

# Introduction to Software Testing

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# Autobiography

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- Role in eSpace:
  - Senior QC engineer
- Background and Experience:
  - Software Engineer – Tester in C-TDC, IBM Egypt
  - ISEB Certified
  - Application Developer in Extracted Oils Company



# Agenda

- **Introduction to Software Testing**
- **Defect Tracking**
- **Automated Testing**



# Agenda

- Introduction to Software Testing
- Defect Tracking
- Automated Testing

# Introduction

- **Some Testing Terminologies: Error, Fault and Failure, Verification and Validation, QC and QA**
- **Testing Definition**
- **Why testing is necessary?**
- **Simple Testing process(CMM, Agile)**
- **Types of Testing (Functional, non Functional Testing)**
- **Test Cases Structure**

# Error, Fault and Failure

- **Error:** is a human action that produces an incorrect result.
- **Fault:** manifestation of an error in software. It's also known as defects or bugs.
- **Failure:** a deviation of the software from its existing delivery or service.

# Validation & Verification

- **Validation:** Are we deliver the right products?
- **Verification:** Are we deliver the products right?

# QC & QA

- QC: Product Related
- QA: Process related

# Testing Definition

- The process of exercising or evaluating a system or system components by manual or automated means to verify that it satisfies specific requirements or to identify difference between expected and actual results. *“IEEE Definition”*
- Testing is the process of executing a program with the intent of finding errors.”  
*The art of software testing, Glenford J. Myers”*

# Testing in Different Aspects

- **Tester:** validate and verify the program.
- **Developer:** Program applies the requirements.
- **Project Manager:** delivery is with high quality.
- **Cooperation:** improve customer satisfaction, quality and profit, reduce costs related to customer service calls and re-writes of software.

# Why testing is necessary?

- ARIANE 5 !!

# Why Testing is Necessary? *Cont.*



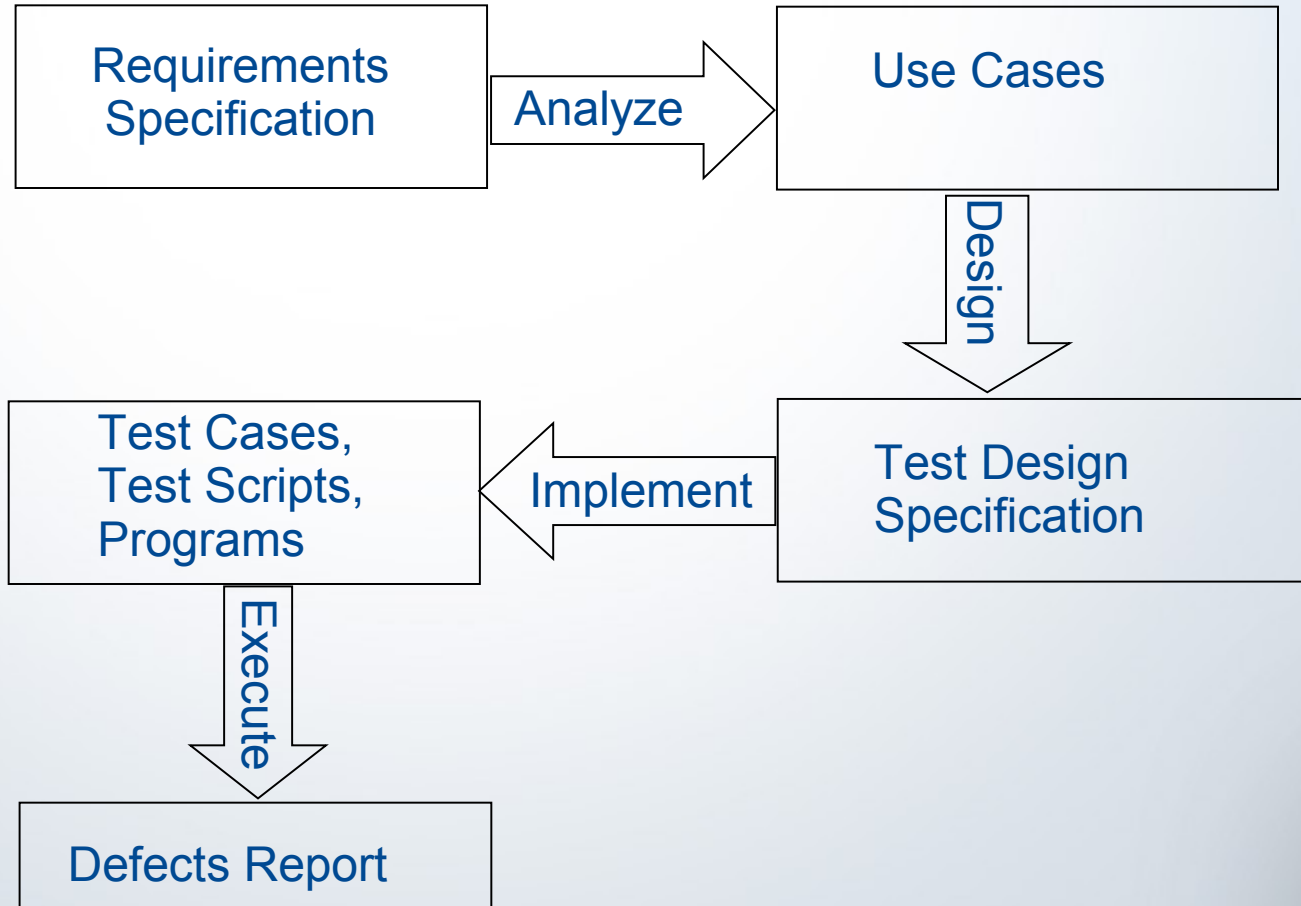
- Example: European Space Agency's Ariane 5 rocket exploded 37 seconds into its launch because.....Guess what?
- Just think of it. Ten years of work was destroyed only 37 seconds after launch.
- Software is NOT linear; small faults can have large effects.



