A REVIEW PAPER ON SOFTWARE DEVELOPMENT LIFECYCLE MODELS

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***Abstract*- As we know the imposition for software is shooting with the less cost, easily deliverable& batten quality. There exists tons of models, what matters is that which project needs which model to develop their software. Out of no.of models here is the trifle of some significant models such as Waterfall, Incremental, Spiral,V-Shaped, RAD(Rapid Application Development), Agile models. In this paper we want to expound the various models. The basic motive of this paper is to enactthe variety of models and make a relative study of them to show the attributes & shortcomings of each model.**

***Keywords- SDLC*, Waterfall model, V-Shaped model, RAD, Agile model.**

I. INTRODUCTION

We are living the world where the use of computers is must. 75% of the life of a person is dependent on computer. So to cop up with the daily increasing requirements of digital world one have to use the computers or laptops or pc. So when we use the computer we need software to work on. Everything in computer works on the principle of the software on the basis of which it is running. So to make thesesoftware we require the models to develop the required software.

A. Software Development Lifecycle (SDLC)

These are the models that help to develop the desired software. It’s adetailed and diagramatic rendering of the software life cycle. It includes all the activities required to make a software product moving through its life cycle phases. In other words, it plans the variety of activities executed on a software product from its foundationto retiral.

A. SDLC Phases

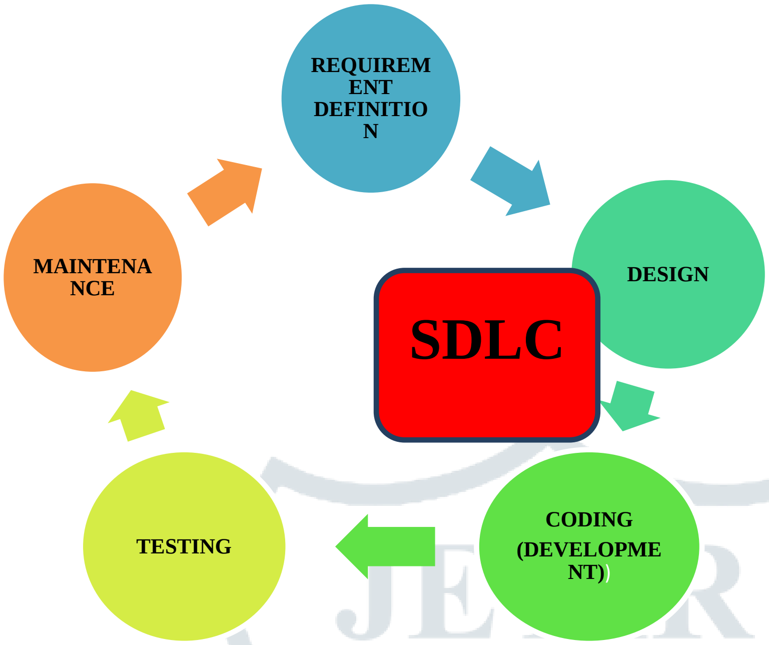

Fig1. SDLC Phases

Above drawn cyclic diagram represents the various phases of SDLC. It include following phases:

1. Requirement Definition
2. Design
3. Coding(Development)
4. Testing
5. Maintenance.

The requirement definition phase involves to intellect the problem. It is followed by the design phase. The planned solution is implemented in the coding phase. This is then tested in the testing stage. Deployment and maintenance is the next required step. These are collectively known as the lifecycle of software.

B. SDLC MODELS

1. **Waterfall Model-** This is the type of model in which each step is carried out one after another. It follows a sequence. The outputs of first stage ‘flow’ into the next stage and these output ‘flow’ to the 3rd stage and so on. Also each stage must be completed for proceeding to the next stage.

