Next Generation Testing Conference
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Testers are Bearers of Good News

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Niels Malotaux

Niels Malotaux is an independent Project Coach and expert in optimizing project performance. He has over 35 years experience in designing electronic hardware and software systems, at Delft University, in the Dutch Army, at Philips Electronics and 20 years leading his own systems design company. Since 1998 he devotes his expertise to helping projects to deliver Quality On Time: delivering what the customer needs, when he needs it, to enable customer success. To this effect, Niels developed an approach for effectively teaching Evolutionary Project Management (Evo) Methods, Requirements Engineering, and Review and Inspection techniques. Since 2001, he taught and coached over 100 projects in 25+ organizations in the Netherlands, Belgium, China, Germany, India, Ireland, Israel, Japan, Romania, South Africa and the US, which led to a wealth of experience in which approaches work better and which work less in practice.

Niels puts development teams on the Quality On Time track and coaches them to stay there and deliver their quality software or systems on time, without overtime, without the need for excuses. Practical methods are developed, used, taught and continually optimized for:

- Evolutionary Project Management (Evo)
- Requirements Engineering and Management
- Reviews and Inspections.

Within a few weeks of turning a development project into an Evo project, the team has control and can tell the customer when the required features will all be done, or which features will be done at a certain date. Niels enjoys greatly the moments of enlightenment experienced by his clients when they find out that they can do it, that they are really in control, for the first time in their lives.

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Result Management

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Niels Malotaux

Result Management

Project Coach

- Evolutionary Project Management (Evo)
- Requirements Engineering
- Reviews and Inspections
- Dependability (Systems that simply work)

Helping projects and organizations to become predictable and more successful in much shorter time

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Testers are Bearers of Bad News

- Heard at various Testing Conferences
- Is this true ?
- Why ?
- Who says so ?
- Or is it just an assumption ?

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Who is the customer of Testing and QA ?

- Deming:
  - Quality comes not from testing, but from *improvement of the development process*
  - Testing does not improve quality, nor guarantee quality
  - It's too late
  - The quality, good or bad, is already in the product
  - You cannot test quality into a product
- Who is the customer of Testing and QA ?
- Developers are the main customer
- What do we have to deliver to these customers ?
  What are they *waiting for* ?

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Ultimate Goal of a What We Do

Quality on Time

Delivering the Right Result at the Right Time,
wasting as little time as possible (= efficiently)

- Providing the customer with
  - what he needs
  - at the time he needs it
  - to be satisfied
  - to be more successful than he was without it
- Constrained by (win - win)
  - what the customer can afford
  - what we mutually beneficially and satisfactorily can deliver
  - in a reasonable period of time

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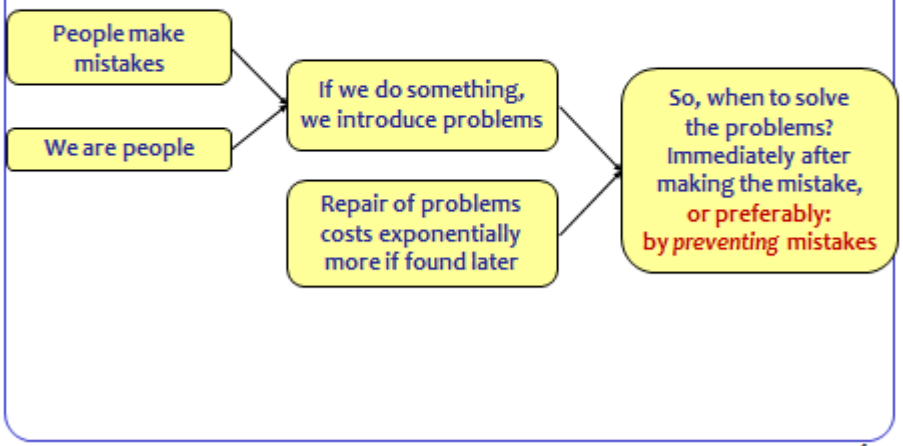
Inevitable consequence



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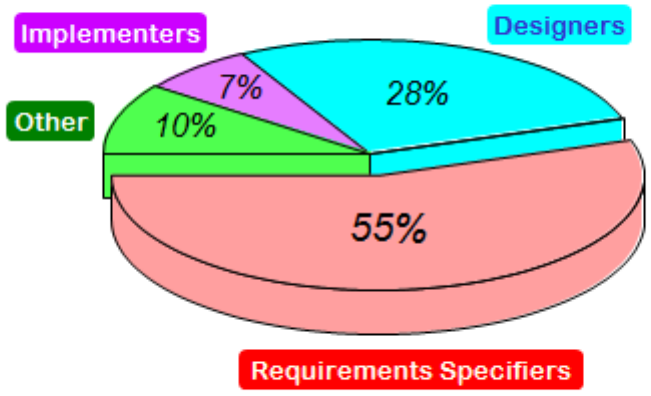
Typical Defect Injectors (cost breakdown)



After Bender Associates, *1996*

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DM

Dijkstra (1972)

It is a usual technique to make a program and then to test it

However:

Program testing can be a very effective way to show the presence of defects

but it is hopelessly inadequate for showing their absence

- Conventional testing:
  - Pursuing the very effective way to show the presence of defects
- The challenge is, however:
  - Making sure that there are no defects
  - And how to show their absence if they're not there

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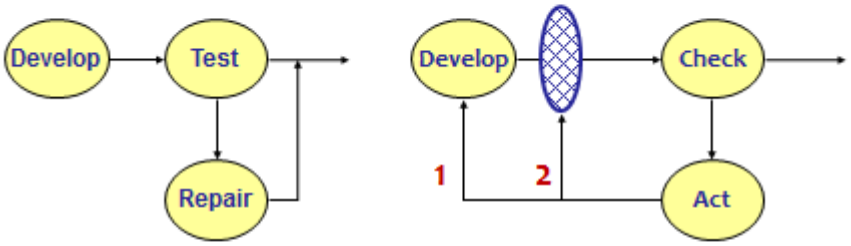
Testing is checking correctness



What we often see

What we should expect

1. How can we prevent this ever happening again ?
2. Why did our earliest sieve not catch this defect ?

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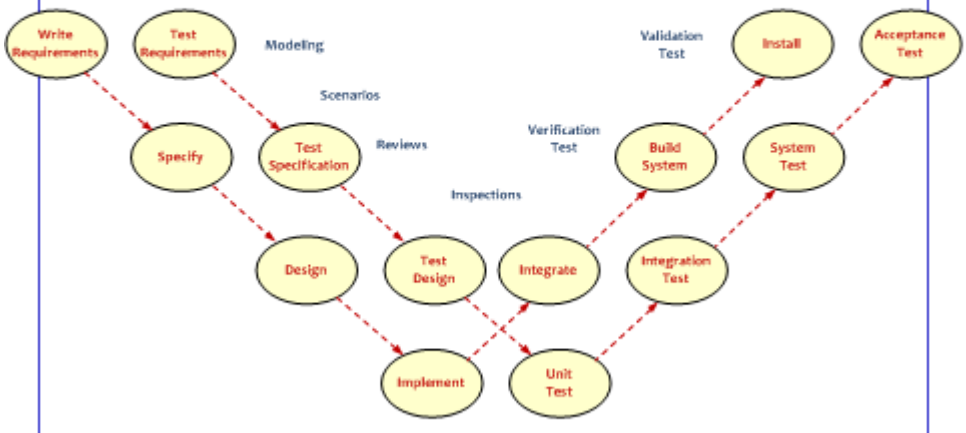
W-model



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What techniques do testers have
to do their job properly ?

- What was their job ? (just checking)
- What techniques do they need to do a proper job ?
  - Focus on what's necessary to reach the goal
  - Even if that's not what you've been told before
  - Don't believe anything I say

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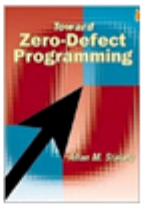
'Old', forgotten or ignored methods

- Cleanroom software engineering - Harlan Mills - 1970's
  - Incremental Development - Short Iterations
  - Defect prevention rather than defect removal
  - Inspections to feed prevention
  - No unit tests needed
  - Statistical testing
  - If final tests fail: no repair - start over again
  - 10-times less defects at lower cost
  - Quality is cheaper
- Evolutionary Delivery - Evo - Tom Gilb - 1974, 1976, 1988, 2005
  - Incremental + Iterative + Learning and consequent adaptation
  - Fast and Frequent Plan-Do-Check-Act
  - Quantifying Requirements - Real Requirements
  - Defect prevention rather than defect removal
- Early Inspections
  - Not waiting until the whole waterfall of a document (or code-module) has been polluted with defects



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Testing in Cleanroom

- Testing is an important part of the process, but it is done only after verification is successfully completed
- Testing is done:
  - Primarily to measure quality
  - Secondarily to find defects that escaped detection during verification
- Number of defects per thousand lines of code <10 after verification, compilation and syntax checking (= *before* test)
- Very good teams produce 2.3 defects per kLoC and reject code with 4 or 5 defects per kLoC
- No attempt is done to try to salvage rejected code by debugging
  - The code is sent back to the developers to be *rewritten* and reverified
  - Then it is tested as a completely new product
- Usage based testing
- Risk based testing

