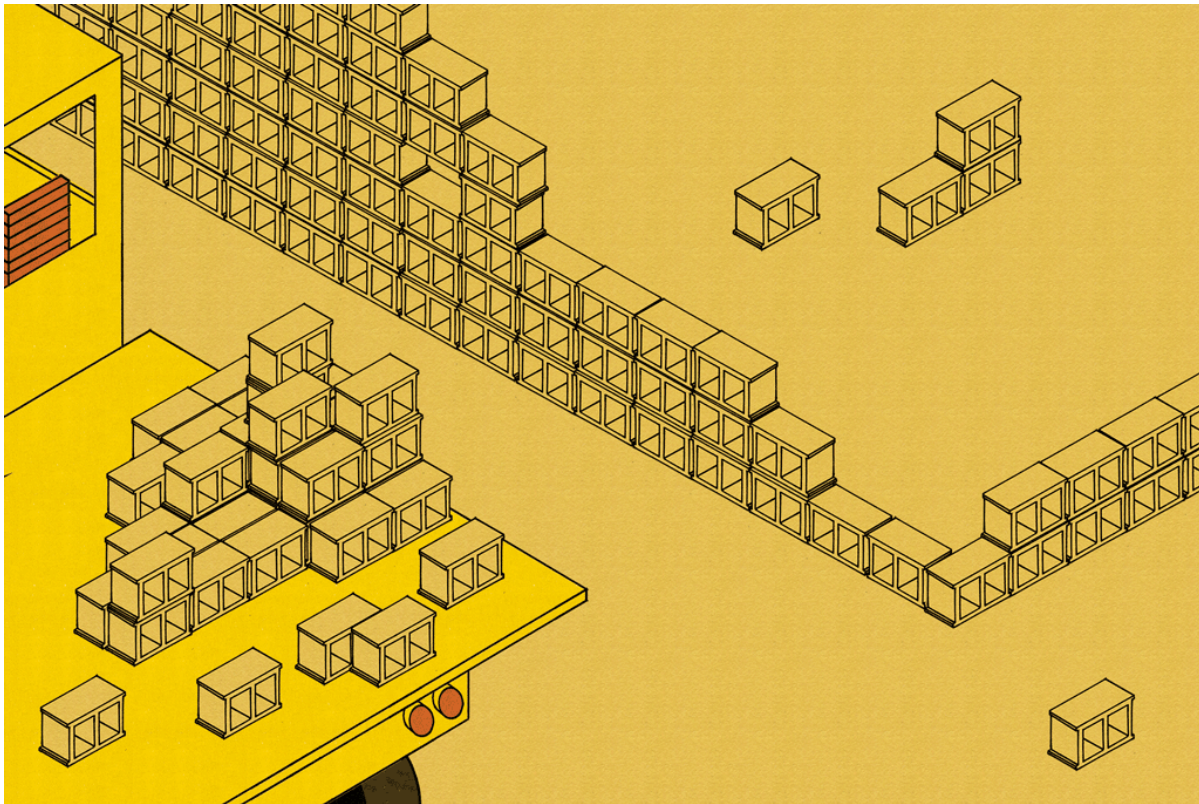


The Joy of Standards

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Our modern existence depends on things we can take for granted. Cars run on gas from any gas station, the plugs for electrical devices fit into any socket, and smartphones connect to anything equipped with Bluetooth. All of these conveniences depend on technical standards, the silent and often forgotten foundations of technological societies.

The objects that surround us were designed to comply with standards. Consider the humble 8-by-16-inch concrete block, the specifications of which are defined in the Masonry Society's "Building Code Requirements and Specification for Masonry Structures."

This book distills centuries of knowledge about the size and thickness of blocks, seismic design requirements and the use of materials like concrete, glass and mortar. Professionals worked through committees organized by the American Concrete Institute, American Society of Civil Engineers and the Masonry Society from 1977 to 1989 to foster consensus around this single national standard.

The number of technical standards that go into some products is astonishing, and the complexity of the methods used to create these standards is perhaps even more remarkable. A 2010 study found that a laptop computer incorporates 251 standards. Companies such as I.B.M. and Microsoft created some of these standards — but only 20 percent of them. The other 80 percent of the laptop’s standards were developed by private or nongovernmental organizations that facilitate collaboration and cooperation among technical experts.

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These facts should prompt some reflection about the exercise of power in a technological society: Amid concerns about the excesses of market power and government regulation, nobody seems to worry much about the private groups of experts who created 80 percent of the laptop’s standards. Standards created this way, known as the “voluntary consensus” process, are ubiquitous. They range from technologies like electrical plugs, lumber and concrete, to rules and certifications for food safety and environmental sustainability, to more personal matters such as definitions of health and disease.

