



STUDY OF VARIOUS SOFTWARE DEVELOPMENT METHODOLOGIES

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ABSTRACT

This paper conducts an analysis of various software development methods. Presently we can control everything at the tip of our fingers. Technology is reached beyond our imagination. This paper explains different models and its advantage and disadvantages. Today there are varieties of software projects are available which requires security, GUI based and for critical projects. These types of project are based on different type of software development methodologies. This paper helps for choosing best software development method for any projects.

KEYWORDS: *software development model, advantage, disadvantage, comparison.*

INTRODUCTION

Presently computer becomes an essential part of our life. It is used in various fields of life like, agriculture, industry, health industry, education and business. Some people use computers for playing game. Computer is also called time saving device its do lots of work in minimum time. Computers also do work with more accuracy. all these events required software. lots of software development methods are available to develop software projects. It's very difficult to identify which software development method is suitable for a certain software projects. All software method has its own advantage and disadvantages. Software development methods are the base of any software project. It makes it successful or failure.

Waterfall Model

In traditional software develop method waterfall model is a linear flow with a specified sequence .user can easily understand the steps .in this method going back is not possible. in this method next step will be started after completion of the previous step. it is suitable for small software development .

Advantage

1. Useful and straightforward.
2. Model is rigid but easy in handling.

3. Helps in saving time.
4. It helps in effortless testing and analysis.

Disadvantages

1. It depends on precise needs.
2. It does not help in maintaining the project.
3. There is no any option to understand the project outcome.
4. It's not good for extended and ongoing software projects.

Prototype Method

Prototype method is useful for large project. It is impossible to define the actual requirements before the actual coding finished. it is also very much useful for innovative type projects.

Advantages

1. Software functional process idea should be clear.
2. Software function failure risk will reduce.
3. This method also helps in information requirements collection and its analysis.

Disadvantages

1. Management cost may be increase.
2. Client inference is very high which affect processing.
3. Lots of frequent changes affect the working process of software.



Iterative and Incremental Software Development Methodology

Iterative and incremental software development methodology based on commencement of only one step at a single time. on the basis of earlier models further expansion of the module take place. Method is based on creating single step at a time. On the base of basic models further extension of the module take place. after creating the each iteration, tested and feedback report will create. This function is repeated till the model is completely functional.

Advantages

1. We can get continuous feedback after each iteration.
2. After each iteration testing and feedback is done so multiple times revision will be done.
3. Sourced code is available after each iteration for testing.

Disadvantage

1. All iteration has rigid structure.
2. Outcome is not clear.

Spiral Methodology

Spiral method is always give attention on objective of the software development goal. it also focuses on alternatives of software development method and its constraints. It divides in to four stages: planning , risk analysis, development and evaluation of project.

Advantages

1. At the starting stage of the project source code is delivered.
2. Its second stage is risk analysis so it minimizes the risk of software development.
3. In spiral method documentation part of software development is very strong .each and everything is properly documented.

Disadvantages

1. Software project cost will be generated by risk handling.
2. It's completely dependent on risk analysis.

Rapid Application Development

This term development rapid application development method is use to giving fast output .this method is giving wonderful development with the help of different development methods. It is designed to take the highest gain from the software. This development method is helps in the increment of software program workability.

Advantages

1. It makes the complete development process simple.
2. This method helps user in taking review.

3. It helps in taking feedback from user for further enhancement.

Disadvantages

1. Performance depends on team performance.
2. Takes an attempt at modularized framework limited on this approach.
3. This method requires skillful person to handle the complex problem.
4. This method is not suitable for small project.

Dynamic System Development Model Methodology

It is an iterative and incremental development methodology. This methodology is also allowing users to involve in the development method. This development method helps in completing the project within given time and assigned budget.

Advantages

1. In software development method users getting a command upon that.
2. A quick delivery of serviceability.
3. User can easily access offers given by developers.

Disadvantages

1. Implementation of this methodology is very costly.
2. Not appropriate for small industry.

Spiral Model

In this methodology developers starts from very smaller level and search for the possible problems and risks. This method mainly focuses on objective selection .It has four phases like planning, risk analysis, development and evaluation. These methodologies follow each phase many times.

