Specification by Example and Executable Specification

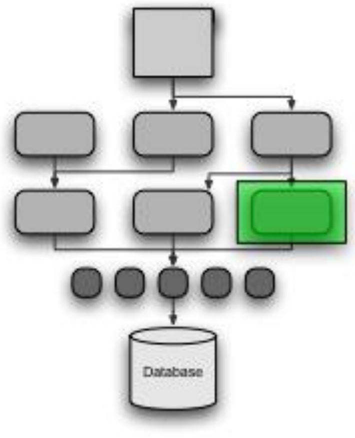
유석문
NHN

목차

1. Introduction

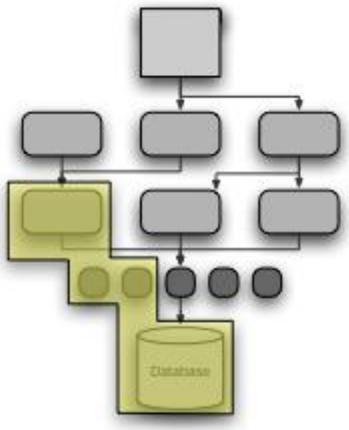
Test Classification

small
a.k.a. "unit"



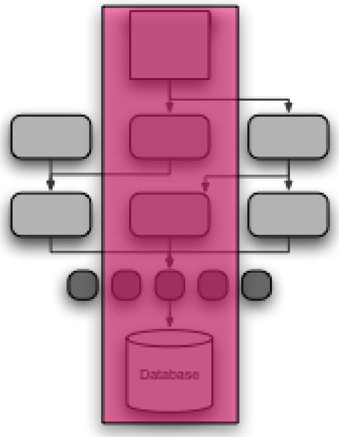
verify the behavior of a small and isolated unit of code, such as a single class or function.

medium
a.k.a. "functional"

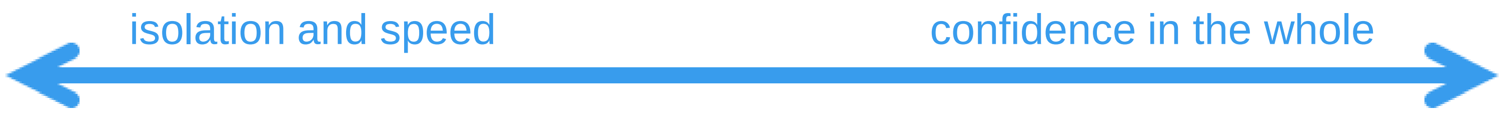


validates the interaction of one or more application modules on a single machine.

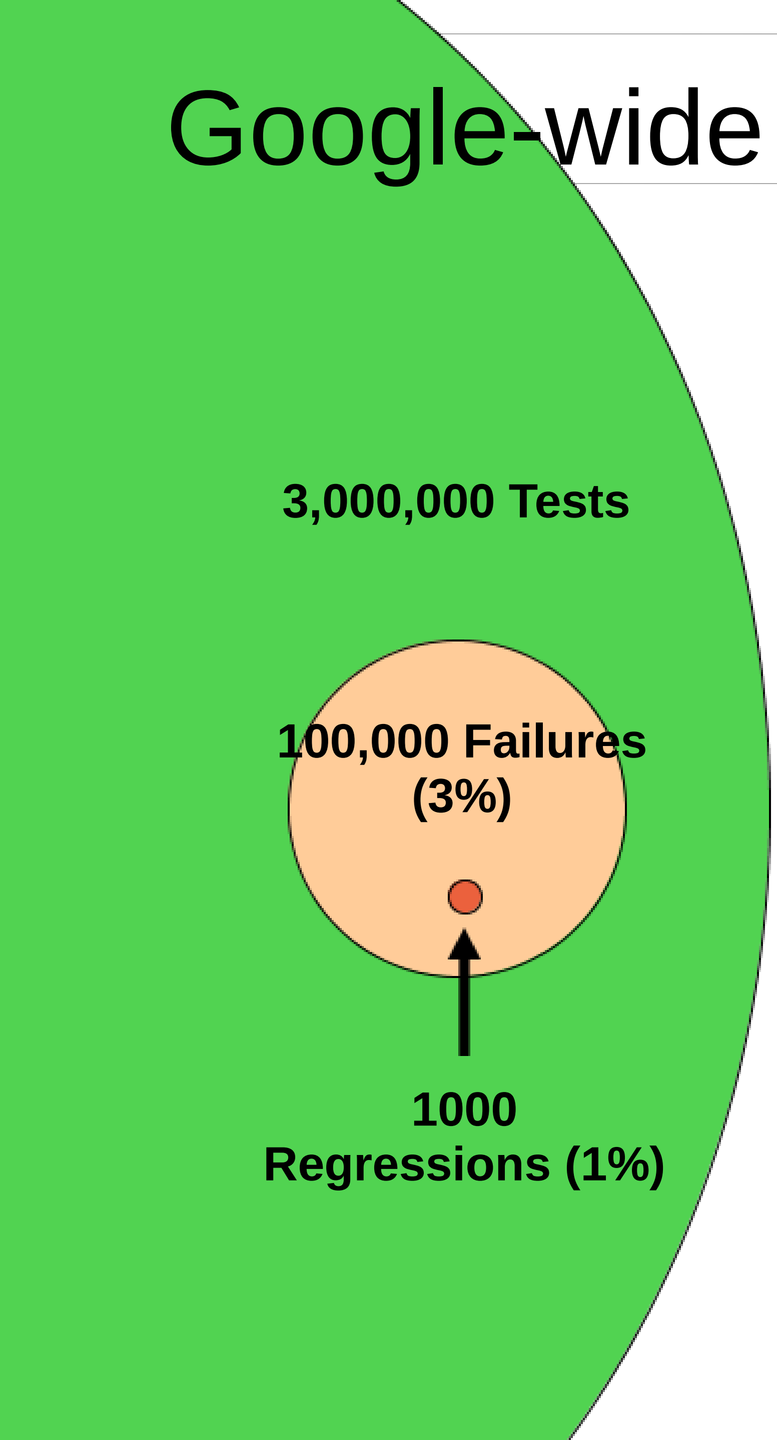
large
a.k.a. "system"

