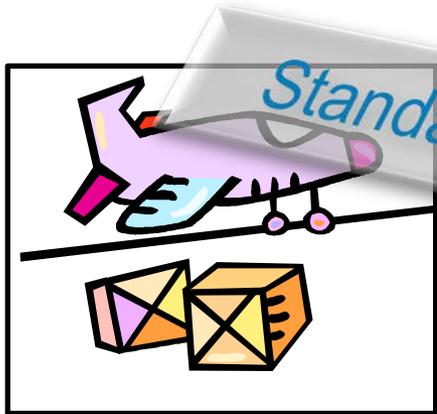
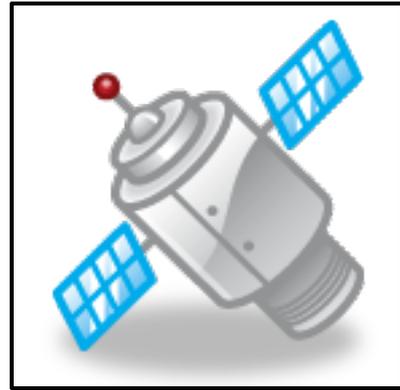


NIST

Global Standards Information



Fundamentals of Standards



U.S. Founding Fathers Recognized 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

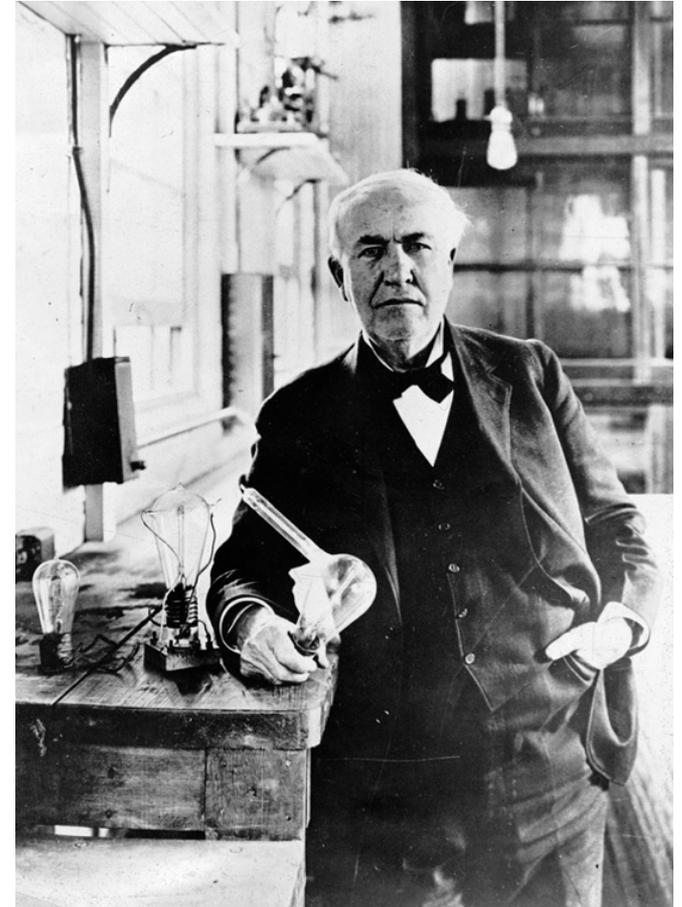
... The Congress shall have Power To ...

