



# Agility vs. Model-based Testing A fair Play?

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Workshop on Evolution Support for Model-Based  
Development and Testing (EMDT2010), Ilmenau  
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# Software Quality Lab (s-lab)



- 5 software engineering professors at University of Paderborn
- 8 associated partners, 9 project partners
  
- Methods & Tools
  - Constructive Quality Assurance
  - Analytical Quality Assurance



## Associated partners



## Project partners



# Software development is a challenge!



- Facts about software development projects

- ca. 23 % successful
- ca. 53 % over budget/time
- ca. 24 % cancelled

Standish Group, Gartner Group, Cutter Consortium and Center for Project Management

- Some of the reasons

- Unrealistic assumptions on time and budget
- Unknown requirements at the beginning, changes during the project
- (Too) Late and inefficient quality assurance

- What to do?

- Early recognition of risks
- Iterations in development
- Frequent feedback from customer
- Early start with testing
- Efficient test design and test execution

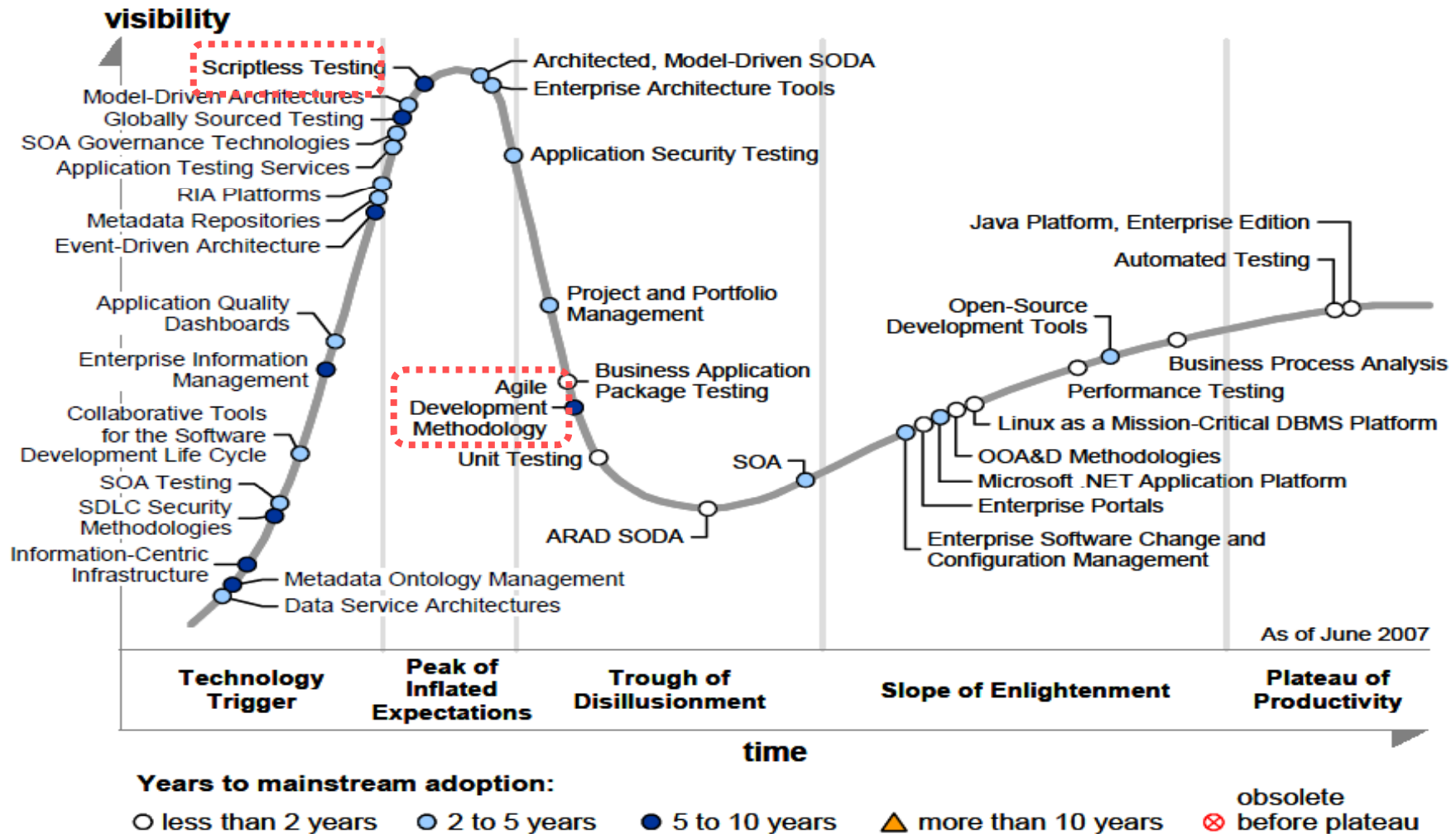
Agility can help!

MBT can help!

