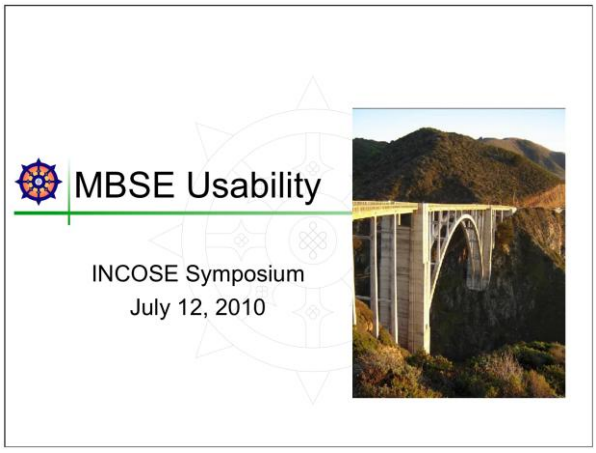
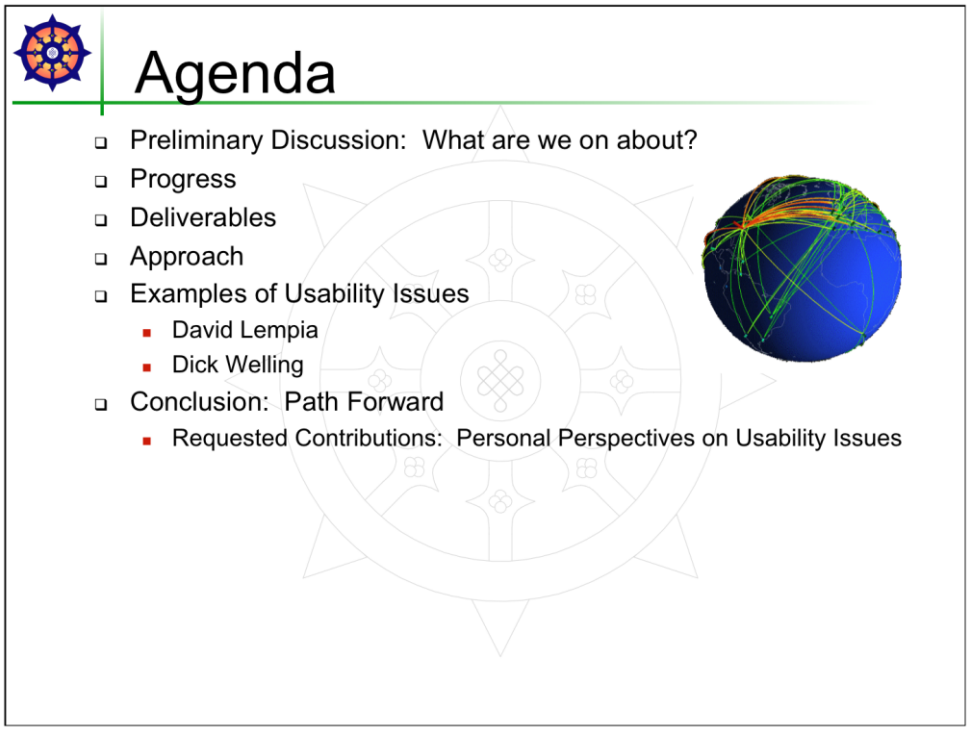
MBSE Usability Team Meeting at the INCOSE International Symposium

