

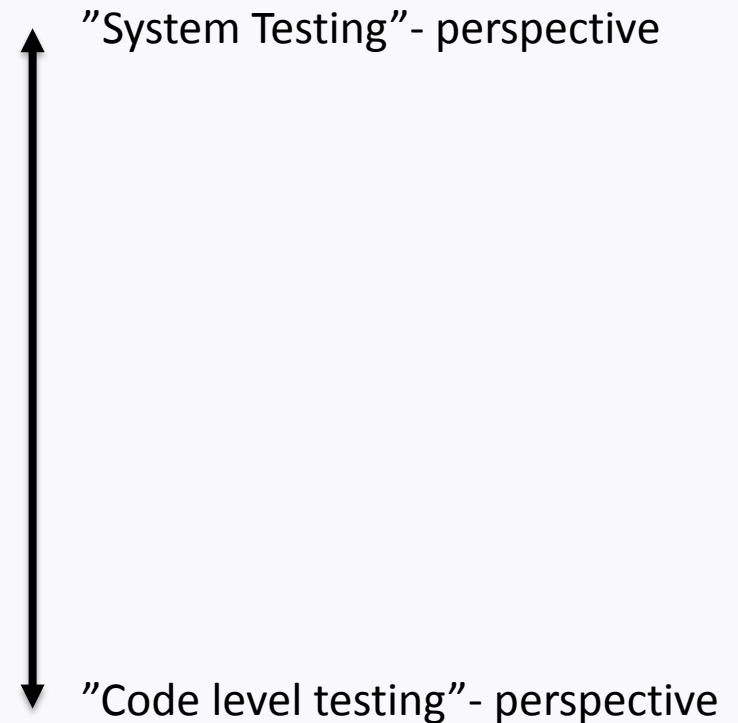
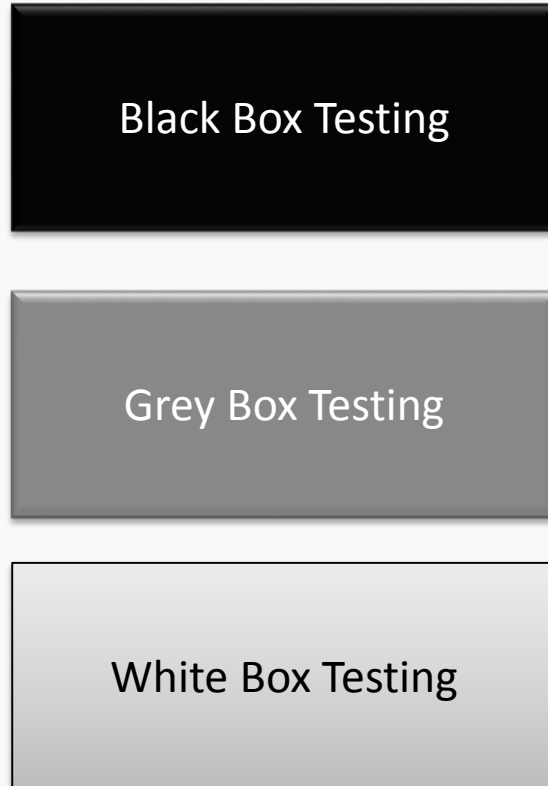
# Important testing concepts

# Agenda

- This is list of serveral important concepts to understand
- Slides are just a background material
- Please read more from course wiki

<https://github.com/narsuman/software-testing-course/wiki/course-materials-2015>

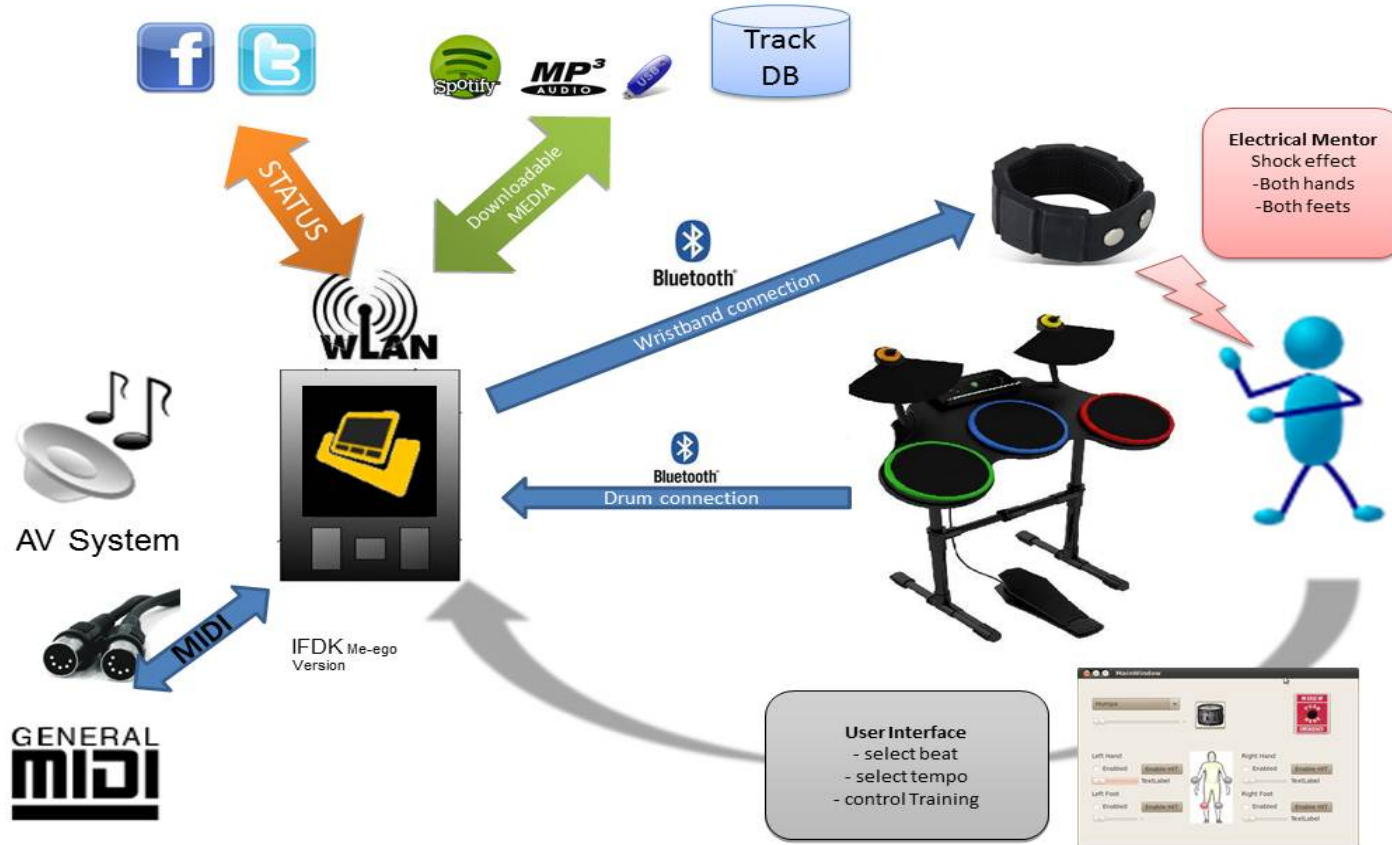
# Testing Orientation



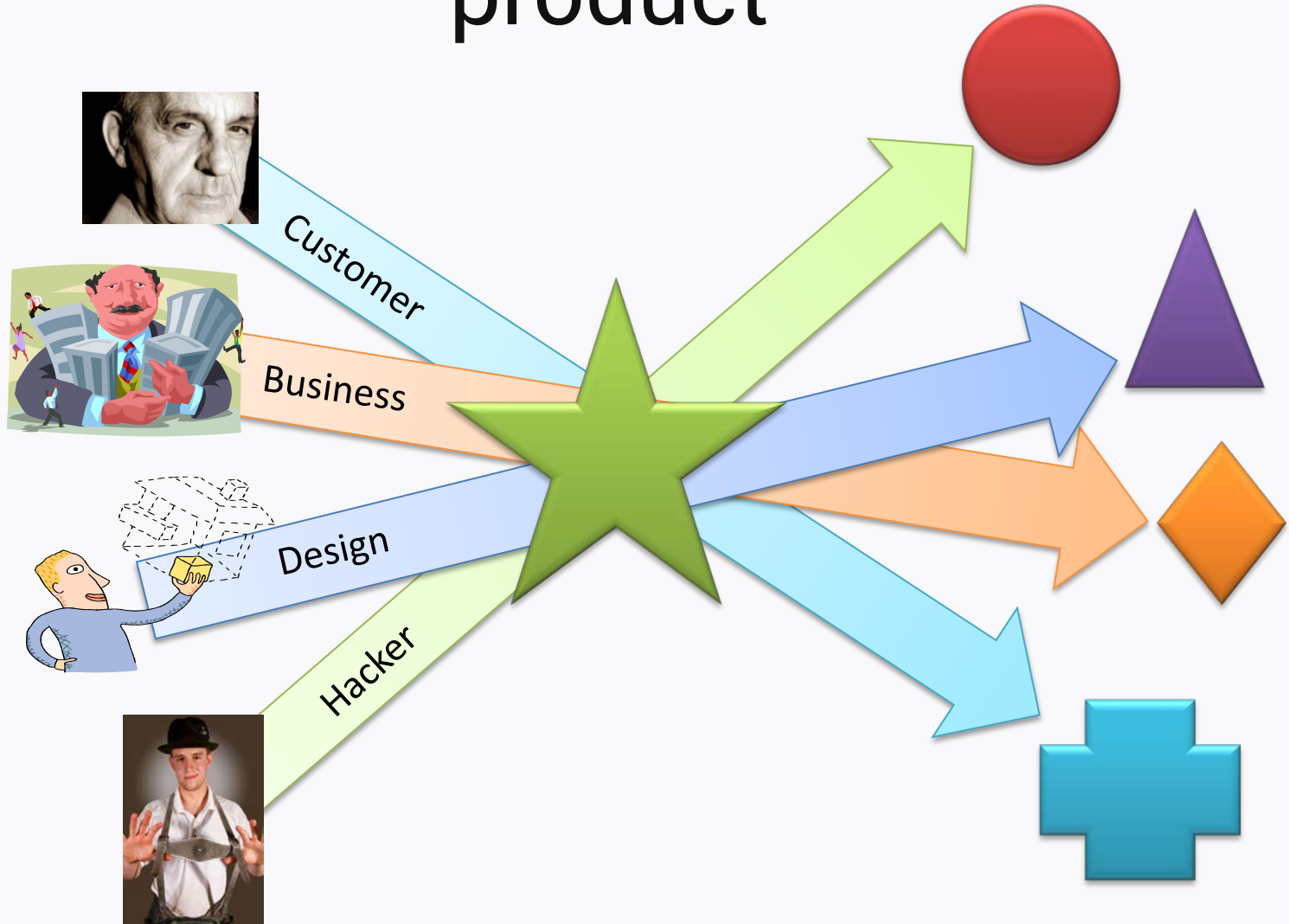
[http://en.wikipedia.org/wiki/Software\\_testing](http://en.wikipedia.org/wiki/Software_testing)

# System Requirements?

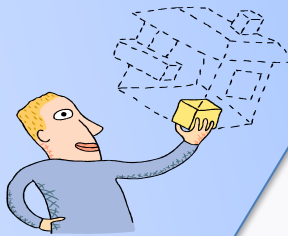
## IFDK Concept in single slide



# Different perspectives on the product



# Test engineer's perspective



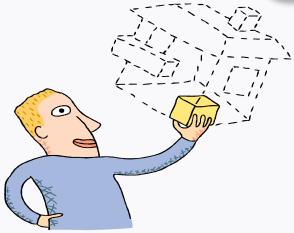
# Product requirements ?