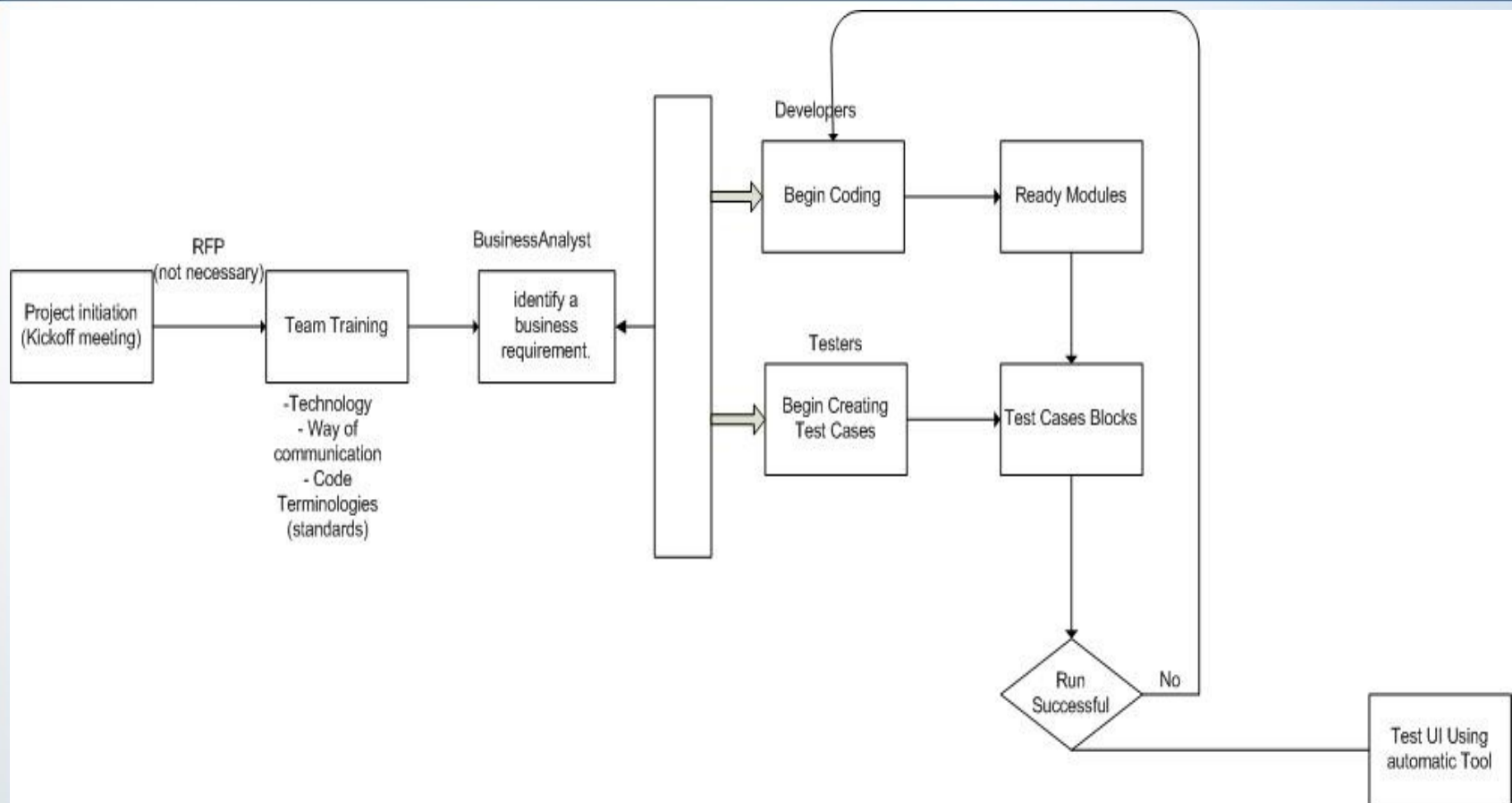
# Process... The Software Paradise

- **Definition**
  - **CMM**
  - **Agile**

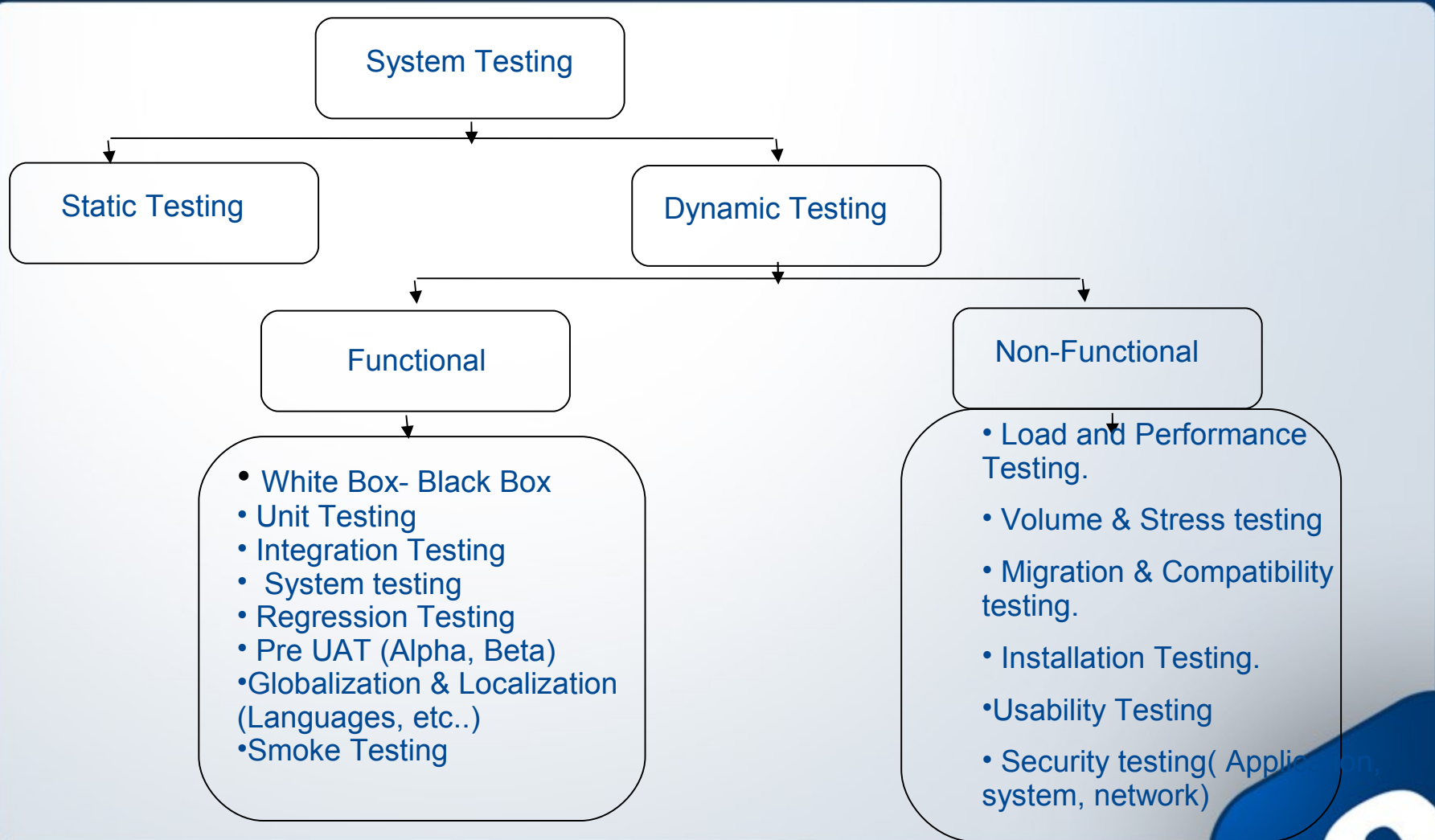
# Simple CMM Testing Process



# Simple BDD Testing Process



# Types of Testing



# Test Case Structure

- Test Case ID
- Subjective
- Prerequisite if there's any
- Scenario
- Expected Results
  
- **Example**
  - **Subjective/ Title**
    - 1- Login to Google account
  - **Prerequisite**

User has to have an account on Google
  - **Scenario:**
    - 1- Navigate to Google webpage
    - 2- Press Login
    - 3- Fill in the user name and password fields with your credentials
    - 4- Press Login
  - **Expected Results**

User is directed to his Google home page

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# Defect Tracking Process

- Is the process of finding defects in a product
- Tools Examples
  - Rational Clear Quest
  - Jira
  - Manits
  - Bugzilla

# Why Bugzilla?

- Advanced Search Capabilities
- Email Notifications Controlled By User Preferences
- Reports and Charts.
- Private Attachments and Comments.
- Move Bugs Between Installs .
- Save and Share Searches.



# It's used by the greats 😊, isn't it?



- **Free Software Projects**
- Mozilla: <https://bugzilla.mozilla.org/>
- Linux Kernel: <http://bugzilla.kernel.org/>
- Gnome: <http://bugzilla.gnome.org/>
- KDE: <http://bugs.kde.org/>
- Apache Project: <http://issues.apache.org/bugzilla/>
- Open Office: <http://www.openoffice.org/issues/query.cgi>
- Eclipse: <http://bugs.eclipse.org/bugs/>
- **Linux Distributions**
- Red Hat: <https://bugzilla.redhat.com/bugzilla/>
- Mandriva: <http://qa.mandriva.com/>
- Gentoo: <http://bugs.gentoo.org/>
- TurboLinux: <https://bts.turbolinux.co.jp/bugtraq/>
- Novell: <https://bugzilla.novell.com/>
- **Companies**
- NASA: <http://itos.gsfc.nasa.gov/~bugzilla/>
- & NOW: **eSapce** 😊



# Screen Shot From Bugzilla

**Bugzilla – Enter Bug: Portal Meta Framework**

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**Reporter:** heba.hosny@espace.com.eg