Advantages

1. Due to movement of repeatedly each phase many times risk and problems will be reduced.
2. This method is best and suitable for big and complex project.
3. In later stages it allows for additional functionality.
4. Very much suitable for high risk projects

Disadvantages

1. This methodology is very expensive in software development.
2. If risk analysis phase is fail it may destroy complete project.
3. Its not suitable for minimum risk project models.
4. Due to again and again checking of each phase the process may be continued and never ends.



Extreme Programming Methodology

This methodology split the process into small process which makes it more manageable this method they two programmer works on a same computer at the same time one is writing code other is supervising .In regular time intervals they change their roles to minimize the errors. This method provides collective ownership code policy that means any developer can change any coding even if that was not written by him. Project owner who decides the task priorities.

Advantages

1. This method pays attention on customer participation.
2. This method creates logical plans and programme.
3. Software programmers are wholeheartedly dedicated to the project.
4. This method is produces quality software by its modernistic method.

Disadvantages

1. Software effectiveness depends on the people involved in the project.
2. Frequently meetings are required for raising development costs.
3. Developmental change is necessary for more development.
4. Future outcomes and possibilities are unknown.

V-Model Methodology

V-model (verification and validation) methodology is an expansion of waterfall model. By pairing of each developmental phase with similar phase of testing. Feedback is received in the acceptance testing phase after completion of complete process .This method is useful for small and medium size projects.

Advantages

1. Systematic development and organized progress is the basic quality of this method.
2. This method is suitable for small and medium size projects.
3. Testing process is run parallel with the starting phase so it helps to find out the ambiguities from the starting phase.
4. Each phase has well defined objectives and goals to managing the phase.

Disadvantages

1. This method is not suitable for large projects.
2. Not suitable when requirements do not fit.
3. In the middle stage not any working software will be produced.
4. In this method risk analysis is not possible so risk and uncertainty are present there.

Scrum Methodology

It is an agile methodology or framework. In this methodology or framework software development is starts with simple known things. After that we can track the progress and manipulate it according to our requirements. Transparency inspection and adaptation are three basic pillars of scrum. Product owner, scrum master and scrum development teams are the roles of scrum team. Scrum team plans a sprint session where task is necessary to complete within the given time period. They also create sprint backlog and plans of sprint and implement it.

Advantages

1. Scrum helps in software development quickly and efficiently.
2. Mega projects are divided into small sprints to manage it properly.
3. Errors are debugged during the sprint review, so final code will be error free. Due to this development of project will fast.
4. Efforts of each team members are observe in scrum meetings.

Disadvantages

1. Scrum project has not defined end date so project development takes longer time period.
2. Scrum framework works properly with experienced people's team.
3. Huge number of meetings sometimes frustrates team members.
4. Quality maintenance is very tough due to step wise testing.

Clean Room Methodology

Project development methodology based on mathematical function theory. Software testing method is based on applied statistical method. Incremental software method is used for design and analysis by using box structure. A Box which wrapped the system with some level of abstraction. When a box is completed verification will be starts. Testing of software depends upon its usage and random tests to conform probabilities.

Advantages

1. Basic knowledge of mathematics and logical for defining notation accurately.
2. Black, state and clear box are the steps used by box structure to refine the requirements of the code.
3. Errors are debug before the system testing phase.
4. Software using criteria is defined by the usage models.

Disadvantages

1. Requires statistical skill and knowledge.



2. Not used for simple commercial development.
3. Not supporting CASE tools.
4. This methodology is project specific.

Rational Unified Methodology: This methodology is based on UML. In this method software development process divided into four phase: 1) inception 2) elaboration 3) construction and 4) transition.

Advantages

1. In itself it is complete methodology.
2. It resolves the project risks.
3. Less time required for integration.
4. For this methodology, online tutorials and training are available.

Disadvantages

1. Team members should be experienced.
2. Development process is very complex.
3. Reuse of components is not possible in cutting edge project.

CONCLUSIONS

This paper focuses on different methodologies of software development tools. Also study the advantages and disadvantages of all software development tool in detail. Our study also provides documentation to project owner to select the best software development method according to the need of the users. For any specific project no methodologies is perfect. Only best matching methodologies will be used in case of experienced project groups. Experienced groups also use combination of methodologies for new software development.

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