

The Modern Day Archimedes: Using International Standards to Leverage World Markets

The Greek mathematician and scientist Archimedes once boasted that given a spot to stand and place a lever, he could move the world. Today's Archimedean are still interested in leverage, but of the entrepreneurial type – gaining access to world markets and increasing trade. And one of the levers used by the modern Archimedean is international standards.

Twenty years ago, companies asked themselves whether they were in a global industry and to what extent (if at all) they should have a global strategy. Today, companies have moved beyond this question and are trying to determine what their global strategy should be. Maturity of domestic markets has driven companies to pursue international expansion more aggressively. International trade agreements; multinational ownership or partnering of companies; the demise of the Eastern European communist bloc; the privatization of formerly state-owned enterprises throughout the world; the information technology revolution; the rise of newly industrializing countries; and the growing confluence of cultural tastes have all contributed to unprecedented global business opportunities.



It's a great time to be a global enterprise. But it is not a time without challenges. Trade barriers are falling, but they still abound. Sometimes trade barriers are in the form of tariffs. Sometimes quantitative restrictions, import licensing or local content requirements can be barriers to trade. Conformance assessment can also create a trade problem. And sometimes, standards are the barrier.

At the Transatlantic Business Dialogue (TABD) meeting in November 1995, over 100 American and European business executives identified standards as one of the major barriers to trade. But as a general rule, these executives recognized that when standards are a barrier, it is a local, national, or regional standard that is the barrier. Rarely is the barrier an international standard. One of the key recommendations from the TABD was to eliminate trade barriers that result from

restrictive standards by developing a common set of harmonized standards, preferably based on international standards.

Before we go further, international standards must be defined. Those standards issued by the International Organization for

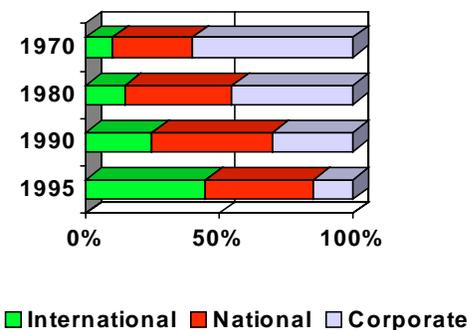
Standardization (ISO) and the International Electrotechnical Commission (IEC) are what many people think of in terms of international standards. There are also intergovernmental organizations that produce international standards, such as the International Telecommunications Union (ITU) and the International Organization of Legal Metrology (OIML). But the true test for whether a standard is "international" is

whether it has broad recognition and acceptance around the world. Using this litmus test, the Boiler and Pressure Vessel Code of the American Society of Mechanical Engineers (ASME), the petroleum and plastics standards of the American Society for Testing and Materials (ASTM), the aerospace standards of the Society of Automotive Engineers (SAE) and Aerospace Industries Association (AIA), and others would also qualify as international standards.

International Standards Are Strategic Trade Levers

As part of their global strategy, most companies have embraced international standards as a key tool to open markets. Caterpillar, Hewlett-Packard, United Technologies Corporation, AMP, Ford Motor Company, and Unisys are just a few of the major corporations that foster the use of international standards in their strategic standardization management plans. Twenty-five years ago, international standards only accounted for about 10% of the standards used by a company. Today, that figure is around 45%.¹

Source of U.S. Industry Standards



Why do companies place such emphasis on international standards? It's because international standards are an

effective way to achieve the synergistic goals of tearing down trade barriers and creating global market opportunities. Of the \$465 billion in U.S. exports in 1993, \$300 billion were affected by non-U.S. standards.² Would a U.S. company prefer those non-U.S. standards to be international or non-U.S. national standards? Would a U.S. company prefer to comply with a single international standard or many different national standards? These rhetorical questions are important because the answers affect global market accessibility and billions of export dollars.

