



No more shelfware! Let's drive!

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Who am I?

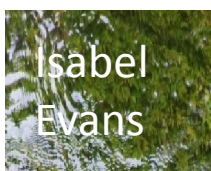


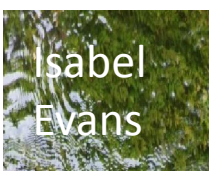
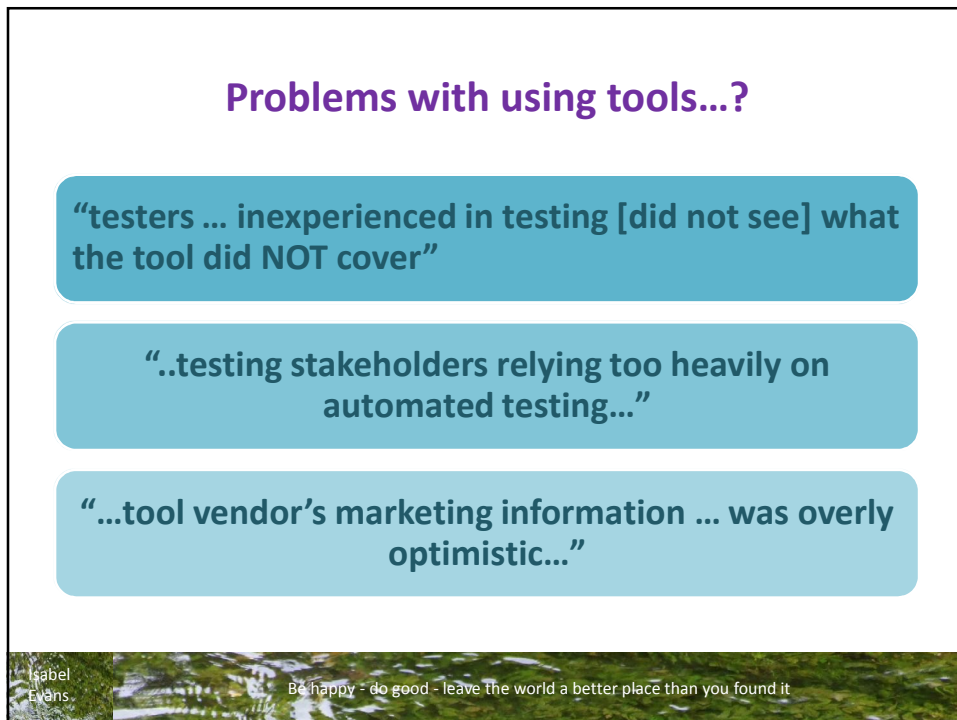
- Opinion, evidence and confirmation bias
- As a consultant, I see problems
- So my hypotheses assume problems
- So I see the evidence that supports my opinions...

Help!
STOP!!

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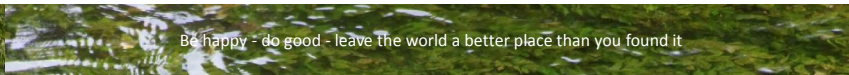
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Problems with infrastructure...?

“...national annual costs of an inadequate infrastructure for software testing is estimated to range from \$22.2 to \$59.5 billion...”



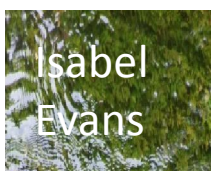
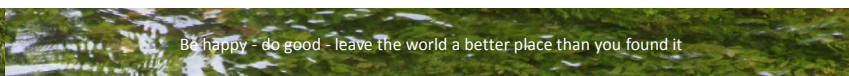
Problems with SW development tools in general...?

“Programming is so hard that only highly talented, trained, and dedicated individuals can do it passably well. The inescapable conclusion is that programming as we know it is just unnatural for humans. The solution is to

***reinvent programming to suit
human cognitive skills***

to program the way we think. This is a matter of usability. The sad fact is that modern programming languages are usability disasters, full of design mistakes inherited from earlier eras.”

<http://alarmingdevelopment.org/>



Complaints about tools...?

I think the UX tool set is better than the testing tool set, because we [UXD'ers] wouldn't put up with it

so now I wanna know why raising a string exception is bad. Like what should I be doing instead? Since it thinks it's a problem. And so none of these [messages] really help me

The test tool marked all the tests as passed except 1, but in fact none of the tests marked "passed" had actually run...

I spend 50% of my time wrestling with the technology instead of solving the problem I am working on

it is like working with something designed to be used by a 12-year-old boy in his bedroom in the 1980's

a lack of consideration for how people work and think ... basically it's still the mindset that the human adapts to the computer, not vice-versa

Why would I want to use a tool called Github?

Too many geeks are making Automation Script piles for other geeks, and [calling it] a tool!

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Why this topic?

So far...

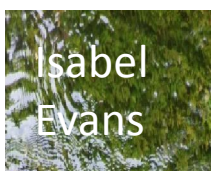
UX methods to help

Next steps...

Finding your way...
ROAD MAP

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Back to school...



