

# Chapter IX

## Information Technology Projects System Development Life Cycles: Comparative Study

**Evon M. O. Abu-Taieh**

*The Arab Academy for Banking and Financial Sciences, Jordan*

**Asim A. El Sheikh**

*The Arab Academy for Banking and Financial Sciences, Jordan*

**Jeihan M. Abu-Tayeh**

*World Bank, USAID, Jordan*

**Maha T. El-Mahied**

*Institute of Traditional Islamic Art and Architecture, Jordan*

### **ABSTRACT**

*This chapter will discuss more than 20 system development life cycles (SDLC) found in the Information Technology project management arena, whereby, a comprehensive overview of the SDLCs history as well as the trigger that instigated its development would be laid out. Subsequently, the chapter will discuss the advantages and disadvantages of using SDLC, whereby the chapter will explain where and when to use which SDLC. As such, the chapter will classify the different SDLCs into three non-exclusive categories: Traditional methodologies, agile methodologies, spiral methodologies and other types of methodologies that used in IT project Management.*

## **INTRODUCTION**

System development life cycle (SDLC) engulfs the whole system life cycle. Not only spanning over the feasibility study, analysis, specification, design, development; but also encompassing the aspects resonating in the operations, maintenance and enhancement, which would take place only after the system has been accepted by the end user.

Additionally, Project encapsulates the management environment set up, whereby ensuring delivery of specifically tailored business product to cater to a pre-defined business case. As such, Project does not cover all stages of system life cycle and covers mostly the technical deliverables.

Within this context, System development life cycle would be also denoted system process in software engineering as an integral part of IT project management. Highlighting the fact that many system development life cycles are developed to enable project managers to manage their project and overcome many constraints, *inter alia*: Money, Time, effort and Human resources. However, in view that two elements affect the project management apt choice of the SDLC; Familiarity of the project and the size of the project, whereas the authors use familiarity when referring to how familiar the project cadre is with the technology implemented in the project and the culture of the project, while the authors use the size of the project when referring to the time needed for project accomplishment, cost of the project, project people (users and development team), and the area of the project.

Accordingly, this chapter will discuss more than twenty SDLCs found in the IT project management arena, whereby, a comprehensive overview of the SDLCs history as well as the trigger that instigated its development would be laid out. Subsequently, the chapter will discuss the advantages and disadvantages of using SDLC, whereby the chapter will explain where and when to use which SDLC. As such, the chapter

will classify the different SDLCs into three non-exclusive categories: Traditional methodologies, agile methodologies and spiral methodologies, of which the chapter will attempt to discuss some models as stipulated in Figure 1.

## **TRADITIONAL SDLC**

This section discusses nine renowned SDLCs: Waterfall, Incremental, V Model, b Model, Fountain Model, Prototyping, Relay Race Methodology (RRM), and Structured Systems Analysis and Design Method (SSADM).

In this regard, certain properties can be attributed to traditional SDLC; First, traditional SDLC is comprised of discrete phase. Second, each phase has a deliverable product at the end. As such, traditional SDLCs are usually used in large projects where the familiarity element is very high.

### **Waterfall Model**

The Waterfall SDLC was first introduced by Dr. Wiston Royce in 1970. Royce's intention was to modify the waterfall model to an iterative model. Albeit, this model offered discrete phase with an emphasis on deadlines, documentation while specifying what each phase entails. Yet this model had many disadvantages, including; lack of user involvement as well as a mistake that was made in the earlier phase and cannot be rectified.

In addition, although this model had many flavors, however, it fell back on the logical thinking process; first, the problem should be defined by collecting the requirements. Second, the solution should be designed in manner that is acceptable to the client. Third, the implementation and execution of the designed solution should be properly planned. Finally, the validation and verification of the implemented solution should be conducted, in order to ensure that the designed solution is efficient and up to the standards of the client.

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