# Trends in software development



Figure 1. Hype Cycle for Application Development, 2007



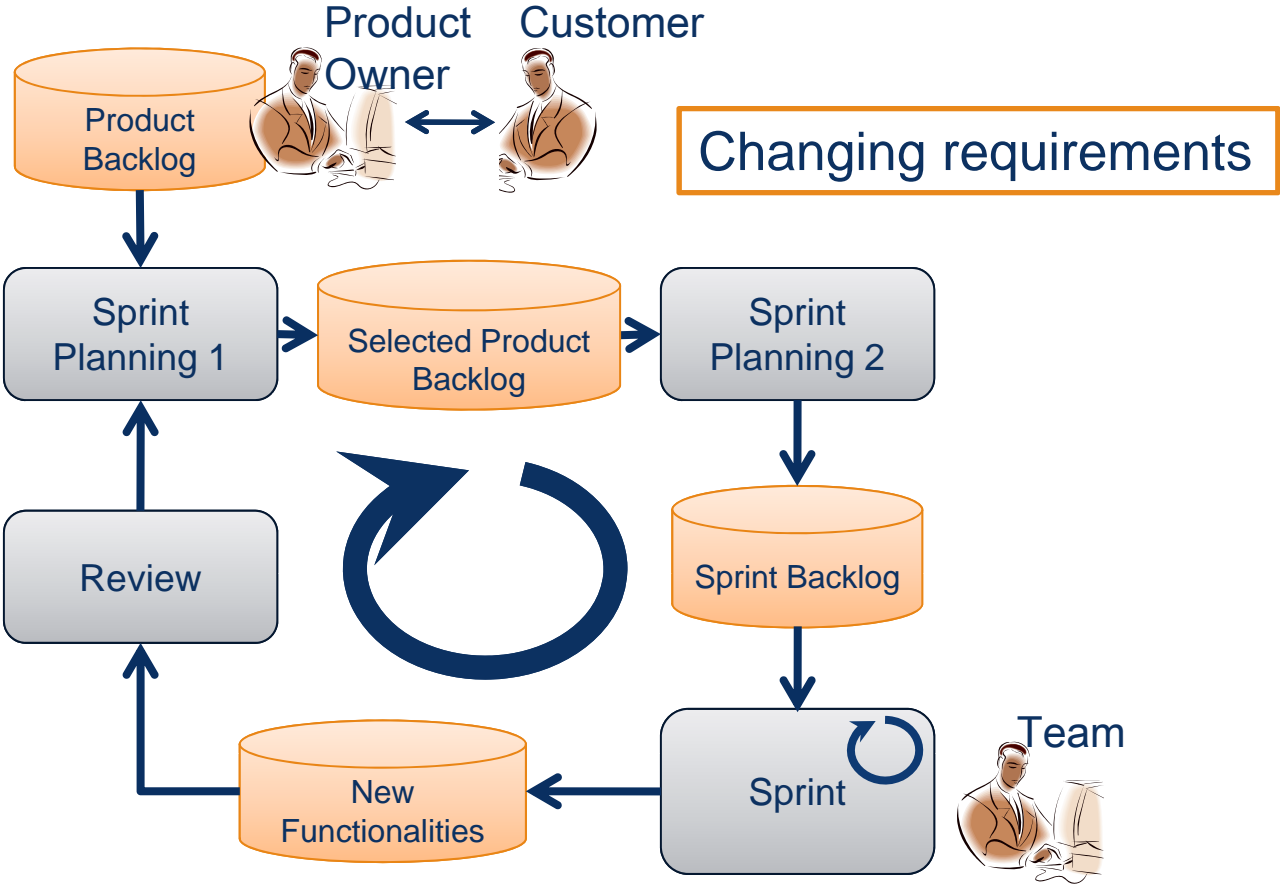
Source: Gartner (June 2007)

- Agility
  - Close collaboration of customer
  - Responding to changes in the requirements
  - Many iterations resulting in working software
  - Light-weight development process
- Model-based testing
  - Models as central artifacts
  - Early start with testing
  - Automated test design and test execution
  - Heavy-weight testing techniques
- Our target: Agility (Scrum) + MBT



Compatible?

