

Notes to Meeting date / time

2017/1/26, 10:00-11:00 GMT, via telecon / webex

This V2 of notes makes corrections in Note to Meeting point 2, of 'former' and 'latter', highlighted. A new figure is introduced.

Objective:

Recap current information, and explore and agree a way ahead to achieve (or at least progress) subgroup objectives.

Agenda

1. -JJ Recap materials around topic of MBSE-MDA available on Wiki
2. -JJ explain two interpretations on MDA: a) the PIM -> PSM solution generation 'focussed' interpretation b) the cross-model compare / interrelate 'wider' interpretation.
3. -Consider whether figures in existing materials getting close to a 'coherent graphical explanation'
4. -Discussion and views, options for way forward
5. -Summarise, collate actions.

Current materials can be found on the subgroup wiki page at

http://www.incosewiki.info/Model_Based_Systems_Engineering/index.php?title=MBSE_%26_MDA

Attendees

Julian Johnson

Ian Clark

Chris Raistrick

Hedley Apperly

Alistair Blair

Apologies

Fran Thom

Notes to meeting

1. JJ showed the wiki page for the group, and reminded the group of the objectives collated from inputs during 2016. He recapped the definitions on MBSE and explanation of approach for MDA recorded there.

He reminded the attendees of a few of the slides from the presentation he had given at the March 2016 meeting, material on the wiki (file

http://www.incosewiki.info/Documents/Site_Resources/Files/MBSE/2016_03_03_MBSE_WG_MBSE_and_MDA_JJ_v1.pdf), and in particular slides on pages 20-25.

Chris summarised the explanation of use of MDA to support MBSE as reported in his slideset, also on the wiki at http://www.incosewiki.info/Model_Based_Systems_Engineering/Files/a/ad/MDA_with_UML_at_the_MoD.pdf. Essentially this was achieved through a combination of domain modelling (separation of concerns across system of interest domains), platform-independent modelling, and transformation – particular of functionality / behaviour through to executable code on a chosen platform.

2. JJ explained that there appeared to be arguably two different interpretations of MDA use:
 - a) the PIM -> PSM solution generation 'focussed' interpretation
 - b) the cross-model compare / interrelate 'wider' interpretation.

The ~~latter~~ **former** is illustrated by fig 9 in Chris' paper NATO Experiences of Modeling Military Embedded Systems [ESC-413], below.

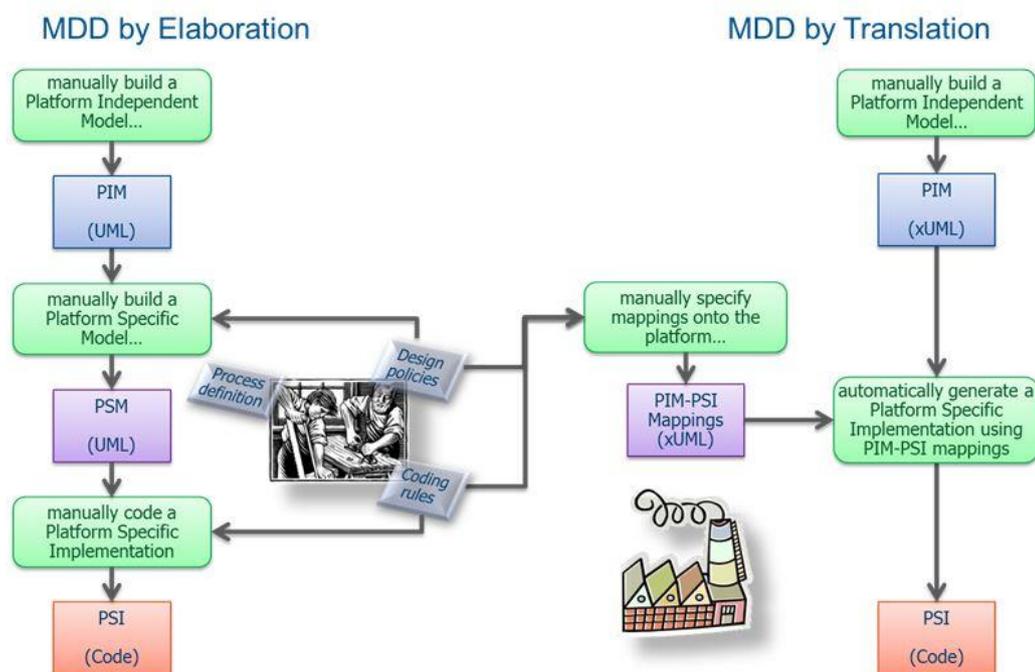


Figure 9 – Elaboration-Based versus Translation-Based Development

The ~~former~~ **latter** is illustrated by the figure on page 9 of the JJ presentation listed above, [figure reproduced on last page of these notes](#).

3. There was no specific discussion of the agenda topic 3.
4. There was a useful discussion with the following points being made.

Ian raised the point that, within MBDA there was ongoing debate between the systems engineering and software engineering communities, around MBSE, and whether each was using MDA or not. In particular the topic of the PIM > PSM, and the CIM was raised; where does CIM fit into this approach. Also is a PIM when used independent of PLA approach? It appears that systems and software communities may be doing the same thing, but difficult to confirm. Perhaps they don't share the same common (mental) models.

Chris remarked that in their approach, a PIM is also configured with data (for instance, weapon stations for a specific air platform).

Alistair suggested that resolving this systems-software discourse might be best resolved with one or both of:

- Common metamodel
- Demonstrations.

The MDA guide clearly sees key concepts: models, transformations, formal language.

Alistair noted there are often different paradigms used in systems / software worlds that can make system / software dialogue a challenge:

- Systems – functional
- Software – object oriented

Hedley noted that there may have been some hijacking of the MDA term, focussing around code generation from UML / SysML. The original MDA guide is clear around concepts such as:

- Models / modelling language
- Viewpoints / concerns
- Architectural layers: business / PIM; logical / functional; implementation / s/w, PLM.

There was some discussion about PLE / PLA / system families / variation points.

Ian felt there was a need (an opportunity) for INCOSE to produce clarity on this MBSE / MDA area – hence the reason for the subgroup. Perhaps we need distinct metamodels from systems engineering, and from MDA camps, to use as a communications (and may be learning?) tool.

JJ remarked that (as well as the broader than PIM > PSM > code interpretation mentioned above, he also saw the implementation transformation potentially including physical fabrication techniques, such as 3D printing / ALM, PCB fabrication and automated assembly.

In terms of the way forward, there was the suggestion, with good support, that what we need is a 'Applying MDA to MBSE Guide'. Perhaps (Chris) this could be reflected in treating the MBSE development system as a system in its own right?

The thought was that the Guide could be structured around the key topics in the MDA Guide, and with what the group recommend against each topic:

- Modelling
- Viewpoints
- Architecture
- Transformation
- (etc)

Ian noted that the Z9 Guide “What is MBSE?” does include a metamodel interrelating stakeholder, concern, representation and model to the system of interest.

Hedley suggested that, given that there was support in the attendees for the ‘Applying MDA to MBSE Guide’, that we could have a subsequent telecon / webex, and spend 5+ minutes to brainstorm each of the topic areas noted above, to move things forward. We could also use that to identify potential examples (Ian thought there may be examples that could be sanitised from MBDA work, subject to appropriate vetting).

5. JJ agreed to produce notes to the telecon (this document). If the attendees could check for any major omissions or errors, we could then revise and post to the Wiki.

JJ can host a subsequent telecon / webex along the lines noted above (to be arranged).

JJ thanked attendees and closed the meeting.

New Figure from p9 of JJ reference above:

