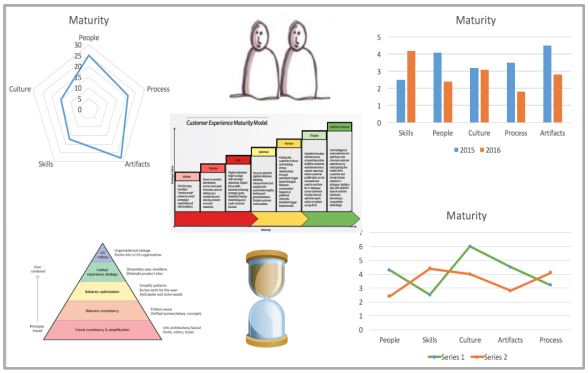
Testing maturity in an agile/CDT environment

Maturity – mature in relation to what?
Maturity is a judgement, not a fact, but an interpretation of facts. Or at least it doesn't fit in facts.[1]



So, when talking about maturity, a first important question is: Maturity in relation to what? Do we want to know our maturity in relation to an abstract model, to other projects, to other companies, to our past selves, or to something else?

A second important question is: why are we doing this? What is the goal of gaining insight in the maturity? How would we want to proceed from that insight?

Our answers to these questions shape our answers to a number of other questions, for example: do we see maturity as something quantitative or qualitative? Do we want hard numbers, a score to judge testing by? Or do we see a maturity assessment as an expert review[2], a means to asking questions and investigate potential problems? The expert review in this sense is a starting point for further investigation towards a solution.

A different approach to maturity
Thinking about those two questions, we came up with the following answers:

- ***Testing maturity should relate to what you (as a tester, test manager, delivery unit manager, …) think is important***. Too many different factors are involved for it to be possible to determine in general and in advance to what the testing maturity of a project/team/individual tester should relate to. This means we accept that your definition of maturity may change over time as your vision and/or your circumstances change. It may also differ per person, project and department. And it will most likely differ per company and per type of business. What is important in one context, might not be important in another. What is important for you, might not be important for me.
  Moreover, not only the maturity measurement cannot be done in general, but the next steps for growth can't be either. The outcome using a general model will be something "average", a "one-size-fits-al", while we want a context-specific solution...
- ***The result of a maturity assessment should be valuable information on what is your vision on good testing and to what degree you live up to that vision***. The result of a maturity assessment should not only be a simple score – in the same way that a test report should not just be a Go/No-Go advice. Finding better questions to ask ourselves about our testing is more important than simple answers and score cards.

This means we see maturity as a subjective and evaluative judgement. Thus, there is no way to measure it objectively or to compare maturity levels (incommensurability). This view is the main thing that sets our approach apart from other testing maturity models like TPI®[3] and TMMi[4]. The consequences of this view can be clearly seen in the description below of our approach.

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[1] Jerry Weinberg, Quality Software Management, Volume 1: Systems Thinking
[2] An expert review in this specific context is where a test expert uses his/her knowledge and experience to evaluate the testing in an organisation, project or an individual tester. The expert will spot problems and recommend changes to improve.
[3] http://www.sogeti.com/solutions/testing/tpi/
[4] http://www.tmmi.org/

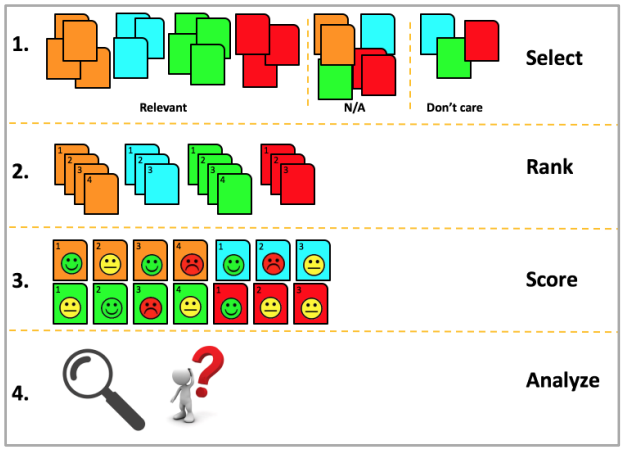
What is the mission of this maturity exercise? We think the assessment should be a pathway to better testing. As a part of solving problems we think the mission should be: "An investigation of strengths and weaknesses. A starting point for a discussion about potential (testing) problems and how to solve them."

