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Industrial Voluntary Consensus Standards – A Process Under Threat

Joel Blumenthal
Walden University

Walden University

College of Management and Technology

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Joel Blumenthal

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Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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Joel Blumenthal

MA, University of Phoenix, 2003

BS, University of Washington, 1982

Dissertation Submitted in Partial Fulfillment

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Abstract

The world relies heavily on industrial voluntary consensus standards to serve public interests through the development of uniform and harmonized social and economic procedures. The research problem focused on generating suggestions for improving collaborative practices between U.S.-based accredited and unaccredited standards development organizations that create voluntary consensus standards. The research centered on assessing the level of consensus among experts regarding what actions may be conducive to improving collaborative practices through the lenses of stakeholder and institutional theory. This modified 3-round qualitative Delphi study began with open-ended questions in Round 1 and progressed towards consensus in Rounds 2 and 3 using close-ended questions. The results encompassed consensus on 12 actions for preserving the historically deliberative and inclusive democratic U.S. voluntary consensus standards process spanning 6 categories: competition, deregulation, oversight, organizational structure, leadership training, and market-driven. The most notable of the 12 actions was an increase in internal and external liaison functions between standards development organizations and more participation on the part of industry and trade groups. This was the 1st study to apply the construct of consensus to the generation of actions focused on reducing the rise of an exclusive and nondemocratic voluntary consensus standards process and preserving a historically deliberative and inclusive democratic process. Incorporating the suggestions identified in this study may lead to positive social change by improving collaborative practices between standards development organizations and preserving the legitimacy of this important social function.

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Dedication

I would like to dedicate this paper to those special individuals who have taught me the value of holding ideals and integrity above short term gains and who have presented me with opportunities to interact with individuals who have different temperments, tallents, and convictions. In particular, I would like to thank my father, Robert M. Blumenthal (deceased), and Bob Anderson of TBI whose encouragement and leadership-by-example have helped me embrace a world view of cooperation and respect and who have allowed me to make mistakes without fear of recrimination. I also want to thank my wife, Kathy, and my mother, Sarah, whose support both finanically and emotionally have given me the opportunity to explore aspects of myself and humanity in ways that I hope will have positive social benefit. Finally, I would like to thank individuals such as Peter Petrillo, Gary Woods, and Evan Peterson who have mentored me, and my Walden committee whose advice and patience have helped guide me through this process.

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I would like to acknowledge the staff of Walden University, especially my committee. The input I received was always offered professionally and helped me refine my work in a positive way. I also want to acknowledge my expert panel members whose input and commitment to this research have helped add another grain of sand to the vast beach of human knowledge; and to my wife, Kathy, who while not always understanding my passion for this journey, nevertheless supported me in so many ways because what I was doing was important to me. Finally, I wish to express my gratitude to everyone else I did not mention, but whose contributions aided in the successful completion of this dissertation.

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Chapter 1: Introduction to the Study

Voluntary consensus standards created by standards development organizations (SDOs) serve public interests by establishing uniform and harmonized social and economic procedures. In industrial manufacturing environments, voluntary consensus standards serve public interests by promoting uniform and harmonized occupational/consumer safety and quality control procedures (Timmermans & Epstein, 2010). When industrial voluntary consensus standards do not exist, are ignored, or are in conflict, the uniformity and harmonization of occupational/consumer safety and quality control procedures are at risk (Botzem & Dobusch, 2012; Brunsson, Rasche, & Seidl, 2012; Ernst, 2013; Reinecke, Manning, & Hagen, 2012).

The United States has historically been a global leader in the development of industrial voluntary consensus standards through accredited industrial SDOs (Behr & Diaz, 2014; Ernst, 2013; Hopper, 2013). Per the American National Standards Institute (ANSI), the only congressionally approved U.S. industrial standards setting organization (SSO), there are currently over 240 accredited U.S.-based industrial SDOs operating under the auspices of ANSI (http://www.ansi.org/standards_activities/domestic_programs/overview.aspx?menuid=3). Accredited industrial SDOs are generally composed of professionals (often engineers) with specific skills. Typical accredited U.S.-based industrial SDOs are incorporated as nonprofit organizations but are increasingly considered hybrid organizations because of funding generation activities. Accredited U.S.-based industrial SDOs fund their activities through membership fees, professional publication fees, certification fees, and fees

generated by selling standards. Most professionals participate on a voluntary basis, with financial support for travel and other participation related expenses being provided by the volunteers' employers. The goal of accredited U.S.-based industrial SDOs is to develop normative guidelines that promote uniform and harmonized occupational/consumer safety and quality control procedures designed to serve public interests by establishing agreed upon industrial voluntary consensus standards (Behr & Diaz, 2014; Ponte & Cheyns, 2013; Timmermans & Epstein, 2010). Industrial voluntary consensus standards can include designs (e.g., automotive seat belts), the meaning of terminology (e.g., *should* versus *shall*), performance specifications (e.g., interference between electrical devices), and operating procedures (e.g., hospital sterilization protocols).

Starting in the late 1970s and early 1980s, there has been an increase in the number of unaccredited industrial SDOs participating in development, adoption, and diffusion of industrial voluntary consensus standards, particularly in the United States (Ernst, 2013; Rindt & Mouzas, 2015). This increase in the number of unaccredited industrial SDOs is thought to be a direct result of deregulation (Coates, 2015; Wijen, 2014) and has created challenges for leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs who now often find their organizations in competition (a struggle for *legitimacy*). Competition of this nature threatens to reduce the legitimacy of accredited U.S.-based industrial SDOs and industrial voluntary consensus standards in general by creating conflicts between accredited and unaccredited industrial SDOs (Osula & Ng, 2014). The challenge is of particular importance in the United States because of the unique U.S. market-driven, bottom-up approach to voluntary consensus standards

development, adoption, and diffusion (Strauss, 2013) and that accredited U.S.-based industrial SDOs must adhere to ANSI *essential requirements* that do not apply to unaccredited industrial SDOs (Hopper, 2013). Collaboration rather than competition with unaccredited industrial SDOs might ultimately be a less contentious approach to developing and establishing uniform and harmonized industrial voluntary consensus standards for all stakeholders. If leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs are not prepared to collaborate with each other, there is the risk of turning the U.S. industrial voluntary consensus standards process into a political and economic conflict as accredited and unaccredited industrial SDOs fight for legitimacy (Fransen, 2011). Such conflicts could potentially endanger public interests by threatening the U.S. industrial voluntary consensus process that has historically focused on the collaborative establishment of uniform and harmonized occupational/consumer safety and quality control procedures through a deliberative and inclusive democratic process (Timmermans & Epstein, 2010).

Chapter 1 includes the background and statement of the problem associated with the increase in the number of unaccredited industrial SDOs. The purpose and significance of this qualitative modified three-round Delphi study was to discover how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may improve collaborative practices to preserve the legitimacy of the U.S. industrial voluntary consensus standards process and better serve public interests. Chapter 1 also includes the research question and subquestions, nature of the study (research design), conceptual

framework that supports the study, definitions, assumptions, scope, delimitations, limitations, and chapter summary.

Background of the Study

Standards development was originally a relatively informal process on the part of the scientific community to establish common practices. Establishing common practices would then allow scientists to reproduce experiments conducted by others (Sandholtz, 2012; Timmermans & Epstein, 2010). By the early 1900s, and based on early scientific community successes, some organizations that would become the model for today's accredited U.S.-based industrial SDOs were beginning to form. The U.S. government legitimized standardization efforts during WWI, partially as a cost saving method but also driven by safety and quality concerns (Timmermans & Epstein, 2010; Yates & Murphy, 2015). Another well-known SDO, the International Organization for Standardization (ISO), was the result of a collaborative post-WWII United Nations effort to promote postwar trade through the voluntary coordination of recommended procedures (Brunsson et al., 2012; Heras-Saizarbitoria & Boiral, 2013).

Since the late 1970s and early 1980s, the power of accredited U.S.-based industrial SDOs has declined significantly as a result of an increase in the number of unaccredited industrial SDOs (Allen & Ramanna, 2013). This decline in the power of accredited U.S.-based industrial SDOs and the increase in the number of unaccredited industrial SDOs is thought to be a direct result of deregulation, which became politically and economically popular in the late 1970s and early 1980s (Coates, 2015; Wijen, 2014). Prior to deregulation, the legitimacy of industrial SDOs and the industrial voluntary

consensus standards they developed was mostly the result of consensus building through a deliberative and inclusive democratic process within and between a highly-concentrated number of accredited industrial SDOs that remained politically and economically neutral while serving public interests. The net result of deregulation in the United States is that a process that has historically been politically and economically neutral is being replaced by a contentious political and economic process whereby accredited and unaccredited industrial SDOs compete for legitimacy (Allen & Ramanna, 2013; Fransen, 2011). The increase in the number of unaccredited industrial SDOs has led to compromises, power plays, competing standards, and other conflicts that potentially threaten public interests (Botzem & Dobusch, 2012). Franzen (2011) suggested that political and ideological differences between interest groups must now be considered a cornerstone of any discussion regarding industrial voluntary consensus standards. The rationalization offered by Franzen is that once formed, SDOs in general are reluctant to let go of what is publicly claimed to have added value and privately perceived to be more about power. If allowed to continue, many industrial SDOs and the industrial voluntary consensus standards they create may be reduced to the status of "paper tiger" (Timmermans & Epstein, 2010, p. 79). Timmermans and Epstein (2010) claimed that the study of voluntary consensus standards in general is now a sociological concern and needs to be treated as such.

The U.S. approach to industrial voluntary consensus standards development, adoption, and diffusion is also unique compared with industrial voluntary consensus standards processes in other parts of the world (Ernst, 2013; Strauss, 2013). In the United

States, the industrial voluntary consensus standards process is based upon a market-driven, bottom-up approach with little if any government oversight or participation. The market-driven, bottom-up approach makes the U.S. industrial voluntary consensus standards process for the development, adoption, and diffusion of industrial voluntary consensus standards unique because industrial voluntary consensus standards processes in other parts of the world are top-down and involve some sort of government oversight and participation. The U.S. market-driven, bottom-up approach creates a situation that is ideal for the rise of competing interests driven by economic and political motivations.

Another consideration important to this study is the structure of industrial SDOs. Most industrial SDOs in the United States, although legally established as nonprofit organizations, are increasingly considered *hybrid* organizations in that they must deal with competing institutional logics of forprofit and nonprofit activities (Pache & Santos, 2013). Leaders of accredited and unaccredited industrial SDOs may find themselves facing a situation where there is no single goal (Schröer & Jäger, 2015). Leaders of accredited U.S.-based industrial SDOs may find the situation particularly challenging because the very nature of being accredited means an accredited organization subscribes to a business model that places mission and vision ahead of profit and discourages over representation by parties with vested interests (Farrell & Simcoe, 2012). Unaccredited industrial SDOs are not constrained in the same way, allowing leaders of unaccredited industrial SDOs greater flexibility in selecting a single goal (Gadinis, 2014). Leaders of industrial SDOs often come from a forprofit or nonprofit background (usually forprofit) and may not be prepared to address the conflicting institutional logics that define a hybrid

organization's structure that places the competitive and economic business model of forprofit activities in conflict with the social, philosophical, and moral business model of nonprofit activities (Pinho, Rodrigues, & Dibb, 2014). The collaborative component of leading a hybrid organization may therefore be an underdeveloped skill set of leaders who come from either a forprofit or nonprofit background (Benner & Pastor, 2015; Osula & Ng, 2014; Smith, 2014), requiring accredited and unaccredited industrial SDOs to more carefully select and train their leaders (Walston, 2014). The net result is that leadership of hybrid organizations such as accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may represent "an extreme leadership challenge" (Battilana & Lee, 2014, p. 422). Pache and Santos (2013) suggested that what makes leaders able to deal with the competing institutional logics of hybrid organizations represents a gap in general leadership studies.

The overarching research literature gap that currently exists, and the focus of this study, is a lack of specific strategies for how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may improve collaborative practices to reduce conflicts that threaten the legitimacy of the U.S. industrial voluntary consensus standards process (Allen & Ramanna, 2013; Botzem & Dobusch, 2012; Fransen, 2011; Timmermans & Epstein, 2010). The current study is needed because even though the public is generally unaware of how the U.S. industrial voluntary consensus standards process works (Ashley, 2015; Gadinis, 2014), the public represents a large group of stakeholders who are greatly affected by industrial voluntary consensus standards (Timmermans & Epstein, 2010). A functional approach to the development, adoption,

and diffusion of industrial voluntary consensus standards is critical to protecting public interests and promoting positive social change by maintaining a deliberative and inclusive democratic process that supports the legitimacy of industrial SDOs and the U.S.industrial voluntary consensus standards process (Behr & Diaz, 2014; Brunsson et al., 2012; Hopper, 2013; Olshan, 1993; Sandholtz, 2012; Timmermans & Epstein, 2010; Yates & Murphy, 2015).

Problem Statement

In industrial manufacturing environments, voluntary consensus standards serve public interests by promoting uniform and harmonized occupational/consumer safety and quality control procedures (Timmermans & Epstein, 2010). When industrial voluntary consensus standards do not exist, are ignored, or are in conflict, uniformity and harmonization of occupational/consumer safety and quality control procedures are at risk (Botzem & Dobusch, 2012; Brunsson et al., 2012; Ernst, 2013; Reinecke et al., 2012). The general problem is that regulatory and collaborative efforts to develop uniform and harmonized industrial voluntary consensus standards to serve public interests are under threat caused by an increase in the number of unaccredited industrial SDOs (Allen & Ramanna, 2013; Yates & Murphy, 2015). The rise of unaccredited industrial SDOs is thought to be a direct result of deregulation, which became politically and economically popular in the late 1970s and early 1980s (Coates, 2015; Wijen, 2014). Prior to deregulation, the legitimacy of industrial voluntary consensus standards was established among a highly concentrated number of organizations that remained politically and economically neutral while serving public interests by creating a win-win environment.

In the postderegulation environment, accredited and unaccredited industrial SDOs increasingly compete with one another, creating conflicts that threaten public interests by creating a win-lose environment (Allen & Ramanna, 2013; Fransen, 2011).

