

# BDD crash-course for Product Owners



**GÁSPÁR NAGY**

TechTalk – developer coach

Creator of SpecFlow

[gn@techtalk.at](mailto:gn@techtalk.at)

<http://gasparnagy.com>

twitter: [@gasparnagy](https://twitter.com/gasparnagy)



Agilia Budapest, June 11th 2014

we do working software  
(and have fun)



# BDD?

*BDD is a second-generation, outside-in, pull-based, multiple-stakeholder, multiple-scale, high-automation, agile methodology.*

*It describes a cycle of interactions with well-defined outputs, resulting in the delivery of working, tested software that matters.*



Dan North, Agile Testing, Specifications and BDD Exchange 2009

# BDD?

**TDD**

Test Driven Development

**Specification by  
Example**

**Definition of  
Done**

**DDD**

Domain Driven Design



**ATDD**

Acceptance Test Driven  
Development

**DSL**

Domain Specific Language

**Outside-In  
Development**

**User Stories**

*fear*

BDD =

Product Ownership +  
Collaboration +  
Automation

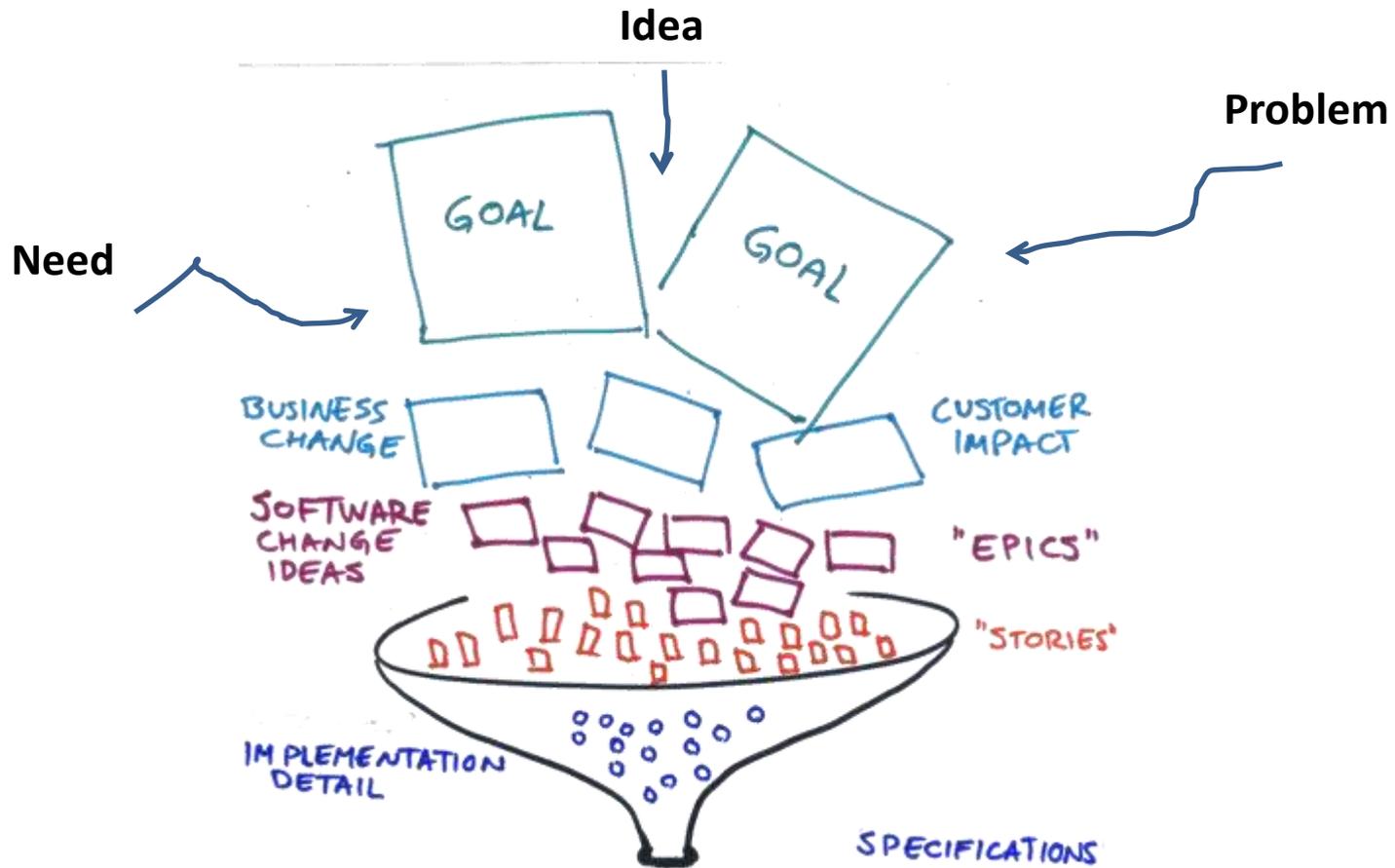
# What makes user stories *agile*?

- *Describe user needs or features*
- *Unit of planning/prioritization*

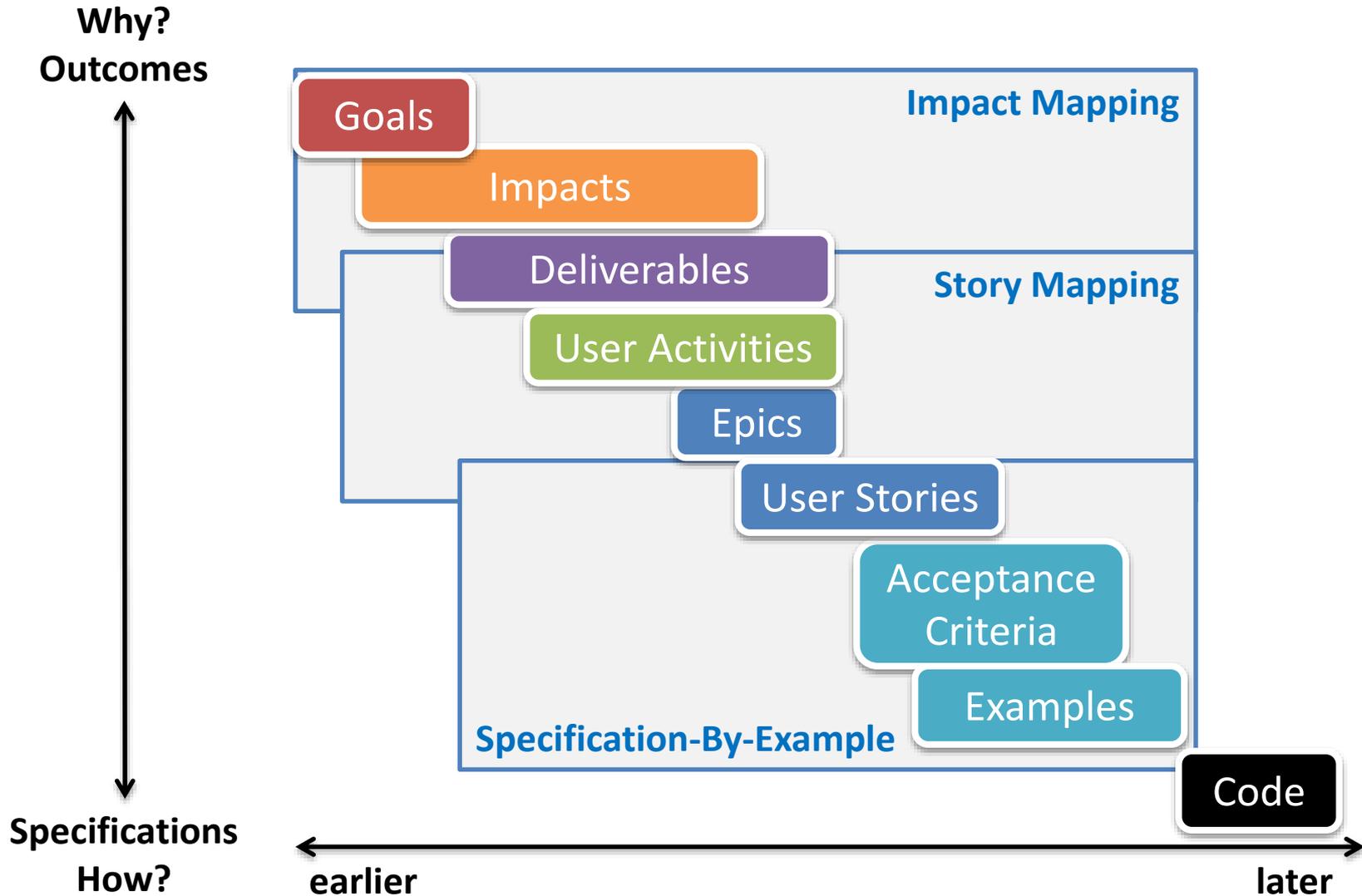
Help solving ***the right*** problem

- Solution options
- Mechanism to defer detail
- Reminder for a conversation
- Evolve over time:  
desired outcome → specification