} Statistical testing

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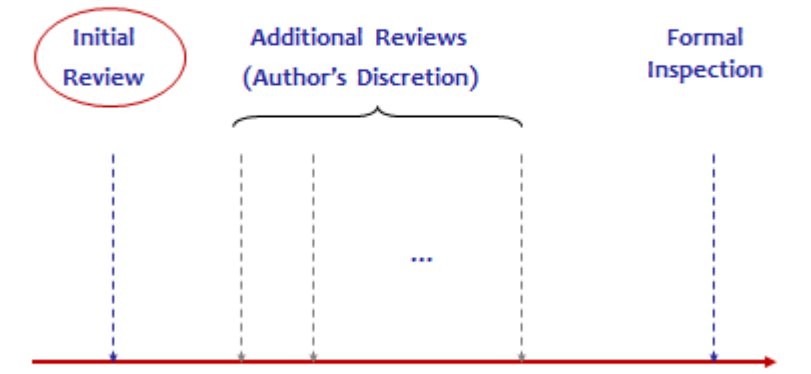
Early Inspection

Prevention costs less than Repair



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E8

Case Study - Situation

- A tester's improvement writing successive test plans
  - Early Inspection used on an existing project to improve test plan quality
  - Test plan nearly "complete", so we simulated Early Inspection
  - First round: inspected 6 randomly-selected test cases
  - Author notes systematic defects in the results, reworks the document accordingly (~32 hrs)
  - Second round: inspected 6 more test cases; quality vastly improved
  - Test plan exits the process and goes into production
  - The author goes on to write another test plan on the next project ...

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E8

Case Study - Results

First round inspection	6 major defects per test case
Second round	0.5 major defects per test case

- Time investment: 2 hours in initial review, 36 hours total in final formal inspection, excluding rework
  (2 inspections, 4 hrs each, 4 checkers, plus preparation and debrief)
- Historically about 25% of all defects found by testing were closed as "functions as designed", still 2-4 hrs spent on each to find out
- This test plan yielded over 1100 software defects with only 1 defect (0.1 %) closed as "functions as designed"
- Time saved on the project: 500 - 1000 hrs (25% x 1100 x 2-4 hrs)

Defect Prevention in action: First inspection of this tester's next test plan: 0.2 major defects per test case

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E8

Early Detection vs. Prevention

Denise Leigh (Sema group, UK), British Computer Society address, 1992:

An eight-work-year development, delivered in five increments over nine months for Sema Group (UK), found:

- 3512 defects through inspection
- 90 through testing
- and 35 (including enhancement requests) through product field use

After two evolutionary deliveries, unit testing of programs was *discontinued* because it was *no longer cost-effective*

Nice job! Early detection has big benefits - BUT...

How many of the 3512 defects found in end-of-line inspections could have been completely prevented by Early Inspection?

Cost-effective defect prevention is the bottom line

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E8

Let's move

Let's move from

Fixation to Fix

to

Attention to Prevention

- If we don't deal with the root, we will keep making the same mistakes over and over
- Toyota Production System: "Stop the Line"
- Without feedback, we won't even know
- Only with *quick feedback* we can put the repetition to a halt

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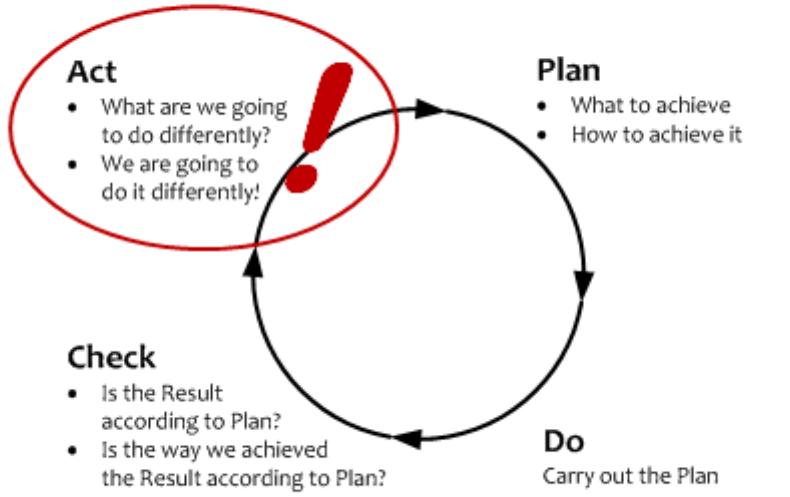
The essential ingredient: the PDCA Cycle

(Shewhart Cycle - Deming Cycle - Plan-Do-Study-Act Cycle - Kaizen)



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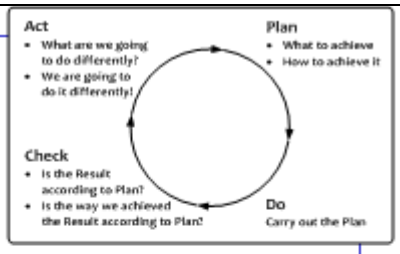
Evo (also for Testers !)