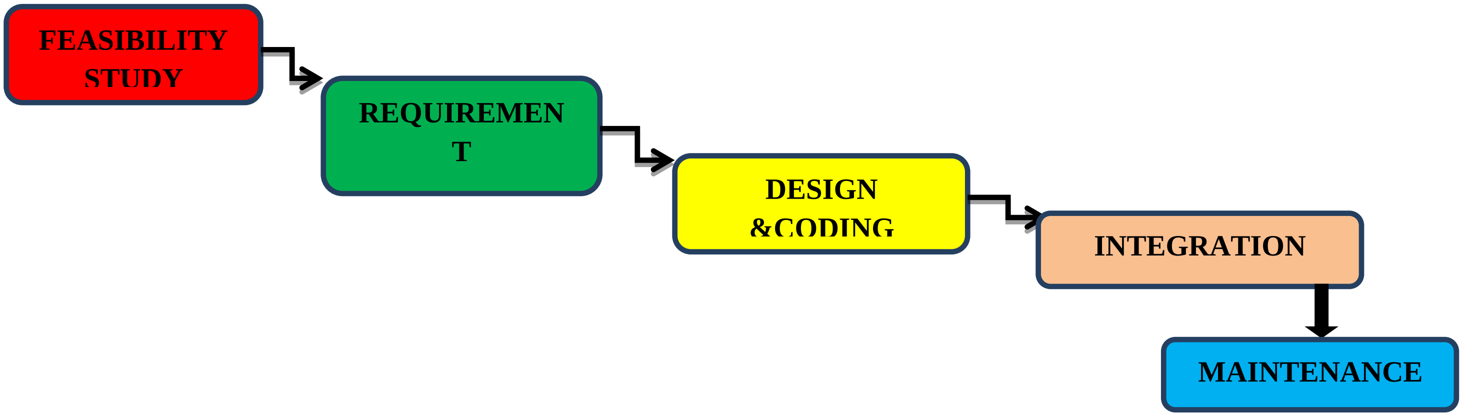

Fig 2. Waterfall Model

2. **Incremental Model-** This model merges components of the linear sequential model with the repetitive philosophy of prototyping. In this 1st increment is a core product. This means introductory needs are addressed but number of auxiliary features remain undelivered. The gist product is used by the customer. After its result, next plan is established for further step.

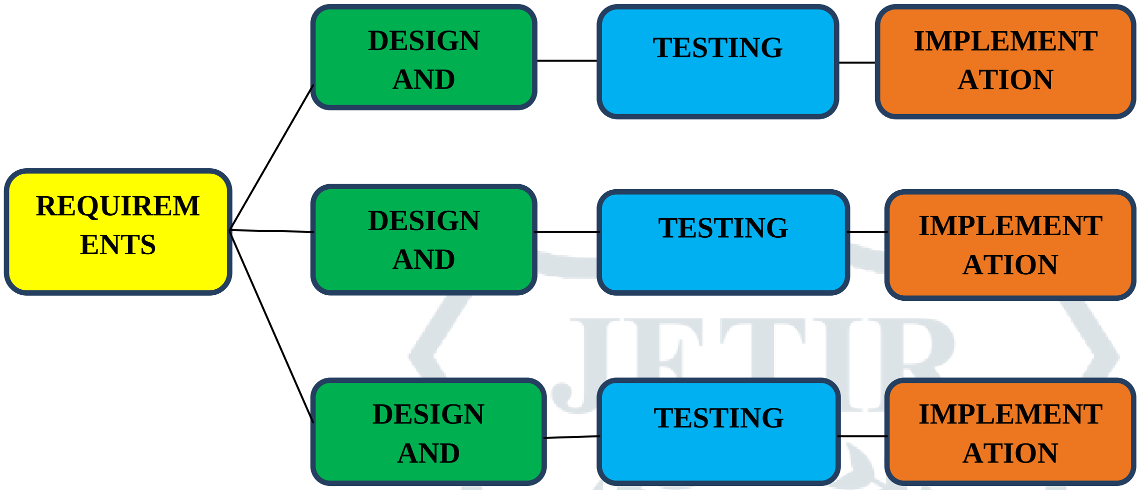

Fig 3. Incremental Model

3. **Spiral Model**- It is somewhat same as to incremental model and it concentrated more on the risk analysis. It includes 4 parts: Planning, Risk analysis, Engineering and Construction and release. The certain software passes through these phases again and again in loop corresponding to different spirals in model. It starts with plan phase,here requirement gathering is done. When risks are identified in risk phase the corresponding solutions are suggested. At end of engineering stage the tested software is produced. In the last phase the customer evaluates the output of the software.

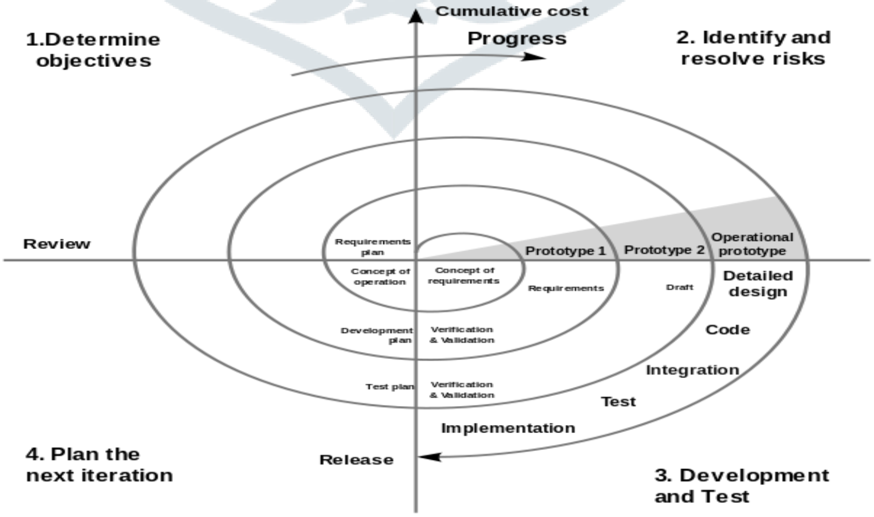

Fig 4. Spiral Model[13]

4. **V-Shaped Model-** It is said to be verification and validation model. Akin the earliest model it is also follows the sequence and before completion of one phase the next phase cannot be started. The different feature about it is that testing is done simultaneously with development phase, i.e., the tasks done before are verified later.