## Communication und Documentation



High testing efforts because of increments

# Our target: use models



## Communication und Documentation

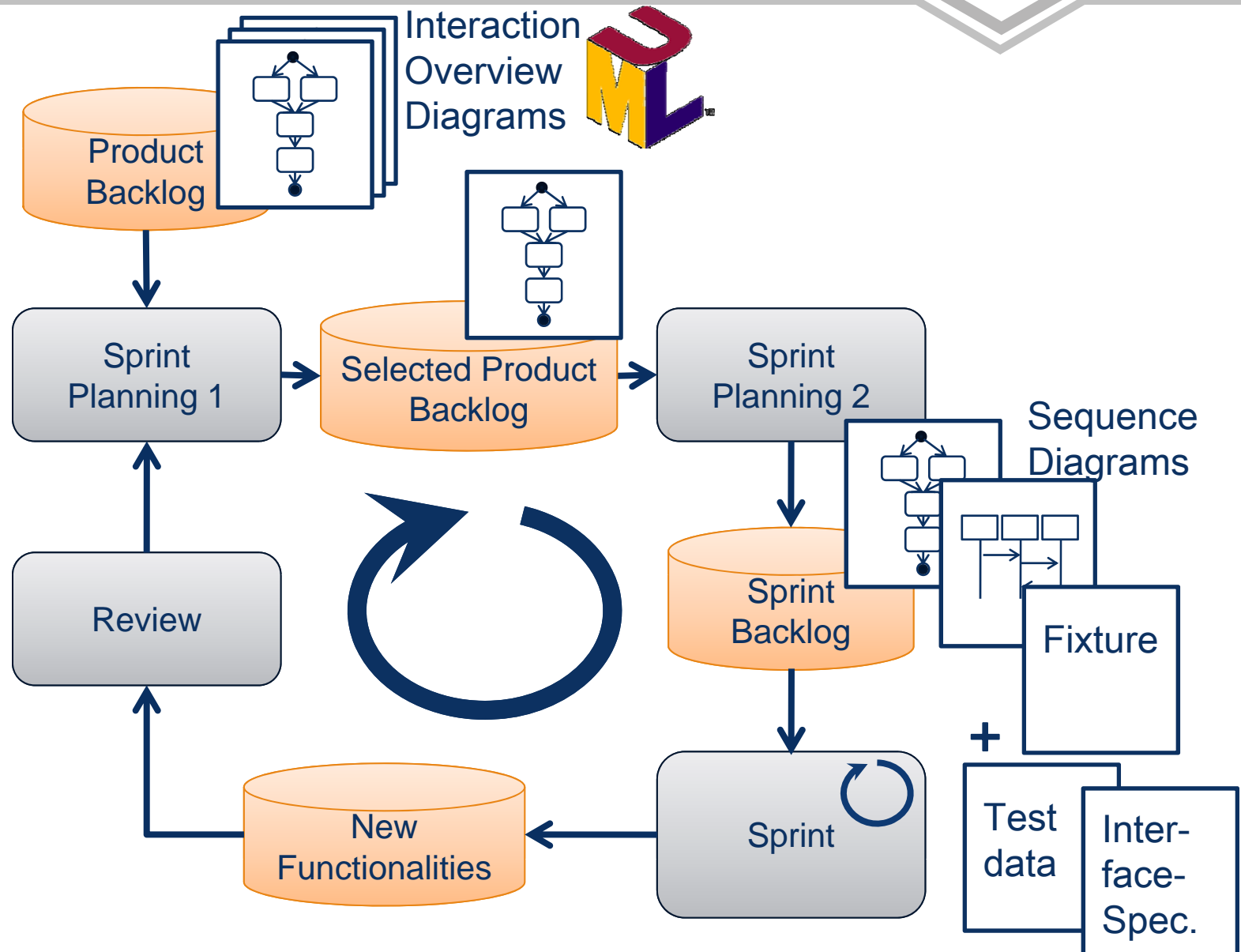
### Changing requirements

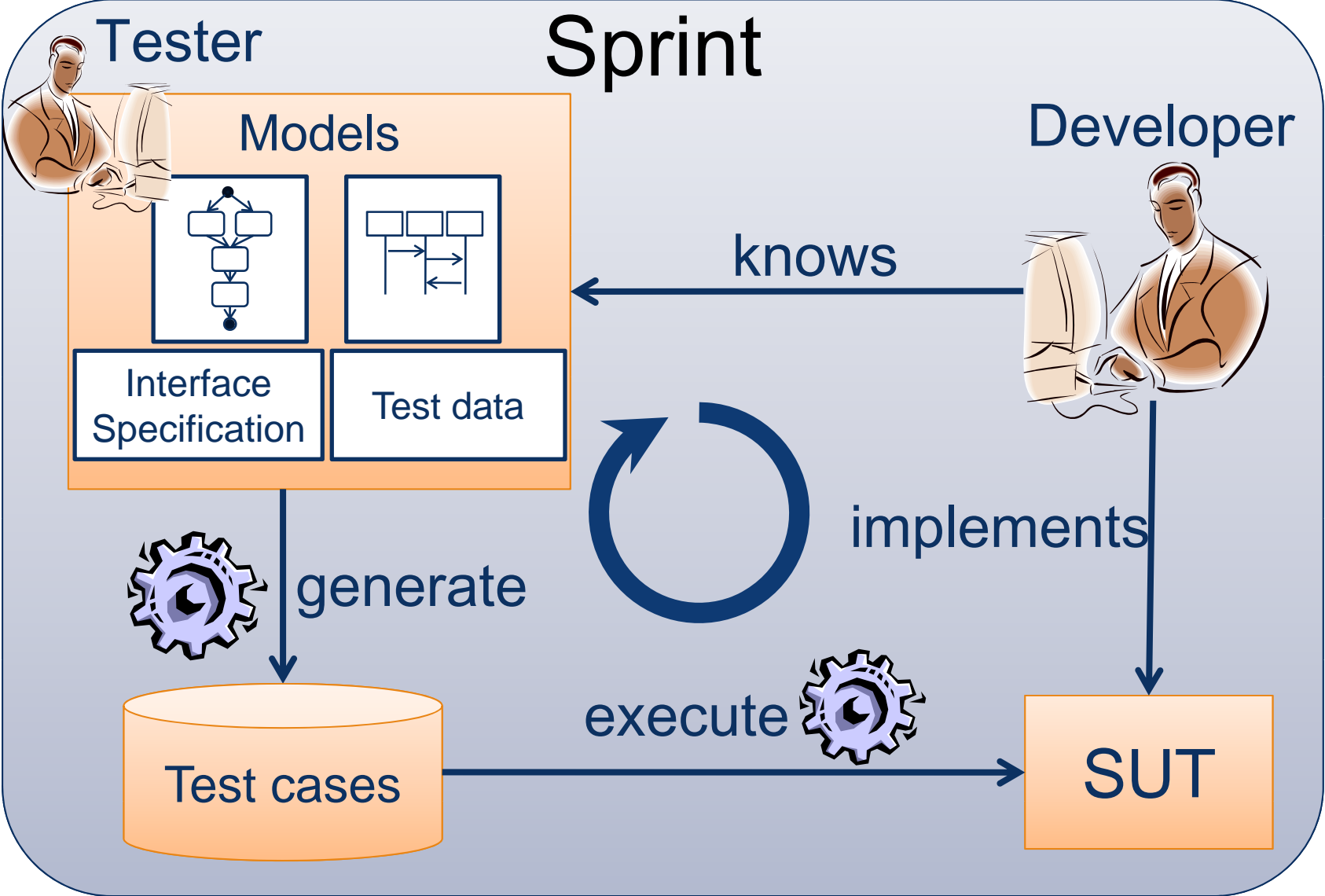
- Improved communication and documentation of requirements
  - by using light-weight modeling languages
- Traceability

### High testing efforts because of increments

- Automation of testing activities
  - Generation of test cases
    - efficient
    - repeatable
    - traceable
    - maintainable
  - Test execution
    - Test scripts in Selenium/Fitnesse

