Qualitätssicherung und Testen von automatisierten Geschäftsprozessen

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Wir lösen das – persönlich!

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About us

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APACHE ODE

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BPMN

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The Talk Today

- Introduction
- How to come to a “good” Business Process
  1. Defining Quality Criteria
  2. Applying QA Criteria to the BPM lifecycle
  3. Verifying Quality
  4. Tools
- Demo
- Conclusion

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Business Processes: A Definition

Hammer & Champy [1993]

"a **collection of activities** that takes one or more kinds of **input** and **creates an output** that is of **value to the customer**."

Davenport [1992]

"a **structured, measured set of activities** designed to produce a specific output for a particular customer or market. It implies a **strong emphasis on how work is done** within an organization, in contrast to a product focus's emphasis on what. A process is thus a **specific ordering of work activities across time and space, with a beginning and an end, and clearly defined inputs and outputs**: a structure for action. ... Taking a process approach implies adopting the customer's point of view. Processes are the structure by which an organization does what is necessary to produce value for its customers."

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Motivation

Modeling Business Processes

- You understand **what is happening** in your organization.
- You understand **who is responsible** for certain tasks.
- You understand **which resources** are involved.

Simulating Business Processes

- You understand **how your processes** could be optimized.
- You can **identify bottlenecks**, **dead locks**, **waste of time** and **resources**.

Executing Business Processes

- You can **automate** parts of your business processes.
- You can **implement changes** to your processes **as you go**.

Monitor Business Processes

- You can get a **health status** of your organization in **real time**.

Optimize Business Processes

- You can **continuously improve** your organization's processes.

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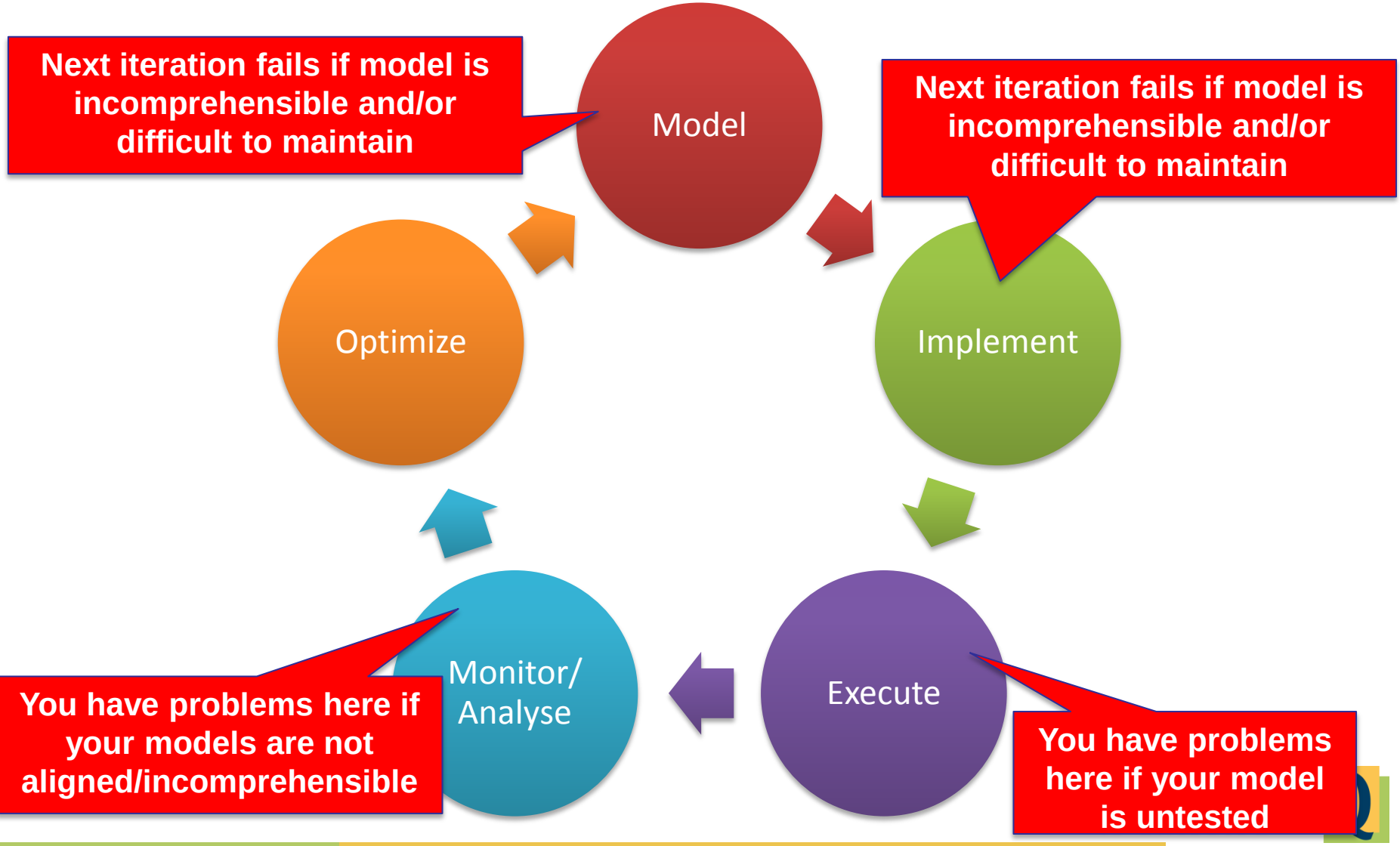
Business Process Lifecycle



