U.S. Government and Emerging Technology Standardization –

Implications for NIST's Roles

National Institute of Standards and Technology
U.S. Department of Commerce

Issues of Interest

The US approach to standards development

NIST's role in documentary standards

Trends in documentary standards development

How NIST is preparing and responding

Documentary Standards

Courtesy: Werner.com

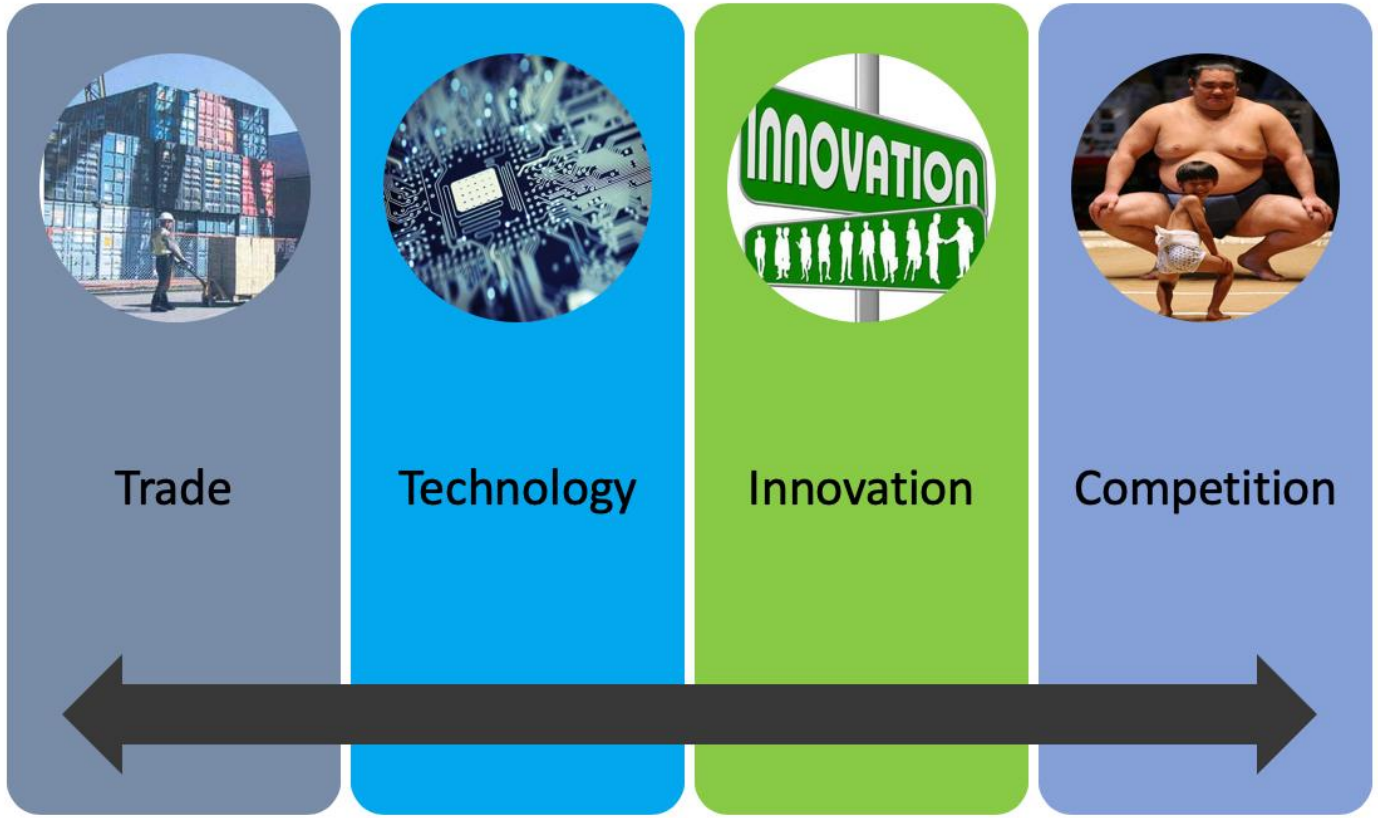
Courtesy: Newegg.com

Documents that provide for common and repeated used, rules, guidelines or characteristics for activities or their results

