

Practical Software and Systems Measurement

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A foundation for objective project management



***COSYSMO Requirements
Volatility Workshop***

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Workshop Participants

<i><u>Name</u></i>	<i><u>Organization</u></i>
• <i>Mauricio Aguiar</i>	<i>TI Metrics Ltda.</i>
• <i>Betsy Clark</i>	<i>Software Metrics Inc. (SMI)</i>
• <i>Betsy Legg</i>	<i>Tecolote Research Inc.</i>
• <i>David Lubanko</i>	<i>IBM</i>
• <i>Adrain Pitman</i>	<i>Australian Department of Defence</i>
• <i>Lori Saleski</i>	<i>BAE Systems</i>
• <i>Jim Stubbe</i>	<i>Raytheon</i>
• <i>Denton Tarbet</i>	<i>Galorath Incorporated</i>
• <i>Angela Tuffley</i>	<i>Systems and S/W Quality Institute</i>
• <i>Ricardo Valerdi</i>	<i>MIT</i>
• <i>Mauricio Peña</i>	<i>USC</i>

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Summary

- ***Provided an overview of COSYSMO and the latest research results in systems engineering reuse***
- ***Presented background on requirements volatility, its impact on systems engineering effort and implications to COSYSMO***
- ***Conducted a two-round Delphi Survey to collect participant data on:***
 - ***Expected level and distribution of requirements volatility over the system life cycle phases***
 - ***Breakdown of type of changes (added, deleted, modified) over the system life cycle***
 - ***Weighing factor / effort penalty due to the timing of the changes***
- ***Discussed requirements volatility data collection challenges and share lessons learned***

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Conclusions, Recommendations, and Results (1 of 2)

- ***Delphi Survey Results Summary (2 rounds)***
 - ***There is an expectation that, on average, 40% of the initial set of requirements will change (added, deleted or modified) through the system life cycle***
 - ***Most of those changes (~65%) are expected to occur during the development and operational test & evaluation life cycle phases***
 - ***The breakdown of volatility per type of change is expected to be approximately:***
 - ***37 % added, 52% modified, and 11% deleted***
 - ***On average, the respondents expect a systems engineering effort penalty for making changes to requirements after the conceptualize phase***
 - ***However, the results depend on the organization – some respondents indicated no time dependency to the impact of changes***

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Conclusions, Recommendations, and Results (2 of 2)

- ***Feedback on Requirements Volatility Data Collection***
 - ***When should we start tracking volatility?***
 - ***The timing depends on the organization's specific processes (in some cases after SRR, in others after specification release regardless of the milestone)***
 - ***Tracking should start when the change starts affecting the planned systems engineering effort***
 - ***Count only changes to requirements for the system-of-interest at a specific level of design***
 - ***Editorial and/or administrative changes to requirements have little impact on systems engineering effort***
 - ***Should not be counted for the purposes of estimating impact to effort as long as they don't affect the technical meaning of the requirement***

Next Steps

- ***Complete Delphi survey analysis and share them with workshop participants***
- ***Proceed with project data collection phase***
- ***Engage workshop participants and PSM group in the progression of the research (data collection, results)***
- ***Finalize COSYSMO requirements volatility recommendations / updates***