Quality Criteria

- Quality is relative to the “customer”
  - i.e. Quality Criteria are project-specific
  - Can be implied and are possibly not documented
- You need to elicit, understand, and define the quality criteria that your customer wants to achieve
- Doing this is the first step of Quality Assurance

Fefes Blog

Wer schöne Verschwörungslinks für mich hat: ab an felix-bloginput (at) fefe.de!

Fragen? Antworten! Siehe auch: Alternativlos

Wed Feb 20 2013

- [l] GovData zeigt, was passiert, wenn man echte Software-Ingenieure ranlässt:

> Mit bis zu 20.000 Klicks pro Stunde sei das System allerdings überfordert gewesen und habe wieder offline gestellt werden müssen, sagte ein Sprecher des federführend agierenden Bundesinnenministeriums gegenüber tagesschau.de.

20000 Klicks pro Stunde, ja? Wir rechnen das mal kurz runter. 20000 / 60 sind 333 Klicks pro Minute. Das sind 5,5 Klicks pro Sekunde. OH MEIN GOTT! FÜNF KLICKS PRO SEKUNDE!!! Also mit SO VIEL ANSTURM konnte ja wohl NIEMAND rechnen!1!!

Nebenan im Von Leitner-Institut für verteiltes Echtzeit-Java knallen die Korken, dass sich moderne Gewinner-Technologien endlich auf breiter Front durchsetzen!1!!

ganzer Monat

Proudly made without PHP, Java, Perl, MySQL and Postgres

Impressum

How can I derive my quality criteria?

Our Approach

- Identifying project dimensions and quality criteria
- Building a quality tree
- Defining methods and expectations
- (Use ATAM)
- Integrate with BPM lifecycle

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BPM Project Dimensions

- Project Dimensions give you a feeling for priorities and challenges:
  - Modelling Style: business, technical, hybrid
  - Purpose: Documentation, Simulation, (Semi-)Automation
  - Exposure: Orchestration, Choreography, both
  - Scope: Department-wide, Company-wide, Partners, Public
  - …

Quality Models

- Quality models describe software quality by attribute structures
- Quality attributes ensure that software fulfils the desired requirements
- Other quality models describe product quality attributes:
  - DIN 66272 (retracted in 2006)
  - ISO/IEC 9126
  - ISO/IEC 25000
- These Models can be good checklists to help you!

