Information Technology Standards: What are they? Why Should I Care?

Session 8713

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Topics, more or less in order

- What are standards?
- Why do we care about standards?
- Standards activities and organizations
- Information Technology standardization
- Why standards can conflict
- The future of IT standardization
- Standards and SHARE
- What can you do about standards

What are standards?

The ISO Definition:

"Standards are documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics, to ensure that materials, products, processes and services are fit for their purpose."

For example, the format of the credit cards, phone cards, and "smart" cards that have become commonplace is derived from an ISO International Standard. Adhering to the standard, which defines such features as an optimal thickness (0,76 mm), means that the cards can be used worldwide.

Types of standards

- Regulatory
  - E.g. health and safety standards
- Management systems and quality
  - ISO 9001, 14001, etc.
- Technical
  - Most IT standards
- Conformity Assessment Standards
  - How to determine an implementation conforms to a standard

Why do we care about standards?

- Products work with one another
- Open evolutionary roadmap
- Product differentiation based on value-add, not proprietary and exclusionary interfaces
- New technologies tend to evolve to work with existing technologies *if* they are dominant
  - Voice over IP; Device-independent markup language
- More choice
- Product development dollars spent on development, not alternatives

Types of standards bodies

- “De Jure” formal standards development organizations
- “De Facto” standards development organizations
- Industry Consortia specification developers
- Regulatory bodies and test labs
  - Conformity assessment, not development
- Advocacy bodies (for or against use, not development)

Note that lines of demarcation between de facto organizations and industry consortia are blurred

Types of standards bodies

- Original standards organizations designed in part to avoid antitrust provisions of Sherman & Clayton Antitrust Acts (1890, 1914)
- In 1984, National Cooperative Research Act provided some antitrust protection to allow pre-competitive direct cooperative R&D by producers
- Result was mix of R&D and standardization – development or adoption of a technology by key competitors = Industry Consortium

De Jure Standards Organizations

- Part of formal, accredited international structure
- International bodies are established by treaty
- International, national, industry level
- Voluntary, consensus-driven
- High level of process integrity
  - Open, balance, due process, consensus

De Jure Standards Organizations

- Designed to avoid anti-trust issues
- Explicit policies for intellectual property, patents
- Output (national, international standards) is highest consensus-level document
- Globally, international standards have extra regard and weight compared to lesser-consensus documents
- What the term “standard” generally suggests

De Facto Standards Organizations

- Generally industry-specific, e.g.
  - W3C (World Wide Web Committee)
  - IETF (Internet Engineering Task Force)
- In IT, usually international in scope
- Populated by vendors, academia, customers, individuals
- Often born from some new but pervasive technology

De Facto Standards Organizations

- Processes looser than de jure organizations
  - Issues with intellectual property
  - Lesser consensus methods, products
- Products not formal standards but often called “standards” and thought of as standards
- Products may be sufficient for industry, or progressed into de jure standards by submission to national or international process

Industry Consortia

- Mostly IT and Telecom phenomenon so far
- Often formed by producers around new technology to achieve rapid adoption of specification
- Membership frequently restricted by high fees and requirements for intense participation; stated goal to keep the distractions and ‘dilettantes’ away

Industry Consortia

- Some Consortia are de facto standards organizations
- Others are largely marketing or market segmentation oriented
- Frequently these groups need customer input
- Often can’t figure out how to get it
- Such input is usually requirements rather than standards development activities

International De Jure Organizations

- ISO (International Organization for Standardization)
- IEC (International Electrotechnical Commission)
- ITU (International Telecommunications Union)
- Members are national bodies
- Policy, management and technical committees

- WSC World Standards Cooperation

- ISO/IEC JTC 1: Joint Technical Committee of ISO and IEC on Information Technology

