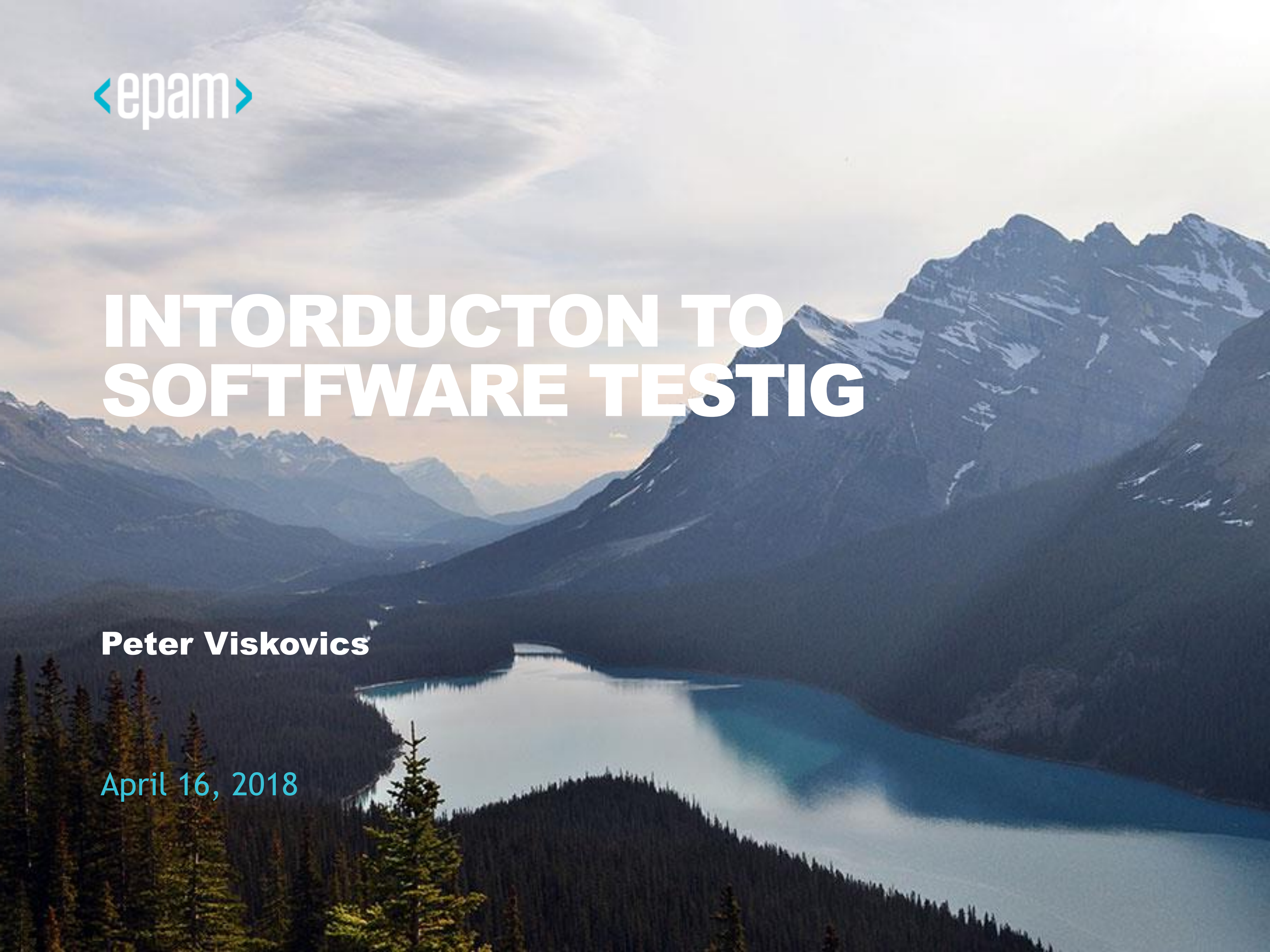


INTORDUCTON TO SOFTWARE TESTIG

Peter Viskovics

April 16, 2018

Agenda

1. About me
2. About Epam
3. Why to learn software testing?
4. What is quality?
5. What do QA-s do?
6. Test principles
7. Test levels
8. Dynamic and static testing

About me

Peter Viskovics

Lead Software Test Automation Engineer at EPAM Systems

EPAM Systems • Budapest University of Technology and Economics

NOKIA | Networks

SMS Team

Software Engineer
- TNSDL & C programming
- DX200 platform testing

<epam>

French Travel Company

Senior Test Automation Engineer
- Web frontend testing
- Automation with Selenium

<epam>

Swiss Bank

Lead Test Automation Engineer
- Full stack testing
- Automation with Selenium/Java

<epam>

British Luxury Fashion House

Lead Test Automation Engineer
- Mobile Web Frontend testing
- Automation with Selenium/Ruby

<epam>

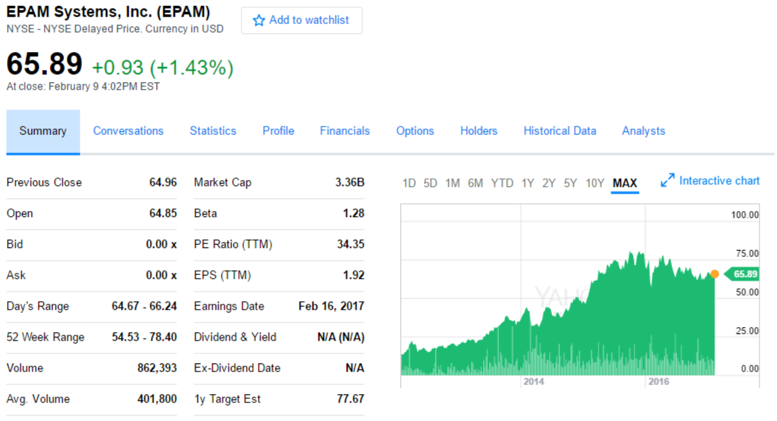
German Startup

Lead Test Automation Engineer
- Full stack testing
- Automation with Selenium/Java

Epam Fact Sheet

Company

1993 founded, US-based
Public (NYSE:EPAM)



EPAM Systems, Inc. (EPAM)
NYSE - NYSE Delayed Price. Currency in USD

65.89 +0.93 (+1.43%)
At close: February 9 4:02PM EST

Previous Close	64.96	Market Cap	3.36B
Open	64.85	Beta	1.28
Bid	0.00 x	PE Ratio (TTM)	34.35
Ask	0.00 x	EPS (TTM)	1.92
Day's Range	64.67 - 66.24	Earnings Date	Feb 16, 2017
52 Week Range	54.53 - 78.40	Dividend & Yield	N/A (N/A)
Volume	862,393	Ex-Dividend Date	N/A
Avg. Volume	401,800	1y Target Est	77.67

Headcount

~25,000 IT engineers

Transparency and Security

ISAE 3000 Type 2 (SAS 70 Type II)

**CMMI – DEV v. 1.3
Maturity Level 5**

ISO 27001:2005

SEC governed

Industry Focus

Ind. SW Vendors and Tech.	22%
Banking and Finance	31%
Travel and Consumer	21%
Information and Media	13%

