



Standards Engineering

The Journal of SES – The Society for Standards Professionals

Volume 65, No. 1

January/February 2013

The Efficiency Impact of International Standards on Global Trade, National Industries, and Individual Organizations: The Influence of Quality and Risk Management

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Introduction

Standards provide crucial communication, alignment and compatibility at an international, national, industry, and individual organizational level. These standards—accessible to everyone from global powers to developing countries, from international corporations to the mom-and-pop small business—provide guidance and infrastructure, state of the art technical knowledge, and management best practices. In a global environment, standards ease the crossing of borders, cultures, and languages. They form the basis in building trust, avoiding conflicting standards, and reducing technical barriers; therefore, standards facilitate the achievement of regulatory compliance. By driving efficiencies and the diffusion of new products into the marketplace, standards increase export capacity, and facilitate global trade, national competitiveness, and economic growth. At an organizational level, standards provide agreed metrics, and the opportunity for benchmarking and improving existing effectiveness and efficiency. They impact organizations by reducing waste, defects, accidents, emissions, negative environmental impact, and liability while mitigating losses all aimed at reducing production costs. While doing this, standards also leverage the increase of supplier, employee, and customer satisfaction and innovation through improved performance.

All of which drives the penetration of foreign markets and the increase of sales, and supports sustained growth and long term competitive advantage. The impact of standards is dramatic, and on a global scale it allows organizations and countries to drive efficiencies and more effectively focus resources and priorities.

While standards have national and international impact as a whole, a key group of standards—management leadership standards—have a significant impact. The international scale and range of issues that organizations have to deal with today create significant pressure on resources. Consider the BP Gulf oil spill or the Japanese tsunami and the impact of these events on the international supply chain. Other examples

are the financial crisis, national food issues involving e-coli, international toy recalls due to hazardous levels of cadmium, IT security, and homeland security. The global environment has not become slower or safer.

Key tools to dealing with this fast moving environment are the world's most referred and implemented standards of quality, safety, environmental, social responsibility, and risk management. Combined they provide an infrastructure to manage the range of diverse variables such as those mentioned above while supporting strategic decision making and sustainability. At the core of this set of management and leadership standards is the International Organization for Standardization (ISO) standard, ISO 9001 (*Quality management systems – Requirements*) which is critical to their integration, and ISO 31000 (*Risk management – Principles and guidelines*) which, while a new standard, is one that has the potential to have the largest impact in the future.



The Impact of Standards on Global Trade

Standards provide state-of-the-art best practices and internationally-agreed technical information, they coordinate compatibility and enhance communication while avoiding conflicting or duplicating standards and therefore have global influence and impact. *Export Quality Management: A*

Guide for Small and Medium Sized Exporters, published by the International Trade Centre (ITC) and Physikalisch-Technische Bundesanstalt (PTB), states that “standards support compatibility and can drive down costs through the use of common parts, specifications, and methods. They can facilitate the creation of new industries and allow new technologies to be exploited. They are also crucial to realizing and maintaining market access . . . because of global trade, many of today’s products are built with components sourced from around the world, which must fit together and perform as expected.” [ITC & PTB, 2011, p1]

While the development and application of standards may seem to be on only a technical detail, they have much broader and dramatic ramifications. In fact “global trust in products and services is built on international standards.” [Squirrell & Tholen, 2011, p14] Pascal Lamy, Director General of the World Trade Organization (WTO) stated that “what the WTO seeks to do is to reduce or even eliminate those barriers that unnecessarily restrict trade, and, in this effort, international standards play an important role.” [Lamy, 2011, p4] But, standards are not only key in the issue of reducing or eliminating trade barriers, but most importantly, in enhancing trade and specifically improving the performance or economies of exporting countries. [Swann, 2010]

