



Standardization and innovation

CONVEGNO ISO – CONFORMA LA NORMAZIONE ALLA SFIDA DELL'INNOVAZIONE

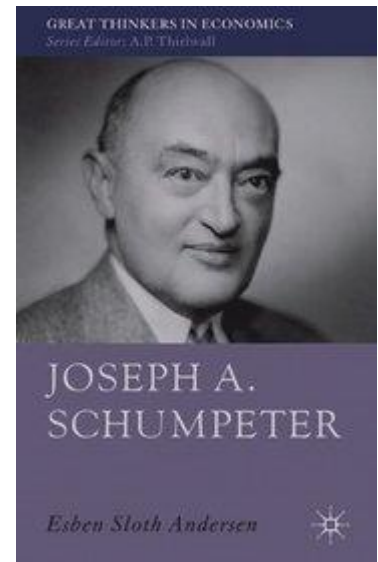
Daniele Gerundino
Director, ISO Academy

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- Standards supporting innovation: fundamental aspects
- Some remarkable examples
- New directions

Innovation

- An innovation is the **implementation of a new or significantly improved** product (good or service) or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations (Oslo Manual 2005, OECD)
- According to Schumpeter:
 - I. Introducing a new good including a new level of quality of a good
 - II. Employing new processes of production (e.g. automation)
 - III. Successfully exploring new markets (e.g. export)
 - IV. Using “new” resources or raw materials (incl. supply chain)
 - V. Changing the setup or market position of an organization
- **Inventions and innovations** can be separated
- Key to innovation is (successfully) finding and employing new combinations of I-V





Innovation and standards

Innovation:

- The conversion of knowledge and ideas into a benefit, which may be for commercial use or for the public good; the benefit may be new or improved products, processes or services
- The successful exploitation of invention which has found a market

Standard:

- Document which defines **a limited set of solutions, to solve matching problems, to the benefits of the parties involved** for common and repeated use
- Document established by **consensus** and approved by a **recognized body** that provides for common and repeated use, rules, guidelines or characteristics for activities or their results aimed at achieving the **optimum degree of order** in a given context (*NOTE: standards should be based on the consolidated results of science, technology and experience, and aimed at the promotion of optimum community benefit*)



Standards are an essential element of the infrastructure of modern industrial societies

Ensuring:

- *reliable measurement and testing*
- *interchangeability of parts*
- *interoperability of components*
- *codification of knowledge re: characteristics and properties of materials and products, structure and organization of processes*
- *objective criteria and methods to assess health and safety requirements and environmental impact*

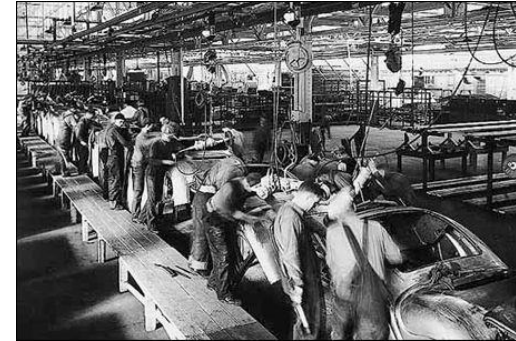
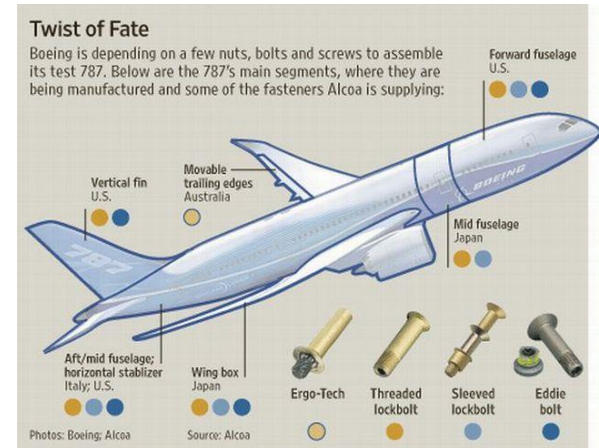




Figure 1 illustrates the geometry of a screw thread. The diagram shows a cross-section of a thread with the following labeled parameters:

- INTERNAL THREAD**: The upper part of the thread profile.
- EXTERNAL THREAD**: The lower part of the thread profile.
- Pitch (P)**: The distance between corresponding points on adjacent threads.
- Major Diameter (D_{maj})**: The outermost diameter of the thread.
- Pitch Diameter (D_p)**: The diameter at the pitch line.
- Minor Diameter (D_{min})**: The innermost diameter of the thread.
- Thread Angle**: Indicated as 60° for the internal thread and 90° for the external thread.
- Height Parameters**:
 - $H/8$: Height from the pitch line to the major diameter.
 - $5H/8$: Height from the pitch line to the minor diameter.
 - $H/4$: Height from the pitch line to the minor diameter.
 - $3H/8$: Height from the pitch line to the minor diameter.
 - $P/4$: Height from the pitch line to the minor diameter.
 - $P/2$: Height from the pitch line to the minor diameter.
 - $P/8$: Height from the pitch line to the minor diameter.
- AXIS OF SCREW THREAD**: The central axis of the thread.