Quality Criteria (1)

Criteria	Comments	Relevant to	
		BM	TM
Suitability	ISO/IEC 9126 Functionality	✓	✓
Accuracy	ISO/IEC 9126 Functionality	(✓)	✓
Interoperability	ISO/IEC 9126 Functionality	✓	✓
Security	ISO/IEC 9126 Functionality		✓
Runtime Behaviour	Joint criteria of ISO/IEC 9126 Operability, Reliability, Efficiency, and Maturity	✓	✓
Usability	Includes Understandability & Learnability	✓	✓
Analysability	ISO/IEC 9126 Maintainability	✓	✓!
Changeability	ISO/IEC 9126 Maintainability	✓	✓
Testability	ISO/IEC 9126 Maintainability		✓

Quality Criteria (2)

Criteria	Comments	Relevant to	
		BM	TM
Co-existence	To other, different Systems/Organizations. ISO/IEC 9126 Portability. Adaptability, Installability & Replaceability have been dropped, since they are not applicable to APIs.	(✓)	✓!
Flexibility	Non-ISO criteria.	✓	✓
Robustness	Non-ISO criteria. “Give clients a chance to build robust processes/software.”	✓	✓
Completeness	Non-ISO criteria. “External consistency”	✓	✓!
Consistency	Non-ISO criteria. “Internal consistency”	✓	✓
Standards compliance	Non-ISO criteria.	(✓)	✓
Complexity	Non-ISO criteria, also includes Size & Granularity	✓	✓

Quality Criteria (3)

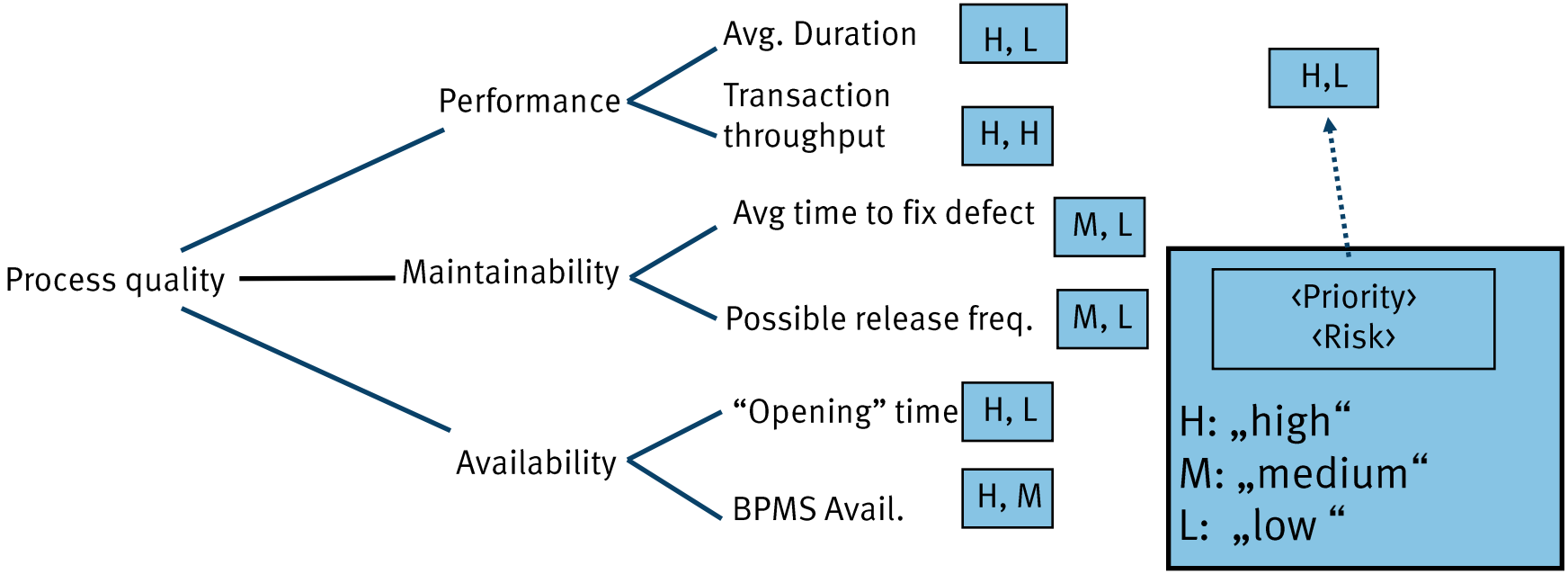
Criteria	Comments	Relevant to	
		BM	TM
Dependency	Non-ISO criteria, dependencies to other subprocesses, systems, ... Also includes Interoperability & Complexity.	✓	✓
WS-*-related criteria	Only applicable to WS-* APIs		(✓)