Geography Focus

North America	50%
Europe	39%
CIS	8%
APAC	2%

Service mix

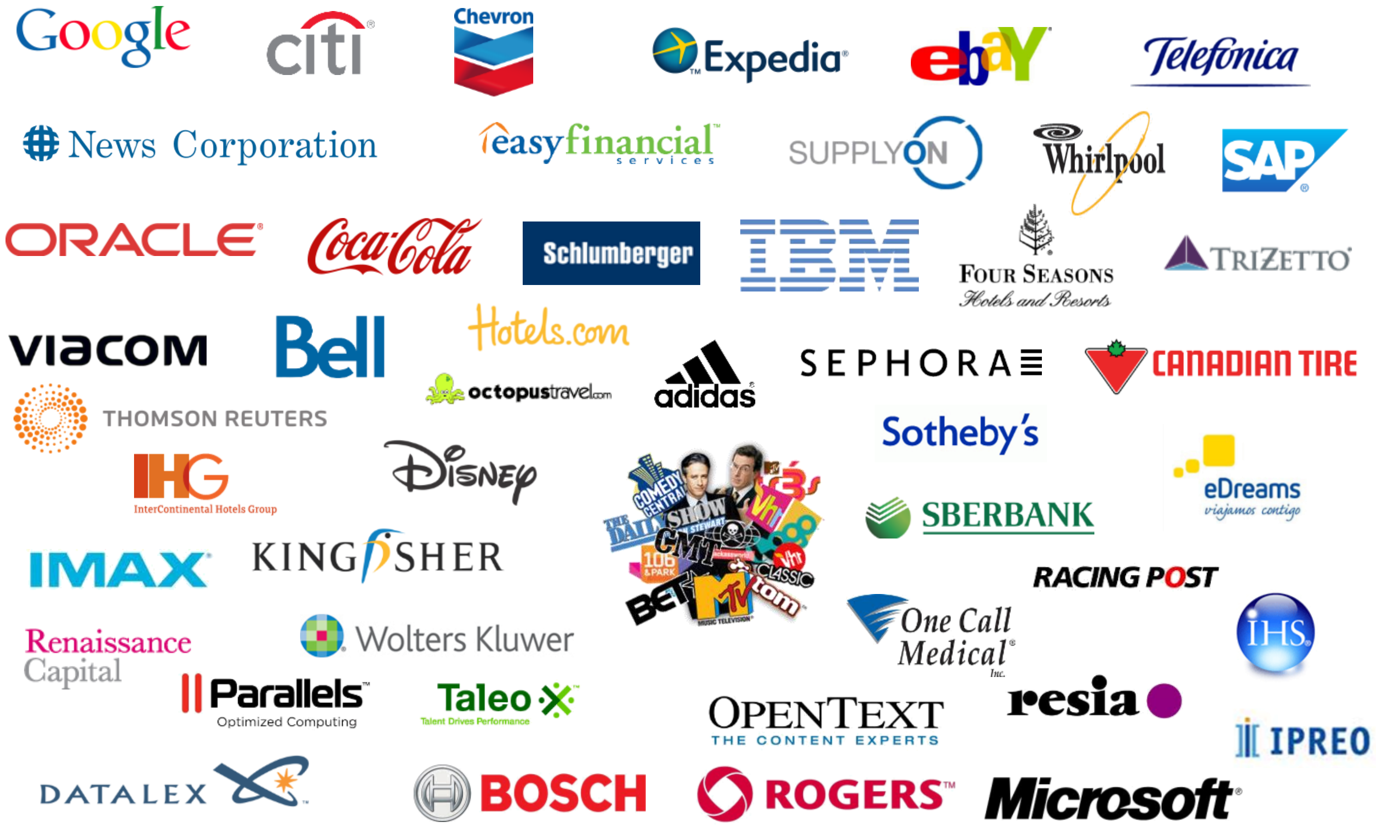
Software development	69%
Application testing	20%
Maintenance and support	8%
Infrastructure services	2%
Licensing	1%

Locations (55+)

- US: Newtown, New York, Boston, Philadelphia, Santa Clara, Atlanta, Chicago, Houston, LA, Minneapolis, Seattle, San Diego, Orlando, Washington
- Canada: Toronto
- UK: London
- Switzerland: Zurich
- Germany: Frankfurt, Munich
- Netherlands: Amsterdam
- Sweden: Goteborg
- Belarus: Minsk, Gomel, Brest, Grodno, Mogliev, Vitebsk
- Russia: Moscow, St. Petersburg, Ryazan, Izhevsk, Samara, Saratov, Tver, Sergiev Posad, Togliatti
- Ukraine: Kiev, Dnipro, Kharkiv, Lviv, Vinnitsya
- Poland: Krakow, Wroclaw, Gdansk
- Kazakhstan: Astana, Karaganda
- **Hungary: Budapest, Szeged, Debrecen**

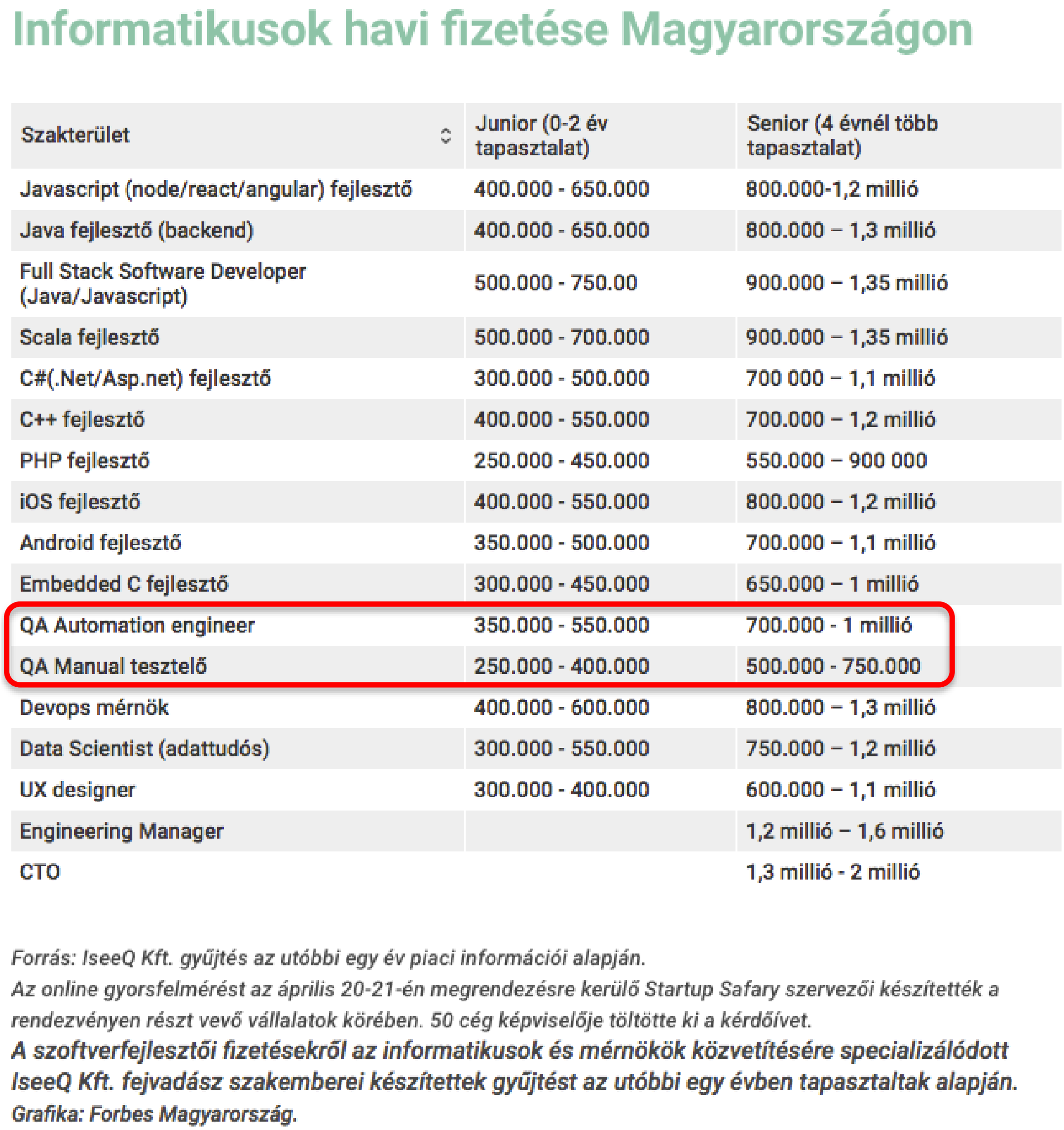
  ~1700 ~1200 / ~400 / ~100
- Bulgaria: Sofia
- Singapore
- China: Shenzhen; Hong Kong
- Armenia: Yerevan
- Mexico: Guadalajara
- India: Hyderabad, Pune

Blue-chip clients rely on EPAM



WHY TO LEARN SOFTWARE TESTING?