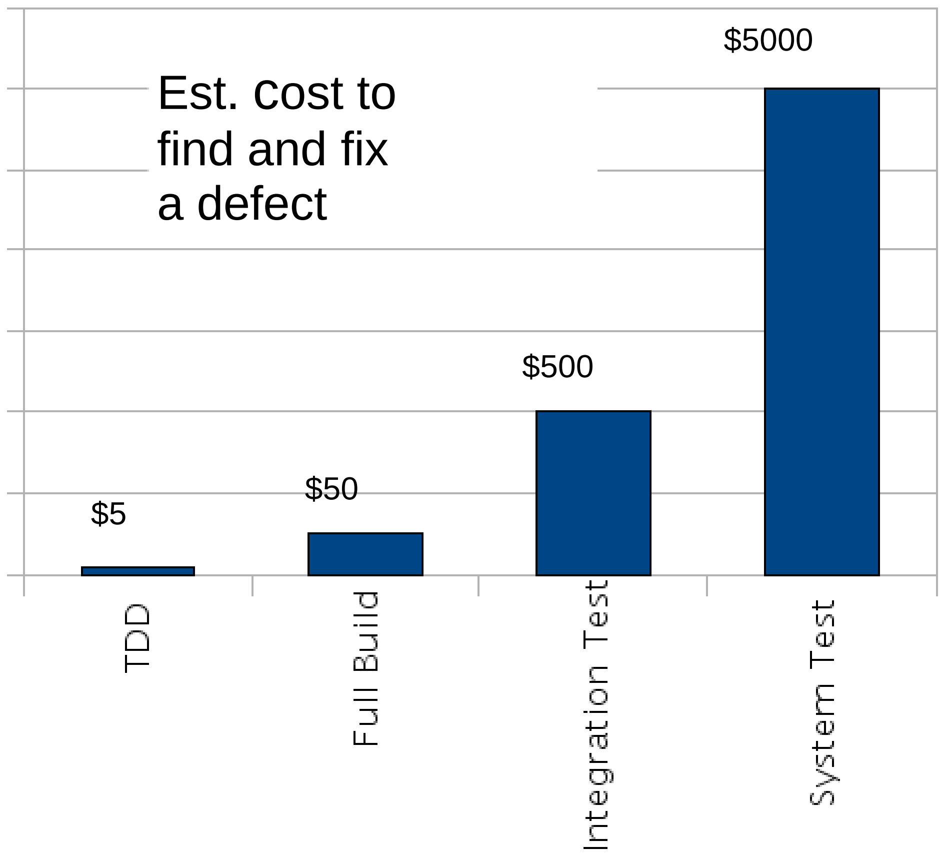


end-to-end test that verifies the whole system and behavior of external subsystems.



Google-wide Regression Analysis





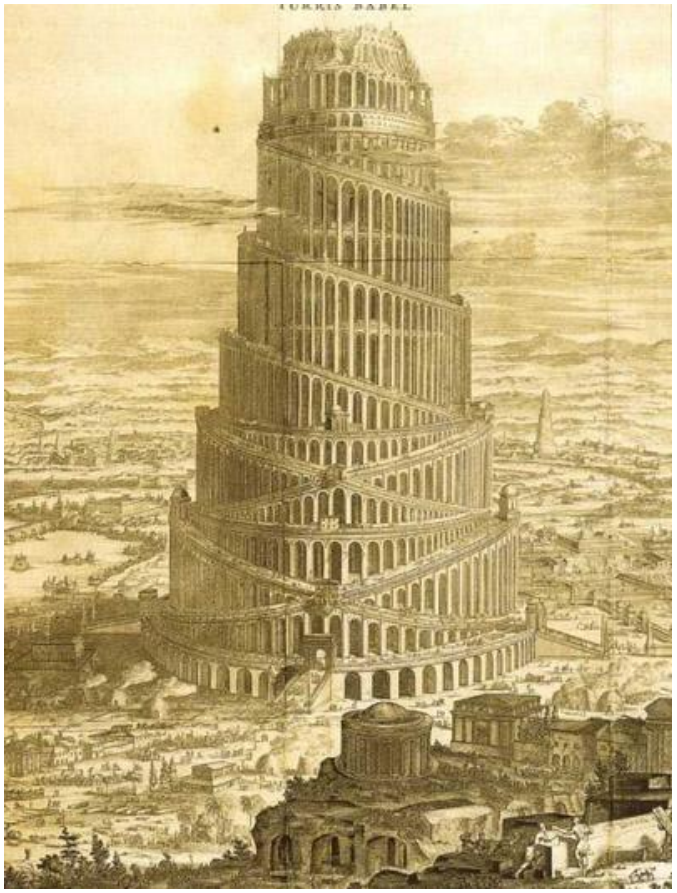
Back of envelope savings: $160M
Or 774 engineers.

1.1 What are we up to now?

- Lost in translation (Business -> Dev -> QA)
- Do not explain why
- Gaps discovered only until coding started
- Cumulative effects of small misunderstandings
- Inadequate and essentially flawed requirements and specification
- Fulfilling specifications does not guarantee success

1.2 The communication gap in software projects

- Every participants on software project use their own languages.
- Hard to collaborate among business analysts, developers, testers, and customers due to communication gap.
- Even a well written specification has ambiguities and the danger then is in making assumptions.
- A written specification never updated.



Athanasius Kircher's illustration of the Tower of Babel
http://www.rereviewed.com/roguesemiotics/?p=686

1.3 Lost in translation

- An experiment with four active battalions in US Army

  “*Commander expectations matched actions in only 34% of the cases*”

