



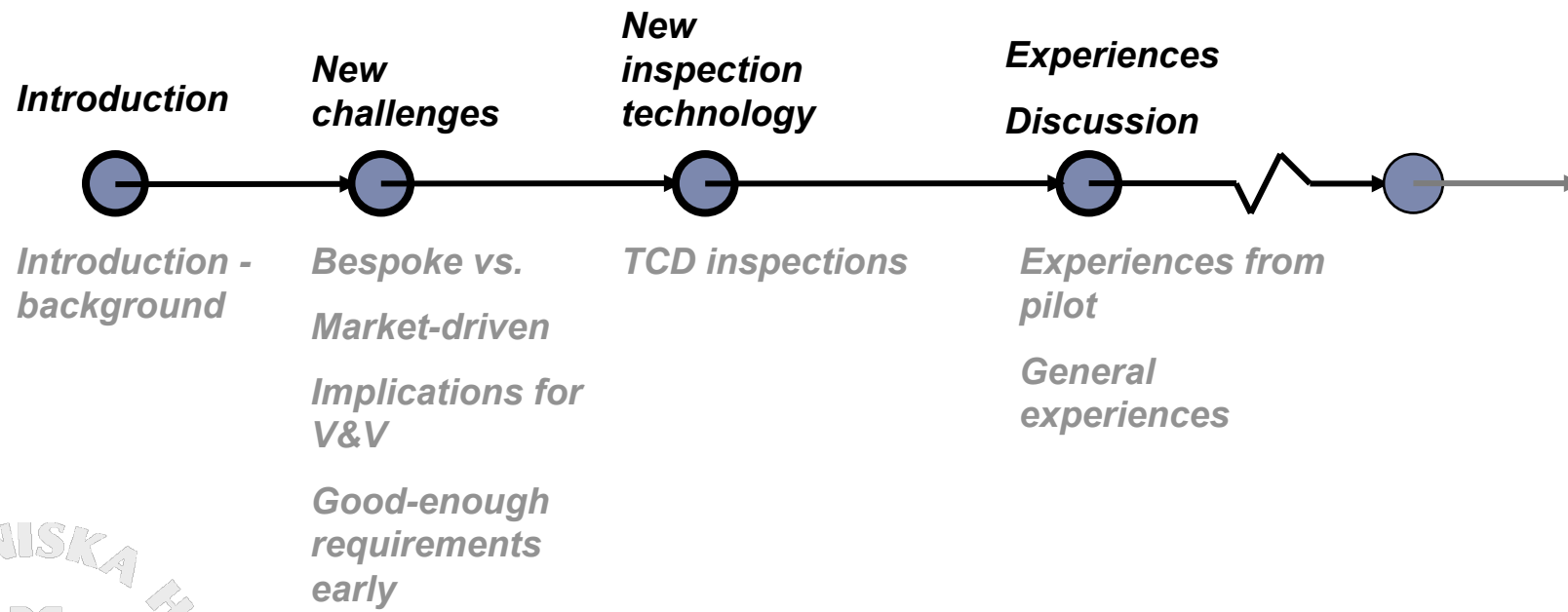
Requirements in the wild - towards *good-enough* requirements in market-driven development

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presentation outline



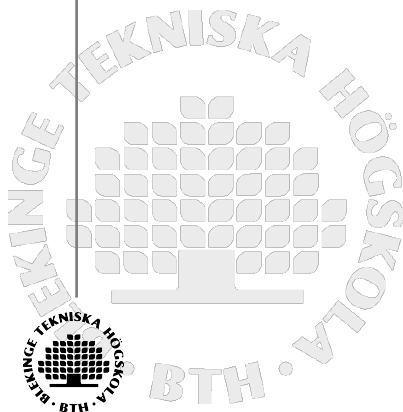
introduction (requirements in the wild...)(2)



→ Requirements should be:

- Unambiguous
- Singular/atomic
- Testable (possible to create input/output, exit criteria, quantified etc)
- Base for design/implementation...
etc

→ Seldom happens, and future challenges makes it even harder...



introduction – background

→ But...