Customer Business Stakeholder



System

Design

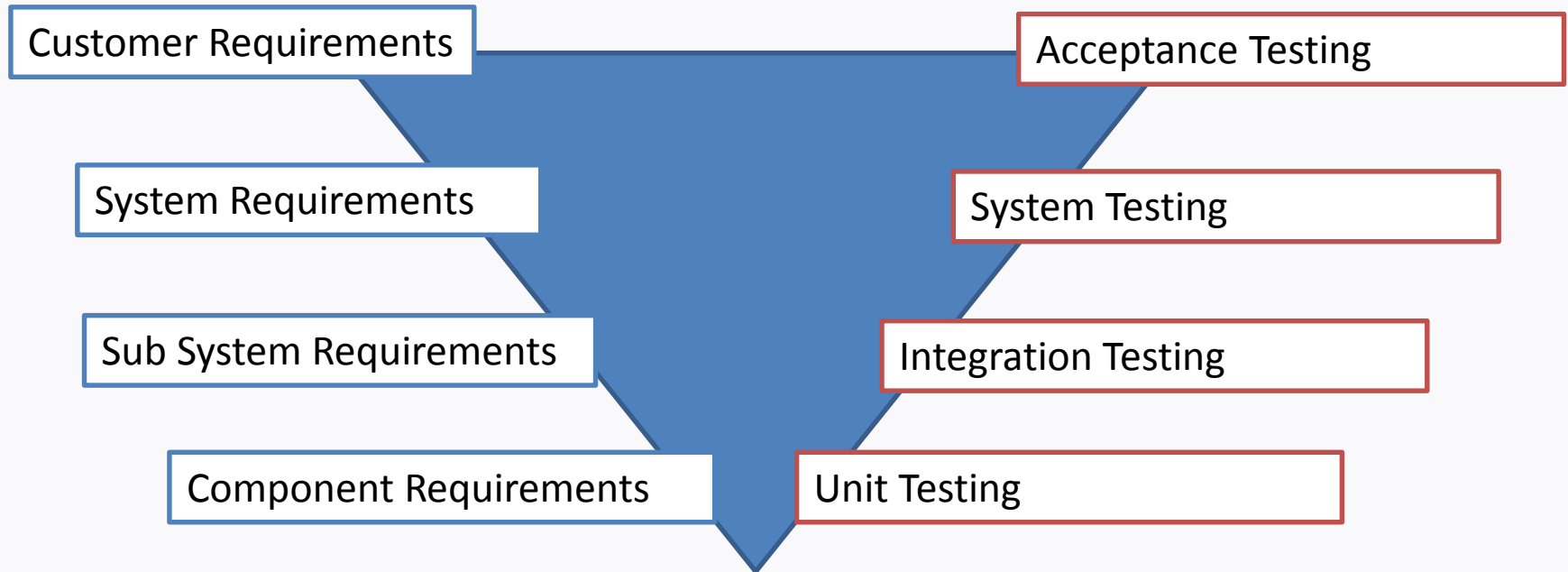


Components

Implementation



# V-Model for testing



[http://en.wikipedia.org/wiki/V-Model %28software\\_development%29](http://en.wikipedia.org/wiki/V-Model_%28software_development%29)

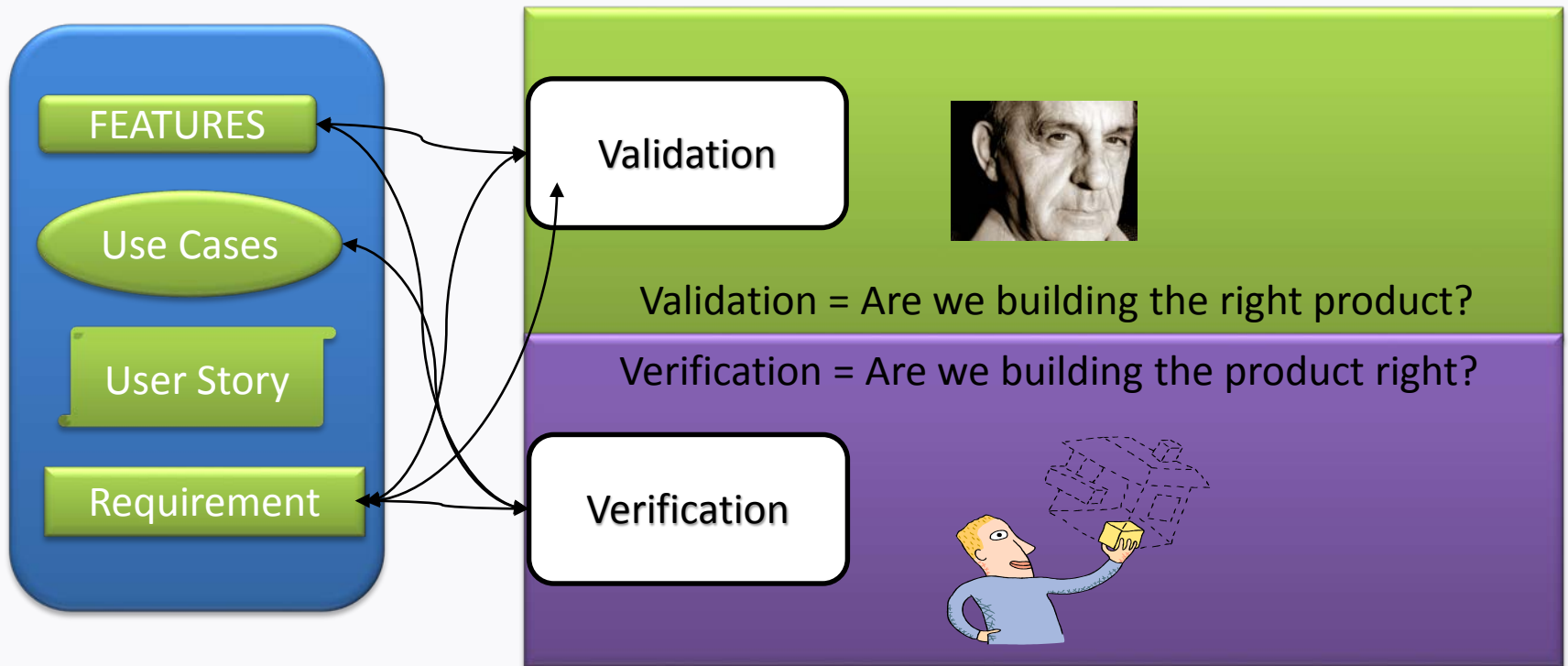


# Verification & Validation

Validation = Are we building the right product?

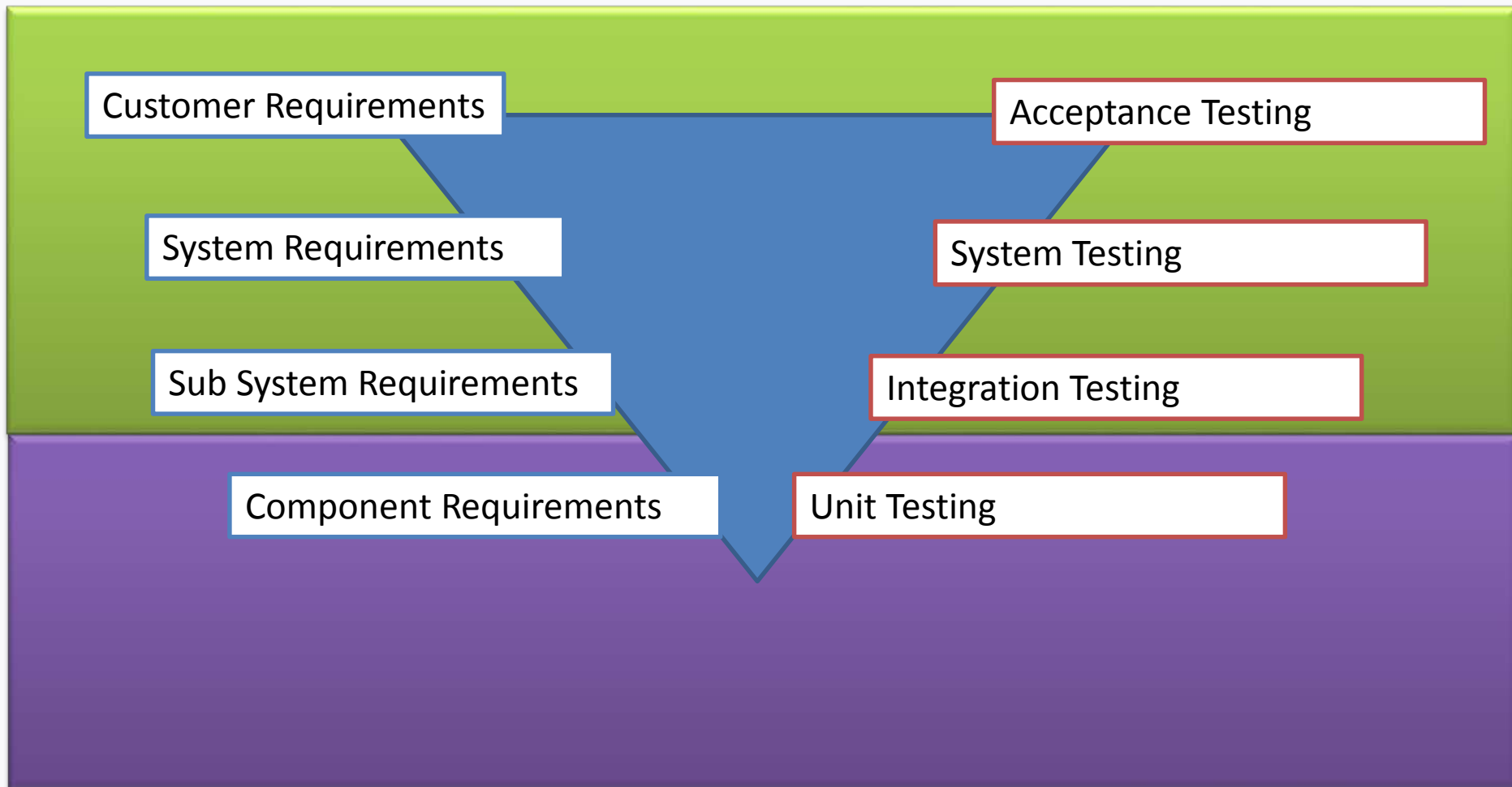
Verification = Are we building the product right?