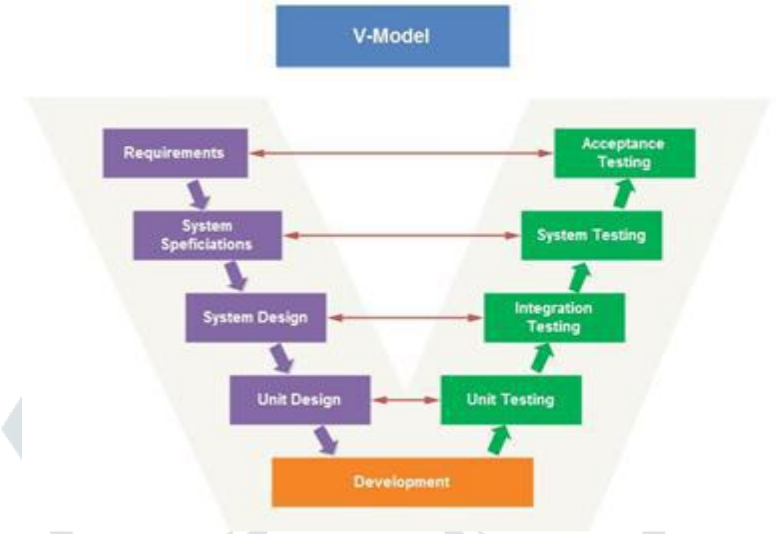

Fig 5. V-Shaped Model

5. **RAD(Rapid Application Model)-** It concentrates more on the output which is better in quality and that too in less time. In this elements are produced parallel and delivered fast. This allows the customer to use something and ask for the changes if required any. Thus the team gives the complete functional model in less time to the customer.

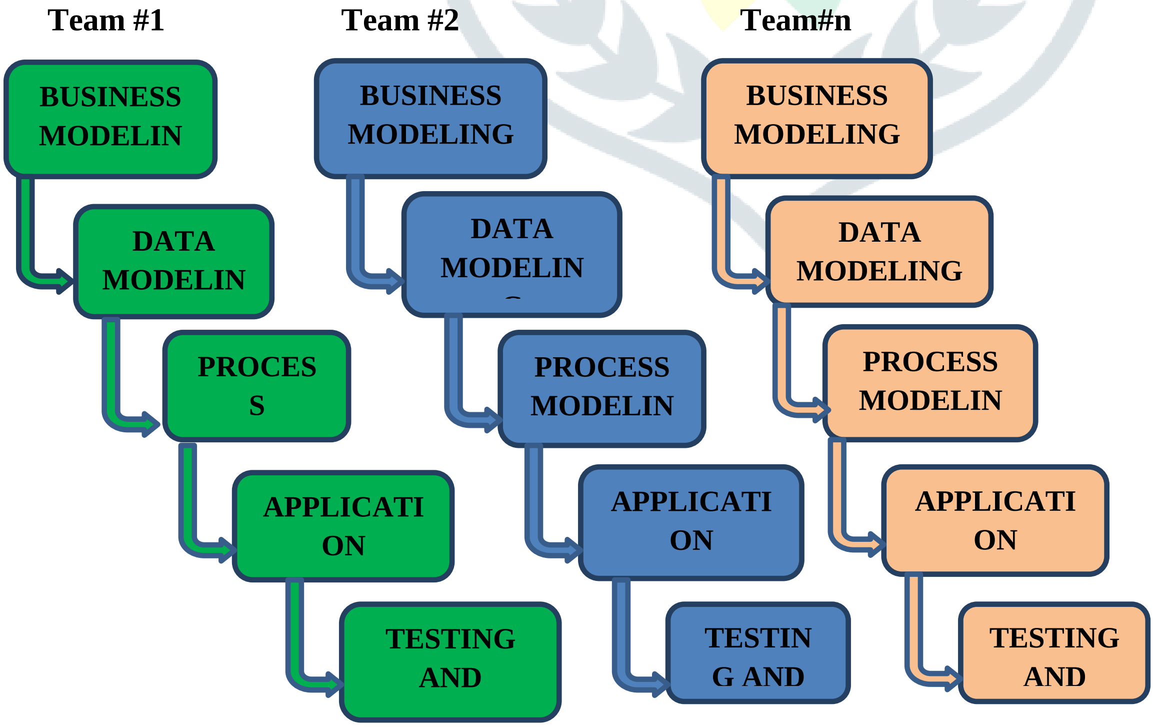

Fig 6. RAD Model

6. **Agile Model-** Introduction of this software has been done in the year 2001 by the agile team. Its main purpose is early and uninterrupted delivery of software in order to attain client gratification. The main imputes of this are:
    - Incremental- Minor softwares are produced, attended by rapid development cycles.
    - Co-operative- More client-developer interaction
    - Adaptive- Whippy enough to conform to immediate alterations.