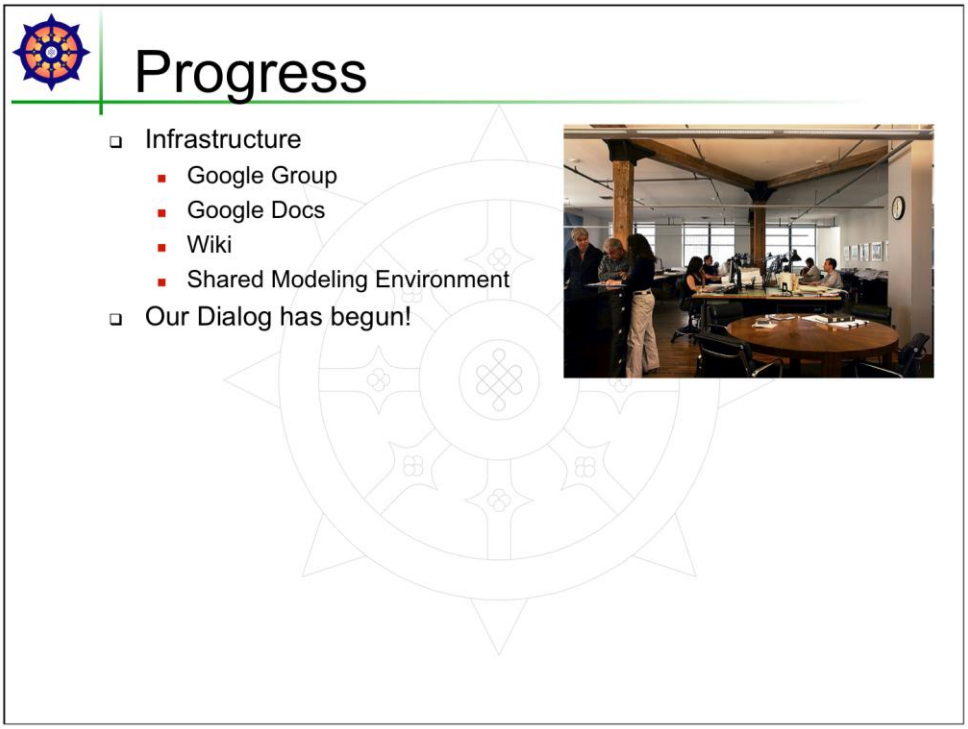
Minutes: 7/12/10



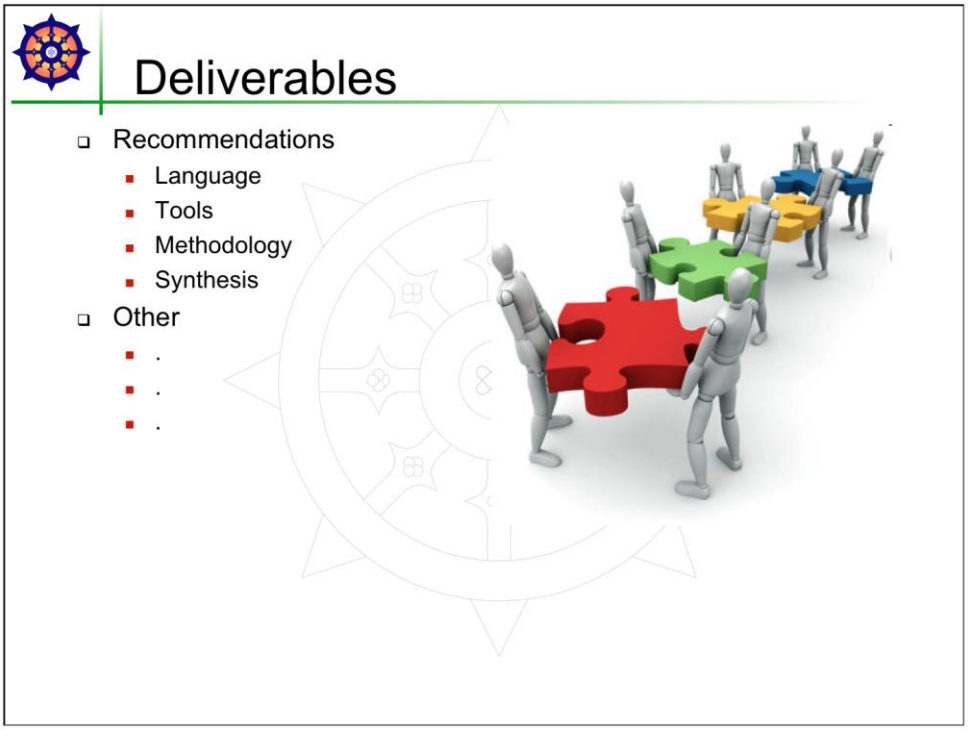
Thanks to all of you who made the journey to Chicago and supported our efforts at the MBSE Usability Team Meeting.