Finally, it's important to note that one can see testing as a performance[5] (testing is what testers do) or as an activity (testing is testing regardless of who does it). Your paradigm of testing or how you choose to perform testing, will have consequences for the scope of your testing maturity. For example: are unit tests in scope or not?

Using the model
The model consists of a set of criteria (or heuristics) in six different areas. For details see below. To use the model you follow these steps:

1) Deciding the relevance of the criteria
   The criteria are sorted into three groups per area: relevant, don't care, not applicable. Only the 'relevant' group is used in the two subsequent steps, the other two groups (and the distinction between them) are used in the analysis.

2) Stack ranking the relevant criteria
   The criteria of the 'relevant' group for each area are stack ranked based on importance. Using stack ranking instead of categories (e.g. high/medium/low) forces hard choices: Yes, all these criteria are important, but is this specific criterion more important than these others or not?



3) Scoring the relevant criteria
   All the relevant criteria get a 'score': green (good), yellow (to improve), red (poor). The scoring is explicitly not based on points to discourage a quantitative conclusion, i.e. the reduction of maturity to a score. Also, points, for example on a scale from 1 to 10, suggest an unrealistic amount of precision. Besides being misleading, a high-precision scale might also lead to unproductive discussions on the difference between two scores: Should this be a 6 or a 7? Hence the simple scoring into three groups: yes (green), not there yet (yellow), no (red).

4) Analysing the results
   The analysis does not limit itself to the results of the third step. The choices made in step 1 (relevance) and step 2 (stack ranking) are also important input for the analysis. We do not want to limit the maturity analysis to how good you are in what you value: we also consider what you value and to what degree.

[5] http://www.testingcircus.com/testing-trapeze-2014-february-edition/ and http://www.developsense.com/blog/2014/10/testing-is/

Maturity areas
The maturity criteria are divided in the following six areas:

1) Test Culture – where testers work
   Shared patterns of behaviours and interactions, cognitive constructs and understanding[6].

2) Context – what testers are surrounded with
   Testing is not an isolated activity. (Neither is software development as a whole.) Your context, your environment may be conducive to good testing or it may not be. Criteria relating to 'outside influences' can be found in this area.

3) Trait – who testers are
   Testing is executed by people. Excellent testers have the right characteristics and traits to perform well.

4) Skills – what testers do
   Testing is a performance. Testing may produce artefacts through (explicit or tacit) processes, but without the proper skills from the actual people involved, the testing being done will not be very good. The skills area contains criteria to answer this very important question: do the people involved in testing have the capabilities to do what they need to do?

5) Processes – how testing is performed
   The criteria in this area are mainly about interactions. Interactions between people, between people and artefacts, etc. It's about how work is getting done.

6) Artefacts – what testers create
   This is the most easy and visible category, as it concerns artefacts: the things that are produced as part of the testing effort.

A note on the difference between traits and skills.
Although traits and skills cannot be completely separated from each other, we do see value on a distinction between the two. Skills relate to what you do: are you able to perform a certain activity and how well are you able to perform it? Skills can be developed through study and practice. Traits relate to how you are: do you display certain characteristics on your behaviour? Note that for you to display a trait, it needs to be part of your personality to some degree **and** your environment needs to be conducive to it. Traits can be developed through introspection and practice.