IT salaries in 2017



Informatikusok havi fizetése Magyarországon

Szakterület	Junior (0-2 év tapasztalat)	Senior (4 évnél több tapasztalat)
Javascript (node/react/angular) fejlesztő	400.000 - 650.000	800.000-1,2 millió
Java fejlesztő (backend)	400.000 - 650.000	800.000 – 1,3 millió
Full Stack Software Developer (Java/Javascript)	500.000 - 750.00	900.000 – 1,35 millió
Scala fejlesztő	500.000 - 700.000	900.000 – 1,35 millió
C#(.Net/Asp.net) fejlesztő	300.000 - 500.000	700 000 – 1,1 millió
C++ fejlesztő	400.000 - 550.000	700.000 – 1,2 millió
PHP fejlesztő	250.000 - 450.000	550.000 – 900 000
iOS fejlesztő	400.000 - 550.000	800.000 – 1,2 millió
Android fejlesztő	350.000 - 500.000	700.000 – 1,1 millió
Embedded C fejlesztő	300.000 - 450.000	650.000 – 1 millió
QA Automation engineer	350.000 - 550.000	700.000 - 1 millió
QA Manual tesztelő	250.000 - 400.000	500.000 - 750.000
Devops mérnök	400.000 - 600.000	800.000 – 1,3 millió
Data Scientist (adattudós)	300.000 - 550.000	750.000 – 1,2 millió
UX designer	300.000 - 400.000	600.000 – 1,1 millió
Engineering Manager		1,2 millió – 1,6 millió
CTO		1,3 millió - 2 millió

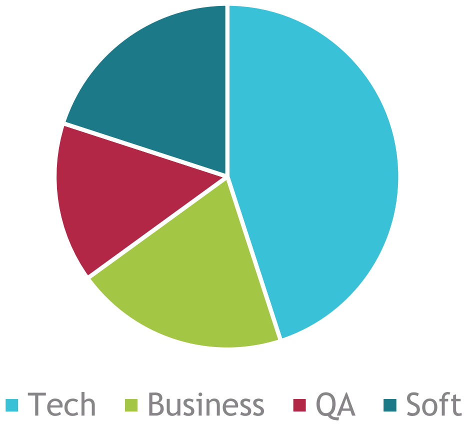
Forrás: IseeQ Kft. gyűjtés az utóbbi egy év piaci információi alapján.
Az online gyorsfelmérést az április 20-21-én megrendezésre kerülő Startup Safary szervezői készítették a rendezvényen részt vevő vállalatok körében. 50 cég képviselője töltötte ki a kérdőívet.

A szoftverfejlesztői fizetésekről az informatikusok és mérnökök közvetítésére specializálódott IseeQ Kft. fejvadász szakemberei készítettek gyűjtést az utóbbi egy évben tapasztaltak alapján.

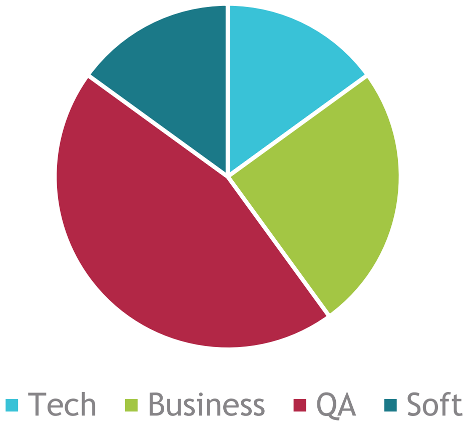
Grafika: Forbes Magyarország.