In the forward, of the ISO/ITC publication, *Building Linkages for Export Success*, ITC Executive Director Patricia Francis and ISO Secretary General Rob Steele state that “the growth of international trade and the increasing importance of high level standards and technical regulation in developed markets presents greater opportunities for national standards bodies and trade promotion organizations to collaborate and create more opportunities for exporters to demonstrate compliance with market requirements and enhance national competitiveness.” [ISO/ITC, 2010, p9] Therefore, international standards help to “facilitate world trade, clarify the market and competition, and disseminate useful technologies and good business practice.” [Steele, 2011, p7] Indeed, international standards have such an impact that Sergio Marchionne, Chairman and CEO of Chrysler and CEO of Fiat, stated

simply that “the world needs standards.” [Marchionne, 2012, p4]

So how do standards have such a dramatic impact? Their influence begins at the most fundamental aspects of business: the creation of a product or service. “Standards clearly support the diffusion of new prod-

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ucts into the marketplace, and that supports economic growth. If you don’t have ideas that get turned into new products, then there will be no economic benefit.” [Blind, 2010, p26] Beyond the basics of supply and demand, they also influence management system infrastructure: “standards help an enterprise manage business critical issues such as quality, environmental performance, and safety.” [Marchionne, 2012, p4] Standards are equally important at the next level: ongoing product development and innovation, the need to continue to grow and develop the next generation of product and service. Pascal Lamy, Director General of the WTO refers to this level when he stated that standards “reflect state-of-the-art scientific and technological developments.” [Lamy, 2011, p4]

Data shows the impact of standards on the economy of nations. AFNOR (Association Française de Normalisation - the ISO member for France) published a study in 2009 on the impact of standardization from both the macro and micro economic standpoints focused on the French economy. “Standardization directly contributes approximately 25 percent of French GDP and 66 percent of the 1,790 French companies interviewed stated that standardization contributed to the generation of profits.” [Peyret, 2010, p17] “70 percent found that standards provide a genuine advantage for developing international exchanges. 46 percent of companies actually found that standards enabled them to increase their export capacity. 74 percent confirm that standardization gives them greater control over safety related problems. 79 percent say it helps optimize compliance with regulators.” [Peyret, 2010, p19]

A generic ISO methodology has been developed to assess and quantify the economic benefits of standards on a more global scale. In 2010, a pilot study using this methodology focused on a small number of company assessments in the automotive industry. It was found that for engineering, manufacturing, and procurement for both vehicle manufacturers and parts suppliers, the economic benefits of standards ranged from 0.5 to 2.5 percent of total sales. “Extrapolating these figures to the worldwide automotive industry shows, as a preliminary result, that the benefits of standards range between 28 and 55 billion US dollars per year.” [ISO, 2010, a, p10]

Pascal Lamy emphasizes “the importance of enhancing developing country participation in the standard setting process.” [Lamy, 2011, p5] This is indeed a critical issue for the future of standards as developing countries constitute about two thirds of ISO’s membership. Their participation is essential to ensure the global relevance of ISO standards.” [Takeda, 2011 a, p5] This aligns with the second objective of the 2011–2015 ISO Strategic Plan, which is to ensure that “the capacity and participation of developing countries in international standardization is significantly enhanced.” [ISO, 2011, b, p27] This focus also aligns with the American Society for Quality *2011 Future of Quality Study*, which cites globalization and global responsibility (social responsibility) as key forces shaping the future of quality. “Woven into the opportunity and risk of globalization and the challenges of organizations to manage their enterprises that now cross borders, cultures, and economic development stages, are the issues of finite resources.” [ASQ, 2011, p14]

Certification to international standards has been found to be “particularly important for exporters in developing economies, who compete with firms in developed countries that have longer histories and better reputations in export markets. Firms that are certified as meeting international standards create favorable perceptions of their company or brand and attract buyers.” [Otsuki, 2011, p2] Indeed, Otsuki’s study found that for organizations in 25 countries in Europe and Central Asia certification increased “export share in firm’s sales by 44.9 percent

on average.” [Otsuki, 2011, p10] In Asia “98 percent of certified organizations considered ISO 9001 implementation and certification to have been a good investment.” [Croft, 2011, p39] Therefore, ISO standards provide the infrastructure and opportunity for developing countries to improve their efficiencies and drive exports.

