

## Interface Patterns Project

### Meeting Minutes

**Date/Time:** Friday, April 21, 9:00 – 11:00 AM EST

**Attendees:**

Bill Schindel	ICTT System Sciences	<a href="mailto:schindel@ictt.com">schindel@ictt.com</a>	812.232.2062
Frank Salvatore	Engility Corp.	<a href="mailto:frank.salvatore@engilitycorp.com">frank.salvatore@engilitycorp.com</a>	973.607.2068
Jon Torok	NSWC Crane	<a href="mailto:torokrj@gmail.com">torokrj@gmail.com</a>	812.854.5247
Jason Sherey	ICTT System Sciences	<a href="mailto:sherey@ictt.com">sherey@ictt.com</a>	812.232.5968
Stephen Lewis	ICTT System Sciences	<a href="mailto:lewis@ictt.com">lewis@ictt.com</a>	812.231.7930

**Summary:**

1. This was the first meeting of the Interface Patterns Project team of the INCOSE Patterns Working Group.
2. We discussed and confirmed our draft Project Charter with limited adjustments, and briefly discussed probable early deliverables and their potential uses, along with some logistical issues.
3. Most of the meeting was spent on technical review and discussion of Interface model representation foundations, some related S\*Metamodel and SysML modeling language aspects, and related tooling.
4. We agreed on action items, and the next meeting will be on Friday, May 5, 9:00 AM EST.

**Details:**

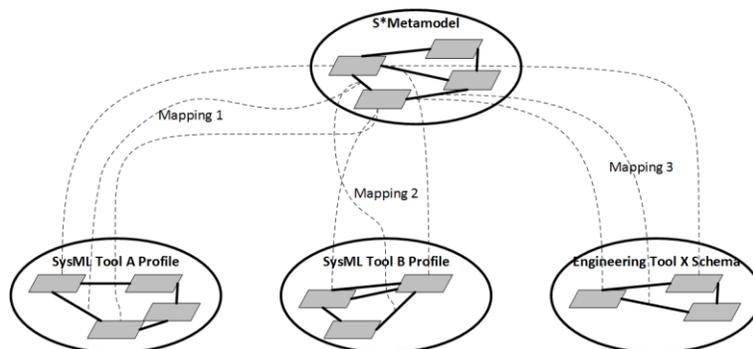
5. Project Charter Review:
  - a. Bill recognized Frank for persistently suggesting this project for several years
  - b. Plan to add roles, tasks, and schedules as priority deliverables and work plans identified
  - c. Misspelling of Frank's name (apologies from Bill)
6. Priority project tasks within charter:
  - a. Nail down preliminary tooling and sharing environment
  - b. Focus initially on examples Power, Mechanical (space reservation & mounting), & Data, illustrating how diverse interfaces can be well represented within a single specialize-able pattern framework, organized in its specialization by some taxonomy
  - c. Strong interest in generating model query view equivalent of an Interface Control Document (ICD) that is as complete as legacy ICDs, but more effective/efficient/uniform.
  - d. Discussed identifying some deliverables to have available by the time of IW2018, of a nature likely to draw others into this project and its application.
  - e. Discussed including executable models at some later point.
  - f. Discussed potential interest growth in Interface Patterns from Open Systems community.
7. Related activities by others: Important for this team to engage with other groups who may be pursuing patterns of modeled interfaces, to form a community that is not isolated islands. Among these are the JPL MBEE effort, and the (closely related) OMG SysML 2.0 specification effort. See References below.
8. Project and meetings web site and future collaboration IT support:
  - a. Location on OMG/INCOSE MBSE wiki:  
[http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:interface\\_patterns\\_team](http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:interface_patterns_team)