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TX: Improving software by enhancing the testers' user experience (UX) of their test tool set

UNIVERSITY OF MALTA, FACULTY OF ICT, DEPARTMENT OF COMPUTER INFORMATION SYSTEMS
Supervisors: Dr. Chris Porter and Dr. Mark Micallef

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Picking that apart

- *TX: Test Experience*
 - *TX as a type of UX*
- *Improving software*
 - *If the tools are better will the resulting software be better???*
 - *If the tools are different, maybe different people will join IT projects???*
 - *If different people join IT projects, maybe software will end up being different???*
 - *Maybe increasing UX of software development (testing) tools could contribute to a diversity of personalities and thinking in the industry???*

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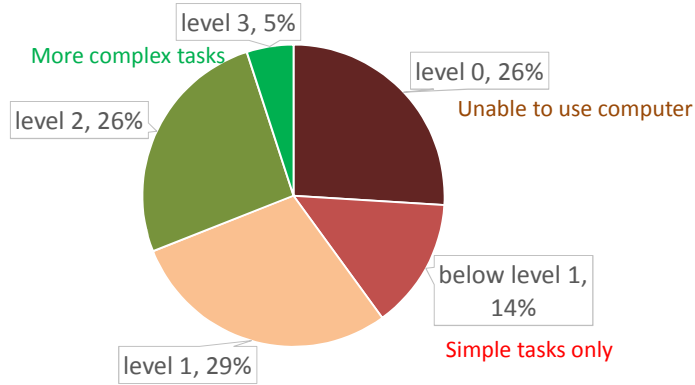
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Who are we building software for?

Level of skills with computers
working people 18-65, 33 richest countries



<https://www.nngroup.com/articles/computer-skill-levels/>

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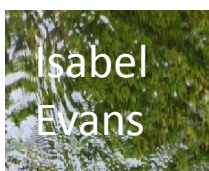
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So far I have... and next...



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What am I finding so far?

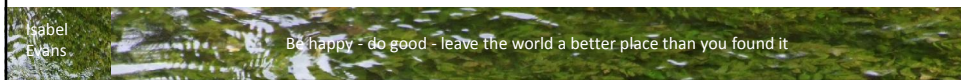
Reading: Literature review

- Started reviewing what else has been researched in these areas:
 - SW development tools
 - Test tools
 - Selection & Use of test tools

Listening: to gather new data

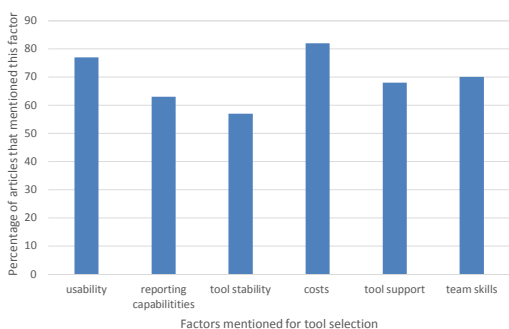
- Interviews
- Workshops
- Focus group
- Conversations
- Surveys

- How long have you been using test tools?
- Which test tools have you used?
- Are they useful? Why?
- What testing tasks are supported by the tools you have and how well? Why?
- What tasks could be completely automated? Why?
- What do you count as a testing tool?
- Could those tasks be done without the tools? Why?
- What's been particularly easy or difficult about those experiences?



Reading: How do we choose tools...?

Factors mentioned for tool selection
 (based on: *Choosing the right test automation tool: a grey literature review of practitioner sources* (2017) Raulamo-Jurvanen, Mantyla, Garousi)

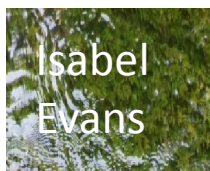
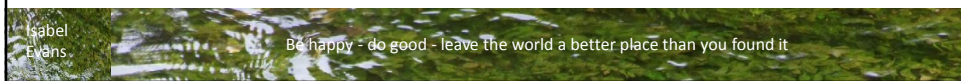


“social proof as a weapon of influence is claimed to be most influential under 2 conditions: uncertainty and similarity”

“tendency for cognitive overload is likely to increase the prevalence of shortcut decision making proportionately”

“trial use would often lead to wrong decisions”

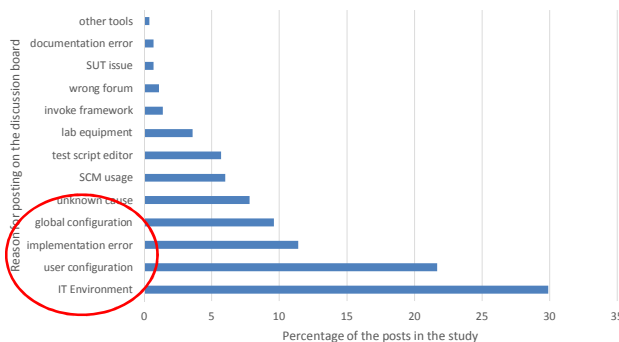
Choosing the right test automation tool: a grey literature review of practitioner sources (2017) Raulamo-Jurvanen, Mantyla, Garousi



“neither the researchers nor practitioners should be surprised by the findings”

Reading: What do we ask for help with...?