National De Jure Organizations

- Umbrella organization for formal standards activities in a country, e.g.
  - ANSI – American National Standards Institute
  - BSI – British Standards Institute
  - DIN – Deutsches Institut für Normung e.V.
- Accredited representative for their country
- Accredit representatives to international bodies and subcommittees (via delegations)
- Provide accreditation for industry-specific de jure standards bodies

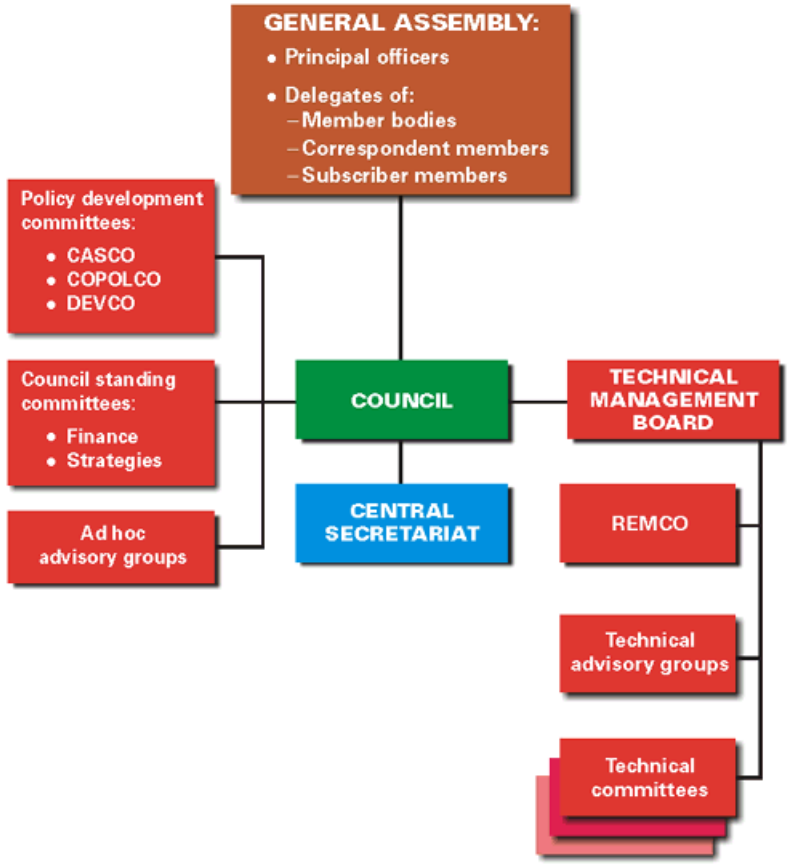
Industry De Jure Organizations

- Accredited by ANSI in the U.S.
- Often held by industry associations
  - INCITS (International Committee for IT Standardization) (via ITI)
  - IEEE Standards Association (via IEEE)
  - ASME (American Society of Mechanical Engineers)
- Or organizations created for the purpose
  - ASTM (American Society for Testing and Materials)