Being Software Tester

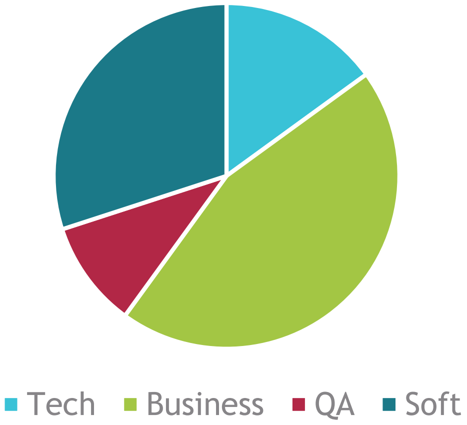
Developer profile



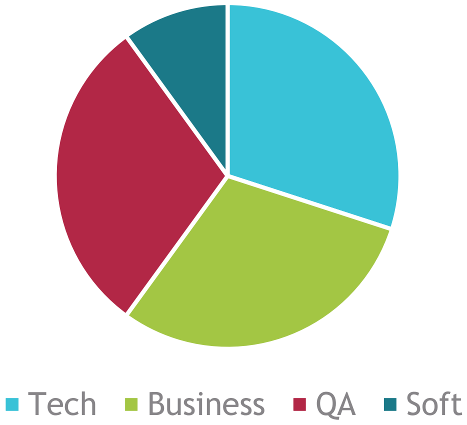
QA profile



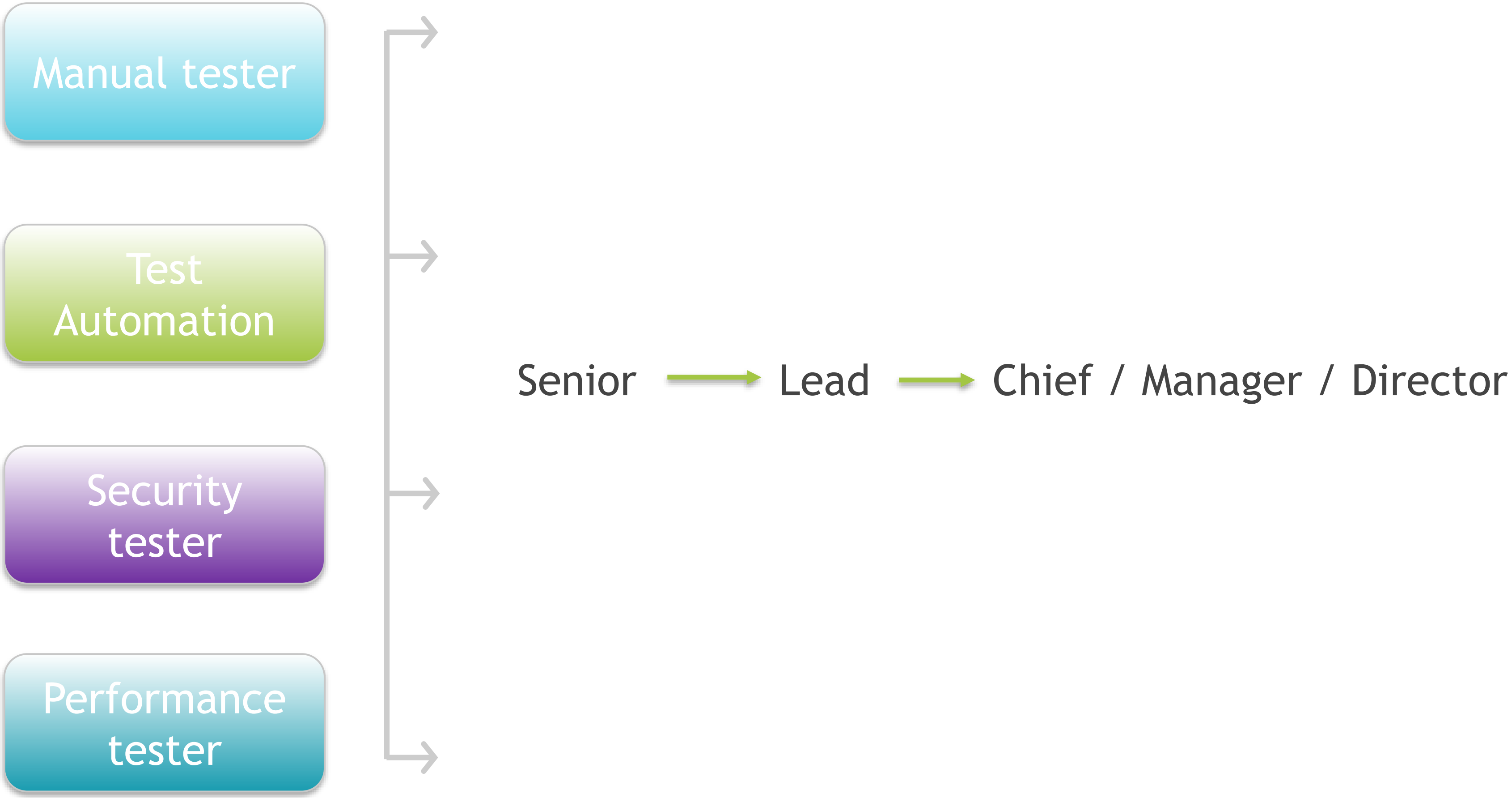
Business Analyst profile



Test Automation profile



QA careers



Manual tester

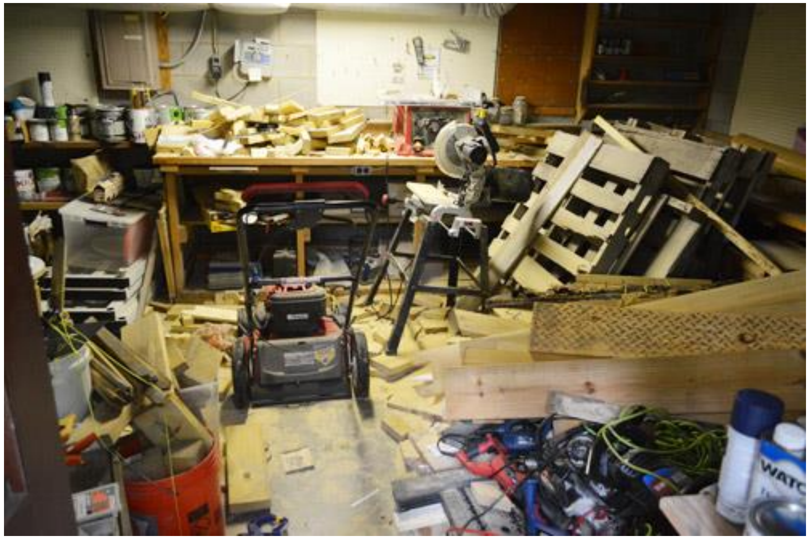
Test Automation

Security tester

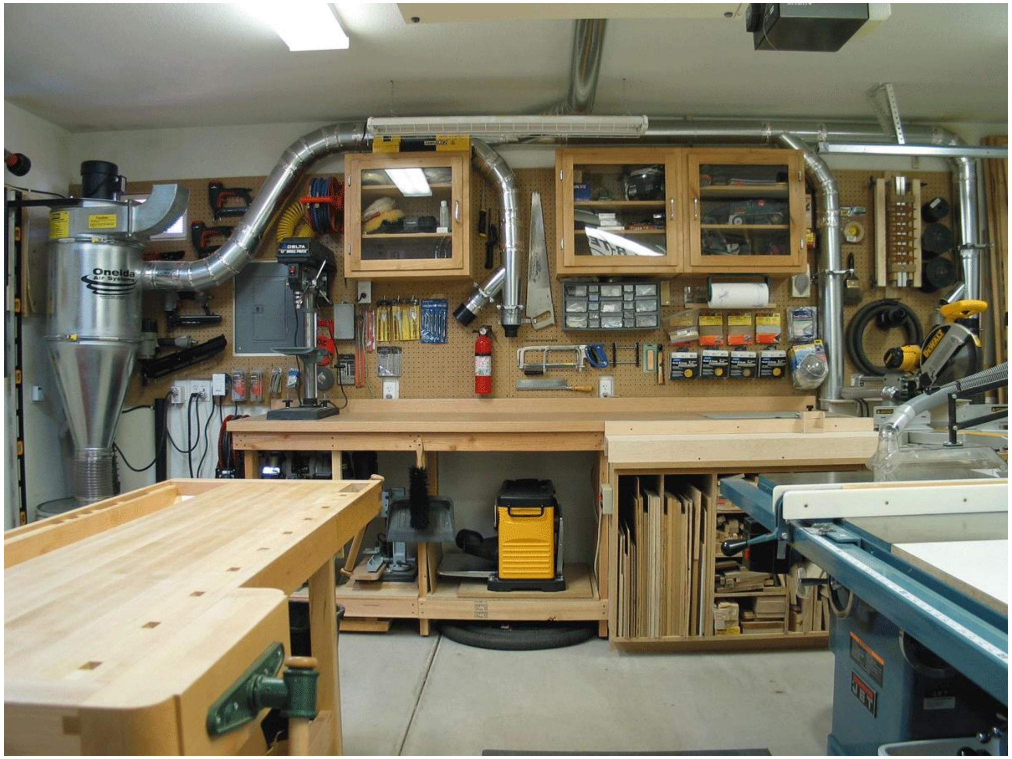
Performance tester

Senior → Lead → Chief / Manager / Director

What is quality?



vs.



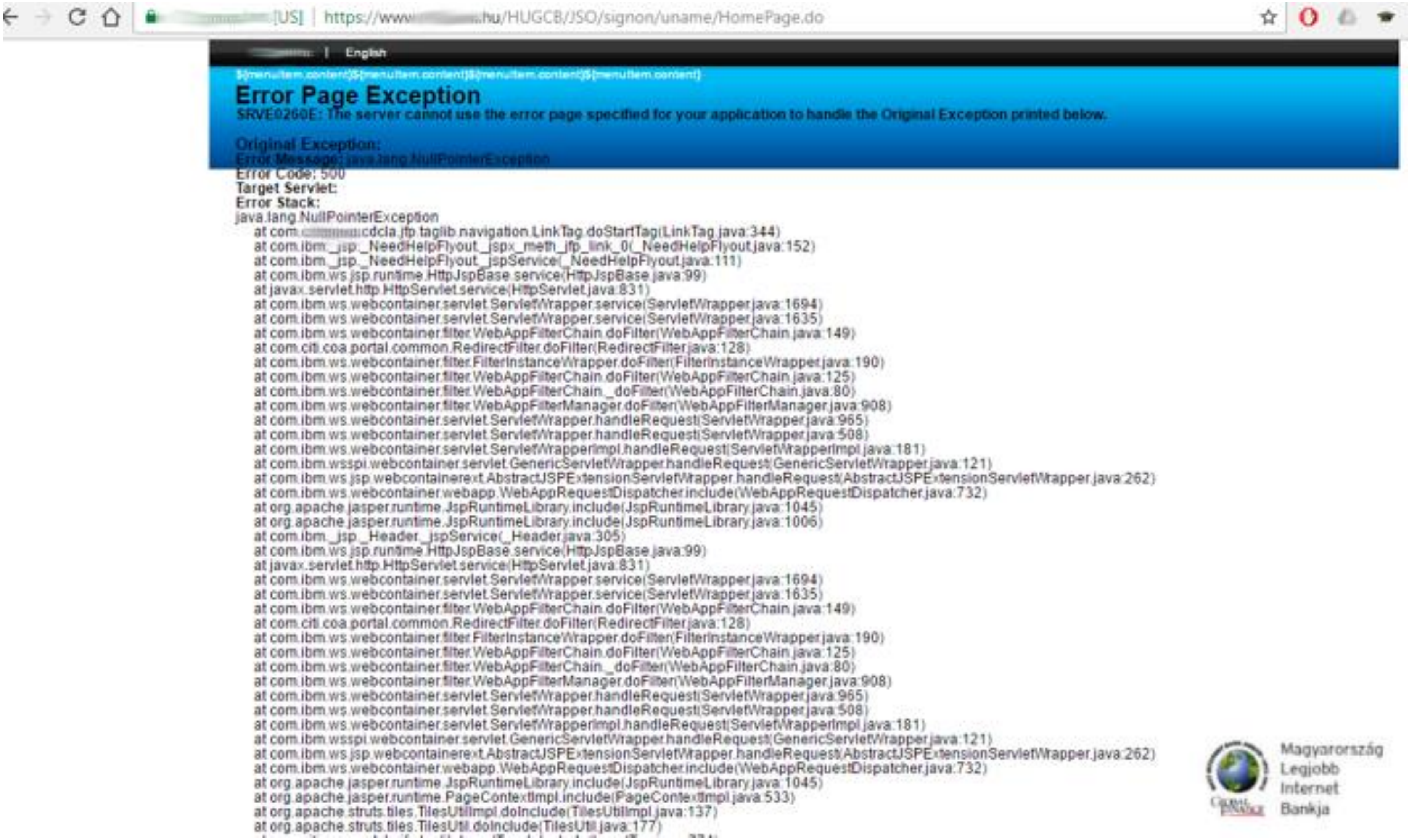
What is quality?

```
public void addCard(String username, String password, String type, String token)
        throws InterruptedException {
    addBag("sized", "004", token);
    WebDriver browser = new ChromeDriver();
    WebDriverWait wait = new WebDriverWait(browser, 20);
    browser.manage().window().setSize(new Dimension(640, 480));
    LoginPage login = new LoginPage(browser);
    CartPage cart = new CartPage(browser);

    // authentication bypass
    long t = System.currentTimeMillis();
    long pass = t-9/1000;
    browser.get(base + "/request/mytestdata/?pass=" + pass);

    wait.until(login.login_link_element.isExist());
    login.login_link.click();
    Thread.sleep(1000);
    login.setEmailField(username);
    login.setPasswordField(password);
    login.login.click();
    wait.until(cart.rfm_gen_element.isExist());
    Thread.sleep(1000);
    cart.rfm_gen();
    wait.until(cart.address_element.isExist());
    cart.address();
    wait.until(cart.saved_address_element.isExist());
    cart.saved_address.click();
    JavascriptExecutor jse = (JavascriptExecutor)driver;
    jse.executeScript("function(){document.getElementById('addressbar').display = 'block'}");
    wait.until(cart.cartPaymentElement.isExist());
    wait.until(cart.paymentElement.isExist());
    Thread.sleep(1000);
    cart.payment();
}
```

