Study of Interplay between long-term Ecma- and short-term TC39-standardization-polices-and-practices

Proposal TG5 soliciting suggestions for studies, topics to discuss (Issue #532)

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Formal Standardization started by the ITU in 1865

The International Telecommunication Union (ITU), originally founded as the International Telegraph Union, held its first meeting on May 1-17, 1865, in Paris, France (20 participants).

Incl.: Austria-Hungary, Bavaria, Belgium, Denmark, France, Greece, Italy, Netherlands, Portugal, Prussia, Russia, Spain, Sweden-Norway, Switzerland, Turkey, United Kingdom, Wurttemberg

This meeting led to the establishment of the first International Telegraph Convention and the creation of the Union to facilitate international cooperation in the field of telecommunication.

2nd meeting: 1868 July in Vienna, Austria

Way of working:

1) **Face-to-Face meetings in a few years distance at the location of the members (included travel).**
   Meeting language: French
2) **Documentation of the meeting:**
   Input documentation: Text
   Output documentation: Text
3) **Distribution of input/output: via Mail**

Some other relevant SDOs emerged

- **IEC**: The International Electrotechnical Commission held its inaugural meeting on 26 June **1906**, following discussions among the British Institution of Electrical Engineers, the American Institute of Electrical Engineers, and others, which began at the 1900 Paris International Electrical Congress.
- **ISO**: International Standardisation Organisation was founded on 23 February 1947, and (as of January 2024) it has published over 25,000 international standards covering almost all aspects of technology and manufacturing. It has over 800 technical committees (TCs) and subcommittees (SCs) to take care of standards development.

Way of working: Paper and travel/mail based - exactly the same as ITU

ICT Standardization

On the push of the emerging ICT industry in North America(pushed by CBEMA) and Europe (pushed by Ecma) it started about end of 1950s, beginning 1960s.

ICT subjects were taken over by several SDOs, including the global ITU, ISO, IEC + Reginal SDOs + National SDOs…

Still the same working style and similar SDO policies/rules:

1) Face-to-Face meetings progression in few months/years distance at the location of the meeting hosts (always required travel).
   Meeting language: English/French
2) Documentation of the meeting:
   Before: Input Text documentation preparation/distribution
   After: Output text documentation preparation/distribution
3) Distribution of input/output: via Mail / later in urgency Facsimile

Some upcoming issues related to ICT standardization in the 1980s:

- Often too slow process that could not take up with the speed of ICT development. E.g. Formation of ISO/IEC JTC1 – did not help.
- Emergence of patents in standardization. First – "quick and dirty" – RAND patent policies appeared. They remained since then mostly a "wish list", rather than a policy that can deal effectively with all cases. Often it rather gave certain parties significant playing field advantage, instead of equal playing field for all.

Significant changes related to ICT standardization in the 1990s:

- Emergence / Spread of Internet / Web / Email in many parts outside of the formal SDOs (by Consortia/Fora like IETF, W3C, Unicode, JPEG, etc..)
- Completion and spread of Multimedia (instead of ASCII text all languages supported, hypertext, still pictures (JPEG), Videos (MP4), Audio (MP3)/Speech, JavaScript,
- Internet/Web prefers RF patents (and policy) in standardization.
- Paper Based standardization started second leg with electronic documentation (increased use of email for submission of contribution, distribution, storage/archival).
- Many SDO policies/procedures were/are still lagging behind

Significant changes related to ICT standardization in the 2000s:

- **After 130 years Paper Based standardization basically ended** and transition to electronic documentation completed (full use of email for submission of contribution, distribution, storage/archival).
- All paper based archives have been scanned and put up electronically in PDF/Word format in SDO archives available over the Web. It turned out that most of the old paper based archives were already destroyed before scanning and electronic archiving.
- Increased daily standardization working via email groups / reflectors between meetings.
- Meetings still Face-to-Face with travels and full use of WLAN and Memory sticks. No more paper distribution in the meetings, all participants use their own Laptops.
- Many SDO policies/procedures were/are still lagging behind. All procedures and policies behaved like in the old paper based standardization environment (neglecting the new type of working).

