

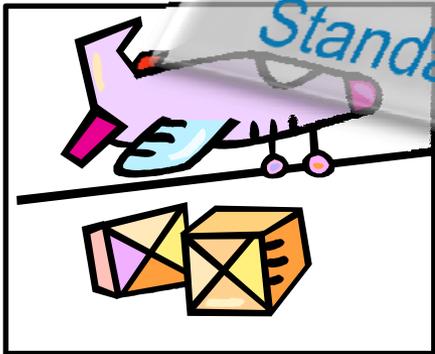
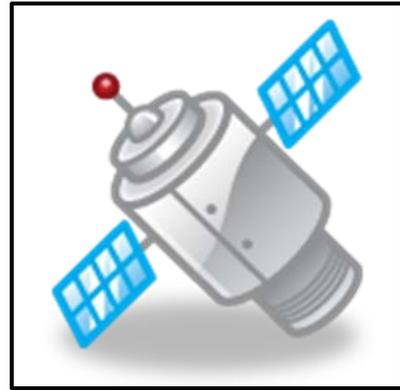


NIST

Global Standards Information



Fundamentals of Standards



Standards are all around us



Standards in History



U.S. Founding Fathers Recognized the Importance of Standards

“Uniformity in the currency, weights, and measures of the United States is an object of great importance, and will, I am persuaded, be duly attended to.”

George Washington, State of the Union Address, 1790

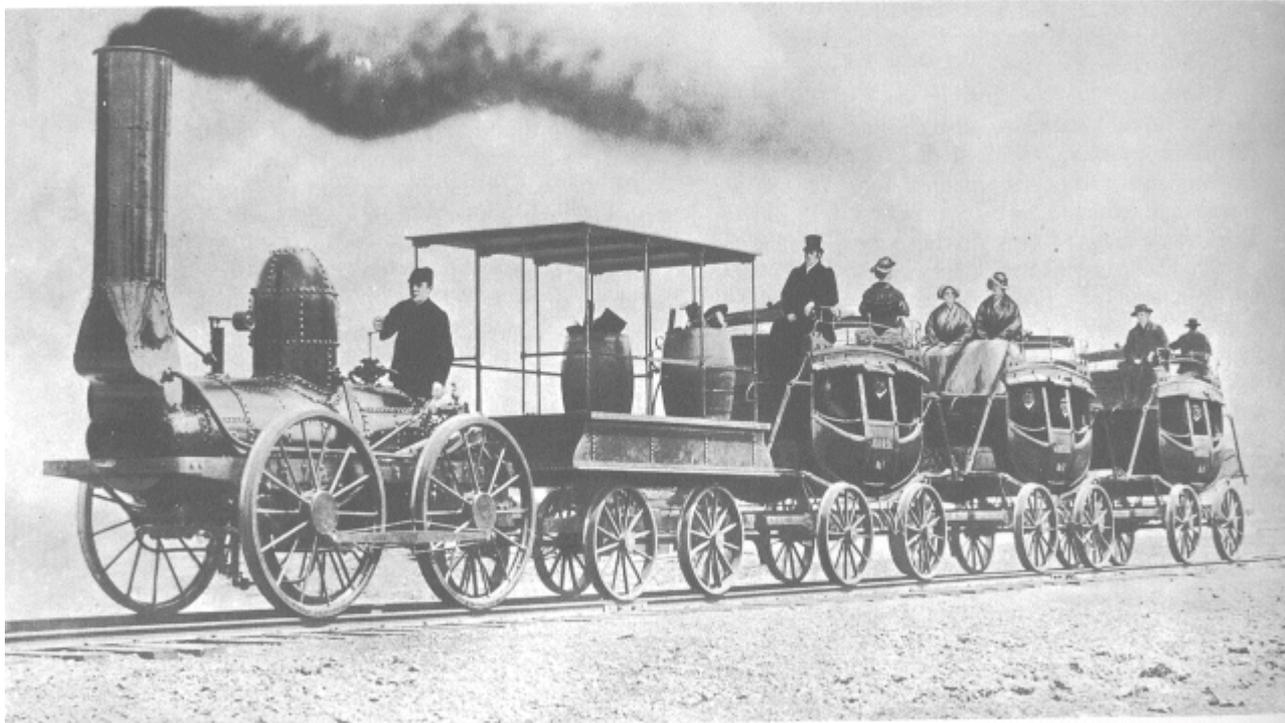
... The Congress shall have Power To ...

