

# Standardising the Internet of Things – Is Today's System Adequate?

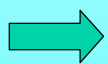
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## A Bit of Motivation

The IoT represents another paradigm shift in communication

- initially, communication occurred between humans,
- ICT enabled communication between humans and machines and between machines,
- the IoT will enable communication between 'things', without any human intervention.



This will change people's lives perhaps even more dramatically than ICT has done so far.

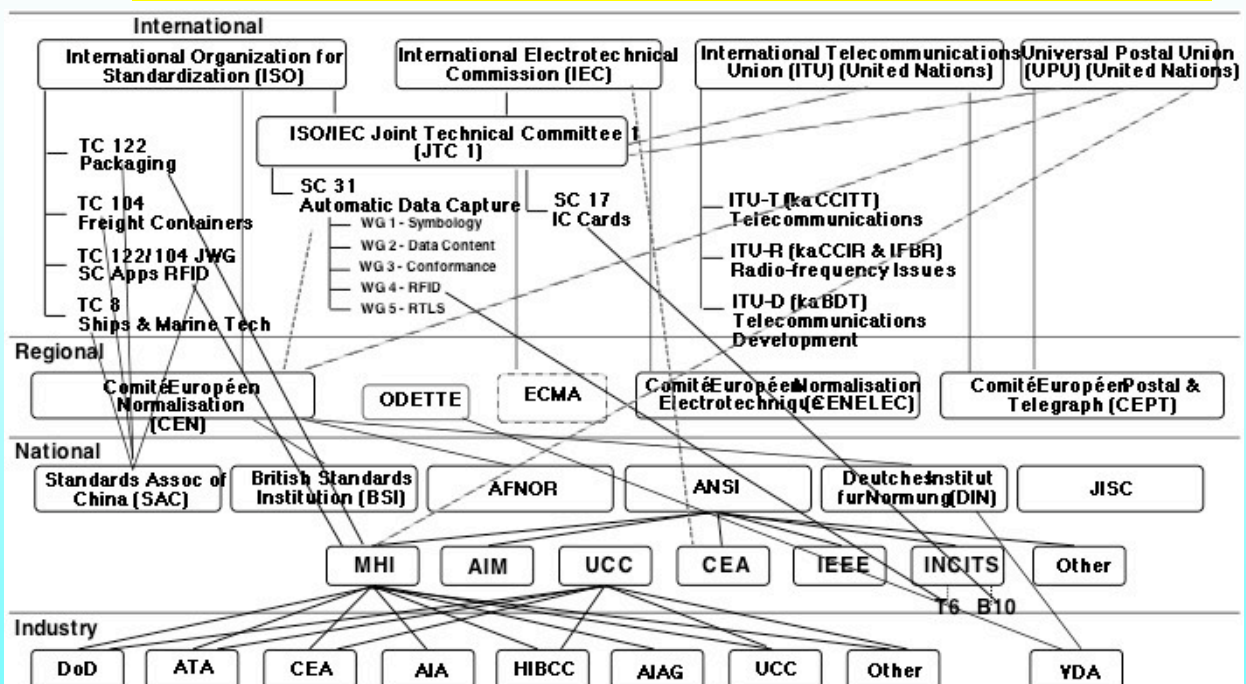
# Standards for the IoT

- For the IoT, internationally agreed standards will be essential; it will largely be shaped by these standards.
- The standards setting process will need to reflect the fact that the IoT will have an unprecedented impact.
- (New) ways to enable all interested and affected parties to participate in this process will have to be identified.



Standardisation must not be limited to technical matters, but also take into account socio-economic and political aspects.

## The Full(?) Picture



according to [Jennings, 2007]

# Standards Setting Bodies Analysed

Acronym	Full Name
<i>Directly working on (Networked) RFID standardisation</i>	
ISO*	International Organization for Standardization
ISO/IEC JTC1	ISO/IEC Joint Technical Committee 1
ITU-T	International Telecommunications Union – Telecommunications Sector
ETSI	European Telecommunications Standards Institute
EPCglobal	Electronic Product Code
<i>Working on supplementing/related standards</i>	
IEC*	International Electrotechnical Commission
CEN	European Committee for Standardisation ( <i>Comité Européen de Normalisation</i> )
CENELEC*	European Committee for Electrotechnical Standardisation ( <i>Comité Européen de Normalisation Electrotechnique</i> )
IEEE	Institute of Electrical and Electronics Engineers
IETF	Internet Engineering Task Force

\* These SSBs were eliminated from analysis as their characteristics are very similar to those of ISO.

## WTO Requirements - Theory

- **Transparency**  
All essential information should be made easily accessible.
- **Openness**  
Membership should be open on a non-discriminatory basis to relevant entities.
- **Impartiality and consensus**  
The standards development process must not give privilege to particular suppliers, countries or regions; consensus procedures should be established.
- **Effectiveness and relevance**  
International standards need to be relevant and to effectively respond to regulatory and market needs, and to technological developments.
- **Coherence**  
International standards bodies should avoid duplication of work.
- **Development dimension**  
Constraints on developing countries, to effectively participate in standards development, should be taken into consideration.