L.G.Shattuck, 2000
http://www.au.af.mil/au/awc/awcgate/milreview/shattuck.pdf

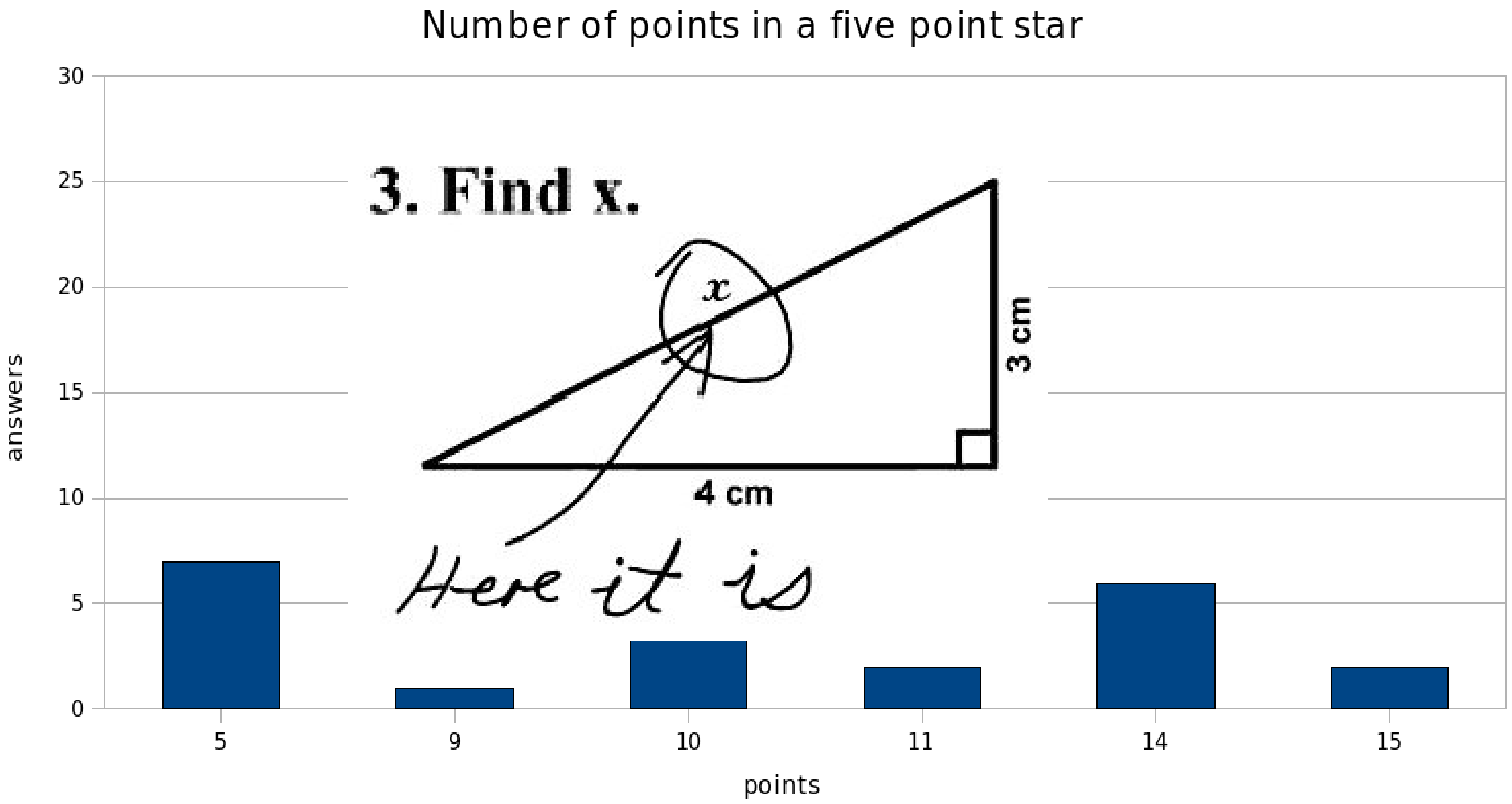
1.3 Lost in translation

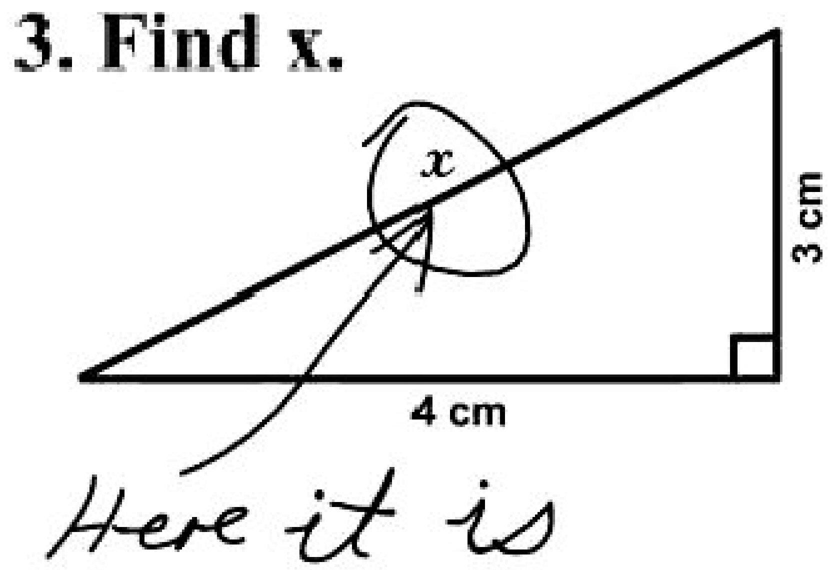
- The process is very much like a telephone game

http://www.flickr.com/photos/mataniere/3107073262

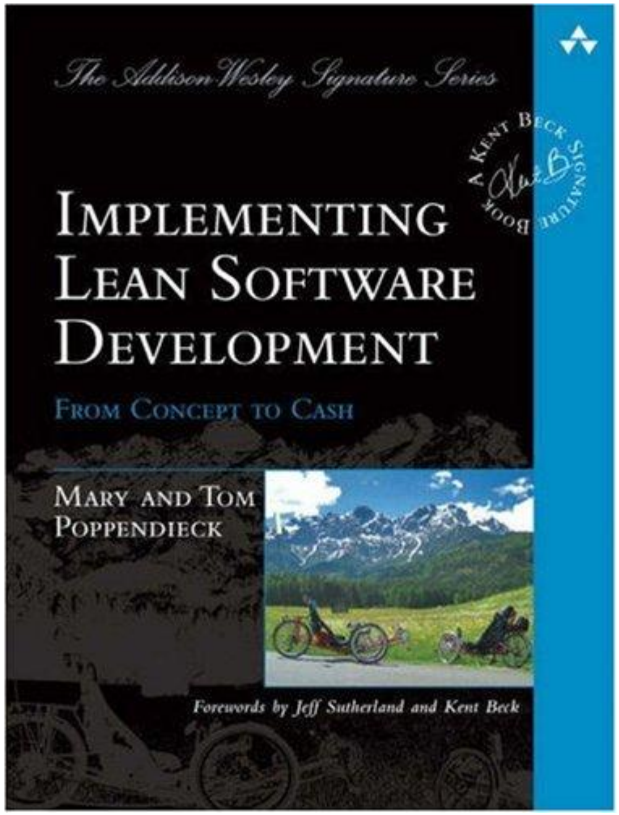
1.4 Are obvious things really obvious?

- How many points are there?





“Just-in-case code is the biggest source of waste in software development”


The Addison Wesley Signature Series
A Kent Beck Signature Book
Implementing Lean Software Development
From Concept to Cash
Mary and Tom Poppendieck
Forewords by Jeff Sutherland and Kent Beck

Mary and Tom Poppendieck

Lean Software Development

1.5 Do not explain why

- F-16 design team was asked to do the impossible – a cheap 2.5 Mach airplane!

"When asked […] why they need Mach 2 – 2.5, the answer was to be able to escape from combat. Their solution was […] providing acceleration and manoeuvrability, not maximum speed."

http://www.97-things.com/wiki/index.php/Seek_the_value_in_requested_capabilities

