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**Architecture Study Group
Meeting Minutes and Plan
October 28, 2005**

Architecture Study Group - Background

The SC7 architecture study group was chartered via an SC7 resolution to investigate the possibility of additional standards in the area of architectures and to assess how SC7 standards address architecture and architecture management issues.

Architecture Study Group - Approach

The architecture study group met for the first time in conjunction with the SWG5 interim 2004 meeting in October 2004. Between October 2004 and October 2005, additional reviews were conducted, and study group members circulated materials and discussions via email. An additional face-to-face meeting was held during the Helsinki plenary meeting in May 2005, and a resolution was approved to extend the study group period until 15 April 2006. A final face-to-face meeting was held at the interim meetings in Bari, Italy in October 2005.

Additional study group members may be added by sending an email request to Cheryl Jones (cheryl.jones_at_us.army.mil).

This file contains meeting summaries and minutes from all architecture study group meetings and reports, in reverse date order.

Study Group Members:

Name	Country / Organization	Email	Oct 2004	May 2005	Oct 2005
Mark Maier, chair	IEEE	Mark.W.Maier@aero.org		X	
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Bryan Wood	UK	bryan.wood@open-It.co.uk		X	X

Summary Meeting Notes from 25 October 2005 meeting

At this meeting, the architecture study group held a joint session with SWG5, WG7, WG10, WG19, and the operations study group to discuss ways of representing the SC7 standards collection. Meeting notes for that joint session are provided separately.

At this meeting, the relationship between 1471 and 10746 were discussed. Detailed notes are provided below, and further email exchanges on this topic will occur over the next several months.

The final work of the architecture study group will be conducted via email between now and April 2006.

Detailed Meeting Notes from 25 October 2005 meeting

1471: At the previous meeting, we defined the scope of revision.

10746: This standard provides a specification of viewpoints for large-scale systems (parts 2 & 3). It doesn't provide a notation.

19793: This standard provides a notation: UML for ODP.

WG19 is considering a NWI for a revision to 10746. If they do so, it would be a good opportunity for harmonization with the recommended changes to 1471.

For reference, need to look at the Open Group Architecture Framework (TOGAF).

1471 and 10746 complement each other. They do use different words for similar terms. They need to be harmonized, or we at least need to explain the mapping.

Need to look at use of term "architecture" across SC7.

There is different use of architecture in SC7 standards. WG19 has a common definition across WG19 standards.

Action Item: WG19 (Antonio) to send this definition to Arch study group.

Action Item: WG19 (Antonio) to provide description of different architectures.

Architecture descriptions can be useful. WG19 has an example (which covers some things). Study group might recommend covering some other things.

Model-driven architectures provide a framework for specifications.

Can any of the current processes be used to generate viewpoints? Is more needed? It would be useful to provide guidelines on how to use 12207 / 15288 in generating viewpoints.

Summary Results of May 2005 Meeting

Recommendations:

- The study group concurred to submit ANSI/IEEE 1471 as a fast-track standard. Study group participants prepared a set of recommendations for changes for a revision project.

Action items:

- Draft resolution to establish Architecture Working Group – SG chair - Bari
- Draft New Work Item resolution – SG chair - Bari
- Draft guidelines for the revision joint standard revision project – ASG (completed in Helsinki) – provided in file entitled “1471 Revision Recommendations -v1_May_05”

Detailed Notes from May 2005 meeting:

- Additional information and decisions from the May 2005 meeting are contained in the draft architecture study group report and the in the 1471 Revision Recommendations.

Meeting Notes:

- An overview of ANSI/IEEE 1471, with a position on revision was provided (Maier)
- A note in the forward of the revised standard should be added indicating that the standard is in revision.
- Care should be taken to use terminology consistently (“architecture of what?”)
- RM-ODP is generally consistent with ANSI/IEEE 1471 – Wood
 - RM-ODP includes a viewpoint that explicitly incorporates the systems context
 - Purpose of the standard is not clear. How would people use it?
- The standard should be in a separate working group – Bieihe
 - Don’t see a major difficulty in accomplishing the reconciliation
 - Perhaps should do a systems working group instead of an architecture WG
 - 1471 contains generalized concepts that are useful in other contexts, such as overall standards reconciliation.
- In favor of WG on the topic – Steve Seidman
- 1471 has a broad view of designing systems – Timo Kakala
 - What are current views of 1471. Is there usage feedback? What are the most critical problems?
 - 1471 is missing requirements views (presumably as mandated content), other mandatable architecture views.
- Great care should be taken with setting the system level (software, computer system, etc.) in defining what we are looking at the architecture of – Prof Azuma
- Distinction between architecture and architecture description in 1471 is important and could be useful across SC7 – Lawson
 - Need to be open-minded in reconciliation among standards. Need a workable mix of concepts.
- Adoption and revision is necessary and should go forward – Jones
- 15704

Summary Results of April 2005 Report

The study group recommends that:

1. SC7 establish a new working group to address architectural issues.
2. IEEE Std. 1471 be adopted as an ISO/IEC technical report
3. IEEE and ISO/IEC SC7 start an immediate revision to 1471 to establish a joint standard, based on the study group recommendations
4. Other standards be updated as necessary for commonality

Additional detail is provided in the study group report.

