Homework #4
CSE 566: Software Project/ Process/ Quality Management
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Proposal on need for Test Driven Development training for software leaders

Test Driven Development (TDD): "A Software development process in which developer writes an automated test case for given function, then code to pass the test and then refactors the code to meet organization standards." The main goal of TDD is "clean code that works". [1]

Test Driven Development is important for following reasons: [2] [3]

1. "Breaks bug loops and can produce quality product in less time
2. Quality Code with decreased number of defects, especially defects from regression testing
3. Earlier and Easier detection of flaws in code integrations
4. Effective refactoring of code
5. Smaller development life cycles with simple designs
6. Learning from developed code and test cases
7. Loosely coupled code"

Training Objectives

1. Where and When to use Test Driven Development
2. How to transform "customer requirements into software specifications" in Test Driven Development. [4]
3. How to incorporate "Test Driven Development into existing development environment." [5] and how to change the thinking process to TDD. Understand problem and then code.

Best Reference for Further Investigation

"Test-Driven Development: Concepts, Taxonomy, and Future Direction" - http://ieeexplore.ieee.org.ezproxy1.lib.asu.edu/stamp/stamp.jsp?tp=&arnumber=1510569 is the best reference to know more about Test Driven Development. This paper explains how Test Driven Development is used in Extreme Programming an Agile Method. It explained in detail about TDD concepts, history and differences between the actual TDD methodology and myths. It also conducted a survey using TDD on different group of software developers and recorded quality, time and effort saved while using TDD. It explained what factors effect while adopting a software development practice. It clearly states that when a software development methodology is taken up it is a mixture of various other methodologies. For suppose in each SCRUM, water fall is implemented. More over this paper brought a clear distinction between software development practice and what it means in theory where other papers lack.

References:

1. "http://en.wikipedia.org/wiki/Test-driven_development"
2. "http://blogs.agilefaqs.com/2011/11/01/importance-of-unit-testing-and-test-driven-development-tdd/"
3. "https://practicingruby.com/articles/tdd-costs-and-benefits"
4. "http://www.netobjectives.com/training/acceptance-test-driven-development"
5. "http://braintrustgroup.com/class-descriptions/certified-scrum-developer-agile-engineering/test-driven-development/"

Training Objective

How to transform “customer requirements into software specifications” in Test Driven Development.

The following topics will be covered in this training objective.

1. Introduction
    a. Principles of Testing and unit Testing
    b. Important design methods
    c. Patterns in unit Testing

2. Test Driven Development
    a. What is test driven development
    b. Differences between TDD vs. traditional testing approach
    c. How TDD effects design
    d. Example with a tool

3. Dealing with legacy applications
    a. Testing applications with external dependencies
    b. Testing database
    c. How to do regression and integration testing with legacy systems

4. Test Driven Development in Design and efficiency
    a. Testing tools like Selenium, JUnit
    b. Importance of documenting test cases
    c. Example

5. Application Development using Test Driven Development
    a. Break requirement into use cases
    b. Develop tests for use cases
    c. Write code and test with test cases
    d. Refactor the code to company standards
        i. Refactoring methods & Types
        ii. Examples
    e. Implement regression and acceptance testing with multiple parts of code
    f. Deploy working code with high quality