Overview of JTC 1 SD 24 Systems Integration

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Summary

- ISO/IEC JTC 1 Standing Document N 24
  - JTC 1 Systems Integration Standardization Guidelines
- Report of the JAG-Systems Integration Facilitation (JAG-SI F) Convener at the July 2017 JAG meeting, London (JAG N 0252)
- JTC 1 topics at the JAG London meeting July 24-27, 2017
- SC24 and JTC 1 Systems Integration

ISO/IEC JTC 1 Standing Document N 24

JTC 1 Systems Integration Standardization Guidelines

Background

- Not only has IT become ubiquitous, but it is also on the verge of going through another major expansion
- For instance, the Internet of Things, which enables devices, bui ldings, and entire cities to become ‘smart’, is on its way to bec oming ubiquitous, as well
- When JTC 1 did a major re-engineering exercise in 2000-2002, it viewed its 58 subgroups as a series of divisions, each with it s own expertise and deserving of its own IT market and comm unity (Figure 1)
- The new areas are much more complex, and definitively point toward a more matrix type relationship between JTC 1 subgro ups (Figure 2)

Classification of JTC 1 Subgroups by Technical Areas (Figure 1)

Technical Areas	JTC1 Subcommittees and Working Groups
Application Technologies	SC 36 - Learning Technology
Cultural and Linguistic Adaptability and User Interfaces	SC 02 - Coded Character Sets SC 22/WG 20 – Internationalization SC 35 - User Interfaces
Data Capture and Identification Systems	SC 17 - Cards and Personal Identification SC 31 - Automatic Identification and Data Capture Techniques WG 09 - Big Data
Data Management Services	SC 32 - Data Management and Interchange
Document Description Languages	SC 34 - Document Description and Processing Languages
Information Interchange Media	SC 11 - Flexible Magnetic Media for Digital Data Interchange SC 23 - Optical Disk Cartridges for Information Interchange
Multimedia and Representation	SC 24 - Computer Graphics and Image Processing SC 29 - Coding of Audio, Picture, and Multimedia and Hypermedia Information
Networking and Middleware	SC 06 - Telecommunications and Information Exchange Between Systems SC 25 - Interconnection of Information Technology Equipment SC 38 - Cloud Computing and Distributed Platforms WG 07 – Sensor Networks WG 10 – Internet of Things
Office Equipment	SC 28 - Office Equipment
Green IT	SC 39 – Sustainability for an by IT
Programming Languages and Software Interfaces	SC 22 - Programming Languages, their Environments and Systems Software Interfaces
Security	SC 27 - IT Security Techniques SC 37 - Biometrics
Software, Processes and Systems	SC 07 - Software and System Engineering SC 40 – IT Governance and IT Management
Smart Cities	WG 11 Smart Cities

Fig 1 - Classification of JTC 1 subgroups by technical areas

JTC 1 System Integration Matrix (Figure 2)

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	Application technologies	Cultural and Linguistic Adaptability and User Interfaces	Data Capture Iand Identification Systems	Data Management Services	Document Description Languages	Information Interchange Media	Multimedia and Representation	Networking and Middleware	Office Equipment	Green IT	Programming Languages and Software Interfaces	Security	Software, Processes and Systems	Accessability	Big Data	Internet Of Things	Cloud Computing	Smart Cities	3D Scanning & Printing	Smart Machines
SC 02 Coding		X																		
SC 06 Network								X						x	x	x	x			x
SC 07 Sw&Sys	X												X	x	x	x	x			x
SC 17 Cards ID			X											x	x	x	x	x		x
SC 22 Prog. Lang		x									X									x
SC 23 Disk						X														
SC 24 Graphic							X										x	x		
SC 25 Interc.								X							?		?	?		
SC 27 Security												X	x	x	x	x	x			x
SC 28 Office Eq.									X									?		
SC 29 Multimed.							X			x				x	x			x		
SC 31 Data Cap			X											x	x	x	x			x
SC 32 Data int.				X										x			x	x		
SC 34 Doc.					X															
SC 35 User Int.		X																		
SC 36 Learn	X																?			
SC 37 Bio												X					x			
SC 38 Middl								X					x	x	x	X	x			x
SC 39 IT Sust.										X				x			x			
SC 40 Gov & M													X			x	x			x
WG10 IoT								X						x	X	x	x			x
WG 7 Sensor Ntw														x	x		x			x
WG9 Big Data			x	x										X	x	x	x			x
WG11 Smart Cities														x	x	x	X			x