# Process overview



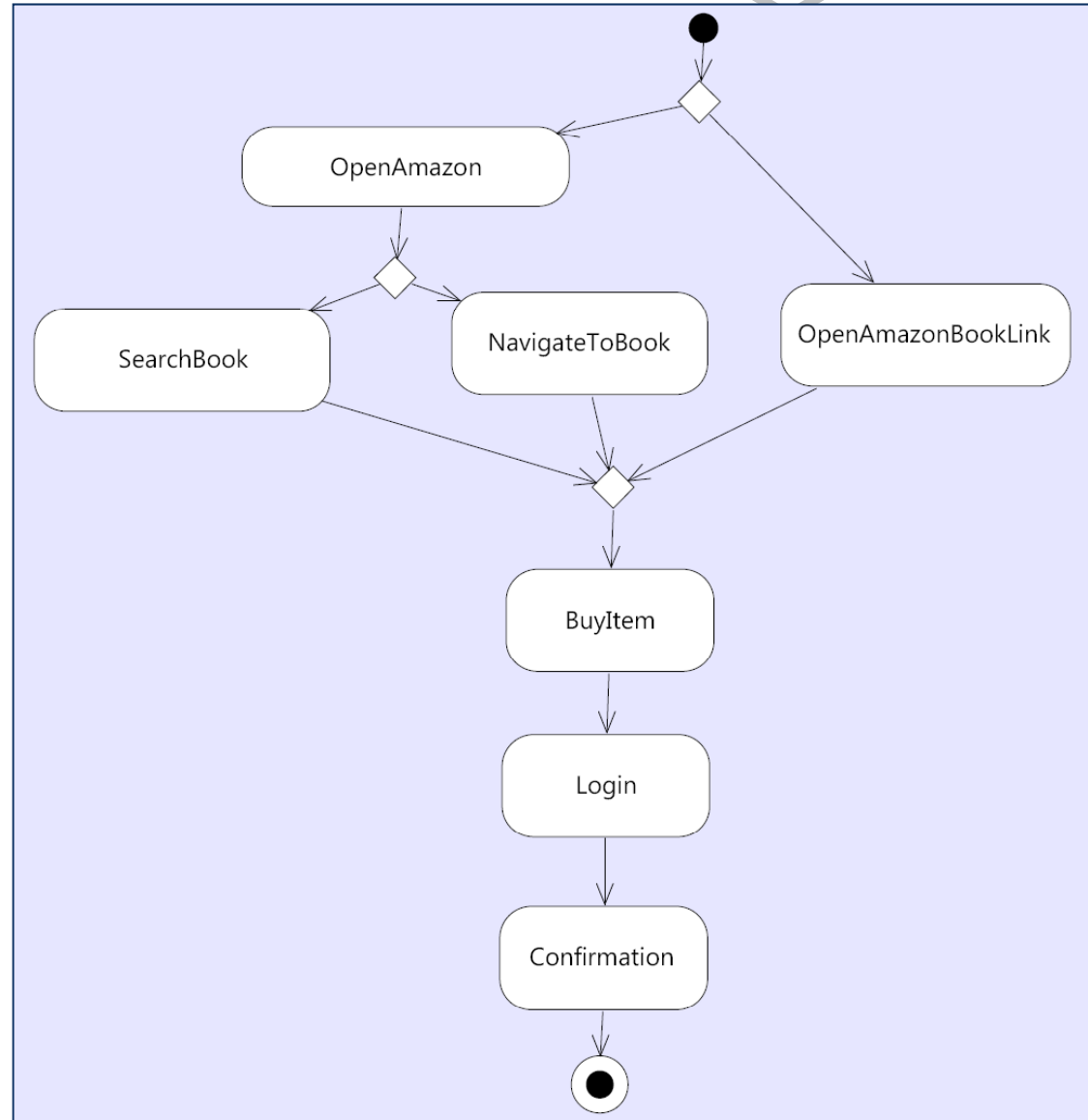




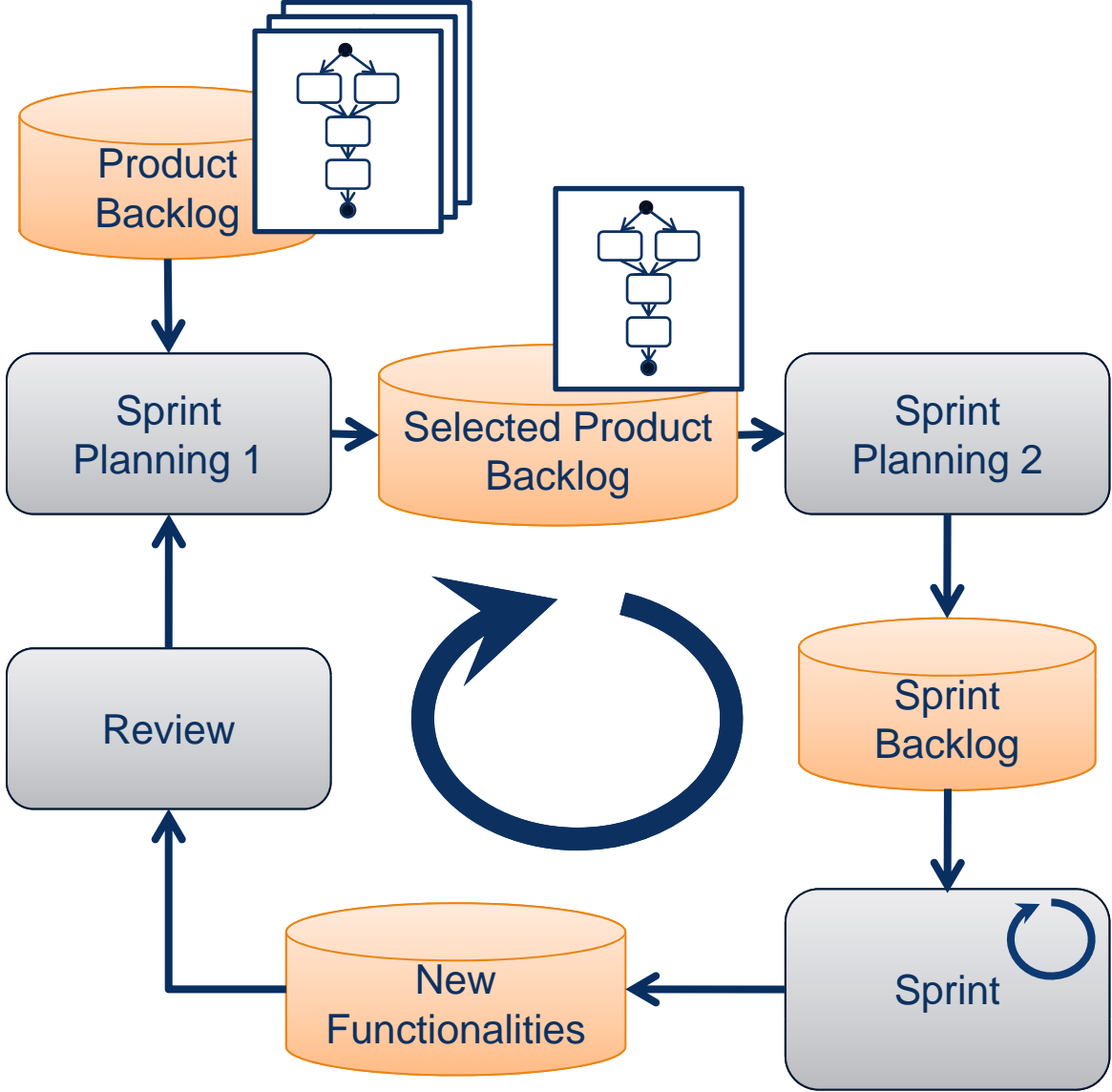
# Scenario: Buy a book



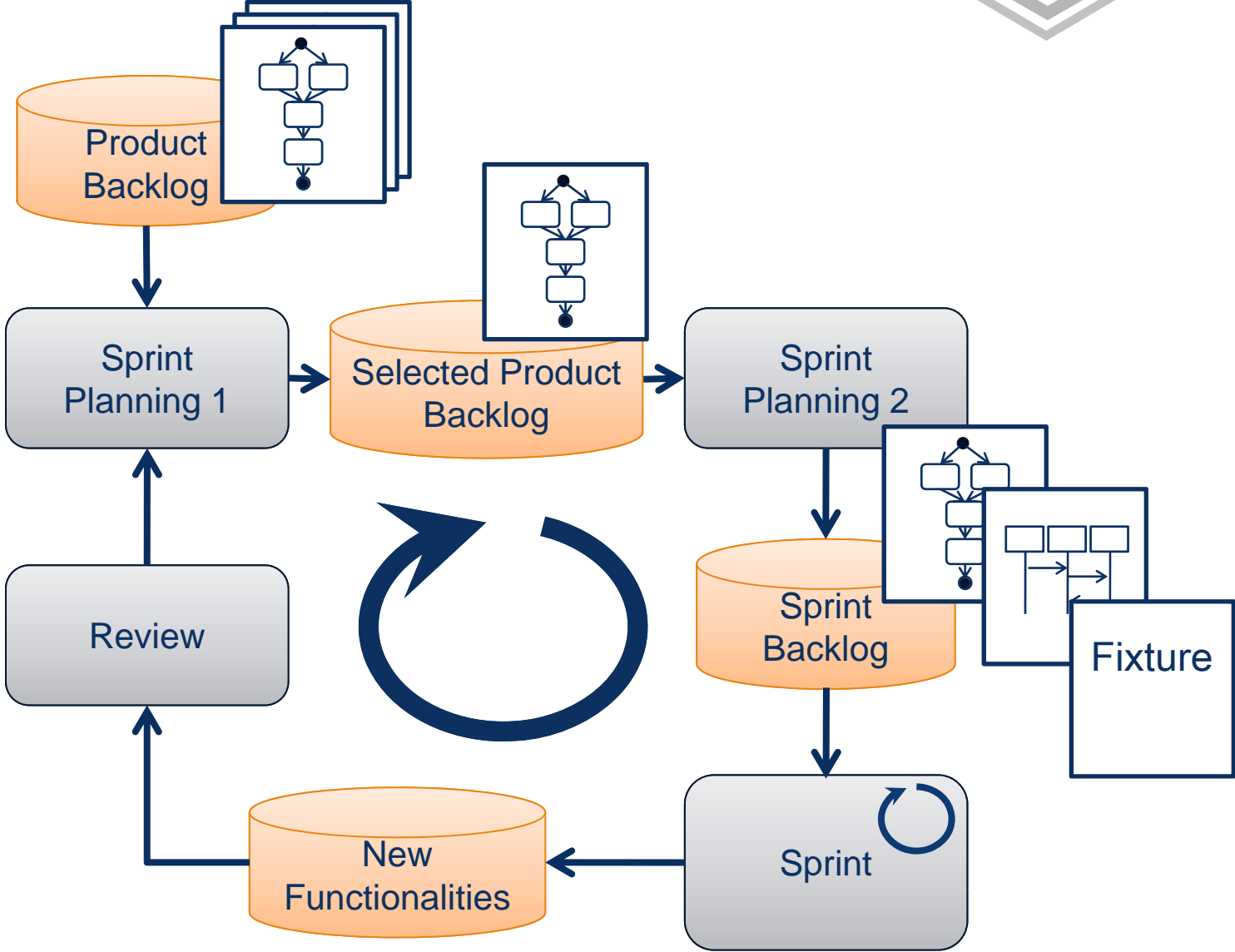
- User Stories for Product Backlog
- UML 2 Interaction Overview Diagrams
- Hierarchical diagrams
- Benefits:
  - Light-weight
  - Easy-to-learn
  - Decomposable for sprint planning