- Evo (short for Evolutionary...) uses PDCA consistently
- Applying the PDCA-cycle
  actively, deliberately, rapidly and frequently,
  for *Product*, *Project* and *Process*, based on RoI and highest *value*
- Combining Planning, Requirements- and Risk-Management into
  Result Management
- We know we are not perfect, but the customer shouldn't be affected
- Evo is about delivering Real Stuff to Real Stakeholders
  doing Real Things *"Nothing beats the Real Thing"*
- Projects seriously applying Evo, routinely conclude
  successfully on time, or earlier

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Evolutionary Project Management (Evo)

- Plan-Do-Check-Act
  - The powerful ingredient for success
- Business Case
  - Why we are going to improve *what*
- Requirements Engineering
  - What we are going to improve *and what not*
  - How much we will improve: quantification
- Architecture and Design
  - Selecting the optimum compromise for the conflicting requirements
- Early Review & Inspection
  - Measuring quality while doing, learning to prevent doing the wrong things

Zero Defects Attitude

Right product

Evo Project Planning

- Weekly TaskCycle
  - Short term planning
  - Optimizing estimation
  - Promising what we can achieve
  - Living up to our promises
- Bi-weekly DeliveryCycle
  - Optimizing the requirements and checking the assumptions
  - Soliciting feedback by delivering Real Results to *eagerly waiting* Stakeholders
- TimeLine
  - Getting and keeping control of Time: Predicting the future
  - Feeding program/portfolio/resource management

Right time

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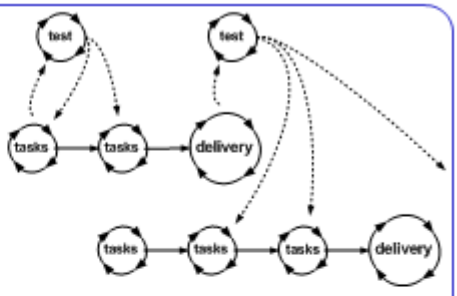
How to start doing it



- Testers organize their work in weekly TaskCycles
- DeliveryCycle is the Test-Feedback cycle
- Testers use their own TimeLine, *synchronized* with the TimeLine of development
- Testers conclude their work in sync with developers
- Testers *know* what they are supposed to test
- Testers check work in progress *even before* it is finished

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The aim of Testing

- Being done as soon as the development is done
- Well, almost

- Excuses, excuses, excuses
  - The developers are always late
    (Evo developers live up to their promises)
  - The developers don't take us seriously
    (Evo developers ask testers for help)
  - The developers don't inject enough defects
    (now testing becomes a challenge)
  - We are the bearers of bad news
    (find out what you're supposed to do)
- Helping development to be successful

No testers needed !

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More

www.malotaux.nl/?id=booklets

1 Evolutionary Project Management Methods (2001)
Issues to solve, and first experience with the Evo Planning approach

2 How Quality is Assured by Evolutionary Methods (2004)
After a lot more experience: rather mature Evo Planning process

3 Optimizing the Contribution of Testing to Project Success (2005)
How Testing fits in

3a Optimizing Quality Assurance for Better Results (2005)
Same as Booklet 3, but for non-software projects

4 Controlling Project Risk by Design (2006)
How the Evo approach solves Risk by Design (by process)

5 TimeLine: How to Get and Keep Control over Longer Periods of Time (2007)
Replaced by Booklet 7, except for the step-by-step TimeLine procedure

6 Human Behavior in Projects (APCOSE 2008)
Human Behavioral aspects of Projects

7 Evolutionary Planning, or How to Achieve the Most Important Requirement (2008)
Planning of longer periods of time, what to do if you see you don't have enough time

8 Help! We have a QA Problem! (2009)
Use of TimeLine technique: How we solved a 6 month backlog in 9 weeks

RS Measurable Value with Agile (Ryan Shriver - 2009)
Use of Evo Requirements and Prioritizing principles

www.malotaux.nl/?id=inspections
Inspection pages

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Do we deliver Zero Defect products ?

- How many defects do you think is acceptable ?

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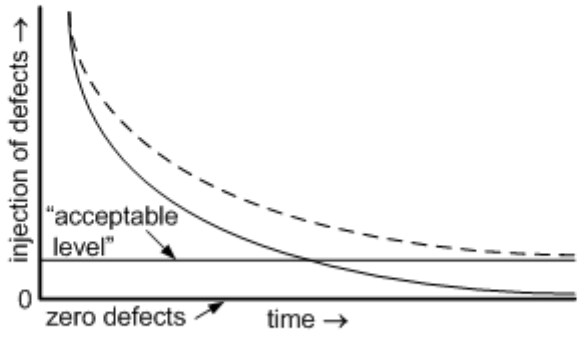
Is defect free software possible?

- Zero Defects is an asymptote



- When Philip Crosby started with Zero Defects in 1961, errors dropped by 40% almost immediately

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