V&V can't afford a narrow perspective

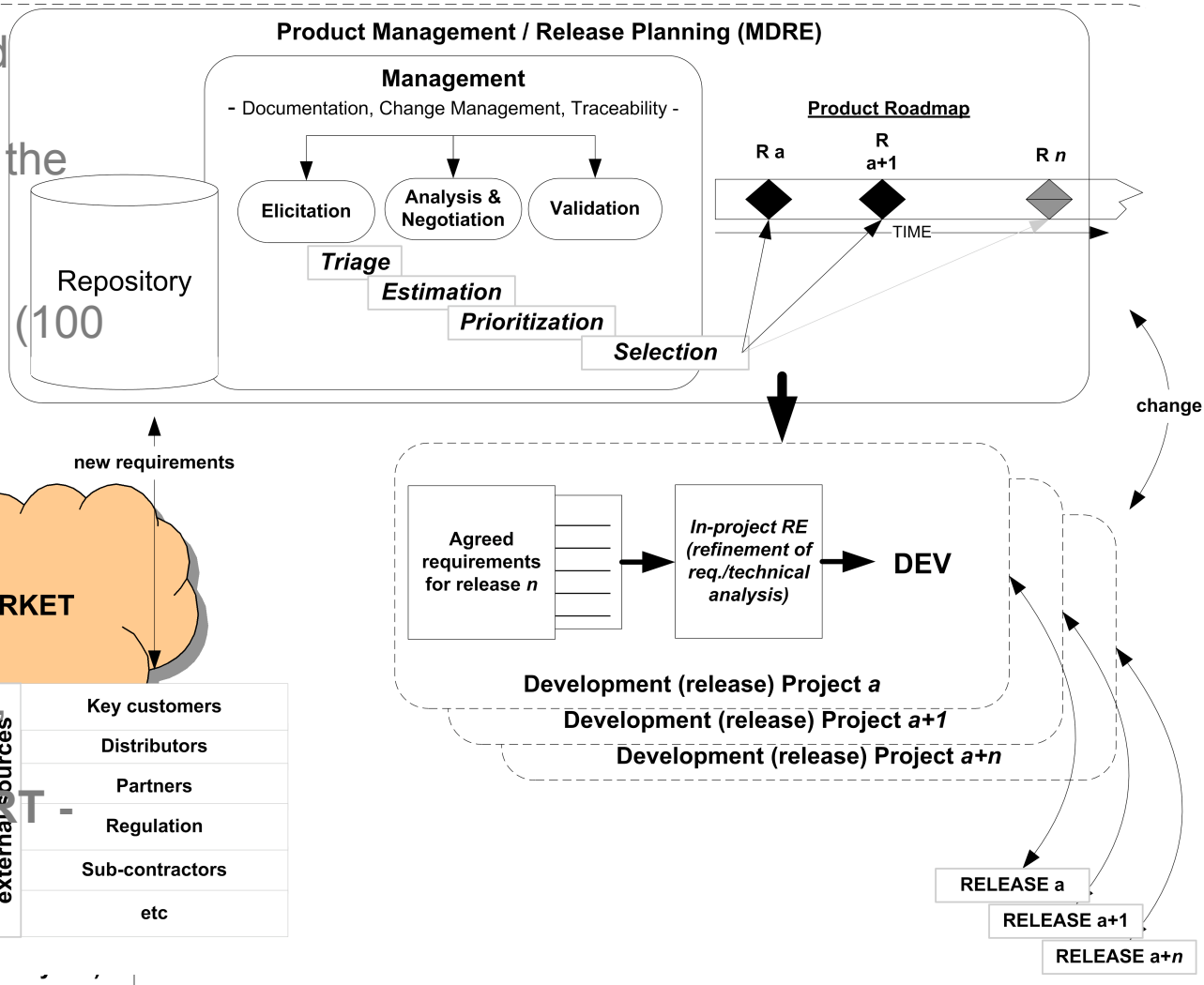
→ The reality is that we are moving from traditional bespoke development towards market-driven development

→ Requirements initiated development where pre-project requirements are the base...

→ Large amounts of req. (100 to 10 000) testable?

→ New role of V&V, i.e. pre-project - part of product management (estimates, risk analysis, triage etc)

- SELECTION SUPPORT -



good-enough requirements early



→ In order to select requirements for implementation

Requirements need to be good-enough for decision support **SELECTION**:

cost

risk

dependencies

customer priority

internal priority

understandability/implementability/testability

etc

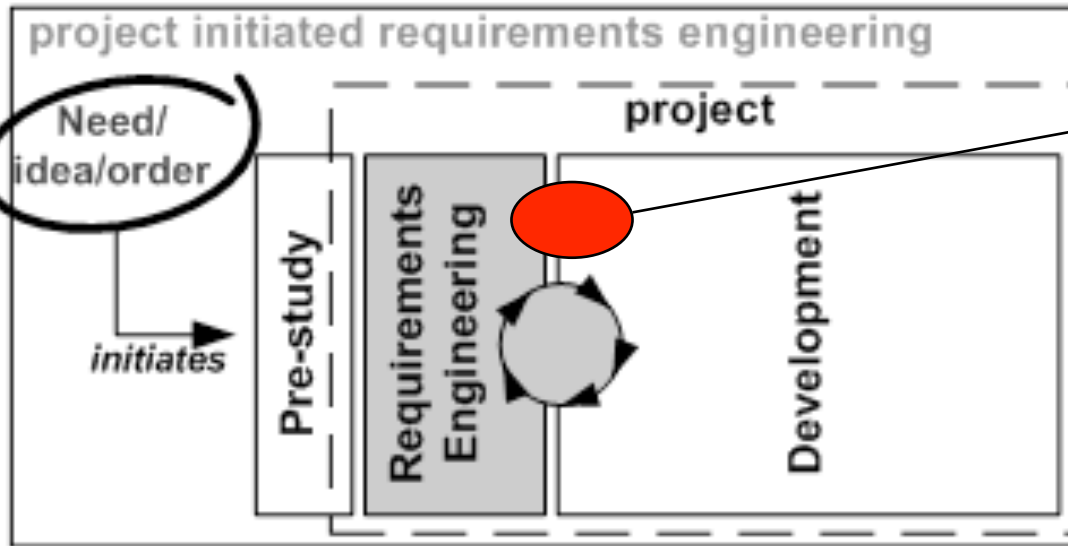
→ Implies the need to assure good-enough requirements at an early stage (pre-project) in order to make selection possible

→ One TECHNOLOGY have been invented and piloted to answer these challenges utilizing the new role of V&V:

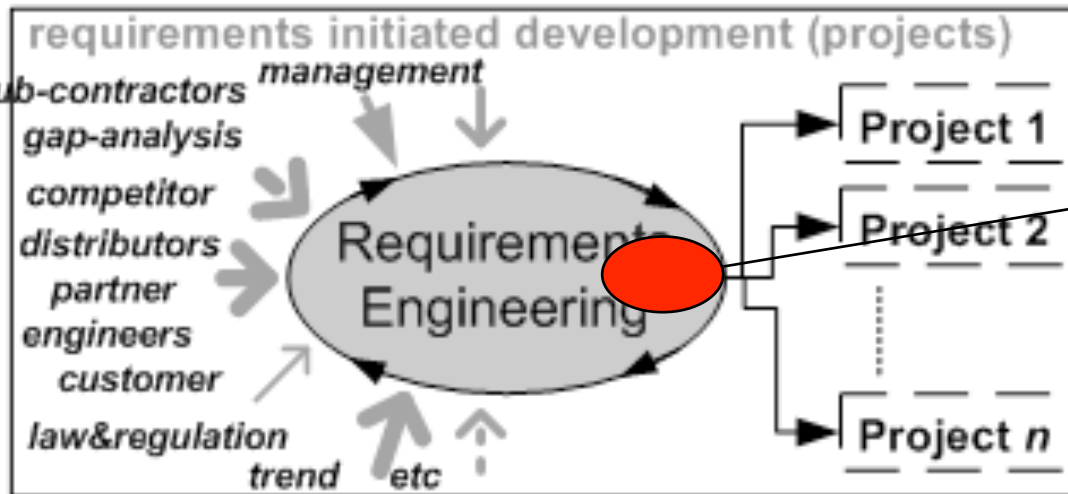
→ TCD Inspections (of pre-project requirements)



TCD inspections



Inspections/reviews



Inspections/reviews

- Inspect req. prior to selection for implementation
- large amount of requirements

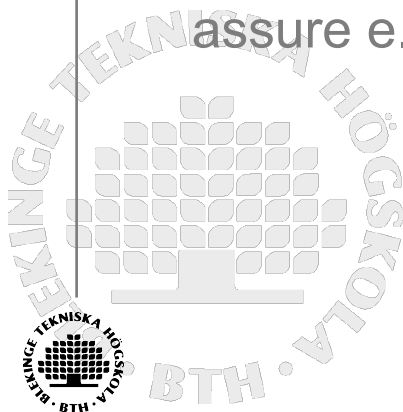
TCD inspections (2) demands on new inspection technology

→ Low cost!

- involve personnel available (pre-project)
- good-enough for SELECTION decision support
- good-enough for post-selection planning activities

→ TCD inspections

- involve product managers (authors of early req.)
- minimize time and cost for inspection activity
- spread the cost of inspections over several stages (REUSE of inspection artifacts)
- involve testers (project independent) – they are expert users and can assure e.g. testability...