Based on: Reasons for posting on a tool discussion board
IMPEDIMENTS FOR AUTOMATED SOFTWARE TEST EXECUTION Kristian Wiklund, 2015, School of Innovation, Design and Engineering, Mälardalen University Press
Dissertations No. 180



“the main problem with the framework is that it is hard to use” (a user quoted)

“have not realised one is building and using a complex system when automating”

“the largest group (of problems) were related to “user behaviours”, that is, things caused by mistakes by the users themselves”

Impediments for automated testing – an empirical analysis of a user support board (2014) (part of Kristian Wiklund PhD Thesis) other authors for the paper – Sundmark, Eldh, Lundqvist

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Listening...



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The illusion of usability...?

Selling?

running the tests is quite easy. The difficult part is maintaining the tests when it grows massively

Adopting?

Usability of what...?

Long term?

90% of the functionality we will never use.

We wanted a lean tool with simple set up, low overhead and short learning curve. What we got was a tool with too many options and hard to use. We needed a "Vauxhall Astra" but ended up with a quick but hard to drive Ferrari

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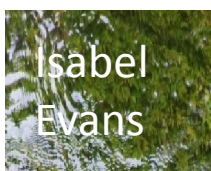
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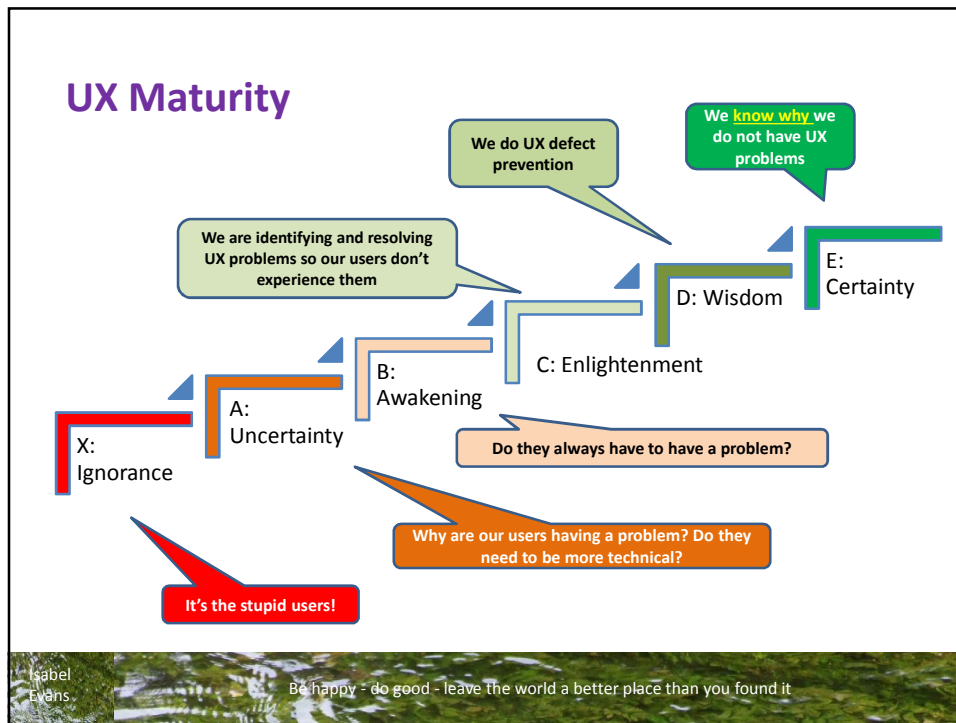
UX methods to help

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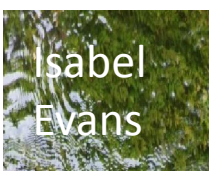
Finding your way...
ROAD MAP

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- ### Start to think TX (UX for testers)
- Identify **WHO** uses your tool
 - Identify **WHY** they use it
 - Identify **WHAT** they want to do
 - Identify their **EMOTIONS** and **EMPATHISE!**
 - Score UX, Quality in Use (QiU) and Internal Quality (IQ) attributes
 - Write **RICH STORIES**
 - Do a **USABILITY REVIEW**
- At the bottom left, it says "Isabel Evans". At the bottom right, it says "Be happy - do good - leave the world a better place than you found it".



TX: Who? Why?

- WHO ←
- WHY
- WHAT
- EMOTIONS
- UX, QIU, IQ
- RICH STORIES
- USABILITY REVIEW

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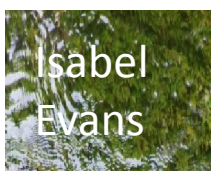
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TX: What tasks?

- WHO
- WHY
- WHAT ←
- EMOTIONS
- UX, QIU, IQ
- RICH STORIES
- USABILITY REVIEW

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TX: What emotions?