This was the nominal agenda for our meeting; however, we were only able to schedule two hours for the meeting. In practice, we spent a significant amount of time discussing deliverables. We let this discussion of deliverables run because agreeing on the nature of our work product is a key part of setting direction for our path forward. Some of us were also able to meet on Sunday evening for dinner. A good time was had by all…



The shared modeling environment referred to in the slide image is a SysML modeling environment using Magic Draw. NoMagic has kindly agreed to host a shared environment for us so that we may build and exchange models and discuss usability issues, together.



We spent most of our discussion time on deliverables. During the INCOSE International workshop, earlier this year, we identified three aspects of the MBSE environment and suggested that we should address issues pertaining to each:

- The language(s),
- The tool(s)
- The methodology

During our meeting at the symposium, it was suggested that we need to have a meta-category:

- Synthesis - issues that transcend a single basic category.

Regarding synthesis issues, there are usability issues that might be considered to pertain to the tool or the language or both. Some examples:

- Certain complexities in SysML can be at least partially mitigated by having a modeling tool hide complexity at appropriate times.
- Different engineers have different approaches toward modeling methodology. To some degree the approach varies, depending upon the current task. The approach used when analyzing a system or developing requirements may be quite different than the approach taken when architecting creatively. Different approaches are supported to differing degrees by the structure of the language and the capabilities of the tools that are available.

Such considerations transcend a single category.

Although we did not complete the agenda in all details, there was a general sense that we needed to spend time discussing the deliverables with some care. Points that came out during the discussion included:

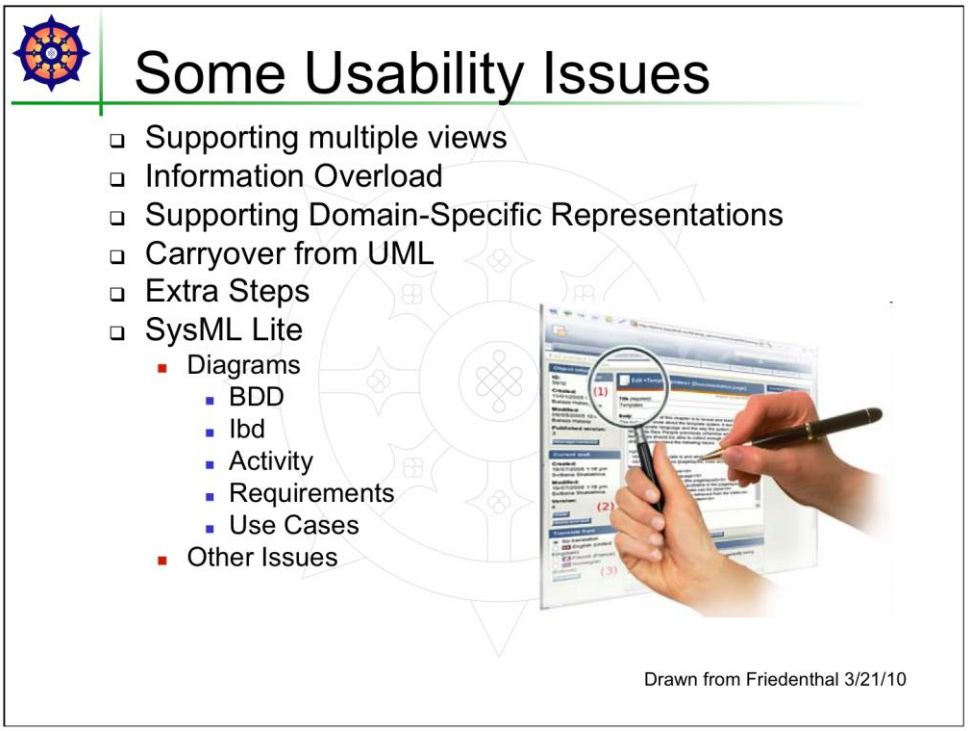
- Identifying and describing the potential users – It was observed that a key aspect of any usability work is identifying and describing the users. The users identified during the discussion included:
    - Main users – Systems engineers engaged in building models
    - Collateral Users – People who may not be SEs but who will need to connect with SE models, such as component engineers. These individuals may be doing extensive modeling in specialized engineering domains.
    - Readers – These are people who will be obtaining data from models but not modifying them. Some technicians will be in this category.
    - Developers – People who are responsible for the modeling environment on a project. These are power users who set up the modeling environment and create some of the high level structures that other modelers will use.
    - Background users – These are people who will use the modeling environment to get context on the technical side of the project. Project leaders and clients will sometimes be in this category.
- Deliverables – It was stated that the deliverables produced by our team will be recommendations of four kinds:
    - Language Recommendations
        - Clients for the language recommendations include:

        - Sandy Friedenthal
        - Roger Burkhardt
        - Rick Steiner
        - OMG
        - The SysML Revision Task Force
    - SysML – SysML language recommendations were seen as a key deliverable
    - Other, non-SysML Language recommendations. There are other potentially relevant languages that we may choose to address at some point, including:
        - SysML Lite – SysML Lite is a proposed simplification of SysML. Starting a new user on SysML Lite has been suggested as a simpler, more user-friendly approach to beginning SysML modeling.
        - Modelica
        - OpCAD
        - AADL
        - Marte
        - AP233 interface standard
        - Languages based upon profiles inside SysML or UML
- Tool Recommendations
    - Clients for the tool recommendations include representatives of tool vendors, including:
        - No Magic – J.D. Baker, Nerijus Jankevicius
        - Artisan - Jim Hummel, House
        - Spark Systems
        - Mathworks – Alan Moore
        - DOORS
        - Caliber
        - Requisite Pro
        - Cameo
- Methodology Recommendations
    - Clients for the Methodology recommendations include:
        - Methodology Group – Jeff Estefan (It was suggested that Jeff's paper may contain a further list of clients.)
        - OOSEM
        - Harmony (IBM) Peter Hoffman
        - RUP SE
        - FODA
        - Goal Modeling
- Synthesis Recommendations
    - Clients for the Synthesis recommendations include:
        - Our own group

- Any of the clients for language, tools and methodology may be interested, depending upon the specifics of the issue.

Due to time pressure, this topic was covered briefly. It was suggested that now is the time to "get our hands dirty." We need to get specific about constructing examples of usability issues and "exemplars" that demonstrate effective "user-friendly" approaches for using the new Model Based Systems Engineering paradigm.

The humble mouse click was mentioned in the context of creating and analyzing examples. Every time that a user clicks a mouse or moves a cursor there is a usage process such as deciding which object to select, designating the object with a mouse click, deciding how to manipulate the object and manipulating the object in some way. Usability problems are frequently revealed by analyzing at this level of detail. Hesitation, confusion, frustration, or error become apparent, as do opportunities for making improvements.

