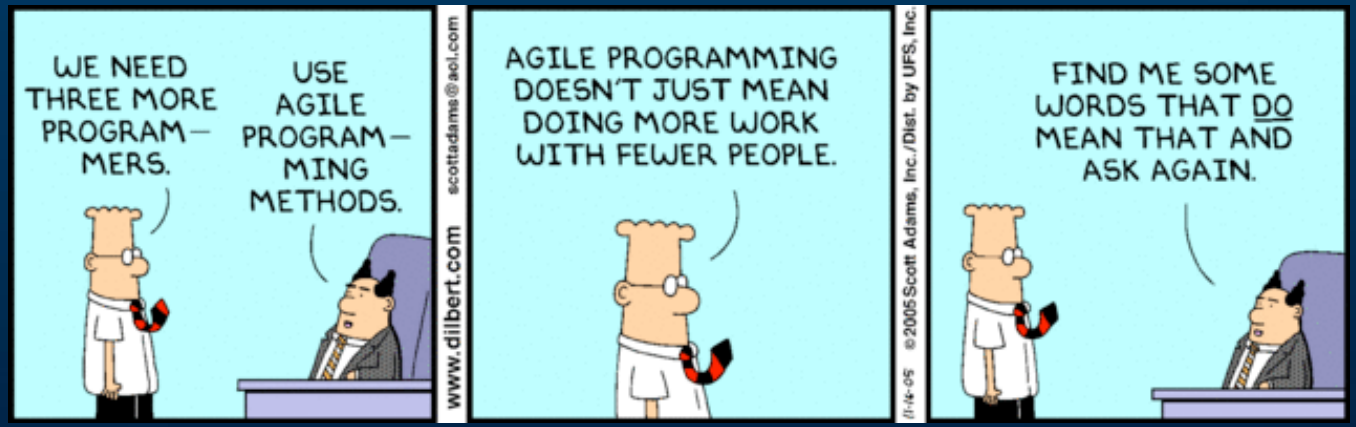
D0020E PROJECT I COMPUTER SCIENCE 2023/2024 LECTURE 2.2: TEST PART 1



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DOES SYSTEM TESTING FIT INTO SCRUM SPRINTS?

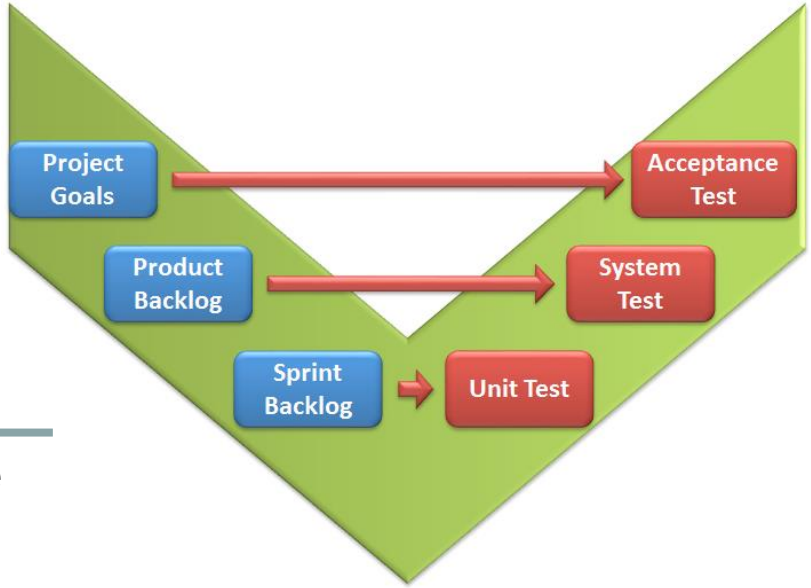
- Sure, we are doing test-driven development and are defining tests together with stories!
- But those tests are only targeting each and every story, non of them actually test the system..
- Yeah, and the system is defined by its parts, so don’t be worrisome and let's move on instead.
- Well, I don’t want to be difficult on this, and since you’re sure the product owner will be happy about what’s delivered without more testing, I am fine with that.
- <cough> Well, some more testing won't hurt, but how do we manage that?

Testing takes a lot time and is hard to time-box since it may reveal unknowns

- Prioritize tests so that, whenever stop testing, you have done the best testing in the time available
- Automated tests to protect internal quality, and assure external quality

WHAT DIFFERENT TESTS SHOULD BE DONE?