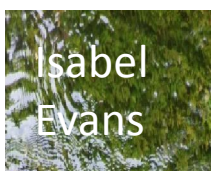
WHO
WHY
WHAT
EMOTIONS
UX, QIU, IQ
RICH STORIES
USABILITY REVIEW

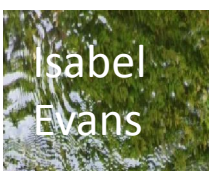
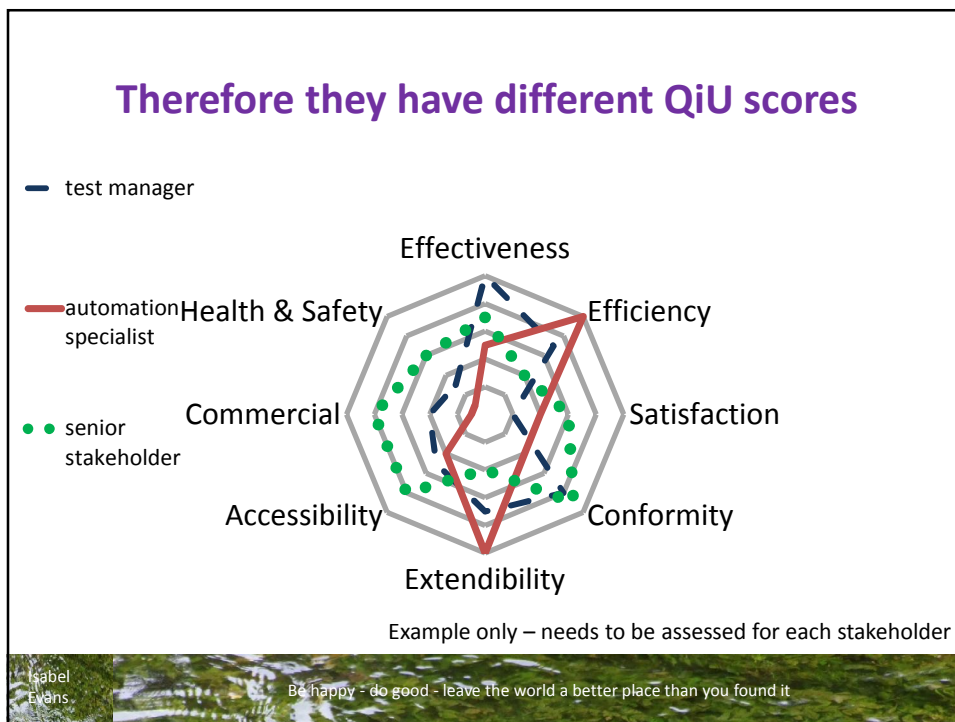
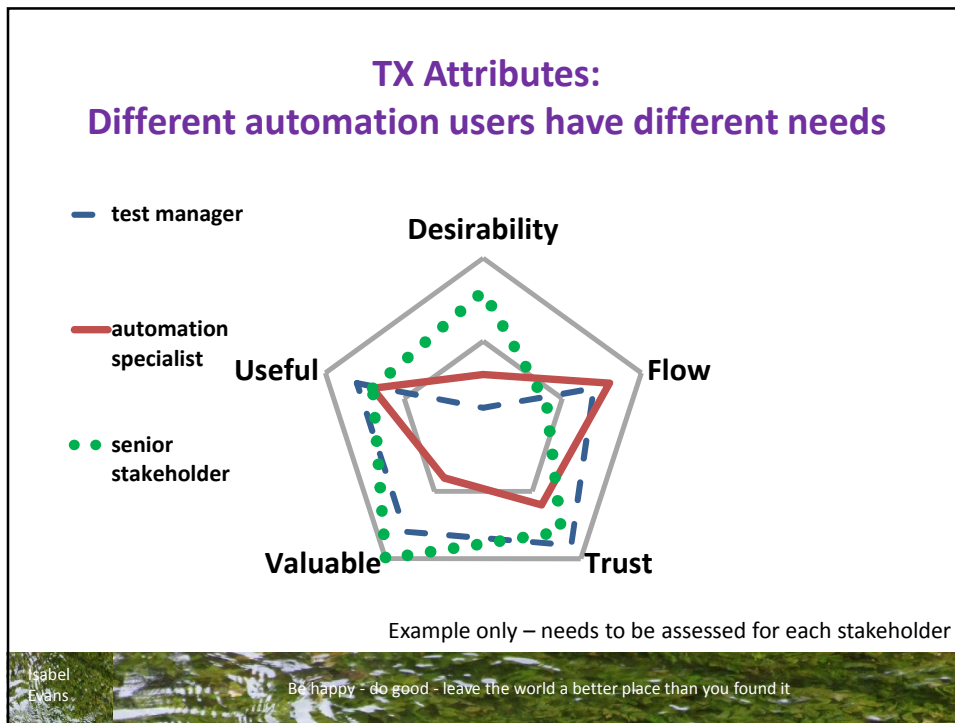
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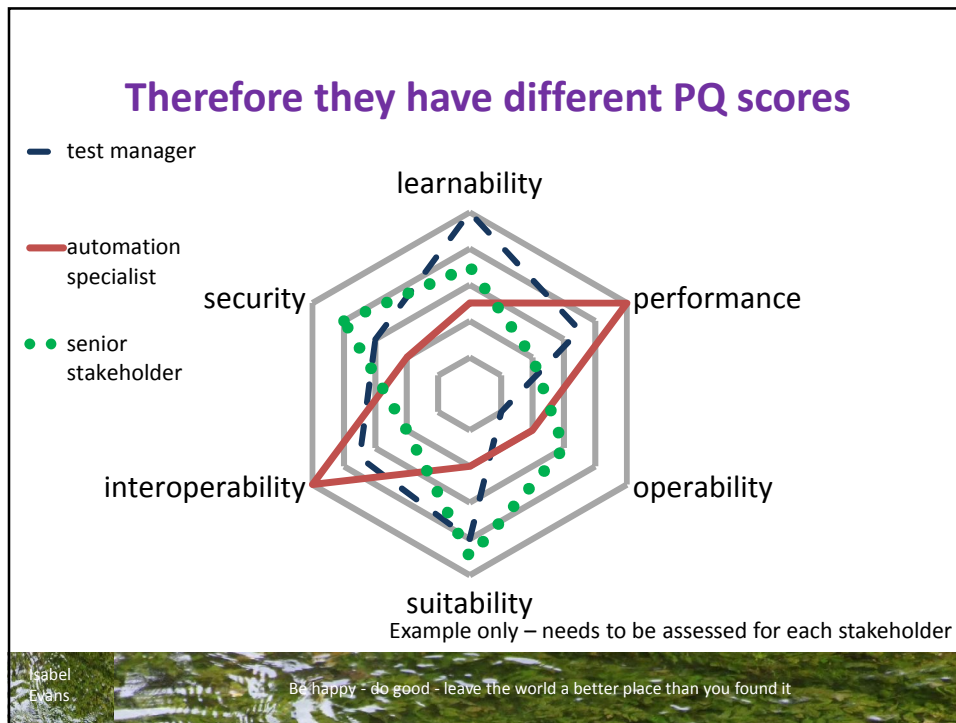
TX: Which attributes?