Building a Quality Tree

1. Finding relevant Quality Criteria
2. Breaking them down (tree structure)
3. Judging client priority, probability of successful implementation

- BPM Projects have typical criteria partly influenced by their dimensions

Example quality attribute utility tree



Iteratively upgrading the Quality Tree

- During the BPM Cycle
- During the phases

- ATAM is suitable for this
  - Scenario-centric
  - Delivers quality tree, risk points, list of important decisions

Verifying Quality

- Different quality subjects require different verification techniques, e.g.
  - Business Models: Reviews, Simulation, Dry runs
  - Technical Models: Reviews, Simulation, Prototypes, Tests

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Reviews

- Different Levels, e.g. RIT-1 to RIT-5
  - Single Responsible Person (RIT-1)
  - Peer Review with increasing effort
  - Technical Inspection/Classical Review RIT-5

Kurt Schneider, Daniel Lübke: *Systematic Tailoring of Quality Techniques*, In World Congress of Software Quality 2005.

- Only technique to have academically validated cost/benefit
- Can be used for all artifacts regardless of their technical/business nature

Full-blown: RIT-5/Technical Inspection

- Set-Up
  - Kickoff Meeting, presentation of subject, allocation of checklist items to reviewers
- Review
  - All reviewers (typically 5) scan through the subject with their personal checklist and create a defect report
- Collection
  - Walk-through through subject and consolidation of review findings
- Duration
  - Typically 1+ week

Tests

- Execution of a system with the intent to find defects
  - Unit Tests
  - Integration Tests
  - System Tests
  - System Integration Tests

Test Case Creation

Facet classification of data and process flow help you to find test cases

- Every aspect needs to be covered once
- Error aspects must not be combined

	count(Articles)		Payment Method		Availability of Article(s)	
	= 1	> 1	Credit Card	Debit	yes	no
TC1	X		X		X	
TC2		X		X		X