The top ten U.S. export industry sectors, which include aerospace, automotive, telecommunications, plastics, and petroleum, have heavy U.S. participation in the development of international standards. These types of advanced technology products are directly influenced by international standards, and they accounted for a U.S. trade surplus of \$25.8 billion in 1993. In contrast, there was a trade deficit of \$141.6 billion in those areas where either there are few international standards or an absence of U.S. participation in the development of the international standards.³ Obviously, the factors that affect trade balances are numerous and complex and many of them have little to do with standards. Nevertheless, the correlation between international standards, U.S. participation, and U.S. trade surpluses seems to be more than a coincidence.

Companies use international standards as strategic levers primarily in four ways to topple trade barriers or pry open doors to increase existing or create new trade opportunities. First, international standards provide companies and their governments with the means to challenge national standards as being restrictive trade

barriers. Second, international standards provide business opportunities by unifying technical requirements, thereby unifying markets. Third, there is a strong link between global trade and global production. International standards allow companies to produce and market the same product globally. Finally, the rapidly changing political, social, and economic landscape has opened many new markets around the world. But emerging trading partners find themselves in need of standards, and international standards are helpful for market entry.

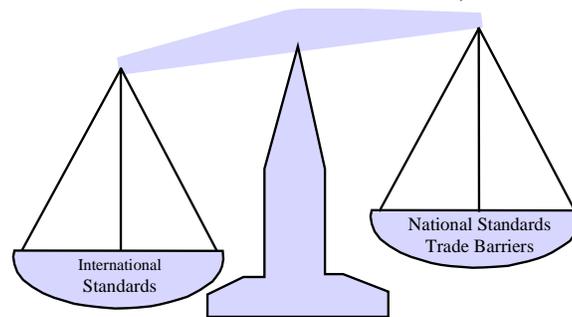
Counterweight to Protective National Standards

Trade experts estimate that U.S. companies could export an additional \$20 to \$40 billion a year if it were not for technical barriers to trade. The most significant technical barrier to trade is the result of differences between U.S. standards and conformity assessment practices and those of our trading partners.⁴ In some cases, it is an international standard that creates the technical barrier to trade. This usually happens when the U.S. does not participate in the development of the international standard. But in most cases, it is a national or regional standard that creates the barrier, which is a situation where the U.S. has limited or no opportunity to participate in the development of the standard.

In the absence of an international standard, it is difficult (though certainly not impossible) for the U.S. to persuade a trading partner to revise or remove their

restrictive standard. Without an international standard, there is no unbiased arbiter to settle technical disagreements. It becomes of matter of your standard versus my standard; your practice versus my practice. But with an international standard, arguments for maintaining a restrictive national standard begin to crumble, and pressure can be brought to bear for changing the restrictive national standard lest a nation be found guilty of violating the General Agreement on Tariffs and Trade (GATT).

When Poland issued a regulation requiring many imported products to obtain safety certification from its Center for Testing and Certification (PCBC) or one of the fifteen institutes supervised by the PCBC, this regulation presented a trade barrier. Aside from the additional cost of testing, Polish standards and certification practices differed from international ones. In some cases, this meant that U.S. products, which complied with international standards, could not be imported because they did not meet the restrictive Polish standards.



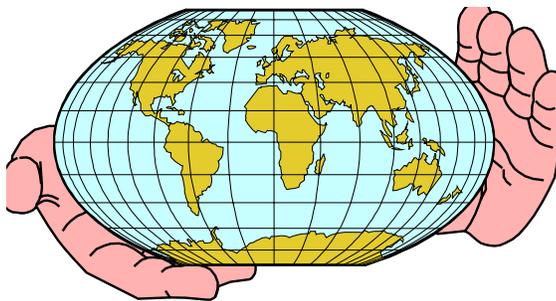
As a result of efforts by the U.S. and the European Union, Poland is changing its product standards and

will allow for producer or third party certifications to confirm compliance with the appropriate international product standards. Poland expects to have their regulations changed in early 1998, and has agreed to suspend the requirement for PCBC safety certification until January 1, 1998.⁵ If not for existing international standards, resolution of this dispute would have been more difficult, and Polish markets closed to some U.S. products.