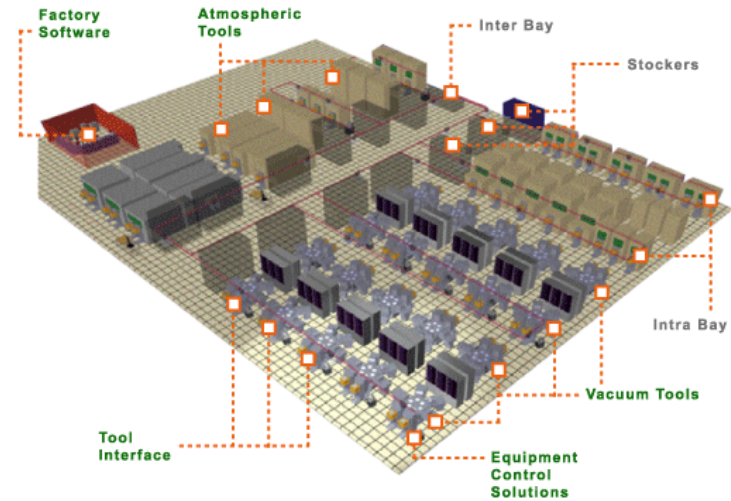
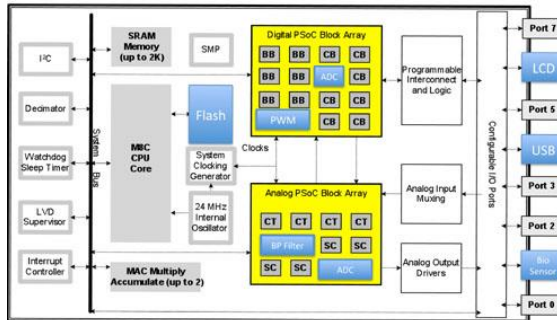
A black and white photograph showing the deck of a ship. Numerous large wooden barrels are stacked in the foreground and middle ground. Several men are visible; one man in the center is standing near a stack of barrels, while another man on the right is leaning over a barrel, possibly securing it with a strap. In the background, the ship's superstructure is visible, including a crane and a large funnel with the number '50' on it. The scene is busy with maritime cargo handling.



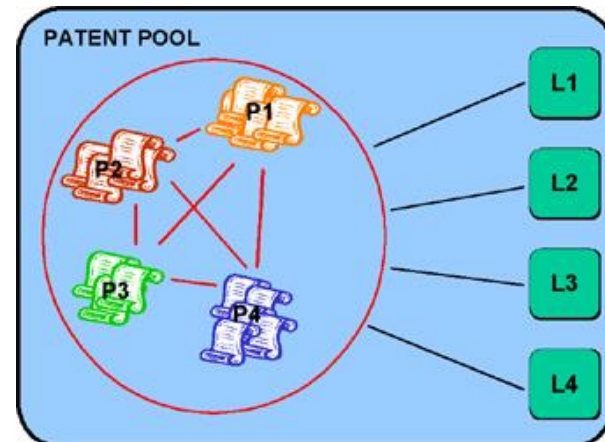
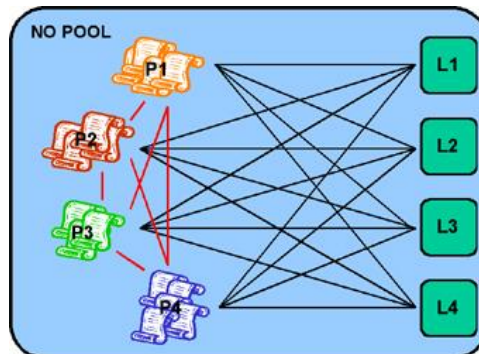


Standards support innovation by

Allowing to share investment and risk



Helping to remove undue proprietary interests and barriers to trade





Fundamental aspects

Standards

- can make an important contribution to technical evolution by applying, at the right time, critical design constraints (i.e. to avoid « re-inventing the wheel »): *standards can do much to reduce wasteful, redundant product development - thus freeing up resources that can instead be dedicated to fresh, inventive work*
- facilitate the development of new markets, economic development and trade (exploit network effects, increase consumer confidence, help to achieve economies of scale)
- allow to share investments and risks associated with the development of new technologies and applications (innovation through collaboration)
- help the commercial exploitation of innovative ideas, providing a basis for dissemination of information and an accepted framework within which patents can be drawn up, removing undue proprietary interests and barriers to trade



Role of standards in the research and innovation process (1)

From **Prof. Swann** (University of Nottingham, UK)

- Standards are a core part of the infrastructure that supports efficient innovation. They provide **a focus for critical mass effects** in product and service markets. Standards can effect innovation through a variety of mechanisms
- As codified information, **standards serve to spread knowledge** of the requirements for market acceptability and **contain quite explicit technical information**, reducing uncertainty for both producers and customers. They **promote and enable the diffusion of technology** in a form that is readily assimilated by firms with the complementary capabilities to take up and use the new methods.
 - NOTE: Meeting standards and regulations can also be perceived by business as a constraint on their ability to undertake certain forms of innovation. There are two reasons **why this is an apparent and not a real paradox**. One is that what the individual firms perceives as a problem may be of benefit to the national innovation system and thereby to overall economic performance. Standards enable larger markets and promote competition, so individual firms see a smaller market share and more competitors than they would like.
 - But this diversity faces customers with more but more compatible choices and lower prices, promoting their welfare. But the innovation promoting and hampering effects of standardization can also be reconciled by their interdependence as the constraint effect directs investment into certain paths and leading to more credibility and critical mass in markets for new technologies. Thus creating an infrastructure for future innovation,



Role of standards in the research and innovation process (2)

From prof. **Knut Blind** (Tech. University of Berlin, Germany)

Standardization is a catalyst for innovation:

- a facilitator for research
- a channel for the transfer of technology
- a possible mechanism for streamlining intellectual property management and
- an important component of public procurement aiming to stimulate innovation

