SYSTEMS SIZE AND STABILITY WORKSHOP
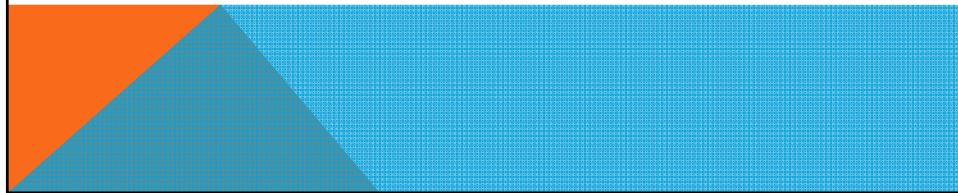
PSM USER CONFERENCE 2010
NEW ORLEANS

PURPOSE

Identify the primary management needs in assessing the size and stability of systems engineering work products. Management information needs (for size and stability) will be proposed and documented such that SE work products can be planned and monitored in a typical control loop fashion. A set of candidate SE work products will be elaborated from CMMI, ISO-15288, INCOSE SE Handbook, as well as team contribution.
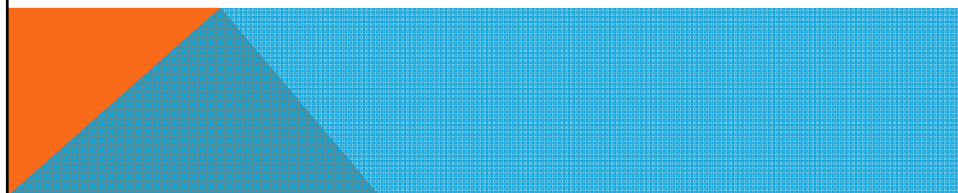
DESIRED OUTPUTS

- Draft set of SE work products to which measures could be applied
- Draft measurement specifications for SE size and stability
- Obtain feedback for SE measurement specifications
- Opportunity for participants to exchange lessons learned on measuring systems engineering work products and processes
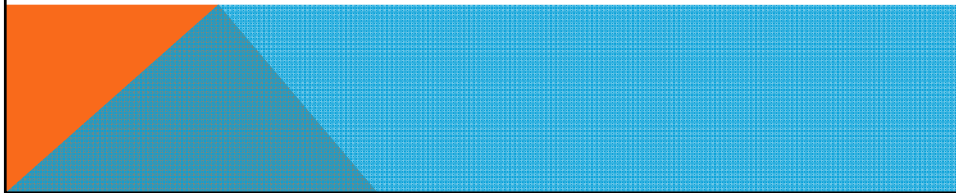
MATERIALS TO BRING

- Past performance, in the form of estimates, plans or experience reports related to the engineering or delivery of system engineering work products.
- A candidate list of measures which address sizing or stability of work products in use across your project or organization.

