

***Practical Software and Systems Measurement***

# ***Practical Software and Systems Measurement***

***A Foundation for Objective Project Management***



***SE Product and  
Process Measurement  
Workshop***

***Garry Roedler  
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***In Cooperation With:***



# ***Practical Software and Systems Measurement Workshop Participants***

- ***Guy Bois***
- ***Bill Smith***
- ***Keith Kratzert***
- ***Natalie Reed***
- ***Scott Lucero***
- ***Garry Roedler***
- ***Ken Stranc***

## ***Restatement of Objectives***

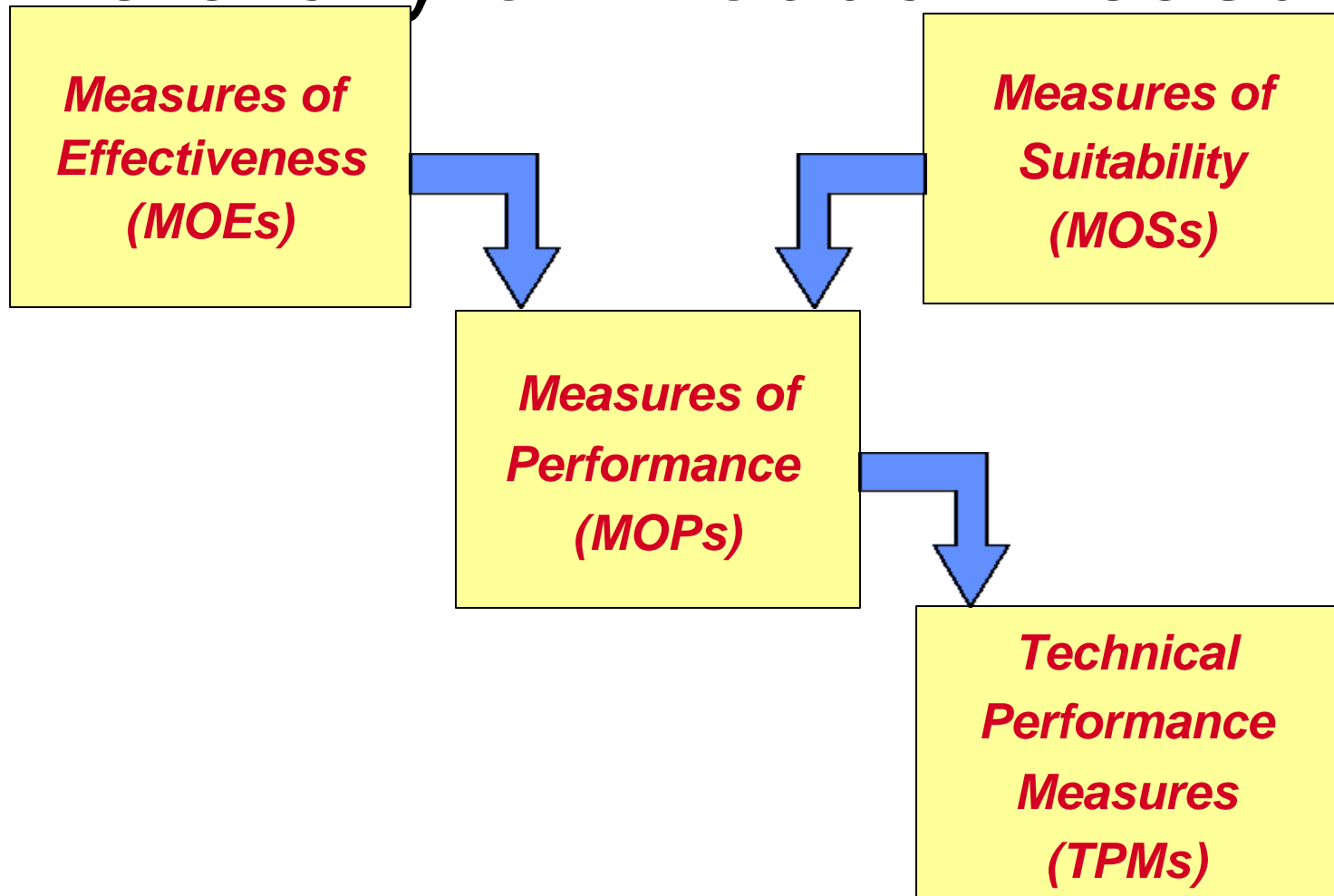
- ***Develop guidelines***
  - ***Determine if additional guidance is needed***
  - ***Identify practical ways to use PSM to define and apply MOEs, TPMs, MOPs, MOSs, and other measures specific to SE products and processes***
- ***Outline a SE case study***
  - ***Produce an outline showcasing examples of SE product measures and indicators such as MOEs, TPMs, MOPs, MOSs, and other product measures***