1.6 Cleaning up the Mess?

WHEN THE PARTY'S OVER...
UNTIL RECENTLY I NEVER DREAMED THIS JOB WOULD EVER GO TO A BLACK MAN: ON THE OTHER HAND, YOU COULDN'T HAVE PICKED A BETTER TIME
PRESIDENT OF USA
SUBPRIME FRAUD
TORTURE
$TRILLION BAILOUTS
$TRILLION IRAQ WAR
AFGHAN
JANITOR-IN-CHIEF?
©08

http://www.bendib.com/newones/2008/

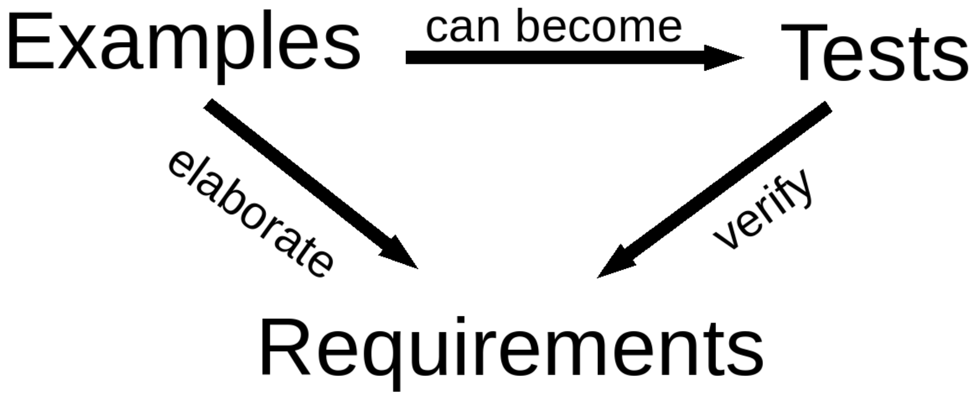
2. ATDD/BDD

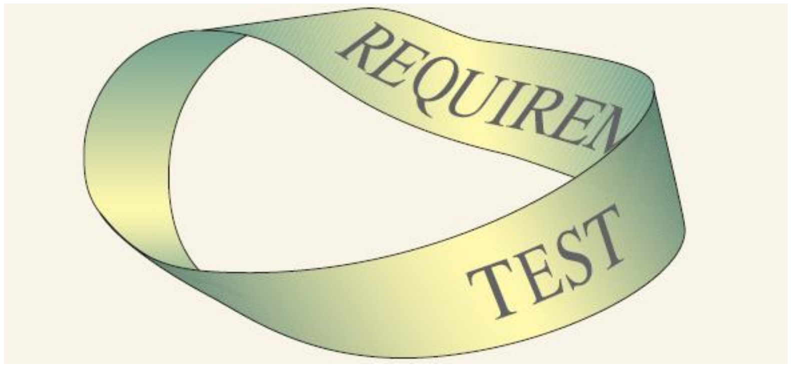
2.1 ATDD/BDD in a Nutshell

- Real-world examples to build a shared understanding of the domain
- Select a set of these examples to be a specification and an acceptance test suite
- Automated the verification of acceptance tests
- Focus the software development effort on the acceptance tests
- Use the set of acceptance tests to facilitate discussion about future change request

2.2 Benefits of ATDD

- Comprehensible examples over complex formulas
- Close Collaboration
- Definition of Done
- Trust and Commitment
- Testing on system level





As formality increases, tests and requirements become indistinguishable.

