

Software Development Life Cycle Models - A Comparative analysis

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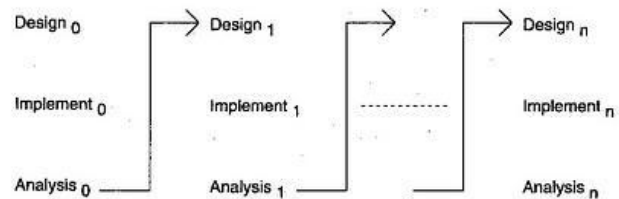
Abstract: Software Development Life Cycle Models are frameworks used to design, develop and test the software. They define a set of guidelines which are to be followed during the development. These models make sure that the software is designed systematically, according to the need of the customer and within the time schedule. Different types of software development life cycle models are waterfall, iterative, V-shaped, prototype and spiral model. Each of these models has its own benefits and drawbacks. The main aim of this research paper is to study different aspects of all these models and compare them so as to help the developers to choose the most suitable method according to the situation.

Keyword: SDLC, waterfall, iterative, V-shaped, prototype, spiral model.

1. INTRODUCTION

Software development life cycle (SDLC) is a method by which quality software can be developed in the given time and according to the customer expectations. SDLC ensures quality product. All software development processes include various activities like requirements gathering and analysis, system analysis, system design, coding, testing, implementation. It is the choice of the developer or the team of developers to choose the SDLC model. Each SDLC model may have advantages and disadvantages in different situations. The challenge is to determine which model should be selected under certain circumstances.

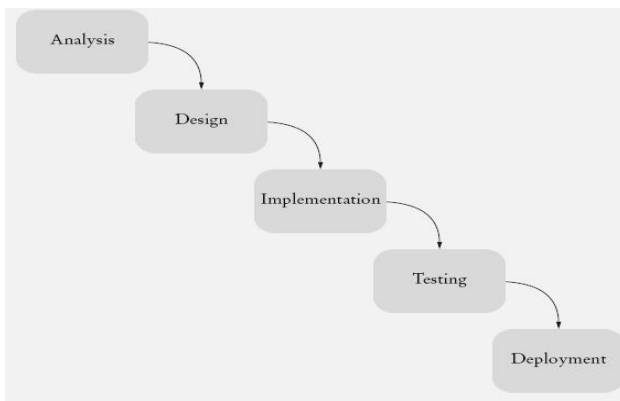
implementing a part which can then be reviewed and the next part can be planned according to the requirements. This process is repeated, giving new version of the software for each cycle of the model. In this model we can get user feedback. As this model proceeds step by step, it can be used when the project is big.



2. SOFTWARE DEVELOPMENT LIFE CYCLE MODELS

2.1 Waterfall Model:

It is also known as linear sequential life cycle model as it consists of sequence of phases. Once a development phase is completed, the development proceeds to the next phase in the sequence and there is no turning back to the previous phase. Thus it is not suitable for dynamic projects. Various phases in this model are Requirement gathering, system design, implementation, testing, deployment and maintenance.

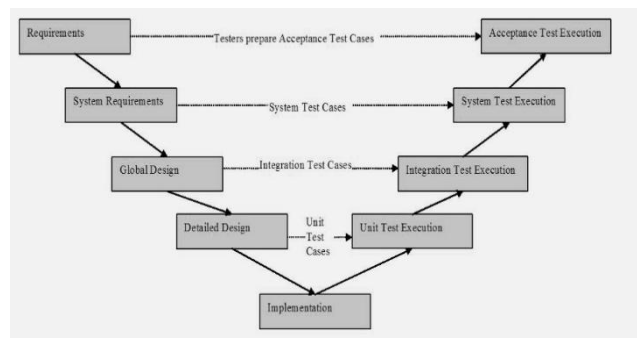


2.2 Iterative Model

In this model it is not required to start with the complete specifications. Instead, development starts by

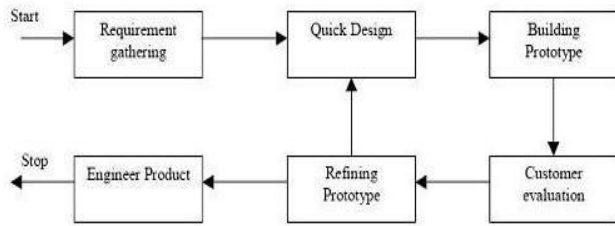
2.3 V-Model

V model stands for verification and validation model. It is a modification of Waterfall model. In this, development and testing is done simultaneously. Both, verification and validation activities go hand in hand.



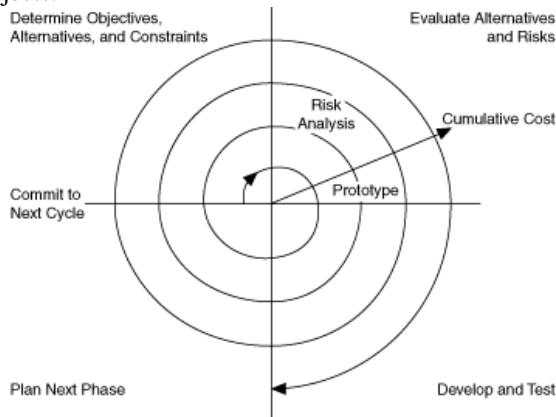
2.4 Prototype Model

This model includes building a prototype before building the actual software. The prototype displays the functions of the product but may not actually hold the logic of the original software. It provides scope for understanding customer requirements at early stage and then proceeding accordingly. Also, errors can be detected much earlier. This model is used for applications which tend to have lot of user interactions.



2.5 Spiral Model

In this model, development starts with a particular part and goes through each development phase for the set of requirements. First prototype is evaluated and accordingly the second prototype is developed considering the requirements. Based on the refined prototype, the final software is created. It is used for big and complicated projects.



3. COMPARISON OF DIFFERENT SDLC MODELS

Table 1-COMPARISON OF DIFFERENT SDLC MODELS

FEATUR-ES	Water fall Model	Iterative Model	V-Model	Prototype Model	Spiral Model
Requirement specification	Initial level	Initial level	Initial level	Frequently changes	Initial level
Cost	Low	Low	High	High	High
Risk factor	High	Low	High	Low	Low
Success rate	Low	High	High	High	High
User involvement	Low (at initial stage only)	High (after each cycle)	Average	Average	Low (after each cycle)

4. CONCLUSION

In this research paper various models like waterfall, iterative, V-shaped, prototype and spiral model have been studied and various features like requirement specification, cost, risk factor, user involvement, success rate, simplicity are analysed. Each model has its own merits and demerits. From the analysis as shown in the table 1, the developer can choose the appropriate software development life cycle model according to the requirements.

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