



INCOSE MBSE Initiative

Methodology and Metrics Activity Overview, Update, & Breakout Agenda

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Early Work (1/2)

- *Processes, Practices, and Methods* identified as a key MBSE roadmap activity area during MBSE breakout sessions at INCOSE IW 2007
- Around the same time, internal JPL effort was launched to survey candidate MBSE methodologies
 - Objective to go beyond simple survey
 - Differentiate processes, methods, and tools (see *Backup* charts)
 - Characterize role of life cycle models (project, acquisition, and systems engineering)
 - Models in support of MBSE processes
 - Five (5) MBSE methodologies surveyed:
 - Telelogic Harmony-SE [*Telelogic now an IBM Rational Company*]
 - INCOSE Object-Oriented Systems Engineering Method (OOSEM)
 - IBM Rational Unified Process for Systems Engineering (RUP-SE) for Model-Driven System Development (MDSD)
 - Vitech MBSE Methodology
 - JPL State Analysis (SA)



Early Work (2/2)

- Internal report scrubbed for external release and “donated” white paper to INCOSE MBSE Focus Group as [Rev. A](#) (published in May 2007)
 - Key component of *Processes, Practices, and Methods* roadmap activity of early INCOSE MBSE Focus Group (now INCOSE MBSE Initiative)
- Survey report updated and released as [Rev. B](#) in June 2008 but now as INCOSE Technical Data product (INCOSE-TD-2007-003-02) and included:
 - Dori’s Object-Process Methodology (OPM) MBSE methodology
 - References to Embedded Computer System Analysis and Modeling (ECSAM) and Model-Based [System] Architecture and Software Engineering (MBASE) embedded- and software-intensive methodologies
 - Acknowledgement/overview of Wymore’s mathematical foundation of MBSE
 - Status and update of OMG Executable UML Foundation [N. Rouquette]
 - Reference to Cloutier’s work on Model-Driven Architecture (MDA) for SE
 - Minor editorial updates



Recent Updates

- Activity area expanded to include metrics, now officially called “Methodology and Metrics Activity Team”
- [MBSE Wiki](#) stood up as publically-accessible portal for collecting MBSE Activity and Challenge Teams information and work products
 - [Methodology and Metrics Wiki page](#) includes brief description of methodologies surveyed in 2008 report *plus* those identified as gaps since report
 - Weilkiens Systems Modeling Process (SYSMOD)
 - Fernandez Process Pipelines in OO Architectures (PPOOA)
 - Also includes section on Metrics w/special interest in *tool metrics* as well as *process metrics*
 - Michelle Sprecht of IBM contributed to tool metrics content
- Jeff Estefan to transfer Activity Lead role to John Watson of LMCO



Methodologies Outbrief (IW09) (1/2)

- Most recent participant recommendations comes from MBSE Workshop at INCOSE IW09 held in San Francisco
 - MBSE workshop at INCOSE IW10 did not formally break out Activity Lead and Challenge Teams
- Participant Feedback (morning session)
 - Create public Wiki site to capture
 - Best practices & experiences using methodology(ies)
 - Discussion forum for methodology Q&A
 - Forum for methodologist to post latest updates and links to resources
 - Include comparison chart/table of features for each methodology to identify strengths or “sweet spot” for lifecycle SE functions (e.g., reqts, architecture, design, risk)
 - Provide tailoring guide to map to standard project phases (what is coverage to lifecycle phase (needs evaluation))
 - Evaluate methodologies to determine of certain methods have strengths that should be incorporated into local process models



Methodologies Outbrief (IW09) (2/2)

- Participant Feedback (afternoon session)
 - Differentiate work product-centric methodologies from process-centric methodologies (R. Hodgson)
 - Review “X-model” (R. Hodgson)
 - Seek process element/ process pattern reuse
 - Role of governance
 - Do some methods work better in certain domains?
 - Enterprise modeling and instantiation (R. Griego)
- Response to recommendations:
 - Will need a great deal more participation from practitioners and other interested stakeholders to adopt these recommendations
 - This is A LOT of work
 - Best opportunity near-term is to stand-up public Wiki site for methodologist to post information about their particular methodologies
 - Possibly continue annual update of MBSE Methodology Survey (TBD)
 - Want to get out of annual “maintenance” business



