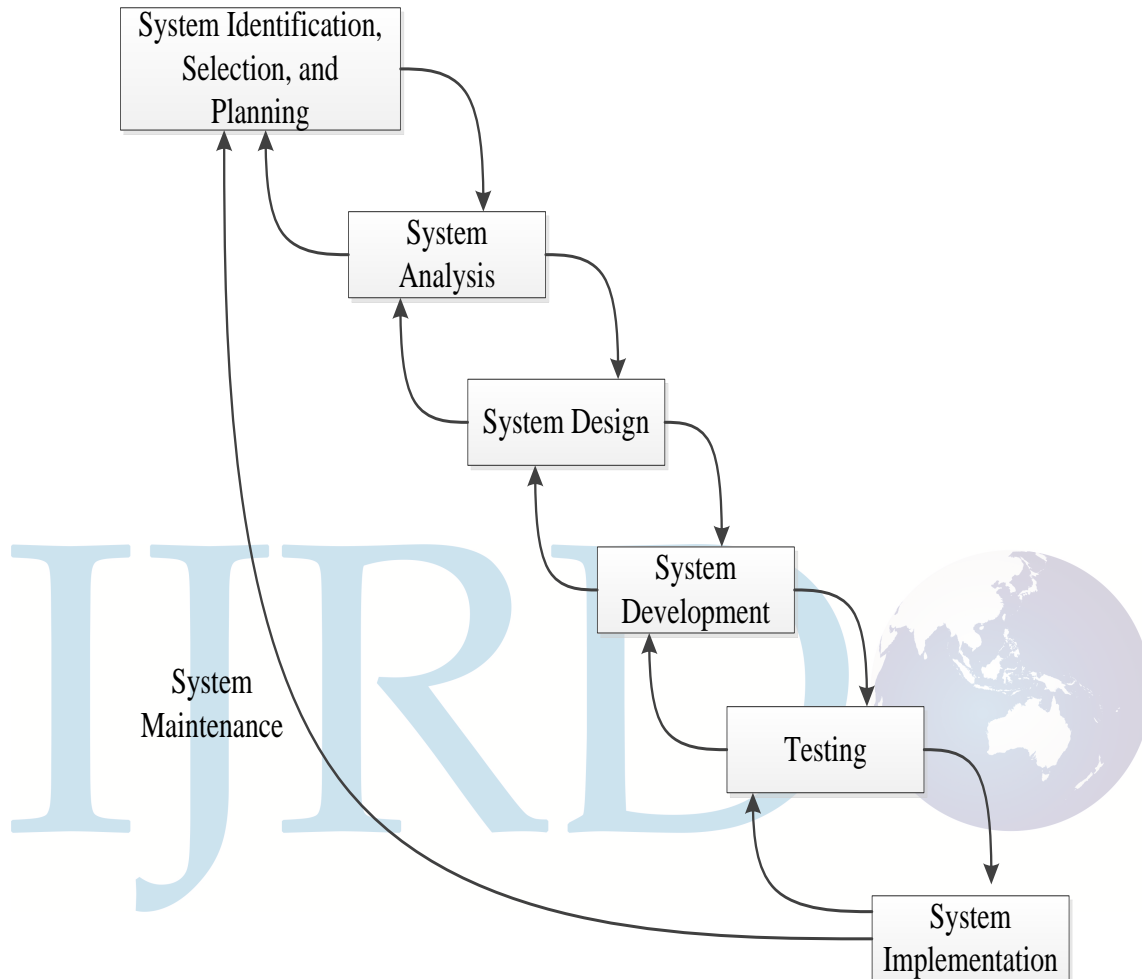6. System Implementation, and

7. System Maintenance

Fig. 1: Seven step SDLC process defines the typical process for building Information System

Fig. 1 is a graphical representation of a seven stage SDLC model. The SDLC is represented

as six boxes connected by arrows. Within the SDLC, arrows flow in both directions from top

box to the next bottom box and from bottom box to previous top box. For example we can find

arrow from System Analysis stage (top box) to System Design Stage (bottom box) and another

arrow from System Design Stage (bottom box) to System Analysis stage (top box). Arrow

flowing down symbolize that the information produced at one stage is being used to seed the

activities of the next. Arrows flowing up symbolize the option of returning to a previous stage,

if needed (Leonard Jessup and Joseph Valacich, 2006). The System maintenance arrow connects the last stage to the first is what makes the process into a complete cycle.