The specific problem is that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs are unprepared to collaborate with each other (Krug, Rabczuk, & Cenian, 2015; Ponte & Cheyns, 2013). Leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs need to improve collaborative practices to serve public interests and promote positive social change by reducing conflicts between accredited and unaccredited industrial SDOs (Fransen, 2011; Ponte & Cheyns, 2013; Timmermans & Epstein, 2010).

Purpose of the Study

The purpose of this qualitative modified three-round Delphi study was to discover what consensus could be built among a panel of subject matter experts (SMEs) regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improved collaborative practices and better serve public interests.

Research Question

Overarching Research Question: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

Subquestion (SQ) 1: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions regarding competition that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 2: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in deregulation that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 3: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in oversite that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 4: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in organizational structure that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 5: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in leadership training that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 6: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in market-driven standards that leaders of

accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

Conceptual Framework

The development of this study drew on institutional theory and stakeholder theory to explore the institutional mechanisms by which industrial voluntary consensus standards are developed, adopted, and diffused and the tensions that exist between significant stakeholders. Institutional theory and stakeholder theory assisted in exploring the challenges leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs must confront in the face of increasing conflict caused by competition (See Figure 1).

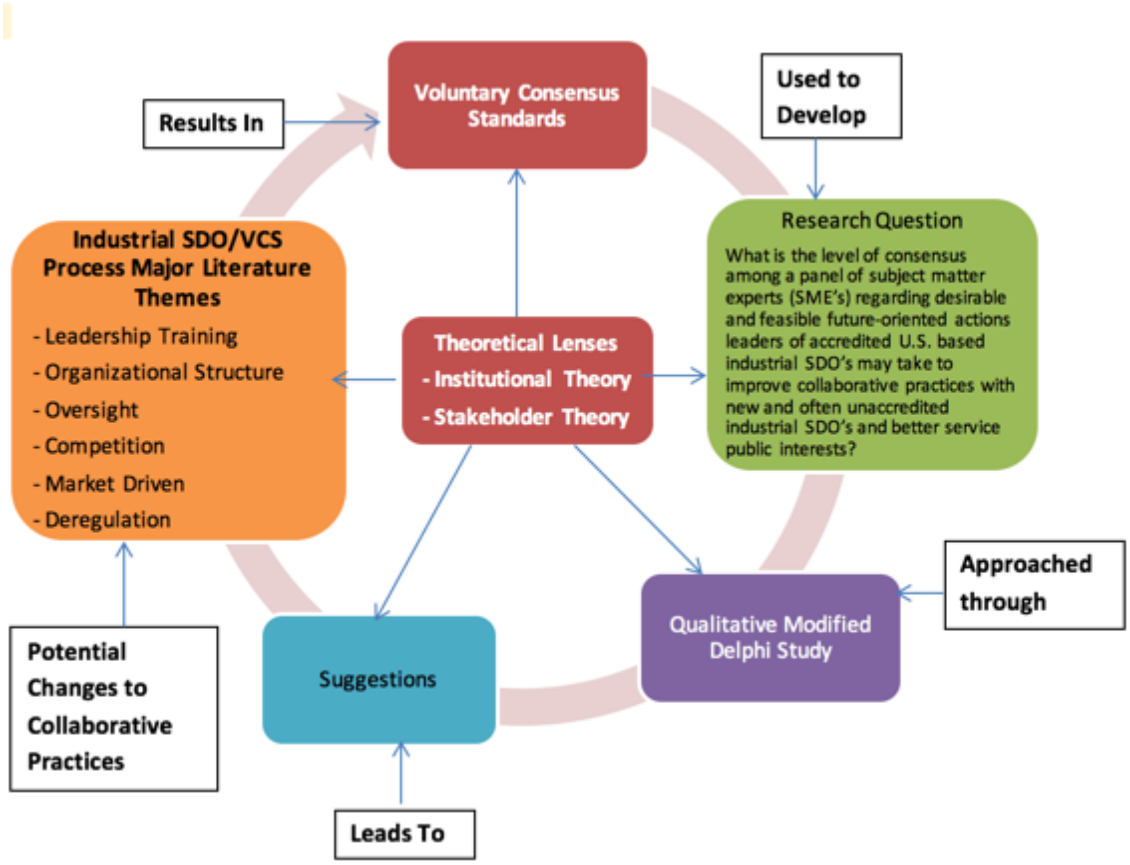

Figure 1. Conceptual framework.

The Figure 1 conceptual framework describes all the various aspects reviewed in this study. Six themes were derived from the literature as depicted in Figure 1 and formed the basis for this study.

The process of acceptance and convergence of industrial voluntary consensus standards by potential adopters typically follows a path that includes development, adoption, and diffusion (Slager, Gond, & Moon, 2012). The ultimate goal in the case of industrial SDOs is that voluntary consensus standards developed by industrial SDOs will become legitimate through acceptance by industry, government, society, SSOs, and other

SDOs (Stranieri, Cavaliere, & Banterle, 2015). Industrial voluntary consensus standards, perceived as legitimate, enhance perceptions of legitimacy of the SDOs that developed them (Stranieri et al., 2015). Stakeholders affected by industrial voluntary consensus standards and the U.S. voluntary consensus standards process often have different value systems, cultures, and agendas (Eskerod & Huemann, 2013). Competing interests between industrial SDOs, regulatory bodies, end users, or even between members who are part of a given SDO tend to make the development, adoption, and diffusion of industrial voluntary consensus standards a time consuming, costly, and politically and economically contentious process (Ponte & Cheyns, 2013). Depending on the mix of stakeholders potentially affected by a specific industrial voluntary consensus standard, the environment can be dynamic and confrontational with political and economic agendas within and between stakeholder groups changing over time (Verbeke & Tung, 2013).

Institutional Theory

Institutional theory was appropriate for this study because institutional theory deals with what, why, how, and when ideas are adopted and diffused (Brunsson et al., 2012; Chandler & Hwang, 2015; Suddaby, 2010). These concepts are an important part of how industrial voluntary consensus standards processes work (Simpson, Power, & Klassen, 2012). The primary concept behind institutional theory involves a tendency towards convergence through normative, coercive, and mimetic institutional pressure (Brunsson et al., 2012; Suddaby, 2010). Convergence is often described using the terms isomorphism or homogeneity. According to institutional theory, organizations tend to resemble one another over time (institutional isomorphism) through the use of similar

practices driven by institutional pressures (Zorn, Flanagin, & Shoham, 2011). Gadinis (2014) suggested that convergence brought about by normative institutional pressure (normative institutional isomorphism) is generally most compatible with the deliberative and inclusive democratic process employed by accredited industrial SDOs. Competition between SDOs can also increase institutional pressure (Fernando, Ng, & Walters, 2015), but competition tends to result in convergence driven by coercive institutional pressure (coercive institutional isomorphism) or mimetic institutional pressure (mimetic institutional isomorphism) because of power imbalances (Gadinis, 2014). Coercive and mimetic pressures, compared with normative pressures, are generally not as compatible with a deliberative and inclusive democratic industrial voluntary consensus standards development process (Gadinis, 2014). Coercive or mimetic behavior is often the form of institutional isomorphism practiced by unaccredited industrial SDOs whose motives tend to be more about securing economic and competitive advantages rather than taking a deliberative and inclusive democratic approach (Gadinis, 2014). In the case of accredited and unaccredited industrial SDOs, the increase in conflicts in pursuit of legitimacy only invites more institutional pressure of the coercive and mimetic variety and causes rivalry between power structures (Rindt & Mouzas, 2015) or encourages "free rider" behavior (Behr & Diaz, 2014, p. 598). Institutional theory does not necessarily point to a best approach for dealing with institutional pressures, but the lens of institutional theory can help explain the tensions created by what has been described as an emerging standards market (Reinecke et al., 2012). At the heart of any SDO is the SDOs culture, which is largely determined by leadership behavior. How institutional isomorphism works is then

of importance to leaders of accredited and unaccredited industrial SDOs who should be striving for all parties to adopt a normative approach in support of a deliberative and inclusive democratic process.

Stakeholder Theory

Stakeholder theory was appropriate for this study because stakeholder theory deals with conflicts of interest that may exist between various parties affected by direct or indirect interactions (Garriga, 2014; Hasnas, 2013; Tullberg, 2013). The development, adoption, and diffusion of industrial voluntary consensus standards involves multiple stakeholders, each with their own personal and/or group bounded rationalities (Tashman & Raelin, 2013). The primary or critical stakeholders involved during the development, adoption, and diffusion of industrial voluntary consensus standards tend to be classified as *influencers* (Miles, 2012). Influencers can include accredited and unaccredited industrial SDOs, SSOs, end users (industry), manufactures (suppliers), employees, legislative bodies, and potentially even the public at large (Tullberg, 2013). Members of accredited industrial SDOs are often also members of unaccredited industrial SDOs. Dual participation can complicate identifying stakeholders and determining each stakeholder's relative importance and motivations (Tashman & Raelin, 2013). Per Yates and Murphy (2015), some unaccredited industrial SDOs further complicate the stakeholder picture by interjecting standards they develop into existing accredited industrial SDO processes to enhance adoption and diffusion. There is also a leadership component to stakeholder theory in that several studies placed leaders at the center of the stakeholder discussion and suggest that it is the responsibility of leaders to identify and

classify various stakeholders and then identify what each stakeholder considers to be of value (Garriga, 2014). Parmar et al. (2010) suggested that leaders must also engage stakeholders from a "two-way" perspective (p. 22) in that leaders must look inward as well as outward. Since accredited and unaccredited industrial SDOs tend to compete in the same space, stakeholder theory becomes an important lens for trying to understand the tensions that exist between industrial SDOs and significant stakeholders.

Chapter 2 expands upon the potential roles of institutional theory and stakeholder theory to better explore the dynamics of industrial voluntary consensus standards processes, particularly in the United States. Included in Chapter 2 is a discussion of how deregulation and the unique U.S. market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion has encouraged an increase in the number of unaccredited industrial SDOs and presented leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs with unique institutional and stakeholder challenges.

Nature of the Study

In this dissertation, I used a qualitative modified three-round Delphi study designed to discover what consensus could be built among a panel of SMEs from accredited U.S.-based industrial SDOs regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. Qualitative research is consistent with the goal of exploring how leaders of industrial SDOs approach industrial voluntary consensus standards development, adoption, and

diffusion, and what changes in leadership approach might be conducive to improving collaborative practices between accredited and unaccredited industrial SDOs. The selection of a Delphi design was deemed appropriate because of the desire to compare expert opinions (Hasson & Keeney, 2011). Gaining insight into the current mindset, behavior, and qualifications of leaders of industrial SDOs might suggest changes in how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs deal with potential conflicts, and how collaborative practices may be improved between accredited and unaccredited industrial SDOs. Although generally incorporated as nonprofits, industrial SDOs are increasingly considered hybrid organizations that present leaders with unique challenges because of the blending of conflicting forprofit and nonprofit institutional logics (Dimitrios, Sakas, & Vlachos, 2013; Osula & Ng, 2014; Pache & Santos, 2013; Schröer & Jäger, 2015). Researchers suggested that leaders of hybrid organizations that come from forprofit or nonprofit backgrounds may be unprepared to manage the conflicting institutional logics of forprofit and nonprofit activities inherent to hybrid organizations (Schröer & Jäger, 2015). Other researchers suggested studies regarding leadership of hybrid organizations are neglected in favor of research specifically focused on forprofit organizations, and to a lesser extent on nonprofit organizations (Smith, 2014). Understanding desirable characteristics of leaders of hybrid organizations could illuminate potential collaborative practice improvements (McMurray, Islam, Sarros, & Pirola-Merlo, 2012). Researchers posited that hybrid organizations may benefit from adopting some forprofit leadership practices because of the forprofit focus on profit and competition that is increasingly a component of

industrial SDOs (Pinho et al., 2014). Researchers also suggested that leaders of hybrid organizations may need to be specifically selected or trained to do justice to a hybrid organizations' unique leadership challenges (Schröer & Jäger, 2015). Exploring these considerations made a Delphi design appropriate for this study.

For this study, SMEs who qualified as potential expert panel members where defined as individuals with similar experiences (Förster & von der Gracht, 2014), with a focus on expertise with accredited U.S.-based industrial SDOs. Assuring similar experiences was accomplished by selecting expert panel members who were currently active in accredited U.S.-based industrial SDOs and met a specific set of criteria outlined in detail in Chapter 3. All questionnaires were sent electronically to expert panel members using SurveyGizmo. In Round 1 of the study, semistructured open-ended research questions were sent to the expert panel members. The questions were based upon the outcome of the literature review in which six themes related to management practices were identified as being critical for improving collaborative practices. The expert panel members responded to the questions by identifying actions for improving collaborative practices that exemplify each management practice. Based on word frequency and interpretation of responses using traditional text analysis (Bright & O'Connor, 2007), a series of closed-ended questions for each theme was created. In Rounds 2 and 3, a Likert-type approach was applied to each question and descriptive statistics were used to evaluate the ratings expert panel members provided for enabling the evaluation of consensus for each question.

Analysis of the data from Round 1 focused on looking for subthemes and considering which subthemes and resulting questions under the six major themes demonstrated a level of consensus or not in Rounds 2 and 3. The ultimate goal was to analyze the data in a way that answered the primary research question (Laick, 2012; Skulmoski, Hartman, & Krahn, 2007) and to suggest topics for future research (Asselin & Harper, 2014).

Definitions of Terms

Throughout the dissertation, the follow definitions are used:

American National Standards Institute (ANSI): A congressionally authorized accrediting organization responsible for representing the United States in the development of international consensus standards and managing the U.S. standards development organization accreditation process (Hopper, 2013).

Bounded rationality: A concept whereby individual and/or organizational sense-making and rational decision-making abilities are constrained (Tashman & Raelin, 2013).

Delphi design: A research technique used to understand group behavior by interviewing subject matter experts in the area of focus (Davidson, 2013).

Forprofit organization: An organization specifically formed to generate profit for the organization and for selected stakeholders (shareholders) (Cooper, Santora, & Sarros, 2011).

Hybrid organization: An organization that incorporates competing institutional logics of both forprofit and nonprofit organizations (Pache & Santos, 2013).

Institutional theory: A theoretical approach to understanding organizational behavior through a social lens rather than just an economic lens (Suddaby, 2015).

Isomorphism: A similarity of the processes or structures between organizations representing a trend towards convergence or homogeneity (Zorn et al., 2011).