# User Story life-cycle

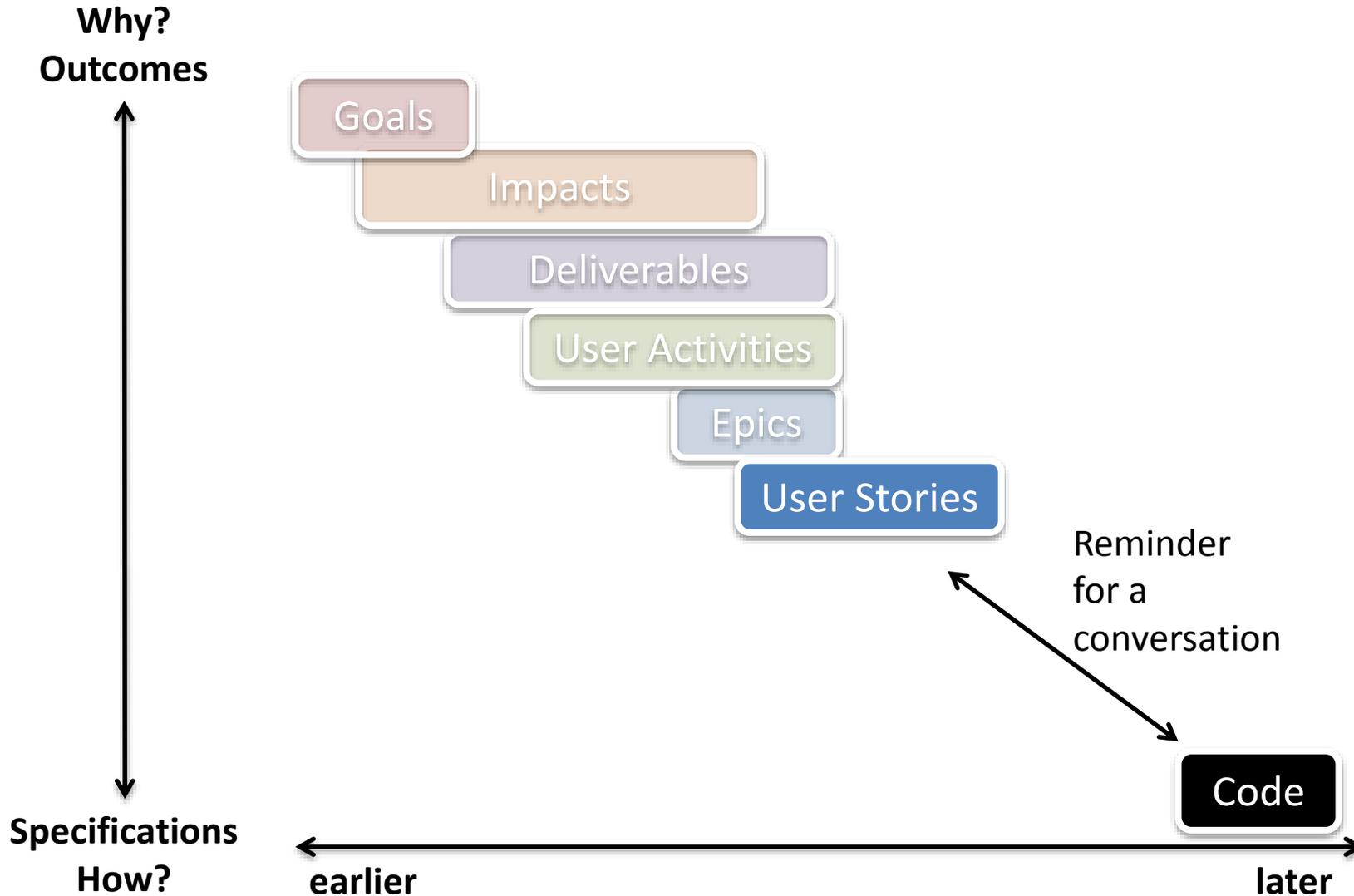


# Agile Product Ownership



# **Evolving User Stories into Specifications**

# Specifying user stories



# Having a conversation...

We would like to encourage new users to buy in our shop.  
Therefore we offer 10% discount for their first order.

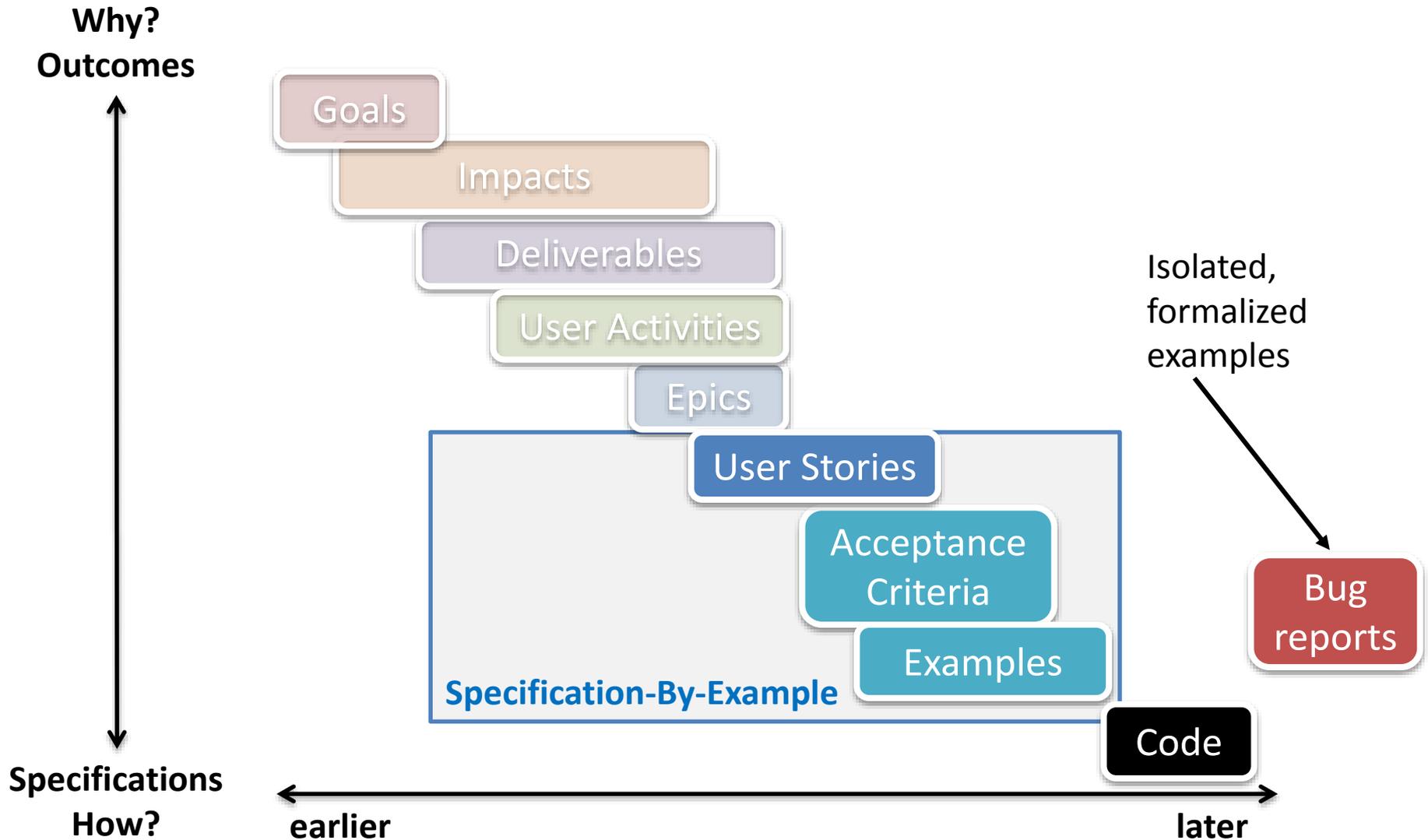


Register as "bart\_bookworm"  
Go to "/catalog/search"  
Enter "ISBN-0955683610"  
Click "Search"  
Click "Add to Cart"  
Click "View Cart"  
Verify "Subtotal" is "\$33.75"

```
public void CalculateDiscount(Order order)
{
    if (order.Customer.IsNew)
        order.FinalAmount = Math.Round(order.Total * 9/10);
}
```

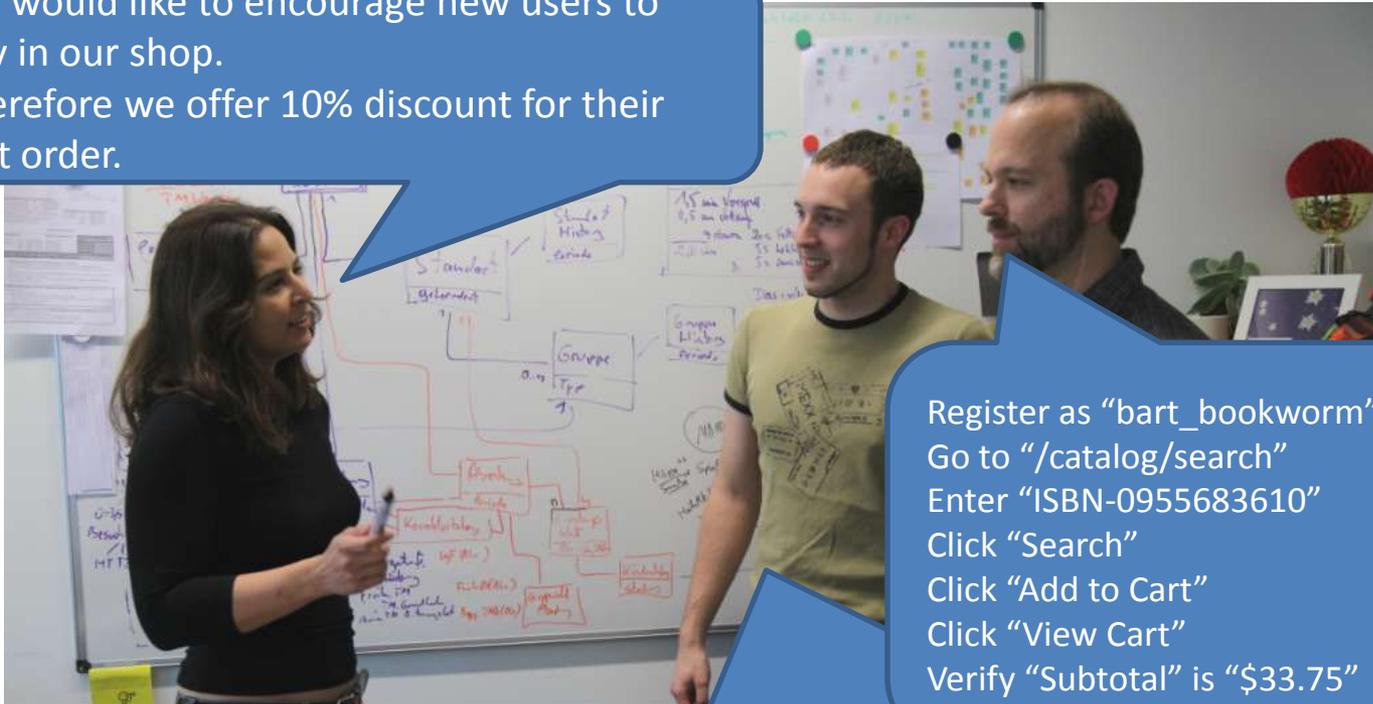
<http://blog.gdinwidiee.com>

# Establishing a shared understanding



# Discussing acceptance criteria ...

We would like to encourage new users to buy in our shop.  
Therefore we offer 10% discount for their first order.



