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SC7
Future Watch

François Coallier, Eng., Ph.D.
SC7 Chair
2013 JTC 1 Plenary
Future Watch

- Initiative from Dr. Tom McBride (Australia), member of SC7/SWG5, initiated in 2010
- Report presented at each AG meeting – on the Sunday preceding the plenary
- May result in initiatives

Ref. SC7 N4624, N5111, N5869. N5870
Future Watch - Challenges

- The systems we create are of increasing complexity
- The problems we try to solve are of increasing complexity
- The margins for error are reducing.
- Increased expectation of almost everything
- The different aspects of software, system or service development, deployment and operation must integrate and integrate to address these needs

Ref. Tom McBride - 2010
2010 Status: the world move on

- Since 1993
  - Agile software development
  - Software development environments have automated many mundane tasks away
  - Java and other languages
  - Internet introduced a new type of consumer application
  - Internet introduced new concerns about security and privacy
  - Mobile devices have changed the game yet again

Ref. Tom McBride - 2010
2013 Topics

- Big Data
- Cyber Security
- Cloud Computing
- Ubiquitous Software
- Mobile Computing
- System Complexity
- Design as a Discipline
- Gamification

Ref. Tom McBride - 2010
Ubiquitous Software

- So many systems now incorporate software that software has become ubiquitous.

- It is not just commercial transaction systems but medical devices, cars, cameras, feral pest tracking collars, domestic appliances to name but a few. This software is assumed, not especially noticeable.

- It is expected to function with similar characteristics of dependability as the device in which it is embedded. We expect a washing machine to work unless there is some visible fault with it. We expect a car to behave as if we have had 100 years of experience in making them work, not 40 years of haphazard progress in making software do what it was intended.

Ref. Tom McBride - 2010
Ubiquitous Software

- Standards of safety and dependability of devices are being extended to include the software embedded in them. Notable standards include IEC 62628 Guidance on Software Aspects of Dependability (TC56).

- In the absence of any advice or active involvement by SC7, ISO and IEC committees will try to address software from their own perspective. This will not always achieve the intended results.

- How can SC7 make its knowledge and expertise available to other JTC1 committees without ramping up active liaison.

Ref. Tom McBride - 2010
Mobile Computing

- The last few years have seen the emergence of mobile devices: smartphones and tablet computers, all with hundreds of apps. The quality of these apps seem to be managed by the various app markets. However, is it possible that this might prove inadequate in some circumstances.

- Who certifies that any particular app has been adequately tested and is fit for its intended use?

- Apps are software, developed using software development processes. Are the development processes any different and should SC7 processes change to accommodate app development or mobile device software.

- What effect might this market have on SC7’s suite of standards?

Ref. Tom McBride - 2010
System Complexity

- Most IT development is approached as if the system is complicated, not complex. That is, although it might be large it is essentially understandable and predictable. An automobile is complicated. It has a lot of interacting components but is essentially understandable and behaves predictably. But most large IT systems interact with their environment and internally between components producing unexpected effects. They are complex.

- Although this characteristic of software and systems has been observed for a long time our development processes are appropriate for complicated, not complex, software and systems.

- Can SC7 consider if and how SC7 processes address development of complex software and systems.

Ref. Tom McBride - 2010
Design as a Discipline

Throughout its history, however, design has generally remained a discrete set of deliverables or project phases, completed by specialised teams at distinct points during a project’s lifecycle. Individual facets of design have reflected little understanding of other related project activities, much less the broader context of the business vision and expected outcomes.

What’s missing may be a commitment to design as a business discipline, a commitment that takes shape by asking: “What benefits would we gain if design were a pervasive and persistent aspect of each part of the enterprise?” – Deloitte Tech Trends 2013.

SC7 could consider a “design” process that coordinates the different architecture and design processes in the software or systems development life cycle.

Ref. Tom McBride - 2010
Gamification

- Organizations are finding that command and control systems of management are not so successful when the problem to be solved is complex and the solution requires fast paced interaction between multiple parties and multiple domain experts.