# Select backlog

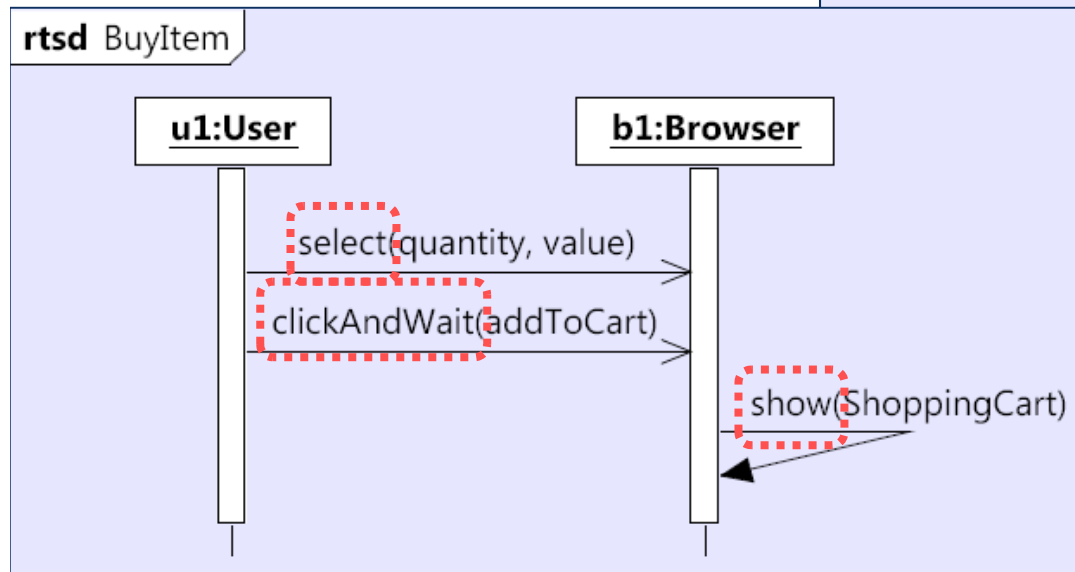
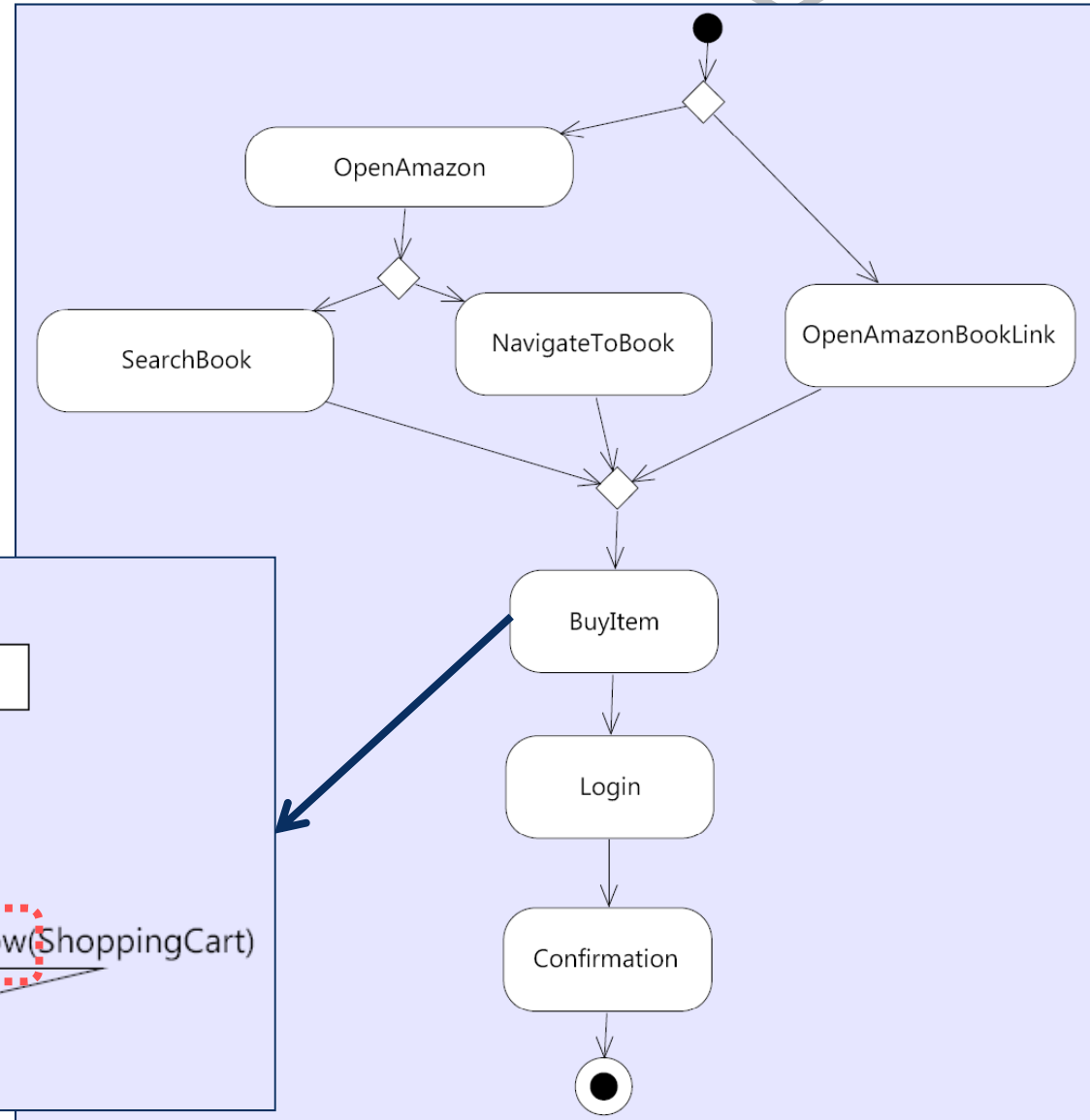