Systems Integration Challenges in JTC 1

- The JTC 1 challenge can thus be how to approach Systems Integration projects:
  - Where cross-functional expertise is required
  - Deliverables need to be coordinated as a first step across many J TC 1 entities, and also with external entities

Process for JTC 1 Systems Integration

- How to address the challenges around:
  - Clarification of Systems Integration scope
  - Limited number of experts in JTC 1
  - Defining terminology for common use across JTC 1 subgroups
- How to identify the partners
- How to involve partners in sitting together with JTC 1 to define
  - Structure
  - Strategy
  - Tracking / Progression
- How JTC 1 interacts with other systems groups in IEC, ISO, ITU-T
- Finding advantageous ways for JTC 1 experts to work together with out interference from organizational issues

JTC 1 Systems Integration Approach (1)

- The JTC 1 Systems Integration approach is, at its basis, evolutionary in nature - it reuses existing frameworks as much as possible
- Systems Integration within JTC 1 means accepting a paradigm shift
  - Covering aspects and solutions of other SCs and/or WGs within JTC 1 is all about “systems in systems”
  - The paradigm shift relates to the fact that new projects/topics, like Smart Cities, Smart manufacturing, Smart “anything”, fall into a category of applications that are based on various standards which have already been developed by established JTC 1 entities (e.g. SC 27, SC 38, WG 10, WG 9, and others)
  - Since these existing standards may not fit precisely, it would be the goal of the entity that is responsible for an application, like Smart Cities, e.g., to identify gaps and describe specific requirements to enhance or amend existing standards, or to set up New Work Item Proposals for the dedicated SCs and/or WGs

JTC 1 Systems Integration Approach (2)

- It must be the responsibility of the Systems Integration en tity (like Smart Cities) to orchestrate existing, to be enhan ced, or newly developed standards by setting up/developi ng policy documents and specifications
- However, these Systems Integration entities are not empo wered to instruct other JTC1 entities
- Systems Integration leads to a matrix organization

JTC 1 Process of Creation of Systems Integration Entity (1)

- JTC1 Advisory Group (JAG): a governing entity of Systems Integration efforts in JTC1
- The primary Systems Integration role of the JAG is to meet the demand of a top down approach to standardization to accommodate the multiplicity of technologies and their convergence in many new and emerging markets

JTC 1 Process of Creation of Systems Integration Entity (2)

- The principal tasks of the JAG for Systems Integration:
  - Continuous monitoring of potential new work using input from SCs, National Bodies, and directly from the market
  - Provision of a JTC1 strategy for Systems Integration efforts
  - Provision of a JTC1 governance policy on Systems Integration efforts
  - Provision of JTC 1 Systems Integration guidelines
  - Make recommendations to JTC 1 on establishment or disbandment of JTC1 Systems Integration entities
  - Assignment of qualified facilitators to Systems Integration efforts in JTC1

JTC 1 Process of Creation of Systems Integration Entity (3)

- A Study Group for Systems Integration (coherent with IEC Systems Evaluation Group (SEG) http://www.iec.ch/about/activities/systemswork.htm) is chartered to investigate the need and feasibility of additional standardization and/or guidance in a technical area
- The main objective of a Study Group is to understand the current activities in the area and make recommendations to JTC 1; a Study Group for Systems Integration is an open and potentially large group drawn from within and beyond the JTC1 community, used in the first stage of Systems Integration development
- A Study Group's role is to engage a community of experts, identify relevant stakeholders, define the general architecture and boundaries of the subject to be addressed, and propose a possible program of work and a relevant roadmap for the implementation of Systems Integration standardization activities
- Study Groups for Systems Integration are established and dissolved by JTC1; they have a limited life, normally 12 to 24 months, and do not have ongoing tasks; they are not entitled to develop standards or other JTC1 deliverables

JTC 1 Process of Creation of Systems Integration Entity (4)

- The principal task of a Study Group for Systems Integration is to evaluate whether or not there is a need for new work of a Systems Integration nature that could be done by JTC 1; this requires sufficient consensus among JTC1 National Bodies; the SG may be extended until an NWIP is proposed and accepted or a new subgroup is created by JTC 1
- The subgroup may be a WG, reporting directly to JTC 1, with Systems Integration responsibilities, if an NP is already approved or a fast-track submission is initiated in the subject area; or an SC, if the scope of the work warrants it; or be delegated by JTC 1 to one of its existing subgroups (e.g. SC) that might already be doing work, within their scope, on the Systems Integration topic