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# Relationship to PSM

<u><i>Common Issue Area</i></u>	<u><i>Measurement Category</i></u>	<u><i>Measures</i></u>
<i>Product Size and Stability</i>	<i>Physical Size and Stability</i>	<i>Database Size</i> <i>Components</i> <i>Interfaces</i> <i>Lines of Code</i> <i>Physical Dimensions</i>
<i>Product Quality</i>	<i>Functional Correctness</i>  <i>Supportability</i>  <i>Efficiency</i>  <i>Portability</i> <i>Usability</i> <i>Dependability</i>	<i>Defects</i> <i>Technical Performance</i> <i>Time to Restore</i> <i>Maintenance Actions</i> <i>Utilization</i> <i>Throughput</i> <i>Timing</i> <i>Standards Compliance</i> <i>Operator Errors</i> <i>Failures</i> <i>Fault Tolerance</i>

# Hierarchy of Product Measures



# Issues and questions

- Issues and questions regarding the use of MOE/MOS/MOP/TPMs in Tailoring
  - Trace of critical customer needs, system requirements, or design attributes to measures
    - Incorporate additional guidance into the issue identification and prioritization
  - Clear definitions and examples for several domains
  - Selection and examples of measures for Life Cycle Maintenance
    - Supportability
    - Proving original MOEs
  - Break “Technical Performance” and “Physical Dimensions” into a few additional measures

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# Issues and questions

- Issues and questions regarding the use of MOE/MOS/MOP/TPMs in Tailoring
  - Prioritization of technical parameters to identify candidate TPMs
  - How to integrate into the Life Cycle processes
    - Definition of data sources (including allocations, models, early testing)
    - Definition of when to analyze and use
  - Volatility of critical requirements

# Issues and questions

- Issues and questions regarding the use of MOE/MOS/MOP/TPMs in Applying
  - How to update estimates with partial actual data as it becomes available
    - Estimates, Designed/Modeled, and Actual Values
  - Description and examples of forecasts, thresholds, and growth functions
  - How to use the RYG metrics (this one is for Jack)
  - Guidance and example of how to analyze across measures to support trades
  - How to establish or use predictive models from the measurement results
  - How to perform estimation, feasibility, and performance analysis

# Case Study Outline

- Commercial Aircraft
- Establish 1-2 MOEs
  - Profitability (in terms of passengers and miles)
  - Passenger/Customer Satisfaction
- Establish 1 MOS
  - Reliability
- Establish 3 MOPs
  - Number of passengers
  - Maximum range of flights
  - Operating cost per passenger
- TPMs
  - Range, Capacity, Ops Cost, Weight, Strength, Size

## Case Study Outline

- Modernization project - incremental fleet replacement by customer
- Show how MOE/MOP/TPMs were chosen and defined from customer issues
- Show how measures were integrated into the life cycle processes (including O&M)
- Show estimation, feasibility and performance analysis
- Show trades that were needed due to exceeding one of the TPMs
- Show alternatives and recommendations

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# ***Conclusions, Recommendations, and Results***

- ***Focus on SE product measurement for now; SE process measurement not felt to be very different***
- ***Additions are needed in PSM Parts 2 and 4 to address SE product measurement***
- ***Include case study for SE product measurement***
- ***Long term direction: Consider CAI, Cat, and Measures for O&M***



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### ***Next Steps/Action Items***

- ***Conduct additional sessions to develop the required content for Parts 2 and 4***
- ***Conduct additional sessions to develop the case study***