

# Re-designing Standardization for Inclusivity

*“A Search for the Perfect Standard”*

Michael B. Spring  
Professor Emeritus  
University of Pittsburgh

# Overview

1. Answers to some of the questions posed by the moderator
  - Public and private goods
  - Monopoly or monopsony power
  - The role of government
  - Critical infrastructure
  - Social Goals
  - Role of standardization
  - IPR
2. A few thoughts about perfecting the standards process
  - Historical Context
  - The unique nature of ICT standards
  - The perfect standard

# Are standards a public, private, or impure public good

- An economic term related to availability and cost
  - The question seems to be directed at:
    - the licensing of intellectual property that may underlie standards
    - The selling of standards documents as a way to recoup costs
- Broad standards should be public goods.
- This in no way deters organizations from making public specifications that are private goods.

# Can standardization confer monopoly or monopsony power

- Economic terms related to control
- In capitalistic societies, control of trade or labor is considered contrary to capitalisms and is restricted by government.
- In contrast it would seem to be a goal in totalitarian or centrally controlled nations.
- A standard, which follows RAND/FRAND intellectual property guidelines, would have few monopolistic implications.
- Nations vary on a continuum. It is not clear if a global policy is possible.

# The Role of Government in Standards

- The simple answer is that government is and should be involved.
- The complication is related to the degree/amount.
  - the government sets some standards, is active in working on others, promotes standards use, and in some cases, like DOD, will not award contract that are non-compliant.
  - In the US the amount of money is a relatively small percent of the total cost, but not trivial
- Another way to look at the question is to ask if the government should absorb the cost of participation in standardization by various interested groups – significantly increasing its share of the total cost.

# Standards in Critical Infrastructure

- Yes, standards should be used in critical infrastructure, both in the US and countries around the world.
- The question is whether they will be international, national or government.
- Keep in mind, national defense has long been one reason not to harmonize US standards
- The US has now identified 16 critical infrastructures
  - Chemical Sector; Commercial Facilities Sector; Communications Sector; Critical Manufacturing Sector; Dams Sector; Defense Industrial Base Sector; Emergency Services Sector; Energy Sector; Financial Services Sector; Food and Agriculture Sector; Government Facilities Sector; Healthcare and Public Health Sector; Information Technology Sector; Nuclear Reactors, Materials, and Waste Sector; Transportation Systems Sector; Water and Wastewater Systems Sector;

# Standards promoting Social Goals

- Of course they should
- They have been since long before the modern era of standardization.
- They are generally regulations put forward by governmental units.
- They could be built into technical standards in areas such as:
  - safety guarantees
  - privacy guarantees
  - security assurances
- This will become complicated and ultimately would involve “regulation” and oversight of certain industrial standards. (For example, IOT and security)

# Role of standardization organizations in a new system

- Existing organizations will evolve, as they have in the past
  - IPR policies
  - Digital dissemination and free access
  - Low cost digital participation
- There is extensive knowledge embedded in the existing organizations about life cycle, due process, and remediation
- New standards developers will need to buy into all the requirements of the process – not just market building
- There will be new requirements – such as an interface with government



# Should IPR royalties be allowed

- This is closely related to the cost of standards and to a lesser extent related to public goods questions.
- The extensive efforts of many individuals and organizations to promote RAND/FRAND seems to be managing these complex issues
- My position would be to treat the matter on a case by case basis
  - When contribution can be accomplished, perfect
  - When not, it must be clear that the inclusion of IPR is RAND and offers significant “correctness” to the standard

# Some Thoughts on Perfect

# Historical Perspective

**Management of Commerce**

**Industrial Needs**

**Scientific Advances**

**ICT/IOT**

1500

1800

1900

2000

# A Personal Perspective on ICT Standards

- I am generally ignorant about the vast majority of things we call standards -- I am ICT and US biased
- ICT standards are different from industrial and scientific standards
  - Number being developed annually (100/1)
  - Number of pages of specification (10/1)
  - Longevity of a standard (1/10)
  - Stability of the standardization process
    - SDOs
    - IETF,W3C,IEEE
    - Consortia
    - Special Interest Groups

# How do Standards and Standardization Vary

- **Life cycle**
  - origin, development, enforcement, maintenance, sunset
- **Scope**
  - company, industry, country, global
- **Responsibility**
  - for development, for implementation
- **Mandate**
  - legal, business imperative, professional ethics
- **Inclusion**
  - who cares, who is impacted, ???

Pressure  
Vessels

Web Content  
Accessibility

WiFi

Phone Tariffs

Drinking  
Water

Electrical  
Measures

Screws

# The Perfect Standard

Take 30 seconds

Write down what you consider the best  
exemplar of a standard

# My Choices for a Perfect Standard

- Drinking water (Safe Drinking Water Act, 1974, as amended in 1986,1996)
- Screws (ASME B1.1-2003 (R2018))
- Wifi (IEEE 802.11a-?)
- Web content accessibility (W3C WAI: WCAG and ATAG)
- Keyboards (ASCII; QWERTY; PC interface signaling)
- Boiler Pressure Vessel (ASME BPV code – 16,000 pages in 28 volumes)
- Bluetooth (IEEE 802.15.1; BSIG BT1-5)
- US Interstate Highways (<https://www.fhwa.dot.gov/resources/>)
- Phone tariffs (ITU D Series)

# What makes for the Perfect Standard?

- It's correct,
  - Driven by the best knowledge available; responsive to the need it is intended to meet; free of organizational biases; Lasts a reasonable time.
- It's fair
  - Doesn't favor one organization or another; takes the needs of all those impacted into account; has a mechanism that allows for redress of issues.
- It's free
  - Someone has to pay for development, availability and maintenance. When people say free, they mean they want people and groups to be able to participate in developing it for free, accessing it for free, and not having to pay to implement it. The question is not whether it is free or not. The question is who bears the costs that are involved.



Thank You

# New Forces in the World

- Cyberterrorism
  - Nationally based
  - Economically based
- The European Union
  - Multi-national standards
  - Trade promotion
- Emergence of Asian economies
  - Trade controlling standards
  - New protections for intellectual property
- Africa and South America
  - Post Information Evolution

# Structure Will Follow Issues/Needs

- What are the issues/needs?
  - Are data breaches the result of inadequate standards?
  - Are we facing a crisis in standards quality – due to narrow market focus?
  - Have we lost our ability to produce roadmaps for the future?
  - Is there an imbalance in governance structures?

# Possible Solutions

- Are data breaches the result of inadequate standards?
  - Can a security framework for standards be provided by governments?
- Are we facing a crisis in standards quality – due to narrow market focus?
  - Is there a way to insure for professional review of business motivated standards?
- Have we lost our ability to produce roadmaps for the future?
  - Should the development of roadmaps be funded by governments or industry groups
- Is there an imbalance in governance structures?
  - How does Openstand differ from ISO/IEC and ANSI type oversight?

# The Responses to ICT Standards Issues

- IETF versus OSI
  - Standards by demonstration
  - Standards by competition
  - Lightweight standards
- W3C versus ANSI
  - An echo of professionally dictated standards
- INCITS and TIA
  - Diversification of standards
- Ad hoc Standardization (see next slide)

# IOT & New ICT standards developers

- ZigBee Alliance,
- 3MF Consortium(3D Printing),
- Mobile Payment Forum (MPF),
- Car Connectivity Consortium,
- SD Card Association Security Industry Association (SIA),
- Smart TV Alliance,
- EIS Alliance(energy management and smart grid),
- HDMI Forum,
- HomePlug Powerline Alliance,
- Open Automotive Alliance,
- Open Geospatial Consortium (OGC).