Register as "bart\_bookworm"  
Go to "/catalog/search"  
Enter "ISBN-0955683610"  
Click "Search"  
Click "Add to Cart"  
Click "View Cart"  
Verify "Subtotal" is "\$33.75"

```
public void CalculateDiscount(Order order)
{
    if (order.Customer.IsNew)
        order.FinalAmount = Math.Round(order.Total * 9/10);
}
```

<http://blog.gdinwidiee.com>

# ... illustrated with formalized examples



**Given** the user has not ordered yet

**When** the user adds a book with the price of EUR 37.5 into the shopping cart

**Then** the shopping cart sub-total is EUR 33.75.

Original idea for the illustration: George Dinwiddie  
<http://blog.gdinwiddie.com>

# Discover hidden assumptions

Actually, this is not quite right:  
Books on sale should be excluded.



Original idea for the illustration: George Dinwiddie  
<http://blog.gdinwiddie.com>

# Collaboration: 3 amigos



Original idea for the illustration: George Dinwiddie  
<http://blog.gdinwiddie.com>

# Structuring the conversation

# Collecting Acceptance Criteria

As a potential customer  
I want to **collect books in a shopping cart**  
So that I can order several books at once.

*“Imagine this story is already implemented: how would you verify it?”*

*“I would try to put a book into the shopping cart ...”*

Books can be added to shopping cart.

*“I would try to remove a book from the shopping cart...”*

Books can be removed from shopping cart.

*“I’d check whether the shopping cart is empty, when I enter the shop ...”*

Shopping cart should be empty when entering the shop.

*“I would try to add 1000 books to the shopping cart ...”*

... ? ...

# Exploration through examples

*... I want to find books in the catalogue by author and title*

**Context**

Books in catalogue:

Title	Author
Specification-By-Example	Gojko Adzic
Impact Mapping	Gojko Adzic
Explore It!	Elisabeth Hendrickson
Competitive Engineering	Tom Gilb

**Action**

**Assertion**

Search for ...	Books found ...
Spec	Specification-By-Example
Hend	Explore It!
et	Explore It!, Competitive Engineering

# Key examples: Breaking the model

... I want to find books in the catalogue by author and title

Books in catalogue:

Title	Author
Specification-By-Example	Gojko Adzic
Impact Mapping	Gojko Adzic
Explore It!	Elisabeth Hendrickson
Competitive Engineering	Tom Gilb

What happens, if I search for "Explore Specification"?

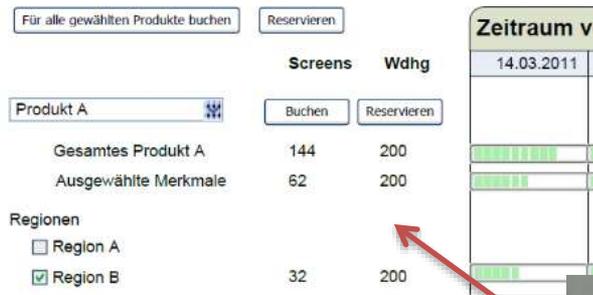
Can I search for single characters, e.g. "e"?

Is the number of search results limited, or paged?

Search for ...	Books found ...
Spec	Specification-By-Example
Hend	Explore It!
et	Explore It!, Competitive Engineering

Is the search also performed in the sub-title of a book?

# Different kinds of examples



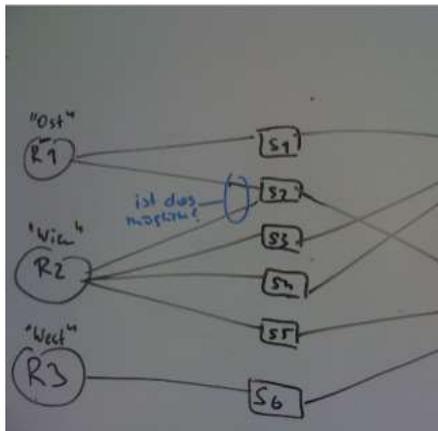
UI wire frames,  
existing UI

Screens auswählen  
Als Verkäufer  
will ich Screens eines Produkts über eine Kombination von Merkmalen zur Buchung auswählen  
weil die einzelne Auswahl von Screens beim Verkaufsgespräch und der Besprechung von Varianten zu langsam ist.

	A	B	C	D	E
1	ID	Attribute 1	Attribute 2	Blacklist 1	Blacklist 2
2		1 Wien	Wohngebiet Verkehr		Mobiltelefon
3		2 NO	Wohngebiet		
4		3 DO			
5		4 Stmk			
6		5 Bgld	Büros		
7		6 Kärnten	Bahnhof		
8		7 Sbg	Uni/Schule		
9		8 Tirol	Bahnhof		
10		9 Vbg	Uni/Schule	Elektroartikel	
11		10 Vbg			
12		11 Vbg			
13		12 Vbg	Büros		
14		13 Vbg	Büros		

existing artifacts,  
samples

rules, key examples



	Regul Typlos	nur Beginn		Alle		nur Typ ? erlaubt	
pub. Screen	S2	S1, S2	S7, S8, S9, S4, S5	S1-S6	S1, S3, S4		
G/A	6/1	6/2	6/5	6/6	6/3		
R							
R1: "Ost"	✓ 1	✓ 2	✓ 2	✓ 2			
R2: "Wien"			✓ 4	✓ 4			
R3: "West"				✓ 1			
T							
T1: "gross"			✓ 3	✓ 3			
T2: "klein"	✓ 1		✓ 2	✓ 3			

# Examples in Gherkin

As a shop visitor  
*I want to* **collect books in my shopping basket**  
*so that* I can purchase multiple books at once.

Books can be added to the shopping basket

*Given* my shopping basket is empty

*When* I add the book "Harry Potter" to my shopping basket

*Then* my shopping basket should contain 1 copy of "Harry Potter"

# Examples in Gherkin

As a shop visitor  
*I want to* **collect books in my shopping basket**  
*so that* I can purchase multiple books at once.

B The same book can be added multiple times to the shopping basket

*Given* my shopping basket contains 1 copy of "Harry Potter"

*When* I add the book "Harry Potter" to my shopping basket

*Then* my shopping basket should contain 2 copies of "Harry Potter"

# Structure of examples

**Title:** Describes intention/abstract acceptance criterion

**Arrange:** Context, describes state of the system

**Act:** Execution of the feature

**Assert:** Assertion of observable behaviour

The same book can be added multiple times to the shopping basket

*Given* my shopping basket contains 1 copy of "Harry Potter"

*When* I add the book "Harry Potter" to my shopping basket

*Then* my shopping basket should contain 2 copies of "Harry Potter"

*And* I should see the warning: "Book already existed in basket"

Triple-A  
constraint  
"Checks"

Chaining  
up steps

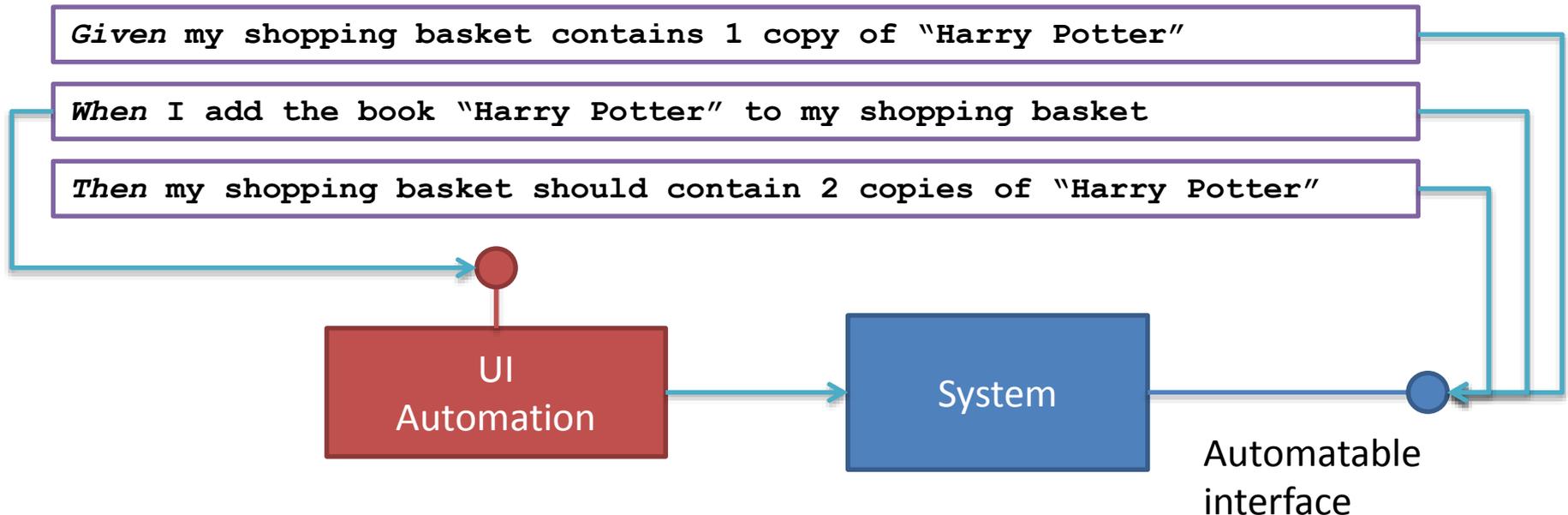
Evolution of a domain specific  
test and specification language.

