

ITU-T Kaleidoscope 2010
**Beyond the Internet? - Innovations for
future networks and services**

**How Many Standards in a Laptop
(and Other Empirical Questions)**

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Pune, India, 13 – 15 December 2010

About the Authors

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- *Paper and related comments reflect only our personal views*

How Many Standards in a Laptop?

■ 5? 50? 500?



Counted *Interoperability Standards* in Various Technical Areas

- Memory
- Display
- Graphics
- Wireless
- Sound
- Power
- Input/Output (I/O)
- Security
- Processor
- Content Protection
- Software
- Networking

(We know we missed some key areas)

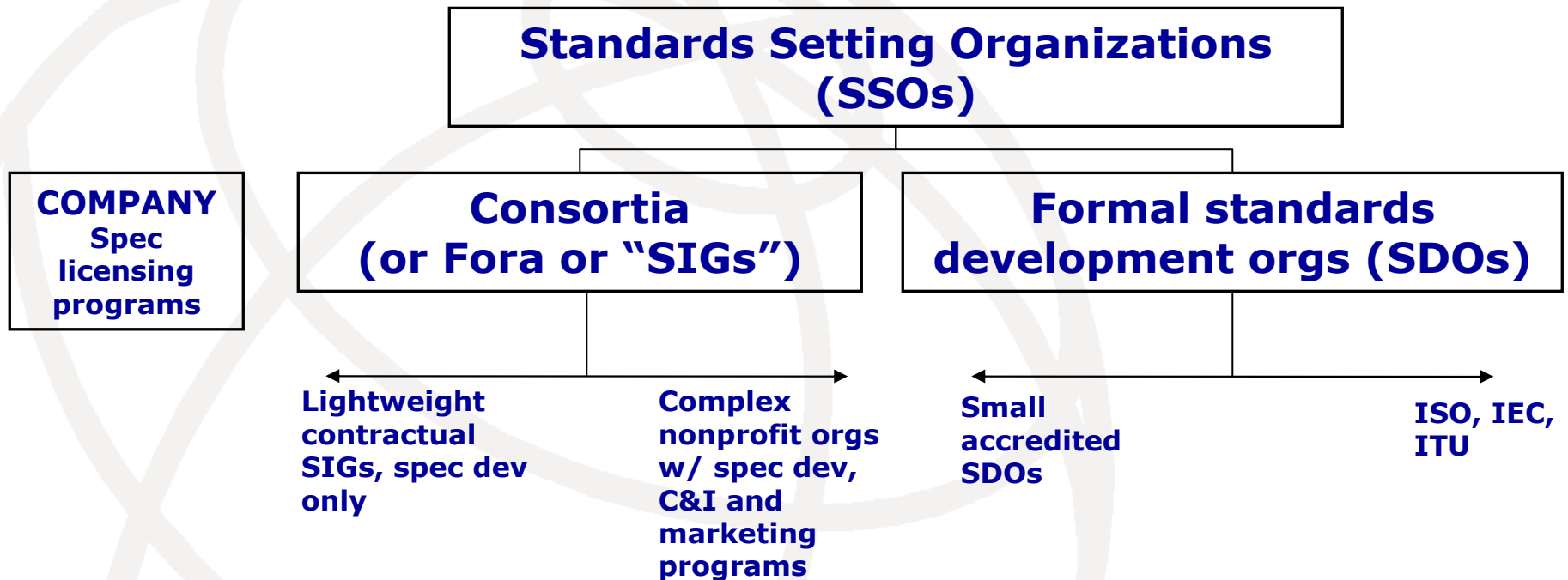
Excluded Other Kinds of Standards

- Performance
- Accessibility
- Design Process
- Manufacturing Process
- Quality
- Safety
- Environmental
- Measurement
- Electromagnetic compatibility

“Standards”

- Technical specifications produced and made available for 3rd party adoption by:
 - 1. Formal SDOs
 - 2. Consortia
 - 3. Individual companies
- **Not** popular/dominant proprietary technologies

SSO Framework



How Many Standards in a Laptop?