# Verification & Validation



Validation VS verification?

# Developer vs Tester???

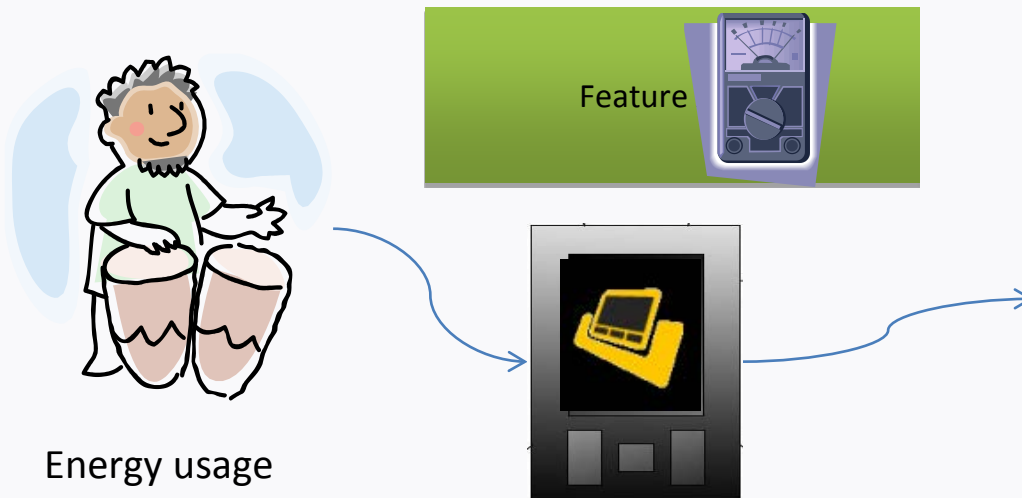


# Feature Oriented Development ?

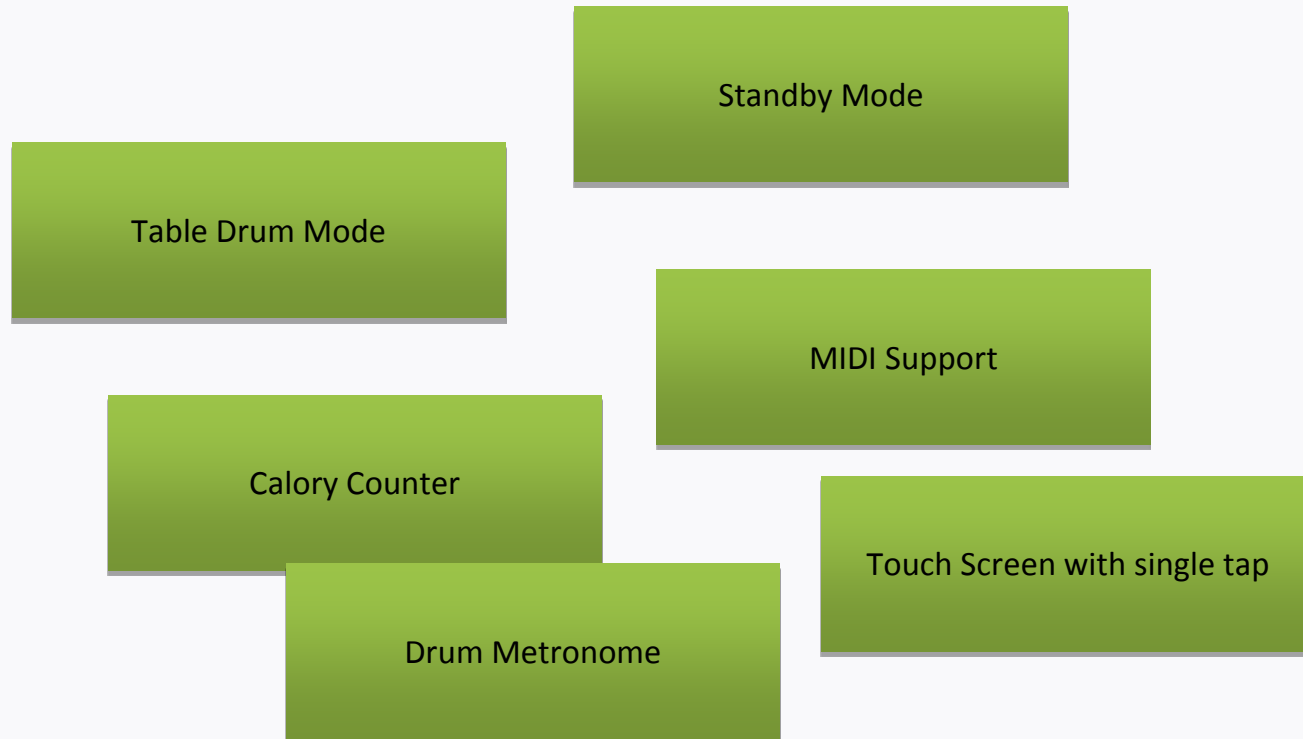
# What is feature?

Calory Counter:

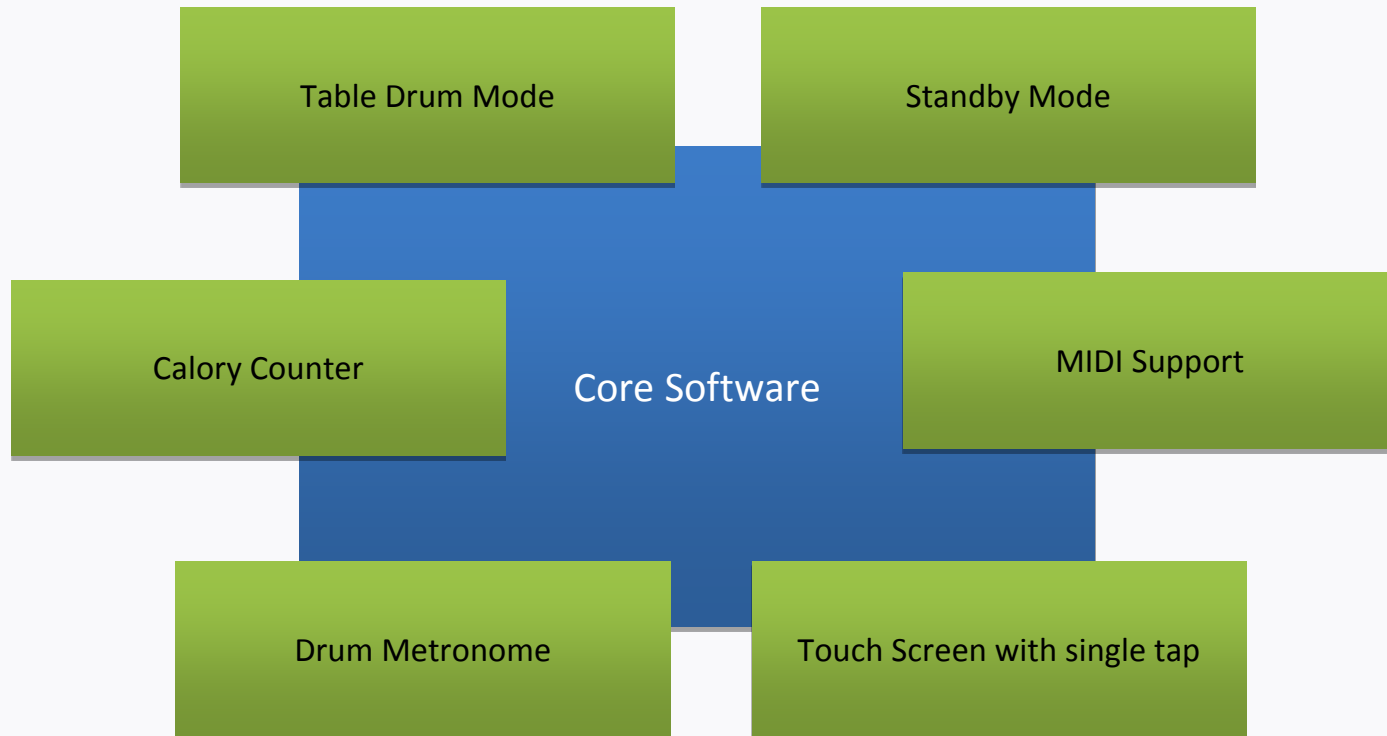
Player can measure calories during training session. This can be seen as exercise result in web service eg. Facebook application



# Is product a combinatio of features?



# Is product a combination of features



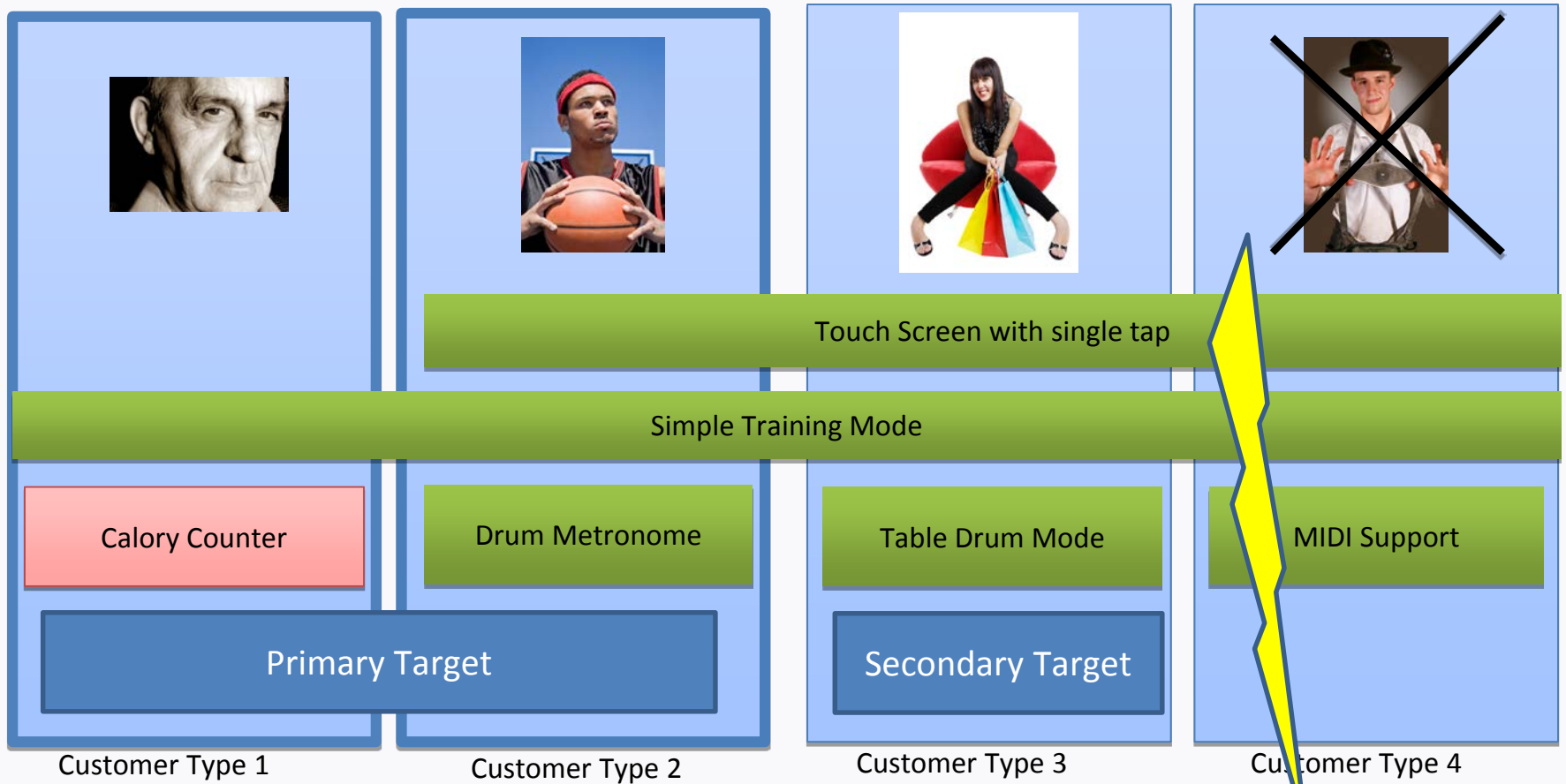
# Customer/Business request



Who are our target customers?