**Version:**

**Severity:**

**Priority:**

**Target Milestone:**

**Initial State:**

**Assign To:**

**CC:**

**Default CC:**

**URL:**

**Summary:**

**Description:**

**Attachment:**

**Keywords:**  (optional)

**Depends on:**

**Blocks:**

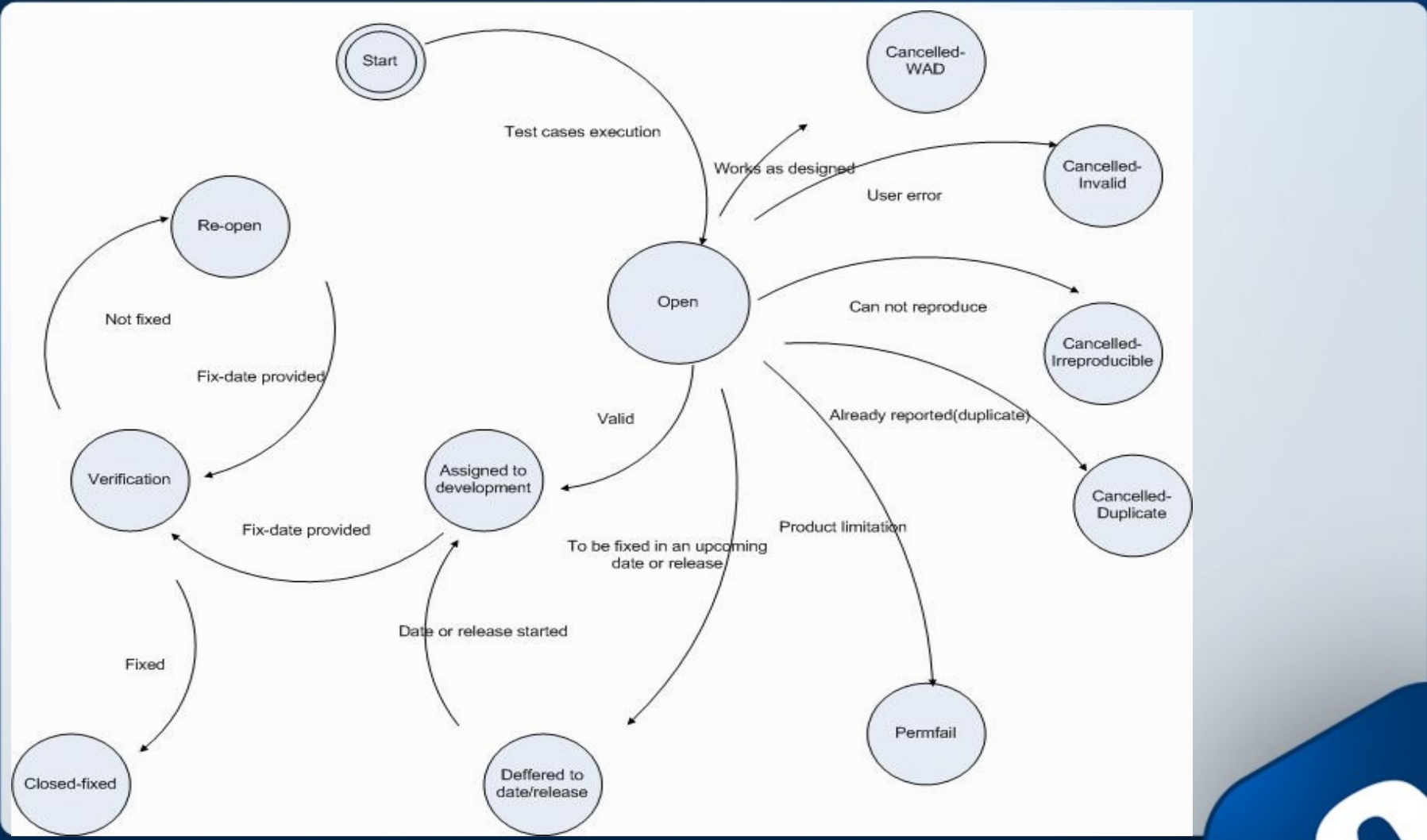
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# Defect Life Cycle



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# Automated Testing Concept

- Definition
- Why/When Automation
- Automated Testing Framework, i.e. xunit



# Challenges in Automation

- Development project in itself
- Could have bugs in it too
- Hard when:
  - Ad-Hoc Testing
  - If requirements or GUI changes, scripts have to be modified all again
  - No solid specs



# & Solution is:

- **Process**



# Select the Right Testing Tool

- Rational Robot
- Rational Functional Tester
- Winrunner
- Watir
- Rspec
- Selenium

# RSPEC

Story: transfer from savings to checking account

As a savings account holder

I want to transfer money from my savings account to my checking account  
So that I can get cash easily from an ATM

Scenario: savings account has sufficient funds

Given my savings account balance is \$100

And my checking account balance is \$10

When I transfer \$20 from savings to checking

Then my savings account balance should be \$80

And my checking account balance should be \$30

Scenario: savings account has insufficient funds

Given my savings account balance is \$50

And my checking account balance is \$10

When I transfer \$60 from savings to checking

Then my savings account balance should be \$50

And my checking account balance should be \$10

# Selenium Modes of Operation

- Core
- Selenium IDE
- Remote Control
- Selenium on Rails

# Selenium

- Automated Web Testing
- Run inside Your Browser
- Supports Tests in many languages:
  - Selenese (Pure HTMLs “Commands, Parameters”)
  - Java, C#, Perl, Python, Ruby, Java Script
- Record, Playback



# Selenium Core Demo

- Demo



# Selenium Core

- Implemented in 100% Java Script
  - Simple language called “Selenese(Java Script, no backend)”
- How to start it:
  - Drop it into your AUT
  - Create your test suite as an HTML file with a row for each test
  - Create your tests as HTML file with a command for each row ( action or accessors )
  - Access Selenium/TestRunner.html to run the test you've created