- Unit tests performed by developers, against sprint print backlog stories (tasks)
- System tests performed by a tester in the team, against product backlog stories
- Acceptance tests performed by customer against the project goals



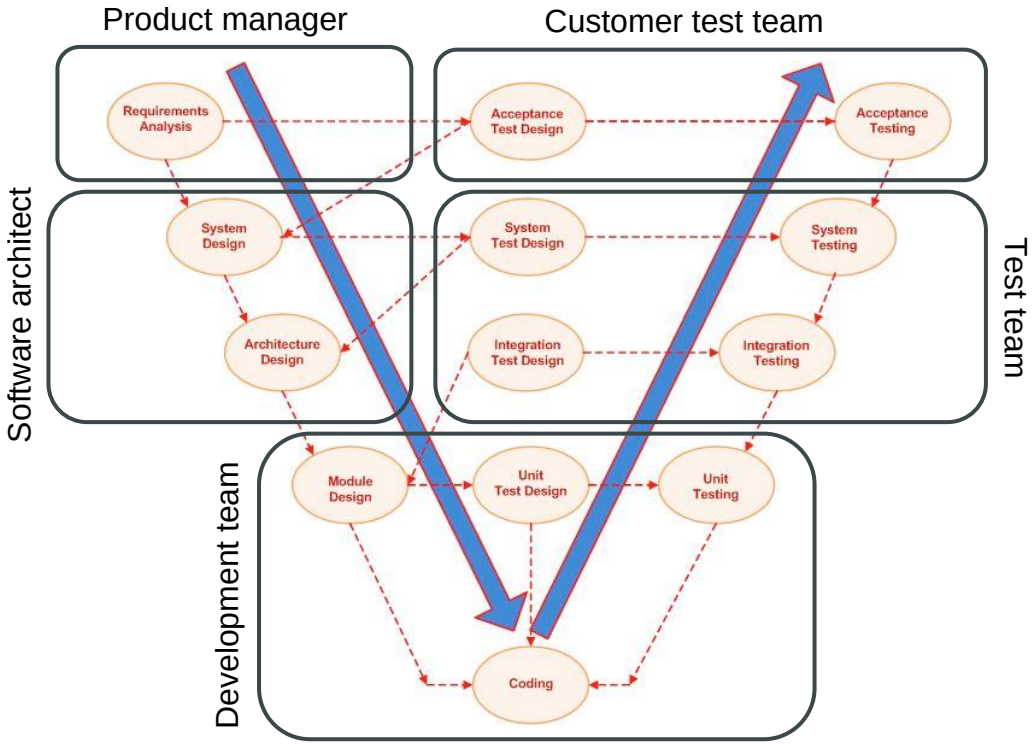
Testers are requirements stakeholders for the system, while developers focus on stories

- Include system tests as tasks in sprints
- Amount and coverage depends on sprint goal, e.g. the goal is to:
  - Demo stories to customers as teasers, aiming for getting orders for new stuff -> mainly automated testing, and limited if any manual system testing
  - Deliver new stuff while keeping existing things intact -> more system testing

CAN EXTENSIVE TESTING FIT INTO SPRINTS?

Mission critical systems will need more focused testing

- Separate team for test with own stories and sprints
- Perform tests and automate testing
  - Make no mistake, automated tests means developing code



CAN EXTENSIVE TESTING FIT INTO SPRINTS (CONT.)?

- Testing team
  - Feed development teams with identified bugs/issues and may suggest stories