# Automated continuous validation

„Step Definitions“ are binding individual steps to an automatable interface of the application.

Automation does not necessarily have to bind to the UI.

Automatability of system is supported/evolving with development.



„Living documentation“

# Demo



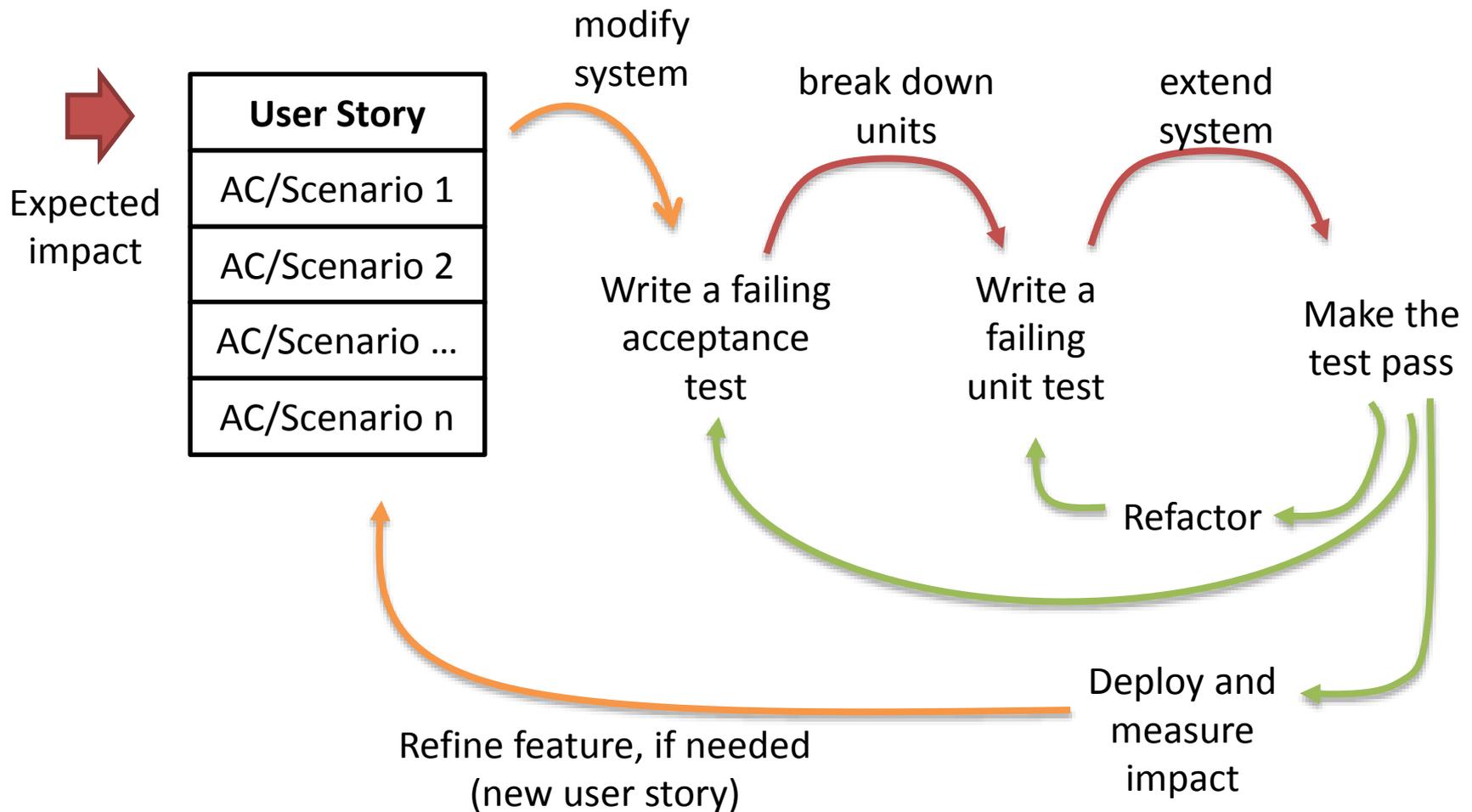
<http://www.specflow.org>

## Gherkin automation for .NET

- Visual Studio plugin (VS-Gallery)
- NuGet Package

# **Business readable team flow with ATDD**

# ATDD cycle



# Tasks are not business readable

1584	Product Back...	US115 - Create bookings for a fixed time loop on
1588	Task	Extend/change screen selection page: spot lei
1591	Task	Screen selection page: add validation for date
1592	Task	Create booking details page (UI only: fields, r/o attribute and time range list, take ov...
1593	Task	Navigation and keeping form data (+AC for navigation)
1594	Task	End-to-end booking creation without overbooking check and confirmation (+AC)
1595	Task	Integrate overbooking calculation
1596	Task	Refactor controllers (actions, responsibilities, etc)
1611	Task	Overbooking calculation prototype
1612	Task	Add confirmation logic
1617	Task	Refactor screen selection page to use model binding (prepare for more complex form ...
1618	Task	Handle favico requests
1620	Task	Add validation for: date+time together should build a valid range, start date >= curr...
1621	Task	Check MVC model binding & validation infrastructure
1647	Task	Fix checkbox refreshing issue (timebox: 30min)
1652	Task	Validate time ranges (at least one selected for booking)
1653	Task	Validate time format (start time, end time)
1654	Task	Validate start date and expiration date is not in the past

US115 - create bookings for a fixed time loop on... ▶ ✕

As a Sales representative,

I want to create bookings for a fixed time loop on  
selected screens

So that I can place orders from my clients during a sales  
discussion

DETAILS Estimate: 3

# ... but scenarios (AC) are

- ⊕ Navigating from (utilization view) to (booking details) should copy: booking details, se
- ⊕ Navigating from (booking details) to (utilization view) should copy: booking details, se
- ⊕ Successful booking should save entered booking attributes along with screen selection details and time ranges
- ⊕ Overbooking should only concern "Bookings" and "Reservations" but not "Pre-Reservations"
- ⊕ Overbooking should display warning message and ask for confirmation
- ⊕ Confirming overbooking should save the booking
- ⊕ Rejecting overbooking should navigate back to utilization view
- ⊕ Missing required fields should cause validation error
- ⊕ Invalid spot length should cause validation error on the booking details page
- ⊕ Invalid dates should cause validation error on the booking details page
- ⊕ Invalid date range should cause validation error on the booking details page
- ⊕ Invalid times should cause validation error on the booking details page
- ⊕ No time ranges selected should raise a validation error

US115 - create bookings for a fixed time loop on... ▶ ✕

As a Sales representative,

I want to create bookings for a fixed time loop on  
selected screens

So that I can place orders from my clients during a sales  
discussion

DETAILS Estimate: 3

# Current sprint report: all sprint scenarios

techtalkat:8111/viewLog.html?buildId=149&buildTypeId=bt5&tab=SpecFlow\_Reports

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #6 (05 May 11 15:18)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #5 | All history | #7 >>

### AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/05/2011 15:19 (see <http://www.specflow.org/>).

#### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	0%	50	0	0	50	0

#### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	0%	30	0	0	30	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

#### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in mont		
Should allow paging forwards in month		
Should allow switching to month view		
Should allow switching to the booking r		
Should display maximum 31 days when		

Scenario: Should display utilization in green when spot length invalid  
@specified

Given I am on the screen selection page  
And the calendar shows the booking range from '2011-05-11' to '2011-05-11'  
When I enter 'x' for the spot length  
Then the displayed overall utilization for all screens should be green for every day

Status	Time(s)
pending	15.413
pending	0.187
pending	0.147
pending	0.437
pending	0.150

# Starting with first scenario (AC)

Grassfish.AD.Werbeitverw x

techtalk.at:8111/viewLog.html?buildId=151&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #7 (06 May 11 10:43)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #6 All history #8 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/06/2011 10:44 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	0%	51	0	1	50	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	0%	31	0	1	30	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in mont	pending	15.554
Should allow paging forwards in month	pending	0.288
Should allow switching to month view	pending	0.189
Should allow switching to the booking r:	pending	0.157
Should display maximum 31 days when	pending	0.161

Scenario: Should display utilization in green when spot length invalid  
@automated @in\_progress

Given I am on the screen selection page  
And the calendar shows the booking range from '2011-05-11' to '2011-05-11'  
When I enter 'x' for the spot length  
Then the displayed overall utilization for all screens should be green for every day

# Finishing the first scenario (AC)

Grassfish.AD.Werbeitverv x +

techtalk.at:8111/viewLog.html?buildId=162&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #14 (09 May 11 10:48)