The Most Influential Standards

By 2011, ISO had developed more than 19,000 international standards and standard type documents, [ISO, 2011, a]. Of all of the ISO standards, ISO 9001:2008 and ISO 14001:2004 (*Environmental management systems – Requirements with guidance for use*) have achieved truly global status and are now thoroughly integrated in the world economy. [ISO, 2012, b] ISO’s best-selling standards include ISO 26000:2010 (*Guidance on social responsibility*) and ISO 31000:2009 [ISO, 2012, a] both of which are guidance documents. [ISO, 2012, b]

At the end of 2010, a record number of ISO 9001 certificates had been issued: 1,109,905 in 178 countries and economies, representing an increase of more than

4 percent over 2009. A record number also was reached for ISO 14001 with 250,972 certificates issued in 155 countries, an increase of 12 percent over 2009. [ISO, 2010, b] Other standards which have alignment to ISO 9001, using its framework and its plan-do-check-act (PDCA) cycle are ISO 14001 and OHSAS 18001 (*Occupational health and safety management systems – Requirements*). [ISO, 2012, c]

“The tremendous impact of ISO 9001 and ISO 14001 on organizational practices and trade has stimulated the development of other ISO standards and deliverables that adapt the generic management system approach to specific sectors or aspects.” [ISO, 2012, d] The range of sectors and aspects can be seen in Figure 1, which highlights the broad influence and interaction of ISO 9001.

The Global Impact of ISO 9001

In the Foreword of *Export Quality Management: A Guide for Small and Medium Sized Exporters*, Patricia Francis, Executive Director ITC and Ernst Otto Gobel, President of PTB state that “quality is a prerequisite for successful market access

and for improving the competitiveness of exporters.” [ITC & PTB, 2011, piii] Quality management has been “identified as one of the top most important factors in internationalization” as it reduces reject rates and production costs and increases the levels of exports and sales. [Awan, Bhatti & Bukhari, 2010, p107]

Quality management has a significant impact on the most commonly used management standards through the PDCA operating principle of ISO’s management system standards [ISO, 2012, f] and because the other management standards such as ISO 14001 and OHSAS 18001 are based on the ISO 9001 framework for direct alignment. Due to this influence, ISO 9001 is a key driver and coordinator of other standards including ISO 31000 and thereby facilitates the leverage of integrated management systems, in and of itself a driver of efficiencies. This influence can be seen in Figure 2.

Therefore, ISO 9001 “remains firmly established as the most globally implemented standard to provide assurance about the ability to satisfy quality requirements and to enhance customer satisfaction,” [Editor, 2012, p37] and so having a positive and significant impact on international trade. [Boys & Grant, 2009] Evaluating the impact of ISO 9000 on trade between 91 nations from 1995 to 2005 revealed the common language of ISO 9000 created benefits between nations and there was an “enhanced competitiveness effect . . . [to]involve a robust positive push with respect to home nation exports.” [Clougherty & Grajek, 2011, p32] For example, “the exports of European nations increase the most when other nations adopt ISO 9000.” [Clougherty & Grajek, 2011, p33]

A study of 60 countries revealed that “trade competition encourages firms located in structurally equivalent countries (those with comparable levels of dependence on the same export markets) to adopt ISO 9000. [Cao & Prakash, 2007] A study of 59 countries showed “strong correlations between productivity and certification. . . . In turn, certification contributes positively to productivity levels, as manufacturing benefits and operational or technological improvements are being implemented in the course of, or as a result of, certification. Interestingly, the disciplining effect of cer-