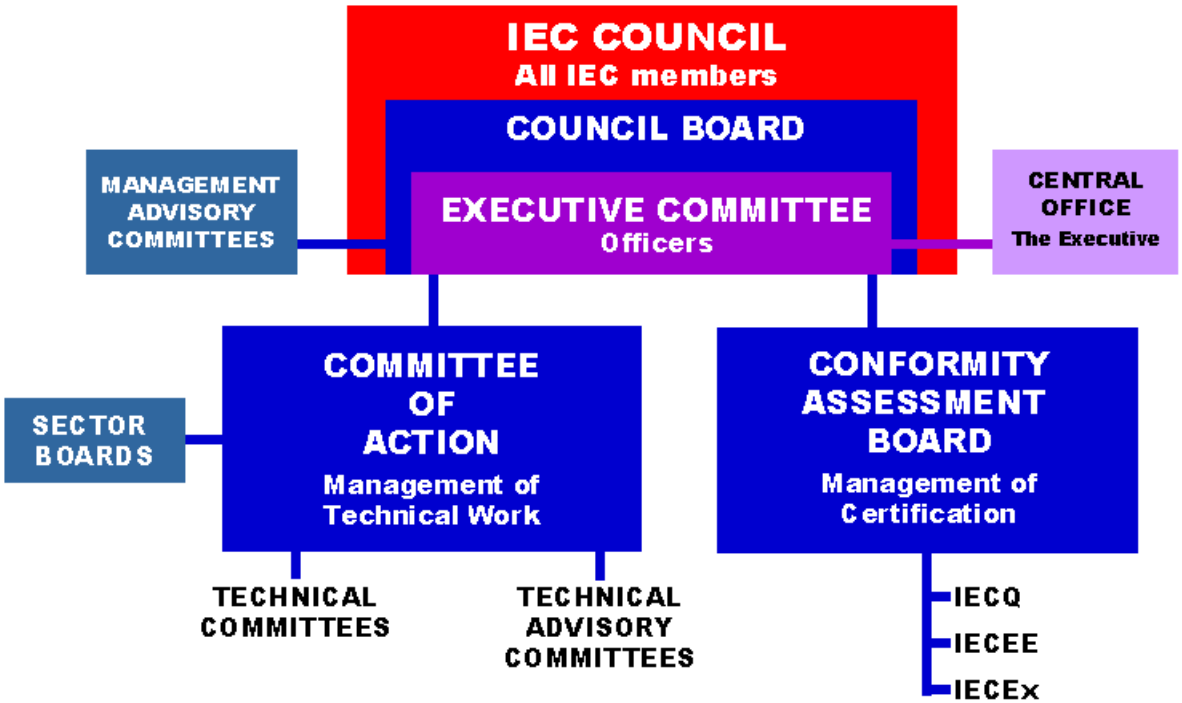
Industry De Jure Organizations

- In IT, members of standards bodies tend to be producers (IBM, HP, etc.) , testing labs (UL), other standards bodies, and government bodies (NIST)
- Management and technical committees
- Committees provide delegations to international equivalent committees
  - NCITS/T4 (U.S. Technical Committee on Security) is the TAG (Technical Advisory Group) to JTC 1/SC27 (International Subcommittee on Security)