Overview Changes (2) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #13 All history #15 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/09/2011 10:49 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	2%	50	1	0	49	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	3%	30	1	0	29	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in mont	pending	12.176
Should allow paging forwards in month	pending	0.227
Should allow switching to month view	pending	0.208
Should allow switching to the booking r	pending	0.168
Should display maximum 31 days when	pending	0.173

**Scenario: Should display utilization in green when spot length invalid**  
 @automated @done

Given I am on the screen selection page  
 And the calendar shows the booking range from '2011-05-11' to '2011-05-11'  
 When I enter 'x' for the spot length  
 Then the displayed overall utilization for all screens should be green for every day

# Progressing scenario after scenario

Grassfish.AD.Werbezeitverv x +

techtalk.at:8111/viewLog.html?buildId=163&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #15 (09 May 11 11:47)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #14 All history #16 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/09/2011 11:49 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	4%	50	2	0	48	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	7%	30	2	0	28	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	pending	14.029
Should allow paging forwards in month view	pending	0.182
Should allow switching to month view	pending	0.171
Should allow switching to the booking range view	pending	0.169
	pending	0.176

techtalk.at:8111/viewLog.html?buildId=165&tab=SpecFlow\_Reports&buildTypeId=bt5view

# Progressing scenario after scenario

Grassfish.AD.Werbezeitverv x +

techtalk.at:8111/viewLog.html?buildId=165&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #16 (09 May 11 13:16)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #15 All history #17 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/09/2011 13:18 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	6%	51	3	0	48	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	10%	31	3	0	28	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	pending	13.217
Should allow paging forwards in month view	pending	0.191
Should allow switching to month view	pending	0.324
Should allow switching to the booking range view	pending	0.202
Should display maximum 31 days when selecting the booking range view	pending	0.172

# Progressing scenario after scenario

Grassfish.AD.Werbezeitverv x +

techtalk.at:8111/viewLog.html?buildId=167&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #17 (09 May 11 15:06)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #16 All history #18 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/09/2011 15:08 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	8%	51	4	0	47	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">Calendar views</a>	0%	8	0	0	8	0
<a href="#">Create booking</a>	13%	31	4	0	27	0
<a href="#">Create reservation</a>	0%	5	0	0	5	0
<a href="#">Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	pending	12.952
Should allow paging forwards in month view	pending	0.248
Should allow switching to month view	pending	0.258
Should allow switching to the booking range view	pending	0.355
Should display maximum 31 days when selecting the booking range view	pending	0.171

# Implementing user stories in parallel

Grassfish.AD.Werbeitver x +

techtalkat:8111/viewLog.html?buildId=207&buildTypeId=bt5&tab=SpecFlow\_Reports

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #42 (13 May 11 17:09)

Overview Changes (7) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #41 All history #43 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/13/2011 17:13 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	22%	51	11	4	36	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">US110 - Calendar views</a>	88%	8	7	0	1	0
<a href="#">US112 - Create reservation</a>	0%	5	0	0	5	0
<a href="#">US114 - Show availability of spot length</a>	0%	3	0	0	3	0
<a href="#">US115 - Create booking</a>	13%	31	4	4	23	0
<a href="#">US116 - View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

#### Feature: US110 - Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	success	42.743
Should allow paging forwards in month view	success	1.793
Should allow switching to month view	success	1.482
Should allow switching to the booking range view	success	2.340
Should display maximum 31 days when selecting the booking range view	success	1.318

# First user story ready for testing

Grassfish.AD.Werbeitverw x +

techtalk.at:8111/viewLog.html?buildId=282&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #91 (19 May 11 16:43)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #90 All history #92 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/19/2011 16:47 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	49%	51	25	0	26	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">US110 - Calendar views</a>	88%	8	7	0	1	0
<a href="#">US112 - Create reservation</a>	0%	5	0	0	5	0
<a href="#">US114 - Show availability of spot length</a>	100%	3	3	0	0	0
<a href="#">US115 - Create booking</a>	48%	31	15	0	16	0
<a href="#">US116 - View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

#### Feature: US110 - Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	success	24.682
Should allow paging forwards in month view	success	2.373
Should allow switching to month view	success	1.901
Should allow switching to the booking range view	success	3.581
Should display maximum 31 days when selecting the booking range view	success	1.725

# Testing can start even earlier

Grassfish.AD.Werbezeitverv x +

techtalk.at:8111/viewLog.html?buildId=295&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #99 (23 May 11 09:43)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #98 All history #100 >>

**Feature: US115 - Create booking**

Scenario	Status	Time(s)
Confirmation of overbooking should save the booking	success	9.504
Invalid date range should cause validation error on the booking details page	success	6.988
Invalid dates should cause validation error on the booking details page("31/05/2011",System.String[])	success	6.218
Invalid dates should cause validation error on the booking details page("2011.05.31",System.String[])	success	6.127
Invalid dates should cause validation error on the booking details page("///",System.String[])	success	6.183
Invalid spot lenght should cause validation error on the booking details page("xxx",System.String[])	success	6.032
Invalid spot lenght should cause validation error on the booking details page("201",System.String[])	success	5.839
Invalid spot lenght should cause validation error on the booking details page("-1",System.String[])	success	6.277
Invalid spot lenght should cause validation error on the booking details page("0",System.String[])	success	5.854
Invalid times should cause validation error on the booking details page("xxx",System.String[])	pending	0.274
Invalid times should cause validation error on the booking details page("1800",System.String[])	pending	0.428
Invalid times should cause validation error on the booking details page("25:00",System.String[])	pending	0.380
Invalid times should cause validation error on the booking details page("08:00AM",System.String[])	pending	0.271
Invalid times should cause validation error on the booking details page("12:61",System.String[])	pending	0.310
Navigation from booking details to utilization view takes over the booking details and the selected attributes and time ranges	success	82.914
Navigation from utilization view to booking details takes over the booking details and the selected attributes and time ranges	success	76.330
None of the required fields filled should cause all required validation errors displayed	success	4.440
None of the required fields filled should cause all required validation errors displayed on select product configuration page	success	1.526
No time ranges selected should raise a validation error	pending	0.347
Overbooking calculation should handle different booking types("Reservation","Pre-reservation","no",System.String[])	pending	0.337
Overbooking calculation should handle different booking types("Booking","Pre-reservation","no",System.String[])	pending	0.321
Overbooking calculation should handle different booking types("Booking","Reservation","yes",System.String[])	pending	0.346
Overbooking calculation should handle different booking types("Reservation","Booking","yes",System.String[])	pending	0.263

# Already done work can break again

Grassfish.AD.Werbeitzeitver... x

techtalk.at:8111/viewLog.html?buildId=301&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #103 (23 May 11 16:29)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #102 | All history | #104 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/23/2011 16:37 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	53%	51	27	0	24	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">US110 - Calendar views</a>	88%	8	7	0	1	0
<a href="#">US112 - Create reservation</a>	20%	5	1	0	4	0
<a href="#">US114 - Show availability of spot length</a>	100%	3	3	0	0	0
<a href="#">US115 - Create booking</a>	52%	31	16	0	15	0
<a href="#">US116 - View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

Feature: US110 - Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	success	24.295
Should allow paging forwards in month view	success	2.427
Should allow switching to month view	success	2.273
Should allow switching to the booking range view	success	3.493
Should display maximum 31 days when selecting the booking range view	success	1.877

# Already done work can break again

Grassfish.AD.Werbeitver x +

techtalkat:8111/viewLog.html?buildId=308&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

> CI > #108 (24 May 11 15:51)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #107 All history #109 >>

## AcceptanceTests Test Execution Report

Generated by SpecFlow at 05/24/2011 15:59 (see <http://www.specflow.org/>).

### Summary

Features	Success rate	Scenarios	Success	Failed	Pending	Ignored
5 features	58%	59	34	1	24	0

### Feature Summary

Feature	Success rate	Scenarios	Success	Failed	Pending	Ignored
<a href="#">US110 - Calendar views</a>	88%	8	7	0	1	0
<a href="#">US112 - Create reservation</a>	69%	13	9	0	4	0
<a href="#">US114 - Show availability of spot length</a>	67%	3	2	1	0	0
<a href="#">US115 - Create booking</a>	52%	31	16	0	15	0
<a href="#">US116 - View bookings related to utilization value</a>	0%	4	0	0	4	0

### Feature Execution Details

#### Feature: US110 - Calendar views

Scenario	Status	Time(s)
Should allow paging backwards in month view	success	21.132
Should allow paging forwards in month view	success	2.408
Should allow switching to month view	success	2.151
Should allow switching to the booking range view	success	3.729
Should display maximum 31 days when selecting the booking range view	success	1.920

# See what is temporarily not working

Grassfish.AD.Werbeitverv x

techtalkat:8111/viewLog.html?buildId=308&tab=SpecFlow\_Reports&buildTypeId=bt5

Welcome, Guest user Logout

Projects Agents (1) Build Queue (0)

CI > #108 (24 May 11 15:51)

Overview Changes (1) Tests Build Log Build Parameters Artifacts SpecFlow Reports

<< #107 All history #109 >>

**Feature: US114 - Show availability of spot length**

Scenario	Status	Time(s)
Should display utilization in green when spot length available	success	2.794
Should display utilization in green when spot length invalid	success	12.665
Should display utilization in red when spot length not available	failure [show]	2.826

**Feature: US114 - Show availability of spot length**  
@current\_sprint  
LAST UPDATED: 2 MINUTES AGO

**Background**

Given a product with the following properties

Id	Name	BookingVariant	SecondsAvailable
Gas station	Gas stations in Austria	Loop	200

And the following screens

Screen
S1

And the following time ranges

Name
Morning

And the following bookings

Start date	End date	Time range	Duration
2011-05-11	2011-05-11	Morning	100

**Scenario: Should display utilization in red when spot length not available**  
@automated @done

Given I am on the screen selection page  
And the calendar shows the booking range from '2011-05-11' to '2011-05-11'  
When I enter '101' for the spot length  
Then the displayed overall utilization for all screens should be red for every day