Knowledge experts: Individuals with specific or unique knowledge regarding an area of interest. Knowledge experts in industrial settings tend to be those with specific technical or scientific skills (Sandholtz, 2012).

Nonprofit organization: An organization whose mission is primarily one of social responsibility and philanthropic values (Cooper et al., 2011).

Servant leadership: A theory of leadership that is marked by a leaders concern for others and a desire to help others grow (Cooper et al., 2011).

Stakeholder theory: A theoretical approach for connecting ethics and strategy that creates value for a broad group of stakeholders (Harrison & Wicks, 2013).

Standard development organizations (SDOs): Organizations whose primary responsibility is to develop voluntary consensus standards (Behr & Diaz, 2014).

Standards setting organizations (SSOs): Organizations whose primary function is to review standards developed by SDOs and to establish criteria for SDOs that wish to become accredited (Behr & Diaz, 2014).

Subject matter experts (SMEs): Individuals with specific or unique competence in the subject of interest (Hopper, 2013).

Systems theory: A group of specific propositions that when brought together can aid in the understanding of complex systems, especially those that operate on a long-term basis (Adams, Hester, Bradley, Meyers, & Keating, 2014).

Transactional leadership: A theory of leadership that is marked by leaders motivating followers through a system of reward and punishment (McMurray et al., 2012).

Transcendent leadership: A theory of leadership that is marked by a leaders concern for followers that takes into account the motivation and empowerment of others (Shiva & Suar, 2010, p. 118).

Transformational leadership: A theory of change leadership that is marked by relationship-oriented and inspirational behavior (Bordia, Restubog, Jimmieson, & Irmer, 2011).

Voluntary consensus standards: Nonlegally binding standards created by deliberation of interested parties who attempt to reach consensus and a balance of interests through respectful dialogue between members of a development committee (Yates & Murphy, 2015).

Assumptions

This Delphi design relied on input from a panel made up of SMEs with me (the researcher) playing an integral role in soliciting input and analyzing data. This study was based on nine assumptions regarding expert panel members and my role. The first assumption was that the established criteria did qualify an individual as a SME. The second assumption was that individuals who agreed to become expert panel members met

the established criteria of being a SME regarding industrial voluntary consensus standards processes, especially from a U.S. perspective. The third assumption was that expert panel members would provide thoughtful and truthful answers to questionnaire questions and statements. The forth assumption was that expert panel members were familiar with the function of accredited SDOs and at least anecdotally familiar with the function of unaccredited industrial SDOs. The fifth assumption was that expert panel members understood the development, adoption, and diffusion processes by which standards become legitimized. The sixth assumption was that expert panel members tended to represent the attitudes of the larger body of SMEs familiar with the U.S. process. The seventh assumption was that expert panel members had no ulterior political and/or economic motivations for participating in this study. The eighth assumption was that definitions of consensus and data analysis supported claims of rigor and infused this study and the study results with "a quality of *undeniability*" (Miles, Huberman, & Saldana, 2014, p. 4). The ninth assumption was that my personal biases would not adversely impact input or analysis.

Scope and Delimitations

The scope of the study was accredited U.S.-based industrial SDOs and unaccredited industrial SDOs and the discovery of how a panel composed of SMEs familiar with industrial SDO processes could build consensus regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. Per studies discovered during the literature review, accredited

U.S.-based industrial SDOs in particular could be facing challenges from several quarters. These included challenges directly from unaccredited industrial SDOs, legislation that could either be too restrictive or not restrictive enough, the SSO (ANSI) that oversees the industrial SDO accreditation process in the United States, the U.S. market-driven, bottom-up approach to voluntary consensus standards development, adoption and diffusion, and leaders themselves who may be unprepared to manage industrial SDOs.

The delimitations were established boundaries within the study (Leedy & Ormrod, 2010). One delimitation was having a purposive sample. In this qualitative modified three-round Delphi study, the purposive sample included SMEs from accredited U.S.-based industrial SDOs and did not include SMEs from only unaccredited industrial SDOs.

Per the literature reviews, a lack of collaboration between accredited and unaccredited industrial SDOs is the primary threat to SDO legitimacy and the legitimacy of the U.S. industrial voluntary consensus standards process. Leaders of accredited U.S.-based industrial SDOs are constrained by the accreditation requirements to which their organizations subscribe. Such constraints generally do not apply to leaders of unaccredited industrial SDOs. The pool from which SMEs were recruited to participate as expert panel members were comprised of selected ANSI accredited SDOs. ANSI is the only congressionally approved U.S. SSO authorized to represent the United States on international industrial voluntary consensus standards matters and manage the U.S. SDO accreditation process. Selected SDOs were sent a request to extend the invitation to

participate as an expert panel member to their respective volunteer membership bases, or, potential expert panel members were contacted directly by me. Expert panel members drawn from this pool of SMEs were expected to represent a competent source of opinion regarding challenges faced by leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. Another delimitation was that I was only looking at two theories, institutional theory and stakeholder theory. These theories were selected because they came up most frequently during the voluntary consensus standards literature reviews. Institutional theory was of interest to explore what types of institutional isomorphism resulted from the current competition between accredited and unaccredited industrial SDOs, what types of institutional isomorphism would be desirable, how to achieve desirable institutional isomorphic behavior, and what impediments may exist that interfere with desirable institutional isomorphism. Stakeholder theory was of interest to explore how stakeholders with similar or different agendas were affected by industrial voluntary consensus standards and could be managed in ways that promoted collaboration that did not significantly favor or disenfranchise specific stakeholders.

Limitations

The primary limitations were time, cost, communication, fatigue, panel member dropout, attracting potential expert panel members, selecting expert panel members (uncritical adoption), and biases. Accredited U.S.-based industrial SDOs and their volunteer members tend to be geographically dispersed. This presented a problem regarding travel time and cost. My contact and subsequent communication with potential SMEs during the expert panel member attraction and selection process was conducted by

electronic means. While a relatively efficient and cost effective way to communicate, there was the inevitable loss of visual and audio cues that could increase the possibility of not getting appropriate or sufficient expert panel members prior to starting the study or a failure to communicate between expert panel members and me during the study.

Another aspect of time that was a potential limitation was how long each expert panel member took to complete each questionnaire and resulting fatigue that might drive expert panel members towards a central selection tendency. Related to the central selection tendency limitation were dropout limitations. Birko, Dove, and Özdemir (2015) suggested designing questionnaires that took no more than 30 to 45 minutes to complete as a defense against a tendency towards central selection and dropout.

Attracting qualified expert panel members was a limitation from the perspective of who volunteered. Presenting a compelling reason to participate hopefully mitigated the potential for attracting expert panel members who were not committed to the study. Selecting qualified expert panel members (avoiding uncritical adoption) represented another potential limitation. Uncritical adoption occurs when one takes an individuals' claim of expertise at face value (Rowe & Wright, 2011). I had little choice but to accept potential expert panel member claims that they were SMEs. Presenting a simple but concise list of qualifications that accurately defined the desired skill sets hopefully mitigated this limitation.

Biases of expert panel members were also a potential limitation. I had little control or even awareness of expert panel member biases. The biases I was most

concerned with involved nonobjective mindsets on the part of panel members. Biases could adversely affect the objectivity of self-reporting.

Significance of the Study

Industrial voluntary consensus standards are an important way in which the world communicates on a local and international level (Timmermans & Epstein, 2010). The development, adoption, and diffusion of industrial voluntary consensus standards contributes to positive social change by serving public interests through the establishment of uniform and harmonized occupational/consumer safety and quality control procedures. When industrial voluntary consensus standards do not exist, are ignored, or are in conflict, the uniformity and harmonization of occupational/consumer safety and quality control procedures are at risk (Botzem & Dobusch, 2012; Brunsson et al., 2012; Ernst, 2013; Reinecke et al., 2012). From an industrial perspective, most industrial voluntary consensus standards have historically been created by accredited industrial SDOs through established processes designed to provide equal (democratic) representation (Yates & Murphy, 2015). These types of industrial voluntary consensus standards have often been referred to as soft law (Wijen, 2014). As suggested by Reinecke et al. (2012), the recent and uncoordinated proliferation of industrial voluntary consensus standards has created a standards market that threatens the legitimacy of industrial SDOs and the legitimacy of industrial voluntary consensus standards processes. This threat needed to be explored because society relies on industrial voluntary consensus standards to clarify designs, terminologies, performance, and procedures (Timmermans & Epstein, 2010).

This study was significant for several reasons. First, there is the importance of exploring the political and economic aspects of modern industrial voluntary consensus standards processes so that what is an increasingly competitive and crowded field of participants can work together to serve public interests. The increase in competition between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs in particular could be leading to conflicts that are not politically and economically neutral, and threaten public interests (Fransen, 2011). From a political perspective, the effects of deregulation in the United States (Coates, 2015; Wijen, 2014) made this study significant because deregulation has resulted in a situation where there is increasingly little if any legislative oversight regarding the creation of industrial SDOs. Any U.S. state or industry consortium can create an SDO, and seeking improvements in collaborative practices with unaccredited industrial SDOs may be a moot point without reengagement on the part of legislative bodies (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). From an economic perspective, unaccredited industrial SDOs are often motivated by business related objectives (Reinecke et al., 2012). Business related objectives tend to be about regulating private markets and are at odds with historical industrial voluntary consensus standards processes that have favored a deliberative and inclusive democratic approach. As suggested by Ponte and Cheyns (2013), the moral responsibility of industrial SDOs to serve public interests primarily by promoting uniform and harmonized occupational/consumer safety and quality control procedures is in danger of being replaced by political and economic motivations that placed special interests ahead of public interests. Researchers claimed the development,

adoption, and diffusion of voluntary consensus standards in general is now a sociological concern that demands greater research to understand how the processes are changing and potentially affecting all stakeholders (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010).

Second, there was a need to understand how industrial SDOs work from a leadership perspective. Most industrial SDOs, although legally established as nonprofits, are increasingly considered hybrid organizations in that they must deal with the conflicting institutional logics of forprofit and nonprofit organizations (Pache & Santos, 2013). Leaders of accredited and unaccredited industrial SDOs may find themselves facing a situation where there is no single goal (Schröer & Jäger, 2015). Leaders of accredited U.S.-based industrial SDOs may find the situation particularly challenging because the very nature of being accredited means an accredited organization subscribes to a business model that places mission and vision ahead of profit and prevents over representation by parties with vested interests (Farrell & Simcoe, 2012). Unaccredited industrial SDOs are not constrained in the same way, allowing leaders of unaccredited industrial SDOs greater flexibility in selecting a single goal (Gadinis, 2014). Leaders of industrial SDOs often come from a forprofit background and may be unprepared to deal with the conflicting institution logics that are inherent to hybrid organizations (Pinho et al., 2014). The collaborative component of leading a hybrid organization may be an underdeveloped skill set of leaders who come from a forprofit background (Benner & Pastor, 2015; Osula & Ng, 2014), requiring industrial SDOs to more carefully select and train their leaders (Walston, 2014). The net result is that leadership of hybrid

organizations such as accredited and unaccredited industrial SDOs may represent "an extreme leadership challenge" (Battilana & Lee, 2014, p. 422). Pache and Santos (2013) suggested that what makes leaders able to deal with the conflicting institutional logics of hybrid organizations represented a gap in leadership studies.

Third, the U.S. industrial voluntary consensus standards process is unique in that the U.S. process is based on a market-driven, bottom-up approach instead of the more top-down approach employed by regions outside of the United States, (Ernst, 2013). The U.S. market-driven, bottom-up approach has served the U.S. industrial voluntary consensus standards process well for many years, but with changes brought about by deregulation and globalization, the market-driven, bottom-up approach may be facing challenges. Researchers suggested that the U.S. market-driven, bottom-up approach was part of the reason that U.S. industrial SDOs are losing legitimacy compared with their non-U.S. counterparts (Kaplan & Kinderman, 2015: Lampland & Star, 2009). The loss of legitimacy poses a problem not only for leaders of industrial SDOs, but for U.S. governmental organizations who have been hesitant to interfere in the industrial voluntary consensus standards process as long as the market-driven, bottom-up approach appeared to be working (Krug et al., 2015). When industrial SDOs begin to compete, some researchers suggested that a robust oversight process led by governmental organizations may be a necessary part of the solution (Makiya & Fraisse, 2015). Olshan (1993) claimed that the power to set premise by the private rather than the public sector in the United States is a battle that was won by the private sector. However, since deregulation, the private sector approach has resulted in a contentious and political

process that only seems to be getting worse. As a result, the development, adoption, and diffusion of industrial voluntary consensus standards in the United States are increasingly contested and fought over (Vogel, 2010). The net result is recent concern that the U.S. market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion may not be able to survive without increased government involvement (Coates, 2015).

Significance to Practice

Improvements to practice in the United States could come from three directions. First is the potential need for leaders of industrial SDOs to be properly selected and trained so that they can be better prepared to deal with the conflicting forprofit and nonprofit institutional logics that are inherent to hybrid organizations (Smith, 2014). Second is the possibility that increased government intervention may be deemed necessary in order to maintain the legitimacy of the U.S. industrial voluntary consensus standards process (Hopper, 2012; Vogel, 2010). Third is the need for greater collaboration between various stakeholders in order to reduce conflict (Ashley, 2015; Brenner & Pastor, 2015).

Significance to Theory

Institutional theory and stakeholder theory have long been used as lenses to view the behavior of forprofit organizations (Hasnas, 2013; Modell, 2012). However, there has been less research into how institutional theory and stakeholder theory apply to nonprofit organizations and even less research into how institutional theory and stakeholder theory apply to hybrid organizations (Chandler & Hwang, 2015; Hasnas,

2013). This study has the potential to expand the use of institutional theory and stakeholder theory beyond the forprofit and nonprofit sectors and discover new and potentially unique ways that institutional theory and stakeholder theory can be used to understand and guide the behavior of industrial SDOs from both an internal and external perspective. Leadership theory (although not a focus of this research) might also benefit from this study because leadership research in hybrid organizations has been relatively overlooked in favor of leadership research in forprofit sectors and to a lesser extend in nonprofit sectors (Brown & Yoshioka, 2003; Chadwick-Coule, 2011; Cho & Perry, 2012; Goldkind, 2015; Lazurko, Miller, & Ghoneim, 2014).