## WTO Requirement - Practice

- **Transparency**  
In most cases, draft standards and other 'interim' docs are not publicly available (exception: IETF).
- **Openness**  
Ok.
- **Impartiality and consensus**  
There is an under-privileged 'Third Estate' (SMEs, consumers) who cannot afford participation (travel/personnel costs, lack of knowledge).
- **Effectiveness and relevance**  
There are many counter-examples, but that's probably unavoidable.
- **Coherence**  
OOXML and ODF would be the latest popular counter-example.
- **Development dimension**  
Developing countries may be considered as members of the 'Third Estate' (e.g., 192 countries world-wide, 161 ISO members, 42 JTC1 P-members, 5-6 developing countries).

## SSB Evaluation Criteria

- Overall # of members
- Key players involved?
- Membership levels
- Annual membership fees
- To establish new activity
- Average time until finalisation
- Openness of technical activities
- Transparency
- Voting policy
- Required level of consensus
- Observation of due process
- Individuals' capacity
- Types of 'products'
- Output
- IPR policy
- Liaisons
- Free specs
- Standards maintenance

# The Most Relevant Characteristics

<b>ITU-T</b>	<ul style="list-style-type: none"><li>• Only member states may vote.</li><li>• 'Sector members' are typically large organisations.</li></ul>
<b>EPC Global</b>	<ul style="list-style-type: none"><li>• Clear focus on users.</li><li>• Seems to put off manufacturers.</li></ul>
<b>JTC1</b>	<ul style="list-style-type: none"><li>• Oriented towards broad consensus.</li><li>• Participation/voting through NSOs may be beneficial for SMEs.</li></ul>
<b>IEEE</b>	<ul style="list-style-type: none"><li>• 'Individual' projects favour large companies'.</li><li>• 'Corporate' projects are more suitable for smaller ones.</li><li>• Very keen on avoiding dominance of one player.</li></ul>
<b>IETF</b>	<ul style="list-style-type: none"><li>• 'Individualistic' approach may work both ways.</li><li>• Very 'technical' orientation typically bad for users.</li><li>• Work through mailing lists may be good for 'Third Estate'.</li><li>• But presence at meetings is essential.</li></ul>
<b>CEN/ISSS</b>	<ul style="list-style-type: none"><li>• Everyone can initiate and run a WS ⇒ good for 'Third Estate'</li><li>• Limited level of consensus ⇒ CWAs may not be taken overly serious.</li></ul>
<b>ETSI</b>	<ul style="list-style-type: none"><li>• Voting system clearly favours large companies.</li><li>• 'Full' members enjoy a slight advantage in voting.</li></ul>

## What Influences Standards Setting?

### ISO & ITU

- speaking out at meetings
- technical merits of a proposal
- corporate/government interests.

### IETF

- technical merits of a proposal
- defend proposal at meetings.

### IEEE

- presence and reputation of proposers
- technical merits of a proposal
- desire to create a level playing field, but also
- employer's power.

