Software Development Processes

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Abstract

This article is about software development processes which includes software process models. It gives a brief explanation of the various software models and their advantages and drawbacks.

1 Introduction

When we provide a service or create a product we always follow a sequence of tests to accomplish a set of tasks. Software development process is a set of activities, methods, and practices that are used in the production and evolution of software.

2 Software Process Models

It is a specific embodiment of a software process architecture. It presents a description of a process from some particular perspective as: Specification, Design, Validation and Evolution. Software process model is helpful in many ways.

- It provides a common understanding of the activities, resources and constraints involved in software development.
- Creating a process model helps the development team find inconsistencies, redundancies and omissions in the process and in its constituents.
- The model should reflect the development goals and provide early evaluation.
  There are many models. Some of which are:
  1. Waterfall Model
  2. V Model
  3. Prototyping model
  4. Spiral model, phased development model, etc.
     This report will cover the first three models listed above.

2.1 Waterfall Model

The waterfall model is the classical model of software engineering. This model is one of the oldest models and is widely used in government projects and in many major companies. As this model emphasizes planning in

early stages, it ensures design flaws before they develop. The waterfall model has the following **advantages**: [1]

1. Easy to understand and implement.
2. Widely used and known (in theory!).
3. Reinforces good habits: define-before- design, design-before-code.

It has the following **disadvantages**

1. Idealized, doesn't match reality well.
2. Doesn't reflect iterative nature of exploratory development.
3. Unrealistic to expect accurate requirements so early in project.

2.2 V Model

As shown on figure 2, the V model is a variation of the waterfall model that demonstrates how testing activities are related to analysis and design. Developers can loop back in case of discrepancy.

It is **advantageous** it is easy to use and has a higher chance of success over the waterfall model due to the early development of test plans during the life cycle. As a **drawback**, it is very rigid like the waterfall model and does not provide a clear path for problems found during testing phases.

2.3 Prototyping Model

Prototyping model allows all or part of the system to be constructed quickly to understand and clarify issues. Its goals are to meet (some) user requirements at an early stage and reduce risk and uncertainty. Its advantages include:

1. Demonstration of the consistency and completeness of a specification.
2. Reduced need for documentation.
3. Reduced maintenance costs.

Its **disadvantages** are:

1. Users sometimes misunderstand the role of the prototype.
2. Lack of project standards possible.
3. Lack of control.

3 Conclusion

Software process models help developers understand the various development activities and a variety of models enables them to choose a model that suits the sofware requirements.

References

[1] Nabil Mohammed Ali Munassar and A. Govardhan *A Comparison Between Five Models Of Software Engineering*