Breakout Agenda for IW11

- Kickoff w/brief introductions
- Jeff E. to introduce John W. as new Activity Lead following IW11
- Guest talk by Gundars Osvalds (Northrop Grumman) entitled “Using Simulation and Visualization to Support MBSE”; will include a video
- Jeff E. to briefly review content of Wiki
- Jeff E. to recap IW09 MBSE workshop breakout participant feedback to set stage for workshop interaction, dialog, and participation
 - Seeking active participation from MBSE Usability team from morning session
- Jeff E. and John W. to facilitate working dialog and capture notes
 - Need to make time for workshop dialog and solution ideas on Metrics (tool metrics, process metrics, other metrics?)
- Jeff E. and John W. to submit breakout notes to Sandy F. and Mark S. for incorporation into MBSE workshop outbrief



Backup

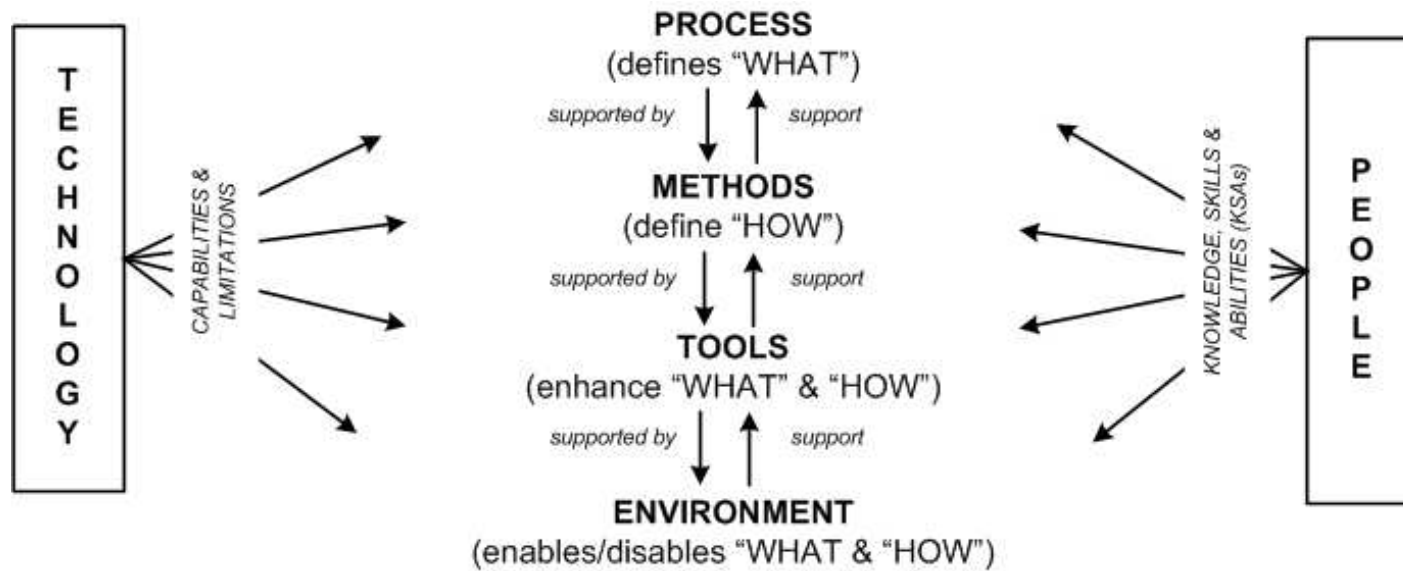


Distinguishing Processes from Methods, Tools, & Methodology*

- A **process** is a logical sequence of tasks performed to achieve a particular objective. A process defines the “WHAT” is to be done, without specifying the “HOW” each task is to be performed.
- A **method** consists of techniques for performing a task, the “HOW” of each task. The terms “method,” “technique,” “practice,” and “procedure” can be used interchangeably in this context.
 - Attributes:
 - Thought patterns/processes
 - Knowledge base
 - Rules and heuristics
 - Structure and order
 - Notation
- A **tool** is an instrument that, when applied to a particular method, can enhance the efficiency of a task. Thus, methods help bridge the gap between process and tools. The purpose of the tool should be to facilitate the accomplishment of the “HOWs.”
- A **methodology** can be defined as a collection of related processes, methods, and tools.



Influence of Technology and People on PMTE Elements*



- Environment (E) – Consists of surroundings, external objects, conditions, or factors that influence actions of an object, individual person or group