Week04 – Short Paper Assignment – Extreme Programming (XP)

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# Introduction

The extreme programming (XP) method is another variation of agile method that has the capability to incorporate dynamic changes. This method has frequent releases in very short development iterations and take the feedback from the client and improve the application. Kent Beck who is an American software engineer and was one of the original signatories of Agile manifesto, is called as the creator of this methodology. He started working as a project leader of the C3 (Chrysler Comprehensive Compensation) System project in 1996 and started implementing the method. The concept of XP came into picture when he published the book “Extreme Programming Explained” in 2001. However, many of the implementation of this methodology have been around since 1960s in NASA’s Project Mercury.

In the book, Kent wrote, “One of the universal assumptions of software engineering is that the cost of changing a program rises exponentially over time.”. The cost of change is the main reason why developers need the software requirements to be frozen as early as possible. However, the XP method does not agree on this and has an opposite argument and conclusion, which is a controversial aspect of the method. As any agile method makes way for changes in the requirements, similarly the XP method also does not require the requirements to be frozen in the early stage of the project. Any changes to the user requirements are welcome in this method more dynamically.

Apart from the short development releases, this software development method enforces and encourages pair programming, extensive code review, test driven development, just-in-time features, frequent communications with the customer. The method has four main values; 1) Communication, 2) Simplicity, 3) Feedback and 4) Courage. Each of these will be discussed in detail in the next section.

# Variables for XP

The concept of extreme programming is based on the below variables.

1. Cost – The budget for the project drives the XP method. The number of developers required for the project and other resources such as tools, environments, platforms, they all count towards the cost of the project.
2. Time – The extreme programming method works on short iterations, so as to keep a checkpoint for the release time of the product. This is another factor that leads towards this method.
3. Quality – How accurate the system is as per the customer’s requirement is another controlling variable for this method. A constant communication with the customer and validation of the system by the onsite customer is done frequently to measure this factor.
4. Scope – Another vital variable for this method is the scope of the project. How much and what features will be done in the development process, is also another controlling factor for this method.

# Roles and Practices in XP

Just like any other agile methods, XP also has its own ceremonies, roles and defined practices in the process.

**Roles:**

1. On-site Customer – The actual customer who requires the software to be built in a stipulated period. One or more representatives from the customer side may be closely involved in the project development from the beginning to the very end, they are called as On-site customers. They are nothing but the same as a product owner as in the case of scrum.
2. Programmer – Developers who build the application and they are the core team members who are committed to the work.
3. Coach – A coach can be a project leader, architect or any mentor, who can lead the project with their knowledge and prior experience. They also help the programmers to adhere to the basic principles of XP.
4. Tracker – They are the ones who track the project progress and validate it against a few reports of the development. If there are any deviations, they may discuss this with the coach and programmers to bring them back to project guidelines.
5. Tester – The testing team who may write the tests before or after the development method.
6. Consultant – Internal or external consultants.

**Practices:**

1. The Planning Game – This is the meeting of all the team members, onsite customer, coach and testers, right before the iteration starts. This meeting addresses two major questions; 1) what will be accomplished by the due date 2) what will be tackeled next. Also these meetings may include release planning along with the iteration planning.
2. Small Releases – Extreme programming strictly follow small and continuous release to production, thus allowing the customers to give feedback. The main moto is to deliver a quality product which addresses all the requirements with least bugs or deviations.
3. Simple Design – Unlike other practices, there is no such formal design phase with least required documentation. The design is kept as simple as possible.

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1. Testing – XP is a test driven development framework. The best practices include writing unit tests first and programming next. Also the acceptance tests are also created by the onsite-customer which are validated after the integration and right before the release.
2. Pair Programming – In this phase two developers interachangeably do programming and code reviewing on one computer. Basically, while one developer is writing the code, the other just watches it and continuously monitoring the code standard and best programming practices. They may change the role after a few hours.
3. Refactoring – Since there is no formal big bang design upfront, the code is refactored many times to incorporate new implementations and have better performance.
4. Continuous Integration – With small and frequent releases, continuos integration is achieved. In this case the version control systems like GitHub or BitBuckets are used for code merges and other integrations. Having automated deployments in place, the CI/CD (Continuous Integration and Continuous Delivery) process is maintained through out the development period.
5. 40-hour week – No overtime work is encouraged. That is why the estimation in the planning game is important. The 40 hour week is also critical for the developers morale and to keep them motivated.

# Pros and Cons of XP

The objective of this method is to deliver a product very quickly and keep enhancing and building on the base application. The advantages of this method are:

* Fast
* Transparent
* Lower cost
* Team work

However, there are a few drawbacks of this methods too.

* Code valued more than design – Even though the application works and meets the customer’s requirements, a badly designed code, may cause many issues in future for any maintenance or for adding any new feature. The design may not support some critical features, in that case the code has to be completely scarpped and built again with a new design.
* Lack of documentation – With so frequent changes in the system there is little chance to document everything, which becomes a problem in future.

# Reference

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