Functionality Performance Reliability Security Maintainability Interoperability Portability Compatibility Etc.	Usability Flexibility Safety Accessibility Etc.	valuable useful credible findable usable accessible meaningful flowing playful immersive seductive pleasurable desirable, etc.
Product quality	Quality in Use	UX-D

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Test automation user: Rich User Story

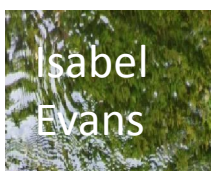
As a domain specialist tester
 I want to use software dev/test tools that provide me with information in my domain language
 That don't force me to engage with technical issues
 That provide information for the developers that they & I can trust
 And don't make me feel stupid
 So that we make decisions we both trust
 Without interrupting our flow of work.

Functional Suitability

Usability
Effectiveness
Conformance

Flow, credibility, trust

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Check your tools interfaces today...

Easy usability testing - Heuristic Evaluation

WHO

WHY

WHAT

EMOTIONS

UX, QIU, IQ

RICH STORIES

USABILITY REVIEW ←

Visibility of system status	Match between system and the real world	User control and freedom
Consistency and standards	Error prevention	Recognition rather than recall
Flexibility and efficiency of use	Aesthetic and minimalist design	Help users recognize, diagnose, and recover from errors
	Help and documentation	