# Transparency for stakeholders

## AD Project Dashboard

### Last Finished Sprint results

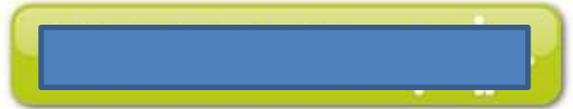
- Done report: [here](#)
- Application: [http://\[redacted\].techtalk.at:8890/](http://[redacted].techtalk.at:8890/)
- Test files:
  - Product & Booking import sample: [\[redacted\]\\_Testdaten\\_01.xlsx](#)

### In Progress

- Build status: see on the right side
- Current done report: [on build server here](#)
- Current sprint report: [on build server here](#)
- Sprint burndown: [generated every day at noon](#) or [on reporting server here \(internal\)](#)
- Latest application (internal): [http://ttvm-\[redacted\]:8889/](http://ttvm-[redacted]:8889/)
- Latest smoke-tested application (internal): [http://ttvm-g\[redacted\]8888/](http://ttvm-g[redacted]8888/)

### Infrastructure summary

- Project Sharepoint Site: [https://projects.techtalk.at/projects/\[redacted\]](https://projects.techtalk.at/projects/[redacted])
- Build Server: [http://\[redacted\].techtalk.at:8111/](http://[redacted].techtalk.at:8111/)
- SpecLog: ttvm-tt-sfee-net4:4243[redacted]



#### Build status:

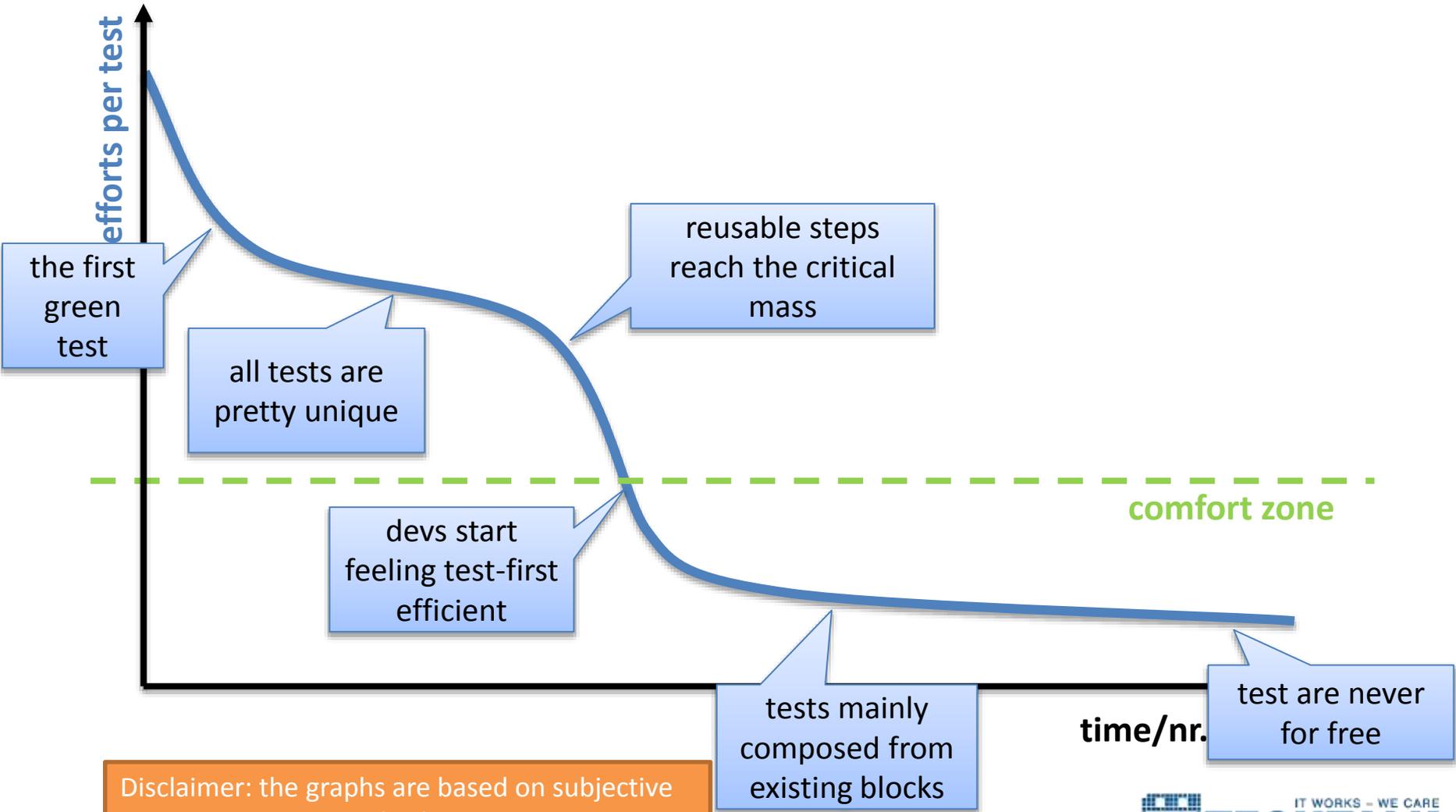
[redacted] hg  
✔ Acceptance build #176 artifacts  
17 Jun 11 16:34