Summary Results of October 2004 Initial Meeting

Recommendations:

- The study group decided on these draft recommendations. They will be re-considered as the action items are completed. Based on inputs from study team member (see action items below), these draft set of recommendations will be updated in February 2005, and submitted to the group for review. Assuming that the study group members reach consensus (via email discussions in February 2005), final recommendations will be published in April 2005, in the final study report.
 - Fast track 1471 as a TR(preferred) or a standard (if required because of 1471 is an IEEE “recommended practice”) - since this is a long lead item, this process will be started now (there was consensus that this was a useful document, even before the changes discussed in the next step)
 - After approval of the fast-track, start an immediate IEEE/ISO joint revision to 1471 to:
 - Work for system architectural description (not just software-intensive)
 - Add an annex: Context of how to use this standard in relation to others
 - Make changes to ensure compatibility with 15288, 12207, 15504, and 25000
 - Make changes to ensure compatibility with other standards - e.g. 15704
 - Recommend revisions to 15704 for compatibility with 1471, 15288, 12207, 15504, and 25000 (need to figure out which SC or TC is responsible for making changes to this document).
 - Recommend new or additional changes to other standards/guides (e.g. 1471, 15288, 12207, 15504, 25000, 15704, MOF, etc.).
 - Recommend new working group to address architecture issues.

Notes from October 2004 meeting:

Action items:

Preparation

- Jim Moore to send IEEE 1471 to Witold for distribution to SC7 National Bodies (as an advance copy prior to the fast track) (completed)
- Jim Moore to request IEEE to fast-track 1471 within ISO (completed)

Research and Review - to be completed by 31 January 2005 (25 February 2005)

- Identify additional research papers (Bibliography) - Everyone
- Review 1471 against 15704/19439/19440 - Peter -18 Mar 2005 (completed)

- Review 1471 against 15288/12207 - Stuart, Bud, Mark Maier - 10 Feb 2005 (Maier completed)
- Review 15704 against 15288/12207 - Ovidiu - 31 Jan 2005 (18 Mar 2005) (completed)
- Review 15704/1471 against SQUARE - Prof. Azuma - 27 Feb 2005 (completed)
- Review 1471 and MOF (Meta Object Facilities) - Jean-Philippe – 25 Feb 2005
- **Additional reviewers for each of these review tasks would be welcome**

Research and review should:

- Identify inconsistencies
- Identify gaps in one document or another
- Identify additional areas to cover
- Relationship of one standard/guide to another (e.g. scope, depth and breadth comparisons)
- Recommendation on what the standard (or revision) that we are recommending should cover (scope)
- Top-level recommendations (concurrence on those above or revisions as appropriate)
- Recommended involvement (convenor for WG, editor, participant countries)

Develop report

- Consolidate top-level recommendations from all reviewers - send to all study group members for review and comment - facilitate consensus building process - Cheryl - February 2005 (12 April 2005 - completed)
 - Draft study report and send to study group members for review - Cheryl - 28 February 2005 (12 April 2005 - completed)
 - Draft NWI (revision to 1471) and resolution (approving NWI) - Cheryl - after concurrence by study group members, send to Secretariat for distribution to SC7 National Bodies - 15 March 2005 (deferred to October 2005)
 - Finalize study report based on comments received - Cheryl - 15 April 2005 (deferred to April 2006 with study group extension)
- An overview of IEEE 1471 was provided. (see wicsa2002-1471.ppt)
- Standard about architecture descriptions (abstract view)
 - “Recommended practice” versus a standard or a guide
- An overview of ISO 15704:2000 was provided.
- Intended as a generalized Architectural Framework for systems (“empty” framework)
 - Came out of manufacturing, but grew into a framework for any type of system
 - 2 types of architectures:
 - describing structures (sometimes patterns)
 - lifecycle architectures