Mocking

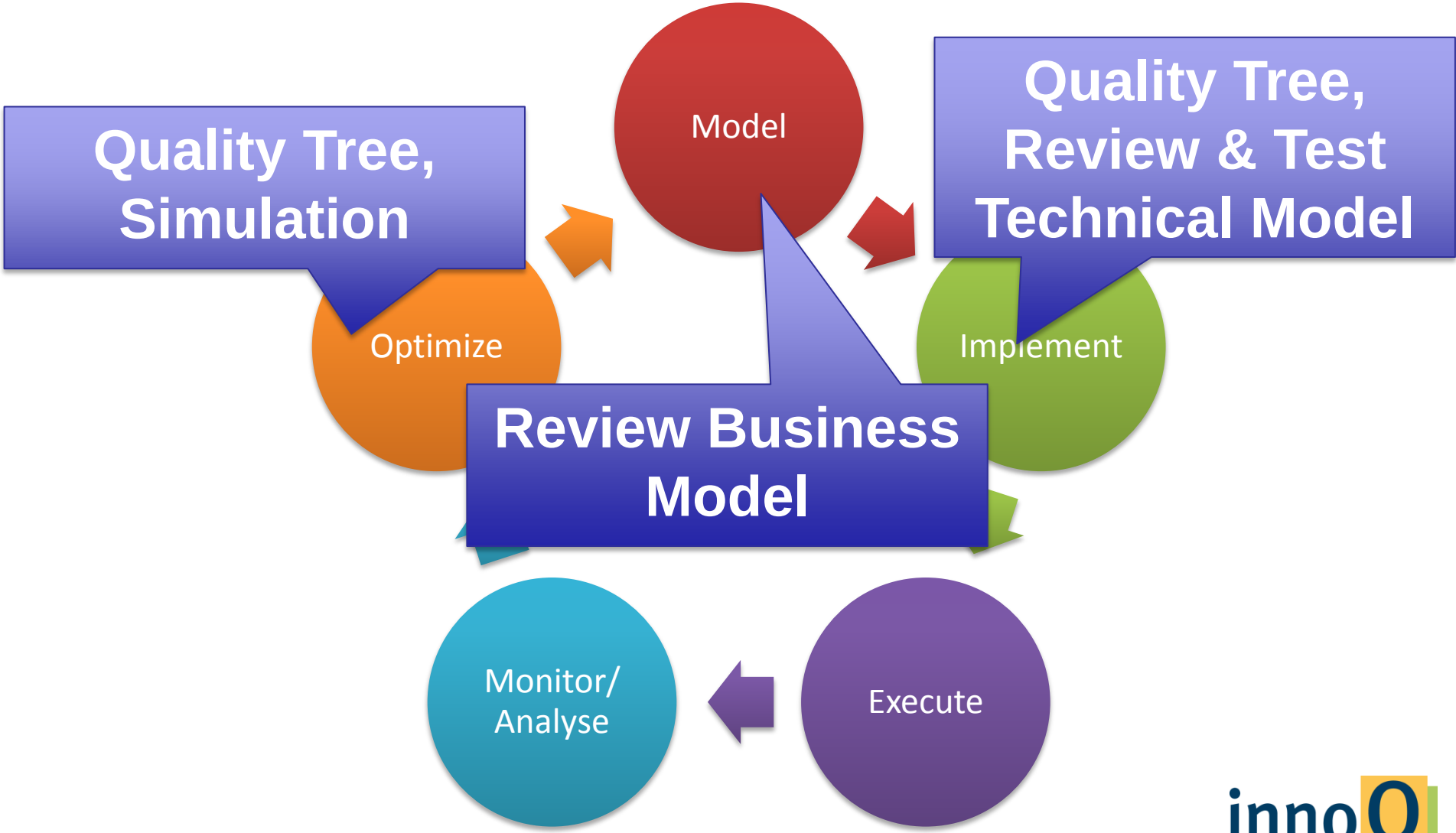
Mocking allows you to isolate the executable process

- Depending on the technoloy simulate a Web Service, replace Java object, ...
- Allows isolated testing in both context and time
- Frameworks help to test efficiently
  - soapUI, BPELUnit, Mockito, ...