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

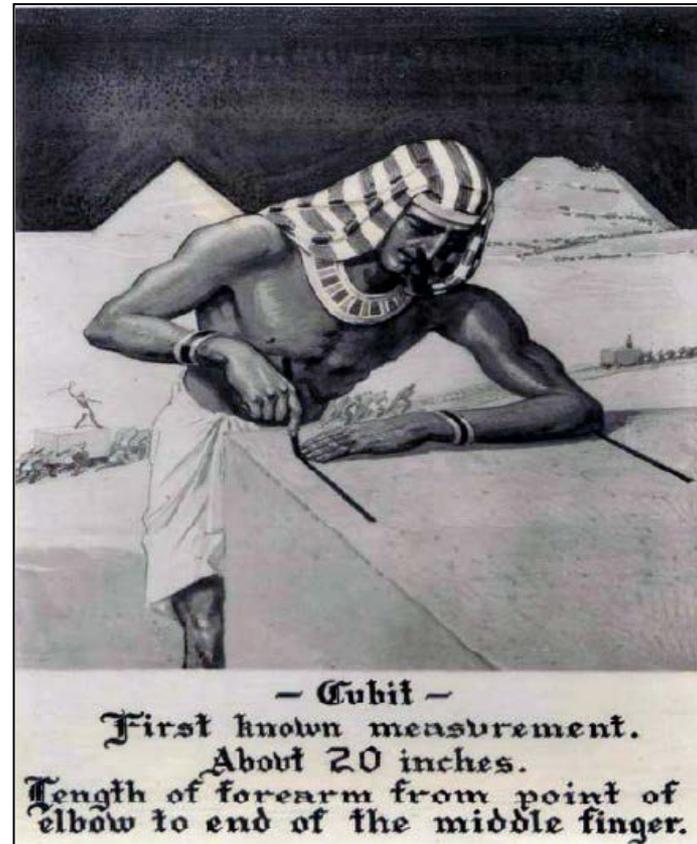
- U. S. Constitution

NIST was Established to Meet Early Standards Challenges

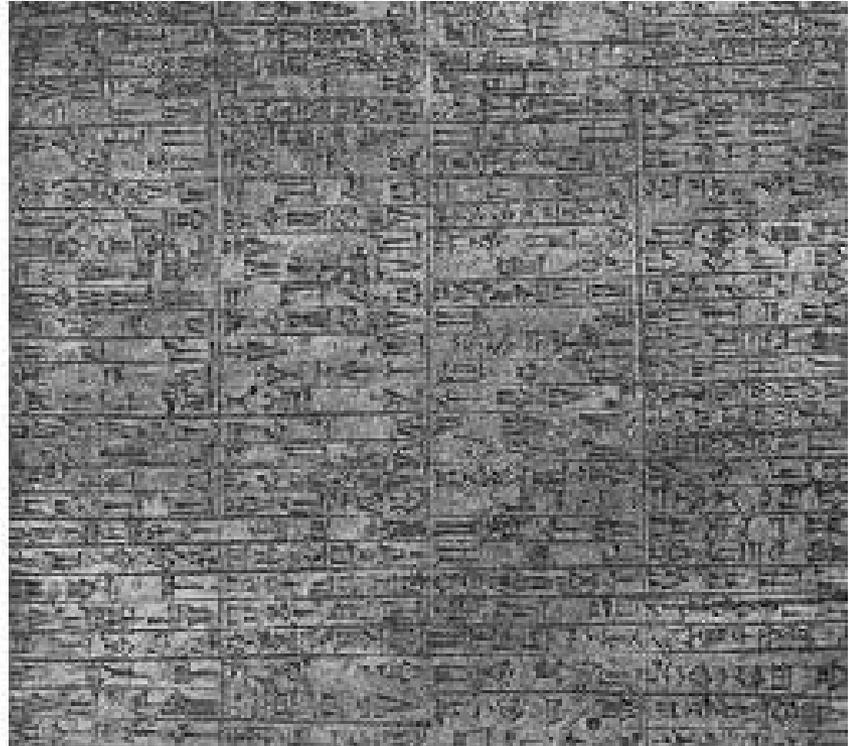
- Established by Congress in 1901 as the National Bureau of Standards (NBS)
- Eight different 'authoritative' values for the gallon
- Nascent electrical industry needed standards
- American instruments sent abroad for calibration
- Consumer products and construction materials uneven in quality and unreliable