# Sprint Planning 2

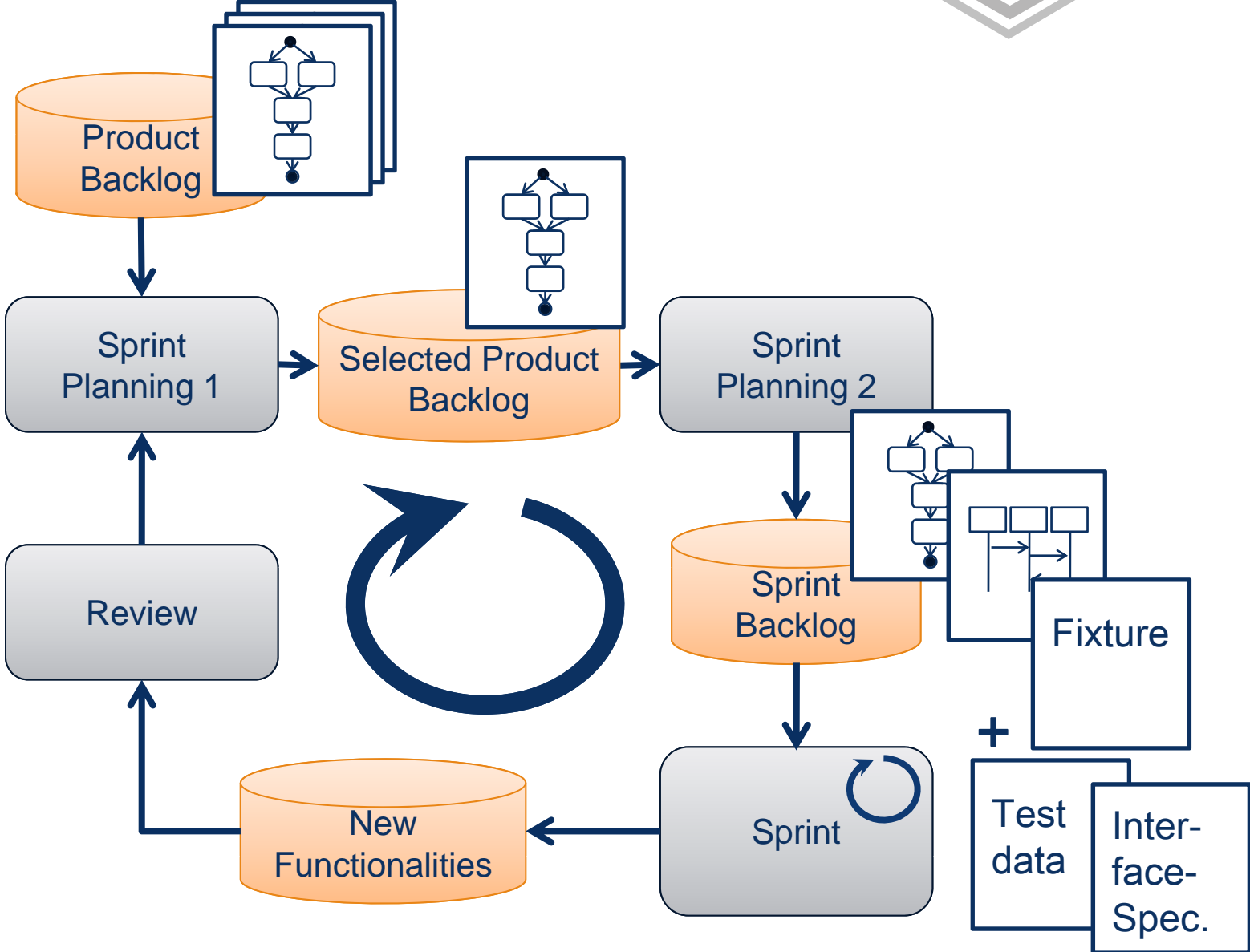


# Sprint Planning 2

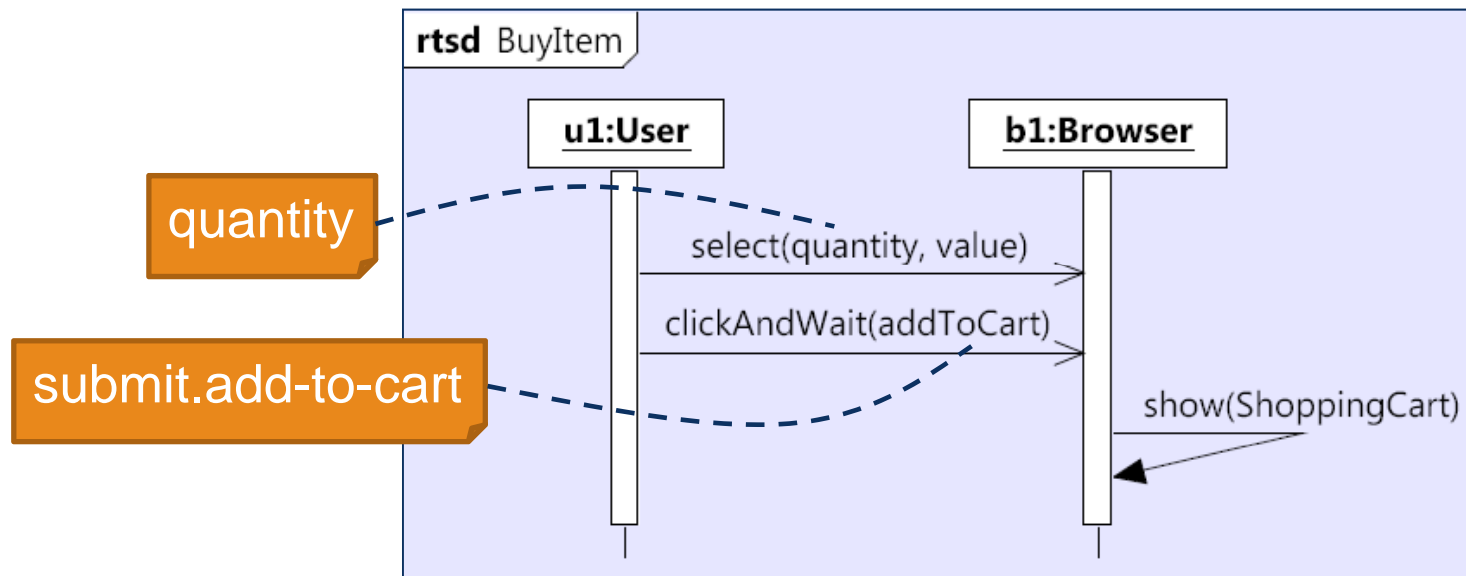
- Refine activities with sequence diagrams
- Define a domain language → Fixture