- While there has been considerable discussion of the shortcomings of command and control management of software development, this has not been matched by realistic methods of management. Instead there seems to have been a tacit “trust us” approach from the agile community.

Ref. Tom McBride - 2010
Gamification

- Gamification borrows elements from games then applies them to other contexts.

- Gamification, like artificial intelligence, is expected to be absorbed into other systems and become part of the general landscape as management methods introduce methods of directing behaviours toward organizational objectives through social and intrinsic motivations instead of the extrinsic motivations of command and control.

- Can SC7 processes support elements of gamification?

Ref. Tom McBride - 2010
## Gamification

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<tr>
<th>User experience solutions</th>
<th>Customer loyalty solutions</th>
<th>Enterprise learning solutions</th>
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<tr>
<td><em>Explore how lightweight gamification can meaningfully differentiate the user experience designs</em></td>
<td><em>Bring innovation into loyalty solution by introducing features like badges, virtual currency, community ranking and social media integration.</em></td>
<td><em>Introduce games, scenario simulations and achievement challenges as new learning enhancement strategies</em></td>
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<th>Collaboration solutions</th>
<th>Innovation management solutions</th>
<th>Employee productivity solutions</th>
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<tbody>
<tr>
<td><em>Bring gamification components into the process designs to influence the motivation for the collaboration</em></td>
<td><em>Improve the participation, collaboration and exploration by gamifying the innovation process</em></td>
<td><em>Turn the mundane, routine and run-of-the-mill activities into fun to improve the workforce productivity range</em></td>
</tr>
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Gamification
Gamification

Figure 1: Research activities for assessing gamification in a software development context.
Gartner's 2013 Hype Cycle for Emerging Technologies

http://www.gartner.com/newsroom/id/2575515#!
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| JTC 1/SC7 instructs its Secretariat to establish a Study Group for the investigation of gamification practices and explore the possibility of additional standards or guidance in the area of software and systems engineering within SC7. A report including, if pertinent, a draft NWIP, shall be submitted to the SC7 Secretariat no later than 2014-05-01.

The study group shall liaise closely with the following SC7 work groups WG10 and WG26.

The Study Group shall take into consideration published research and guidance in the area of gamification and related disciplines.

The study group shall provide an analysis of the requirements of the market and a status of current standardization activities. If pertinent, it shall make recommendations on changes to existing standards/guidance and/or the creation of new standards or TR.

The study group will be led by Mr. Alec Dorling (United Kingdom)

Initial membership will consist of:

- Stuart Reid, United Kingdom
- Terry Rout, Australia
- Jørn Johansen, Denmark
- Marion Lepmets, Ireland
- Alison Holt, New Zealand
- Cheryl George, United Kingdom

Additional members can be added until 2013-06-30. Nominations must be sent to the SC7 Secretariat. Experts wishing to participate should contact the chair of the study group before the end of June 2013 at alec.dorling@improna.com;

The report produced by the study group will contain the report of activities and a list of recommendations to SC 7.

The SG chair shall take reasonable action to ensure that the material included in the study group report is appropriate for public release. Study. Group chairs are reminded that study group reports are to be treated in a similar manner to working drafts with regard to availability and distribution.
2013 – Other Active Study Groups

- Study Group to investigate the possibility of a new standard on "Guidelines for the Evaluation and Selection of Software and System Engineering Tools"
- Study group to prepare an NWIP for a revision project and an initial working draft for the third edition of ISO/IEC 20000-1
- Study Group on "Emerging Software Asset Management (SAM) standard requirements"
2013 – Other Active Study Groups

- Study Group on feasibility of preparing an Ontology for the SC7 domain and Standards
- Study Group on Architecture Guidance
Future Watch 2013 Sources

- Baseline ‘Ten Tech Trends that will change IT in 2013”
- Deloitte “Tech Trends 2013”.
- IEEE “Top Trends for 2013”
- IT Business Edge.
- PWC. “Digital IQ. 2013 Top Ten Trends for Business”

Ref. Tom McBride - 2010