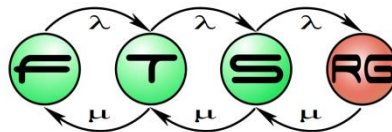


Introduction

Zoltan Micskei

**Budapest University of Technology and Economics
Fault Tolerant Systems Research Group**



Main topics of the course

- Overview (2)
 - Introduction, V&V techniques
- Static techniques (1)
 - Verifying source code
- Dynamic techniques: Testing (7)
 - Testing overview, Test design techniques
 - Test generation, Automation
- System-level verification (3)
 - Verifying architecture, Dependability analysis
 - Runtime verification

Who is this course for?

Systems Engineer

- Requirements, verifying specification

Architect, Designer

- Modeling and verifying designs

Developer, Coder

- Verifying source code, unit testing

Test Designer

- Test processes and techniques

Test Engineer

- Test automation, integration and system tests

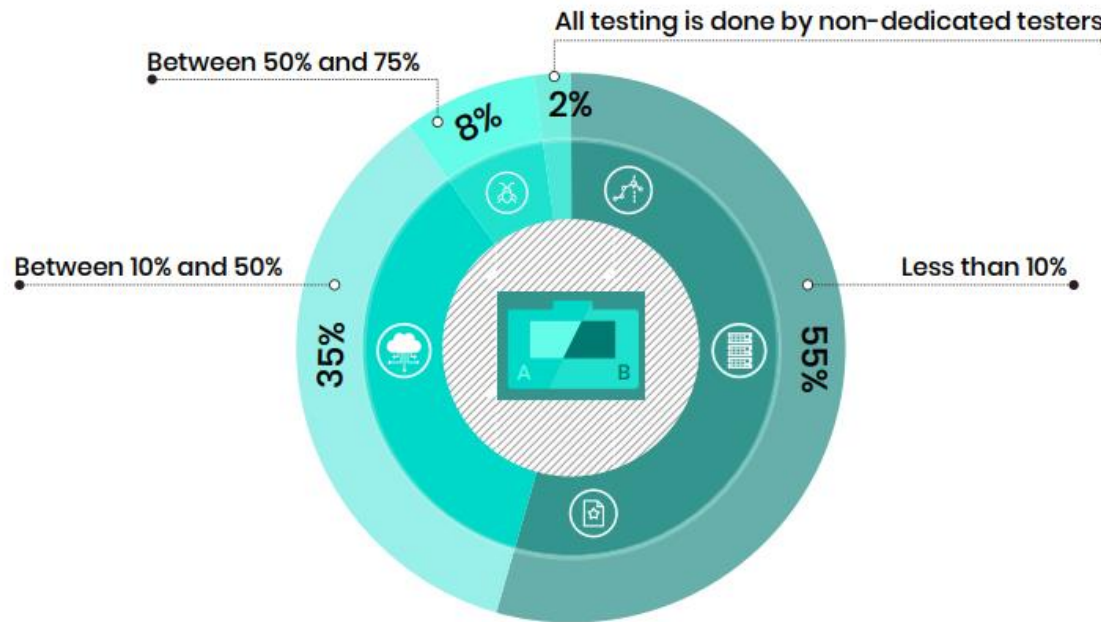
Safety Engineer

- Safety analysis

State of Testing Report 2019

How much of your testing is done by non-dedicated-testers?

In many organizations other team members also take part in the formal testing process.
(Developers, Product Owners, Support, End Users etc.)



Report: tools, techniques, skills, challenges...

<https://www.practitest.com/assets/pdf/stot-2019-ver1.0.pdf>

Stereotypes

“Testing is destructive.”

“Testing is just pushing buttons
and supplying values randomly.”

“If you are not good for a
developer, you can be a tester.”

“Testing is boring.”

“I tested in the debugger...”

V&V (and testing) in reality

V&V (and testing) is creative!

How is this working?

How can I prove it works?

How should it work?