Stage 1: System Identification, Selection and Planning

An organization can work only on a limited number of projects at a given time due to limitation of resources. This makes this phase as most critical. An organization must consider only those projects that are important in enabling the organization's vision; mission, objectives and goal are undertaken. This stage describes the desired operational detail, including screen layouts, process flow charts, business rules, and other key documentation. As this phase develops the outline of a proposed information system, a feasibility analysis covering technical difficulties and risks is also put into action (Hoffer, George, and Valacich, 2005).

Stage 2: System Analysis

This is the stage in which the system analysts try to understand an organization's current way of operation in the area where the new information system will be developed. This stage consist of many sub-phases such as 1) Collecting system requirements through interviews, Questionnaires, and Observations, 2) Modelling organizational data using entity- relationship diagram (ERD), 3) Modelling organizational processes and logic, etc.

Stage 3: System Design

As with system analysis stage, many different activities may occur during this stage. The elements that must be designed in this phase include: 1) Forms and Report, 2) Interfaces and

dialogues, 3) Database and files, and 4) Processing and logic (Leonard Jessup and Joseph Valacich, 2006).

Stage 4: System Development

At this stage the organization hire programmers, data base developers and network engineers. This is the final stage of the primary development, and the system is put into operations. Instillation is a part of this stage. Training on the operations of the new system could be given during this stage (Kevin Roebuck, 2011).

Stage 5: Testing

Once the primary system is built testing must take place to ensure workability. Some of the tests include checks for errors, bugs and interoperability.   In this phase, verification and validation of the system is done.

Stage 6: System Implementation

Transformation of System design into a working information system takes place in this stage. Some of the activities to be done in this stage include Software coding and testing, and preparing the organization for using the new information system. This stage also includes other activities such as user training & tutorials, documentation and other support activities (Kevin Roebuck, 2011).

Stage 7: System Maintenance

At this stage changes and corrections are made. The information system maintenance process function follows the process used for primary development of information system (Leonard Jessup and Joseph Valacich, 2006).

3. FOUR STEP SYSTEMS DEVELOPMENT LIFE CYCLE MODEL

Step 1: Initiation

The analyst works with the customer (the potential users of the new system and their Managers) to collect a wide range of information like project size, potential benefits and costs, duration, complexity, and risk, etc. After collecting and analyzing the information, the analyst can bring it together into a summary plan that could be reviewed and compared with other projects. Organizations most often examine multiple criteria to make the decision of accepting or rejecting the project. If the organization accepts the project then the planning stage begins.

Step 2: Planning

Identification of manpower, workload and other non- development tasks required to be completed before the system implementation is studied and discussed in this phase. Critical success factor methodology (Boynton and Zmud, 1994) or Joint application design (JAD) are some of the techniques may be used in this phase.
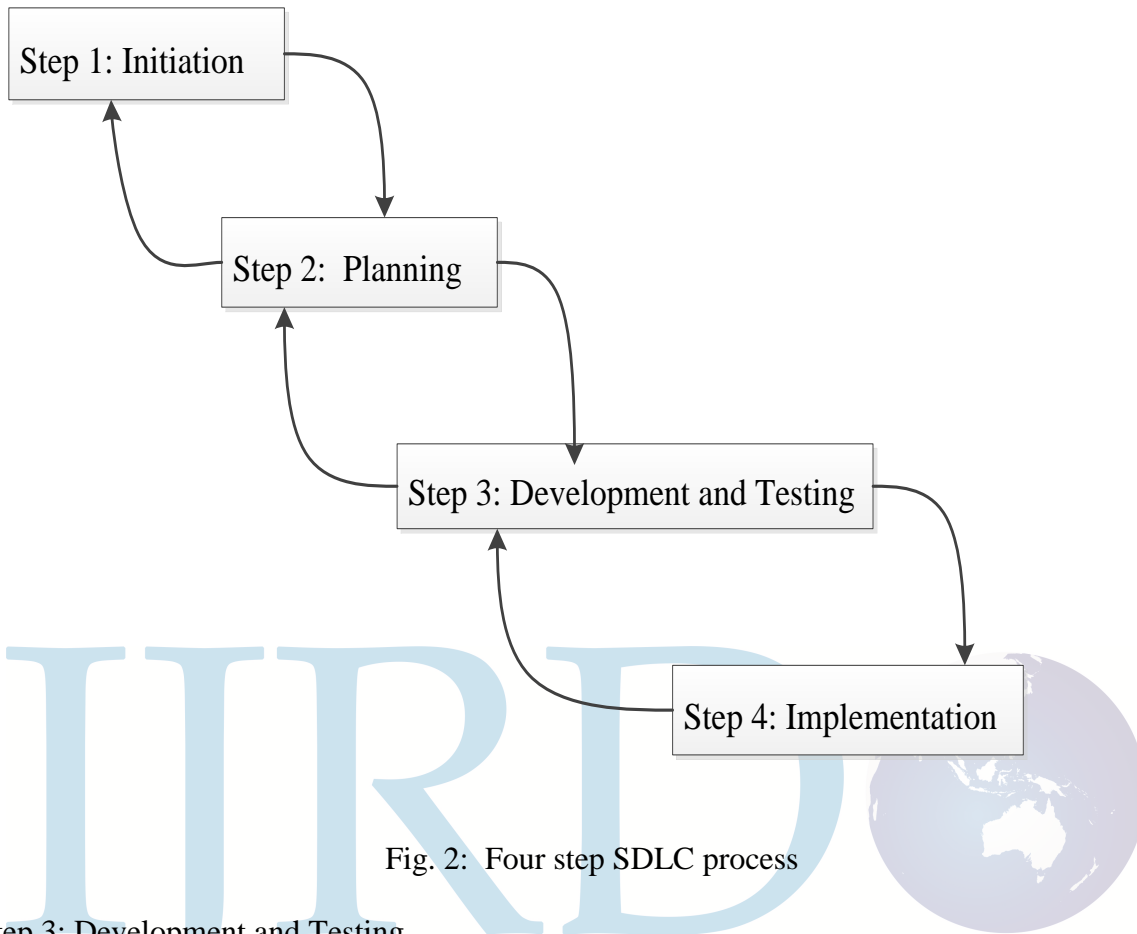
Fig. 2: Four step SDLC process

Step 3: Development and Testing

The proposed information system is designed. Also, all the necessary supporting elements such as Forms and reports, Database and files, Processing and logic, etc, are developed in this step. The system is tested for all types of bugs and errors; they are rectified with the help of Quality control team (Avison, and Shah., 1997).

Step 4: Implementation

Finally when the development and the testing step gets over the project is ready for final assessment. The project leader examine every aspect of the project success, the project is forwarded in the market as beta version. The beta version is rolled out in the market to test for the existence of any real time bugs and errors. The development team then analyzes the error report received from the BETA testing and solves them for the final version. The project

reaches to the end of its development cycle and released into the market for end users to purchase. Figure-2 is a graphical representation of a four step SDLC model.