# Selenium IDE Demo

- Demo

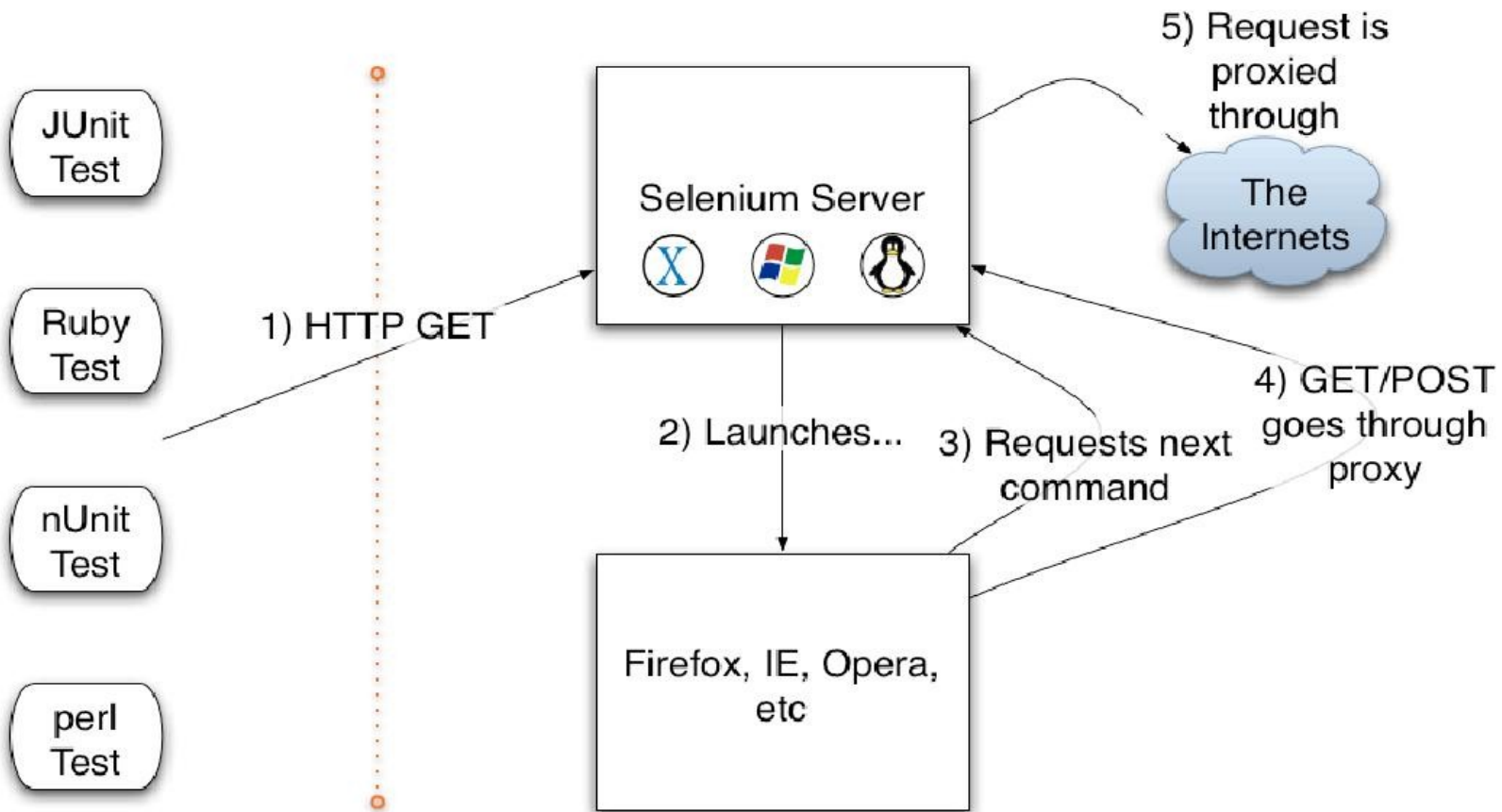


# Selenium IDE

- Firefox plugin that helps with records selenium tests scripts
- Supports core commands... you can record tests and copy it into core



# How Selenium RC works?



# References

- ISEB certification manual.
- Agile Automation Solutions- Lisa Crispin
- <http://selenium.openqa.org/>



# Questions



**Thank You** 😊