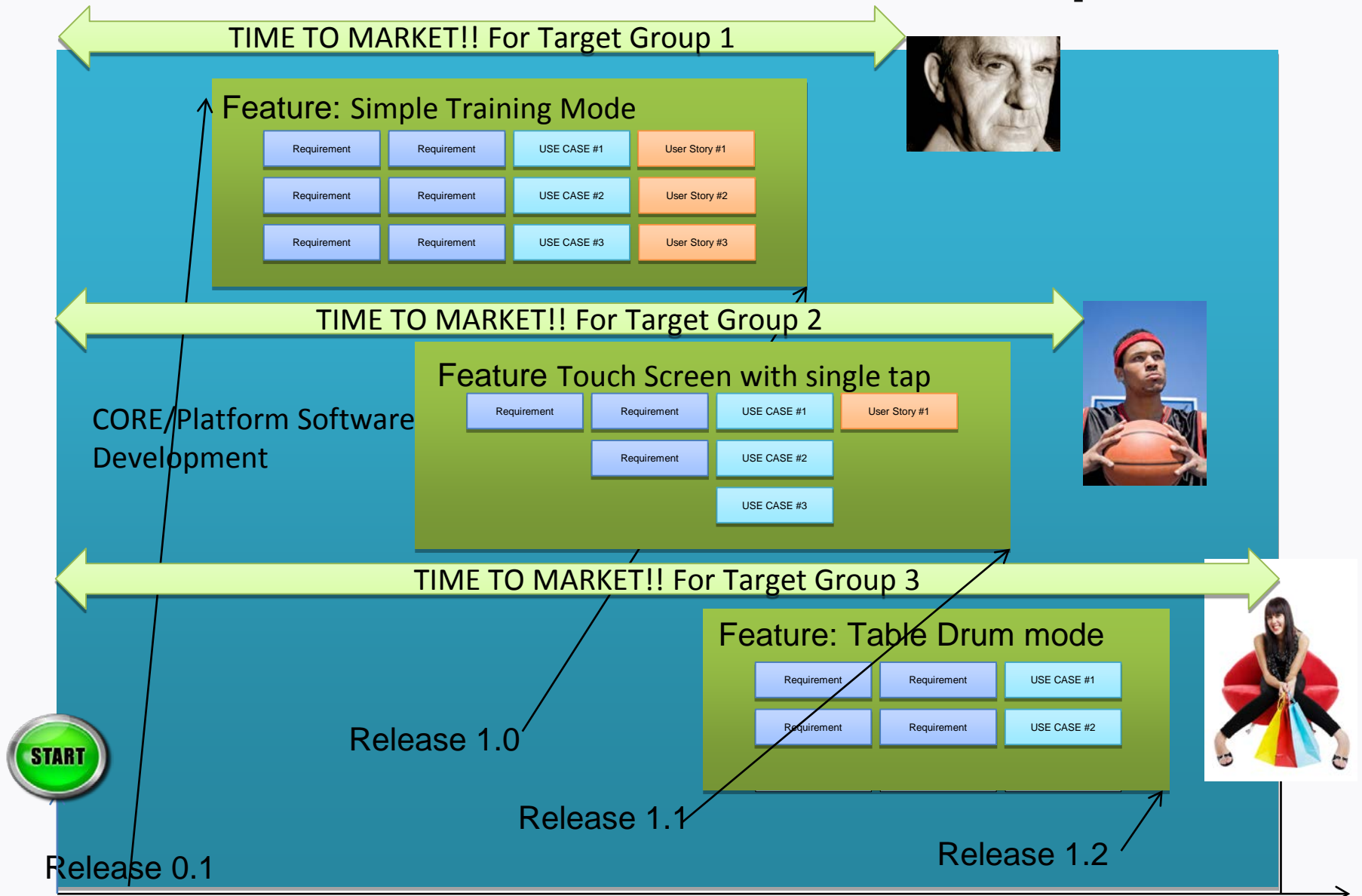


# Customer strategy

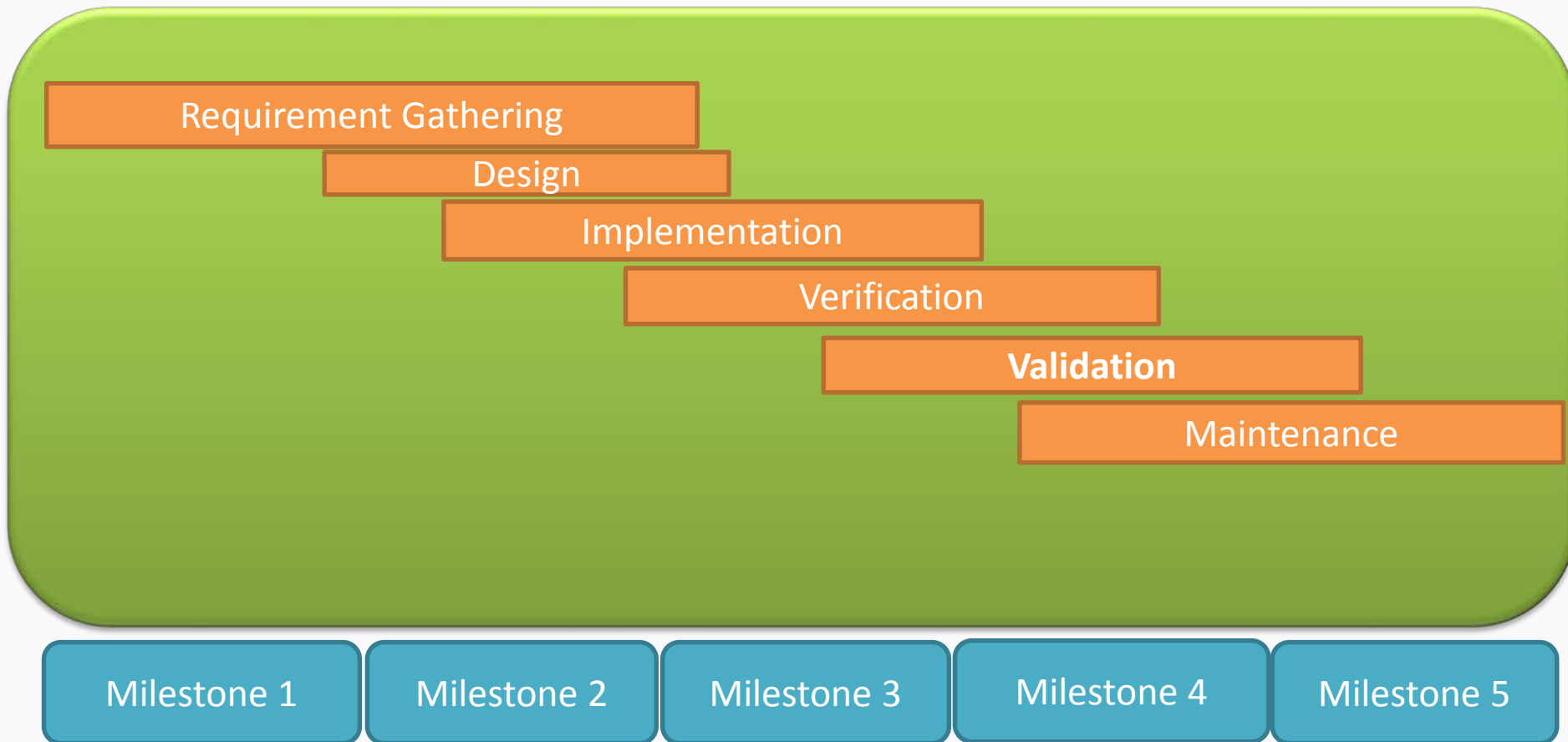


What is our key customer?