Robert C. Martin and Grigori Melnik

Tests and Requirements, Requirements and Tests: a Mobius Strip

IEEE Software January/February Issue 2008

Acceptance Criteria

- A set of conditions that the Story must meet for it to be accepted as complete
- Typically provided by the customer or product owner
- Acceptance Criteria should contain:
  - Actor
  - VERB – DESCRIBING A BEHAVIOR
  - OBSERVABLE RESULT
- To accommodate pre-conditions Acceptance Criteria can be expressed as
  - Given [Precondition]
  - When [Actor + Action]
  - Then [Observable Result]

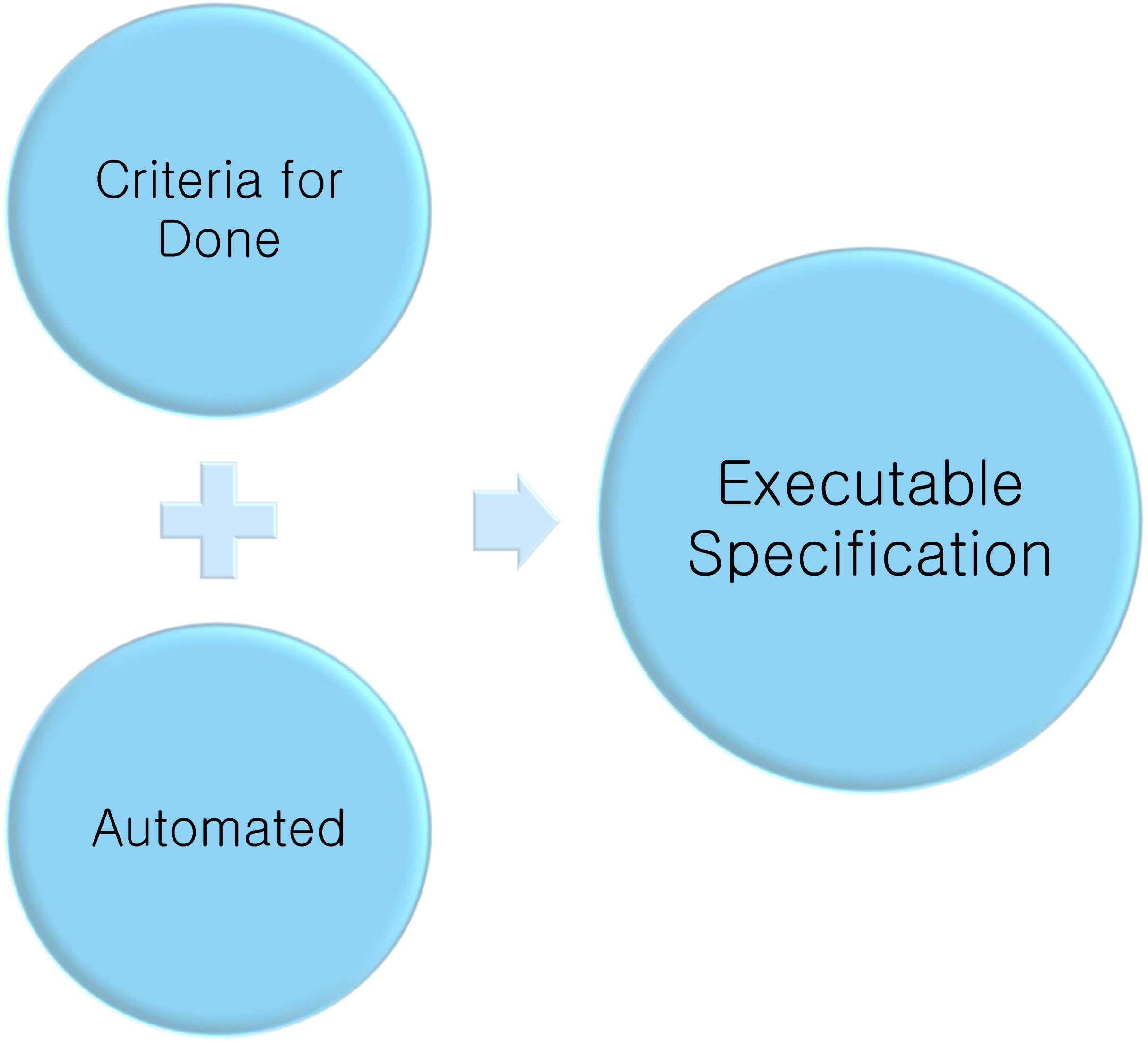
❖ Acceptance Test

Acceptance Criteria

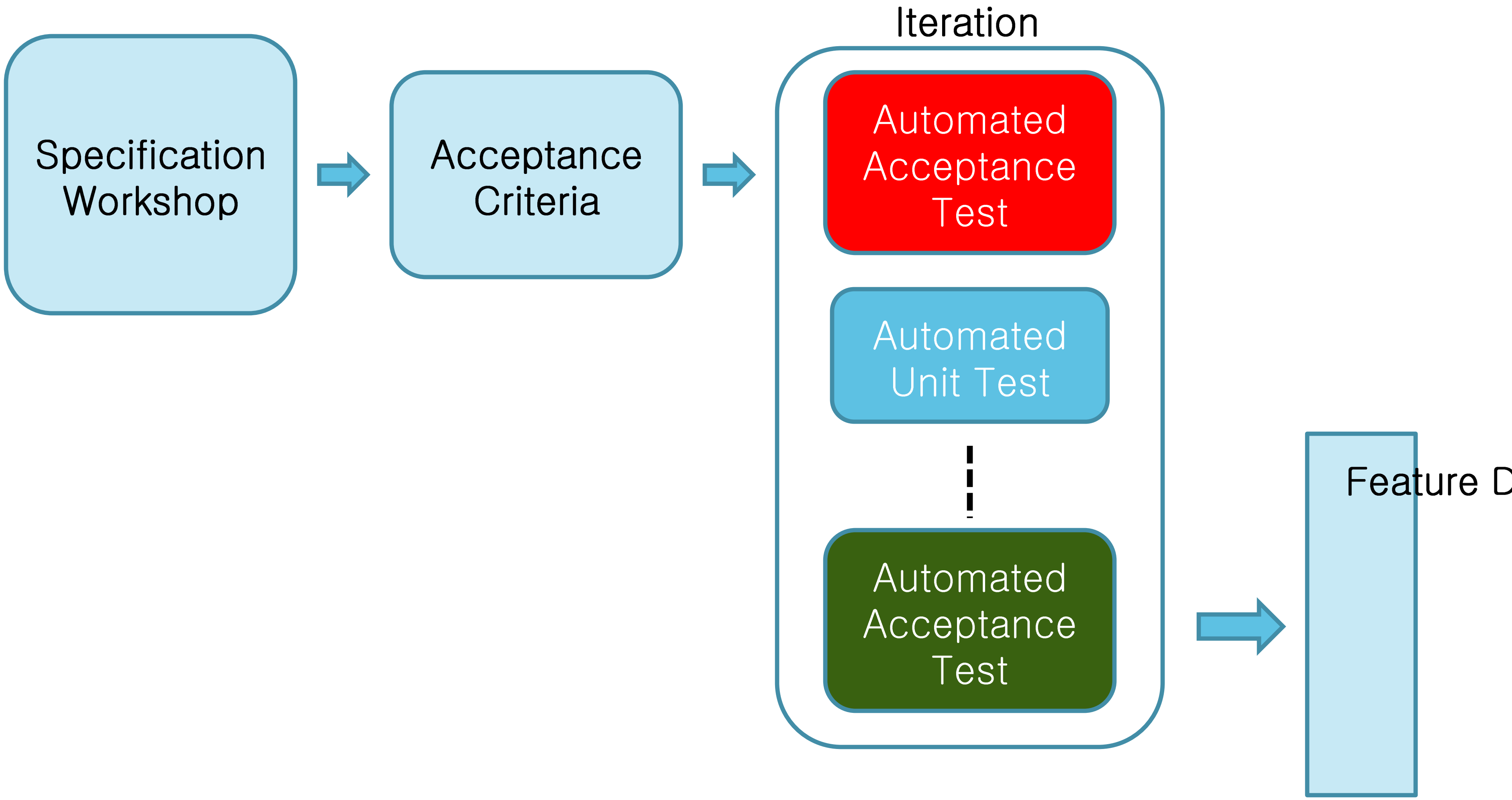
+ Examples (data + scenarios)