- b. Pages easily added under that location, such as today's meeting:  
[http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:meeting\\_04.21.2017](http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:meeting_04.21.2017)
      - c. Files can be inserted there when appropriate (see same)
      - d. Looking into other cloud site for shared development environment
9. Future meeting plans: Every other week, Fridays, 9:00 – 11:00 AM, through early July; check around time of IS2017 whether this is working as needed for later in year.
10. Intended uses of project deliverables:
  - a. Bill referred to an emerging “model stakeholder requirements on models” (distributed), emerging from the joint INCOSE-ASME effort on V&V of models themselves; its Stakeholder Requirements on Models table in it is potentially helpful checklist for this project to remind us of some issues of future stakeholders of Interface Models.
  - b. Example use of interface patterns (per Jon): More effectively manage system interfaces between contractor-provided systems, as means of coordinating contractors
  - c. Example use of interface patterns (per Frank): Capture interface information more effectively, efficiently, and uniformly
11. Discussion of Interface-related subset of S\*Metamodel:
  - a. We discussed the definitions of the S\*Metaclasses related most closely to Interfaces: System, Interaction, Interface, Input-Output, System of Access. (See the attached updated Interface Classes V1.6.4 and Glossary V4.3.1, noticing that:
    - Interfaces as associations of System (which has Interface), Interactions (behaviors at interface), IOs (passing through Interface as Energy, Force, Mass, or Information), and System of Access (SOA, providing means of interaction)
    - SOA is a first class system which can be further modeled using all aspects of the S\*Metamodel.)
  - b. Jon and Jason had exchanged emails on related aspects, but it turns out that not all these were received, so we will follow up on these by next meeting. See Jon's emails of Feb 06, Feb 10, March 03, March 09 and Jason's email of March 13 ; Jon had suggested more elements of SOA be considered; Jason had noted the nature of S\*Interactions; etc.
  - c. Briefly looked at JPL and OMG layered interface materials; we have used layered SOA cases in past interface S\*Patterns
  - d. Discussion of interests periodically heard in protecting proprietary aspects of designs while sharing community frameworks; formal structure of S\*Patterns helps with this and we might want to illustrate.
  - e. Discussion of the notion that description of an interface often develops in stages, with earlier logical abstractions followed at a later stage by physical choices and allocations; related S\*Metamodel principle that the sequence in which aspects of a model develop is separate from the ultimate structure of the model as a complete representation; various practices arrive at the same model by different evolutionary paths. S\*Model content is accordingly devoid of the process of creating it, but also common to create S\*Models of those processes, (sometimes referred to as System of Innovation), and can be connected to (but kept separate from) the model of the System of Interest.

- f. Model Views, Documents: Specification documents or verification processes show up in the Systems of Innovation Model/Pattern, as does ISO15288, Agile Methods, Model Views, and other related notions, and the models of the System of Interest “appear in” those Systems of Innovation Models. This is a long way of saying that for Interface Patterns, we expect to include logical, physical, and other aspects of the model, and may reveal those different aspects in different views, but their sequence of development is quite different from where they are in the model. In fact, PBSE methods tend to create configured models in a somewhat different order than “from scratch” methods. The examples we prepare should potentially include aspects of the processes as well as the system of interest. For additional follow up discussion as we proceed.

12. SysML and other tooling support for project:

- a. We discussed WG practice of using the S\*Metamodel as an intermediate neutral reference point for describing systems (including interfaces), separately mapped to each modeling tool, language, or engineering schema. See Figure 1 below.



- b. As engineering tools or modeling languages evolve, the above allow us to map the S\*Metamodel, and all S\*Model and S\*Patterns, to them, avoiding the problem of still incomplete or changing languages, evolving standards, the  $N^2$  complexity of finding or transporting the same information across different schema. (For example, in the current project, we are interested in Interface S\*Patterns that can not only exist in SysML tools, but also in third party simulators, DOORS, and other toolsets with S\*mappings.)
- c. We recently undertook a mapping to the S\*MTM to Magic Draw / Cameo Systems Modeler (MD CSM) 18.x, and discussed in this meeting some related issues:
- S\*MTM has been mapped to other SysML tools, but the S\*Profile for MD CSM is not yet an internally connected drawing, because of questions about how to make this constrain models in this specific tool.
  - Jon agreed to take a look and give us some feedback / suggestions, and mentioned related use of tags

13. Queries for auto-generations of ICD-like views: There was a discussion of the visions of queries of configured Interface Patterns to produce ICD-like model views. This discussion included some reference to possible tooling resources that could help with this.