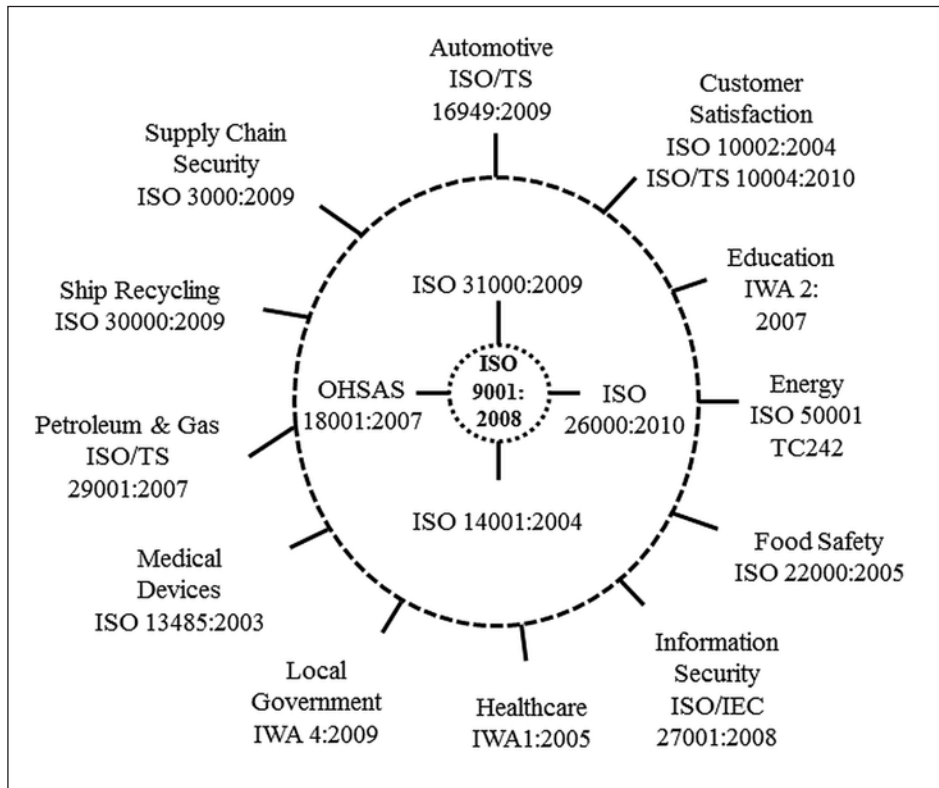


Figure 1: Model developed to show ISO 9001 core influence and leadership management standards specific applications