TCD inspections (3)

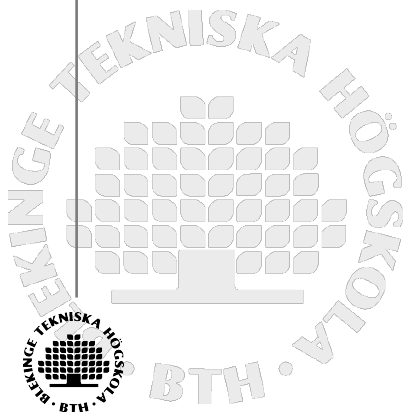


→ 2 person inspection

- Product Manager (author, selector, owner) and
- Tester (inspector, creating test plan and test-cases)

→ Perspective based inspection (tester has the perspective of a tester...
(and expert user))

→ Inspection artifact are draft test-cases (*have to be created in any case*)



TCD inspections (4)

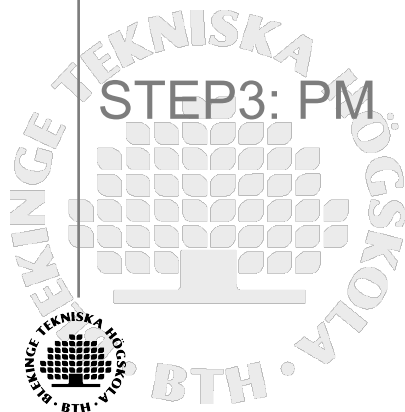
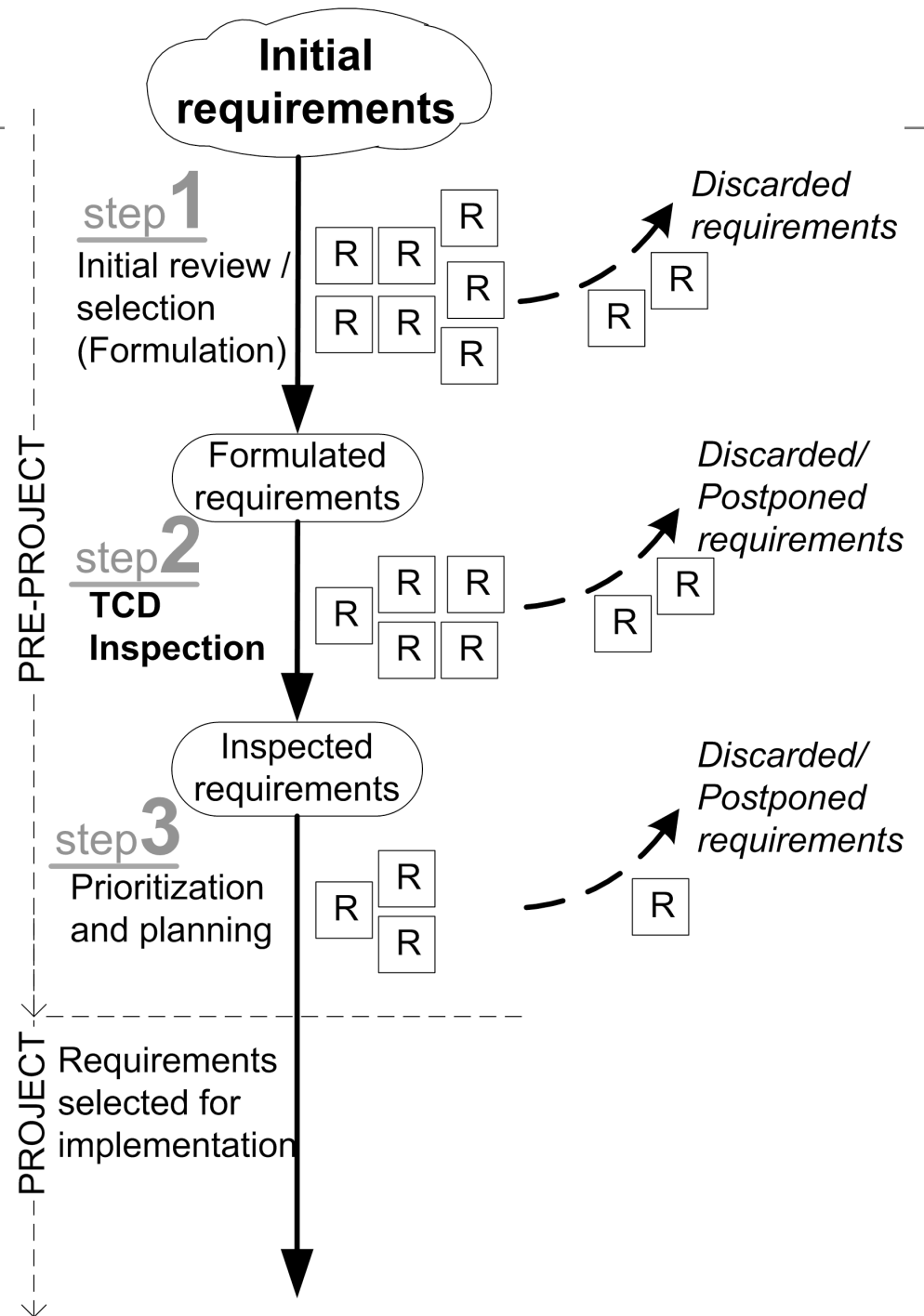
Process overview