... and fix the Standard of Weights and Measures;

U. S. Constitution



More Standards in History





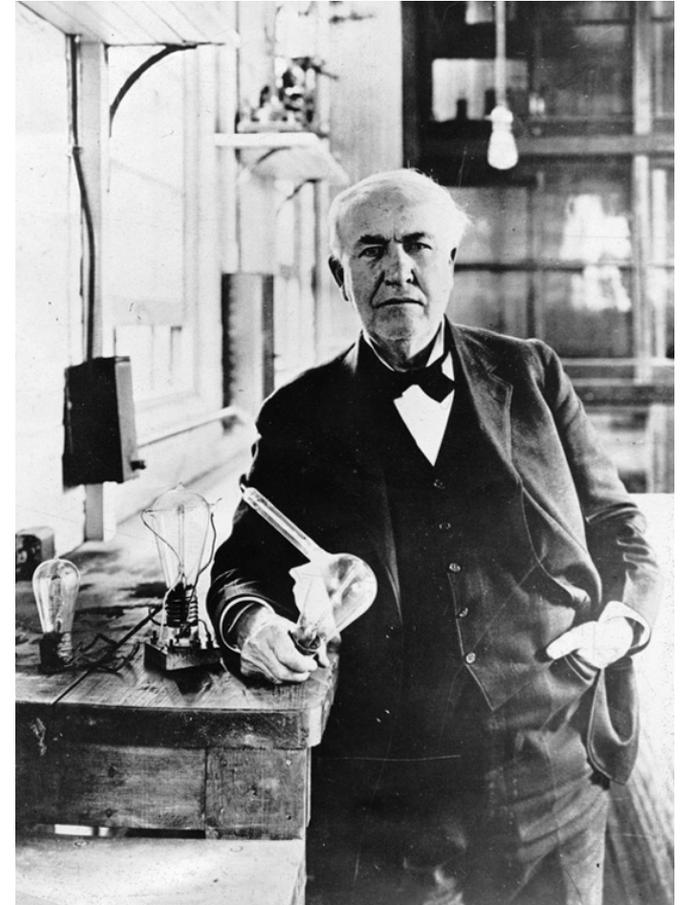
Early Drivers for Standards



Baltimore
Fire of 1904

NIST Was Established to Meet Early Standards Challenges

- Established by Congress in 1901 as the National Bureau of Standards (NBS)
- Eight different 'authoritative' values for the gallon
- Nascent electrical industry needed standards
- American instruments were sent abroad for calibration
- Consumer products and construction materials were uneven in quality and unreliable





Key Standards Terms

Standards

Market-driven technical specifications for a product, service, person, process or system; compliance is voluntary

Documentary Standards

Technical specifications

Measurement Standards

Underpin most documentary standards

Voluntary Standard

Mandatory Standard



Key Standards Terms, continued

Technical Regulations

Technical specifications, which may include (or reference) particular standards, with which compliance is mandatory.

Conformity Assessment

Processes used to verify the compliance of a product, service, person, process or system to either a standard or a regulation. (ISO/IEC 17000)

The U.S. Standards System

The U.S. standards system is voluntary, decentralized, sector driven and, sometimes, competitive and duplicative

The system relies on cooperation and communication among:

- Private sector standards organizations
- Industry
- Government

The U.S. Standardization Model – “One Approach Among Many in the World”

The U.S. “standardization” model:

- resembles the nation’s economic structure:
 - sector-based and driven by market needs
- reflects government/private sector dynamics
- relies strongly on diversity and decentralization



Key Concepts in Standards Development

Openness

- all stakeholders may participate; no single interest may dominate

Transparency

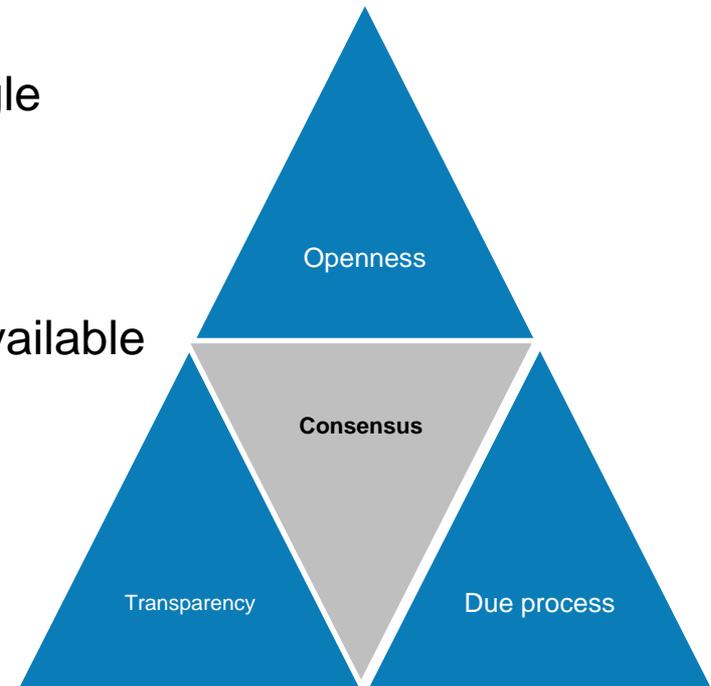
- records/ processes open and publicly available