Significance to Social Change

There are four implications for positive social change because of this study. First, this study could result in improvements to collaborative practices in industrial voluntary consensus standards development, adoption, and diffusion that "help to ensure the quality and safety of production processes, products, and services" (Ernst, 2013, p. 9). These potential improvements would be primarily focused on how accredited and unaccredited industrial SDOs share the industrial voluntary consensus standards landscape, and how other stakeholders participate in developing, adopting, and diffusing industrial voluntary consensus standards. Second, the results of this study could aid in the development of more effective oversight of the industrial voluntary consensus standards process (Hopper, 2013). Improving oversite practices could help reduce conflicts, resulting in more robust and legitimate industrial voluntary consensus standards (Timmermans & Epstein, 2010). Third, the results of this study could help the public gain a greater understanding of

industrial voluntary consensus standards processes and remove some of the mystery often referred to as the *black box* that surrounds industrial voluntary consensus standards (Gadinis, 2014; Slager et al., 2012). A greater understanding of industrial voluntary consensus standards processes might encourage more participation on the part of the public in crafting industrial voluntary consensus standards. Finally, the results of this study could support positive social change by strengthening the claim that industrial voluntary consensus standards and industrial voluntary consensus standards processes should be treated as a sociological concern and not as processes that are simply technical, political, or economic (Fransen, 2011; Timmermans & Epstein, 2010).

Summary and Transition

In Chapter 1, I addressed the challenges faced by accredited U.S.-based industrial SDOs and their leaders brought about by an increase in the number of unaccredited industrial SDOs. I also addressed the importance of how industrial voluntary consensus standards support public interests by promoting uniform and harmonized occupational/consumer safety and quality control procedures. I described the role of institutional theory and stakeholder theory as a lens through which industrial voluntary consensus standards processes and the role of SDOs could be explored. I also described the potentially unique role leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs could play in improving collaborative practices. Considering the importance of industrial voluntary consensus standards regarding commerce, social order, and supporting public interests, gaining an understanding into how the processes work and are potentially changing is of importance to all stakeholders

(Behr & Diaz, 2014; Botzem & Dobusch, 2012; Brunsson et al., 2012; Fransen, 2011; Reinecke et al., 2012; Timmermans & Epstein, 2010). I also discussed potential study limitations and steps taken to mitigate these limitations.

In Chapter 2, I provide literature reviews of historical and current industrial voluntary consensus standards development processes and the changing roles of SDOs. The literature review includes selected studies focused on institutional theory and stakeholder theory as lenses for understanding how industrial voluntary consensus standard processes work and the potential role of SDOs. I also include literature reviews of leadership in specific types of organizations and the unique role that leaders of accredited industrial SDOs play in supporting functioning industrial voluntary consensus standards processes. The literature review also touches on the claims made by some researchers that the processes by which industrial voluntary consensus standards are developed, adopted, and diffused are now a sociological concern and should be treated as such (Botzem & Dobusch, 2012; Brunsson et al., 2012; Fransen, 2011; Timmermans & Epstein, 2010).

Chapter 2: Literature Review

The general problem is that regulatory and collaborative efforts to develop uniform and harmonized industrial voluntary consensus standards that serve public interests are under threat caused by an increase in the number of unaccredited industrial standards development organizations (SDOs) (Allen & Ramanna, 2013; Yates & Murphy, 2015). The specific problem is that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs are unprepared to collaborate effectively with each other (Krug et al., 2015; Ponte & Cheyns, 2013). The purpose of this qualitative modified three-round Delphi study was to discover what consensus could be built among a panel of subject matter experts (SMEs) regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. Major sections of Chapter 2 include the literature search strategy, conceptual framework, the general literature review, and summary.

The gap in current literature was a lack of research into how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs could improve collaborative practices. This gap raised questions regarding how leaders of industrial SDOs can work with significant stakeholders to encourage more effective collaboration in order to reduce conflicts that threaten public interests (Fransen, 2011; Ponte & Cheyns, 2013; Timmermans & Epstein, 2010).

Literature Search Strategy

The primary sources for the literature review were scholarly peer reviewed journal articles. The topics of the literature were voluntary consensus standards, SDOs, tensions that exist between competing interests, leadership challenges based on organizational structure, institutional theory, stakeholder theory, and Delphi design considerations. Literature sources came from databases available from Walden University, Google Scholar, and the University of Nevada Reno. Key words used for the literature review searches included *voluntary consensus standards, standards development, leadership, hybrid organizations, institutional theory, stakeholder theory, deregulation,* and *collaboration*.

For the literature review, I started by examining the general role of voluntary consensus standards in society. I was primarily interested in industrial voluntary consensus standards and how industrial voluntary consensus standards are incorporated into the fabric of society. I then turned my attention to the history of industrial voluntary consensus standards and the unique U.S. market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion. I next focused on industrial voluntary consensus standards processed today, primarily from a U.S. perspective. This section includes a more detailed review of the conflicts that have developed between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs, and how the increase in the number of unaccredited industrial SDOs in the United States is affecting a voluntary consensus standards process that has historically followed a deliberative and inclusive democratic approach. During the review of literature related

to voluntary consensus standards, references to institutional theory and stakeholder theory were constant features as researchers sought to understand and explain tensions. Subsequently, part of the literature review strategy included literature relating to institutional theory and stakeholder theory. I had initially anticipated adding system theory to the literature review, and although there were several references to voluntary consensus standards systems or systems that included voluntary consensus standards (Behr & Diaz, 2014; Delmas & Montiel, 2008; Ernst, 2013; Krug et al., 2015), I did not find any references to systems theory. Finally, I addressed literature on leadership challenges based on organizational type (nonprofit, forprofit, and hybrid). My primary focus was on hybrid organizations (the most common U.S. industrial SDO type). What became apparent as the literature review progressed was that in the United States, the increase in the number of unaccredited industrial SDOs since the 1970s and 1980s has increased conflicts between accredited and unaccredited industrial SDOs, presenting leaders of industrial SDOs with unique challenges.

There was no shortage of literature regarding the tensions involved in the development, adoption, and diffusion of industrial voluntary consensus standards. There was also no shortage of literature regarding the increase in conflicts between industrial SDOs driven primarily by the increase in the number of unaccredited industrial SDOs. The literature review revealed five major topics of interest. First, today's industrial voluntary consensus standards are ubiquitous, but the processes by which they are developed, adopted, and diffused are considered *black boxes* (Behr & Diaz, 2014; Lampland & Star, 2009; Slager et al., 2012). Second, although incorporated as

nonprofits, the increasingly hybrid nature of industrial SDOs may present a special challenge to leaders of industrial SDOs because of the need in hybrid organizations to address the conflicting institutional logics of forprofit versus nonprofit constructs (Pache & Santos, 2013; Schröer & Jäger, 2015). Third, the unique U.S. market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion creates an environment that is ideal for the rise of competing interests between accredited and unaccredited industrial SDOs (Ernst, 2013; Strauss, 2013). Forth, the industrial voluntary consensus standards development process in the United States may be facing a problem of legitimacy brought about by the increase in conflicts between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. Fifth, institutional theory and stakeholder theory were the primary lenses used by researchers to examine the tensions that exist regarding how industrial voluntary consensus standards are developed, adopted, and diffused, and how industrial SDOs compete for legitimacy. The overarching gap in the literature was a lack of specific recommendations regarding actions that could be taken by leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs to reduce conflicts and improve collaborative practices.

Conceptual Framework

Yates and Murphy (2015) stated that voluntary consensus standards processes, in general, work best when combined with a deliberative and inclusive democratic approach. In the United States, accredited industrial SDOs must subscribe to a deliberative and inclusive democratic process that provides a venue for all significant stakeholders to participate in the industrial voluntary consensus development process. By

allowing all significant stakeholders to play a role in the development of industrial voluntary consensus standards, there is an opportunity for buy-in by "multiple others" (Timmermans & Epstein, 2010, p. 75). Unaccredited industrial SDOs do not have to subscribe to a deliberative and inclusive democratic process, and voluntary consensus standards developed by unaccredited industrial SDOs are less a result of consensus building and more related to an exclusive and preferential process (Behr & Diaz, 2014).

The Value of a Deliberative and Inclusive Democratic Process

Industrial voluntary consensus standards processes that follow a deliberative and inclusive democratic approach offer a number of benefits. First, industrial voluntary consensus standards processes that follow a deliberative and inclusive democratic approach are not driven by the desires of a small group of powerful players whose motivations are frequently intrinsic in nature, such as increased sales or competitive advantage (Simpson et al., 2012). Second, a deliberative and inclusive democratic approach tends to guarantee the processes are open to multiple participants and are not based on proprietary technology or intellectual property often used to ensure competitive advantages based on power relationships (Rindt & Mouzas, 2015). Involving multiple participants tends to reduce the potential for industrial voluntary consensus standards to be used as a method for excluding certain actors (Ponte & Cheyns, 2013). Third, involving multiple participants also increases the potential for knowledge experts with potentially opposing views to be part of industrial voluntary consensus standards processes. Including knowledge experts with potentially opposing views tends to increase the flexibility of industrial voluntary consensus standards, making standards

more adaptable for different stakeholders (Sandholtz, 2012; Simpson et al., 2012). Forth, flexible industrial voluntary consensus standards tend to reduce resistance to normative institutional isomorphism. Reducing resistance to normative institutional isomorphism increases the chances of industrial voluntary consensus standards gaining support because of the appearance of legitimacy of industrial voluntary consensus standards processes, the legitimacy of industrial SDOs that develop standards, and the ability of adopting organizations to more effectively harmonize institutional requirements with user capabilities (van den Ende, van de Kaa, den Uijl, & de Vries, 2012; Simpson et al., 2012). Fifth, employing a deliberative and inclusive democratic process is likely to reduce the threat of legislative or regulatory intervention. Industrial voluntary consensus standards are considered a form of soft-law and tend not to be legally enforceable (Stranieri et al., 2015; Vogel, 2010). The soft-law aspect is of particular importance to the U.S. market drive, bottom-up approach where an important component of the industrial voluntary consensus standards process is to demonstrate that the process works and there is no need for legislative intervention (Kaplan & Kinderman, 2015; Pirard, Fishman, Gnych, & Obidzinski, 2015; Vogel, 2010).

Threats

The primary threat to the existing deliberative and inclusive democratic industrial voluntary consensus standards development process in the United States is the increase in the number of unaccredited industrial SDOs that are in direct competition with accredited U.S.-based industrial SDOs (Behr & Diaz, 2014; Botzem & Dobusch, 2012; Brunsson et al., 2012; Ernst, 2013; Yates & Murphy, 2015). The increase in the number of

unaccredited industrial SDOs is thought to be a direct result of deregulation that became politically and economically popular in the late 1970s and early 1980s (Coates, 2015; Wijen, 2014). As a result of deregulation, any state or industry consortium in the United States can create an SDO (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). In the United States, the threat created by the increase in the number of unaccredited industrial SDOs has several facets.

First, there is the threat that a process that has historically been politically and economically neutral is becoming more exclusive and preferential, resulting in an increase in conflicts between accredited and unaccredited industrial SDOs. Increases in conflicts could reduce political and economic neutrality, and threaten public interests (Fransen, 2011). Second, there is the threat to the legitimacy of accredited industrial SDOs and the legitimacy of the industrial voluntary consensus standards process (Botzem & Dobusch, 2012; Brunsson et al., 2012). Third, there is the threat of U.S. legislative intervention driven by political and economic concerns and potential threats to public interests (Brunsson et al., 2012; Coates, 2015). Some researchers concluded that re-engagement on the part of governmental organizations will be necessary because the current conflicts between accredited and unaccredited U.S. industrial SDOs may not be something that can be resolved without legislative intervention (Coates, 2015; Delmas & Montiel, 2008; Ernst, 2013).

Leaders

Industrial SDOs are typically set up as nonprofit organizations (Anheier & Krlev, 2015; Smith, 2014). However, there is a growing body of research that suggests

nonprofit organizations like industrial SDOs are actually hybrid organizations because of their funding generation activities (Pache & Santos, 2013; Schröer & Jäger, 2015). Hybrid organizations present unique challenges in that leaders of such organizations must deal with conflicting institutional logics that pit the economic institutional norms of forprofit organizations against the mission driven institutional norms of nonprofit organizations. The potential problem is that leaders of industrial SDOs may be unprepared to deal with conflicting institutional logics due to lack of proper training (Battilana, Lee, Walker, & Dorsey, 2012; Schröer & Jäger, 2015). Battilana et al. (2012) suggested that most leaders of hybrid organizations come from forprofit backgrounds. Lack of proper training may present a special challenge for leaders of industrial SDOs in that they may only be familiar with the competitive and economic responsibilities of forprofit organization leaders, and may be unprepared to deal with the politically and economically neutral functions of nonprofit organizations. Specifically, collaboration with competitors is not the norm with forprofit organizations (Anheier & Krlev, 2015), and leaders of industrial SDOs who come from forprofit backgrounds may lack the necessary collaboration skills. The challenge might not be as great for leaders of unaccredited SDOs whose organizations are frequently motivated more by forprofit institutional logics, thereby making unaccredited industrial SDO leaders less prone to being incompatible with an unaccredited industrial SDOs leadership needs (van den Ende et al., 2012; Hopper, 2013). The challenge is potentially the same for leaders who come from a nonprofit background in that they may not be prepared to address the competitive

and economic responsibilities required of forprofit organizational leadership (Battilana & Lee, 2014).

The Role of Theory

Institutional theory deals with institutional isomorphism and the mechanisms by which similar organizations tend to respond to pressure and resemble each other over time (Modell, 2012, Scott, 2008; Suddaby, 2015; Zorn et al., 2011). The three most common mechanisms are normative, coercive, and mimetic pressure (Brunsson et al., 2012; Chandler & Hwang, 2015; Guerreiro, Rodrigues, & Craig, 2012; Heras-Saizarbitoria & Boiral, 2013). Some researchers suggested that voluntary consensus standards development, adoption, and diffusion driven by deliberative and inclusive democratic processes are most compatible with normative isomorphic pressures (Behr & Diaz, 2014; Olshan, 1993; Ponte & Cheyns, 2013; Wijen, 2014). These same researchers indicated that coercive and mimetic isomorphic pressures are becoming more common because of an increase in conflicts between accredited and unaccredited industrial SDOs. Institutional theory provided a lens by which I expected to gain insight into what a panel of SMEs believed was the effect of an increase in the number of unaccredited industrial SDOs on institutional isomorphism, and the role of leaders of industrial SDOs in the United States to affect institutional isomorphic mechanisms and pressures.