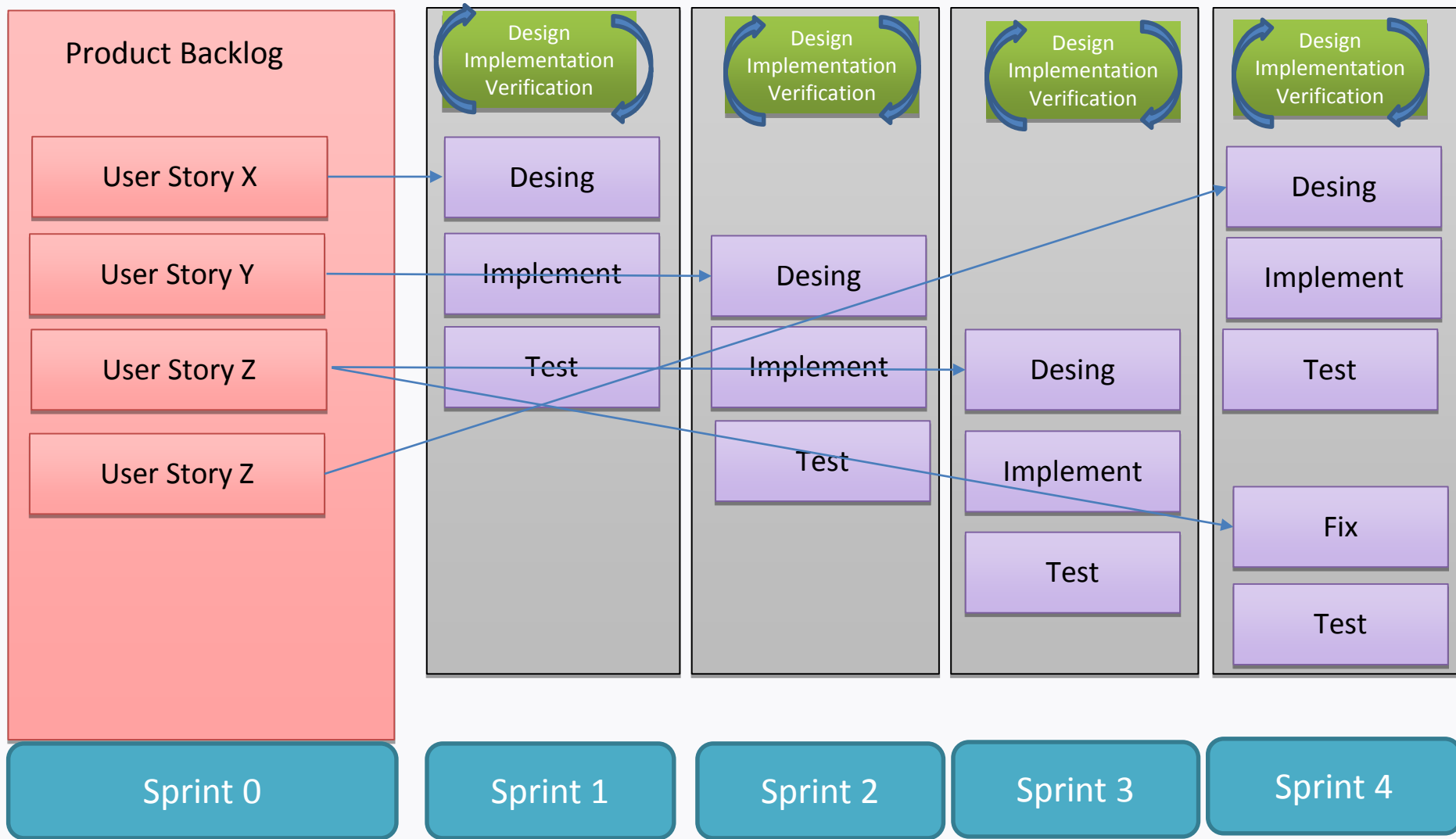
# Features and roadmap



# Development Process (Waterfall)



# Development Process (Agile)



# Testing levels ?

White Box  
Testing

Grey Box Testing

Black Box Testing

- Unit testing
- Integration Testing
- System Testing
- Acceptance Testing

"Code level testing" - perspective

"System Testing" - perspective

# Unit/Component testing ?

Example of implementation....

<https://github.com/N4SJAMK/teamboard-api/blob/master/routes/board.js>

....and unit test

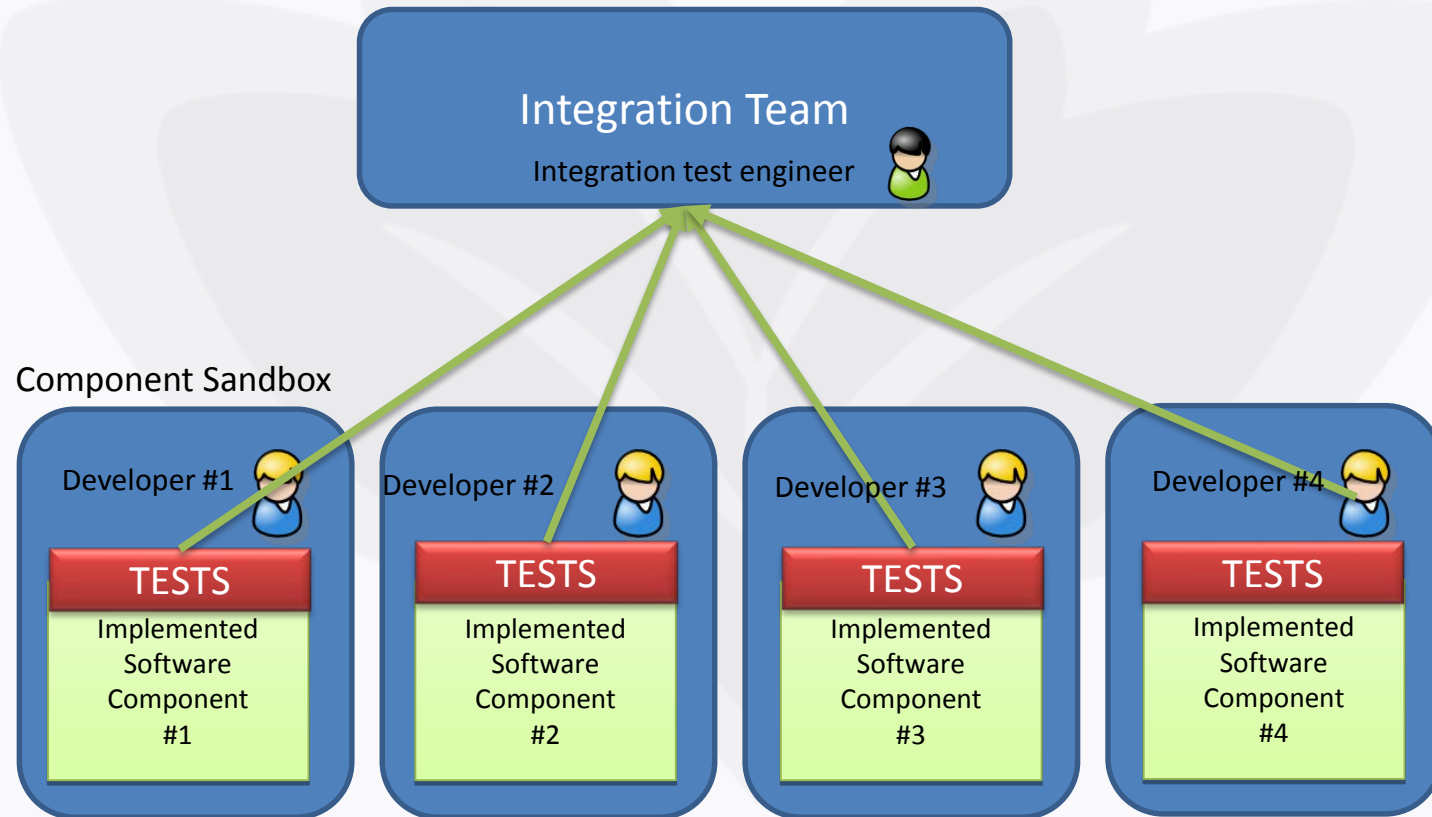
<https://github.com/N4SJAMK/teamboard-api/blob/master/test/spec/creating-a-board.js>

[http://en.wikipedia.org/wiki/Unit\\_testing](http://en.wikipedia.org/wiki/Unit_testing)