SIZE & STABILITY IN THE ICM TABLE

- Size Measures
  - Requirements
  - Physical Dimensions
  - Interfaces
  - Lines of Code
  - Components
  - Database Size
- Stability
  - Requirements Volatility
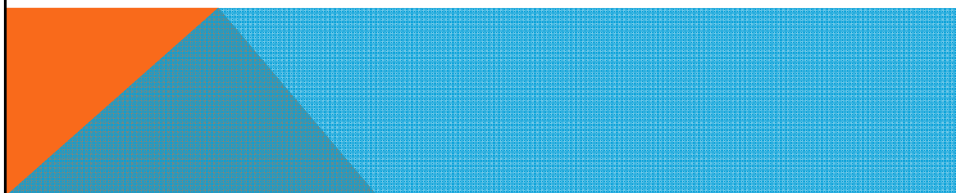 - Functional Change Workload
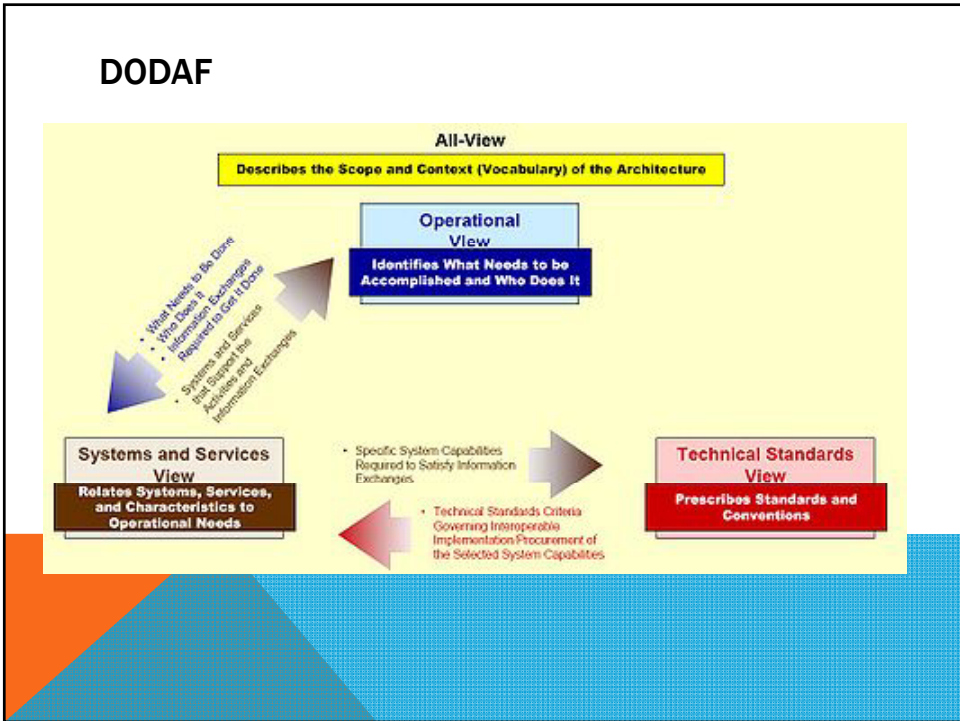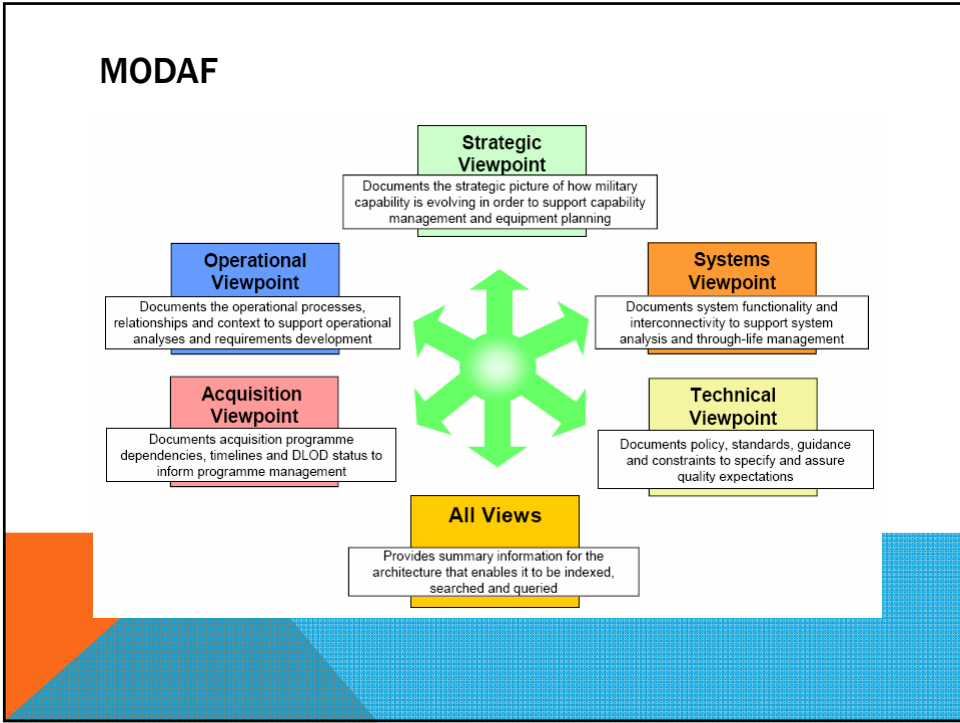
From Excel ICM table

FROM SELI 2.0 GUIDE

Most are relevant but most relevant are:

- Requirement Trends
- Interface Trends
- Algorithm/Scenario Trends
- System Definition Change Backlog
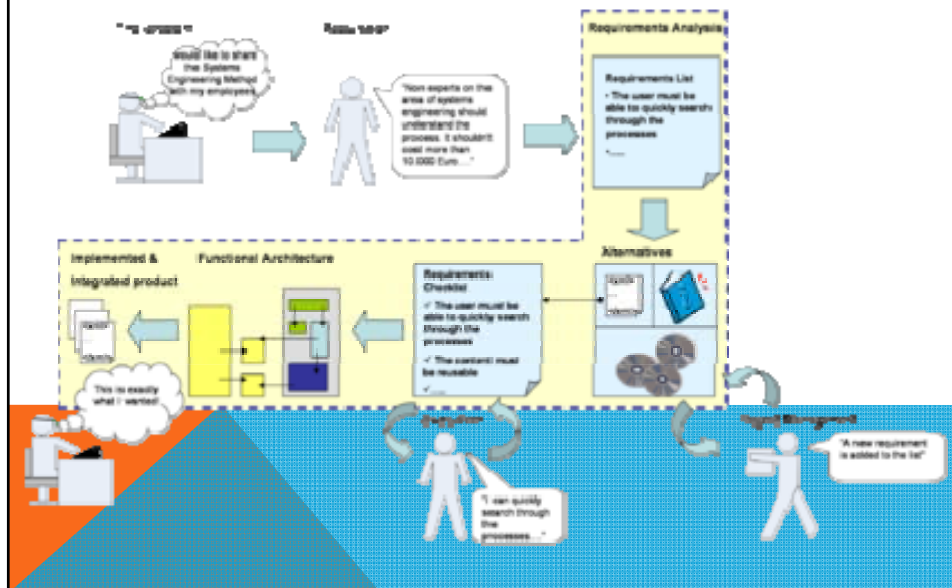
MODAF

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COSYSMO SEA LEVEL CONCLUSION

It has been shown that the *sea level* analogy developed for use cases provides a useful framework for the decomposition of system requirements from the customer to the contractor's system-of-interest. Leveraging off this framework, summary level requirements can be broken down into user level requirements. These user level requirements are then used to estimate the amount of systems engineering hours associated with the requirements. The guidance provided can help organizations uniformly count the *# of system requirements* for accurate use in COSYSMO. With this framework clearly delineated, it can lead to extensions for the three other size drivers in the model. Finally, counting rules were shown to significantly improve the predictive abilities of requirements in different experiments. While more work needs to be done to refine the counting rules for COSYSMO size drivers, significant progress has been made thanks to the support of INCOSE member companies and USC CSE13 Affiliates.

WIKIPEDIA SAMPLE FLOW OF SE PRODUCTS

CANDIDATE SE WORK PRODUCTS

Measures initially evaluated with respect to these work products:

- Mission / Needs Document
- Concept Document
- Design Options/Design to Cost
- Architecture Documents (specific types?)
- Requirements Specification (SoS, System, Subsystem)
- Interface Requirements/Definition
- System Information Model

CRITERIA FOR AN SE SIZE MEASURE

- Directly measureable from a product
- Product Developed by a Systems Engineer
- Or, Product Provided to the Systems Engineer (?)
- Associated with an SE ANSI-632 phase (?)

DISQUALIFIERS FOR AN SE SIZE MEASURE

If the candidate addresses one of the following then we
can exclude it?

- Schedule
- Resources and Cost of items under development
- Quality ?
- Software-only

OUTBRIEF NOTES

Attendees (not final)

Peter Baxter

Garry Roedler

Tom Conrad

Don Reifer

Mauricio Pena

Celia Modell

Ilya Lipkin

Peter Thomas

Phil Flora

Shally Malhorta

Antonia Catena

PRIMARY DISCUSSION POINTS

When does systems engineering start?

At what level do we measure a requirement?

How can requirements expansion be measured?

What are the various SE work products (DoDAF, ISO-15289, experience, etc)?

What are the methods or mechanisms to represent requirements that could influence the size measures?

Can we just use a single concept called "requirement unit"?

Let's start with the "COSYSMO Four" and go from there.

ACTION ITEMS

Agree on an approach for finishing the work after the conference.

- Phase 1
    1. Create/Verify measurement specification for 4 COSYSMO inputs
    2. Send for Workshop Attendees Review
    3. PSM/INCOSE review
- Phase 2
    1. Develop set of work products
    2. Develop set of mechanisms for representing work product
    3. Map of WPs to Mechanisms
    4. Develop Draft SE Size and Stability ICM table –
    5. Identify applicable criteria (e.g. SE lifecycle, phase applicability)
    6. Finalize SE Size ICM Table

ACTION ITEMS

- Assemble a list of SE work products from various workshop attendee sources and distribute Baxter)
- Review ICM table and verify that 4 COSYSMO inputs (requirements, interfaces, algorithms, scenarios) are represented in both size and stability/volatility measures (Baxter)

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