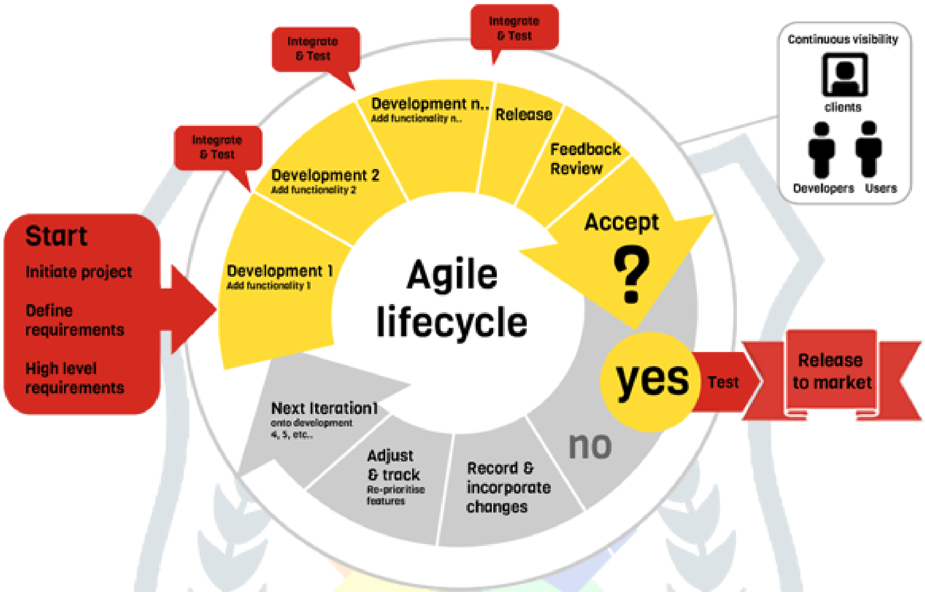

Fig 7. Agile Model[14]

II. LITERATURE REVIEW

ShubmeetKaur[1]in 2015 gave a Review paper on the software development models, Volume 5, Issue 11. This paper reviewed the models that are used in the area of software development. It elucidates about the definitions of these models and their working.

HarshdS.Modi,NikhilKumarSingh,HarshaPradepbhaiChauhan[2]gave a paper named Comprehensive analysis of SDLC, International Resarch Journal of Engineering and Technology.Volume:4 in june-2017. This paper is followed by discussion and comprehensive comparison among various models.

IqbalH.Sarker,FaisalFaruque,UjjalHossen and AtikurRahman[3] gave a paper named A Survey S/w Process Models in S/wEngineering,Vol 9,No.11 in 2015. This paper is concerned with the representation of various models and various expressions of allmodel to help the developers to choose specific model at particular situation depending on client needs.

PreetiGulia and Palak[4] has given a cost adequate,hasty and modular access for developing complex software generally based on the concept of reusability. It includes various advantages as well as challenges. Also includes comparative study of various models with their strengths and weaknesses.

Prof.Sema Suresh Kute,Prof.SurbhiDeependerThorat[5] has given the review paper on various SDLC in 2014. This paper gave the summarized comparison of the models and their advantages and disadvantages.

SriramasundararajanRajagopalan[10], emphasized on the use agile technologies. The understanding of this evolving type of model and main focus is on the agile model.

HaneenHijazi, ThairKhdour, AbdulsalamAlarabeyyat[11], the concerned paper is all about the risk management in different software development methodologies. It focuses in finding that how risky a model is.

Malik Hneif, Siew Hock Ow[12], has given the variety of agile methodologies. Basically three types of it and the process involved in those are discussed. The benefits are also discussed in it. It includes some history of the development models and evolution of the agile methodologies.

III. CONCLUSION

We have gone through various articles based on SDLC and found that there exists number of models to develop software. Each software has some strengths and weaknesses. Models are adopted on the basis of the requirements. Nowadays we are watching that technology is evolving at a very high speed. Keeping this in mind the developers have to choose the particular model to make the desired software. Correct selection of the development model can lead to the fast delivery and quality product.

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