Significant changes related to ICT standardization in the 2010s:

- Uninterrupted daily standardization working via email groups / reflectors between meetings is typical. Use of many additional tools (e.g. ES-wiki, ES-discuss, TC39 GitHub besides classical Ecma TC39 Email and File Server). Fragmented input / output from TC39 work. Archival difficulties.
- Meetings still dominantly Face-to-Face with travels and full use of WLAN and Internet/Web.
- Starting use of Web computer conferencing based meetings (like Webex, Zoom, etc.) either “remote only” or with “mixed” (local and remote) participation
- External pressure of saving time, costs, environmental conservation / climate change issues
- Many SDO policies/procedures were/are still lagging behind. All procedures and policies behaved like in the old paper based standardization environment (neglecting the new type of working). Very few policies emerged to reflect new reality

Significant changes related to ICT standardization during COVID:

- In 2020 Face-to-Face meetings stopped completely for about 3 years. Slow recovery afterwards but it will never come back fully.
- Generally, homeworking….Therefore, for many groups, like TC39, uninterrupted daily standardization working via email groups / reflectors between meetings continued and went well. Several different Web computer conferencing based meetings were used (like Webex, Zoom, Teams, Google Meets etc.) all with "remote only" participation.
- External pressure of saving time, costs, environmental conservation / climate change issues became even stronger
- In major SDOs (like ISO, ITU, office work completely stopped). Many SDO policies/procedures were/are still lagging behind. All procedures and policies behaved like in the old paper based standardization environment (neglecting the new type of working).

Significant changes related to ICT standardization after COVID:

- Starting in 2023 Face-to-Face meetings started. For TC39 out of 6 meetings, 3 “mixed” and 3 “remote”. Quality of “mixed” better (audio, better transparency over local participation).
- Work: Mixed homeworking and local….
- For many groups, like TC39, uninterrupted daily standardization working via email groups / reflectors between meetings continued and went well. Several different Web computer conferencing based meetings were used (like Webex, Zoom, Teams, Google Meets etc.) all with “remote only” participation.
- In major SDOs (like ISO, ITU, office work came back). Slow recovery. Many SDO policies/procedures were/are still lagging behind. Few procedures and policies started to emergence on remote and mixed meetings.

Conclusions: What new factors will significantly influence future standardization?

- Besides “classical” text also Multimedia (audio, video, text, data) based contributions both for input (e.g. contributions) and output (e.g. reports)
- As tools we can expect the strong use of AI based tools, such as:
  - *transcription (multimedia -→ text)*
  - *Summary of contributions / discussions*
  - *programming / coding*
- Standardization will be a continuous effort using various parallel tools, like GitHub type platforms, ICQ, conferencing platforms. Challenge for a clean archival of significant standardization steps among all these.

Next steps 1:

- Start testing true multimedia based input; like preparation of multimedia contributions in video in MP4 e.g. 2 weeks before the meeting and distribution. (So, not only 4 slides just before the meeting and the multimedia presentation – single time – during the meeting, and 3 people try to capture and transpose that into text during the meeting.)
- Start testing using AI tools to generate from the multimedia mp4 summary and transcript for the meeting (so not after the meeting…)
- Start testing use output documents from the meeting using the above elements.

Next steps 2:

- Start study of what I call **“Human Heritage Standards”**
- This is a set of existing standards that have already proved in practice that they will be relevant “forever” (so also for long term) and where already billions and billions data exists which should be accessible and usable “forever”. Examples:
  - *Digital documents in e.g. already accepted formats like, like PDF, OOXML, ODF – documents with valuable archival content*
  - *Digital pixel oriented (e.g. photos) in already accepted formats, like JPEG-1, MR, MMR, MH, JPEG2000*
  - *Audio-Video in already accepted formats, like MP4, MP3,…*

Next steps 2 cont.:

- Start study of what I call **“Human Heritage Standards”**
- Define criteria for being included in such “Human Heritage Standards” (e.g. must be stable and actually could be already frozen, must be open, must be Royalty Free)
- What other components are needed for a “Human Heritage Standard” (must be accompanied with for long-term functioning reference implementations etc…)
- Create, approve and maintain a list of “Human Heritage Standards”

Next steps 2 cont.:

- Start study of what I call **“Human Heritage Standards”**
- Question / Study: Does JavaScript (ECMAScript) or part of it qualify to be listed among the “Human Heritage Standards”. Here ideas and feedback is required.
- Question: What about lower level layers? Currently the “forever” requirement is rather unsolved. (For the paper, Microfilm based system we have working solutions for a few hundred years – even until 1000-2000 years, on media for digital storage we have best up to a few decades, but what about the always needed IT systems?)
- Question: Can be always rely on the availability of some sort of electricity, or we need a self-supporting solution?