Unify World Market Requirements

Oscar Wilde wrote, “When the gods wish to punish us, they answer our prayers.” For many years, some U.S. companies wished for a single set of standards in Western Europe. Companies had or still have to produce as many as nineteen different versions of their products due to differing national standards. In the 1990s, the gods granted the wish of those seeking unified European standards when the European Community aggressively developed numerous standards. The only problem was that if these standards were not in harmony with the U.S. standards, companies either had to make expensive changes to their production lines, abandon the lucrative Western European market, or try to convince the European Community to change their restrictive standard.

Recent journal articles and government reports are replete with examples of U.S. companies marketing safe, efficient products in some European countries one day, only to find themselves without a market the next day when a unified European standard changes the requirements. For example, Zimmer & Company, the world’s largest producer of orthopedic devices, had to spend \$5 million in testing equipment to make sure that a socket ball in its hip replacement line was smoother and rounder in order to conform to an arbitrary, detail requirement in a European standard. There had never been a complaint before about the smoothness and roundness of Zimmer’s hip replacements, but in the end, Zimmer had to invest the



money or risk losing its substantial European market. Caterpillar had to make similar investments to install sound-suppression devices on some of its earth-moving equipment transmissions, even though the other major world markets did not require it and there was no customer demand for such devices.⁶

Zimmer and Caterpillar coped with the new regional European standards because they had a significant market presence and the money to make changes to their products. But what of small firms that cannot afford the changes, or companies whose European market presence is marginal? They can spend years trying to fight the unfair trading practice through official government channels. They can try to gain a non-voting seat on a European standards developing committee and influence the requirements. These tactics have some examples of success, but usually

with a significant loss of time and revenues. The best tactic, however, is the proactive one. Preempt potentially restrictive national and regional standards efforts by initiating international standards activity or the adoption of a U.S. national standard as the international standard. Such efforts do not guarantee success, but the international forum offers a much more level playing field.

The Association for the Advancement of Medical Instrumentation (AAMI) has been very proactive in participating in the development of international standards to ensure continued

U.S. leadership and competitiveness in the medical devices global markets. When the European Community began developing unified medical device standards in the late 1980s, AAMI moved quickly to ensure that the U.S. had a strong voice in the ISO and IEC committees, as well as access to the European standards committees.

For example, in 1990, AAMI was instrumental in forming ISO Technical Committee 198 on sterilization and providing the secretariat. Because of AAMI's quick action, the international sterilization equipment standards preempted unified European standards, which may have excluded U.S. products. There are unified European standards in this area, but they are harmonized with the international standards.⁷

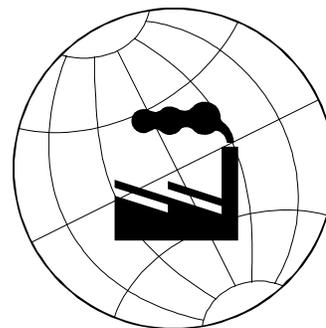
Before 1990, the exports of Amsco, a leading U.S. producer of steam sterilizers, went to Canada, Saudi Arabia, Singapore, and Taiwan – places where the national standards were compatible with U.S. standards. European sales were slight because the company could not justify the cost of building a wide variety of different models to satisfy the national standards of each European nation. Amsco welcomed the effort to develop international standards as a way of gaining increased market entry into Europe and elsewhere. Amsco funded participation on both the European and ISO standards committees as an investment in their future.⁸

In 1996, U.S. medical technology exports reached \$12.9 billion, with a record \$6.5 billion trade surplus. \$5.1 billion of these exports went to Europe, and the U.S. trade surplus with Europe was \$3 billion.⁹ We can only hypothesize whether this would

have been the situation in the absence of harmonized international standards.

Promote Global Production

In simpler times, production took place in a single country, by a single manufacturer, using local suppliers. Today, multinational corporations abound. Former competitors are now partners in strategic alliances. Companies continue to acquire interests in foreign firms to provide easier access to markets.



Manufacturers now search globally instead of locally for the best suppliers. Products are becoming increasingly designed, manufactured, and supported on a world-wide basis, taking advantage of the different talents around the world, while reducing the cost of labor, materials, and transportation. We are entering an era where no single company or single country can successfully compete in the new global game by itself.