# Sprint



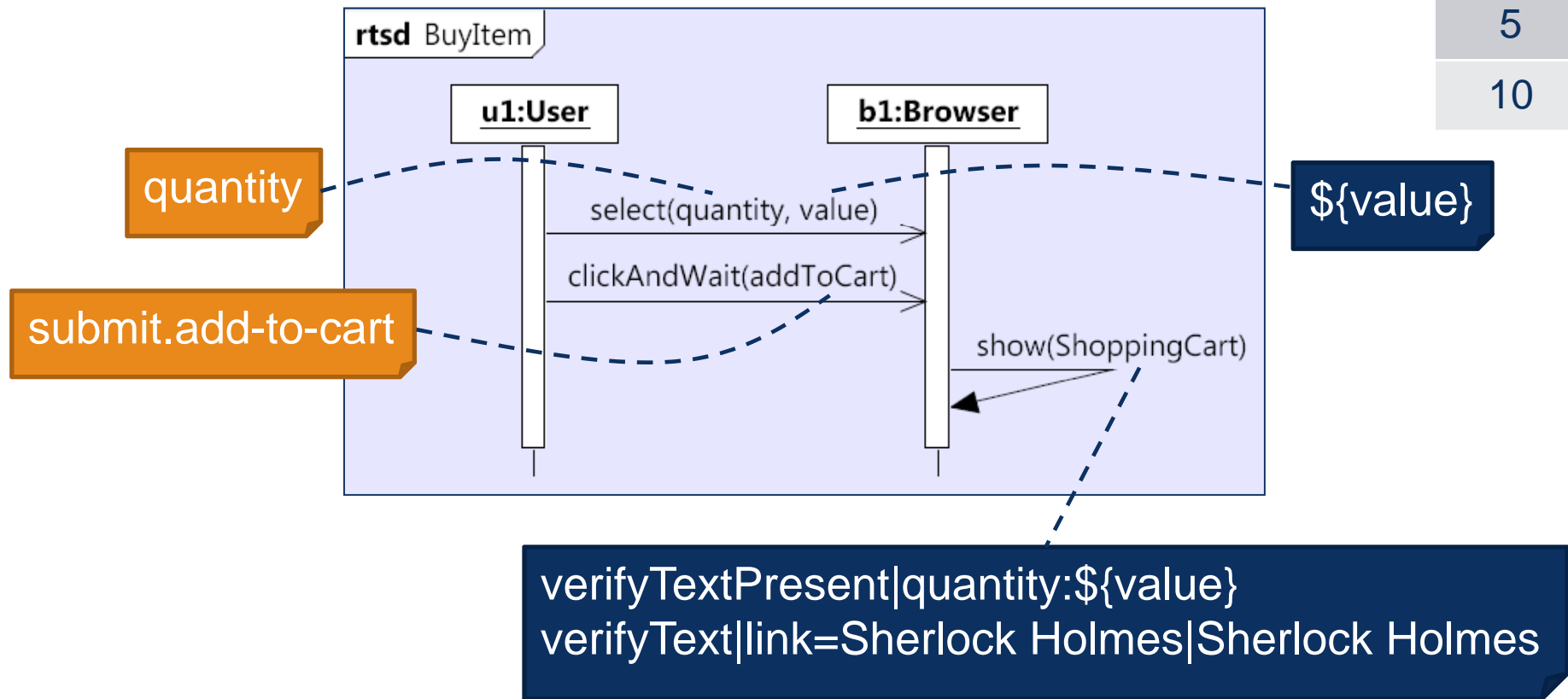
# Interface Specification



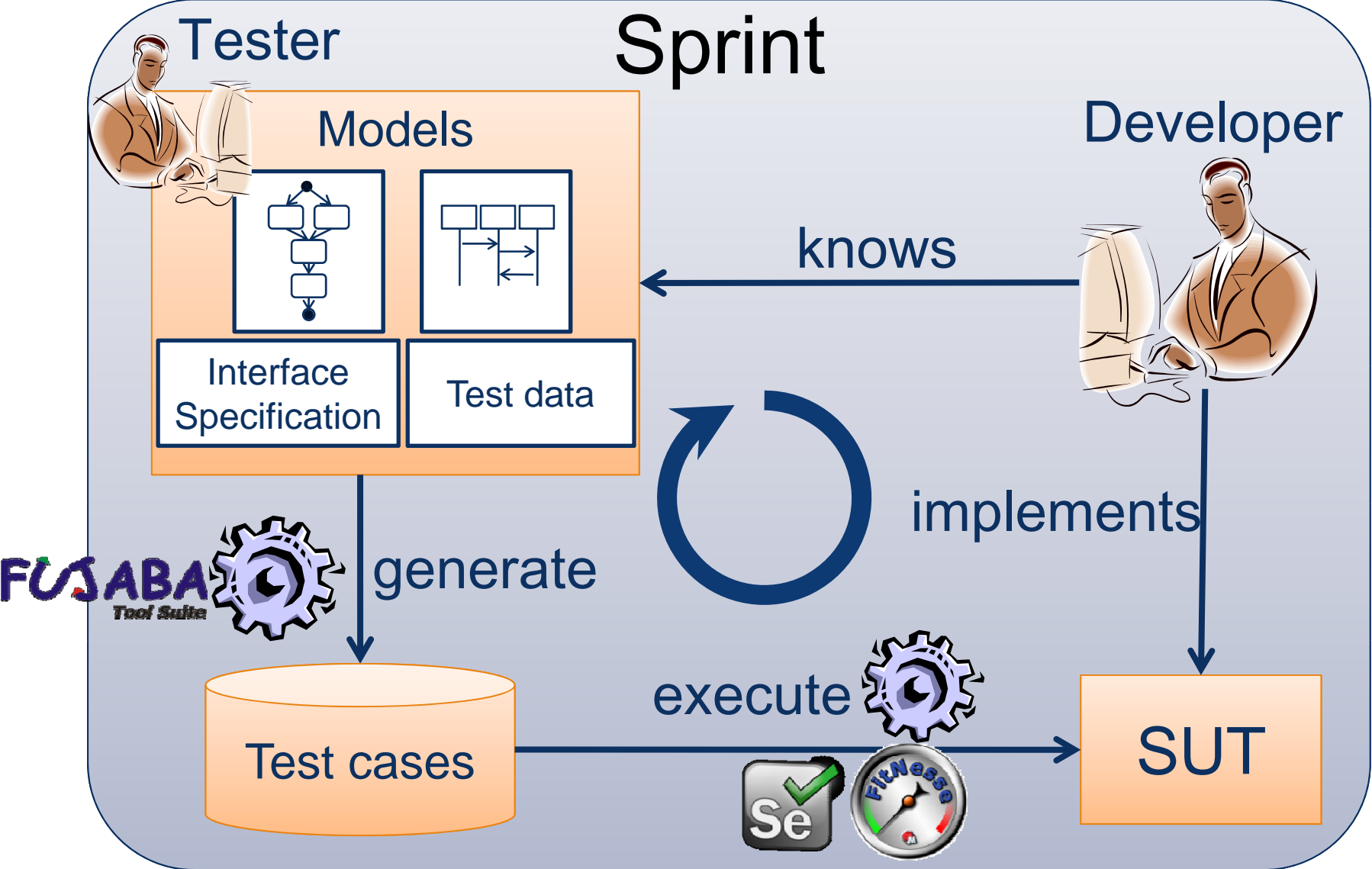
# Test data



value
1
2
5
10



# Test automation



# Exemplary test case



- Test case executable in Selenium

Command	Target	Value
open	http://www.amazon.com	
type	twotabsearchtextbox	Sherlock Holmes
clickAndWait	//input[@alt='Go']	
clickAndWait	//img[@alt='Product Details']	
select	quantity	2
clickAndWait	submit.add-to-cart	
verifyTextPresent	quantity: 2	
verifyText	link= Sherlock Holmes	Sherlock Holmes

Fixture

Interface Specification

Test data