JTC 1 Process of Creation of Systems Integration Entity (5)

- SC_for_Systems Integration or WG_for_Systems Integration (coherent with IEC Systems Committee (SyC) http://www.iec.ch/about/activities/systemswork.htm): a specialized type of committee or group working on systems integration
- An SC_for_SI or WG_for_Systems Integration can draft international standards, as well as other JTC1 deliverables; it functions generally in the same manner as a conventional SC or WG, although special attention might need to be given to ensuring systems integration responsibility under effective liaison and cooperation with members representing stakeholders beyond the JTC1 community
- Facilitator

Responsibilities of the Systems Integration Entity (1)

- Serve as the focus of and proponent for JTC 1's Systems Integration topic standardization program
- Develop foundational standards for the Systems Integration topic - including reference architecture and vocabulary standards - for guiding Systems Integration topic efforts throughout JTC 1
- Identify JTC 1, ISO, IEC, and external organization entities that are developing standards and related material that contribute to the Systems Integration topic and, for each entity, investigate ongoing and potential new work

Responsibilities of the Systems Integration Entity (2)

- Identify gaps in Systems Integration topic standardization for consideration in proposing potential new work to the relevant JTC 1 subgroup(s)
- Develop, in the Systems Integration topic, other standards that build on the foundational standards when relevant JTC1 subgroups that could address these standards do not exist or are unable to develop them
- Develop and maintain liaisons with ISO, IEC, ITU-T, and external organizations working on the Systems Integration topic, as well as with any other JTC 1 subgroup
- Engage the community outside of JTC 1 to grow awareness of and encourage engagement in the Systems Integration topic standardization efforts within JTC 1
- Develop and maintain a list of existing Systems Integration topic standards produced, and standards development projects underway, in JTC 1

Responsibilities of JAG

- Facilitate projects in the Systems Integration topic in JTC 1 by:
  - a) Noting approved NWIPs in the Systems Integration topic
  - b) Facilitating the initiation of NWIPs, considering recommendations p repared by the JTC 1 Systems Integration subgroup
  - c) Advising JTC 1 on Systems Integration topic related projects that ar e ongoing and proposed within JTC 1 subgroups
- Address and coordinate areas of possible conflict, including s uch things as NWIPs and project splits relating to the Systems Integration topic, when a concern is brought forward
- Collaborate with JTC 1 Systems Integration entity efforts to gr ow awareness and involvement of those outside JTC 1 in the S ystems Integration topic within JTC 1 and, especially, interact i n Systems Integration activities in SDOs such as ISO, IEC, and I TU-T

Implementation Guidelines for Systems Integration Entity

- Work that is initiated by any JTC 1 subgroup in the area of the Systems Integration topic should be reviewed for the level of collaboration between JTC 1 subgroups for that project
  - A project editor(s) participate(s) in the meetings of all the JTC 1 subgroups when there is collaboration on a Systems Integration topic project
  - Liaisons between the JTC 1 subgroups collaborating on the Systems Integration topic project are created
  - A joint working group is created when there are multiple JTC 1 subgroups, ISO TCs, or IEC TCs collaborating on a Systems Integration topic project

Facilitation (1)

- The objective of facilitation is to make JTC 1 Systems Integration more efficient
- A facilitator should represent the JTC 1 Advisory Group at the JTC 1 Systems Integration entity meetings for the Systems Integration topic
  - Will suggest recommendations from the JTC 1 Advisory Group and Plenary related to the specific Systems Integration topic
  - Will provide high-level status of ongoing projects in the Systems Integration topic in JTC 1 Working Groups, SCs, and elsewhere in the International Standards community, especially ISO, IEC, and ITU-T
- The facilitator should report to the JTC 1Advisory Group on the status of work on the Systems Integration topic
  - Will note any conflicts across the Systems Integration topic
  - Will make recommendations to the JTC 1 Advisory Group of any actions with respect to the Systems Integration topic

Facilitation (2)