The automotive industry provides the best example of widespread global production. In recent years, Ford has acquired an interest in Mazda; Chrysler in Mitsubishi; and General Motors in Isuzu and Suzuki. General Motors and Toyota built a joint manufacturing facility in California. Ford, General Motors, and Chrysler work together under a joint venture called the Partnership for a New Generation Vehicle to ensure the future competitiveness of the U.S. auto industry. The Mazda Miata can call itself a “world car” since it was designed in California, assembled in Michigan and

Mexico, and some of its electronic components were invented in New Jersey but manufactured in Japan. The increasingly global nature of the automotive industry has also increased the demand for international standards, which can be used to facilitate co-production efforts, reduce costs, and eliminate differing regulatory standards that have become a major trade barrier.

When over 100 top executives from major U.S. and European companies met at the Transatlantic Business Dialogue (TABD) in Seville, Spain two years ago, they specifically cited the need for harmonization of motor vehicle standards. While the automotive industry has more global production than most other industry sectors, the lack of internationally harmonized standards reduces the economic advantages of free trade and fragments prospective markets for products that could otherwise be produced identically at plants around the world. Having to produce right-hand drive cars for the United Kingdom and left-hand drive cars for the United States and continental Europe is one of the most frequently cited examples of a differing technical standard that forces manufacturers selling to multiple markets to produce different versions of the same product.

The TABD identified vehicle safety requirements and environmental emissions as two areas in special need of harmonized international standards since these areas are frequently subject to government regulatory standards that have become major barriers to trade and cost effective production. In fact, these different regulatory and certification requirements may add more than 10 percent to the design and development costs of a vehicle.¹⁰ For the manufacturer, the increased costs and design risks associated with producing a different model for each

market may be enough to prevent or limit market entry. For the consumer, it certainly means higher prices and reduced choices.

As a result of a TABD recommendation, the European Institute hosted the first Transatlantic Automotive Industry Conference on International Regulatory Harmonization in April of 1996. The conference included a broad cross section of the automotive industry, including the American Automobile Manufacturers Association and the Association of European Automobile Constructeurs, as well as government officials from regulatory agencies. Their goal was straightforward: completely eliminate trade barriers resulting from unwarranted differences in vehicle standards and certification procedures. The task of accomplishing the goal, however, was complex because it involved harmonizing many different automotive standards.

The conference concluded with a number of action items. Some of the actions were as simple as seeking worldwide acceptance of the noise test procedures in ISO 362; while efforts to harmonize fuels and emissions standards are more of a challenge and will take longer. Both U.S. and European Union regulators have committed themselves to changing regulations, but the key rests with industry uniting behind harmonized international standards. Given the potential gain in global market accessibility, manufacturing efficiency, and increased profits, the chances of success seem good.

To Go Where Few International Standards Have Gone Before

The radically changing world political scene has created many new market

opportunities. The dissolution of the Soviet Union has resulted in many new independent states. Deregulation and privatization of formerly nationalized industries is occurring at a rapid pace throughout Latin America and parts of Asia and Africa. Such Pacific Rim nations as Indonesia and Malaysia are emerging as the next generation of industrial tigers that are eager for more trade. And as China gradually lessens its political and economic restrictions, the largest trade opportunity of all is opening.

One feature all of these emerging trading partners share is either a lack of standards; a system of standards previously or currently directed by a state bureaucracy motivated more by centralized control than by world trade; or a system of standards founded on obsolete, parochial, or unnecessarily restrictive processes. These nations are not only looking for standards that will ensure the quality, safety, and environmental suitability of products imported into their countries, but reciprocal standards that will allow them to export to the rest of the world as well.