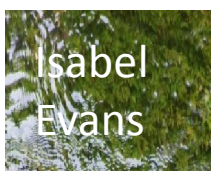
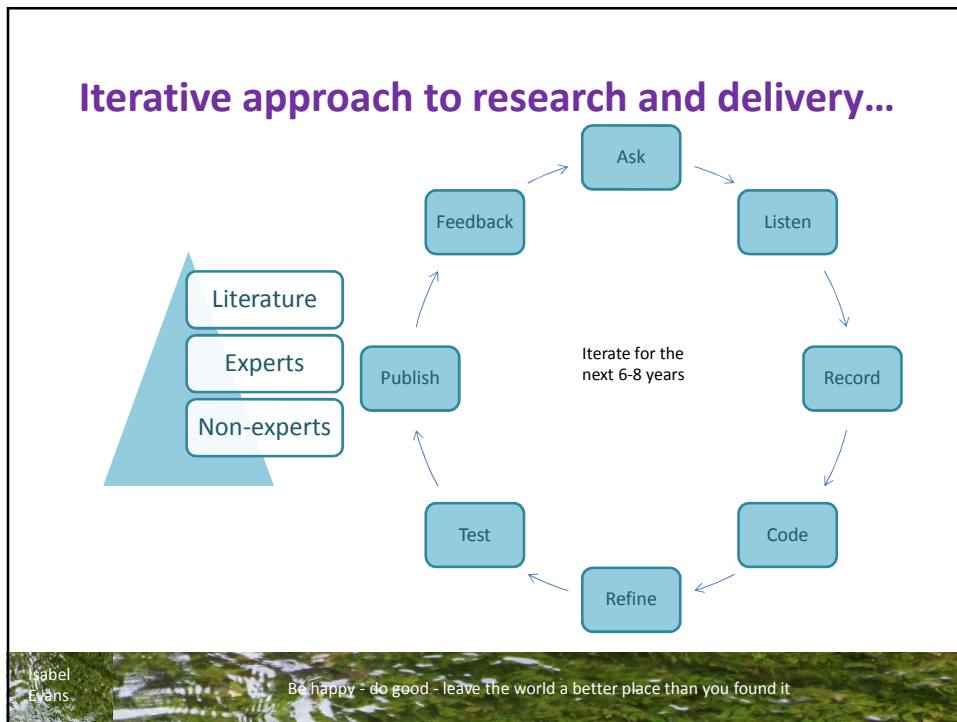
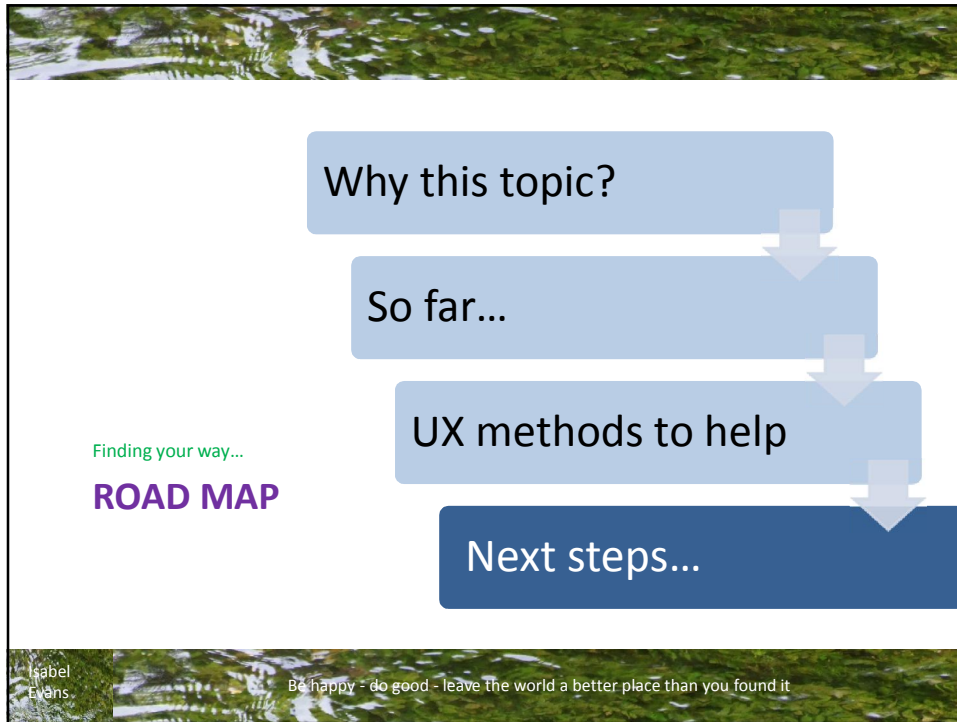
<https://www.nngroup.com/articles/ten-usability-heuristics/>

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Possible way to assess tools: NASA TLX

- <https://humansystems.arc.nasa.gov/groups/tlx/>
- <https://humansystems.arc.nasa.gov/groups/tlx/tlxapp.php>
- The current NASA link is: on the itunes store:
<https://itunes.apple.com/us/app/nasa-tlx/id1168110608>
- NASA TLX software for assessing subjective mental workload (2009) Cao, Chintamani, Pandya, Ellis (older)
ece.eng.wayne.edu/~apandya/Software/NASA_TLX
- <http://isellsoap.github.io/nasa-tlx/>
- <https://www.keithv.com/software/nasatlx/>

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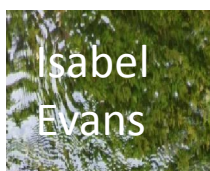


Other references and sources (1)