Stakeholder theory deals with how organizations could or should address the needs and wants of affected stakeholders (Hasnas, 2013; Laczniak & Murphy, 2012). Researchers suggested that one of the first steps that need to be taken is to understand the motivations of different stakeholders (Eskerod & Huemann, 2013; Tashman & Raelin,

2013; Tullberg, 2013; Verbeke & Tung, 2013). Stakeholders are not a homogeneous group, and often have agendas that are not compatible (Bridoux & Stoelhorst, 2014; Garriga, 2014). Stakeholder agendas also change over time (Verbeke & Tung, 2013). Stakeholder theory provided a lens by which I expected to gain insight into who a panel of SMEs considered significant stakeholders, what these SMEs believed are the stakeholder agendas, and the role of leaders of industrial SDO in the United States to identify, understand, and work with significant stakeholders.

Figure 2 represents a current view of the tensions that exist between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. Traditional SDOs that have not subscribed to the ANSI essential requirements for accreditation (e.g., the American Institute of Chemical Engineers) are not included in the unaccredited sector. Figure 2 is meant to depict the potential conflicts that could or do exist between accredited and unaccredited industrial SDOs as they seek to retain or gain legitimacy. The overlap between accredited and unaccredited industrial SDOs represents situations where a member may be part of either type of SDO, or where there is some form of interaction between accredited and unaccredited SDOs. The slight overlap between unaccredited industrial SDOs and ANSI represents ANSI's attempts to encourage communication with unaccredited industrial SDOs through an abbreviated process known as "Publicly Available Specifications" (Yates & Murphy, 2015, p. 32). The challenge for leaders of industrial SDOs is to reduce the potential conflicts indicated by Figure 2. Since the central research question deals with future collaborative practices designed to

reduce the potential conflicts indicated by Figure 2, a qualitative method employing a Delphi design was used to conduct the study.

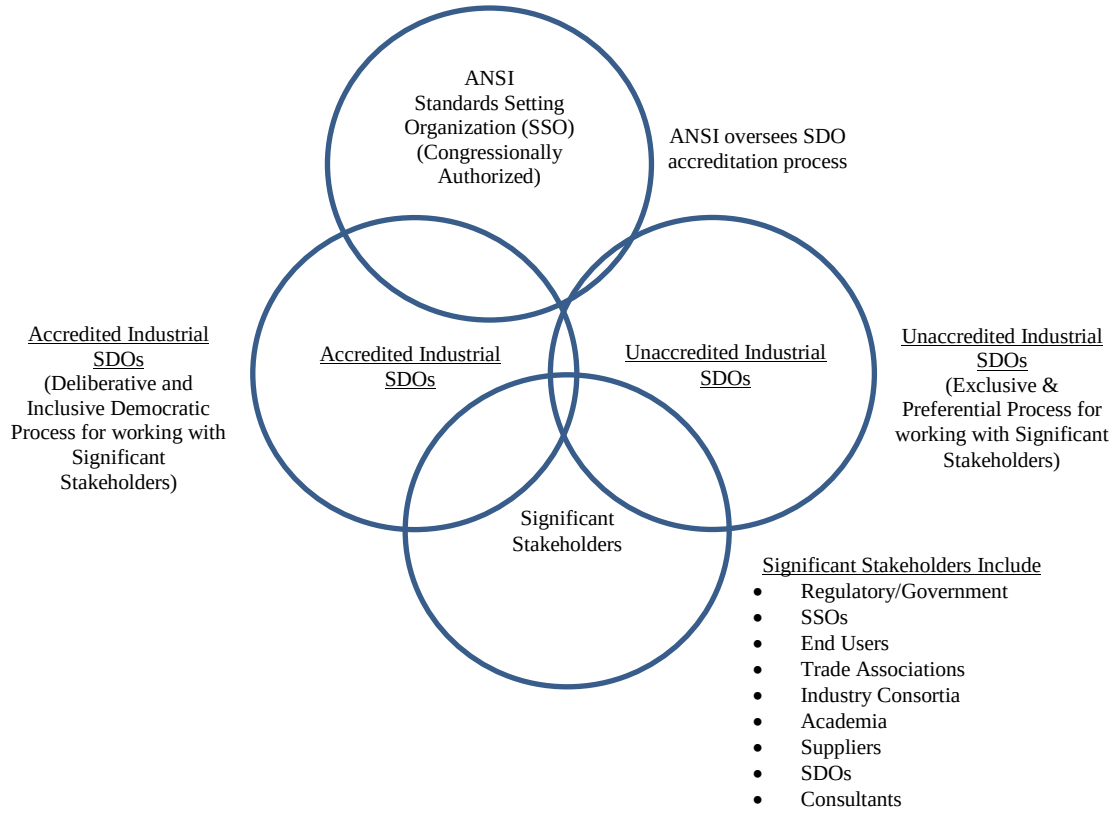

Figure 2. Existing tensions.

Literature Review

The Role and Value of Voluntary Consensus Standards

Voluntary consensus standards contribute greatly to how the world communicates both locally and internationally (Behr & Diaz, 2014; Ponte & Cheyns, 2013; Timmermans & Epstein, 2010). Voluntary consensus standards contribute to

communication primarily by opening discussion and dialog between interested parties through a deliberative and inclusive democratic process (Allen & Ramanna, 2013). Van den Ende et al. (2012) referred to this potential for communication through open discussion and dialog as a form of *collective action*. Open discussion and dialog can enhance voluntary consensus standards processes by bringing together a "community of interest" (Behr & Diaz, 2014, p. 592). Voluntary consensus standards developed, adopted, and diffused through a deliberative and inclusive democratic process can also encourage "mutual and non-coercive justifications" (Yates & Murphy, 2015, p. 25). Communication with the goal of creating voluntary consensus standards has long benefited society by serving public interests through the establishment of coherent social order, creating prescriptions for how to behave, and enabling and restraining social behavior (Botzem & Dobusch, 2012; Sandholtz, 2012; Yates & Murphy, 2015). Voluntary consensus standards often represent rules for organizing society (Brunsson et al., 2012), and voluntary consensus standards often support social and global convergence (Reinecke et al., 2012). Other benefits to society include the promotion of innovation, interoperability, uniformity, mutual compatibility, and consistent interface procedures (Botzem & Dobusch, 2012; Brunsson et al., 2012; Strauss, 2013). SDOs that develop voluntary consensus standards can support the process by encouraging adopters to seek direct or independent auditing and surveillance services that may strengthen the legitimacy of voluntary consensus standards and the legitimacy of SDOs that create them (Boiral & Gendron, 2011; Heras-Saizarbitoria & Boiral, 2013; Ponte & Cheyns, 2013; Slager et al., 2012). Voluntary consensus standards also act as a form of voluntary

governance (Brunsson et al., 2012; Heras-Saizarbitoria & Boiral, 2013). By acting as a form of voluntary governance, voluntary consensus standards present opportunities for adopters to increase perceptions of legitimacy among significant stakeholders by increasing trust (Fernando et al., 2015; Sandholtz, 2012; Slager et al., 2012; Zorn et al., 2011). Voluntary consensus standards also provide a level of protection for adopters by helping to control risk (Rindt & Mouzas, 2015; Ringsberg, 2015; Stranieri et al., 2015; Vogel, 2010). Risk control occurs by providing adopters with a *safe haven* for both producers and users (Hopper, 2013). The greater the perceive legitimacy of voluntary consensus standards and the SDOs that develop them, the greater the level of risk control (Brunsson et al., 2012, Fernando et al., 2015; Slager et al., 2012).

Industrial Voluntary Consensus Standards

Industrial voluntary consensus standards help to ensure the quality and safety of processes, products, and services, and to prevent negative impacts to public health and the environment (Ernst, 2013; Fernando et al., 2015). In these ways, industrial voluntary consensus standards can increase trust and perceived legitimacy of organizations, the products they design, and the institutions that help organize societal and organizational interactions (Ernst, 2013; Sandholtz, 20120). Botzem and Dobusch (2012) defined voluntary consensus standards of all types as "detailed rules structuring interaction" (p. 739). When treated as rules, industrial voluntary consensus standards can act as artifacts of legitimacy that in some cases are accentuated by displaying symbols of the SDOs that created them (Fernando et al., 2015, Slager et al., 2012; Zorn et al., 2011). Industrial voluntary consensus standards developed by SDOs with perceived legitimacy can

encourage neutral participation among interested stakeholders (Farrell & Simcoe, 2012) and help push the development of formalized and inclusive committees which then potentially benefits adoption and diffusion (Gadinis, 2014). Industrial voluntary consensus standards and the SDOs that create them can also educate potential adopters and significant stakeholders by helping adopters and significant stakeholders "separate objectives and policy considerations" (Gadinis, 2014, p. 9).

Industrial voluntary consensus standards often provide cost benefits. First, there is the potential cost benefit to public organizations and governments. Industrial voluntary consensus standards are often utilized by governments to create codes that reduce the cost to government and indirectly to taxpayers and organizations (Abrams, 2014; Strauss, 2013). In the United States, the method is called *incorporation by reference* (IBR). Incorporation by reference has the advantage of borrowing industrial voluntary consensus standards that already exist, resulting in codes that are familiar to many stakeholders. Industrial voluntary consensus standards can also have a cost benefit by keeping switching costs high (Botzem & Dobusch, 2012; van den Ende et al., 2012). At first glance, keeping switching costs high may seem like a contradiction. But by keeping switching cost high, some researchers suggested this helps ensure that considerations such as uniformity and mutual compatibility remain relatively stable (Brunsson et al., 2012; van den Ende et al., 2012). Industrial voluntary consensus standards can also have positive economic value by improving efficiency within and between organizations by establishing common rules (Brunsson et al., 2012; Gadinis, 2014). Industrial voluntary consensus standard have the potential to improve traceability and reduce fraud, both of

which can have positive economic impacts (Henrik, 2015). Industrial voluntary consensus standards are often "nested" in other standards (Timmermans & Epstein, 2010, p. 71) such as ISO 9001 and 14001. Nesting of standards in what Heras-Saizarbitoria and Boiral (2013) refer to as *Meta-Standards* can help harmonize more specific standards which then improves the potential for supporting uniform and harmonized globalization through the coordination of interchanges. Industrial voluntary consensus standards can therefore stimulate trade and reduce obstacles by providing a basis for reducing information related transaction costs and reduce conflicts that can result from duplication of effort (Heras-Saizarbitoria & Boiral, 2013; Hopper, 2013; Pirard at al., 2015). Per Timmermans and Epstein (2010), even if standards do not directly harmonize or globalize interchanges they can help lead in that direction.

Industrial voluntary consensus standards can also benefit society when governmental regulations are weak or incompatible. Like governmental regulations that are supposed to be applicable to a wide segment of society, industrial voluntary consensus standards are often considers common rules or "rules of the many" (Brunsson et al., 2012, p. 621). In addition, industrial voluntary consensus standards are generally considered voluntary rules or soft-law (Brunsson et al., 2012; Perkins & Neumayer, 2009; Ponte & Cheyns, 2013; Ringsberg, 2015). Soft-laws that result from industrial voluntary consensus standards can help fill the voids between governmental regulations and accepted societal norms (Sandholtz, 2012). By using industrial voluntary consensus standards to fill voids, governments and society may enjoy the benefits of industrial voluntary consensus standards that are already in place and may be more flexible than

government created regulations. As a result, industrial voluntary consensus standards may at times act as viable substitutes for regulations (Timmermans & Epstein, 2010; Vogel, 2010; Wijen, 2014).

Flexibility tends to be another positive feature of industrial voluntary consensus standards. Although flexibility may be considered an oxymoron, many researchers suggested that flexibility is often what makes industrial voluntary consensus standards strong and desirable (Sandholtz, 2012; Simpson at al., 2012; Slager et al., 2012; Timmermans & Epstein, 2010). By leaving room for flexibility, room is left for interpretation by various stakeholders, which can then increase opportunities for adoption and diffusion because adopters are better able to make the standard work within the confines of their organizations' existing structure and capabilities (Wijen, 2014). Flexibility also allows firms to adopt industrial voluntary consensus standards in ways that better comply with stakeholder concerns and demands (Perkins & Neumayer, 2009).

Industrial voluntary consensus standards are often a viable means to limit government intervention (Coates, 2015; Delmas & Montiel, 2008; Gadinis, 2014; Heras-Saizarbitoria & Boiral, 2013; Hopper, 2013; Krug et al., 2015; Pirard et al., 2015). The ability to limit government intervention depends heavily on culture (Ernst, 2013; Strauss, 2013). In China, for example, industrial voluntary consensus standards are typically developed, adopted, and diffused by the central government (Kim, Lee, Kwak, & Seo, 2014). Using this model, the government is essentially in control of industrial voluntary consensus standards and industrial voluntary consensus standards have limited effects on controlling government intervention. At the other extreme is the United States that

practices a market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion. The U.S. government has demonstrated a willingness to let the free market drive the industrial voluntary consensus standards process as long as the process works (Krug et al., 2015). The U.S. culture can encourage collaboration between SDOs because all stakeholders recognize the potential economic benefits of not inviting regulatory intervention (Ernst, 2013; Krug et al., 2015). Europe and similar cultures represent a sort of middle ground in that governments participate in industrial voluntary consensus standards processes, but the SDOs and SSOs tend to be allowed to drive the processes (Strauss, 2013). Some researchers suggested the European model may work the best because all stakeholders realize that governments can not only step in at any time, but since governments are already involved in industrial voluntary consensus standards processes, governments are better prepared to step in (Ernst, 2013; Strauss, 2013; Vogel, 2010). In contrast, the same researchers suggested that the China approach to tightly controlling industrial voluntary consensus standards may be too restrictive, and the U.S. hands-off approach may result in insufficient oversight and unfamiliarity with what has traditionally been a deliberative and inclusive democratic process. For most of the world, when industrial voluntary consensus standards processes work, there is reduced incentive on the part of governments to interfere (Ponte & Cheyns, 2013).

Finally, industrial voluntary consensus standards can help empower significant stakeholders. The first way in which industrial voluntary consensus standards can help empower significant stakeholders is by providing tools outside of state systems (Vogel,

2010). Although not legally binding unless codified, if an industrial voluntary consensus standard has been generally adopted, just the act of adoption may establish a precedent that can be used to bring attention to perceived problems. The second way industrial voluntary consensus standards can help empower significant stakeholders is that industrial voluntary consensus standards can be used as a threat (Makiya & Fraisse, 2015). When industrial voluntary consensus standards are used as a threat, the threat usually comes in the form of coercive pressure to adopt a standard (coercive isomorphism). The ability to pressure organizations to adopt an industrial voluntary consensus standard is enhanced when industrial voluntary consensus standards are made legitimate through the process of adoption and diffusion, giving significant stakeholders a benchmark with which to gauge performance. Such a benchmark can empower significant stakeholders to apply pressure to other significant stakeholders to adopt a standard or face economic penalties. The most common economic penalty usually comes in the form of one party refusing to do business with another party unless an industrial voluntary consensus standard is adopted (Olshan, 1993). Sandholtz (2012) suggested that once an industrial voluntary consensus standard is perceived as being sufficiently legitimate, the potential for economic penalties tends to drive adoption and diffusion through processes that are more normative and mimetic, and less coercive.

The History of Industrial Voluntary Consensus Standards

Industrial voluntary consensus standards are a relatively recent phenomenon with beginnings in the late 1800s as a way for the scientific community to communicate in a consistent manner (Brunsson et al., 2012; Timmermans & Epstein, 2010). As a result of

the industrial revolution, knowledge experts (often engineers) had begun to create societies of like experts in an effort to share experiences. Industries had also become interested in these early societies because many processes were still based on the craftsmanship mentality and few interoperability standards were available to help guide how processes could be harmonized (Timmermans & Epstein, 2010). Interchangeability of parts was, for example, a relatively new concept as parts produced individually were just beginning to be replaced by parts manufactured on an industrial scale. So the sheer volume of components being manufactured was one of the driving forces behind the need for stakeholders to have a common platform or community for exchanging ideas (Brunsson et al., 2012). Governments at the time were also playing an important role because modern industries were in their infancy and governments often represented the only central power for organizing societal behavior. Prior to the industrial revolution, voluntary consensus standards were mostly civil interactions (Vogel, 2010). Voluntary consensus standards of the civil variety had been in existence for hundreds if not thousands of years and were used to govern activities like commerce and other forms of trade. Industrial voluntary consensus standards were a relatively new phenomenon driven by the rise in manufacturing activities, and the need for manufacturers and the scientific and engineering communities that supported manufacturing to be able to communicate using a common language (Timmermans & Epstein, 2010). Organizations frequently had nowhere else to turn but to legislative bodies in order to have a central authority that could coordinate standard development and setting activities. Part of this turn to legislative bodies was also the result of resistance to involvement by firms. The

rationale was that technical standards should be the domain of technical experts, not firms (Yates & Murphy, 2015). Only later would the development of industrial voluntary consensus standards become a more deliberative and inclusive democratic process (Yates & Murphy, 2015). Complexity and scale of manufacturing activities and the number of products produced were also increasing rapidly, and in many cases the lack of standards produced devastating results. Pressure vessels such as boilers were a prime example of the problems that could occur as the result of a lack of standardization. The failure of such devices in the early 20th century because of a lack of standardization in construction frequently had catastrophic consequences that often resulted in significant loss of property and life (Timmermans & Epstein, 2010). Industrial voluntary consensus standards were seen as a way to establish directives and norms (Sandholtz, 2012) so that industrial firms could produce goods that were "comparable in their key aspects" (Brunsson et al., 2012, p. 614). Consequently, in the early days of industrial voluntary consensus standards, there was rarely a focus on industrial voluntary consensus standards from an organizational perspective, but rather from a functional perspective (Brunsson et al., 2012).

One of the first major standardization projects was ordered by the U.S. government during World War I (WWI) as the result of numerous boiler explosions aboard ships that had resulted from the lack of pressure vessel standards (Timmermans & Epstein, 2010). This task fell to an organization that would eventually become the American Society of Mechanical Engineers (ASME), a currently accredited U.S.-based industrial SDO. During the early part of the 20th century, the United States played a

major role in industrial voluntary consensus standards development along with the United Kingdom and Europe because the United States, the United Kingdom, and Europe were often the leaders at the time in large-scale manufacturing and technical innovation (Brunsson et al., 2012; Lampland & Star, 2009; Olshan, 1993). Public pressure was also starting to play a significant role in the development of industrial voluntary consensus standards (Ernst, 2013). The public not only wanted consistency in the products they used but concerns about an increasing number of catastrophic events was creating alarm that essentially forced governments to act. It is important to point out that although public pressure often provided a driving force behind the development of early industrial voluntary consensus standards, the general public was frequently uninformed regarding how industrial voluntary consensus standards processes actually worked (Lampland & Star, 2009). During WWII, there were numerous situations where lack of standards created problems for allied forces because items as simple as nuts and bolts were not standardized between various forces (Yates & Murphy, 2015). After WWII, the United Nations expanded upon the concept of institutionalized standards development and created the International Organization for Standardization (ISO) whose purpose was to encourage commerce through the establishment of international standards that focused on everything from units of measure to manufacturing norms (Timmermans & Epstein, 2010). In the case of industrial voluntary consensus standards, the processes were based on the premise that "technical evidence and argument encourages mutual and non-coercive justification" (Yates & Murphy, 2015, p. 25).

After WWII, industrial voluntary consensus standards processes tended to take different directions depending on the country and culture. In the United States, there was a clear battle forming between two competing interest groups, the National Bureau of Standards (now the National Institute of Standards and Technology or NIST) and the American National Standards Institute (ANSI). ANSI, formed in 1918, was originally intended to coordinate the activities of the National Bureau of Standards and other organizations, but not necessarily have direct control. The battle was primarily one of hard-law (regulation) versus soft-law (voluntary consensus standards), and who would address which aspects of hard-law or soft-law (van den Ende et al., 2012). The battle was also between governance of standards (Ernst, 2013). The United States never established a centralized authority for creating and enforcing industrial voluntary consensus standards, instead learning to rely on the free-market approach to sort out which standards would dominate (Ernst, 2013). The argument made by proponents of little government involvement or intervention was that the free-market approach promoted innovation and suggested an optimistic approach where economic pressures would lead to convergence (Fransen, 2011). This optimistic approach was that organizations were considered logical and altruistic, therefore supporting the *convergence* argument. The pessimistic view was that a free-market approach would only encourage organizations to support whatever was in their best interests (Fransen, 2011). The pessimistic approach was essentially the opposite of the optimistic approach in that organizations were considered logical but self-serving, therefore supporting the *best interests* argument (Fransen, 2011). Over time, the power to set premise for how industrial voluntary

consensus standards should be developed in the United States was successfully claimed by the private sector and led by ANSI (Olshan, 1993). The Nation Bureau of Standards became specifically responsible for helping the U.S. government establish regulations such as those used by the Occupational Health and Safety Administration (OHSA) and government procurement activities. Per Ernst (2013), ANSI recently argued in 2009 that there was no reason to change the U.S. approach because the market-driven, bottom-up system worked well. This argument was predicated based on an increasing call by some stakeholders for government involvement to address conflicts being caused by growing standards wars. In 2010, ANSI suggested that convergence of industrial voluntary consensus standards would be more efficient and involve less conflict if the rest of the world adopted industrial voluntary consensus standards processes that followed the U.S. market-driven, bottom-up approach (Ernst, 2013). One of ANSI's responses to concerns over the U.S. market-driven, bottom-up approach has been the establishment of *essential requirements* for accredited SDOs which was implemented in 1993 (Hopper, 2013). However, other researchers suggested that as the result of deregulation that started in the late 1970s and early 1980s, the U.S.-based market-driven, bottom-up approach has created a more crowded field of SDOs which despite the activities of ANSI to created essential requirements has promoted competition and conflict based on political and economic motivations. Reinecke et al. (2012) suggested that the increasing tendencies of accredited and unaccredited industrial SDOs to "sell their brand" (p. 798) in the absence of oversight should not be an unexpected outcome.

Industrial Voluntary Consensus Standards Today

Industrial voluntary consensus standards processes have always been contested and volatile (Behr & Diaz, 2014, Botzem & Dobusch, 2012; Brunsson et al., 2012; Hopper, 2013; Howard, Tallontire, Stinger, & Marchant, 2015). Even before deregulation in the United States and the increase in the number of unaccredited industrial SDOs, disagreements existed but were addressed through a deliberative and inclusive democratic process. As mentioned earlier, in 2010 ANSI suggested that convergence of industrial voluntary consensus standards would be more efficient and involve less conflict if the rest of the world adopted industrial voluntary consensus standards processes that followed the U.S. market-driven, bottom-up approach (Ernst, 2013). However, recent studies have indicated the United States is losing out to Europe as the dominant industrial voluntary consensus standards driver (Ernst, 2013). If true, the ANSI contention of 2010 may have been premature, or simply inaccurate due to an increasing preoccupation among accredited and unaccredited industrial SDOs to retain or gain legitimacy for political or economic reasons (Behr & Diaz, 2014; Brunsson et al., 2012; Ernst, 2013; Farrell & Simcoe, 2012; Strauss, 2013; van den Ende et al., 2012). Some researchers suggested that political and economic considerations are at the heart of the convergence conflict (Fransen, 2011; Lampland & Star, 2009, Olshan, 1993; Perkins & Neumayer, 2009; Slager et al., 2012; Stranieri et al., 2015) and are likely to continue unless specific stakeholders alter their behavior (Gadinis, 2014, Strauss, 2013; Vogel, 2010). One group of researchers suggested that the private authority approach supported by the U.S. market-driven, bottom-up process has resulted in a trend away from *moral*

responsibility and towards a "here-and-now" rationale (Ponte & Cheyns, 2013, p. 471). Part of this trend away from moral responsibility could also be the result of a lack of any reason for SDOs to collaborate because of the absence of a credible threat from U.S. regulatory bodies (Pirard et al., 2015). So while Botzem and Dobusch (2012) suggested that industrial voluntary consensus standards processes still tend to follow a deliberative and inclusive democratic approach, they also warned this may be changing towards a more confrontational, exclusive, and preferential process.

Existing Tensions and Threats to Legitimacy

Today in the United States, there are three major non-state actors involved in the industrial voluntary consensus standards process, all vying for legitimacy of one form or another. These three major non-state actors include corporations, industry consortia (often formed by corporations), and private organizations such as SDOs and SSOs (Botzem & Dobusch, 2012). Industry consortia and private organizations seem to be playing the leading role in creating tensions between SDOs, the industrial voluntary consensus standards developed by SDOs, and the resulting battle for legitimacy (Botzem & Dobusch, 2012). The overarching tension in the battle for legitimacy is the tension created by competition and conflict between the deliberative and inclusive democratic process advocated by ANSI and accredited industrial SDOs, and the exclusive and preferential process advocated by industry consortia and unaccredited industrial SDOs (Behr & Diaz, 2014, Fransen, 2011; Heras-Saizarbitoria & Boiral, 2013, Makiya & Fraisse, 2015). The battle for legitimacy between accredited and unaccredited industrial

SDOs is also a battle for market share (Pirard et al, 2015) and is likely to continue under the current U.S. market-driven, bottom-up system.

The battle for legitimacy in general is being waged using several approaches. First is the approach of legitimizing industrial voluntary consensus standards themselves (Behr & Diaz, 2014; Boiral & Gendron, 2011; Fernando et al., 2015; Wijen, 2014, Yates & Murphy, 2015). Botzem and Dobusch (2012) argued that the legitimacy of industrial voluntary consensus standards is both a function of input and output legitimacy. From a functionalist perspective that tends to define industrial voluntary consensus standards (an engineering or technical approach), output legitimacy (a standards effectiveness) has become more important than the legitimacy of the input (the need for the standard) (Botzem & Dobusch, 2012). Industrial voluntary consensus standards deemed most effective are the ones that tend to garner greater perceptions of legitimacy by appealing to a wide variety of stakeholders (van den Ende et al., 2012). When the output is deemed to be legitimate, there is also a feedback loop that enhances the perceive legitimacy of the SDOs that developed the standard (Hopper, 2013).

In addition to using industrial voluntary consensus standards to enhance an SDOs perceptions of legitimacy, another approach to enhancing perceptions of legitimacy is through the granting or selling of certificates (Heras-Saizarbitoria & Boiral, 2013; Perkins & Neumayer, 2009). When adopters agree to be certified by industrial SDOs, the SDOs benefit because the adopter is essentially acknowledging the SDOs legitimacy (Sandholtz, 2012). An increasingly popular approach for both adopters and industrial SDOs to advertise certificates is for adopters to display what is effectively a symbolic

seal of the adopters' recognition of the industrial SDOs legitimacy (Sandholtz, 2012). Slager et al. (2012) referred to this approach as encouraging the display of *artifacts of legitimacy*. When an adopter displays an artifact of legitimacy, this can have a snowballing effect, especially if the adopter is well known. Other organizations are likely to copy well-known adopters through a process known as mimetic institutional isomorphism (Zorn et al., 2011). If an industrial SDO is already considered legitimate, adopters that agree to the certification process can increase their own perceptions of legitimacy by showing affiliation with an already legitimate industrial SDO. One major criticism of the current certification process is that certification is not only used by SDOs to increase perceptions of legitimacy, but also used by SDOs to prevent the adoption of competing standards (Boiral & Gendron, 2011; Heras-Saizarbitoria & Boiral, 2013; Howard et al., 2015, Pirard et al., 2015; Reinecke et al., 2012; Stranieri et al., 2015; Strauss, 2013). This process of preventing adoption through granting or selling certificates has been referred to as *capture* (Coates, 2015). Several researchers suggested this problem has only gotten worse with the increase in the number of unaccredited industrial SDOs and is likely to continue (Brunsson et al., 2012; Ernst, 2013; Timmermans & Epstein, 2010).

Along with issuing certificates, industrial SDOs have also begun to encourage adopters to submit to auditing processes (Botzem & Dobusch, 2012). Auditing started to gain popularity in the United States in the 1980s as a direct result of deregulation (Brunsson et al., 2012; Ernst, 2013; Timmermans & Epstein, 2010). Encouraging adopters to submit to an auditing process has become another way for industrial SDOs to

increase perceptions of legitimacy. Some organizations like ISO have made auditing a requirement for an adopter to display or otherwise use ISO's artifacts of legitimacy (Boiral & Gendron, 2011). Auditing can also enhance perceptions of an adopters' legitimacy by demonstrating that adoption of the standard was more than just ceremonial. Ceremonial adoption occurs when an organization adopts a voluntary consensus standard primarily for economic or political reasons, but has little intention of actually complying with the standard (Hopper, 2013; Timmermans & Epstein, 2010; Zorn et al., 2011). Several researchers referred to ceremonial adoption as a form of decoupling (Brunsson et al., 2012; Sandholtz, 2012; Wijen, 2014). When a voluntary consensus standard is adopted but decoupled from an organizations business model, the standard becomes symbolic only (Brunsson et al., 2012; Sandholtz, 2012; Wijen, 2014). Depending on the perceived legitimacy of an industrial SDO, potential adopters may find themselves not only compelled to adopt the SDOs industrial voluntary consensus standards, but also compelled to agree to the SDOs terms of use. This form of coercive or memetic isomorphism (Makiya & Fraisse, 2015) can be particularly effective if adoption of an industrial voluntary consensus standard has become a requirement for conducting business, but also tends to increase ceremonial adoption (Hopper, 2013; Timmermans & Epstein, 2010; Zorn et al., 2011).

The current overarching criticism of auditing processes in the United States is that there is little if any oversight of the auditing process, and this lack of oversight encourages the ceremonial adoption of industrial voluntary consensus standards (Delmas & Montiel, 2008; Fernando et al., 2015). Several researchers suggested the auditing

process and the resulting competition between industrial SDOs have become nothing more than a *race to the bottom* (Ashley, 2015; Boiral & Gendron, 2011; Henrik, 2015; Reinecke et al., 2012). Adopters of industrial voluntary consensus standards are also accused of being complicit in this alleged race to the bottom for two reasons. First, adopters increasingly do not seem to care how industrial voluntary consensus standards are developed if the standards are economically and competitively advantageous (Behr & Diaz, 2014; Fernando et al., 2015). Second, adopters know that supporting perceptions of legitimacy help keep the U.S. government playing the role of interested observer (Behr & Diaz, 2014). One group of researchers indicated that the lack of a credible oversight process favors unaccredited industrial SDOs because unaccredited industrial SDOs are not bound by the essential requirements ANSI imposes on accredited industrial SDOs (Yates & Murphy, 2015). Until the U.S. government is able or willing to engage in oversight of the auditing processes, some researchers suggested the battle for legitimacy between industrial SDOs is only going to get worse (Krug et al., 2015; Simpson et al., 2012; Strauss, 2013; Vogel, 2010; Wijen, 2014).

Industrial Voluntary Consensus Standards Flexibility

A related tension in the competition between accredited and unaccredited industrial SDOs, and part of the legitimacy battle, is that industrial voluntary consensus standards are becoming less flexible. According to some researchers, flexibility is what makes industrial voluntary consensus standards valuable by increasing the standards appeal to a wider range of stakeholders (Botzem & Dobusch, 2012; Howard et al., 2015; Simpson et al., 2012; van den Ende et al., 2012). These same researchers suggested that

part of the explanation for a decrease in industrial voluntary consensus standards flexibility is an increasing tendency on the part of industrial SDOs to try and block the adoption of competing standards. Technology has played a large part in the apparent trend towards decreasing flexibility, in particular, using essential patents (Behr & Diaz, 2014; Delmas & Montiel, 2008; Ernst, 2013; Fransen, 2011; Rindt & Mouzas, 2015). One of the key components of the ASNI essential requirements document created in 1993 was a specific focus on the fair, reasonable, and non-discriminatory availability of patent licensing and the early and enforced disclosure of essential patents (Ernst, 2013). Complying with ANSI essential requirements is mandatory for accredited industrial SDOs. The same constraints do not apply to unaccredited industrial SDOs. Some researchers suggested that suppliers who are part of industry consortia and unaccredited industrial SDOs appear to be the biggest threat to the legitimacy of the U.S. industrial voluntary consensus standards process because there is an unsupervised economic motive for not sharing essential patents (Gadinis, 2014; Makiya & Fraisse, 2015; van den Ende et al., 2012).

Knowledge Experts

Knowledge experts have always been a critical participant in the development, adoption, and diffusion of industrial voluntary consensus standards (Brunsson et al., 2012). Accredited industrial SDOs have historically been national organizations and knowledge experts helped industrial voluntary consensus standards support public interests through respectful deliberation that involved a wide range of interested stakeholders (Yates & Murphy, 2015). Vested interest participants where always

assumed to be a component of developing industrial voluntary consensus standards, but the involvement of a wide range of knowledge experts helped to create a balanced process (Brunsson et al., 2012). The role of knowledge experts, although extremely important to supporting the legitimacy of industrial voluntary consensus standards, has largely been overlooked until recently (Sandholtz, 2012). Before deregulation, one traditional benefit of knowledge expert participation was the willingness of the government to accept industrial voluntary consensus standards as an alternative to regulation (Timmermans & Epstein, 2010). As an alternative to regulation, industrial voluntary consensus standards promised adopters expertise without political entanglements (Timmermans & Epstein, 2010). Postderegulation, and in the interest of cost control, the U.S. government increasingly adopted industrial voluntary consensus standards as code (Abrams, 2014; Straus, 2013) because the legitimacy of industrial voluntary consensus standards was backed by knowledge experts (Hopper, 2013).

While the participation of knowledge experts has historically been important to supporting perceptions of industrial voluntary consensus standards legitimacy, the role of knowledge experts in the United States has changed considerably with the increase in the number of unaccredited industrial SDOs (Brunsson et al., 2012; Ponte & Cheyns, 2013; Slager et al., 2012). One change has been the availability of knowledge experts. Knowledge experts are expensive, especially for long-term participation in developing industrial voluntary consensus standards (Hopper, 2013). Cost has resulted in an increasing lack of knowledge expert participation as employers of knowledge experts have been reluctant to provide financial and logistical support unless there were clear

economic and political benefits. Globalization has also had an impact as industrial SDOs, especially accredited industrial SDOs, seek experts with global and/or diverse credentials (Hopper, 2013; Ponte & Cheyns, 2013). At the same time, knowledge experts are becoming increasingly important in the pursuit of legitimacy by unaccredited industrial SDOs who can often afford to be more selective and frequently do not need experts with global or diverse credentials (Brunsson et al., 2012; Ponte & Cheyns, 2013; Slager et al., 2012).

Unaccredited industrial SDOs, especially those created by industry consortia, tend to focus on single issues driven by personal interests (Lampland & Star, 2009). As a result, unaccredited industrial SDOs often seek out knowledge experts with similar vested interests (Brunsson et al., 2012). This approach to the use of knowledge experts has created conflict where knowledge experts are increasingly pitted against one another in the battle for legitimacy (Brunsson et al., 2012; Ponte & Cheyns, 2013). Per Ponte and Cheyns (2013), using knowledge experts in this way lacks "principals of justice" (p. 472). By selecting specific experts to support personal interests, industrial voluntary consensus standards are often created in isolation (Sandholtz, 2012). Knowledge experts are also used increasingly by all types of industrial SDOs to validate field testing claims (Ponte & Cheyns, 2013) or to convince potential adopters that everyone is already using an industrial voluntary consensus standard (Lampland & Star, 2009). Lampland and Star (2009) suggested that the current approach to using knowledge experts to support industrial voluntary consensus standards has had the net effect of turning knowledge experts into *technical bureaucrats*.

For accredited industrial SDOs, the use of knowledge experts is a necessity (Ponte & Cheyns, 2013). For unaccredited industrial SDOs, the use of knowledge experts is a convenience (Ponte & Cheyns, 2013). What seems to be a consistent perception is that all sides need knowledge experts (Hopper, 2013). The question seems to be, in what capacity.

The Ubiquitous Black Box

Many researchers suggested that voluntary consensus standards processes of all types are at risk of being dragged in to what has been characterized as an expanding standards war (Behr & Diaz, 2014; Botzem & Dobusch, 2012; Ernst, 2013; Farrell & Simcoe, 2012; Pirard et al., 2015). Voluntary consensus standard today have become so ubiquitous as to have been driven below the level of public awareness, become taken for granted, and have simply become *black boxes* (Botzem & Dobusch, 2012; Fransen 2011; Lampland & Star, 2009). Today, the inclusive De jure approach to industrial voluntary consensus standards development, adoption, and diffusion is being replaced by the personal interest De facto approach (Farrell & Simcoe, 2012). Olshan (1993) recognized this over two decades ago and suggested that the U.S. market-driven, bottom-up approach encouraged by the late 1970's and early 1980s trend towards deregulation heralded an era where SDOs were becoming the product of a struggle for organizational power and survival. The net result per Olshan (1993) has been a procedure for developing an "unending output of taken-for-granted standardized technologies" (p. 332). Several groups of researchers suggested that social sciences need to play a greater role in researching voluntary consensus standards processes (Lampland & Star, 2009; Ponte &

Cheyns, 2013). Other researchers have gone further and suggested that voluntary consensus standards are so pervasive and ubiquitous that they have become a sociological concern that affect all individuals, and need to be treated as such (Botzem & Dobusch, 2012; Boiral & Gendron, 2011; Brunsson et al., 2012; Fransen, 2011; Olshan, 1993; Timmermans & Epstein, 2010).

The Role of Theory

Many studies regarding industrial voluntary consensus standards have addressed the processes behind standards development, adoption, and diffusion (Botzem & Dobusch, 2012; Brunsson et al., 2012; Delmas & Montiel, 2008; Heras-Saizarbitoria & Boiral, 2013; Kaplan & Kinderman, 2015; Krug et al., 2015; Perkins & Neumayer, 2009; Reinecke et al., 2012; Simpson et al., 2012; Slager et al., 2012; Stranieri et al, 2015; van den Ende et al., 2012; Vogel, 2010; Wijen, 2014). Frequently, these studies have alluded to or directly mentioned institutional theory and stakeholder theory to explain the dynamics involved in the development, adoption, and diffusion of industrial voluntary consensus standards (Botzem & Dobusch, 2012; Brunsson et al., 2012; Farrell & Simcoe, 2012; Hopper, 2013; Howard et al., 2015; Ponte & Cheyns, 2013; Reinecke et al., 2012; Ringsberg, 2015; Simpson et al., 2012; Timmermans & Epstein, 2010; van den Ende et al., 2012). Systems theory (although not mentioned in the voluntary consensus standards literature and not a focus of this study) may also play a role in future research because the development, adoption, and diffusion of industrial voluntary consensus standards represents a complex system that tends to operate on a long-term basis (Adams et al., 2014; Andretta, 2014; Meadows, 2008; Senge, 2006).

Institutional Theory

The majority of studies discovered during the literature review considered institutional theory to play the primary role as the lens through which the tensions surrounding development, adoption, and diffusion of industrial voluntary consensus standards can be viewed and potentially understood (Brunsson et al., 2012; Fernando et al., 2015; Fransen, 2011; Heras-Saizarbitoria & Boiral, 2013; Lampland & Star, 2009; Makiya & Fraisse, 2015; Olshan, 1993; Sandholtz, 2012, Simpson et al., 2012; Slager et al., 2012; Timmermans & Epstein, 2010; Wijen, 2014; Zorn et al., 2011). Repeated mention of institutional theory informed the decision to include institution theory in this study.

Modern or neo-institutional theory had beginnings in 1991 as a theory that organizations strategically responded to organizational pressures. The inclusion of a strategic response to modern institutional theory replaced the previous view of institutional theory that organizational responses were essentially reactive and naturally resulted in organizations resembling each other over time (Suddaby, 2010). Modern institutional theory did not replace the thought that organizations responded to pressure and tended to represent each other over time, but modern institutional theory now suggested the process was also strategic and proactive, and not merely reactive. The primary approach used by researchers to incorporating institutional theory into the development, adoption, and diffusion process was through the concept of institutional isomorphism (Brunsson et al., 2012; Heras-Saizarbitoria & Boiral, 2013; Olshan, 1993; Sandholtz, 2012; Timmermans & Epstein, 2010).

Some researchers referred to the process of institutional isomorphism as a form of pressure (Brunsson et al., 2012; Zorn et al., 2011). Isomorphism is generally defined as "A similarity of the processes or structures between organizations representing a trend towards convergence or homogeneity" (Zorn et al., 2011, p. 6). Behr and Diaz (2014) suggested that isomorphic pressures in the world of industrial voluntary consensus standards development, adoption, and diffusion involved six key incentives that included (1) advancing standards that promoted economic or business interests, (2) increasing the ability to gain advanced knowledge of emerging standards, (3) a desire to avoid standards that might create a competitive disadvantage, (4) gaining of corporate intelligence, (5) avoiding an *influence vacuum*, and (6) engendering a sense of individual professionalism. The types of isomorphic pressures described in industrial voluntary consensus standards research included normative isomorphism, mimetic isomorphism, and coercive isomorphism (Chandler & Hwang, 2015; Grob & Benn, 2014; Guerreiro et al., 2012; Heras-Saizarbitoria & Boiral, 2013; Modell, 2012; Scott, 2008: Sandholtz, 2012; Suddaby, 2010; Suddaby, 2015).

Normative isomorphism. Normative isomorphism is convergence driven by social or professional norms (Brunsson et al., 2012; Chandler & Hwang, 2015; Grob & Benn, 2014; Guerreiro et al., 2012). In the realm of industrial voluntary consensus standards, the general assumption as suggested by Brunsson et al. (2012) is that the coexistence of multiple industrial voluntary consensus standards is perceived as being counterproductive, and that convergence of industrial voluntary standards and their adoption and diffusion will take a normative path that eventually results in consistent or

normal behavior. Brunsson et al. (2012) also suggested that following the recommendations made by industrial SDOs represents a normative response to the adoption and diffusion of standards based on institutionalized practices. Normative isomorphism tends to represent the most common form of industrial or technical convergence with early adopters seeking economic benefits, and later adopters seeking to comply with now established institutional practices in pursuit of legitimacy (Brunsson et al., 2012; Chandler & Hwang, 2015).