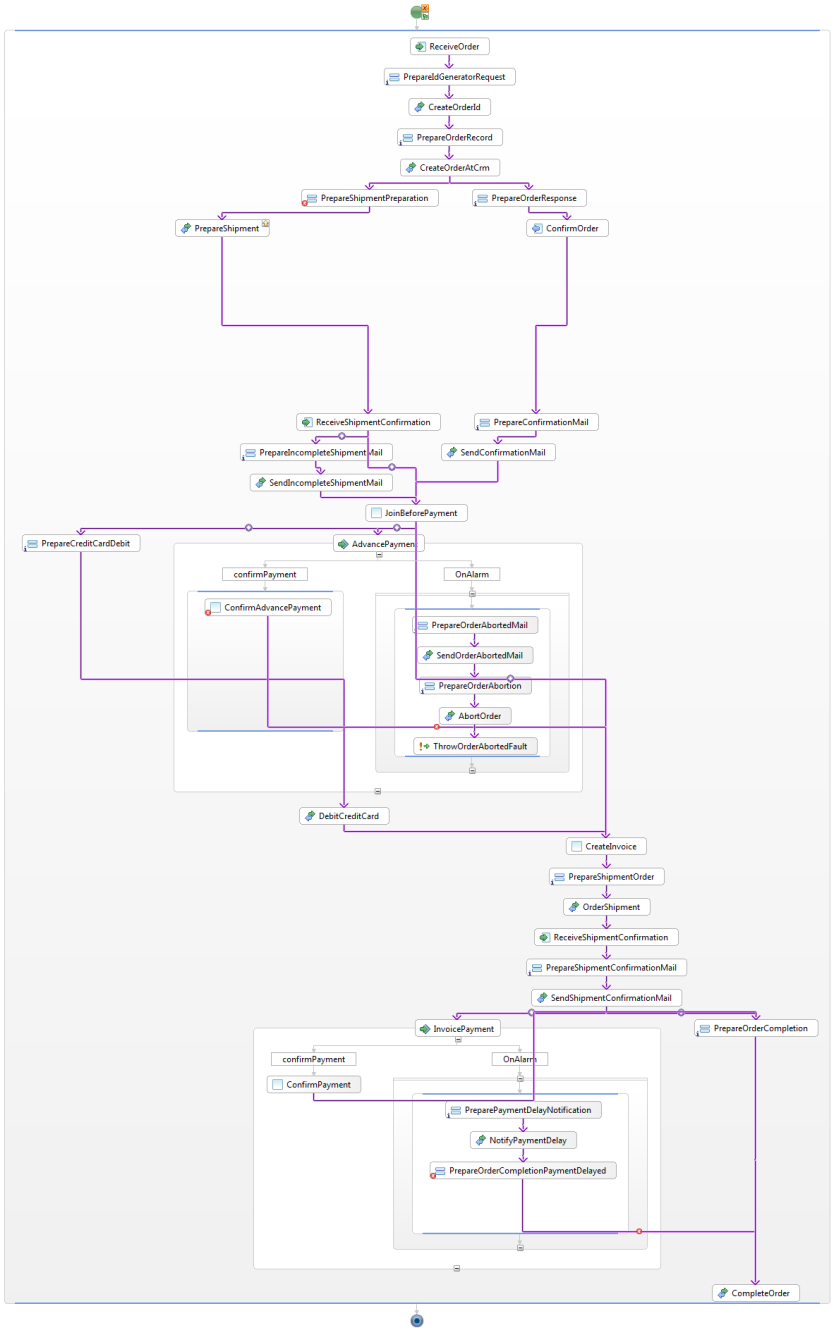
Test Reuse

- Test definitions can be partly reused across test levels:
  - Unit Tests can be extended to Integration Tests
  - Mock data will become persistent data or moved to another mock
  - Usage of facet classification for selecting test cases in different test levels

Business Process Lifecycle



Demo



Test Coverage

Test coverage

Metric	total	tested	%
ActivityCoverage	44	34	77.2%
ActivityCoverage: assign	17	13	76.4%
ActivityCoverage: compensate	0	0	-
ActivityCoverage: compensate...	2	1	50.0%
ActivityCoverage: empty	4	4	100.0%
ActivityCoverage: exit	0	0	-
ActivityCoverage: invoke	15	12	80.0%
ActivityCoverage: receive	3	3	100.0%
ActivityCoverage: reply	2	1	50.0%
ActivityCoverage: rethrow	0	0	-
ActivityCoverage: throw	1	0	0.0%
ActivityCoverage: validate	0	0	-
ActivityCoverage: wait	0	0	-
BranchCoverage	47	37	78.7%
CompensationHandlerCoverage	1	1	100.0%
FaultHandlerCoverage	2	1	50.0%
LinkCoverage	14	14	100.0%
LinkCoverage: negativLinks	7	7	100.0%
LinkCoverage: positivLinks	7	7	100.0%

Test cases

- [x] Test Case TC1-CreditCard-FullReservation
- [x] Test Case TC2-AdvancePayment-FullReservation
- [x] Test Case TC3-Invoice-FullReservation
- [x] Test Case TC4-CreditCardUnsuccessful-FullReservation
- [x] Test Case TC8-Invoice-FailedReservation

Conclusion

- Quality is important to every BPM Project
- Make quality requirements explicit
  - They define how happy the customer and you will be at the end of every BPM cycle
- Use the appropriate QA technique for verification
- Simple tools help a lot, require discipline

Thank you for your attention! Any questions?

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Thank you!

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