[redacted] hg  
✔ CI build #121 artifacts  
17 Jun 11 14:28

# BDD rollout

# “BDD costs”

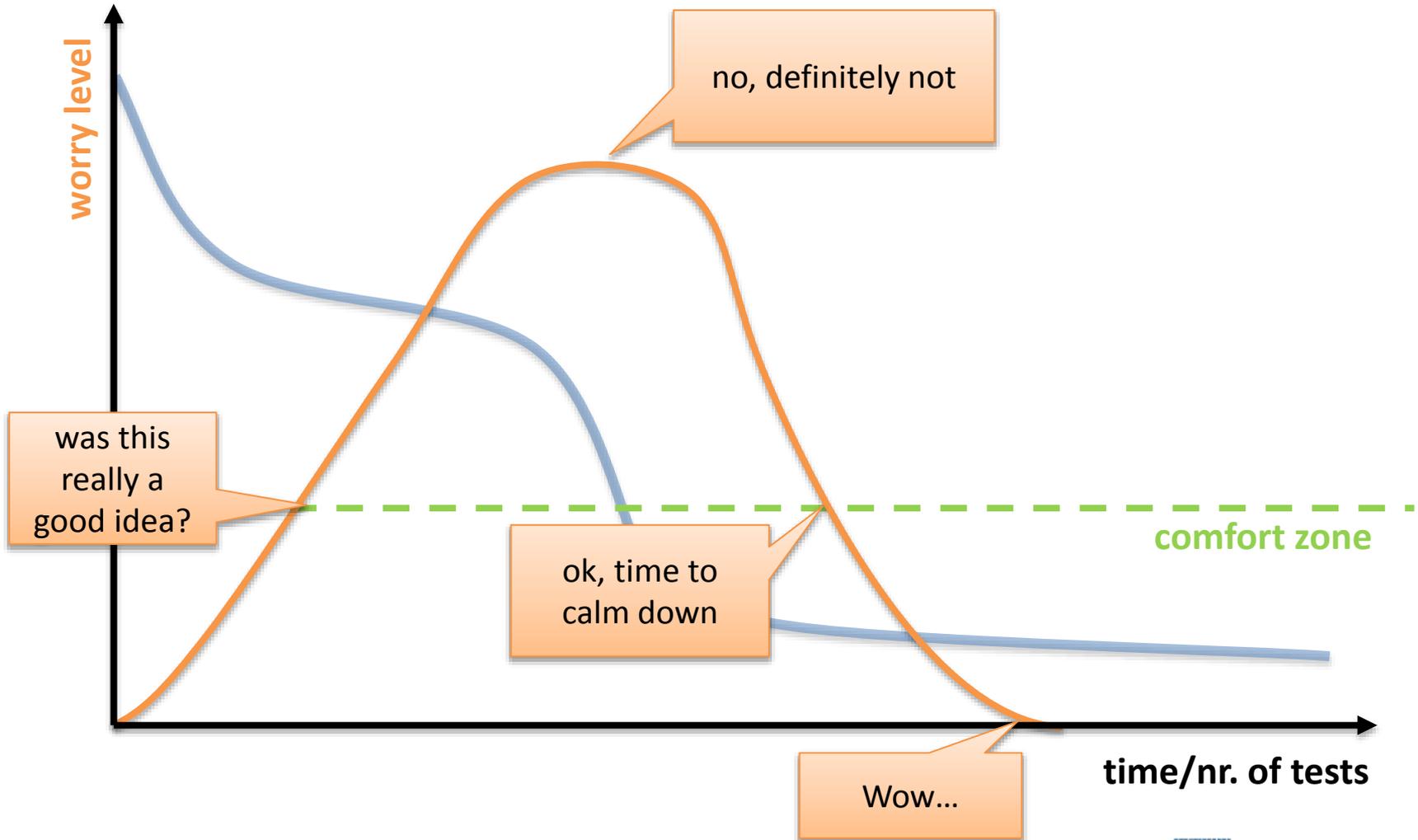
— efforts per test



Disclaimer: the graphs are based on subjective reports, not measured values

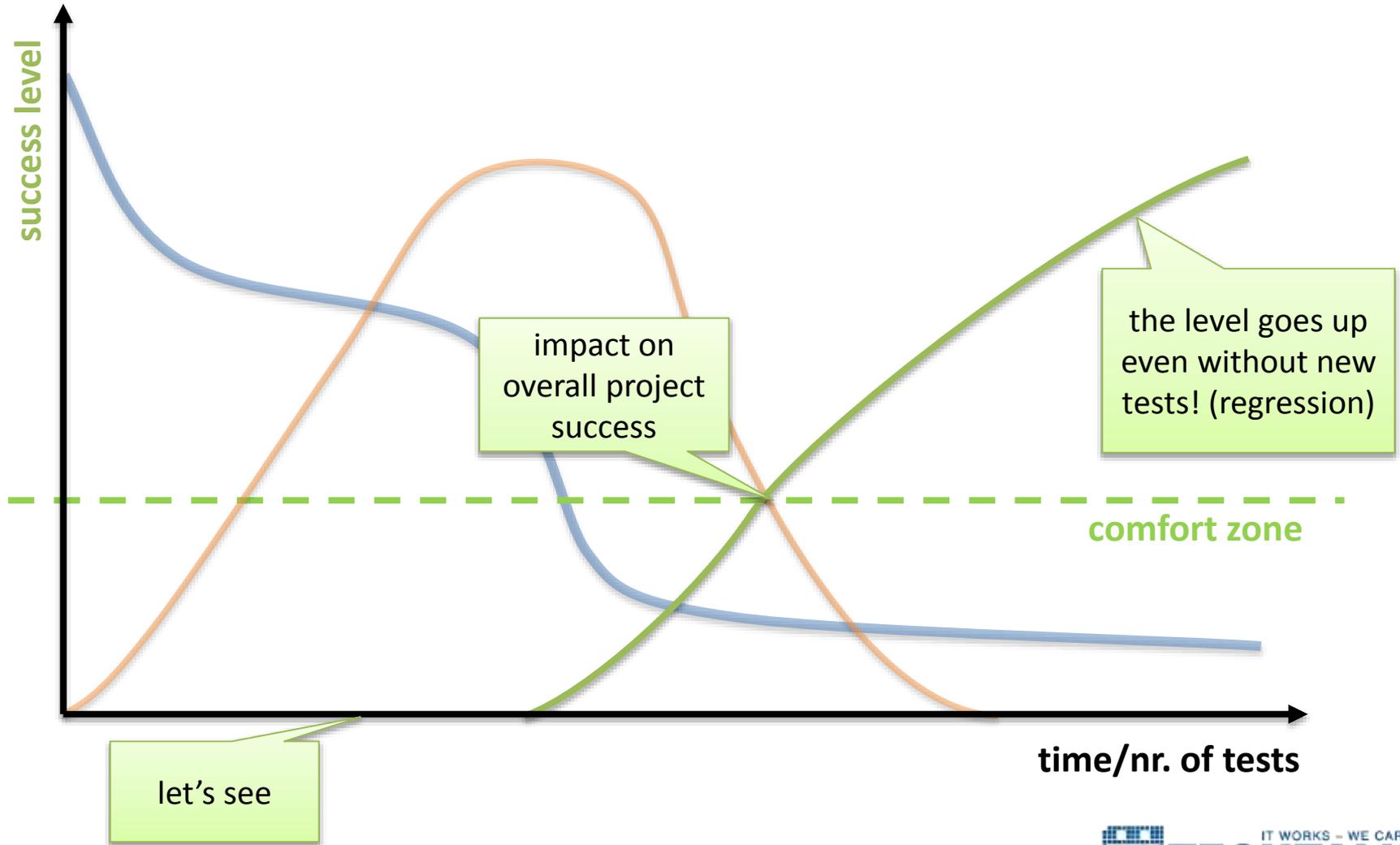
# “BDD costs”