# Who Should Go Where?

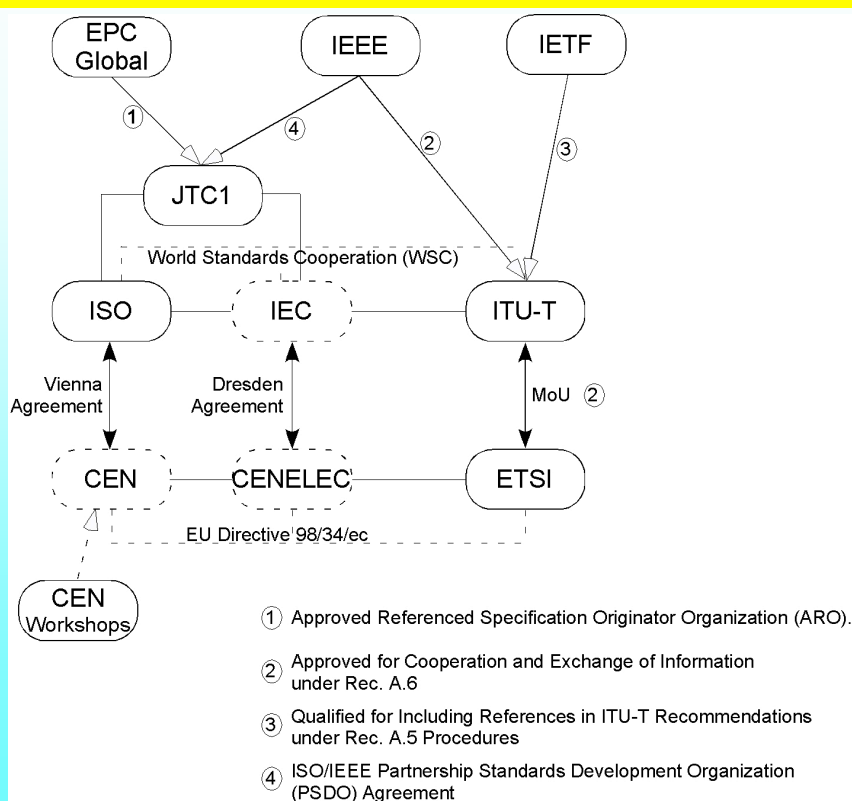
## Users

- EPCglobal
- IEEE corporate (US companies)
- CEN/ISSS

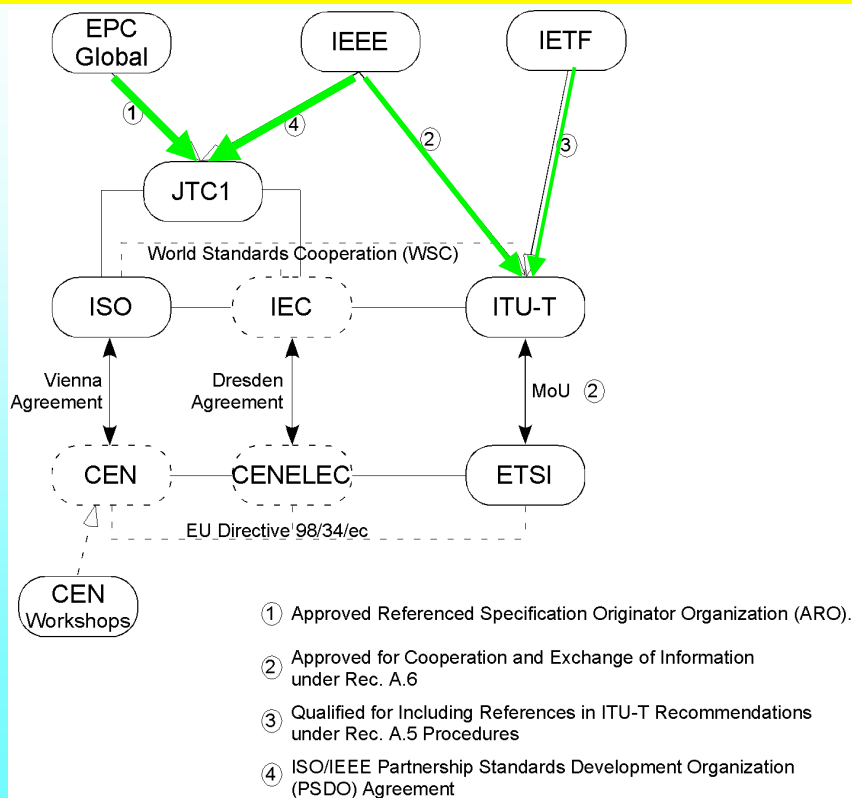
## SMEs

- NSOs → JTC1
- IEEE corporate (US companies)
- IETF (in case of a manufacturer)
- CEN/ISSS

# Links Between Organisations



# The 'Third Estate' Being Crafty

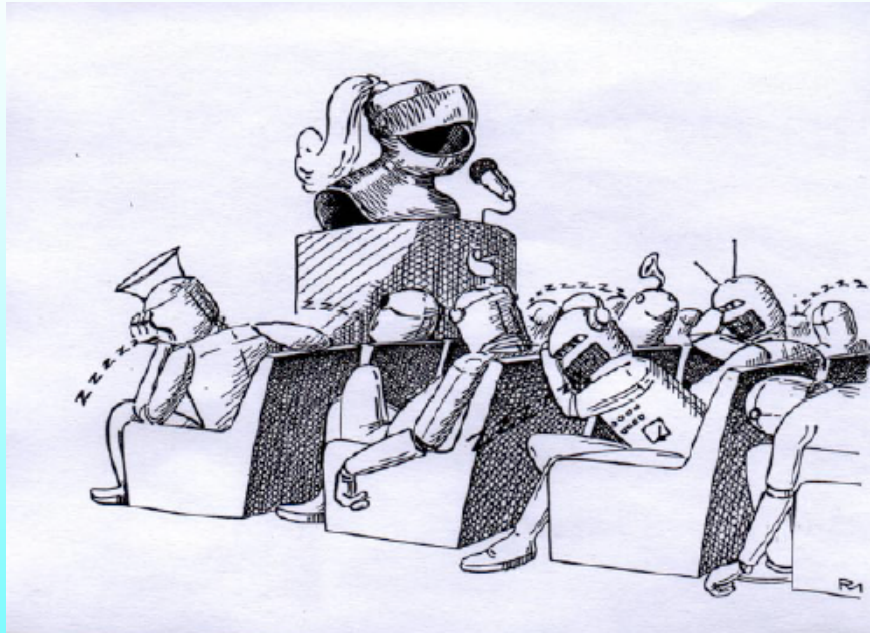


## Some Preliminary Recommendations

- Some stakeholders are still disadvantaged in ICT/IoT standardisation.
- This may (partly) be overcome by a wise selection of SSB, plus exploitation of existing links with other SSBs.
- Still, policy makers and SSBs need to support a more level playing field through e.g.,
  - Education
  - Financial support to individual stakeholders
  - Financial support to umbrella organisations
  - Virtual meetings (to reduce travel costs)
  - More decentralised/regional meetings

*Thank You Very Much for Your Attention*

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*Questions, Please .....*