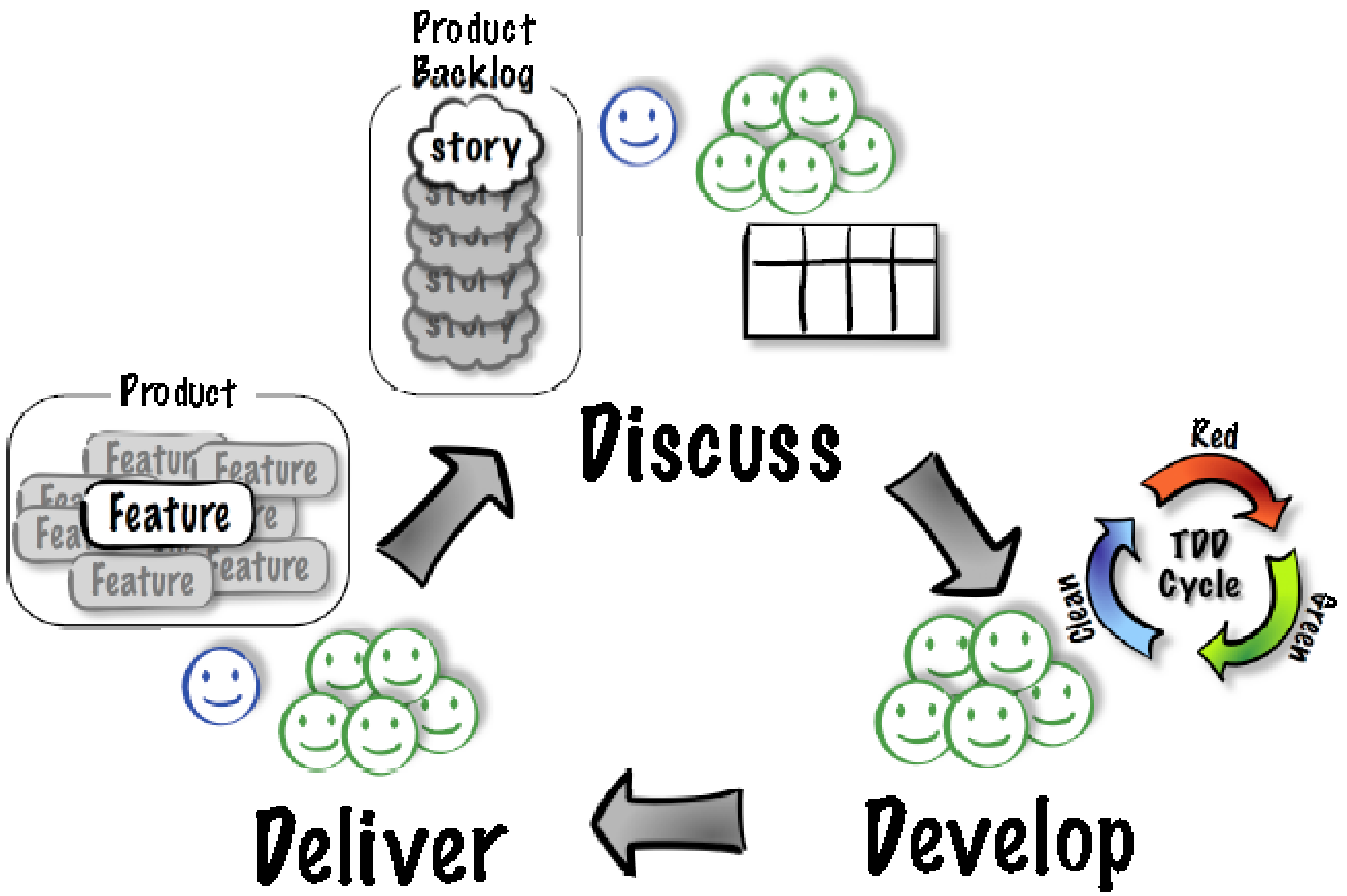
Acceptance Tests

2.2 Executable Specification

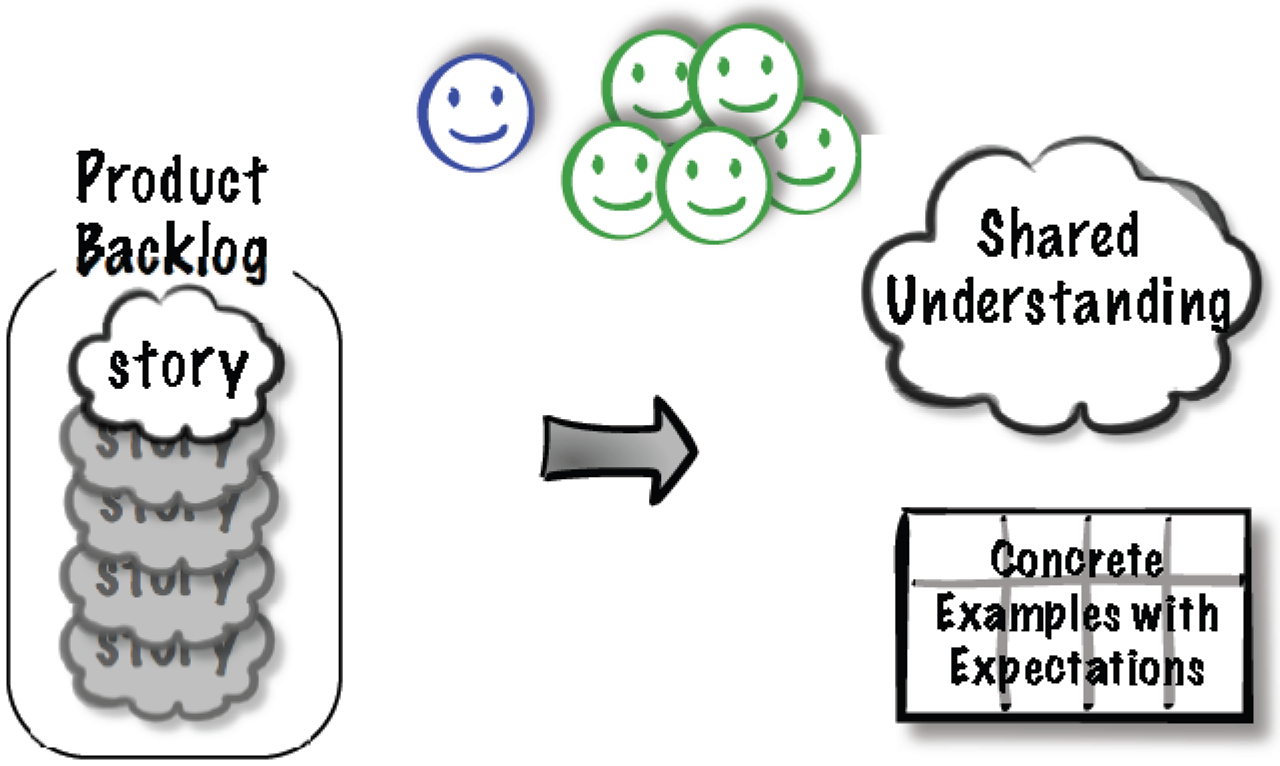


2.3 The ATDD cycle

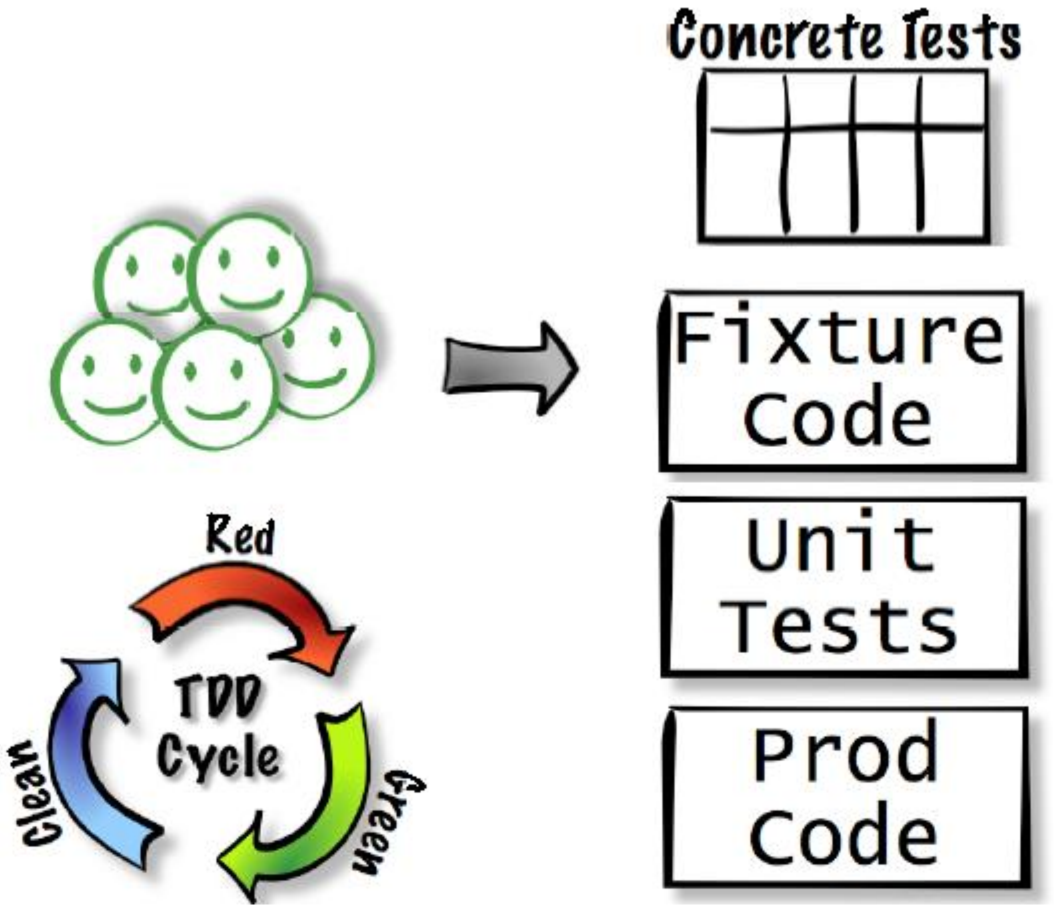



Product Backlog
story
Product
Feature
Discuss
Red
TDD Cycle
Green
Clean
Develop
Deliver