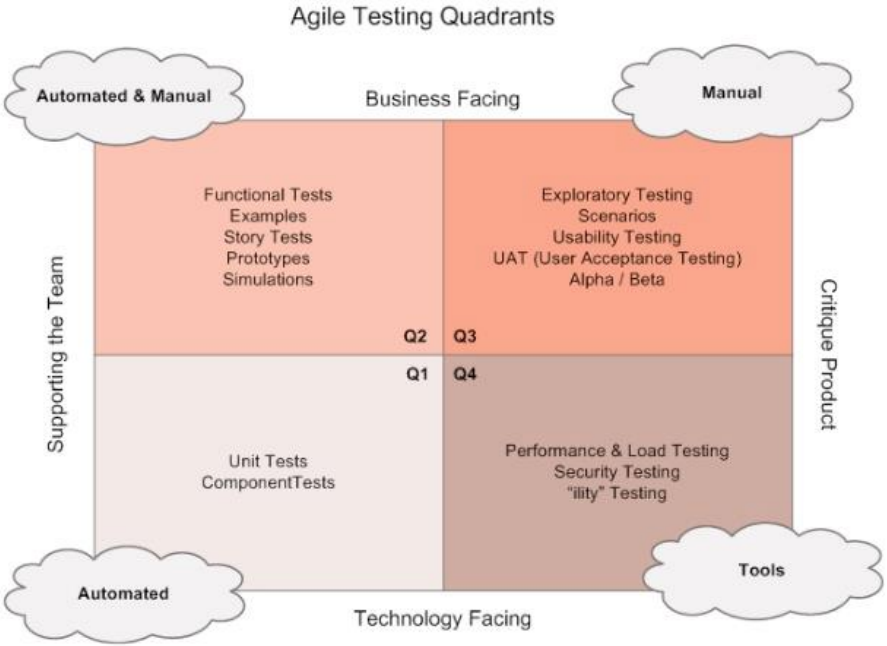
Agile Method

  - Testing comes after development (no surprise…)
  - Testing in separate teams runs in parallel with development sprints
    - May be done through separate sprints, or as a repetitive quality assurance process
  - Developers may (need to) support testing activities
    - Can be done in between sprints
    - Awaiting input from product owner
    - In parallel with software design, identifying development tasks, making time estimates…

WHAT CAN BE AUTOMATED?

Different perspectives to testing

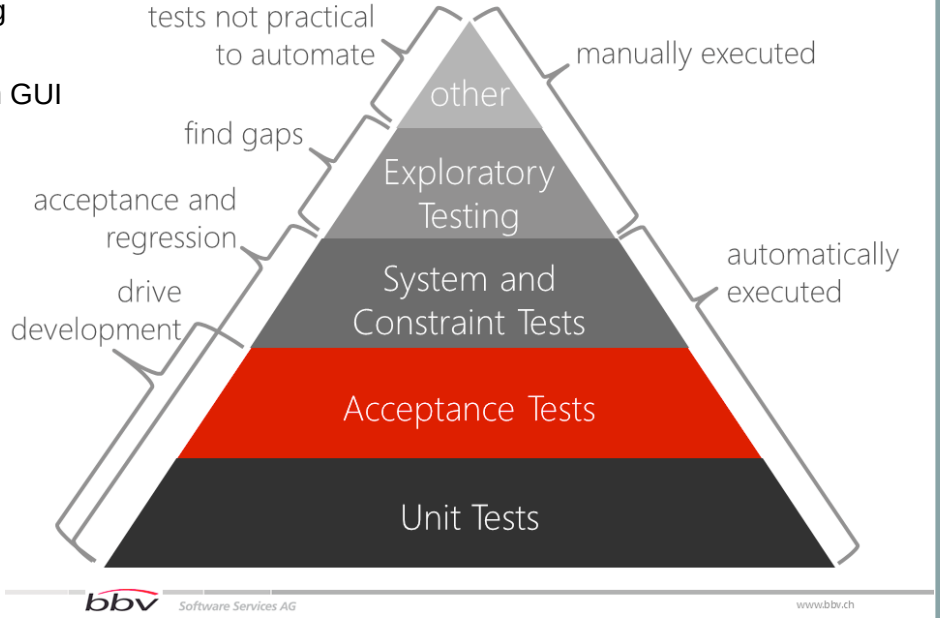
- Business facing
  - Test driven by customer requirements
  - Ensures external quality
- Technology facing
  - Validates software design
  - Protects internal quality
- Support development
  - Tests that illustrate, clarify, reassure how software should behave
- Critique product
  - Tests that find omissions, mistakes, incorrect assumptions



http://lisacrispin.com/2011/11/08/using-the-agile-testing-quadrants/

WHAT CAN BE AUTOMATED (CONT.)?

- Automated testing is any testing that is done without human interaction
- Tests can be fully automated, or just partly automated
- Automated tests can take different forms
  - Unit, component and subsystem testing
  - Installation of the system, plugins, etc.
  - Test execution of any type of test, even GUI
  - Integration with build system
  - Automatic test result reporting
- Automation takes time
  - Automating a test may take 2 to 10 times longer than running the test manually
  - Keep it simple, start small
  - Maintain a test automation backlog
  - Precise reporting, making it easy to follow up
  - Do not automate everything (select wisely)



HOW TO AUTOMATE – APPROACH AND TOOLS

- Make automated tests atomic
  - Tests should not depend on other tests
- Use a framework, or make your own
  - E.g. testNG, http://testng.org/doc/index.html
- Most development environments come with tools supporting testing
  - E.g. for Android developers, http://developer.android.com
  - UI/Application Exerciser Monkey
    - Runs on your emulator or device
    - Generates clicks, touches, or gestures, as well as a number of system-level events

- Web development, e.g.
  - Selenium implemented as a Firefox Add-On
  - Jenkins open source automation server written in Java (can use with Selenium)
  - JUnit unit testing framework for the Java
- Typically, a set of testing tools and frameworks are combined to create a suitable system for the given task (software solution)

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