- [1] Lehner A, Dumke R., Software Metrics: Research & practice in software measurement, Available at: <http://bit.ly/2kSZrs2>, Accessed: 3 Feb 2017.
- [2] Tulpule, N. (2016), Developer Experience. FWTL Conference keynote presentation, Google Test Automation Conference, GTAC 2016 (Isabel attended)
- [3] Havelock, P, Testware or Shelfware - the reality, Article on BCS website, available at <http://bit.ly/2lBmxfM> (Accessed 11 Feb 2017)
- [4] Kaner, C. (1998), Avoiding Shelfware: A Managers' View of Automated GUI Testing, Paper STAR98 conference, Available at <http://bit.ly/2kSMYOI> (Accessed 11 Feb 2017)
- [5] Fewster, M. and Graham, D. (1999) Software test automation: Effective use of test execution tools. Harlow: Addison-Wesley Educational Publishers.
- [6] Graham, D. and Fewster, M. (2012) Experiences of test automation: Case studies of software test automation. United States: Addison-Wesley Educational Publishers.
- [7] Tassey, G. (2003) The economic impacts of inadequate infrastructure for software testing: Final report. Diane Pub Co. Available at <http://bit.ly/2kT520P>
- [8] Jones, C. (2015) Wastage: The Impact of Poor Quality on Software Economics, Software Quality Professional Journal, (article) Dec2015, Vol. 18 Issue 1
- [9] IEEE, (2014) IEEE 730-2014 IEEE Standard for Software Quality Assurance Processes, 3.2
- [10] Nielsen, J and Norman, D., The definition of user experience, Nielsen Norman NN Group Website, available at <http://bit.ly/1T72ZRS> (accessed 11 Feb 2017)
- [11] Hassenzahl, M., The encyclopedia of human computer interaction, Interaction Design Foundation, chapter 3 "User Experience and Experience Design". Available at <http://bit.ly/2k2KI0W> (accessed 11 Feb 2017)
- [12] Atoum, I., Bong, C., Kulathuramaiyer, N., (2013) "Towards Resolving Software Quality-in-Use Measurement Challenges", University of Malaysia Sarawak
- [13] Zubrow, D., Software Quality Requirements and Evaluation, the ISO 25000 Series, Carnegie Mellon University, Report of standards working party
- [14] Richardson, A and Evans, I., Conversation: Automation and People, the UKSTAR 2017 programme includes a debate on technical skills required by testers (<http://bit.ly/2k2NzGY>, see track T10) (conference debate)
- [15] Whittle, J., Hutchinson, J., Rouncefield, M., Burden, H., and Helden, R., (2015) A Taxonomy of Tool-Related Issues Affecting the Adoption of Model-Driven Engineering, Software and Systems Modeling, ISSN 1619-1366 [<http://eprints.lancs.ac.uk/77975/>]
- [16] Johnson, B., Song, Y., and Murphy-Hill, E., Bowdidge, R., (2013) Why Don't Software Developers Use Static Analysis Tools to Find Bugs?, NCSU { <https://people.engr.ncsu.edu/ermurph3/papers/icse13b.pdf>} (accessed 11 Feb 2017)
- [17] CA Consulting, (2016) "Moving IT Service Management to the 21st Century", available at <http://bit.ly/2kggqIX>
- [18] Chemaly, S. (07/27/2015 03:52 pm ET | Updated Jul 27, 2016) What gender stereotypes and sexism have to do with Algorithms and Robots, Huffington Post, Available at <http://huff.to/1iSpek4> (accessed 11 Feb 2017)
- [19] Lent, Knowledge, skills and abilities for software QA jobs, available at <http://bit.ly/1fj0IXq> (accessed 11 Feb 2017, no date on website)
- [20] Own experiences, anecdotal evidence, emails, conference discussions & feedback (UCAAT, PSTQB, EuroSTAR16, CREST workshop, UCL, UK Software testing retreat)

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Other references and sources (2)