2.3 The ATDD cycle – Discuss



2.3 The ATDD cycle – Develop



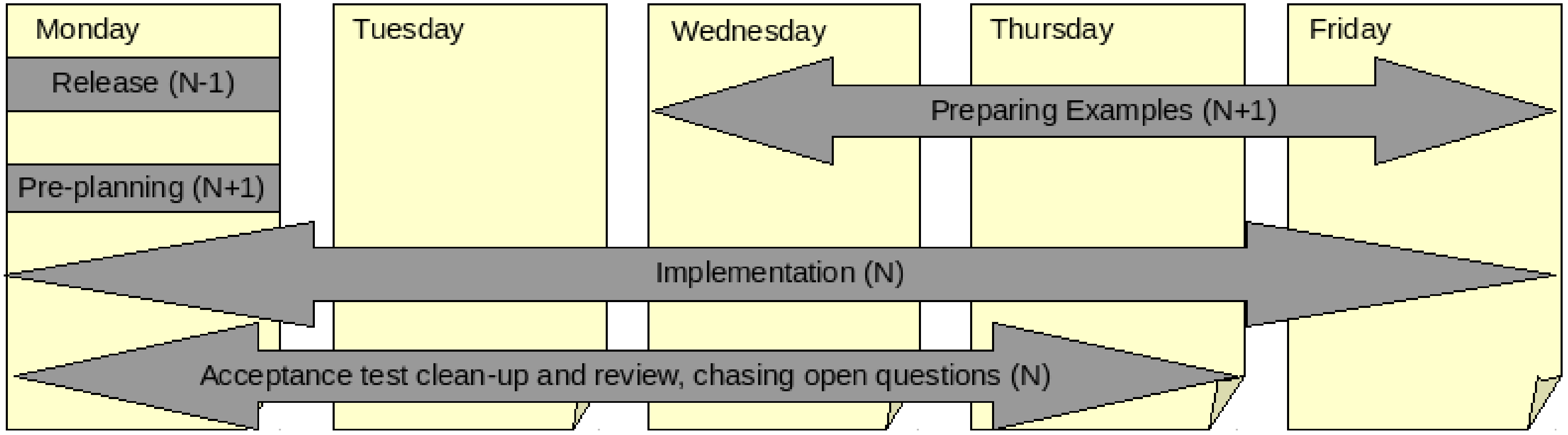
NHN

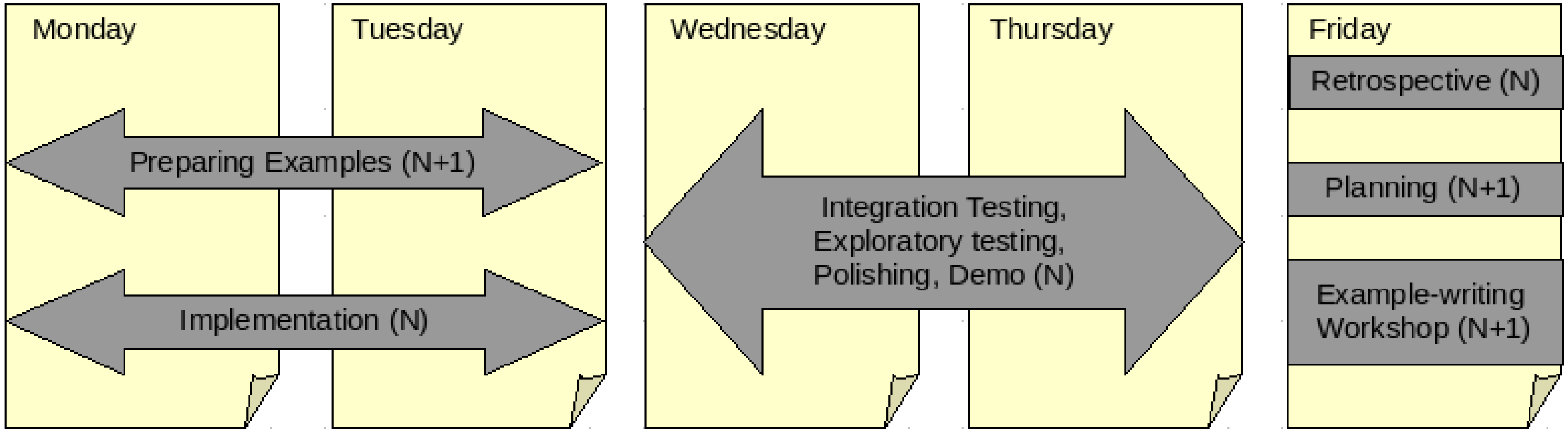
Jim Shore: "Describe-Demonstrate-Develop"

A very useful way to think about acceptanc e tests in practice

http://www.jamesshore.com/Blog/How-I-Use-Fit.html

2.4 Iteration Flow (just suggestion)





3. Specification by Example

3.1 Key Practices

- Discuss real-world examples to build a shared understanding of the domain
- Use those examples as an acceptance criteria
- Automate acceptance tests
- Focus the development on those tests
- Use the tests as a live specification to facilitate change

▲숭례문을 10분의 1로 축소한 실물 모형. (충남 예산군 제공/노컷뉴스)

3.2 Specification Workshop – Building a shared understanding of the domain

- Business people, developers and QA in the same room
- Transfer the knowledge
- Ensure that we all understand the same thing

❖ What Specification Workshop are not

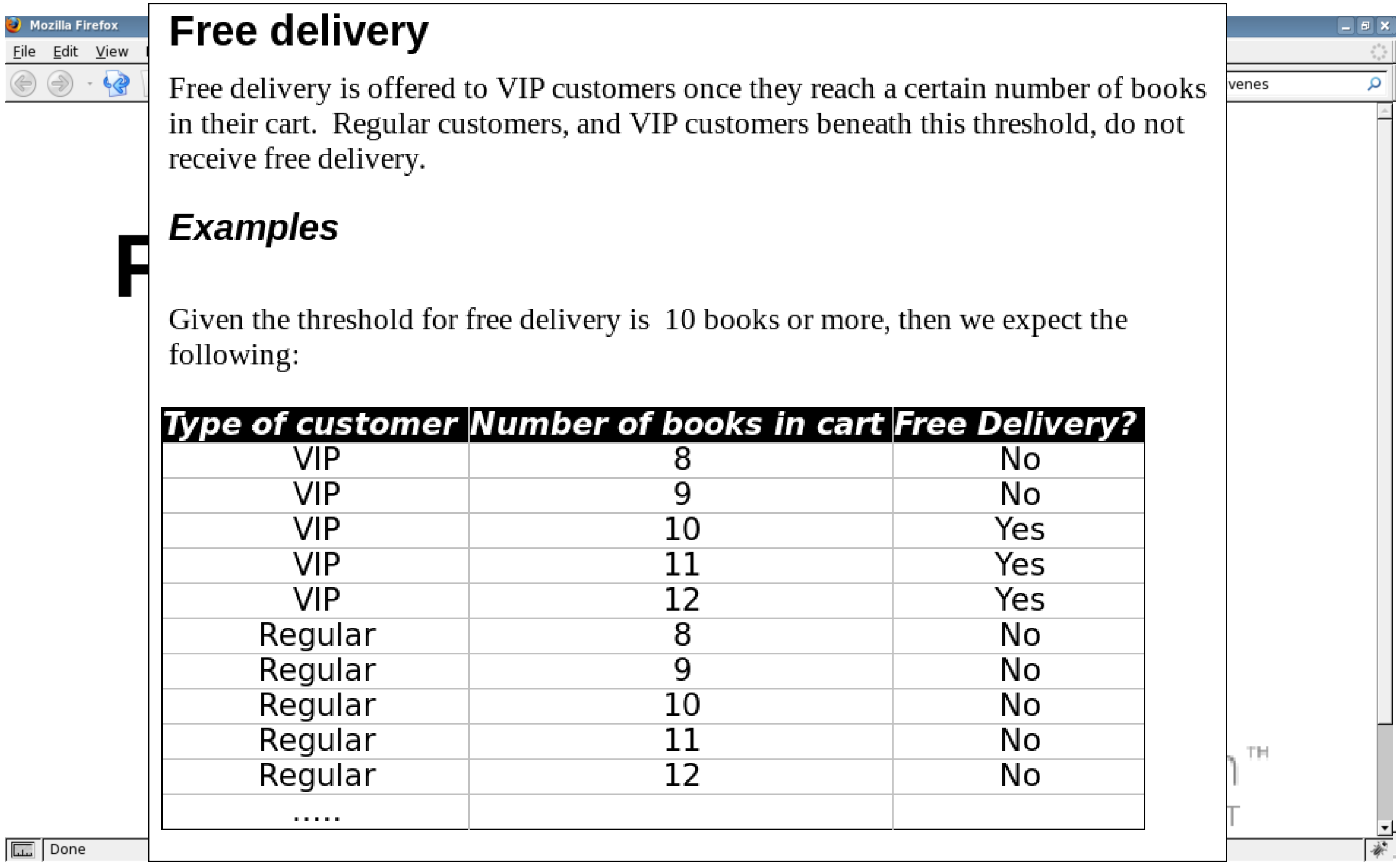
- ❖ The workshop is not a meeting
- ❖ The workshop is not a presentation
- ❖ The workshop is not a design session

3.2 Specification Workshop – Building a shared understanding of the domain

- Inconsistencies and gaps are easy to spot when you write the rules down!
- Real-world examples help flush out incorrect **assumed** rules find **real** business rules!
- People have think at a more detailed level and can't brush questions off…
- People approach the same problem from different perspectives, so this avoids groupthink!

4. Tools

❖ Automate tests, but still keep them human-readable



Free delivery

Free delivery is offered to VIP customers once they reach a certain number of books in their cart. Regular customers, and VIP customers beneath this threshold, do not receive free delivery.