vs.

```
public void addCard(String username, String password,
String creditCardType, String token) {
    log("{} pays with {} type credit card”, username,
creditCardType);
    addToBag("sized", "004", token);
    WebDriver driver =
        DriverProvider.getInstance(BrowserType.CHROME);
    bypassAuthentication(driver);
    CartPage cart = new LoginPage(driver)
        .login(username, password);
    cart.checkout(creditCardType);
    driver.quit();
}
```

What is quality?



[redacted] [US] | https://www[redacted].hu/HUGCB/JSO/signon/uname/HomePage.do

[redacted] | English

${menuItem.content}${menuItem.content}${menuItem.content}${menuItem.content}

Error Page Exception

SRVE0260E: The server cannot use the error page specified for your application to handle the Original Exception printed below.

```
Original Exception:
Error Message: java.lang.NullPointerException
Error Code: 500
Target Servlet:
Error Stack:
java.lang.NullPointerException
    at com.[redacted]cdcla.jfp.taglib.navigation.LinkTag.doStartTag(LinkTag.java:344)
    at com.ibm._jsp._NeedHelpFlyout._jspx_meth_jfp_link_0(_NeedHelpFlyout.java:152)
    at com.ibm._jsp._NeedHelpFlyout._jspService(_NeedHelpFlyout.java:111)
    at com.ibm.ws.jsp.runtime.HttpJspBase.service(HttpJspBase.java:99)
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:831)
    at com.ibm.ws.webcontainer.servlet.ServletWrapper.service(ServletWrapper.java:1694)
    at com.ibm.ws.webcontainer.servlet.ServletWrapper.service(ServletWrapper.java:1635)
    at com.ibm.ws.webcontainer.filter.WebAppFilterChain.doFilter(WebAppFilterChain.java:149)
    at com.citi.coa.portal.common.RedirectFilter.doFilter(RedirectFilter.java:128)
    at com.ibm.ws.webcontainer.filter.FilterInstanceWrapper.doFilter(FilterInstanceWrapper.java:190)
    at com.ibm.ws.webcontainer.filter.WebAppFilterChain.doFilter(WebAppFilterChain.java:125)
    at com.ibm.ws.webcontainer.filter.WebAppFilterChain._doFilter(WebAppFilterChain.java:80)
    at com.ibm.ws.webcontainer.filter.WebAppFilterManager.doFilter(WebAppFilterManager.java:908)
    at com.ibm.ws.webcontainer.servlet.ServletWrapper.handleRequest(ServletWrapper.java:965)
    at com.ibm.ws.webcontainer.servlet.ServletWrapper.handleRequest(ServletWrapper.java:508)
    at com.ibm.ws.webcontainer.servlet.ServletWrapperImpl.handleRequest(ServletWrapperImpl.java:181)
    at com.ibm.wsspi.webcontainer.servlet.GenericServletWrapper.handleRequest(GenericServletWrapper.java:121)
    at com.ibm.ws.jsp.webcontainerext.AbstractJSPExtensionServletWrapper.handleRequest(AbstractJSPExtensionServletWrapper.java:262)
    at com.ibm.ws.webcontainer.webapp.WebAppRequestDispatcher.include(WebAppRequestDispatcher.java:732)
    at org.apache.jasper.runtime.JspRuntimeLibrary.include(JspRuntimeLibrary.java:1045)
    at org.apache.jasper.runtime.JspRuntimeLibrary.include(JspRuntimeLibrary.java:1006)
    at com.ibm._jsp._Header._jspService(_Header.java:305)
    at com.ibm.ws.jsp.runtime.HttpJspBase.service(HttpJspBase.java:99)
    at javax.servlet.http.HttpServlet.service(HttpServlet.java:831)
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    at com.citi.coa.portal.common.RedirectFilter.doFilter(RedirectFilter.java:128)
    at com.ibm.ws.webcontainer.filter.FilterInstanceWrapper.doFilter(FilterInstanceWrapper.java:190)
    at com.ibm.ws.webcontainer.filter.WebAppFilterChain.doFilter(WebAppFilterChain.java:125)
    at com.ibm.ws.webcontainer.filter.WebAppFilterChain._doFilter(WebAppFilterChain.java:80)
    at com.ibm.ws.webcontainer.filter.WebAppFilterManager.doFilter(WebAppFilterManager.java:908)
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    at com.ibm.ws.jsp.webcontainerext.AbstractJSPExtensionServletWrapper.handleRequest(AbstractJSPExtensionServletWrapper.java:262)
    at com.ibm.ws.webcontainer.webapp.WebAppRequestDispatcher.include(WebAppRequestDispatcher.java:732)
    at org.apache.jasper.runtime.JspRuntimeLibrary.include(JspRuntimeLibrary.java:1045)
    at org.apache.jasper.runtime.PageContextImpl.include(PageContextImpl.java:533)
    at org.apache.struts.tiles.TilesUtilImpl.doInclude(TilesUtilImpl.java:137)
    at org.apache.struts.tiles.TilesUtil.doInclude(TilesUtil.java:177)
```
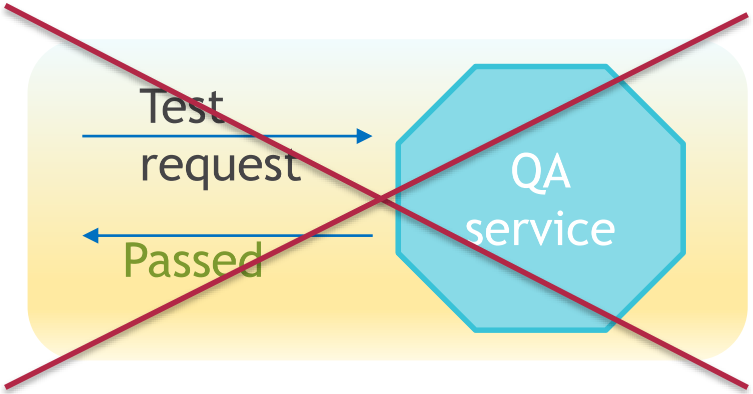
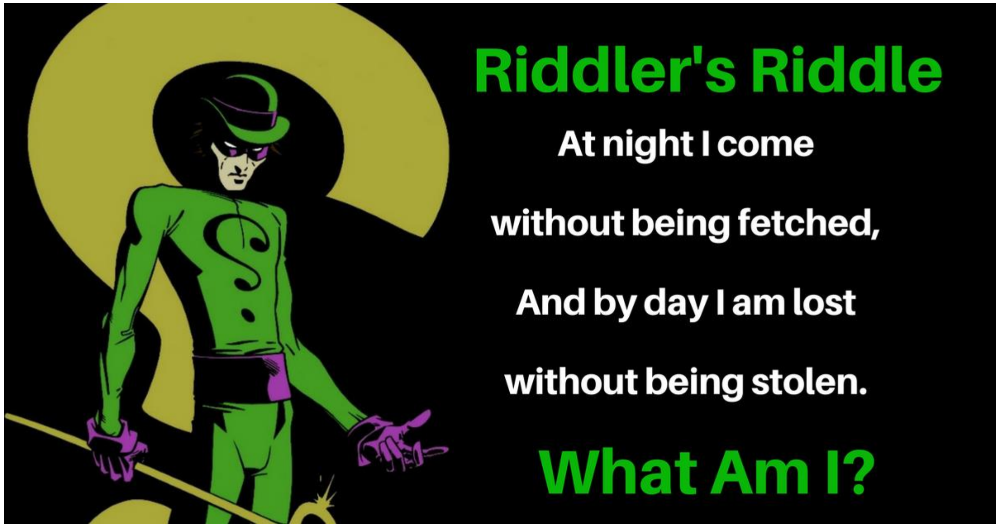

What is quality?