At a recent meeting of the Asia-Pacific Economic Cooperation Council (APEC) countries, the Sub-Committee on Standards Conformance (SCSC) discouraged their member nations from developing internal product standards since these often tended to contribute to trade barriers. Instead, the SCSC recommended its members either accept existing international standards or realign their product standards with those standards accepted worldwide.¹¹ The emerging industrial nations in particular understood that trade is a major engine of economic growth, and that international standards do a better job at fueling that engine than do national standards. They also appreciated

that even though they expose their fledgling industries to some risk when transitioning from protective internal standards to international ones, domestic industries will ultimately benefit from the efficiencies that international competition and cooperation foster.

The recommendations of the SCSC were not new, but part of a larger effort to increase free trade among the Pacific Rim nations that began with an APEC summit in 1993. Are the APEC's efforts to emphasize international standards working? Like anything else, success is mixed, but there are heartening examples. The National Standardization Council of Indonesia (Dewan Standardisasi Nasional, DSN) is committed to ensuring that the existing 3,550 Indonesian standards are in harmony with worldwide practices. Following recently changed processes, the DSN first determines if an ISO or IEC standard exists before developing or revising its own standards. If such international standards do not exist, the DSN seeks national standards that have the reputation of being used worldwide. For example, the new Indonesian cement standards are based on ASTM standards that are *de facto* international standards.¹²

The U.S. Department of Commerce considers Indonesia to be one of the top ten emerging markets where U.S. exports have enjoyed a growth rate of nearly 20 percent a year since 1988. The reason for such an increase is the continual liberalization of Indonesian trade policies, part of which is based on the migration from national standards to worldwide standards.

There's More

While I have focused on the four primary universal reasons international standards help build trade, there are many other ways in which international standards contribute to trade on a more individualized basis. For example, when Canon first entered the photocopier market in the early 1970s, it decided from the outset to design a global product. In contrast to its Japanese competitors, Canon chose to design a copier using ISO and U.S. paper sizes instead of trying to develop multiple versions of the same product to accommodate unique Japanese paper sizes as well. The presence of international standards gave Canon the opportunity to make a strategic business decision to ignore some of its domestic market in order to maximize its overall profits and future prospects in the global market.¹³

We usually think of trade in terms of commerce between nations, but there is also the trade between nations when cooperating in military operations. Interoperability is key to any successful joint military effort, and interoperability has been a central strategy for the member nations of the North Atlantic Treaty Organization (NATO) since its beginning. In the past, this interoperability was largely achieved through the use of military standards. But as defense budgets are reduced throughout NATO, the member nations are placing more emphasis on ISO or IEC standards in order to control costs by buying commercially available products, ensure adequate supplies in times of war, and optimize interoperability. For example, all NATO tactical shelter sizes must conform to ISO standards to ensure transportability on European rails and highways. ISO standards also form the core of most NATO information technology requirements. In the absence of such standards, U.S. or European

standards that are *de facto* international standards are used. For example, NATO automotive gasoline conforms to ASTM D 4814 or European Committee for Standardization (CEN) standard EN 228, and NATO kerosene conforms to ASTM D 3699.

All That Glitters Is Not Gold

King Hiero II of Syracuse knew that all that glitters is not gold, which is precisely why he tasked Archimedes to devise a standard test method to determine the gold content in his crown. It should not be assumed that there is an inherent goodness in a standard just because it carries the international label. The jury is still out on whether horizontal international standards, such as the ISO 9000 quality standards or ISO 14000 environmental management standards, which apply across all product lines, will ultimately prove to be an overall benefit or just an additional cost. For some companies, the cost of certifying to these standards may keep them out of the global market.

U.S. companies must also remain vigilant about the development of international standards and involved in the process. While international standards committees provide a forum to influence standards development, if companies don't participate, the resulting international standard may exclude them from world markets or increase production costs. For example, when an ISO standard for fire sprinkler metal fittings was being developed, the design requirements were based on the fittings of several European manufacturers. If approved, the ISO standard would have excluded a stronger fitting made by a U.S. manufacturer, the Grinnell Corporation. Grinnell was alerted in time to lobby

successfully for a change to the proposed standard, but if they had not, they would have had to abandon some lucrative world markets or spend hundreds of millions of dollars for retooling.¹⁴ While international standards tend to be less restrictive than most other types of standards, any standard can become a trade barrier.