Developed through processes with specific process attributes, such as:

- Consensus
- Openness
- Balance

Why Standards Matter



http://www.technologyed.com/courses/c160/index.ph
http://econintersect.com/wordpress/?p=17696
http://www.guzer.com/pictures/sumo_mismatch.php

- **Pervasive and ubiquitous**
- **Impact every aspect of modern life**
- **Enable health and safety**
- **Provide certainty in commerce**
- **Help realize economies of scale**
- **Essential for interoperability**
- **Are the foundations for technological innovation**

The U.S. Approach to Standards

- Reflects US economic system and culture
- De-centralized and bottom-up, i.e. user-driven
- Private–sector, active government participation
- Stakeholder needs responsiveness
- User choice – organization and model

Over 251 standards and specifications:

112 developed by consortia

90 by consensus standards development organizations

49 by individual companies

- Agile system for fit-for-purpose solutions
- US leadership in industry and technology for many decades
- Strong private-public partnerships

"How Many Standards In a Laptop (And Other Empirical Questions)" *Brad Biddle, Andrew White and Sean Woods,* Arizona State University, Sandra Day O'Connor College of Law, June 2010

NIST's Role

Courtesy: Sean Kelley/PML

NIST staff participation in documentary standards
- 400+ staff
- 100+ standards organizations
- 1000+ unique standards activities

1. Technical

- Knowledge transfer from NIST to large scale practice
- Enhance technical quality and effectiveness of resulting standards
- Identify market needs and trends
- Technology adviser to agencies

2. Policy

- Federal agency information exchange
- Coordination with the private sector
- Standards and conformity assessment resource e.g., WTO TBT Inquiry Point, USTR for trade negotiations, etc.