- At least **251** – and probably closer to 500

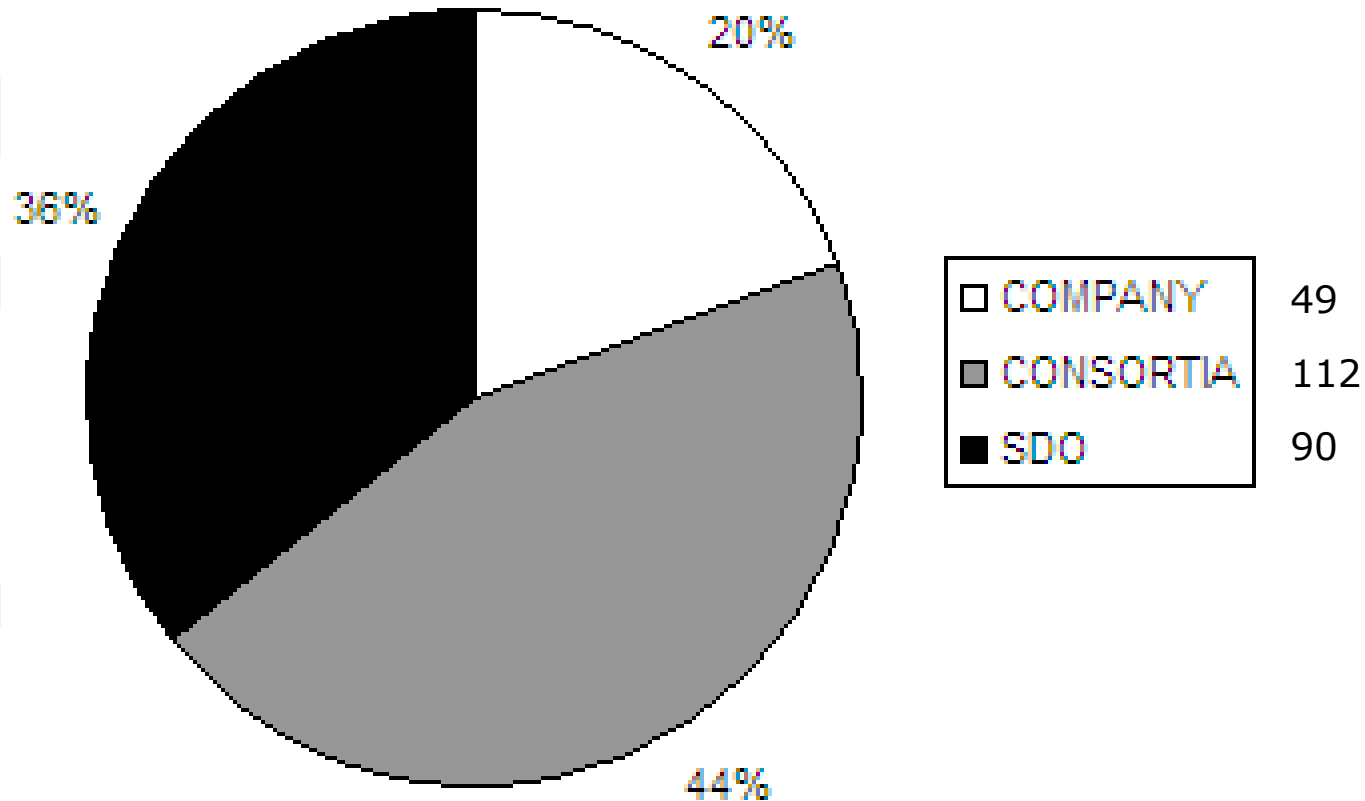


Two Additional Questions

- Who made these standards?
 - SDO, Consortia or Company?
- What intellectual property rules govern these standards?
 - [Fair,] Reasonable and Non-Discriminatory ([F]RAND) license commitment
 - Royalty-Free (RF) (RAND-Z, RAND-Zero, RF-RAND, non-assert, etc...)
 - Patent Pool

Who made these standards?