Key Performance Indicators



- ~~Number of hours in testing~~
- ~~Number of test cases~~
- ~~Number of issues found~~
- ~~Number of bugs created~~
- ~~Automation coverage~~
- ~~Code (branch/line/condition) coverage~~
- Number of software bugs in production / from the users
  - Not environment issues
  - Not requirement problems
  - How do you get bugs from the users / how do you learn if your app is faulty?
  - Not *opinions* reflecting 40% of people (where 60% desire the current behavior)
  - But a bug-free application doesn't mean that it's high-quality or successful
  - Test Manager influence over processes, tools? (time pressure?)

So what do QA-s do?



Riddler's Riddle

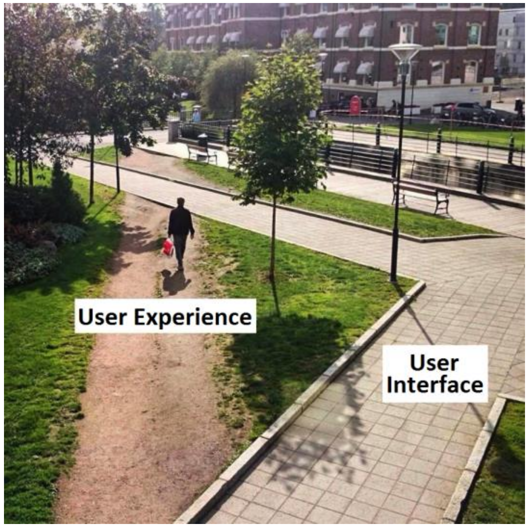
At night I come

without being fetched,

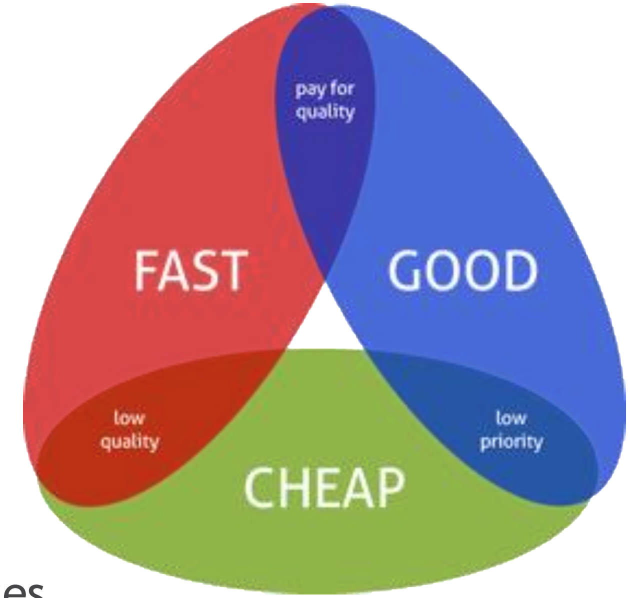
And by day I am lost

without being stolen.

What Am I?