Global Trends and Changes

Role of non-traditional participants

New and alternate approaches

Early stage standardization

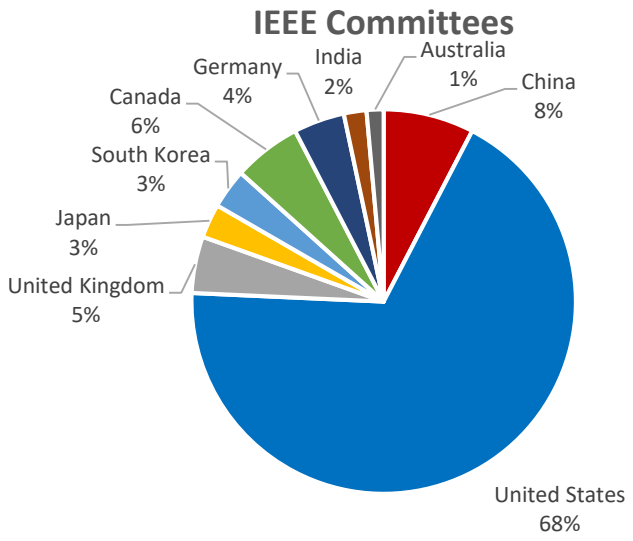
Innovation pace

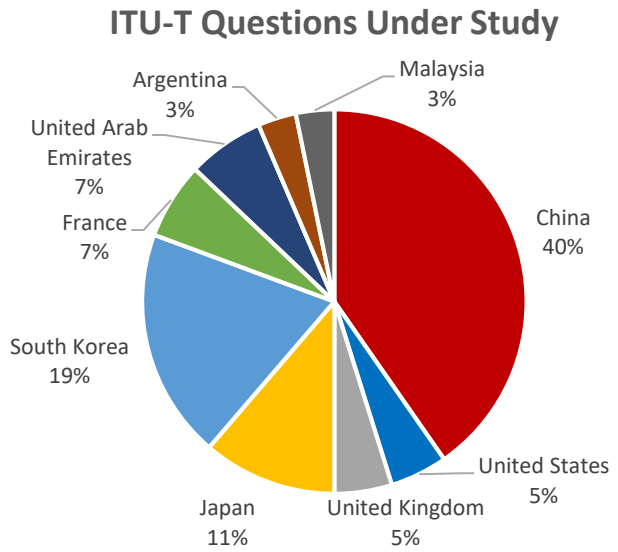
First to market pressures

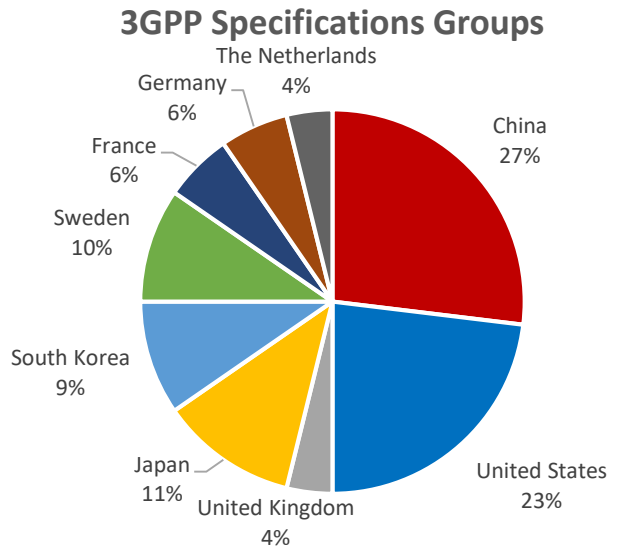
- Most noticeable in emerging digital technologies space

Example of Leadership in Select Standardization Activities

Different models of standards development
Range of leadership roles
Static data not trends







Various search terms in *IEEE Standards Association Find Projects*. Retrieved between April 10, 2019 and May 8, 2019 from https://standards.ieee.org/project/index.html

Leadership from Cloud Computing, Cybersecurity and Privacy, Learning Technology, Microprocessor, and Networking (LAN/MAN) in *IEEE Standards Committees*. Retrieved between April 10, 2019 and May 8, 2019 from https://www.computer.org/volunteering/boards-and-committees/standards-activities/committees

SG13, SG 17, and SG20 in *ITU-T Study Groups*. Retrieved April 9, 2019 from https://www.itu.int/en/ITU-T/studygroups/2017-2020/Pages/default.aspx

RAN1, RAN 2, RAN4, SA1, SA2, SA3, and SA 6 in *3GPP Specifications Group Home*. Retrieved April 9, 2019 from https://www.3gpp.org/specifications-groups/specifications-groups

USG Trends and Changes

Executive and legislative branch interest

National security and economic security considerations

Ensuring technology standards consider and reflect US interests

Tight budgetary environment

Inability to commit to long term participation

Leadership in standards for AI, Quantum, 5G, and other emerging digital technologies

NIST Responses

Changes presenting new opportunities and challenges

Stepped-up efforts to raise awareness among federal staff and leadership

Increased federal inter-agency engagement and information exchange

Enhancing standards and conformity assessment competence of federal staff

Facilitating greater engagement between US private-sector and federal agencies

Impacts and Considerations

Higher profile and understanding of NIST's role and responsibilities

Increased expectations and interest in NIST engagement

NIST asked to fill in gaps in standards development

Reprioritization of limited financial resources

Diversion of technical resources away from research, measurement and technology development

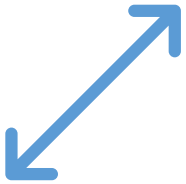
Risk of mission creep and impact on effectiveness

Takeaways

NIST is a valued and key player in the documentary standards ecosystem

Changes and trends in standards development reflect broader economic and geo-political changes

Greater awareness about the need for effective and strong US engagement in standards development



Increased expectations for NIST

Thanks