Due Process

- appeals mechanism

Consensus

- more than a majority but not unanimity





Standards Development is a Business

SDO	Scope	Standards	Technical Comm's	Subcommittees / Working Groups	Volunteer Members	Revenue
ASME	Codes and standards for all engineering disciplines	600+ Codes & Standards	100	700 committees	4,000	\$86 million (2009 annual report)
ASTM Intl.	Standards on characteristics and performance of materials, products, systems & services	12,000+ standards	140	1,800	30,000	\$47 million (2008 annual report)
ISO	Standards for all disciplines except electrotechnical and telecommunications	18,000+ standards	210	3238 technical bodies	161 member countries	\$30 million (2008 annual report)
SAE Intl.	Standards for the automotive, aerospace, and commercial-vehicle industries	9,000 standards & technical documents		700 committees	14,000 developing standards; 121,000 members	\$47 million (2009 annual report)
IEEE		1300+ standards and 600 projects under development			397,001	\$389,660,000 (2009 annual report)



What is “Consensus”?

- ANSI Essential Requirements
 - a majority of the consensus body cast a vote (counting abstentions) and at least two-thirds *of those voting* approve (not counting abstentions).
- SDOs may propose an alternate methodology for determining consensus



Consensus-Based Standards Development

Process

- Stakeholder proposes subject matter (new work item)
- Proposer usually presents a first draft
- Discussed at length
- Incorporate changes
- Balloting process
- Consider comments
- Possible re-balloting
- Final approval and publication
- Review (typically, every 3-5 years), resulting in Reaffirmation, Revision, or Withdrawal



Consensus-Based Standards Development

Characteristics

- Structured process
- Lengthy, laborious process
- Consideration of all views takes time
- Consensus takes time
- Procedural safeguards take time
- Volunteers workforce
- Very expensive



Key Players and Organizations

1. American National Standards Institute (ANSI)
2. National Institute of Standards and Technology (NIST)
3. Standards Developing Organizations (SDO)
4. Consortia Standards Setting Organizations
5. International Players
6. Committee members who provide technical input



Key Player – ANSI



- A federation of 823 members
- Founded in 1918 by five professional/ technical societies and three federal government agencies
- Coordinates the U.S. standards system
- Accredits standards developers
 - 224 ANSI-accredited SDOs
 - Does not write standards
- Represents the US in the ISO and IEC



Key Player – NIST



- National Measurement Institute in the U.S.
- Coordinates federal use of voluntary consensus standards and conformity assessment activities
- Coordinates with the private sector
- Staff participate in standards development
- Provides substantial technical contributions in thousands of committees



Key Player – SDOs

- **Professional Societies** whose members seek to advance their professions, and also develop standards
- **Trade Associations** promote their industry's products, and also develop standards
- **Testing and certification organizations** produce their own standards and may also use those of other organizations
- **Organizations that only develop standards**





Key Player – Consortia

- **Consortia** are groups of companies or individuals that come together to create standards to address a (typically single) commercial need
 - Consortia arose in the late 1980s to meet changing IT industry needs; the consortia model is now used across all industry sectors
- **Characteristics:**
 - Quick standards setting
 - Are often joint ventures where members “pay to play”
 - Enormous variation among consortia in terms of openness, transparency, and consensus



Key Players – International

- International Organization for Standardization (ISO)
- International Electrotechnical Commission (IEC)
- International Telecommunication Union (ITU-T)
- Treaty organizations (government based)
- Regional bodies
- Other private SDO's

Some Numbers in the U.S.

600+ standards developing organizations, with the 10 largest SDOs producing 90% of the standards

Hundreds of **consortia**

There are hundreds of committees addressing the technical requirements of standards

224 **SDOs** are ANSI-accredited

More than **95,000 standards**

Thank You

Fundamentals of Standards

Erik Puskar

erik.puskar@nist.gov

301-975-8619