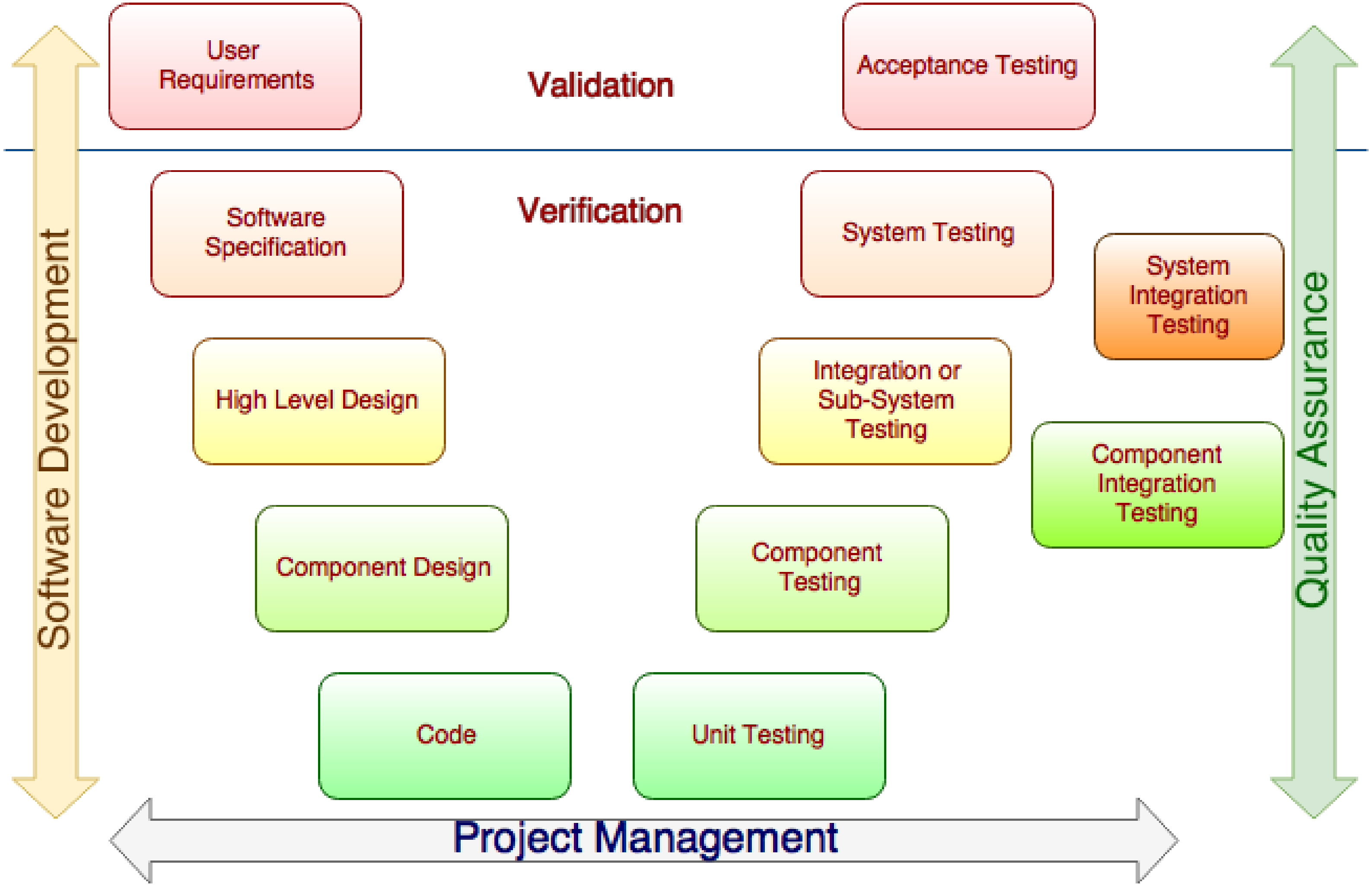


Test principles

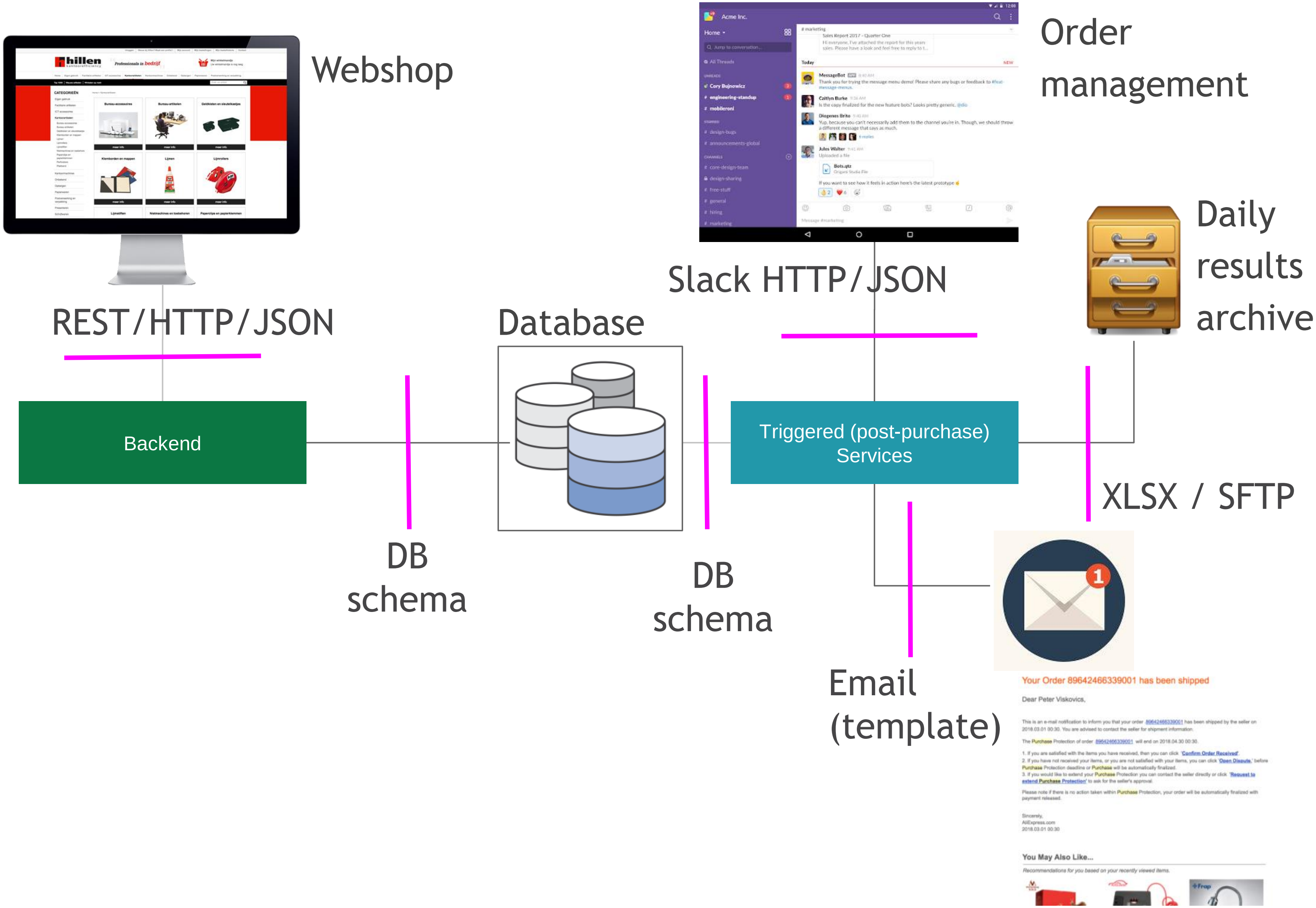


1. Testing shows the presence of defects
2. Exhaustive testing is impossible
3. Defects are clustered
4. Pareto principle: 80% of effects come from 20% of causes
5. Pesticide paradox
6. Testing is context dependent
7. “Absence of errors” fallacy

V-model


User Requirements
Validation
Acceptance Testing
Software Specification
Verification
System Testing
System Integration Testing
High Level Design
Integration or Sub-System Testing
Component Integration Testing
Component Design
Component Testing
Code
Unit Testing
Software Development
Quality Assurance
Project Management

Interfaces / architecture



Acme Inc.

Home

Jump to conversation...

All Threads

Cory Bujnowicz

engineering-standup

mobileroni

design-bugs

announcements-global

core-design-team

design-sharing

free-stuff

general

hiring

marketing

marketing

Sales Report 2017 - Quarter One

Hi everyone, I've attached the report for this years sales. Please have a look and feel free to reply to t...

Today NEW

MessageBot [illegible]

Thank you for trying the message menu demo! Please share any bugs or feedback to #feat-message-menus.

Caitlyn Burke [illegible]

Is the copy finalized for the new feature bots? Looks pretty generic. @dio

Diogenes Brito [illegible]

Yup, because you can't necessarily add them to the channel you're in. Though, we should throw a different message that says as much.

6 replies

Jules Walter [illegible]

Uploaded a file

Bots.qtz

Origami Studio File

If you want to see how it feels in action here's the latest prototype

Message #marketing

Your Order 89642466339001 has been shipped

Dear Peter Viskovics,

This is an e-mail notification to inform you that your order 89642466339001 has been shipped by the seller on 2018.03.01 00:30. You are advised to contact the seller for shipment information.

The Purchase Protection of order 89642466339001 will end on 2018.04.30 00:30.

1. If you are satisfied with the items you have received, then you can click 'Confirm Order Received'.
2. If you have not received your items, or you are not satisfied with your items, you can click 'Open Dispute,' before Purchase Protection deadline or Purchase will be automatically finalized.
3. If you would like to extend your Purchase Protection you can contact the seller directly or click 'Request to extend Purchase Protection' to ask for the seller's approval.

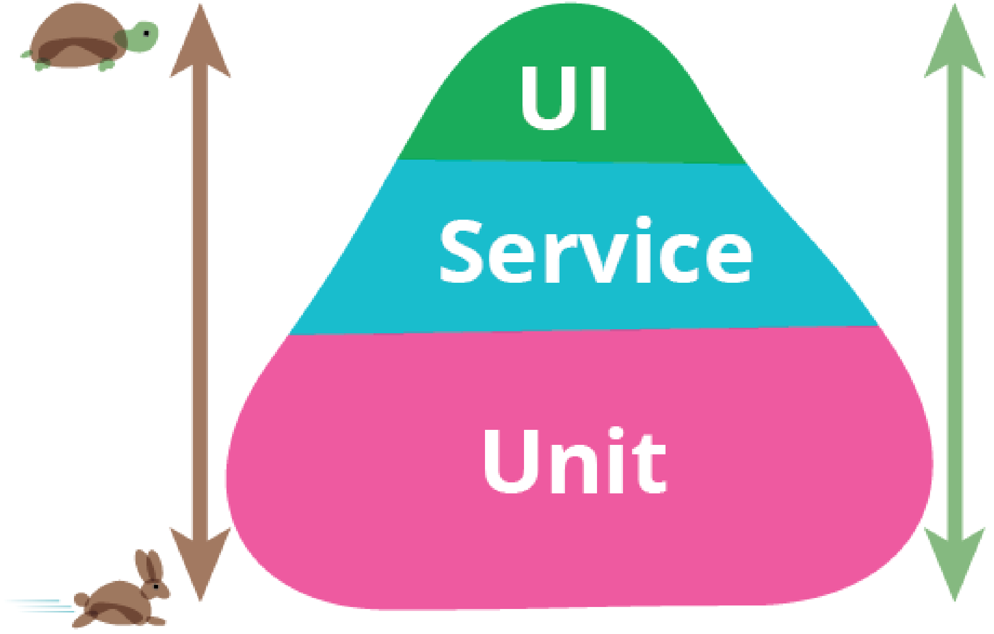
Please note if there is no action taken within Purchase Protection, your order will be automatically finalized with payment released.

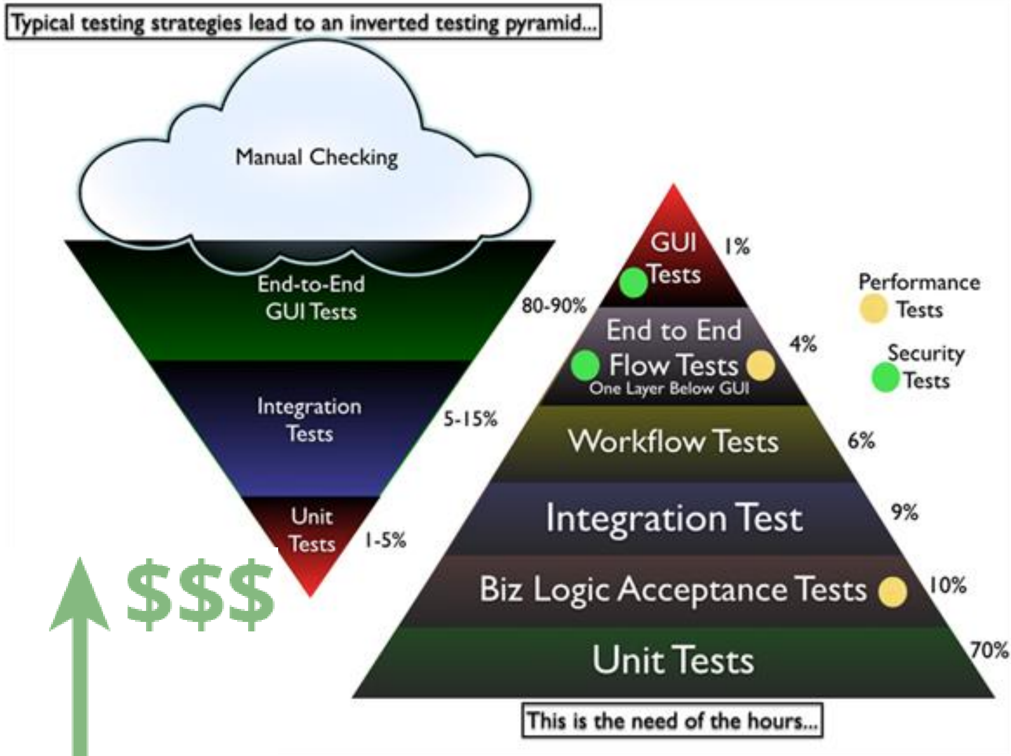
Sincerely,
AliExpress.com
2018.03.01 00:30

You May Also Like...