- Only about 1/3rd produced by formal SDO



What IPR Rules Govern?

- Allocated into four “buckets”
 - ➔ Caution: masks significant complexity



RAND
(148)



RF
(43)



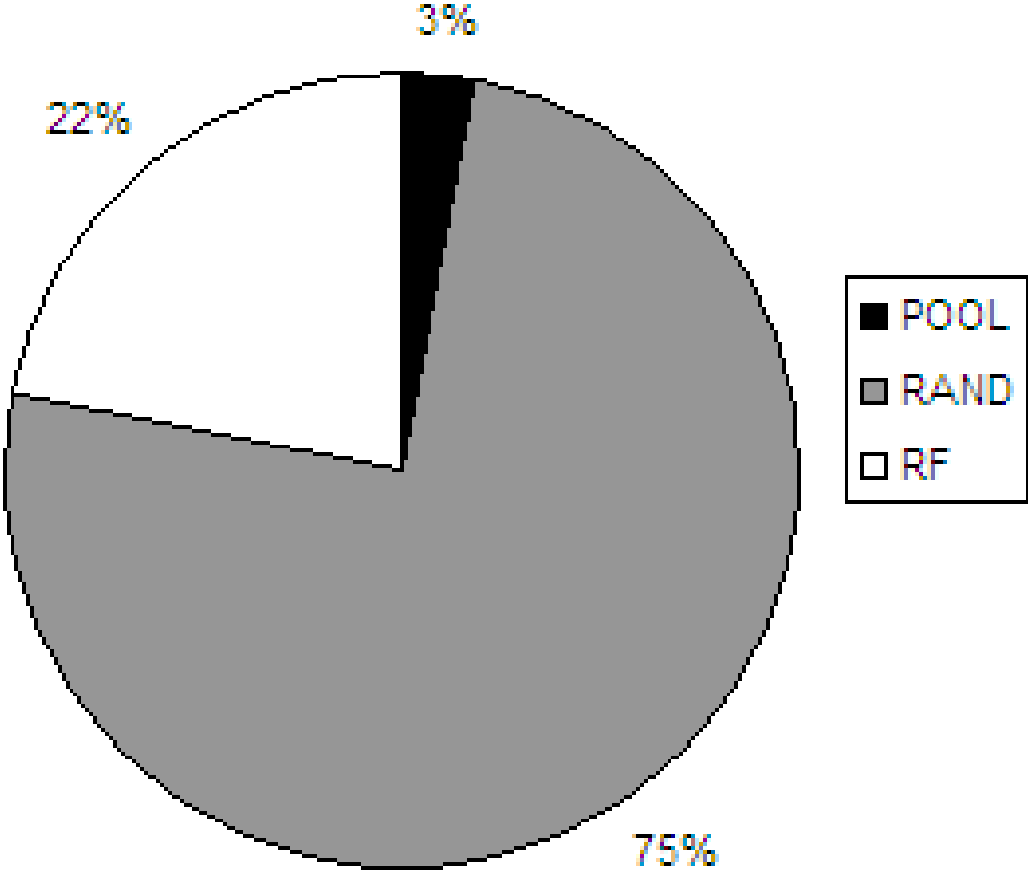
POOL
(6)



UNKNOWN
(54)

IPR Rules, Con't

■ 3/4th RAND, very few Pools



Key Observations

- ~500 interoperability standards in a laptop!
 - ➔ Critical role facilitating innovation, trade, etc.
 - ➔ ICT different from other industries?
- Importance of Consortia, Company specs
- Historical dominance of RAND
 - ➔ But note: RAND with royalty programs v. RAND without
 - ➔ Potential new pressures emerging (e.g. patent litigiousness; open source)
 - ➔ Historic limited role for patent pools

Potential Future Research

- Expand data set and refine data quality
- More granular analysis of RAND
 - Royalty programs
 - 'Hidden' royalty programs, via cross-licenses
 - RAND but *de facto* RF
- Rate standards against "openness" criteria
- Map trade impacts of these laptop standards
 - Global supplier/product ecosystems



Questions / Discussion

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