18th Practical Software and Systems Measurement Users' Group Meeting and Workshops

"Measurement in a Complex Environment"

June 12-16, 2017 Arlington, Virginia

The Future of Software and Systems Measurement: Workshop

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measurement in your own terms

Aim of the Workshop

Following a round table discussion, to report on how we see the future of measurement in the PSM domain:

- What are the key emerging trends in system and software acquisition and management?
- What are their impacts on measurement practices?
- How can / should we evolve measurement practices in response?
- What are the priorities for evolving research / practice recommendations?
- Along the way, where are the best practices?

Workshop Plan

Hold a round table discussion prompted by a set of headings (products, processes, methods, organisation etc). Under these headings ask:

- Are things changing and if so, how?
- If needed, ask what is fundamental and constant (e.g. aspects of people, behaviors, engineering)?
- What are the implications for measurement?
- How can/ might measurement practices evolve in response?

Following this, consider the set of responses generated and ask:

- Can we converge, prioritise the responses?
- What are the underlying changes?
- How can we take this forward to document our considered assessment?

Problems

- **Tame problems** are convergent by nature and will deliver a single best possible solution… can be solved by breaking down into constituent parts; each solved in isolation. Tame does not mean simple.
- **Messy problems** are clusters of interrelated or interdependent problems, or systems of problems. Are puzzles; rather than solving them we resolve their complexities.
- **Wicked problems** have an evolving set of interlocking issues and constraints – no definitive statement of the problem.

(Hancock, 2010)

Proposed Set of Discussion Headings

Top Level prompts proposed:

- Products
- Projects / acquisition
- Processes
- Methods
- Organisation
- People
- Metrics

Products

- Complexity
- Electronic Hardware
- Systems of Systems
- Safety
- Security
- COTS/MOTS

Projects/Acquisition

- Expectations
- Cost, Schedule
- Size & Complexity
- Acquisition complexity
- Risk and liability
- Supply chains
- Cost Pressures

Processes

- Incremental
- Agile
- Systems of Systems

Methods

- Model-based
- Formalised
- Data Science

Organisations

- Project driven
- Teams
  - Distributed
  - Multidisciplinary
- Supply Chains
  - Complex
  - Multinational
- Cultures

People

- Demographics
- Generation Y, Z
- IT Literacy
- Working Styles
- Feedback
- Cross-disciplinary

Metrics

- Tool Generated
- Big Data
- No Data -> Too Much Data

Review Set of Responses

- Can we converge, prioritise the responses?
- What are the underlying changes?
- Practices
  - Models
  - Visibility of artefacts
- Metrics
- PSM
  - At the cusp of Metrics, Projects, Software, Systems, Acquisition

Recommendations

- Can we draw up a considered / converged set of recommendations/ findings?
- How can we take this forward to document our considered assessment?

Next Steps

- Community Response
- What do we do next as a community?
  - Change our message?
  - Role and branding?

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Conclusion

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Developing Measurement Practices

- Size measurement: shift bases upstream?
  - model-based?
  - scale with assurance requirements?
  - incorporate risk/ change assessments?
- Effort estimation: include upstream and downstream aspects?
  - assess scope and velocities of iteration loops?
  - # of crossings of contract and specialty boundaries?
  - experience/ knowledge constraints within and across boundaries?

Developing Measurement Practices

- Strengthen assessment of technical progress?
  - Coordinate measurement against planned technical objectives, engineering maturity, technical debt etc
- Strengthen assessment of assurance progress?
  - Manage added value of assurance expenditures?
- Measurement translation; enabling meaningful comparisons and monitoring where local contexts / practices differ?

Developing Measurement Practices

- How to measure effectiveness of assurance activities?
  - of formal methods?
  - of testing?
  - of regulatory compliance?
  - role of trust?
  - how to support the achievement of balance with delivering capability?

Developing Measurement Practices

- Cost effectiveness of measurement?
  - How to achieve value for money from investment in measurement?
  - Value determined by the decisions informed, value generated/ losses avoided?
- Through life aspects
- Co-creation i.e. convergence of top-down and supply-side bottom-up (rather than classic top-down); measurement to support this

References to past and current PSM work

- PSM tri-services study
- Leading Indicators report
- Discussions on the use of measures in decision making
- Measurement data collection