- The Systems Integration entity should create and maintain a r oadmap of completed, ongoing, and proposed projects in the Systems Integration topic within JTC 1 to be maintained as a s tanding annex to the convenor/chair's Systems Integration top ic report (or facilitation on Systems Integration topic)
- The convenor/chair should create a Systems Integration topic report to be submitted for information to the identified JTC 1 subgroups for the Systems Integration topic in Figure 2:
  - NWIPs proposed on the Systems Integration topic
  - Status of ongoing projects in the Systems Integration topic
  - Standing annex of the roadmap of completed, ongoing, and proposed projects in the Systems Integration topic within JTC 1

JTC 1 Participation in ISO and IEC Systems Integration Activities

- JTC 1 should, as a matter of good practice, consider participating in any ISO and IEC Systems Integration activities in Systems Integration topics that include ICT aspects; it may do so by using any of the following:
  - The JTC 1 Advisory Group
  - A Systems Integration entity that has been created in the Systems Integration topic
  - Liaison officers from any interested JTC 1 subgroup

Report of the JAG-Systems Integration Facilitation (JAG-SIF) Convener at the July 2017 JAG meeting, London (JAG N0252)

JAG-SIF (JAG Systems Integration Facilitation)

- JAG-SIF was re-formed a year ago during the 2016 JAG Dublin, Ireland meeting
- This is a permanent JAG group with the following Terms of Reference:
  - JAG-SIF acts in the capacity of facilitator as described in the JTC 1 Systems Integration Guidelines, Standing Document 24
  - Members are individuals appointed by the JAG
  - JAG-SIF is led by a Convenor, appointed by the JAG Chair
  - JAG-SIF appoints members to attend the System Integration entity's meetings as representatives of JAG-SIF
  - Coordination among JAG-SIF members is conducted via JAG-SIF regular meetings
  - JAG-SIF is responsible for advising the JAG on the evolution of the JTC 1 Systems Integration Guidelines, Standing Document 24

JAG SIF Engagement

- JAG SIF has recommended that its mission initiated with WG 10 IoT be prolonged with the newly created SC 41
- The JAG Chair has since confirmed that, since SC 41 is an SIe, JAG SIF should pursue its mission in providing suppo rt to SC 41

Systems Integration Entities

- WG9 Big Data
- WG11 Smart City
- SC41 IoT (WG7 Sensor Network, WG10 IoT)

Topics Addressed by SI Facilitators

- Education requirements from WG participants (Secretariat , Conveners, Project Editors)
- Need for clarification about the Liaisons establishment pr ocess for JTC1 Systems Integration entities reporting dire ctly to JTC1
- Need for finalization and adoption of SD 24 Systems Integ ration guidelines
- Claim of an overlap between WG11 Smart Cities and TC26 8 over some Indicators-related work

Recommendations by JAG-SIF Conven or Report

- Recommendation 1: JAG SIF participants are current SIF m embers, as well as those responding to a call for new parti cipants
- Recommendation 2: Systems Integration directly reportin g to JTC1 Liaisons establishment process
- Recommendation 3: Joint AHG between ISO/TC268 and JT C1/WG11
- Recommendation 4: Systems Integration and Security asp ects work program

Discussion topics about Systems Integration a t the JAG London Meeting July 24-27, 2017

Vision

- Unified view of our products
  - Proactive
  - Business focus
    - Decision makers (regulators)
    - Real users/sector specific
    - Other ISO and IEC standards developers
  - Enhanced liaison

Products

- Meta-reference architecture document
- Aligned architectures
- Updated matrix
- Use cases for broader shared visions
- Charting of JTC1 liaisons
- Combined story of ISO, IEC, and JTC1
  - Points of strength

Tactical Efforts

- Framework conceptualization
- Lessons learned from IEC SysC activity, greater communic ation
- Common use case template
- Sector specific implementation standards
- Orchestration across new work items
- “Experiments” that lead to best practices
- Metrics for success

SC 24 and JTC 1 Systems Integration

SC24 Areas Related to SI

- Current JTC1 SI topics in SC24
  - Smart city (WG 11)
  - IoT (SC 41)
  - 3D printing and scanning (JTC1 SG)
- Next topics considered in SC24
  - VR education and training
  - Wearable devices
  - 3D digital human representation and healthcare services

SC24 Roles for SI

- 3D visualization for all SI areas
- 3D simulation in virtual environments
- AR/MR/VR representation for all AI areas