“Eureka!”

Barrier-free trade is going to happen. It will happen in ebbs and flows. There will be the inevitable setbacks and horror stories. But in the end, the pragmatism of free trade will overcome the parochialism of protectionism. The only questions are how soon we will arrive at a barrier-free trade world? What will be the cost? How difficult will it be? Harmonized international standards can make the answers to these questions, “sooner,” “cheaper,” and “easier.”

We keep looking for complex solutions to complex trade barrier issues, when international standards hold many of the answers. When Senator Orrin Hatch introduced legislation in 1990 to recognize National Standards Week, he noted that, “we have spent millions of dollars promoting U.S. products overseas and engaged in expensive negotiations with our major trading partners to try to open foreign markets to American products. However, I believe that we have overlooked one of the simplest and least expensive methods of making our products more competitive. I am talking about effort to promote harmonized product standards.” Senator Hatch could not have been more correct.

International standards may not be a panacea in building trade. But the examples of where international standards have torn

down barriers and opened trade doors far outweigh those examples where international standards have been a trade barrier. Moreover, the statements and actions by world leaders in government and industry suggest that they are committed to developing and using harmonized international standards to enhance trade opportunities.

When Archimedes finally discovered a way to determine the purity of the gold in his employer’s crown while taking his afternoon bath, he reportedly jumped from his bath running through the streets of Syracuse shouting, “Eureka,” which is Greek for “I have found it.” If in the future, a coworker runs down the halls of the company shouting, “Eureka,” don’t be alarmed. Chances are it’s just a modern day Archimedean who has discovered an international standard that’s good as gold. And that means more leverage for your company in the global market.

¹ The source for this figure and the table was the 1997 Student Workbook from the “Participate Effectively” course taught by the American National Standards Institute (ANSI).

² *Standards, Conformity Assessment, and Trade into the 21st Century*, National Research Council, National Academy Press, Washington, DC, 1995, p. 111.

³ *Ibid*, pp. 47 and 105.

⁴ Kathleen D. Gaaserud, *NIST Standards in Trade Program*, National Institute of Standards and Technology publication, October 29, 1996, p. 1.

⁵ *1997 National Trade Estimate Report on Foreign Trade Barriers*, Office of the United States Trade Representative (USTR), p. 332.

⁶ Patrick Oster, “Europe’s Standards Blitz Has Firms Scrambling,” *The Washington Post*, October 18, 1992, pp. H1 and H4.

⁷ *Standards and Trade in the 1990s: A Source Book for Department of Defense Acquisition and Standardization Management and their Industrial*

Counterparts, Defense Systems Management College publication, no date, pp 3-12 and 3-13.

⁸ John Burgess, "Competing in a Diverse Market," *The Washington Post*, December 2, 1991, pp A1 and A6.

⁹ *International Agreement Eliminates Redundancy, Cost, Helps Modernize the U.S. Food and Drug Administration*, News Release from the Health Industry Manufacturers Association (HIMA), May 28, 1997.

¹⁰ *Overall Conclusions of the Transatlantic Automotive Industry Conference on International Regulatory Harmonization*, International Trade Agency, April 11, 1996.

¹¹ "SCSC Pushes International Product Standards Harmonization," *Manila Press Review*, Philippine News Agency, October 21, 1996. APEC consists of Australia, Brunei, Canada, Chile, China, Indonesia, Japan, South Korea, Malaysia, New Zealand, Papua New Guinea, the Philippines, Singapore, Taiwan, Thailand, and the United States.

¹² *Standards, Conformity Assessment, and Trade into the 21st Century*, National Research Council, National Academy Press, Washington, DC, 1995, p. 143.

¹³ George S. Yip, *Total Global Strategy, Managing for Worldwide Competitive Advantage*, Prentice Hall, Englewood Cliffs, NJ, p. 93.

¹⁴ Patrick Oster, Vince Gagetta, and Rob Hoff, "10,000 New EC Rules," *Business Week*, September 7, 1992, p. 50.

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