14. Vetting/Validating/Verifying Interface Patterns: There was a discussion of potentially running some legacy interface specifications / ICDs / models / descriptions though the Interface Patterns

we develop, as a way to gain confidence in them. This could also attract participation by others. The Patterns Working Group is following a similar path in its joint project on Legacy Product Lines with the PLE Working Group. Is Jon's example data and template available? Maybe not. How to collect past ICD examples

15. Plans for next activities:

- a. Next meeting: Friday, May 5, 9:00 AM EST
- b. Actions before next meeting: See Action Items
- c. Activities when we meet next: S\*Interface Metamodel mapping to SysML; feedback on profile; project schedule, tasks, assignments; who wants to work on which interface?

**Action Items:**

16. Provide a copy of MD/CSM S\*Profile to Jon for review (Stephen)
17. Provide feedback on MD/CMS S\*Profile (Jon)
18. Ask No Magic, Inc., if they are interested in providing cloud-based collaboration environment in support of this project. (Jon) (Bill chime in)
19. Identify issues to converge, from Jon and Jason's emails (Jon, Jason)
20. Review the JPL MBEE and SysML 2.0 papers and other References (below) on interface models and recommend how they are relate (All)
21. Make sure that Jon and Frank are on the Patterns WG mail list (Bill)
22. Follow up with Frank on his question about content of the S\*Metamodel—provide information and discuss it. (Frank, Bill)
23. Project tasks, assignments, schedule—either in Project Charter or equivalent (Bill)
24. Send out repeating meeting calendar invitation (Bill)
25. Update Project Charter as needed. (Bill)
26. Post minutes and materials to project web site (Bill)

**Reference Materials:** (These may be down loaded from the following project web site)

27. Project web site: [http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:interface\\_patterns\\_team](http://www.omgwiki.org/MBSE/doku.php?id=mbse:patterns:interface_patterns_team)
28. Agenda, 04.21.2017 meeting of Interface Patterns Team
29. Interface Patterns Project Charter, INCOSE Patterns Working Group, V1.3.2
30. Abbreviated S\*Metamodel Glossary, V4.3.1, ICTT System Sciences, 2017.
31. Extract from S\*Metamodel: Interface Related Elements, 03.07.2017, V1.2.6, ICTT
32. Torok, J., Sherey, J., "Interface model content emails Feb-Mar 2017".
33. Shames, Sarrel, Friedenthal, "A Representative Application of a Layered Interface Modeling Pattern", Proc. of INCOSE International Symposium 2016, Edinburgh, UK; paper + slides:  
[http://www.omgsysml.org/A\\_modeling\\_pattern\\_for\\_layered\\_system\\_interfaces-INCOSE%20IS15\\_paper-sarrel-shames.pdf](http://www.omgsysml.org/A_modeling_pattern_for_layered_system_interfaces-INCOSE%20IS15_paper-sarrel-shames.pdf)  
[http://www.omgwiki.org/OMGSysML/lib/exe/fetch.php?media=sysml-roadmap:a\\_representative\\_application\\_of\\_a\\_layered\\_interface\\_modeling\\_2016-07-11.pptx](http://www.omgwiki.org/OMGSysML/lib/exe/fetch.php?media=sysml-roadmap:a_representative_application_of_a_layered_interface_modeling_2016-07-11.pptx)
34. Shames, Sarrel, Friedenthal, "Modeling Systems of Systems Interfaces with SysML", AIAA 2016 Conference, SpaceOps Conference, (AIAA 2016-2500) <http://dx.doi.org/10.2514/6.2016-2500>
35. OMG SysML 2.0 Interface Concepts Team web site:  
[http://www.omgwiki.org/OMGSysML/doku.php?id=sysml-roadmap:interface\\_concepts\\_modeling\\_core\\_team](http://www.omgwiki.org/OMGSysML/doku.php?id=sysml-roadmap:interface_concepts_modeling_core_team)
36. JPL MBEE Project wiki: <https://github.com/Open-MBEE/ProjectWiki>
37. Schindel, Extract from Requirements for Models Project, INCOSE Patterns Working Group and ASME, INCOSE MB Transformation, and VV50 Model Life Cycle Working Group, INCOSE Patterns, 2017.