How can it fail?

V&V (and testing) is constructive!

Testers are not breaking the SW (it was broken)

Testers help make the system better

Passion for quality

V&V (and testing) requires a different mindset

Intuition

Attention to details

...

Systems level thinking

Specific knowledge

V&V is context dependent!

Telco

- E2E, conformance...
- Protocol testing
- ITU, ETSI...

Enterprise

- Process-oriented
- Outsourcing
- Certification, ISTQB

Critical systems

- Safety
- Process, standards
- Documentation

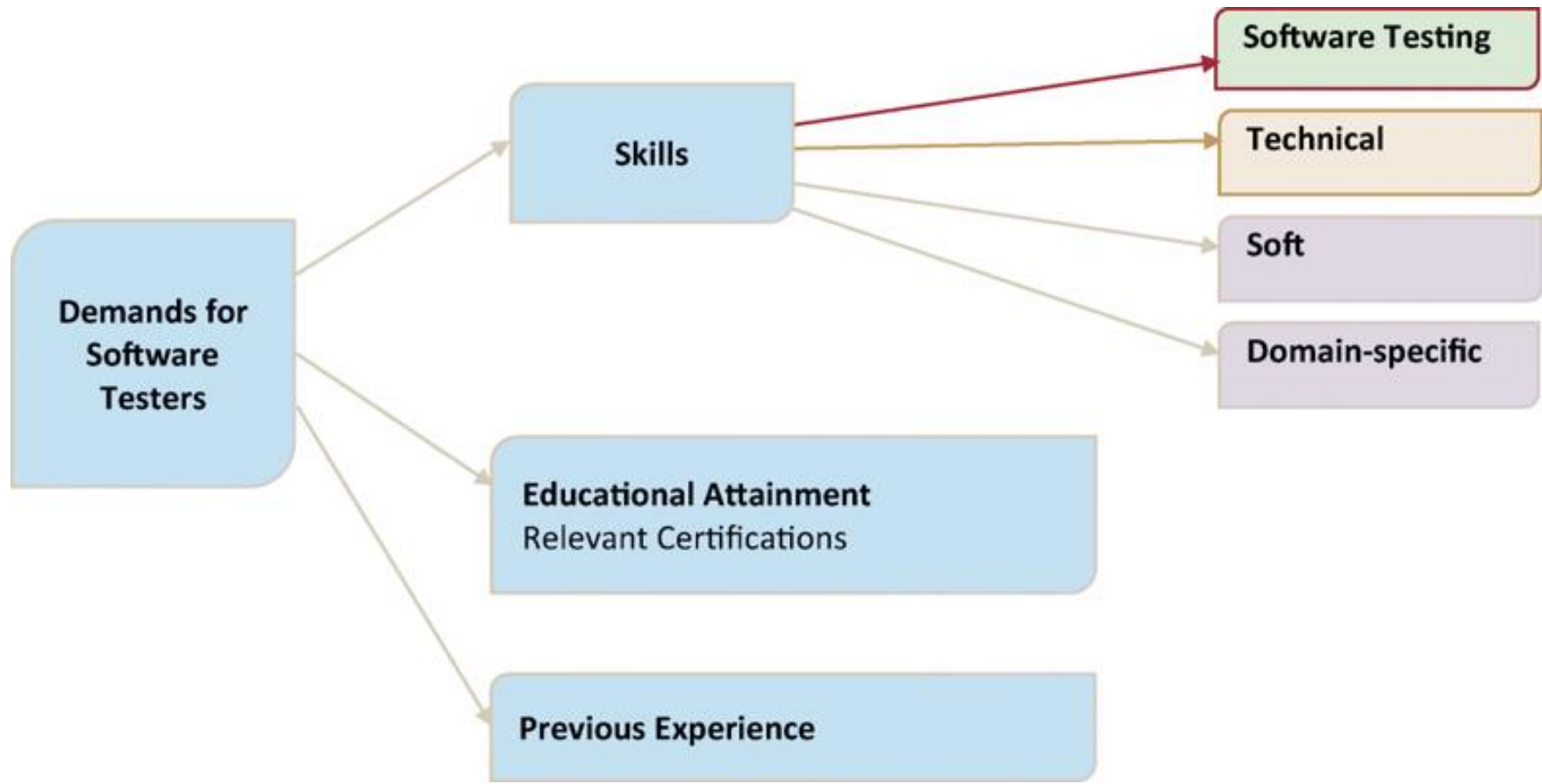
Startup, web

- Agile, Lean...
- Experiment, measure
- Fast feedback

V&V

```
graph TD; Telco[Telco] --> V&V((V&V)); Enterprise[Enterprise] --> V&V; CriticalSystems[Critical systems] --> V&V; StartupWeb[Startup, web] --> V&V;
```

The skills that employers look for in software testers



[Florea, R. & Stray, V. Software Qual J \(2019\).](#)

Useful resources (download now!)

- IEEE standards
 - [24765-2010](#) Systems and SW engineering – Vocabulary
 - [SE VOCAB](#) – online searchable form
 - [29148-2011](#) Requirements engineering
 - 29119 Software testing
 - [Part 1](#) Concepts and definitions, [Part 2](#) Test processes, [Part 3](#) Test documentation, [Part 4](#) Test techniques
- International Software Testing Qualifications Board (ISTQB)
 - [Syllabi](#): Foundation, Model-based Tester, Advanced Technical Test Analyst, Test Automation Engineer
 - [Glossary of Testing Terms](#)
- Hungarian Testing Board (HTB)
 - [Glossary](#) / Kifejezésgyűjtemény (Hungarian translation)

Why is it useful for me?

■ Can I learn this elsewhere?

- ISTQB MBT course [2 days, 1000 EUR]
- ISTQB Advanced TTA [3 days, 1200-1500 EUR]
- ...

■ Will I use it later? (Try searching for testing jobs!)

 Agile Test Automation Engineer Morgan Stanley – Budapest 3.8 ★	 Test Engineer - Aladdin Quality I BlackRock Hungary Kft – Budapest 3.8 ★	 Software Development Engineer in Test LogMeIn – Budapest 3.7 ★
 Test Engineer Dealogic – Budapest 3.3 ★	 Software Engineer in Test Prezi – Budapest 3.1 ★	 Test Automation Engineer - Automotive NNG LLC – Budapest 3.4 ★
 QA Test Engineer Play'n GO – Budapest 4.0 ★	 Vizsgálómérnök (Test Engineer) TÜV Rheinland – Budapest 2.9 ★	 Senior QA Secret Sauce Partners – Budapest 5.0 ★
 Test Engineer (UNIX Environment) Deutsche Telekom – Budapest 3.6 ★	 Engineering Manager Hortonworks – Budapest 4.1 ★	 Senior Software Test Developer Mentor Graphics – Budapest 4.2 ★

Useful events



11
SEP

Tuesday, September 11, 2018, 6:00 PM

Teszt & Tea - Tesztelési piramis a gyakorlatban



Hosted by [Péter Földházi J.](#)

Kedves Kollégák! Az iskolakezdéssel az újabb meetup szezon is elindul. Meginvítalnánk a Google Grundra, ahol előadóink a tesztelési piramis gyakorlati alkalmazását mutatják be. Agenda: 1. Szikszai László (EPAM Systems) teszt piramis? A teszt piramis egy fontos építőköve a hatékony teszteknek, amikor nem lehet megvalósítani a teljes teszt piramist, vagy éppen csak

Prerequisites

- Software Engineering course
 - Concepts: testing, V&V, requirements
- Programming language
 - Java
- Code, build & test tools
 - Version control: Git
 - Build tool: Maven
 - Some static analysis tool
 - Mocking: Mockito

Start with LAB0 materials if you are not familiar with these!