Recommendations for you based on your recently viewed items.

Testing pyramid

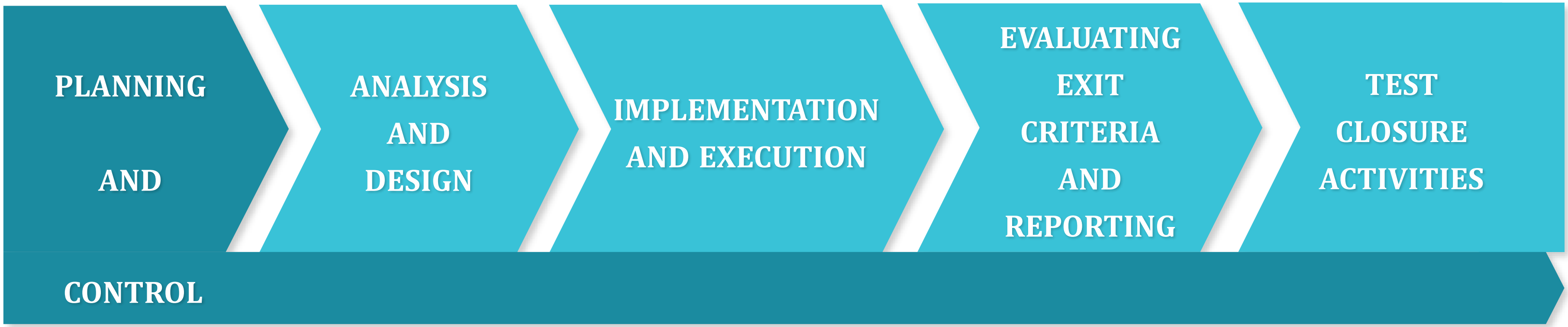




Continuous integration:
Integrate early, integrate fast

Fundamental test process

- Test-level independent



PLANNING AND CONTROL

ANALYSIS AND DESIGN

IMPLEMENTATION AND EXECUTION

EVALUATING EXIT CRITERIA AND REPORTING

TEST CLOSURE ACTIVITIES

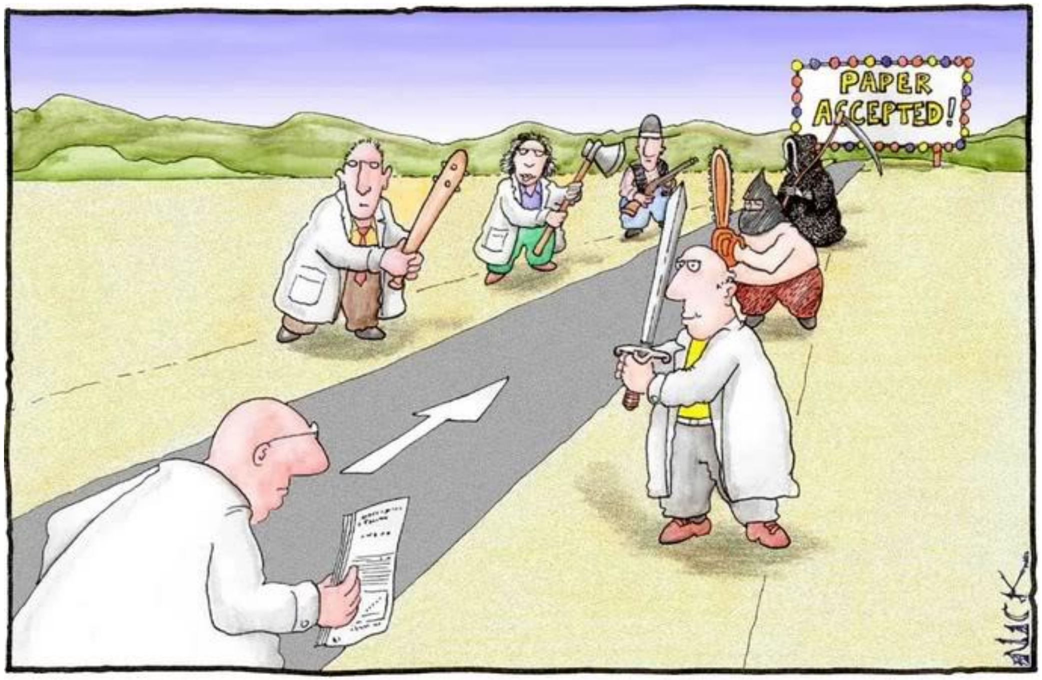
- Tailor for project context

Test types with dynamic testing

1. Functional testing
    - Black box test design techniques can be applied
    - Tests what the system does
    - Characteristics: suitable, accurate, secure, interoperable, compliant
2. Non-functional testing
    - Performance
    - Reliability
    - Availability
    - Efficiency
    - Scalability
    - Security (sometimes listed as functional test type)
    - Usability
    - And many more…
3. Structural testing
    - White box test design techniques can be applied (code coverage)
    - Tests how the system works
4. Change related testing
    - Smoke, baseline or regression testing
    - Re-testing (bugfix)

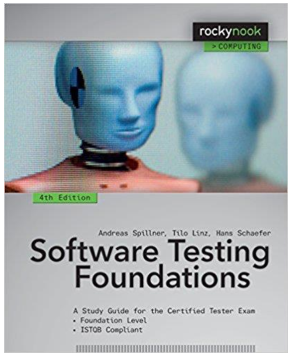
Static testing

- Informal Reviews
- Technical Reviews
- Walkthrough
- Inspection
- Static code review

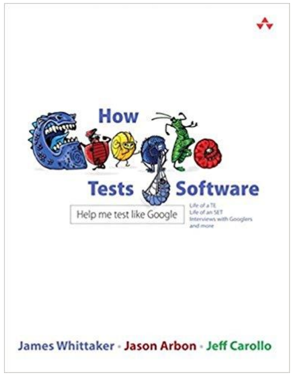


Further reading

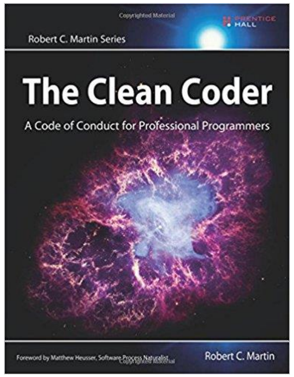
- **Software Testing Foundations: A Study Guide for the Certified Tester Exam (Rocky Nook Computing)** – 2014 by Andreas Spillner, Tilo Linz, Hans Schaefer


rockynook
> COMPUTING
4th Edition
Andreas Spillner, Tilo Linz, Hans Schaefer
Software Testing Foundations
A Study Guide for the Certified Tester Exam
• Foundation Level
• ISTQB Compliant

- **How Google Tests Software** – 2012 James A. Whittaker, Jason Arbon, Jeff Carollo


How Google Tests Software
Help me test like Google
James Whittaker · Jason Arbon · Jeff Carollo

- **The Clean Coder: A Code of Conduct for Professional Programmers** – 2011 by Robert C. Martin


Copyrighted Material
PRENTICE HALL
Robert C. Martin Series
The Clean Coder
A Code of Conduct for Professional Programmers
Foreword by Matthew Heusser, Software Process Naturalist
Robert C. Martin

THANK YOU!
(any questions?)