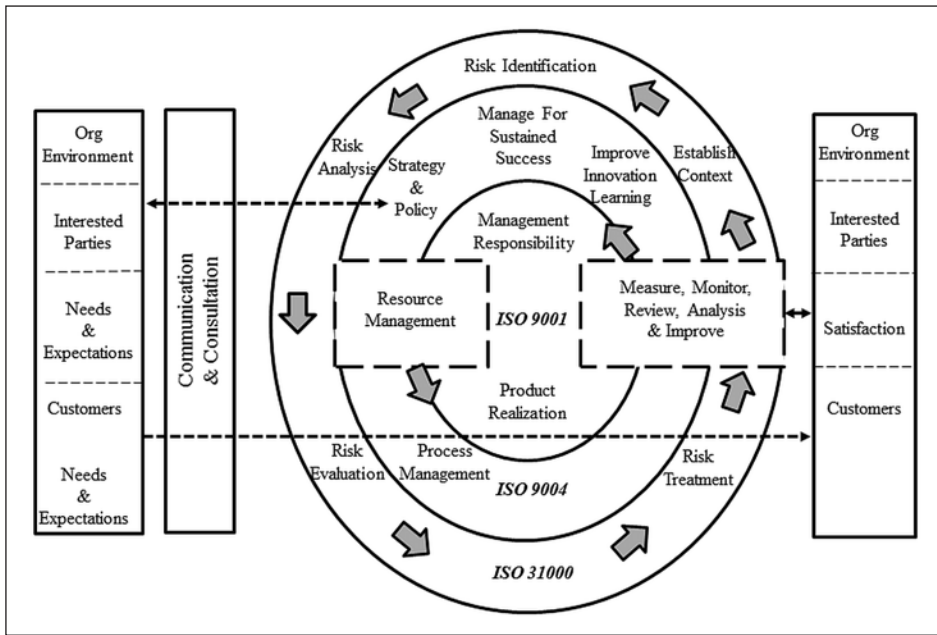


Figure 2: Merging of ISO 9004 & ISO 31000 models to show alignment

tification on performance is stronger in low institutional quality (developing) countries. It is likely that for such countries, to reach best practice, effective improvements in operational performance are necessary, as market forces in institutionally deficient countries are too weak to fully prepare firms for global best practices. . . . Controlling for all relevant determinants, including size, age, and foreign ownership, certification proves to have a strong positive effect on sales growth and on export intensity . . . this effect goes up for firms located in less institutionally developed countries.” [Goedhuys & Sleuwaegen, 2011, p19]

The Influence of ISO 9001 at the Individual Organizational Level

“Innovation it seems is poised to replace manufacturing as the source of wealth creation” [ASQ, 2011, p16] and “the opportunities for innovation and standards need to go hand in hand.” [Marchionne, 2012, p6] While organizations are striving to continually improve and innovate to meet the needs of customers and stakeholders, they need “better capabilities to innovate, manage risk, improve performance, comply with regulatory environment, develop talents, enhance customer and supplier relationships, and improve sustainability. Reliable management system standards are needed to

help meet these drivers’ challenges.” [Marchionne, 2012, p7] ISO 9001, *the* standard for improvement, is the most logical driver to coordinate such improvement efforts.

ISO 9000 has a positive effect on business, achieving reductions in non-conformities and complaints and improvements in customer and supplier satisfaction and an improvement in standardization of work procedures, communication, and employee involvement. [Casadesus & Karapetrovic, 2005] Those organizations with ISO 9001 certification have far lower organizational death rates while sales, employment, total payroll, and annual earnings per employee grew substantially than at matched organizations. [Levine & Toffel, 2010]

In a study of 35 ISO 9000 certified and 35 non-certified companies across a range of industries matched on size and industry, all of which were listed on the Singapore Stock Exchange over a 6 year period, “ISO 9000 certification is associated with significant improvements in profit margin, growth in sales, and earnings per share.” [Sharma, 2005, p170] “The two main dimensions positively affected from the ISO 9000 implementation are improving operating efficiency [and] better control of business operations.” [Cagnazzo et al, 2010, p315] This impact is mirrored in the US where

publicly traded manufacturing organizations experienced significant improvements in financial performance. [Corbett, Montes & Kirsch, 2004]

So the most influential international standard whose focus is improvement has a key role in driving the effectiveness and efficiency of individual organizations and national economies.

The Influence of ISO 14001 and OHSAS 18001

ISO 14001 and OHSAS 18001 are critical links with ISO 9001 for integrated management systems, and are fundamental connections to support risk management. Individually, they also have their own impact on organizational efficiency.

ISO 14001 serves as an “insurance tool for many manufacturers in their risk management practices. Clearly environmental policymakers should . . . encourage firms operating with uncertain but potentially disastrous environmental risks to undertake EMS certifications.” [Takahashi & Nakamura, 2010, p228] Montabon found that based on a survey of 116 manufacturing organizations, ISO 4001 certification had a significant positive impact on efficiency and effectiveness. [Montabon, Melnyk, Sroufe & Calantone, 2000] In a study of 1,222 manufacturing firms, Melnyk found that ISO 14001 achieved positive impact on many areas of corporate performance. [Melnyk, Sroufe & Calantone, 2003] Russo found that over time those certified to ISO 14001 improved their impact on emission reductions. [Russo, 2009]

In a study of eight chemical companies in India with 1,566 workers, organizations with OHSAS 18001 certification had the highest levels of safety management practices and behavior, achieving reduced accidents and liability while improving productivity and the safety and health of employees. [Vinodkumar & Bhasi, 2011]

With environmental and safety representing key areas of risk and liability, the application of ISO 14001 and OHSAS 18001 is fundamental to improving efficiency.