# Integration Testing



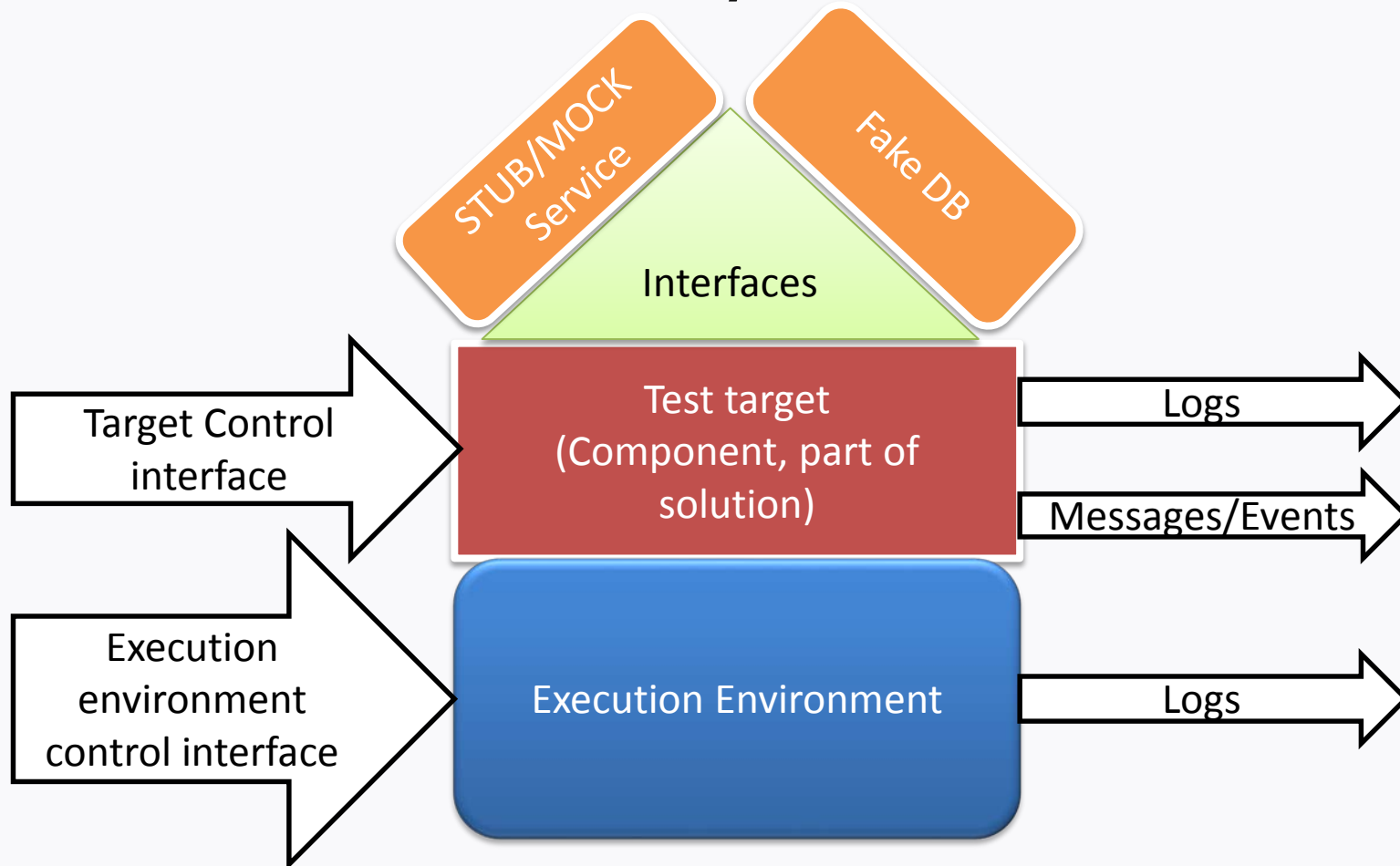
# Ideal project team and unit testing



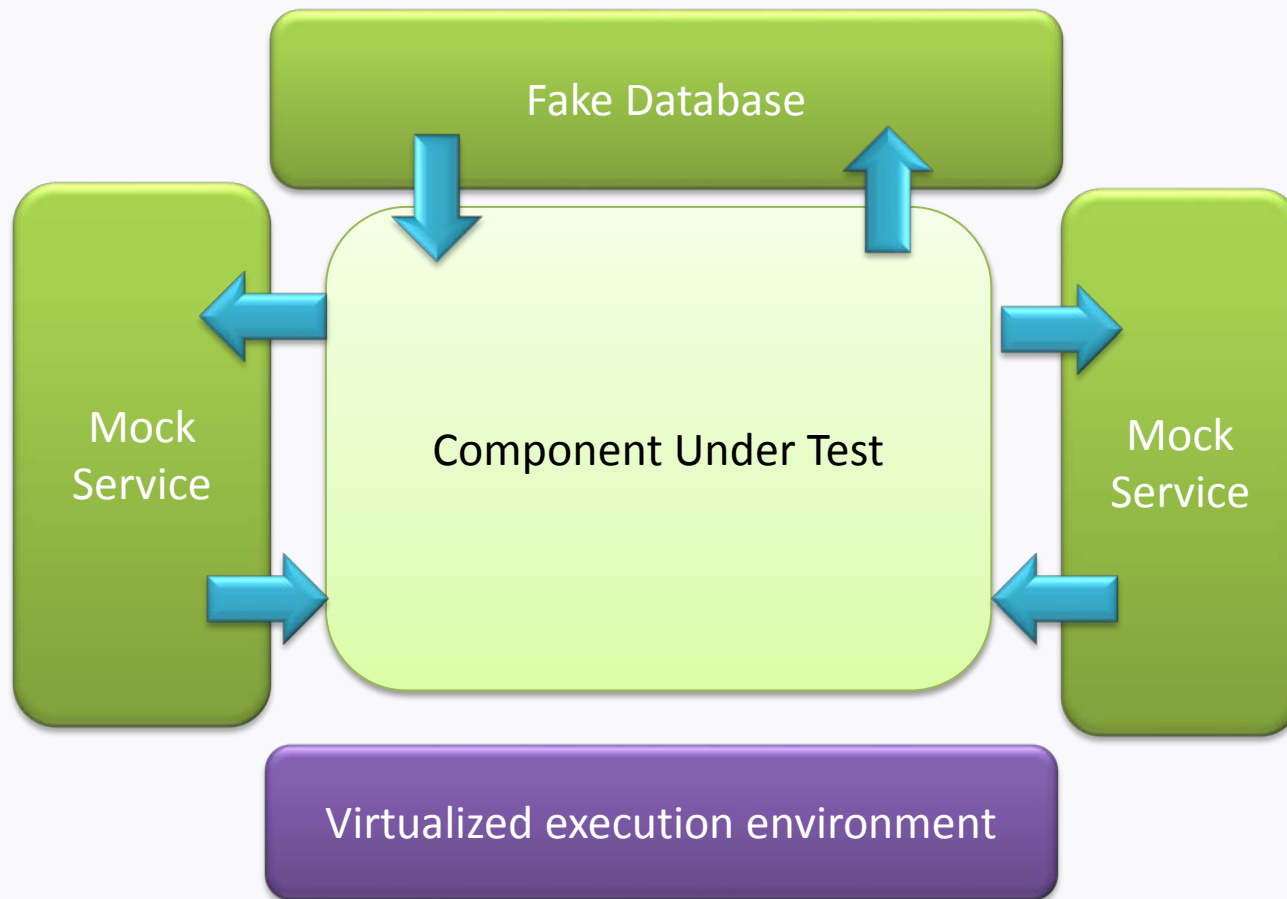
Free**Nest**



# Integration Testing with stubs/mocks

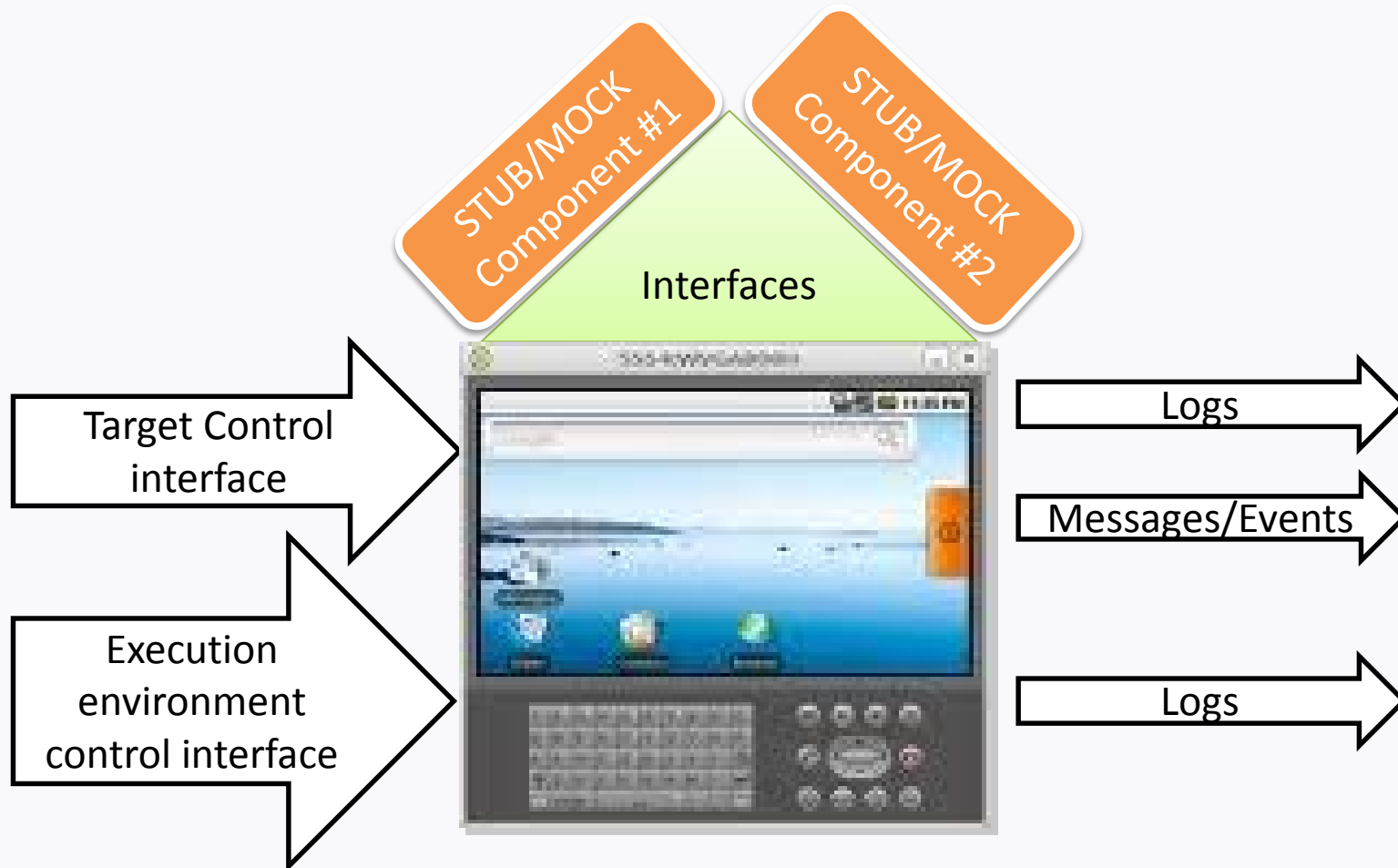


# Integration Testing in sandbox with mock environment

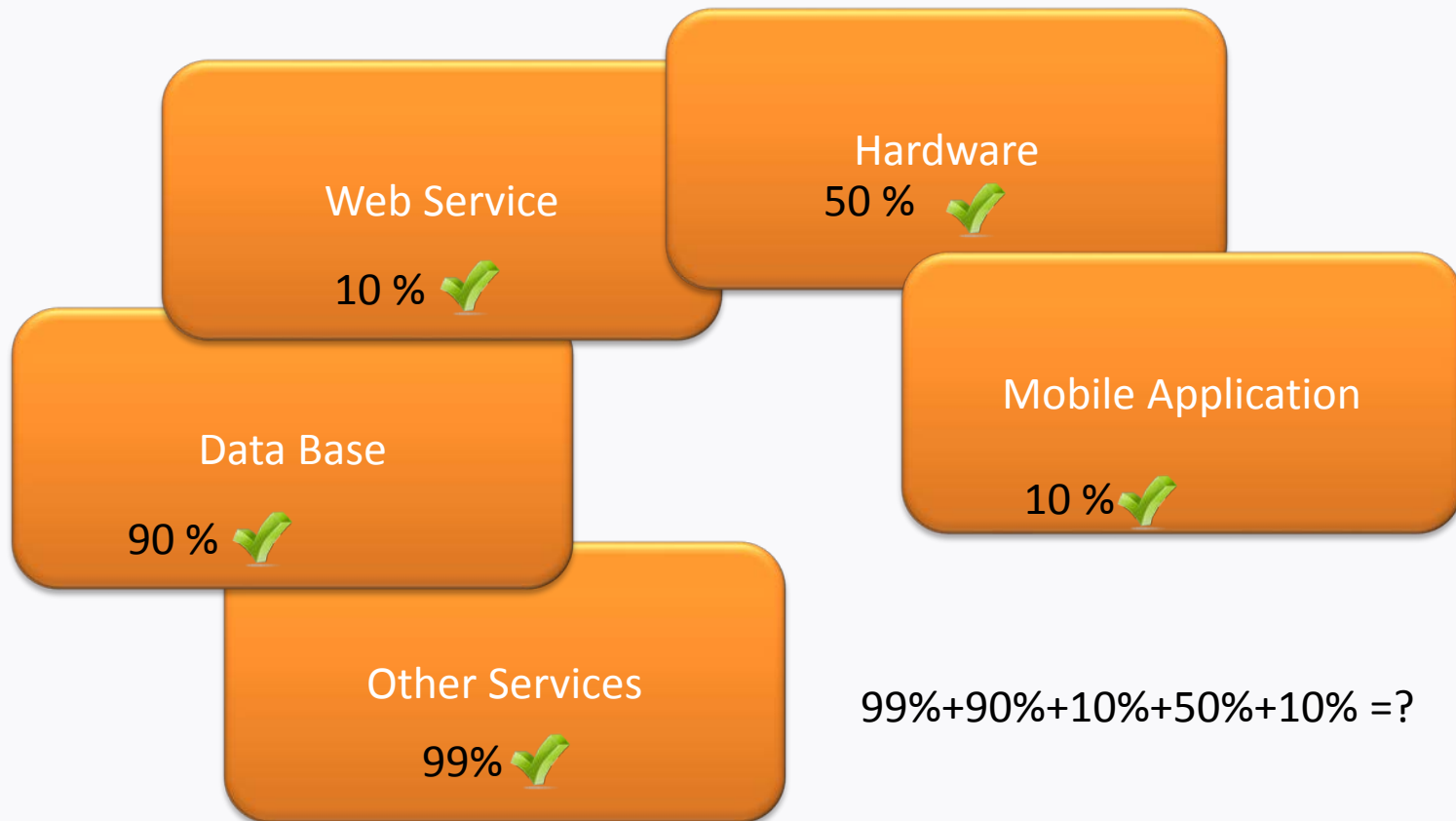


[http://en.wikipedia.org/wiki/Mock\\_object](http://en.wikipedia.org/wiki/Mock_object)

# Integration Testing with stubs



# Integrate early! Avoid Big Bang



$99\% + 90\% + 10\% + 50\% + 10\% = ?$

# System Testing ?



What should be tested?