- Perspectives (views from meeting attendees)
 - Have multiple standards (1471 and 15704) - need guidance on how they all fit together - concerns regarding consistency and completeness of 1471 and the life cycle aspect which is not treated (Ovidiu) - [Note from 1471: It is true that 1471 is not specific on lifecycle integration, but this was a deliberate choice. The 1471 group noted that architecture descriptions are being developed at different points in a lifecycle. Some are written as part of the conceptual design (the classical model). But others are written to document systems that already exist (sometimes called reverse architecting or “Systems Archeology”). Sometimes the AD is written based on an existing system in preparation to change it. The desire was the 1471 accommodate all of these scenarios. Hence, it focuses on the content of the AD rather than system itself or the lifecycle point at which it was developed.]
 - Use 15704 as a top-level view - fit in 1471 (Peter)
 - 15288 should be able to cope with architectures (Mikael)
 - Start with concepts that are compatible and fit well [with current standards] and then build up (Juan)
 - What WG should address architectures? Very important to focus on architectures. Need to fit within the way we have addressed systems in 15288. Important to address how to structure architectures, and the processes on how to use them. One approach - new WG on architectures. Another approach - fast track 1471 (either as a standard or a TR). Definitely need a focus on architectures. (Bud) [Note: We need to be careful to be clear about whether we are talking about architectures or architecture descriptions.]
 - Architecture is a kind of system - runs through 15288 - 1471 goes to a level of practicality and detail that is necessary (lower than 15288) - neither document makes a full contribution without the other - both are different views that are necessary (Stuart)
 - Would like to address what is a good architecture - guidelines or criteria to evaluate “goodness” of architectures (relates to WG6 work on SQUARE architecture) - would be good to have an umbrella framework on architectures - similar to 15939 work on defining measurement information needs which are related to stakeholder concerns which are related to architectural concerns - if we develop an architectural standard, than WG6 can use it as a framework for defining the “goodness” - SQUARE is now addressing quality characteristics - in a similar sense could propose additional ways to evaluate architectural quality (Professor Azuma) [Note from 1471: This was a big point of discussion during the development of 1471. Early in the process there was strong stakeholder interest in having 1471 provide guidelines to good architecture. Put in the 1471 conceptual model, they wanted to know whether or not a proposed system was going to be “good” based on looking at the architecture defined before it was built. While this was certainly desirable, we were at a loss as to how to do it in the very general case. If I don’t know what kind of system I’m working on, if I don’t know what kind of stakeholder needs it is supposed to satisfy, how am I supposed to write a standard that ensures that the system will meet those stakeholder needs? 1471 finesses this point by saying you must be explicit about your stakeholders, you must be explicit about those stakeholders concerns, and you must be able to map those concerns into the views you provide. It says you have to do that, it doesn’t say you have to be competent at doing it. I think that to be explicit about what it means to be competent at doing that would require that we narrow down the scope of the standard to some particular domain in which good practices were well-defined.]
 - Strong concerns with all architectural approaches - no requirements on completeness or typing together of views or validating - need to go far further than 1471 - need to identify methods and means of modeling - there are very many models and viewpoints out there - key aspect of systems engineering is integrating all those views - this is a major problem

today - can't stick to the PowerPoint level - need deeper information for validation - need a level of rigor - need to enhance 15288 guidance - need to address behavioral issues as well (Jean-Philippe). [Note from 1471: I agree this is a big deal. The problem is getting from the abstract to the practical without being overly restrictive. If we defined some fixed Viewpoints (some fixed collections of notations and methods) then I'm sure we could develop some explicit consistency and completeness criteria. But, that would require standardizing on the notations in those Viewpoints. That level of standardization was not acceptable to the IEEE AWG when 1471 was written. Do we think the situation has changed/matured since then? Yes, for sure we need to get beyond PowerPoint. But, on what notations are we ready to standardize?]

- Important to have consistency between the various documents (Spain)
- Questions
 - How do we handle system-of-systems? We talk about system-of-interest. Do architectural descriptions of lower-level systems contribute to the architectural description of the system-of-interest? What threads go through various levels and what are the impacts?
 - How compatible is IEEE 1471 with ISO/IEC 15288? At top level, appear to be compatible, but there are sure to be lower-level issues. If this working group decides to adopt 1471, would have to work out those issues.
 - Different life views: some people view architectures as different than system engineers
- Terms
 - Architecture
 - Engineering (static) and dynamic part - (note: get definitions from Francois)
 - Enterprise architectures use principles
 - Consider IEEE definition
 - Engineering architecture
 - Lifecycle - Lifecycle stages
 - Hierarchy of systems - system-of-systems
 - Architecture standard
- Operational environment may include interfaces - systems may communicate - need a focus on interfaces - could be by agreements, or by interface protocol - need to address how to deal with multiple architects in their operational environment
- Need to carefully define the scope of work that we are addressing and show the various relationships between the different standards (like 1471 and 15704)
- What do we mean by Architecture
 - System architecture description
- Can we use existing standards, or do we need a unique standard?
- Types of Projects
 - System-of-system (recursion)
- Need: To Be Specified

- Customer
 - Architects
 - Users of 15288/12207
 - Understanding (PM) through detailed use (architects)

- Software / System
 - To be Specified

- Options for implementing guidance
 - New standard / guidance document - about 5 years to publish a standard
 - Add bits to existing standards as they are updated in coming years

Check:

- Existing standard - 15704 - framework to organize standards (up for renewal)
 - Up for renewal - should be done jointly with TC184 and SC7
 - Can be used for organizing standards
 - Showing relations
- Lot of interest in architectural framework - how do we derive utility from them - would be helpful to understand how to evaluate architectural frameworks - would be helpful to have a good definition of “architectural framework” and what is envisaged for one.
- Need to look at the relationship to modeling (there are multiple models that can be used - how do you ensure consistency)