Research projects in software testing

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STX among the other software testing research projects

- Top down approach in the research projects:

**ANTI-project:** Basic research of SW testing, 2004 - 2007

**MASTO-project:** Reference model of SW testing, 2008 - 2011

**STX-project:** Intended quality, 2011 - 2014

**Cloud Testing Laboratory** 2014 -

**ISO/IEC 29119:** SW testing standard

SW testing in the cloud

**ISO/IEC 29119, 33063, 25000 series**

5. Improving Software Testing by Observing Practice, ISESE, Rio de Janeiro, Brazil, Taipale, O., K. Smolander.
Overview on MASTO-project (2008-2011)
ISO/IEC 29119 Test processes

ORGANIZATIONAL TEST PROCESS

TEST MANAGEMENT PROCESSES

TEST PLANNING
TEST MONITORING & CONTROL
TEST COMPLETION

DYNAMIC TEST PROCESSES

TEST DESIGN & IMPLEMENTATION
TEST ENVIRONMENT SET-UP & MAINTENANCE
TEST EXECUTION
TEST INCIDENT REPORTING
According to ISO/IEC 25010 (Software product quality), the quality in the software product is a composition of several quality attributes. These quality attributes define the quality objectives for software.
Combination of Test Improvement model (TIM) maturity levels and ISO/IEC 29119 processes. Preliminary study for ISO/IEC 33063 “Testing SPICE”.

Two results:
- General maturity and conformance with the standard model.
- Process improvement objectives to develop test process.
Publications from the MASTO project (2008 -2011)

1. Test Case Selection and Prioritization: Risk-Based or Design-Based? Jussi Kasurinen, Ossi Taipale and Kari Smolander, ESEM
Software testing and development for intended quality, STX (2011-2014)
Research Problem

OU’s are evaluated through an assessment framework

**Software Development**
- Software Products
  - ISO/IEC 12207
  - ISO/IEC 33000 series
- New Services, Cloud computing

**Software Testing**
- ISO/IEC 29119, 33063, IEEE Std 1012, cloud testing

**Intended Software Quality**
- ISO/IEC 25000 series, Software Quality
Objective

- To show how software development, software testing and intended quality depend on one another.
  - Traditional software development and service models
  - Emerging XaaS (Everything as a Service) architectures, technologies and service models.

- The project results help the participating companies in improving the efficiency of their quality management and software testing and hence the efficiency of their software development as a whole.
  - Testing techniques
  - Testing as a service
Testing of Quality Characteristics

Software testing standard 29119 Part 4 contains information on how to map Quality Characteristics to Test Design Techniques and how to map Quality Characteristics to Types of Testing. This is used as reference in this study.
Software Testing in the Cloud

Cloud based testing offers a new delivery, operation and maintenance model that is enabled by the internet.

It affects the actual testing work and the way testing services are delivered. It also engages the management in paying attention to aspects such as pricing and security.

Objective: This is an empirical study aimed at understanding how organizations can successfully use the cloud for testing and how cloud based testing facilitates or hinders in reaching for quality requirements or quality attributes.
1. The system or application under test is available online.

2. Testing infrastructure and platforms are hosted in the cloud (Including crowdsourcing/Human as a Service-(Haas)).

3. Testing of the cloud itself.

Facets of testing in the cloud:

- 1a. SaaS software
- 1b. Non-SaaS software
Testing in the cloud affects:

- **Acquisition** (cloud based testing emphasizes services)
- **Business** (cloud based testing emphasizes pay per use instead of license fees)
- **Access** (services are accessed over internet)
- **Technical models of testing** e.g. scalability
Peer-reviewed articles
Theses
M.Sc.

In Review