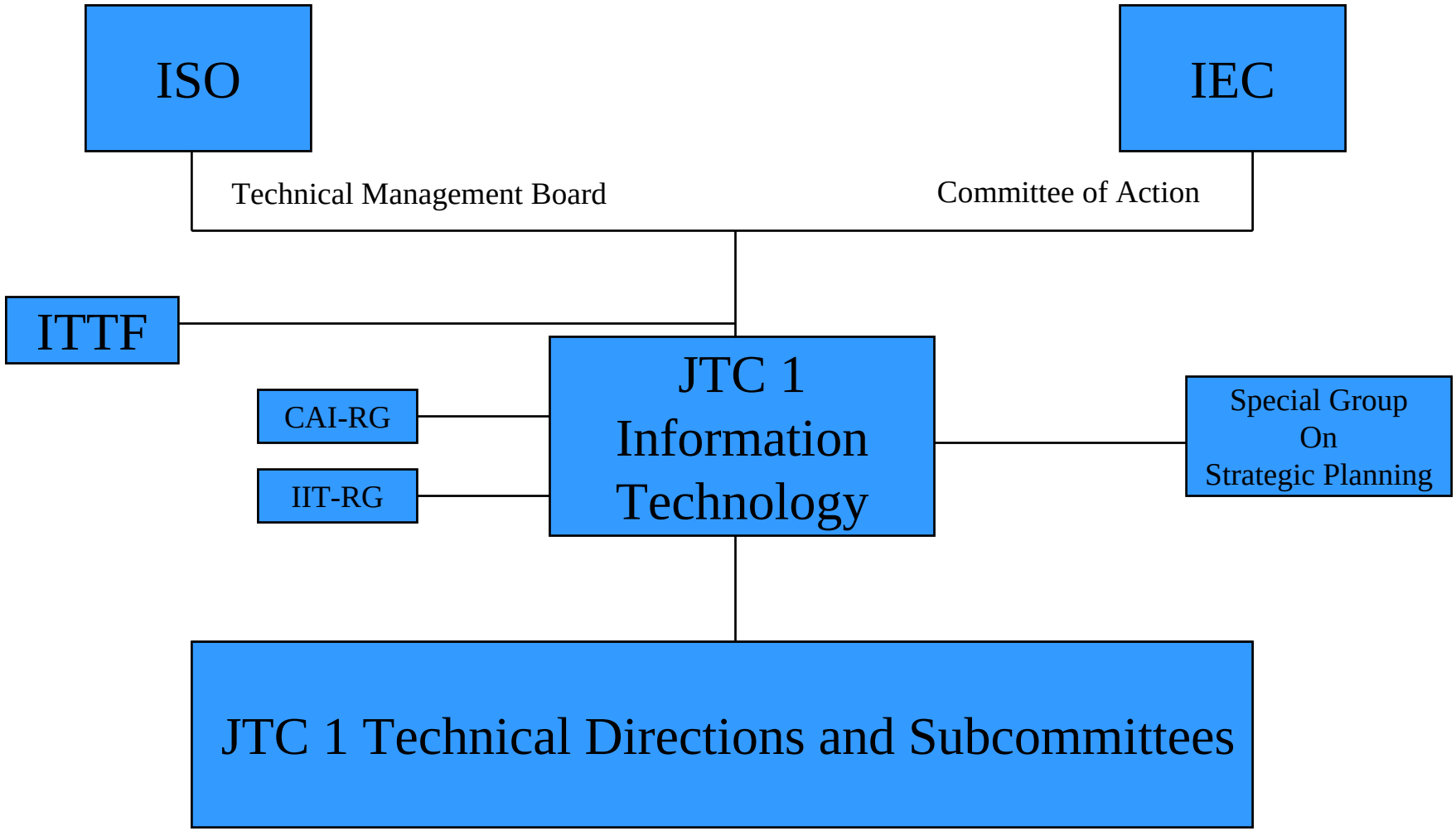
ISO Structure



IEC Structure and Management



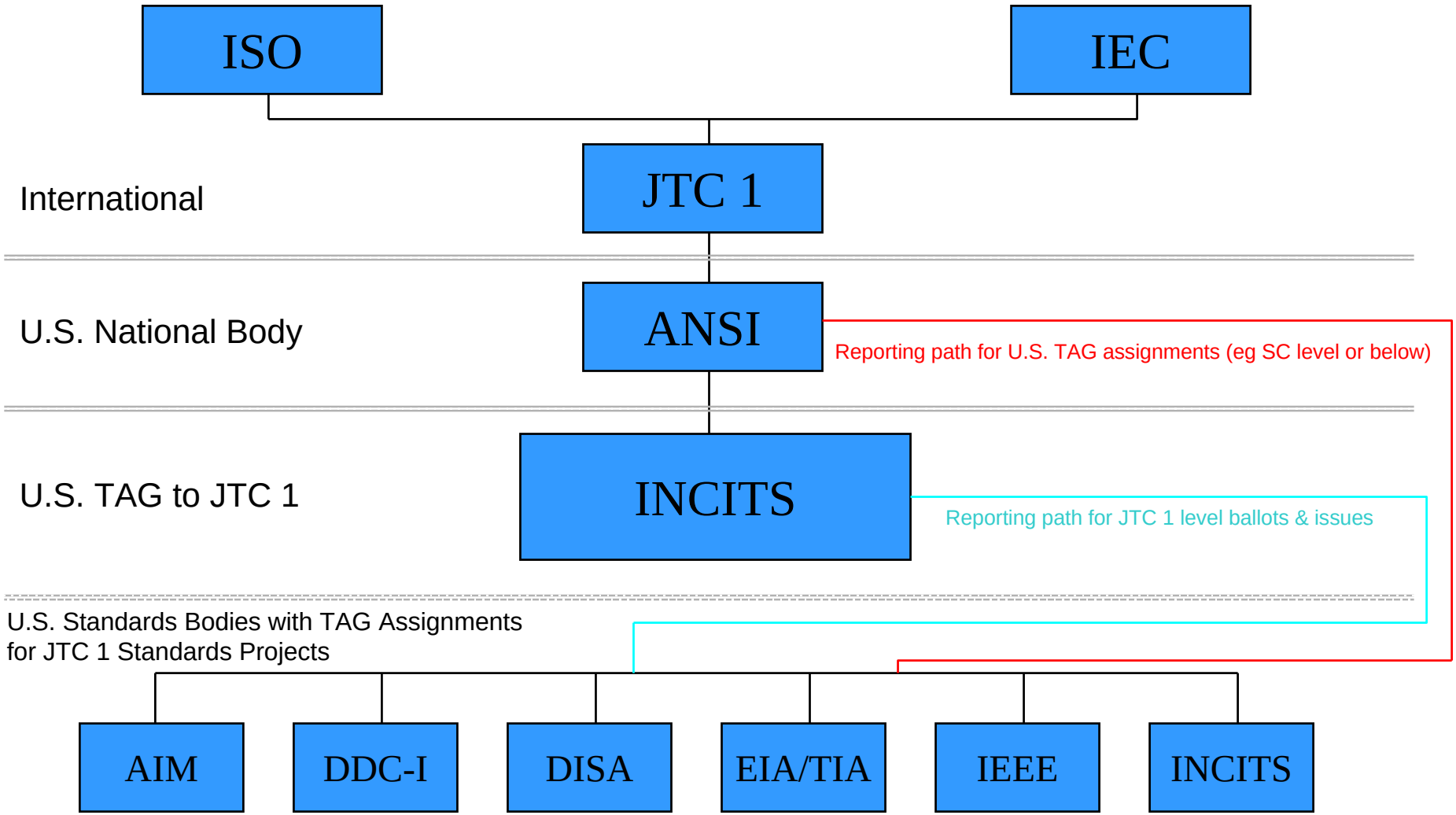
JTC 1 Organizational Chart



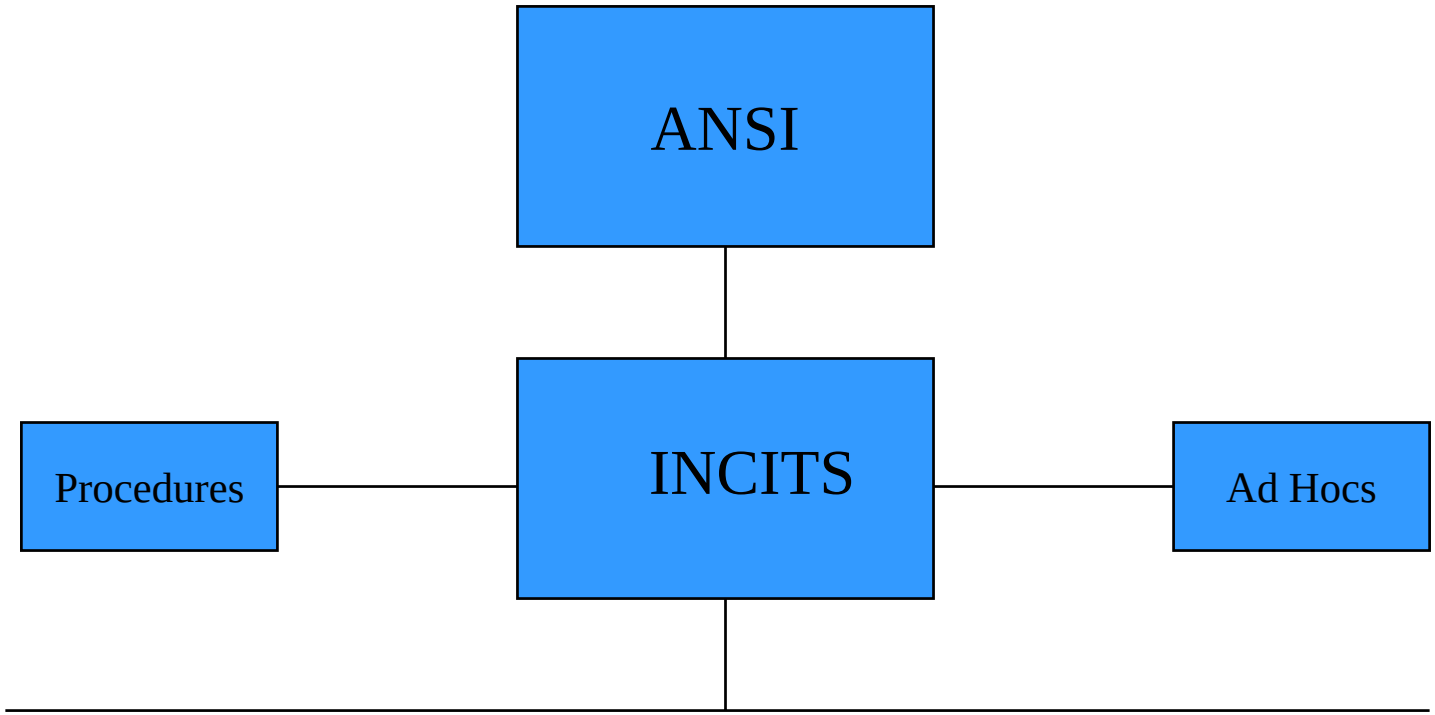
JTC 1 Technical Structure

Biometrics	SC37 Biometrics
Cultural Uniqueness and Internationalization	SC35 User Interfaces SC22/WG20 I18N SC2 Codes & Character Sets
Data Capture & ID Systems	SC17 ID Cards & Related Devices SC31 Automatic ID & Data Capture
Data Management Services	SC32 Data Mgmt & Interchange
Document Desc Languages	SC34 Doc Desc Languages
Information Interchange Media	SC11 Flex Mag Tape & DDI SC23 Optical Disk Technology