— efforts per test  
— worry level

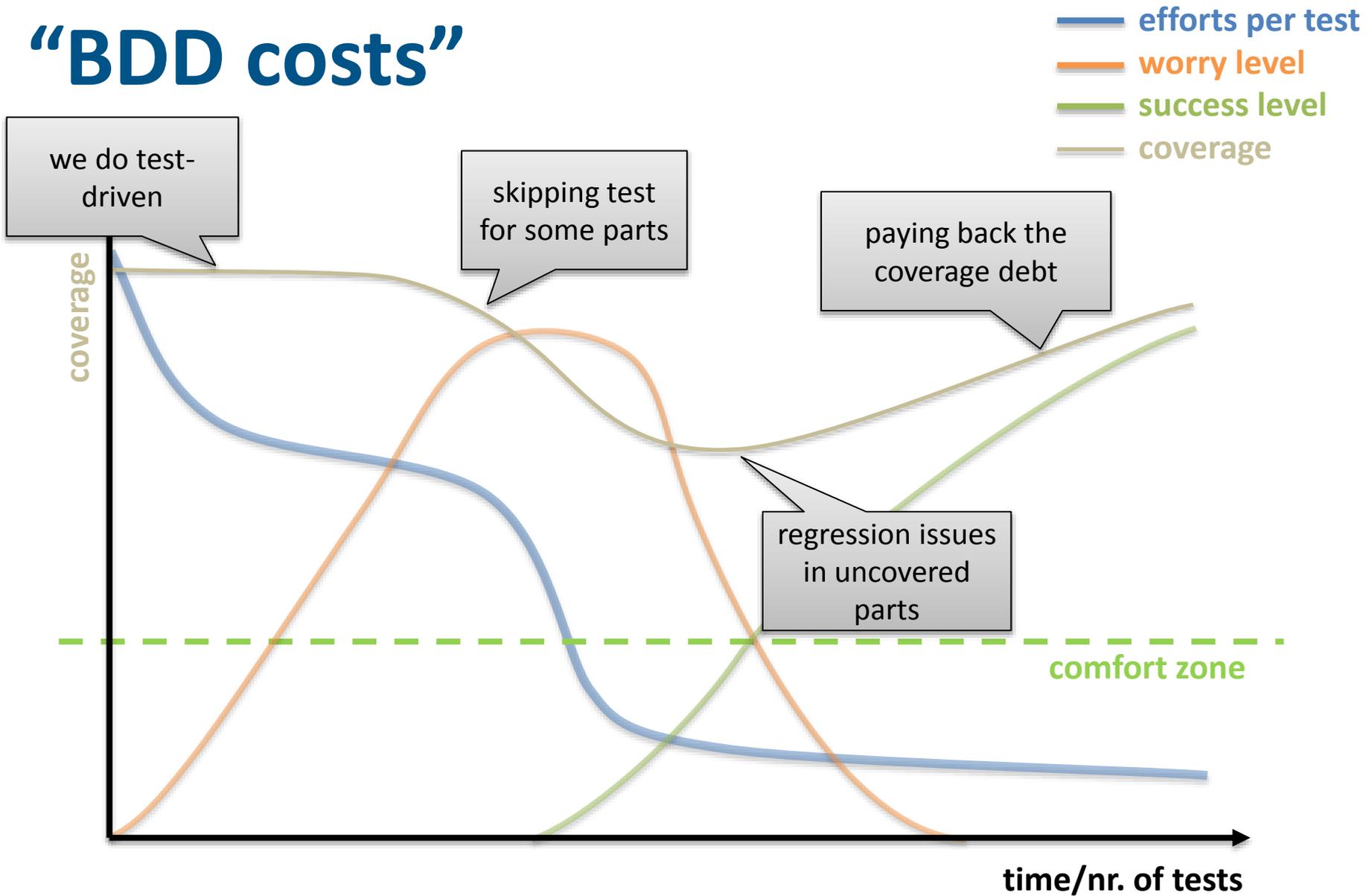


# “BDD costs”

- efforts per test
- worry level
- success level

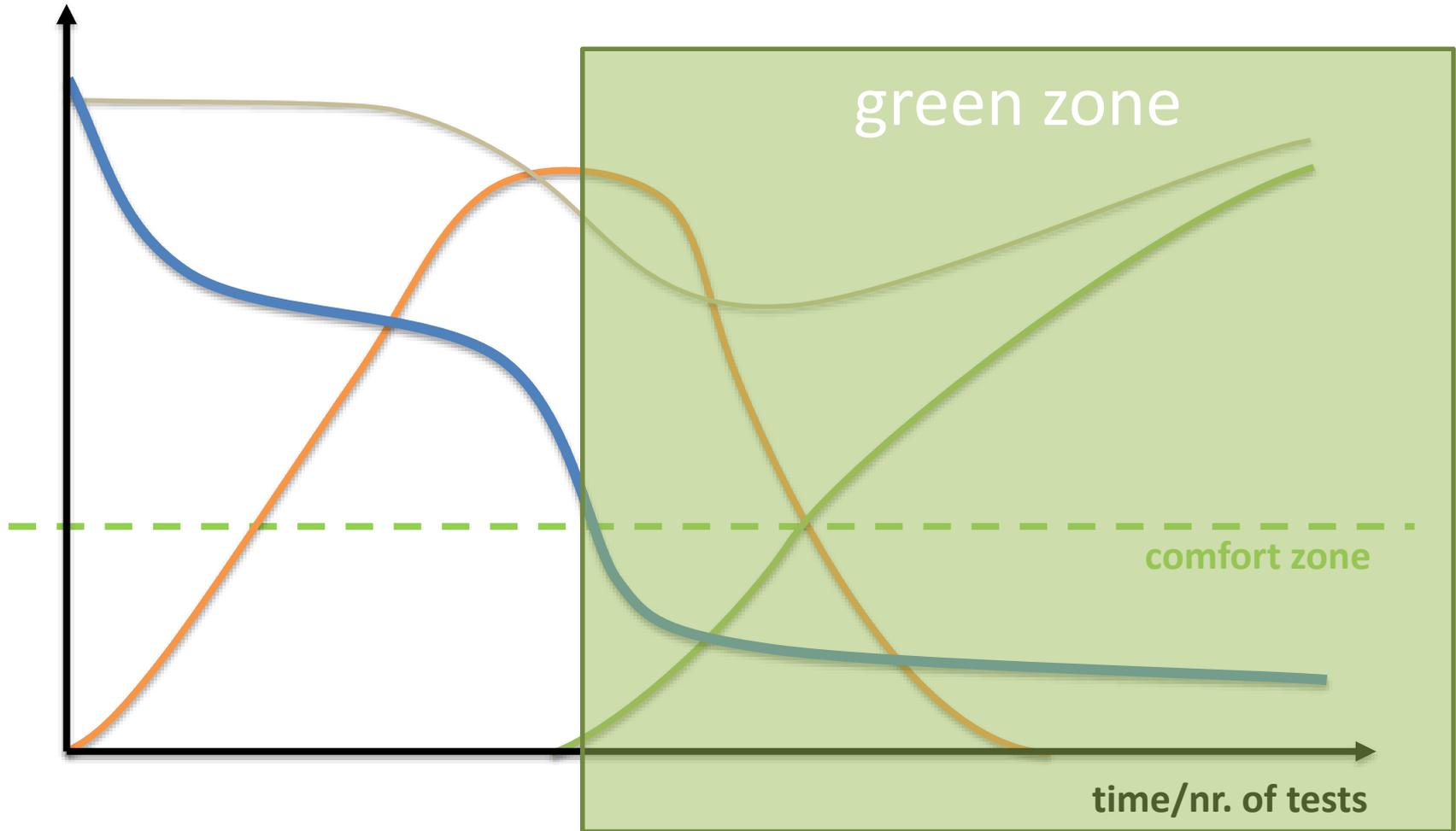


# “BDD costs”



# “BDD costs”

- efforts per test
- worry level
- success level
- coverage



# Getting started with Specification-By-Example

A photograph of two women in conversation. The woman on the left has long dark hair and is smiling. The woman on the right has blonde hair and is wearing glasses. They are in a room with several colorful abstract paintings on the wall.

## Start with the conversation

- What happens when ... ?
- What would you try out ... ?
- Model based on concrete examples

# Grow your team's skills

- (Acceptance) Test Driven Development
- Test Automation Pyramid
- Exploratory Testing



# Decide for an automation tool

Gherkin tools available for  
Ruby, Java, .NET, JavaScript, PHP, ...



Other ATDD tools like:  
JBehave, Fitnesse, Robotframework,  
Concordion, ...

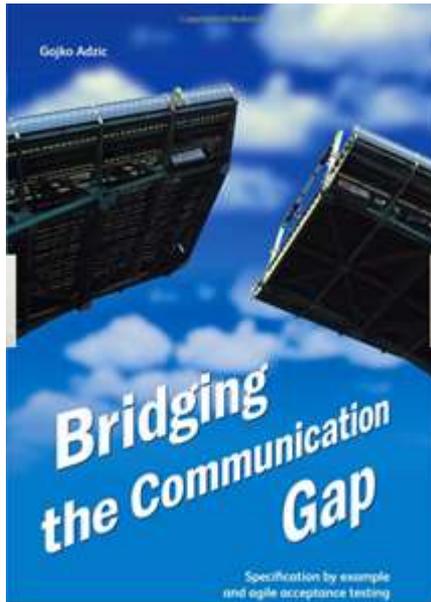


# Treat test automation as a first class citizen

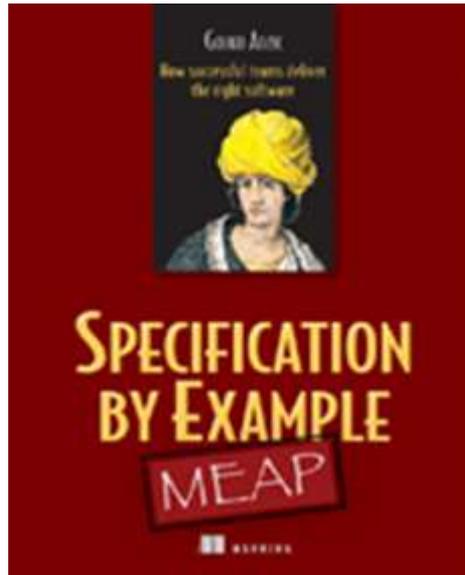
- Emerging architecture
- Refactoring
- Definition of Done



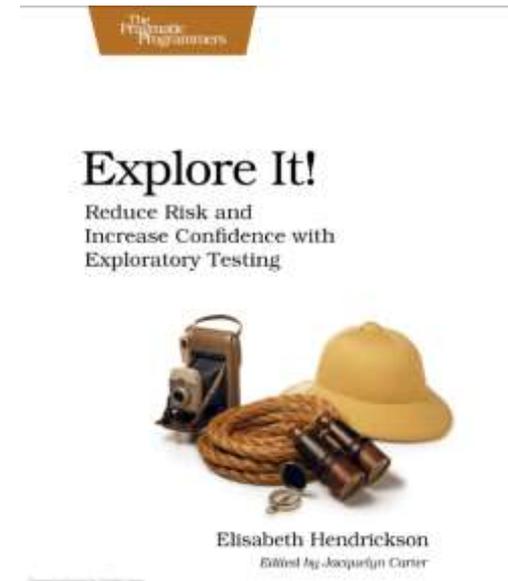
# Books to read



*Gojko Adzic*  
Bridging the  
Communication Gap



*Gojko Adzic*  
Specification by  
Example



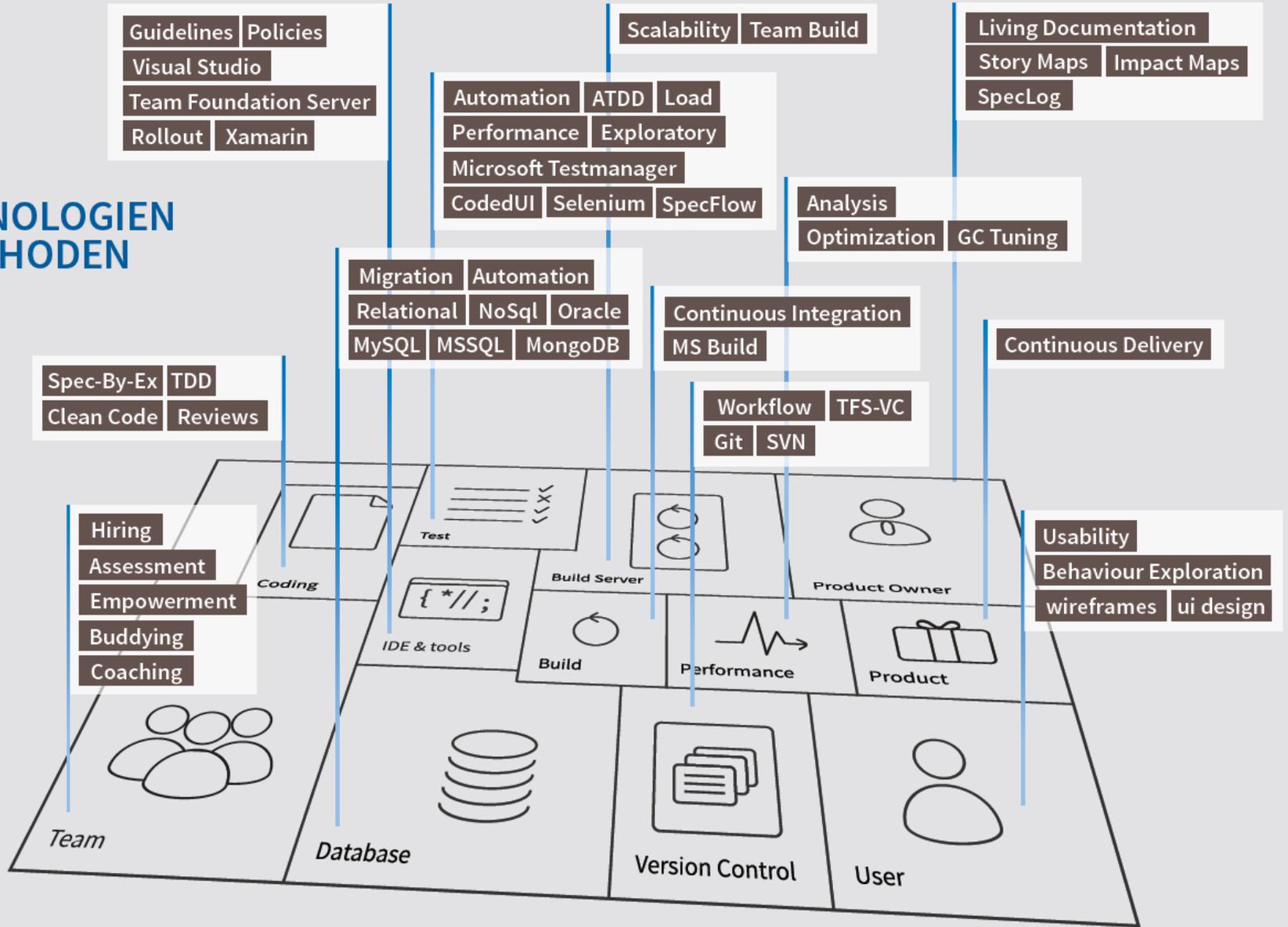
*Elisabeth Hendrickson*  
Explore IT!



# Coaching



## TECHNOLOGIEN & METHODEN



# Thank you!



**GÁSPÁR NAGY**

[gn@techtalk.at](mailto:gn@techtalk.at)

<http://gasparnagy.com>

twitter: [@gasparnagy](https://twitter.com/gasparnagy)

specflow+

Smarter Feedback

---

Agilia Budapest, June 11th 2014