- [21] Smartbear tools vendor, available at <https://smartbear.com/learn/automated-testing/> (accessed 11 Feb 2017)
- [22] Johnson, B., Pandita, R., Smith, J., Ford, D., Elder, S., Murphy-Hill, E., Heckman, S., Sadowski, C., (2016) A Cross-Tool Communication Study on Program Analysis Tool Notifications, ACM SIGSOFT International Symposium on the Foundations of Software Engineering (FSE), [<http://bit.ly/2K4EQI>] (accessed 11 Feb 2017)
- [23] Moore, G., Crossing the Chasm 2nd Edition (1999) Capstone
- [24] Hendrikson, E., Do Testers Have to Write Code? Blog, [Available at <http://bit.ly/2lzuMij>] (accessed 11 Feb 2017)
- [25] Lambert, R, Why testers really should learn to code, Blog, [available at <http://bit.ly/2k2NW4k>] (accessed 11 Feb 2017)
- [26] Gill, M., Software Testing Skills that you must have: An overview, Blog, [available at <http://bit.ly/2k2LmLM>] (accessed 11 Feb 2017)
- [27] Beckwith, L., Kissinger, C., Burnett, M., Weidenbeck, S., Lawrance, J., Blackwell, A., Cook, C., (2006) Tinkering and Gender in End-user Programmers' Debugging, [available at <http://bit.ly/2hpq0ll>] (accessed 11 Feb 2017)
- [28] Morrison, P., Pandita, R., Murphy-Hill, E., and McLaughlin, A., (2016), Veteran Developers' Contributions and Motivations: An Open Source Perspective, [Available at <http://bit.ly/2ke1w5e>] (accessed 11 Feb 2017)
- [29] Fisher, M., Cao, M., Rothermel, G., Brown, D., Cook, C., Burnett, M., Integrating Automated Test Generation into the WYSIWYT Spreadsheet Testing Methodology, [available at <http://cse.unl.edu/~grother/papers/tosem06.pdf>] (accessed 11 Feb 2017)
- [30] Schroeder, K. (2010), Gender dimensions of Product Design, Expert Paper for UNDAW / UNESCO, [online] [available at <http://bit.ly/1MXNTPf>] (accessed 11 Feb 2017)
- [31] Pauleen, D., Evaristo, R., Davison, R., Ang, S., Alanis, M., and Klein, S. (2005) Cultural Bias in Information Systems Research and Practice: are you coming from the same place I am?, ICIS Panel discussion summary [online <http://bit.ly/2bfi5iv>] (Accessed 11 Feb 2017)
- [32] Isabel Evans' Conversations with attendees at the Women in Innovation (WII) meeting, (2016). Quotes: UK Government Infocus/Innovate UK awards Women in Innovation 2016, see <http://bit.ly/1P05CBG> (accessed 7 Feb 2017)
- [33] Nielsen, J. (2017). Ten Usability Heuristics. [online] [Available at: <https://www.nngroup.com/articles/ten-usability-heuristics/>] [Accessed 4 Feb. 2017].
- [34] Firestone, D. (2014). Common System and Software Testing Pitfalls, e-book, Pearson Education Available at Amazon.co.uk
- [35] Borg, A., Porter, C., Micallef, M. (2015). Poster: Is Carmen better than George? Testing the Exploratory Tester using HCI Techniques, International Conference on Software Engineering, to appear, 2015, Florence, Italy
- [36] Micallef, M., Porter, C. (2016). HCI – The Tester's New Sidekick?, The Tester Magazine – BCS 03/2016 (pp 12–15)
- [37] Micallef, M., Porter, C., Borg, A. (2016). Do Exploratory Testers Need Formal Training? An Investigation Using HCI Techniques, The 11th Workshop on Testing: Academia-Industry Collaboration, Practice and Research Techniques, April 11, 2016, Chicago, IL, USA
- [38] Micallef, M., Porter, C. (2017). Help! I'm only human! Understanding and supporting the human tester, Keynote at the British Computer Society SIGIST Testing Conference, March 14, 2017, London, UK

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Other references and sources (3)

- [39] Constructing Grounded Theory, Kathy Charmez
- [40] Quality in Use: Meeting User Needs for Quality, Nigel Bevan, Serco Usability Services Journal of System and Software, 1999 (in press)
- [41] "The test tool marked all the tests as passed except 1, but in fact none of the tests marked "passed" had actually run" Quote from Fewster and Graham "Experiences of Test Automation"
- [42] Quotes from attendees at the WII briefing meeting: "I spend 50% of my time wrestling with the technology instead of solving the problem I am working on" and "it is like working with something designed to be used by a 12-year-old boy in his bedroom in the 1980's". "Why would I want to use a tool called Github?"
- [43] Gender and other bias in IT tools, for example in tool default behaviour, use of language, voice recognition, gendering of support tools, is increasingly being studied and remarked on e.g. <http://huff.to/1ISpek4>, <http://bit.ly/1MXNTPf>, <http://bit.ly/2bfi5iv>
- [44] Problems with customer support tools: "Ethnographic research paints a sad picture of the current state of the ITSM market. ...vision is to build a solution designed for humans, not processes" (<http://blogs.ca.com/2016/01/27/moving-it-service-management-to-the-21st-century/>)
- [45] Evidence that tools do not work for IT people "...a lack of consideration for how people work and think ... basically it's still the mindset that the human adapts to the computer, not vice-versa." (A Taxonomy of Tool-Related Issues Affecting the Adoption of Model-Driven Engineering by Whittle, Hutchinson, Rouncefield, Burden and Helda)
- [46] Evidence that developers do not find tools easy to use: "...so now I wanna know why raising a string exception is bad. Like what should I be doing instead? Since it thinks it's a problem. And so none of these really help me..." (Why Don't Software Developers Use Static Analysis Tools to Find Bugs? By Johnson, Song, and Murphy-Hill).
- ISO 25000 Series of standards (quality in use attributes)
- [47] <http://alarmingdevelopment.org/>
- [48] <http://blogs.ca.com/2016/01/27/moving-it-service-management-to-the-21st-century/>
- [49] <https://www.youtube.com/watch?v=oQ4551aCQ>
- [50] <https://www.nngroup.com/articles/ten-usability-heuristics/>
- [51] <http://research.csc.ncsu.edu/gill/>
- [52] NASA TLX see <https://humansystems.arc.nasa.gov/groups/tlx/>
- [53] <https://www.nngroup.com/articles/computer-skill-levels/>
- [54] *Choosing the right test automation tool: a grey literature review of practitioners sources* (2017) Raulamo-Jurvanen, Mantyla, Garousi)
- [55] Reasons for posting on a tool discussion board; IMPEDIMENTS FOR AUTOMATED SOFTWARE TEST EXECUTION Kristian Wiklund, 2015, School of Innovation, Design and Engineering, Mälardalen University Press Dissertations No. 180

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Be happy - do good - leave the world a better place than you found it