Multimedia & Representation	SC24 Graphics & Image Proc. SC29 Audio/VIdeo/Multimedia/ Hypermedia
Network & Interconnect	SC6 Telecom & Info Exchange SC25 IT Equipment Interconnect
Office Equipment	SC28 Office Equipment
Programming Languages & Software Interfaces	SC22 Programming Languages
Security	SC27 Security
Software Engineering	SC7 Software Engineering
	SC36 Learning Technology

U.S. Interface to JTC 1



National De Jure IT Standardization Structure



INCITS Technical Committees

INCITS Technical Committees

A1 Optical Character Recognition	J20 Smalltalk
B5 Flexible Magnetic Media	K5 Vocabulary
B9 Paper Forms/Layout	L1 Geographic Information Systems
B10 Id Cards & Related Devices	L2 Codes and Character Sets
B11 Optical Digital Data Disks	L3 Audio/Video/Multimedia/Hypermedia
H2 Database	L8 Data Representation
H3 Computer Graphics & Image Processing	M1 Biometrics
H7 Object Information Management	T2 Information Interchange
J1 Programming Language PL/I	T3 Open Distributed Processing
J3 FORTRAN	T4 Security Techniques
J4 COBOL	T6 Radio Frequency Identification
J7 APT	T8 Fault Isolation
J9 Pascal	T10 I/O Interface Lower Level
J11 C	T11 I/O Interface Device Level
J13 LISP	T12 I/O Interface Distributed Data
J14 FORTH	T13 I/O Interface AT Attachment
J15 PL/B	V1 Text Processing: Office/Publishing
J16 C++	V2 Accessibility
J17 Prolog	V3 e-Business
J18 REXX	W1 Office Machines