The Influence of ISO 31000

Risks are part of business. For many companies, risk represents an opportunity for increased return, and so for many it is

considered fundamental to success rather being viewed as a negative. “The secret to systematic business model innovation is to focus on identifying where the risks are in your value chain. Then, determine whether you can reduce them, shift them to other people, or even assume them yourself. If you take this approach, you won’t need extensive experimentation and prototyping to identify very powerful innovations because many tools for managing risk are available.” [Girotra & Netessine, 2011, p103] Indeed, using Standard and Poor’s newly available risk management rating, McShane et al found evidence of a positive relationship between increasing levels of risk management capability and firm value. [McShane, Nair & Rustambekov, 2011]

But risk management capability is the key. Most companies do not have a structured risk management system in place but rather have informal approaches. [Christopher, Mena, Khan & Yurt, 2011] With 65 percent of businesses not conducting systematic risk analysis prior to major corporate decisions and only 42 percent conducting risk management audits or procedure compliance [FERMA, 2010], risk for the majority is not well enough managed to be an opportunity. As we have seen over the last few years, catastrophes created by tsunamis and hurricanes, for example, have more than national implications. But, beyond such natural events there are risks involving homeland security and IT security. Consider the technical and safety issues at the core of the BP Gulf disaster. These incidents highlight how interconnected we are and the need for comprehensive risk management. Kevin W. Knight, Chair of the ISO working group that developed ISO 31000 stated “it can be argued that the global financial crisis resulted from the failure of boards and executive management to effectively manage risk. ISO 31000 is expected to help industry and commerce, public and private to confidently emerge from the crisis.” [Knight, 2009]

The attitude to risk is changing. The Accenture 2011 Global Risk Management Study based on surveys from 397 companies across 10 industries found that risk management is a higher priority now than two years ago for 98 percent of the respondents. Capabilities are becoming “high on the executive

agenda and now seen as a critical business driver and source of sustained growth and long term competitive advantage.” [Accenture, 2011, p4] Specifically “volatility in cash flow planning and commodity markets, and in risk exposure in general, are vexing issues in most industries. Companies are also dealing with multiple elements of their business on a worldwide scope, requiring new forms of coordination to be effective in living their global operating models.” [Accenture, 2011, p7] Leading organizations are starting to focus on integrating risk management across business units, establishing C-level executives and investing in continuous improvement. Enterprise risk management is coming more to the forefront.

The top future risk management challenges for organizations are reducing costs and aligning with the overall business strategy. Risk management also is seen as key to enabling long term profitable growth, sustaining future profitability, and ensuring compliance with regulations. [Accenture, 2011]

Viewing risk management as critical for future business success yet not having an infrastructure in place to support it, for many organizations, the publication of

ISO 31000:2009 and Guide 73:2009 (*Risk management – vocabulary*) has been most welcome. For many, it represents “a very significant milestone in mankind’s journey to understand and harness uncertainty. An unprecedented 15 countries voted for the standard.” [Purdy, 2010, p886]

Risk management standards “identify weaknesses that may contribute to vulnerability, [and] promote market efficiency and discipline . . . As successful implementation requires support and leadership from executive management, a strong culture of risk management into the organization, resources, and time planning, a correlation of risk management standards with other standards during implementation process, a continuous improvement.” [Ciocoiu & Dobrea, 2010, p17]

ISO 31000 provides a framework that helps reflect on what can happen and why, the consequences, probability of occurrences, and the factors to mitigate the consequence or reduce the probability of risk. It also is supported by a range of other national and international related risk management standards, as reflected in Figure 3.