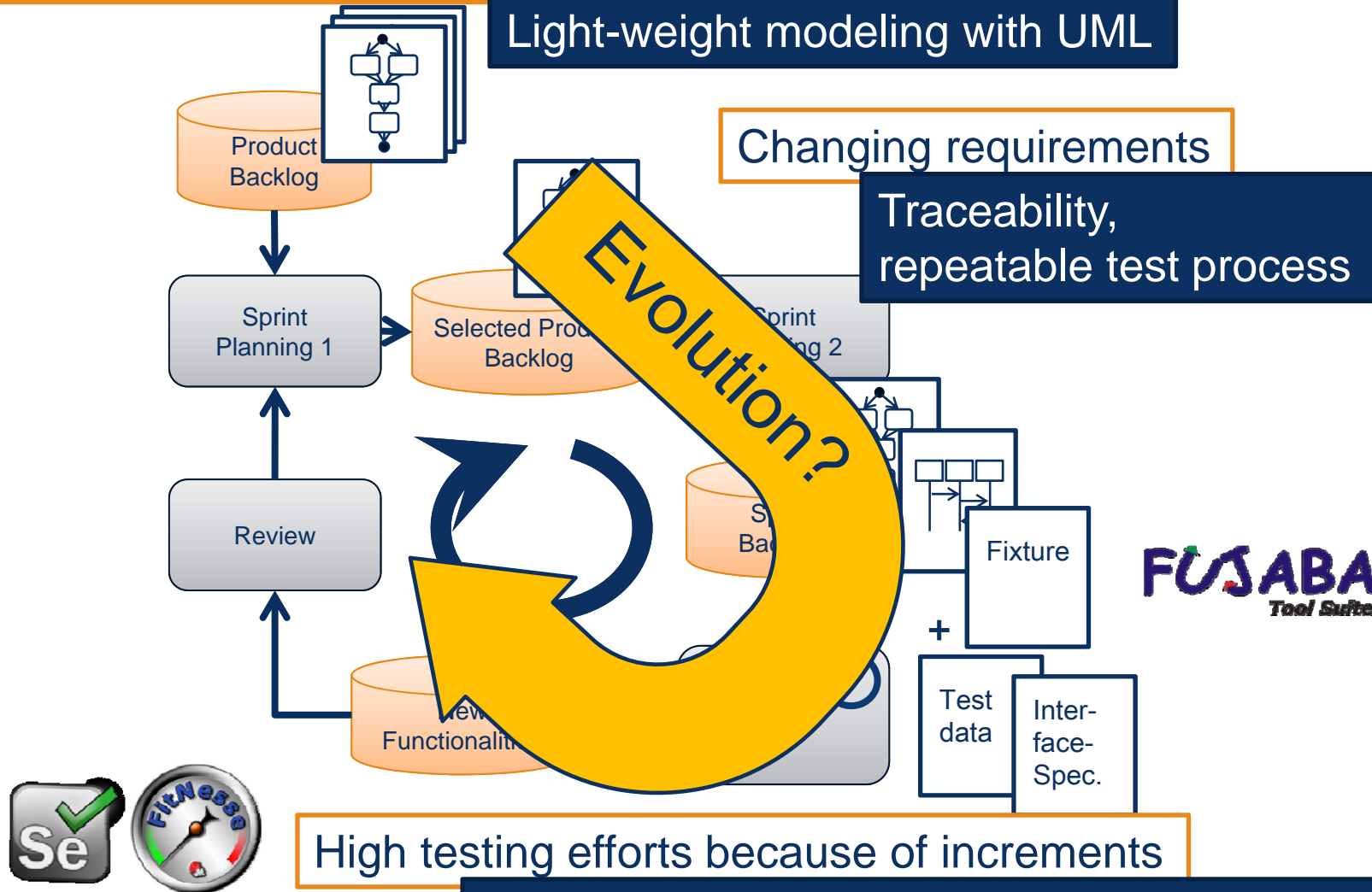
# Conclusion

Communication and documentation

Light-weight modeling with UML

Changing requirements

Traceability, repeatable test process



High testing efforts because of increments

Automated test case generation and execution

- ReVVerT 2011 @ ICST in Berlin
  - Deadline: Dec. 21, 2010
  - Workshop: March 2011



- GI TAV 2011 in Paderborn
  - February 3-4, 2011
  - <http://www.gm.fh-koeln.de/~winter/tav/>
- Working group TOOP/MBT
  - <http://toop.gi-ev.de>



Thank you for your  
attention!

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