The basic irony of standards is the simple fact that there is no standard way to create a standard, nor is there even a standard definition of “standard.” There are, however, longstanding ways that industries and nations coordinate standardization efforts. In the United States, the system of voluntary consensus standards is coordinated by ANSI, the American National Standards Institute.

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The standards-development organizations accredited by ANSI follow a bottom-up process. It begins when someone proposes a draft standard, which then goes through a period of public comment. A panel of stakeholders and interested parties then seeks to resolve points of friction. Eventually this process, which often takes years, results in a final published standard.

ANSI was first known as the American Engineering Standards Committee, which was created to address rampant incompatibility throughout American industry. (It was eventually reconstituted in 1966 and took on the name ANSI in 1969.) Its founders came from engineering organizations and departments of the federal government that all published their own standards, which were of limited value because they varied from group to group. The consequences could be catastrophic, as with the 1904 fire that destroyed much of downtown Baltimore: Buildings could have been saved if fire departments from neighboring cities had hoses that fit Baltimore’s fire hydrants.

The Engineering Standards Committee's solution to technical incompatibility was to get organized. At its first meeting, in 1918, it created a process where people could work out the details of technical specifications and agree to carry them out. The structure of the standardization panels balanced producers and consumers — that is, makers and users of technologies — so that no single company could dictate the outcome. This method incorporated advice from British engineers, who had created a similar organization a decade earlier, and reflected lessons from World War I, where cooperation among engineers led to technological and humanitarian accomplishments. During the war, Herbert Hoover, who was then head of the United States Food Administration, coordinated farming and business interests, as well as the automobile, railroad and shipping industries, to provide food for America and its allies.

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The consensus-driven approach had two clear advantages over existing alternatives. First, a forum to bring “all interested parties” into alignment reduced duplication and wasted effort. Second, the absence of state coercion to enforce standards meant that engineers and executives had strong incentives to resolve conflicts before they published a standard, lest they face government intervention down the road. The success of their efforts would depend on the voluntary adoption of standards. The consensus process was well suited for a society where technological and economic progress was within reach — all it needed to do was to find ways to cooperate.

This was no easy task. The standards committee's longtime secretary, Paul Gough Agnew, looked back wearily at the “endless discussions” that set the stage for the first meeting in 1918. One of the group's founders, the electrical engineer Comfort Adams, observed, “Fear and jealousy, as well as ignorance, were the chief obstacles which had to be overcome.”

Over the past century, standardization has expanded immensely. Today, private transnational organizations create and revise thousands of consensus standards every year.

Although the voluntary consensus method has been effective, it has never been perfect. For example, “consensus” is often a euphemism. Nasty disagreements can derail the process. Companies that agree on standards one day turn around and sue one another the next. In some industries, companies can make fortunes by defying established standards — think of innovative products from Apple, or bold designs from the leaders of the fashion industry. Standardization also creates losers, and it can be very costly to invest in the losing side of “standards wars” like VHS versus Betamax, or Blu-ray versus HD DVD.

Access to standards also poses challenges. Since the consensus-building process is costly, organizations like ANSI often try to cover expenses by selling or licensing access to standards documents. For example, the book of standards for concrete blocks and masonry structures

costs \$150. This business model strikes many critics as unjust, since private standards can be built into regulations, yet sometimes only citizens who pay can look at them.

The American system of standardization is driven by industry, but we should not lose sight of the crucial role played by government agencies. The National Bureau of Standards, now known as the National Institute of Standards and Technology, contributed research and ideas to the standards committee's efforts from the beginning. And governments often mandate standards around air pollution and automotive and aviation safety because industry did not adopt them on a voluntary consensus basis. Federal air pollution standards that led to the widespread adoption of the catalytic converter and reduced some automotive emissions by 99 percent worked through force, not bottom-up consensus.

Standards have always struggled with an image problem. Critics worry that a standardized world is dull and mediocre, a nightmare of conformity and Kafkaesque bureaucracy. Yet the champions of standardization insist that standards create the foundations for a better world. Albert Whitney, who was the standards committee's chairman from 1922 to 1924, argued that many accomplishments of civilization involved "the fixation of advances." The committee's motto in the 1920s declared: "Standardization is dynamic, not static; it means not to stand still, but to move forward together."

In an age of breathless enthusiasm for the new and "disruptive," it's worth remembering the mundane agreements embodied in the things around us. It's very ordinariness and settledness of standards that enable us to survive, and to move ahead.

Andrew Russell, the dean of arts and sciences at the State University of New York Polytechnic Institute, and Lee Vinsel, an assistant professor of science and technology studies at Virginia Tech, are working on a book about innovation and maintenance.