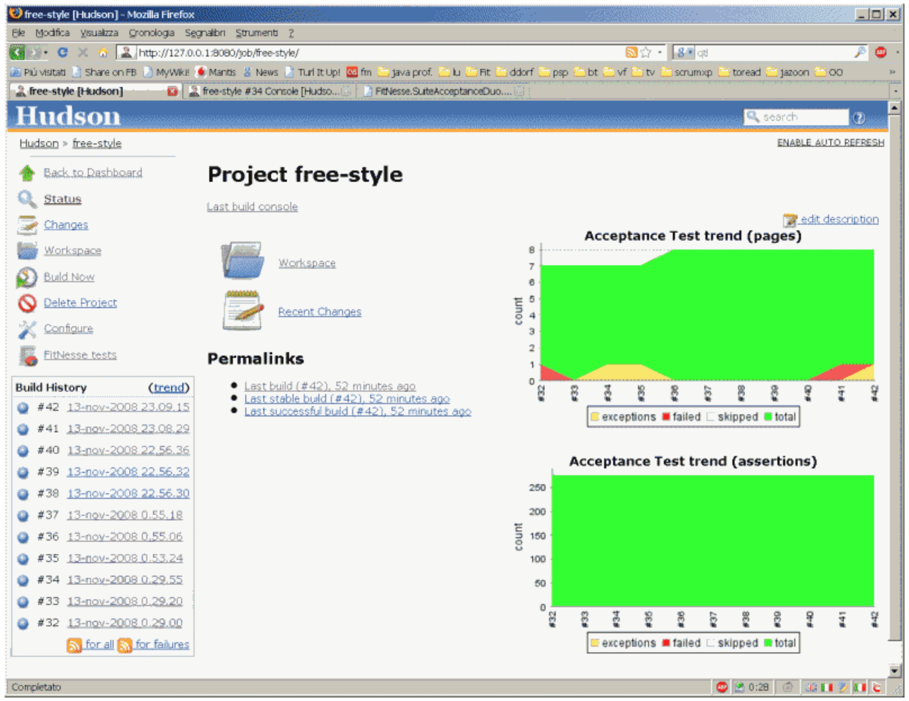
Examples

Given the threshold for free delivery is 10 books or more, then we expect the following:

Type of customer	*Number of books in cart*	*Free Delivery?*
VIP	8	No
VIP	9	No
VIP	10	Yes
VIP	11	Yes
VIP	12	Yes
Regular	8	No
Regular	9	No
Regular	10	No
Regular	11	No
Regular	12	No
.....		

4.2 Providing focus for development – Not just-in-case code

- Developers will have to code exactly what was specified …
  - not just the rules they see
- Automated test reports show where we are…
  - When all the tests are green, the job is done


free-style [Hudson] - Mozilla Firefox
http://127.0.0.1:8080/job/free-style/
Hudson
search
ENABLE AUTO REFRESH
edit description
Acceptance Test trend (pages)
count
exceptions
failed
skipped
total
Acceptance Test trend (assertions)
Completato

Hudson » free-style

Back to Dashboard
Status
Changes
Workspace
Build Now
Delete Project
Configure
FitNesse tests

Project free-style

Last build console

Workspace

Recent Changes

Permalinks

- Last build (#42), 52 minutes ago
- Last stable build (#42), 52 minutes ago
- Last successful build (#42), 52 minutes ago

Build History	(trend)
#42	13-nov-2008 23.09.15
#41	13-nov-2008 23.08.29
#40	13-nov-2008 22.56.36
#39	13-nov-2008 22.56.32
#38	13-nov-2008 22.56.30
#37	13-nov-2008 0.55.18
#36	13-nov-2008 0.55.06
#35	13-nov-2008 0.53.24
#34	13-nov-2008 0.29.55
#33	13-nov-2008 0.29.20
#32	13-nov-2008 0.29.00

for all for failures

4.3 Keeping in touch with changes

- Live documentation
  - As relevant and reliable as executable code, but much easier to read!

- Previous examples help you ensure to discuss all important edge cases.

- Automated tests show straight away when something is obsolete or broken

- [tests became a] “significant and valuable business resource”
  - Rick Mugridge, Doubling the Value of Automated Tests,Google Tech Talks 09/2006

4.4 Demo

- NTAF/FitNesse
- RSpec
- Cucumber

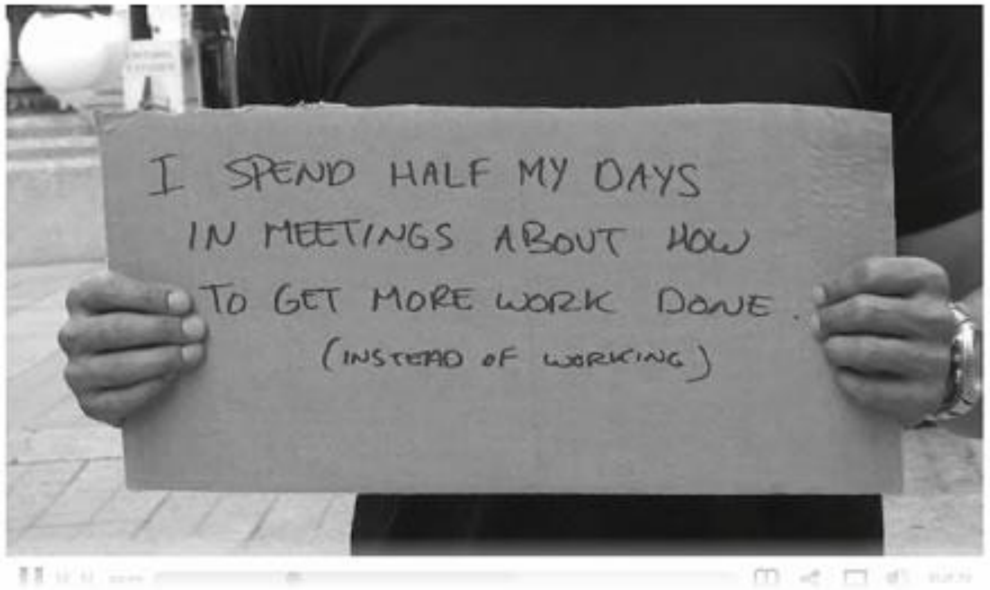
6. Conclusion

6.1 Recap (PM/BA)

- Developers will have to read the specifications to implement tests
- Discussion makes sure that everyone understood the stuff correctly
- To make all tests green, they cannot skip parts of the specs
- You can track the development progress
- Save time on acceptance testing with automated verifications

- Discuss and suggest examples until the gaps and inconsistencies are flushed out
- Make sure that business analysts understood special cases by suggesting them as examples and discussing them
- Acceptance tests are a live specification/documentation for the code

Hug a developer!



6.3 Recap (QA)

- Suggest examples and discuss them to cover mistakes that people make over and over
- Automated tests help you avoid doing the same stuff all the time
- Build quality in from the start by suggesting tests that prevent problems
- Verify business rules by a click on a button

RATBERT, MY COMPANY IS HIRING FOR OUR QUALITY ASSURANCE GROUP. YOU'D BE PERFECT.
WHAT WOULD I HAVE TO DO?
DILBERT
BY SCOTT ADAMS
YOU WOULD FIND FLAWS IN OUR NEW PRODUCT, THUS MAKING YOURSELF AN OBJECT OF INTENSE HATRED AND RIDICULE.
BUT THEN YOU'D FIX THOSE FLAWS... AND YOUR RESPECT FOR ME WOULD GROW INTO A SPECIAL BOND OF FRIENDSHIP, RIGHT?!
NO, THEN WE SHIP.
S. Adams E-mail: SCOTTADAMS@AOL.COM
7/1/96 © 1996 United Feature Syndicate, Inc.(NYC)

Thank you.