Read more:
- Maturity Models Have It Backwards[7]
- xMMwhy[8]

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[6] http://www.livescience.com/21478-what-is-culture-definition-of-culture.html
[7] http://www.developsense.com/blog/2009/10/maturity-models-have-it-backwards/
[8] http://www.developsense.com/blog/2011/10/xmmwhy/

Test Maturity Heuristics

Testing culture – where testers work

- Image of testing
- Alignment with company vision
- Job satisfaction / motivation
  - autonomy
  - purpose
  - mastery
- Feel appreciated
- Feel responsible
- Team sport
  - shared responsibility
  - no silos
- Testing Mind-set
- Continuous learning
  - Coaching
  - Pairing
  - Training
  - Feedback

Artefacts - what testers create

- Context analysis
- Stakeholder focused communication
- Different models of product
- Risk (&value) Analysis
- Test strategy
- Test plan
- Test coverage outline
- Test Design
  - Mind maps
  - Charters
  - Testers always adding test ideas
  - Heuristics
  - Checklists
- Test results
  - Logs
  - Notes
- Test report
  - Written report
  - Dashboard
  - Testing Story
- Problem reports
  - Bugs
  - Issues
- Test infrastructure
- Test data
- Test tools
- Test automation
- Metrics
- Testware Management

Context - what testers are surrounded by

- Paradigm of testing
- Test Policy
  - Rules of engagement
  - Responsibilities
- Mission
- Stakeholder commitment
- Collaboration
  - PO
  - Stakeholders
  - In team
  - Developer relations
  - Between teams
  - Between departments
- Test organization
- Quality Assurance
- Responsibilities do not exceed authority
- Information
  - Requirements
  - Acceptance criteria
  - Manuals
  - Process descriptions
  - Product outlines
  - Architectural overviews
- Equipment & Tools
  - Hardware
  - Automation: tools
  - Probes (observation)
  - Matrices & Checklists (progress)
- Schedule

People – who testers are

- Passion
- Motivation
- Experience
- Tester Professionalism
- Tester self-defence/stand-up for testing
- Courage
- Curiosity
- Flexibility
- Collaboration
- Self-management
- Self-Aware / Asking for feedback
- Ethics
- Proactive
- Team fit
- Sceptical
- Persistent
- Diplomatic

Test Maturity Heuristics

Skills - what testers do

- Thinking
- Learning
- Context analysis
- Risk & value Analysis
- Problem Solving
- Asking questions
- Modelling & visualisation
- Estimating and planning
- Test Strategy
  - Context analysis
  - Define objectives/mission
  - Risk & Value Analysis
  - Creating product coverage outlines
  - Defining scope
  - Heuristics (HTSM)
- Testability
  - Ask for it
- Test Design
  - Test techniques
  - Chartering
  - Design Experiments
  - Heuristics
  - Oracles
  - Tours
- Generating test ideas
- Test Framing
  - Express
  - Annotate
  - Relate to mission
- Test execution
  - Exploring
- Observation
- Note taking
  - Labelling
  - Summarize
  - Listing
  - Outlining
  - Chartering
  - Mapping
- Reporting
  - Telling testing story
  - Bug/issue reporting
  - Status reporting
  - Dash boarding
  - Wrap-up & debrief
- Collaboration
- Political skills
- Negotiating
- Communication
- Technical skills
- Domain knowledge

Processes - how testing happens

- Methodology Practice
  - Agreed test procedures
- Compliance to test policy
  - Discussed with Audit
- Degree of involvement
- Model the test space and risks
  - Context Analysis
  - Product Coverage Outline
  - Test Plan
  - Test scope
  - Risk & Value Analysis
- Determine coverage
  - Test Strategy
  - Test Coverage
  - Test Conditions
  - Test Ideas
  - Design Experiments
  - Test Missions
  - Test Techniques
- Determine & apply oracles
- Configure the test system
  - Test Data
  - Test Environments
- Test Execution
  - Perform experiments
  - Run checks
  - Note taking
  - Test logs
- Evaluate the test results
- Report test results
  - Testing Story
  - Bug reports
  - Issue reports
- Defects Management
- Test Process Management