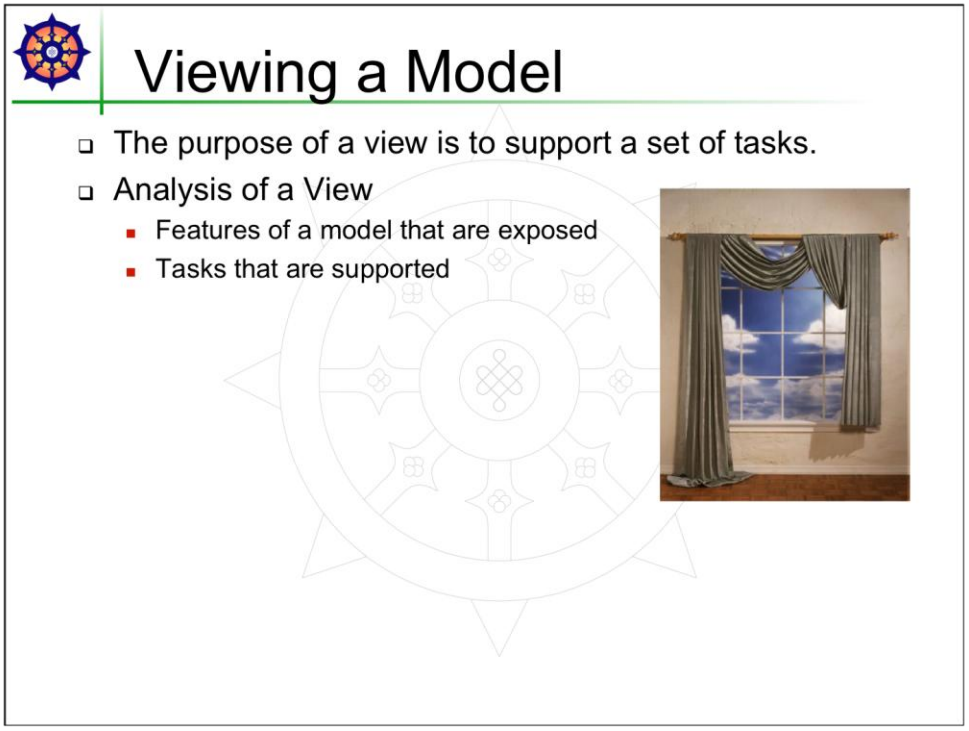


Due to the shortage of time, we skipped most of the points on this slide, referring to Sandy Friedenthal's suggested usability issues, covered in a paper on the MBSE-Usability Google Group: http://groups.google.com/group/mbse-usability/files?hl=en MBSE-Usability Issues – Friedenthal-032110.pdf

David Lempia and Dick Welling were kind enough to present examples of usability issues and analysis. Due to the shortage of time, we covered these presentations relatively quickly; however, both David and Dick were kind enough to post their presentations on our Google Group: http://groups.google.com/group/mbse-usability/files?hl=en as:

- David Lempia: Usability (David Lempia).ppt
- Dick Welling: Usability_Thoughts_r2.pdf

We had some good discussion. One of the interesting points that arose was that some of the usability issues that David highlighted are at least partially tool-specific. (ie. These issues manifest in some tools but not in others.) This reveals an important consideration for our future recommendations. We need to be sure that we're sensitive to the variations in tools. How we address this issue seems to be a good topic for reflection & future discussion.



This was covered briefly due to time pressure. Scott considers the skillful use of model views a key issue in systems engineering and systems engineering modeling.

One more item that could be listed under analysis is the affordances for manipulating objects displayed in a view. (Affordance is a technical term in Human/Computer Interaction design. An example of an affordance in the context of computer graphics is a "handle" for a graphic object that allows one to resize the object.)

Although we had approximately half the time that we would have preferred to cover our agenda, we did have time to discuss the nature of our group's deliverables and to identify major clients for these recommendations. We also discussed an approach to drafting recommendations which begins with an analysis of specific usability issues and we received the benefit of looking at examples of usability issues developed by David Lempia and Dick Welling. In the future, we will be presenting and discussing similar materials at our online meetings.

Request for everyone in the group: Please prepare at least one example of a usability issue for presentation to the group. A couple of suggestions:

- Pick an issue that you feel strongly about. Show us enough of an example that the rest of us can clearly understand the issue.
- Format is not a big deal. Use a format that's comfortable for you.
- If you have a tentative, or fully formed approach to dealing with the issue, please share it, but it is not necessary for you to propose one.
- Please do expect a discussion. The issue that you present will be the starting point and focus for discussion.
- The Magic Draw environment has been made available to you to support your efforts in preparing and discussing examples. If you wish, you can step through actually building a model and showing us the issue, live. This is one of the key purposes for making the modeling environment available to you; however, this is not required. If you prefer to use Power Point slides or some other medium, please do so. The key point is to share your insight with your colleagues.

Thank you for your efforts! – Scott Workinger