STEP1: PM

STEP2: Tester
Planning

- a. Defect detection (“testability”, completeness, non-conflicting etc)
- b. Inspection meeting (stand-up)
- c. Defect correction
- d. Test-case completion

STEP3: PM



TCD inspection (5) experience



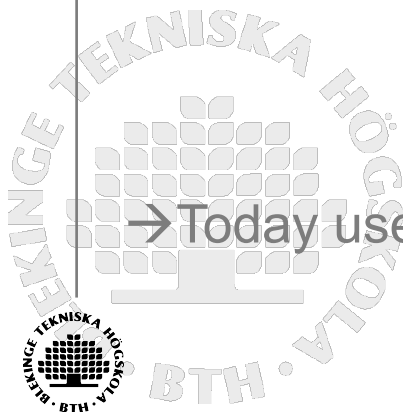
→ Pilot at DHR

- inspection of 25 requirements pre-project
- creation of about 50 “test-procedures/cases”
- test-plan draft (estimations etc)

→ RESULTED in

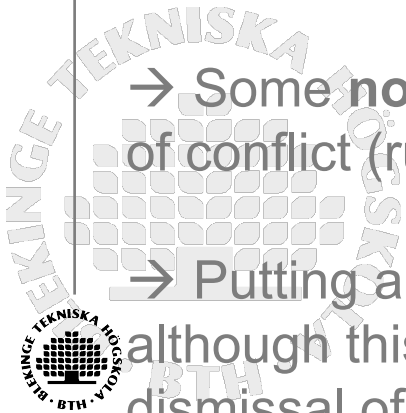
- refinement of 19 requirements
- 7 new requirements
- postponement of 4 requirements
- dismissal of 3 requirements
- 10% increase in effort (put pre-project)
- 50% decrease in uncompleted tests based on req.
- increase in accuracy of test plan, less defects due to req. misunderstanding by developers...

→ Today used on large-scale



TCD inspection (6) experience

- Test-cases (and preparation of test-plan) can be REUSED
 - obvious: for testing... but also as a complement to the requirement itself (attached to the req.) when given to developers for implementation
- Inspected requirements enable SELECTION (better requirements make better decision support... -obvious)
 - ... but as a spin-off there is a learning effect for the PM (through inspections learning to write better req. from the start)
 - ... the planning (e.g. cost estimations) are improved as a result...
- As the tester is involved in the development process very early TESTABILITY and the TEST PLAN ACCURACY can be improved
- Some **non-functional req. were hard to inspect** from the perspective of conflict (running tests is the only way to ascertain certain things...)
- Putting a lot of effort on inspecting req. very early can constitute risk... although this is alleviated though early selection (STEP1) and the fact that dismissal of req. after inspection can be seen as positive...



implications for V&V in the future...

→ Market-driven product development has and will transform the demands on companies...

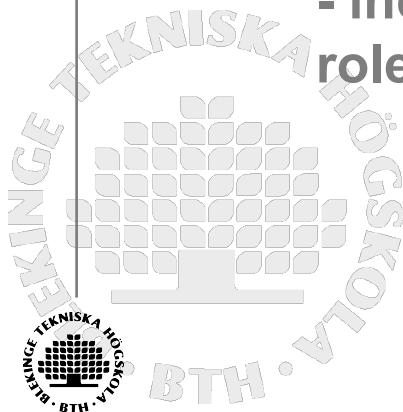
- utilization of V&V resources pre-project

=> all this means, more responsibility and increased status as V&V resources are used to support business decisions...

- system development requires improved prediction and selection of what to test (time-to-market)

- as SW becomes increasingly important as a competitive advantage (e.g. cars, power automation, robots etc) SW test has to cope with larger demands of critical systems

- increased HW + SW integration where SW takes a more active role = SW+HW integration tests





Q & A