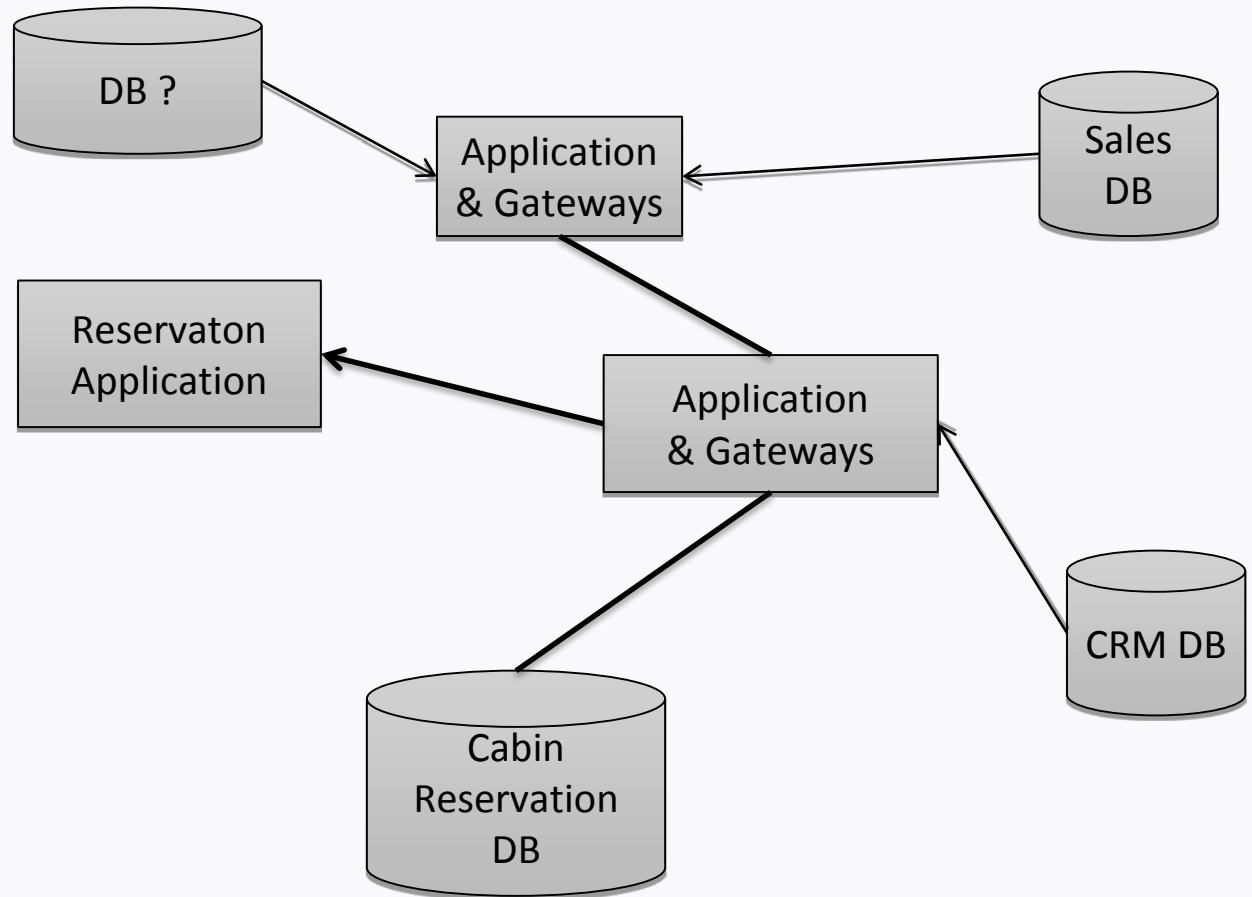
How ?

# System Integration Testing in Large



What should be tested?

How ?

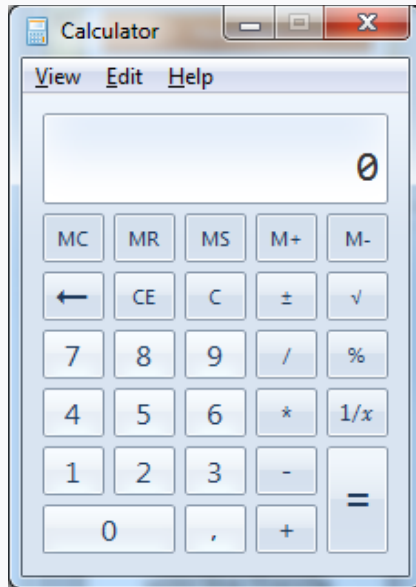


# Acceptance Testing



What should be tested ? How ?

# Test Automation ?



What should be tested?

How ?



# How to test ?

http://prosentti.vero.fi/veropros\_tietojen\_syotto2011.asp

Etusivu > Vero%laskuri

## Vero%laskuri 2011

### Henkilötiedot

Kotikunta 31.12.2010

Seurakuntaan kuuluminen 31.12.2010

Ikä

Alaikäisten lasten lukumäärä alijäämävyytyksen lapsikorotusta varten

Lasten lukumäärä elatusvelvollisuusvähennystä varten

Invalidiprosentti

Vuoden 1982 invalidiprosentti

Mualla kuin Suomessa vakuutettu ☐

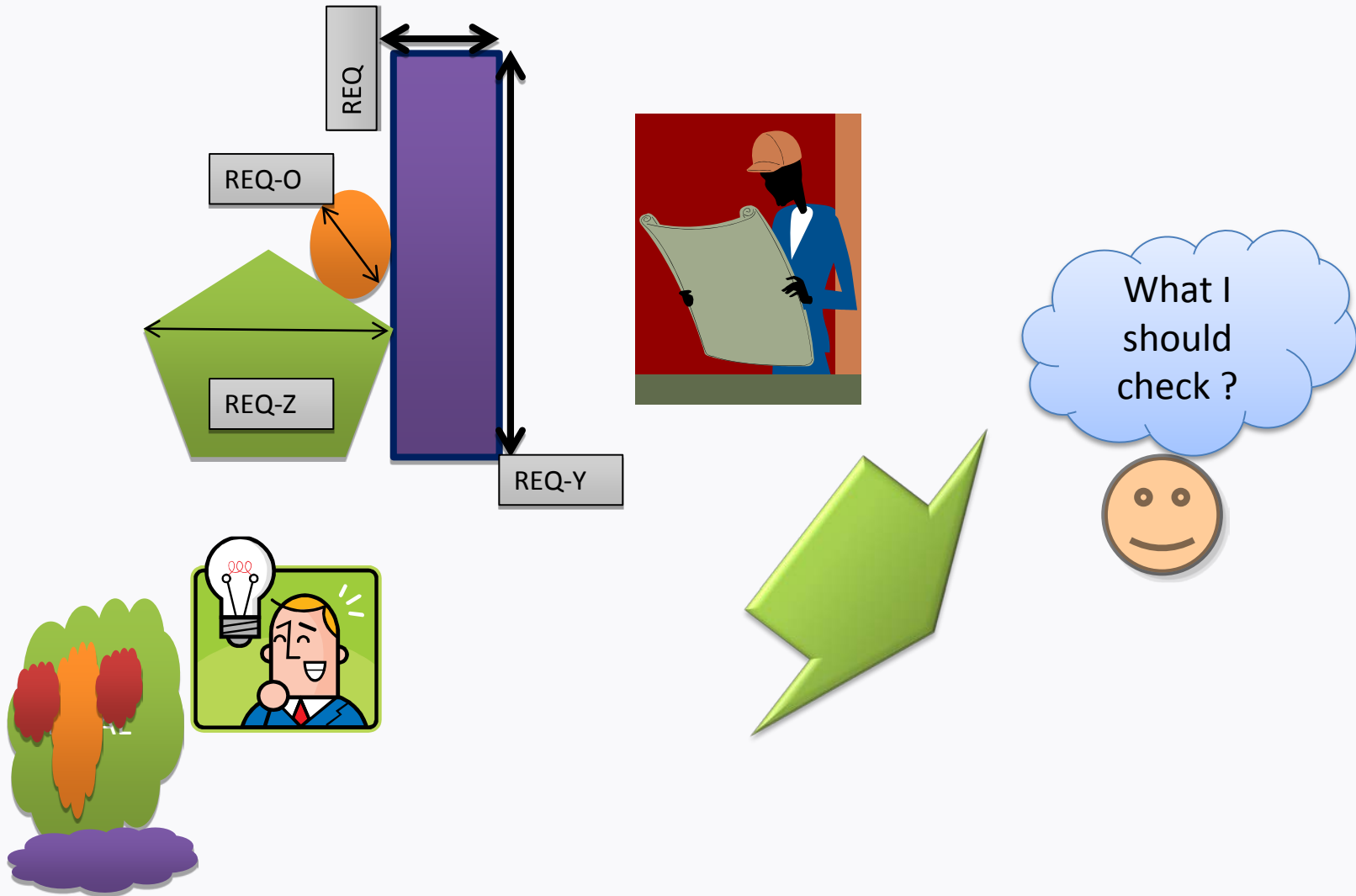
Ennakonpidätyksen alaiset ansiotulot	Arvio koko vuoden bruttotuloista	Saatu bruttotulo vuoden alusta	Ennakonpidätys vuoden alusta
Päätoimen palkkatulo luontoisetuineen	<input type="text"/>	<input type="text"/>	<input type="text"/>
Sivutulot luontoisetuineen	<input type="text"/>	<input type="text"/>	<input type="text"/>
Sosiaali- ja muut etuudet	<input type="text"/>	<input type="text"/>	<input type="text"/>
Merityötulot luontoisetuineen	<input type="text"/>	<input type="text"/>	<input type="text"/>
Perhehoitajan palkkio, omaishoidon tuki	<input type="text"/>	<input type="text"/>	<input type="text"/>
Ennakonpidätyksenalainen työkorvaus	<input type="text"/>	<input type="text"/>	<input type="text"/>
Käyttökorvaus	<input type="text"/>	<input type="text"/>	<input type="text"/>
Kansaneläke ja takuueläke	<input type="text"/>	<input type="text"/>	<input type="text"/>

What should be tested?

How ?

[http://prosentti.vero.fi/veropros\\_tietojen\\_syotto2011.asp](http://prosentti.vero.fi/veropros_tietojen_syotto2011.asp)

# What is test desing?



# Test design & execution

- Discuss about reasons for test design?
- Why we need to do design?
- Stupid work 😊 ! I wan't to progress!??

# Why we need test design ????

- Stupid work! This takes ages! This Test Case documentation is old as soon I have changed some implementation? Why you need to do so hard documentation? Give me a one good reason!

# Test Case ?

Add Information about case

- Test Case Name:
- Test Case Id:
- Test Case owner/writer:
- Date
- comments

Verify what?  
Using configuration?  
With tools?

- Verify drum track player pause mode functionality.
- Do this with IFDK software release X and playing song "Show must go on by Freddy Mercury"
- Test should be done using android emulator environment and using your hands, ears and eyes"

Define pre-state  
Define Steps  
Define end-state

- Pre State:
- Android emulator is running
- Release X is installed on emulator
- Test Case Steps:
- 1. Open drum kit player application
- 2. Select song "Show must go on"
- 3. Start to play
- 4. Press Pause and check song is paused
- 5. Check memory usage from system application
- 6. Press Play
- 7. jump to 4 several time (<10)
- 8. Listen song to the end
- 9. Exit player using "exit button"
- End State:
- IFDK Kit in main screen mode

What is verdict?