Examples of De Facto Standards Bodies and Consortia in IT

- DMTF Distributed Management Task Force
- ECMA (formerly European Computer Manufacturers' Association, now just "ECMA")
- IETF Internet Engineering Task Force
- OASIS (Organization for the Advancement of Structured Information Systems)
- OMG Object Management Group
- TOG The Open Group

Examples of De Facto Standards Bodies and Consortia in IT

- UCC Uniform Code Council
- UTC The Unicode Consortium
- W3C World Wide Web Consortium
- WS-I Web Services Interoperability Organization
- ?JCP – Java Community Process?

Common elements of organizations

- Standards Development (or –Setting) Organizations (SDOs or SSOs), de jure or de facto, tend to have
  - A management and steering body
  - Technical committees or working groups developing specifications
  - Liaisons with other organizations of similar interests
- They also have tend to have
  - Turf issues
  - Problems with coordination, duplication and missing elements

Potential for negative results

- Conflicting standards
  - Beta vs. DHS; DVD-RW vs. DVD+RW
- Conflicting organizations
  - Web services in W3C, WS-I, OASIS
- “My way is better than your way”
  - De jure vs. de facto
  - IETF vs. many others (worldview)
- Corporate manipulation
  - Commercial Joint Ventures, market segmentation

Imminent issues

- Open source community relationship with SDOs/SSOs
- Potential conflicts over copyright and copyleft
  - GNU Public License not legal in Germany?
- Intellectual Property conflicts in consortia
  - RAND (Reasonable and Non-Discriminatory License)/Royalty-Free License/IP donated
- Potential for consolidation
  - Too many consortia costing lots of money
  - Overlaps, conflicts, failures and recoveries

Future of IT standardization

- De jure standards are becoming more important
  - Intellectual property issues are well-understood
  - Participation is open, level, and non-restrictive
  - JTC 1 focus on standards integration, technology watch, speed of standards development
    - Fast Track, Publicly Available Specifications,
  - Value of “International Standard” imprimatur
    - Linux Standards Base; SNIA SMI-S Storage Management Interface Specification; Biometrics Consortia
  - Partnerships and collaboration with consortia

JTC 1 Technology Watch

- Effort to identify emerging technology areas suitable for JTC 1 involvement
- Focus on standards integration
  - Identify roadmaps, missing elements
  - Coordination and collaboration role along with actual standards development
  - Linux Study Group
    - Free Standards Group involved; LSB will become I.S.
  - Web Services Study Group

Standards and SHARE

- SHARE was the only computer user association involved in IT standardization
- Represented Members' Interests
  - To Standards Development Organizations
  - To Providers
  - To U.S. National Bodies
  - To International Bodies

Examples of SHARE Successes in Standards

- Co-developed FORTRAN specification
- Helped develop original work for X3/H3 Graphics Committee and participated in development of early graphics standards
- Brokered merger of ISO 10646 and Unicode into one standard for multibyte character sets
- Participated in development of JTC 1 Policies on Conformity Assessment and Interoperability

Examples of SHARE Successes in Standards

- Authored major JTC 1 document on Collaborative Computing in Standards Development
- Contributions to 1996 Rexx Standard
  - Extensions to date() function
  - New functions for string manipulation
  - Message improvements
  - Overall user perspective complementing theoretical perspective of other committee members

SHARE not currently participating

- Participation became too expensive
- SHARE disengaged at yearend 2002
- SHARE hopes to re-engage in the future

What can you do about standards?

- Anybody can review and comment on (most) standards and specifications either in development or during a public review process
  - ANSI Standards Action (web publication)
  - IETF RFCs
  - W3C Proposed Recommendation
- Direct participation in technical committees
- Direct participation on management steering committees and policy organizations

Questions and information

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