Standards in History



Standards in History



Early Drivers for Standards



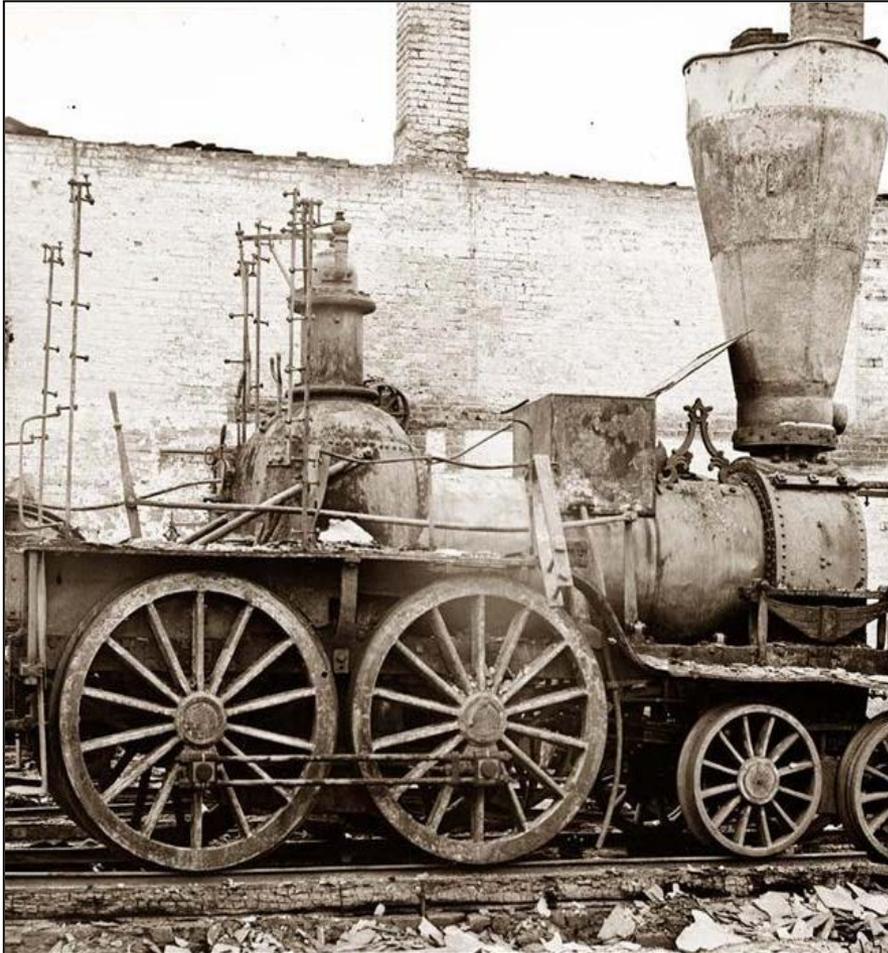
Baltimore
Fire of 1904

Early Drivers for Standards



New York City
Triangle Shirtwaist
Fire of 1911

Early Drivers for Standards



Uniform Practice
in Manufacture
of Train Rails
and Wheels

Key Terms for Today (1)

Standards

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

Documentary Standard and Measurement Standard

Specification and physical measure

Voluntary Standard and Mandatory Standard

Definitions; inconsistent; usage

Key Terms for Today (2)

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.

The U.S. Standards System

The U.S. standards system is voluntary, decentralized, sector driven and is, 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 U.S. culture and traditions
- 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

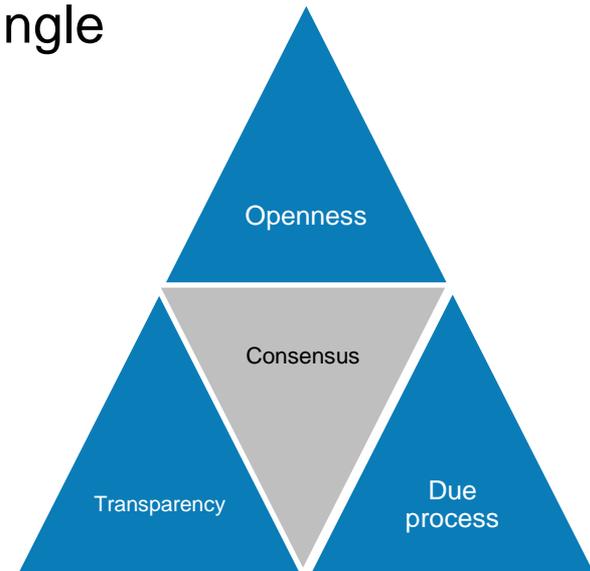
- records/ processes open and publicly available

Due Process

- appeals mechanism

Consensus

- decisions more than majority but not unanimity



Consensus-Based Standards Development

Process

- Standards are written in committee
- Stakeholders proposes subject matter
- Proposer usually present 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)

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. Key International Players
6. Committee members who provide technical input

Key Player – ANSI



- ANSI is a federation of about 1,000 members
- Was founded in 1918 by five professional/ technical societies and three federal government agencies
- Coordinates the U.S. standards system
- Does not write standards
- Represents the United States in the ISO and IEC

Key Player – NIST



- Serves as the 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 that come together to create a standard to address a (typically single) commercial need
- **Characteristics:**
 - Quick standards setting
 - Arose in the late 1980s to meet changing technological needs
 - Most often are joint ventures that “pay to play”
 - Recently, many consortia in the food industry and in the environmental/sustainability sectors
 - “Proprietary” standards
 - 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)
- Other private SDO
- Treaty organizations (government based)
- Regional bodies

ISO (and IEC) Participation

- ISO is a member organization, by National Standards Body
 - ISO has about 250+ technical committees
 - U.S. participates thru ANSI
 - U.S. has a single voice in ISO committees
 - ANSI creates and empowers TAGs (or mirror committees) to develop US positions in ISO committees
 - TAGs are administered by a variety of organizations
 - TAG rules are published by ANSI; membership fees vary
 - In TAGs, USG agencies may have different positions
- 

Some Numbers in the U.S.

Around **600 standards developing organizations**, with the 10 largest SDO producing 90% of the standards

At least **150 consortia**

Hundreds of committees addressing the technical requirements of standards

About **280 SDO** are ANSI-accredited

More than **95,000 standards**

Thank You

Fundamentals of Standards

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