- If Pause is working result is PASS. If Pause mode failed result is FAIL

# Agile Thinking?

- We have to automate all tests!! No sense to create test case documentation ?
- Who does automation without a design?

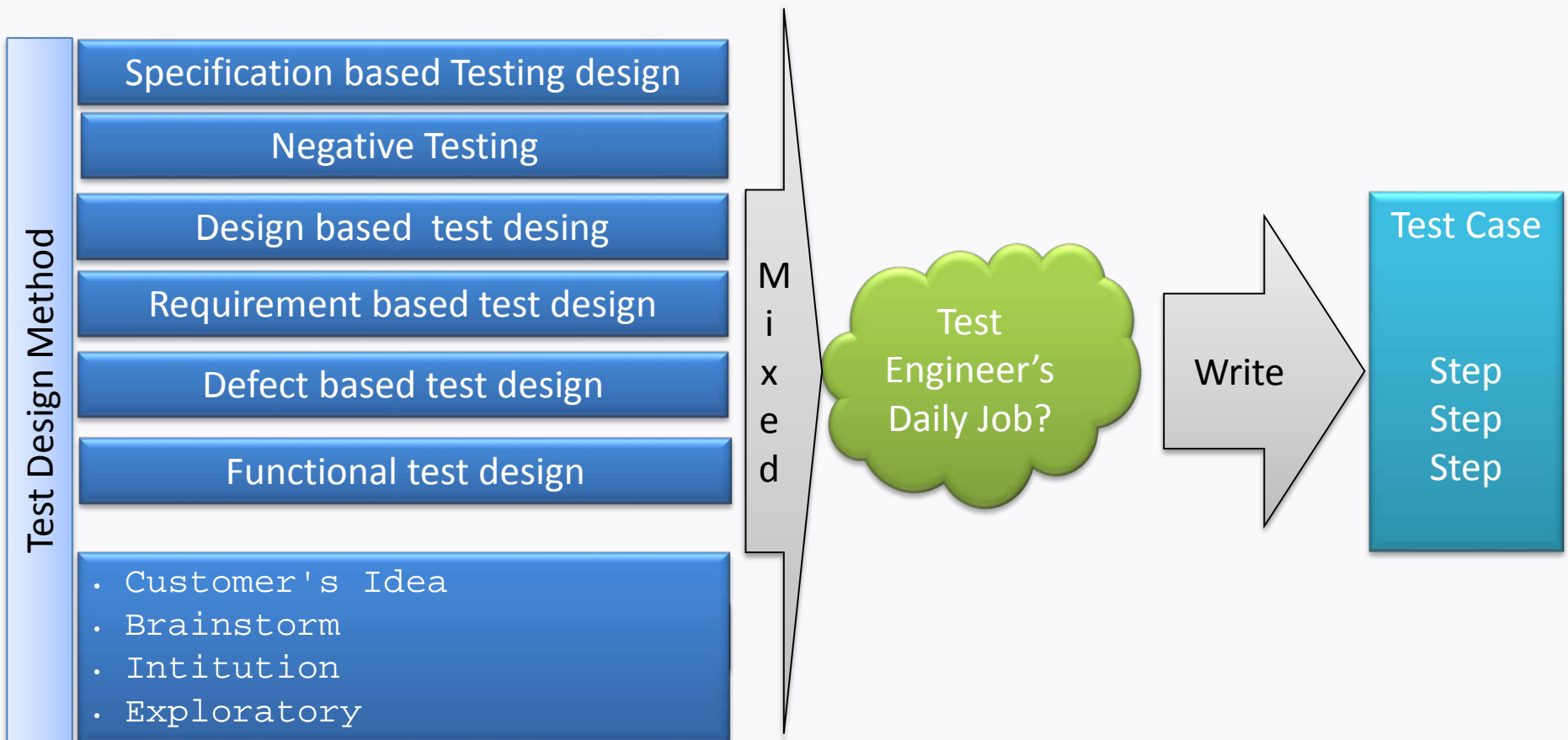
# Checklist vs Test Case?

Check UI is working	Working?
Check color change	Working?
Check Counter value after 50 logins	Working?
Check disable mode for counter	Working?

Checklist can be working great in small team! 😊

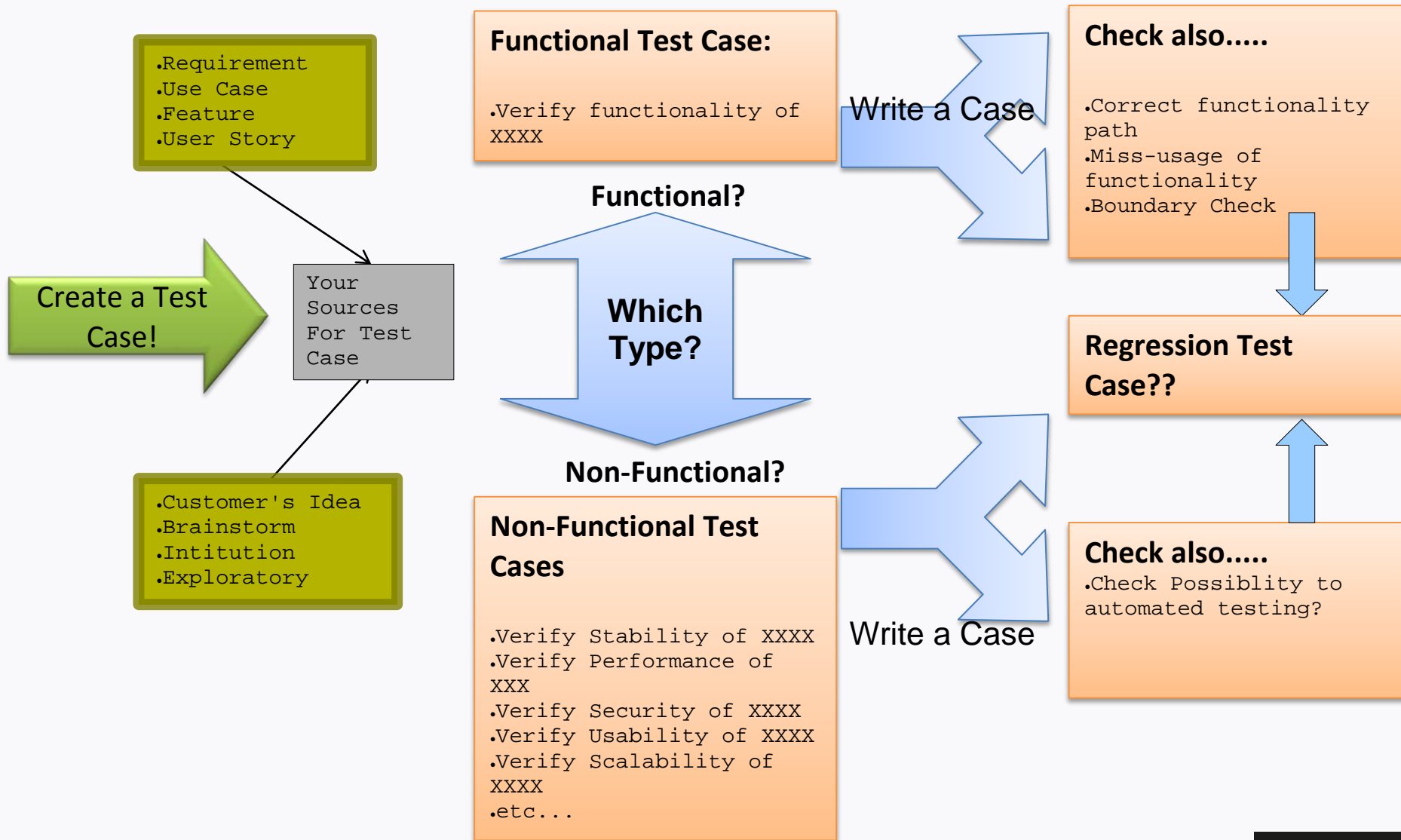
What happens if team is disbanded to other projects? And you are new maintainer for this project?

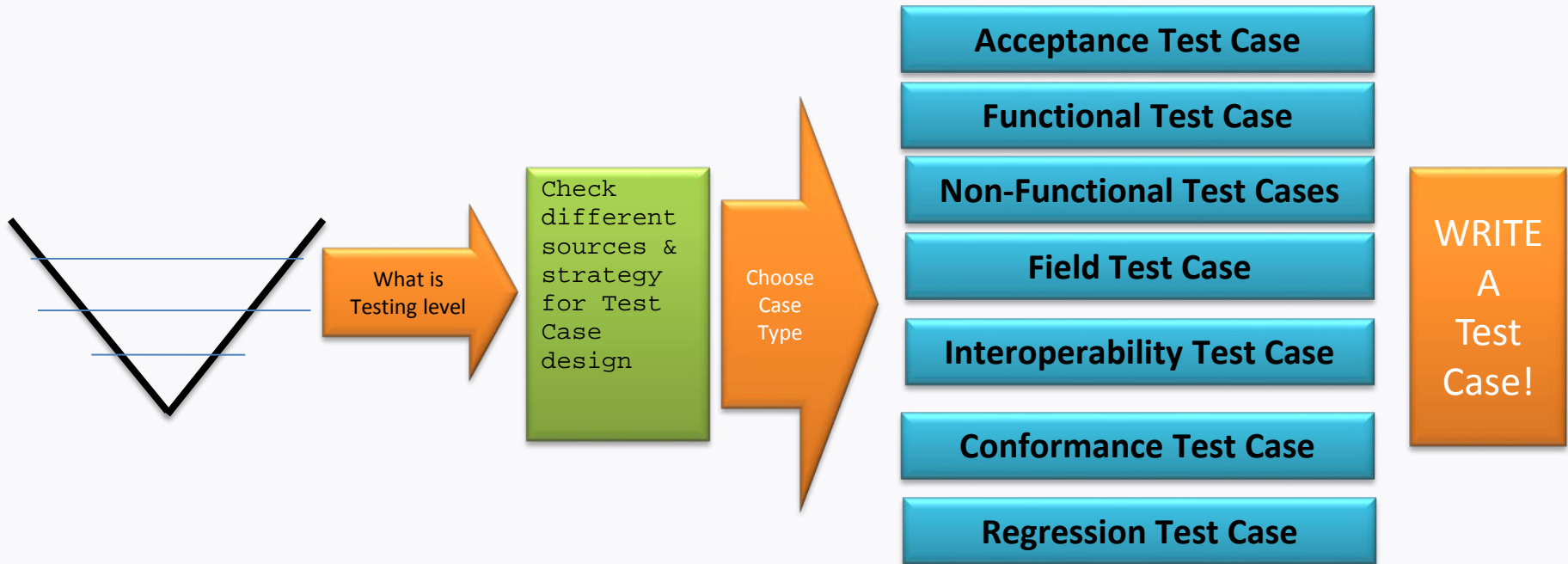
# Source examples for test design





# Mechanical route to design





# Test Driven Development in all testing levels?