In 2011, the ISO Technical Management Board established a new project

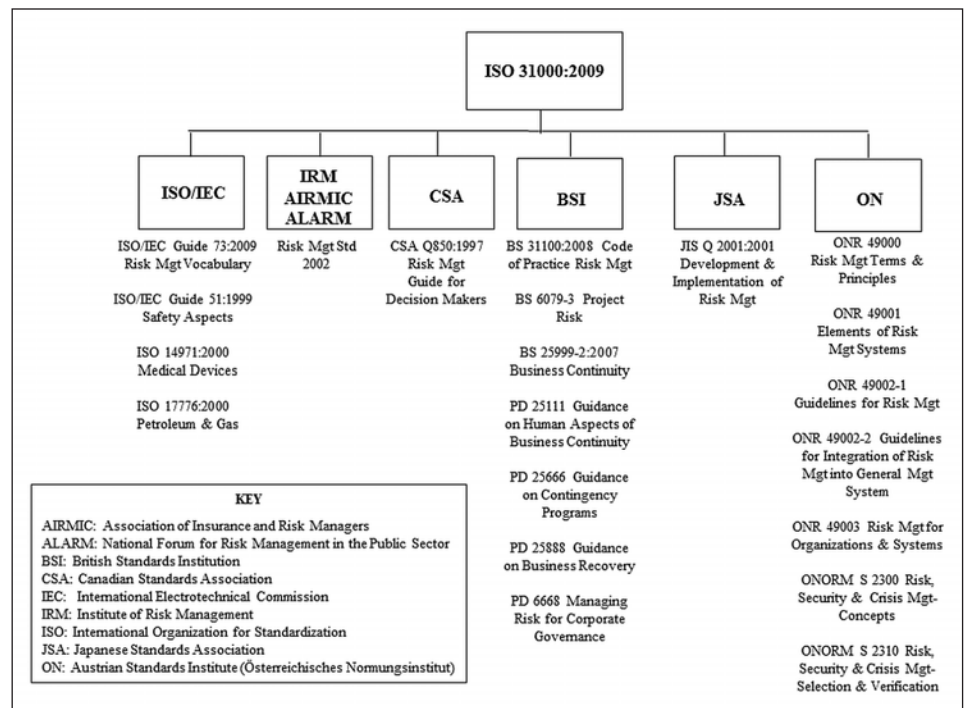
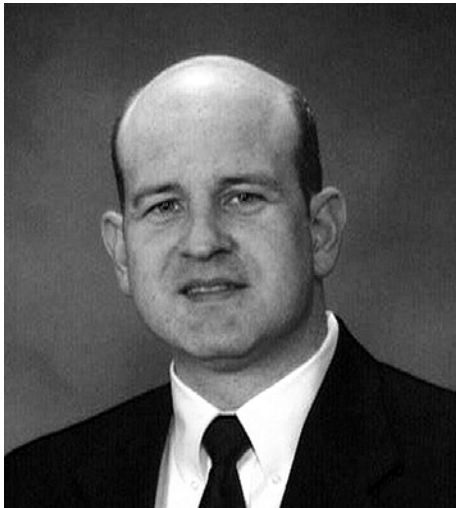


Figure 3: Model developed to represent the key international and national risk management standards

committee, ISO/PC 262, *Risk management*, to further develop guidance on the implementation of ISO 31000 thereby aiding the understanding of the standard, its value, and implementation.

Conclusion

International standards drive efficiencies for individual organizations, the economies of nations, and global trade. The most influential standards are the ISO management leadership standards at the core of which is ISO 9001, a critical standard for improving economic effectiveness and efficiency. As the cornerstone of creating integrated management systems, ISO 9001 is a key driver for the future of standards and is a perfect leverage tool for ISO 31000, which offers a new and much needed guide for organizations dealing with risk in an ever-changing and challenging global environment.



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