4. COMPARISON BETWEEN THE SEVEN STEP SDLC AND FOUR STEP SDLC MODELS

The four step SDLC model is a compressed version of the seven step SDLC information system development process. In both the models the identification of project/system is done in the very first step. But, the planning decision take place in the second step in case of the four step SDLC model whereas the planning is a part of the first step in the seven step SDLC model. In the four step model the analysis of the information system is done in the planning step only.
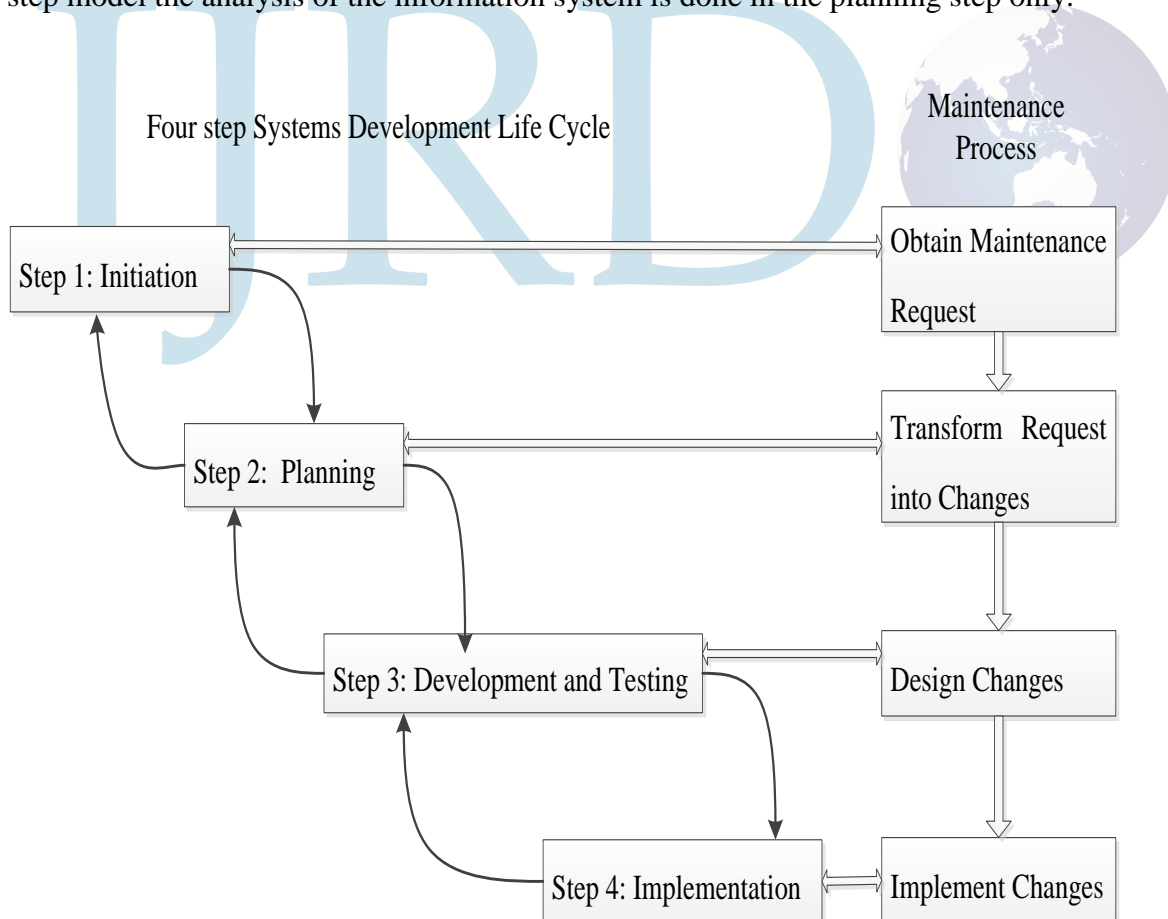

Fig. 3: Mapping of maintenance to four step SDLC model

Also the system design, system development and Testing steps are combined together into one step in case of the four step SDLC model. In both the models we can find the system implementation step, where the release of BETA version and the launch of the final system take place.

The System Maintenance step is missing in the four step SDLC model, which may be considered as the biggest drawback for four step SDLC model. In the seven step SDLC model during the maintenance phase, one person from the system development group is made responsible for collecting maintenance requests from the system users. After the maintenance requests are collected, the developers try to understand how the proposed change might alter the system and business benefits might result from such changes. This helps both the user and the developer to improve their knowledge and upgrade the information system. In the four step model the above discussed drawback could be dealt by running a system maintenance parallel process as shown below in figure 3.

By running this parallel maintenance system we can handle all four types of maintenance; the corrective maintenance, Adaptive maintenance, Perfective maintenance and the Preventive maintenance.

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