Fransen (2011) suggested that an idealist institutional approach assumes convergence is logical and will lead to normative adoption, but also suggested an idealist institutional perspective may be increasingly naive with the rise of economic and political motivations that have tended to drive convergence in a way that is beneficial to powerful actors or those organizations with a specific economic and/or political agenda. In support of this concern, other researchers suggested that the voluntary consensus standards wars common among commodities such as coffee and timber are now becoming more common with industrial voluntary consensus standards due to the increase in the number of unaccredited industrial SDOs and the resulting battle for legitimacy (Botzem & Dobusch, 2012; Reinecke et al., 2012).

Mimetic isomorphism. Mimetic isomorphism is convergence driven by the perceived benefits of copying or mimicking the behavior of others. Copying or mimicking the behavior of other groups has long been an accepted and normal practice among potential adopters, and can increase perceptions of legitimacy for all stakeholders (Chandler & Hwang, 2015; Grob & Benn, 2014; Guerreiro et al., 2012). While many

organizations have embraced standards copied from others for both functional and legitimacy reasons, some have used mimetic isomorphism as a form of ceremonial or symbolic adoption strictly in pursuit of legitimacy (Behr & Diaz, 2014; Brunsson et al., 2012; Sandholtz, 2012; Zorn et al., 2011). The problem from an industrial SDO perspective is that many organizations do not seek a standards designation for technical reasons, but rather for gaining legitimacy in the eyes of significant stakeholders (Sandholtz, 2012). ISO standards were often referenced by researchers as examples of voluntary consensus standards adopted for ceremonial or symbolic reasons strictly in pursuit of perceptions of legitimacy (Behr & Diaz, 2014; Brunsson et al., 2012; Timmermans & Epstein, 2010). Ceremonial or symbolic adoption, or the decoupling of standards adoption from incorporation into actual practice (Wijen, 20140), has ramifications for industrial SDOs who increasingly deal with potential adopters who do not care if an industrial voluntary consensus standard comes from an accredited or unaccredited SDO (Behr & Diaz, 2014).

The primary ramification is that industrial SDOs are increasingly more interested in encouraging mimetic isomorphic adoption to enhance their own legitimacy and the legitimacy of the industrial voluntary consensus standards they develop. Several researchers suggested that mimetic isomorphic pressures dominate when innovations are new or there is ambiguity, and then are replaced by normative and coercive isomorphic pressures as the innovation becomes mainstream (Zorn et al., 2011). As technological innovations advance at an ever-increasing pace, some unaccredited industrial SDOs have attempted to take advantage of innovations using proprietary technology or essential

patents and hope once adopted by a select group of organizations, mimetic isomorphism will then drive further adoption and increase perceptions of legitimacy (Ernst, 2013).

Coercive isomorphism. Coercive isomorphism is convergence that is essentially forced either through political and/or economic means (Chandler & Hwang, 2015; Grob & Benn, 2014, Guerreiro et al., 2012). Enforcement of the adoption of industrial voluntary consensus standards by legislation is one form of coercive isomorphism that happens when industrial voluntary consensus standards (soft-law) are converted to code or codified (hard-law) through a process that in the United States is known as *inclusion by reference* (IBR) (Abrams, 2014; Ernst, 2013; Ringsberg, 2015; Strauss, 2013). This form of coercive isomorphism tends to combine both economic and legal pressures. A more common form of coercive isomorphism regarding industrial voluntary consensus standards occurs when both formal and informal pressure is exerted on organizations by other organizations, or by cultural expectations (Grob & Benn, 2014). ISO is an example of an SDO that has successfully moved from a position of mimetic isomorphism to one of coercive isomorphism (Timmermans & Epstein, 2010). ISO industrial voluntary consensus standards that were once copied because of mimetic isomorphic pressures are today frequently adopted because of coercive pressures exerted by other organizations that carry an implicit or explicit economic threat, usually in the form of loss of business and loss of legitimacy (Behr & Diaz, 2014). These types of threats tend to be tangible in that there is a direct cause and effect, but rarely is there an explicit legal threat. Coercive isomorphic pressure can be the result of current or future threats (Botzem & Dobusch, 2012; Fernando et al., 2015; Wijen, 2014). Liability concerns also represent situations

where an organization may feel compelled (coerced) to adopt an industrial voluntary consensus standard to shield themselves against future legal threats (Stranieri et al., 2015). For industrial SDOs that wish to act in a more aggressive fashion, Vogel (2010) suggested one approach is for industrial SDOs to harden the functions of their voluntary consensus standards (soft-law) to raise the specter of certain threats, thereby creating a coercive effect without changing soft-law into hard-law.

Regardless of the type of isomorphic pressures in play, researchers seem to agree on two points. First, alignment with goals is what drives development, adoption, and diffusion of industrial voluntary consensus standards and alignment of goals is a central component of institutional theory (Guerreiro et al., 2012). Second, the primary goal among primary stakeholders is the perception of legitimacy (Heras-Saizarbitoria & Boiral, 2013; Hopper, 2013; Ponte & Cheyns, 2013; Reinecke et al., 2012; Sandholtz, 2012; Timmermans & Epstein, 2010). Applying institutional theory could help leaders of industrial SDOs understand current institutional pressures and help them prepare for a more collaborative future that protects public interests and is conducive to positive social change (Ernst, 2013; Hopper, 2013; Timmermans & Epstein, 2010).

One important criticism of institutional theory is that it tends to be used increasingly without the inclusion of a temporal factor (Chandler & Hwang, 2015; Suddaby, 2015). By excluding temporal factors, institutional theory may be used to focus only on real-time events while selectively ignoring antecedents or potential future ramifications (Chandler & Hwang, 2015; Modell, 2012; Suddaby, 2015). In the case of industrial voluntary consensus standards, the speed at which technology is advancing

may explain some of the trend away from temporal considerations in the use of institutional theory. Convergence of industrial voluntary consensus standards takes time and is often at odds with a desire to advance new technology or gain a competitive or economic advantage (Gadinis, 2014; Yates & Murphy, 2015). The result from an industrial voluntary consensus standards perspective is that institutional theory may ultimately be relegated to considering only short-term views of institutional pressures with consideration of long-term consequences tending to fade into the background (Yates & Murphy, 2015). Potential solutions to the temporal criticism represent a gap in the literature.

Stakeholder Theory

The majority of studies discovered during the literature review into voluntary consensus standards made mention of the importance of stakeholders and the role stakeholders play in the development, adoption, and diffusion of industrial voluntary consensus standards (Botzem & Dobusch, 2012; Brunsson et al., 2012; Coates, 2015; Ernst, 2013; Farrell & Simcoe, 2012; Hopper, 2013; Howard et al., 2015; Keenan, 2015; Krug et al., 2015; Ponte & Cheyns, 2013; Reinecke et al., 2012; Ringsberg, 2015; Stranieri et al., 2015; van den Ende et al., 2012). Repeated mention of stakeholders informed the inclusion of stakeholder theory in this study.

Stakeholder theory first appeared in 1963 to challenge the notion that only stockholders or shareholders mattered to organizations (Parmar et al., 2010). The core assumption behind stakeholder theory was that anyone affected by business was a stakeholder. Stakeholder theory addressed three problems that included how value was

created and traded, connecting ethics and capitalism, and helping management think about the first two problems (Parmar et al., 2010). Over time, there have been additional refinements to stakeholder theory from the perspective of what stakeholder theory is and is not. Stakeholder theory is not about who and what really counts, an excuse for management opportunism, concern only with financial distributions, a suggestion that all stakeholders must receive equal treatment, requires law changes, is a socialist construct, or a comprehensive moral doctrine (Hasnas, 2013; Parmer et al., 2010). Stakeholder theory is about procedural justice, fair stakeholder treatment, and a normative construct based on fairness (Hasnas, 2013; Parmer et al., 2010).

Concerning ethics, Parmar et al. (2010) suggested one cannot discuss business without discussing ethics. Tullberg (2013) supported the business/ethics link by suggesting business and moral discourse should be integrated. The same researchers suggested stakeholder theory is one of the dominant approaches to analyzing and understanding the obligations of those engaged in business. The underlying assumption appears to be that regardless of the type of stakeholder, all stakeholders want to be treated fairly (Bridoux & Stoelhorst, 2014). Another consistent perspective through the lens of stakeholder theory was that organizations should consider all stakeholders with a valid claim, not just those with the highest perceived value, and that stakeholder theory must be applied to all stakeholders regardless of how stakeholder are defined (Hasnas, 2013). The perception that organizations should consider all stakeholders, and that stakeholder theory must apply to all is stakeholders is supported by other researchers who suggested that there is an urgent need to have a more inclusive approach to stakeholders so that all

organizations become better *stewards of society* (Laczniak & Murphy, 2012). Researchers have also suggested that a more inclusive approach can improve organizational performance while not damaging profits (Laczniak & Murphy, 2012). This inclusive approach supports a *hard form* of dealing with stakeholders that looks at all stakeholders as being important, rather than a *soft form* of dealing with stakeholders that pays lip service to some stakeholders by only pretending that all stakeholders are important. Many stakeholder theory researchers suggested that stakeholders are not homogeneous, that different stakeholders can have different claims, and that stakeholder values can and do change over time (Bridoux & Stoelhorst, 2014; Garriga, 2014; Hasnas, 2013; Laczniak & Murphy, 2012).

Current Schools of Stakeholder Theory

Current schools of stakeholder theory tend to classify stakeholder theory into four categories that include normative, descriptive, instrumental, and managerial (Parmar et al., 2010). The normative perspective focuses on what managers and/or corporations should do (Parmar et al, 2010; Tashman & Raelin, 2013; Verbeke & Tung, 2013). The normative perspective includes a focus on the moral or ethical component of business (Hasnas, 2013). The descriptive perspective focuses on research that factually reports what organizations do (Parmer et al., 2010; Tashman & Raelin, 2013; Verbeke & Tung, 2013). The instrumental perspective focuses on research that explores the outcomes of specific organizational behavior (Parmer et al., 2010; Tashman & Raelin, 2013; Verbeke & Tung, 2013). The managerial perspective focuses on the needs of practitioners and research that supports these needs (Harrison & Wicks, 2013; Laczniak & Murphy, 2012;

Tashman & Raelin, 2013). Variations to schools of stakeholder theory do exist, but always appear to include normative, descriptive, and instrumental perspectives (Hasnas, 2013; Laczniak & Murphy, 2012; Tashman & Raelin, 2013; Verbeke & Tung, 2013).

Of the three schools that all researchers seem to agree upon, the instrumental and normative schools are deemed most important from two perspectives. The first perspective deals with what is ultimately most pertinent to supporting stakeholder theory. Based on this perspective, the school deemed most important is the normative school. The rationale for suggesting the normative school is most important is the claim that stakeholder theory is primarily a vehicle for connecting ethics and business (Harrison & Wicks, 2013). The second perspective deals with what is most often practiced. From the perspective of practice, the instrumental school is deemed most important (Laczniak & Murphy, 2012; Tashman & Raelin, 2013). This tends to make sense from an economic point of view. Regardless of which school is favored, researchers tended to conclude that normative and instrumental schools can and maybe should coexist in the same space at the same time (Hasnas, 2013; Laczniak & Murphy, 2012; Parmar et al., 2010; Tashman & Raelin, 2013).

Defining Stakeholders

Miles (2012) pointed out that as of 2011 there were over 435 definitions of stakeholders, which in his opinion was too many for organizations to manage in any consistent fashion, and has resulted in frequently contested approaches to defining and dealing with stakeholders. For example, ISO defines stakeholders as “interested parties” (Eskerod & Huemann, 2013, p. 43). Eskerod and Huemann (2013) questioned this

definition because they claimed the ISO definition did not provide much guidance as to what constituted an interested party. Yates and Murphy (2015) also appeared to take issue with the *interested party* definition because they claimed that unaccredited industrial SDOs tended to define interested parties based on who the SDO though would support the SDO agenda and excluded interested parties they thought would not support the SDO agenda. A different and maybe more inclusive definition of stakeholders suggested by some researchers was anyone who could be affected (Eskerod & Huemann, 2014; Garriga, 2014). One objection to using this definition of stakeholders in the case of industrial voluntary consensus standards was that society could be defined as a stakeholder because standards affect everyone either directly or indirectly (Vogel, 2010). Yet another definition of stakeholders was anyone that had something to offer (Hasnas, 2013). However, per Eskerod and Huemann (2013), all stakeholders have something to offer. Still other researchers considered anyone who is a customer to be a stakeholder (Harrison & Wicks, 2013). The problem with this definition is that there is no consistent definition of what defines a customer, or what a customer brings in the way of value (Harrison & Wicks, 2013). The problem per Parmar et al, (2010) and Hasnas (2013) with describing stakeholders as anyone who has anything to offer is that everyone could be defined as a stakeholder. Miles (2012) suggested that definitions of stakeholders are so contested that depending on the chosen definition, any person or group could be considered a stakeholder, "even terrorists" (p. 294). The contested perspective seems to turn stakeholder theory and what defines a stakeholder into a catchall that can be whatever one wants it to be. Per Tullberg (2013), stakeholder theory should not be used

to "weave a basket big enough to hold the world's misery" (p. 127). Miles (2012) suggested the best that can be hoped for is working towards a common core. Tullberg (2013) supported this sentiment and suggested the inability to agree on a definition of stakeholders is what keeps the debate about stakeholder theory alive, and prevents stakeholder theory from being properly or consistently implemented. The net result is that stakeholder theory is in a constant state of flux (Parmar et al., 2010). Parmar et al, (2010) suggested that until this state of flux is brought under control, confusion would continue and stakeholder theory would remain at best a framework for deriving other theories.

One solution to considering everyone a stakeholder was to view stakeholders based on a stakeholders' utility (Harrison & Wicks, 2013). The four utilities suggested by Harrison and Wicks (2013) were based on what a stakeholder had to offer, how a stakeholder viewed organizational justice, a stakeholders' affiliation, and opportunity costs presented by a given stakeholder. By considering stakeholders from a utility perspective, potential stakeholders with no utility value could be eliminated from consideration. Another school of thought was to view stakeholders from a capabilities perspective. While a utilities perspective only considers what a stakeholder could offer, a capabilities perspective suggested adding consideration of a stakeholders' opportunity to act, or what the stakeholder could offer (Garriga, 2014). Considering a stakeholders capability or potential to provide value may add to the complexity of classifying potential stakeholders, but adds another dimension that can be used to reduce or at least help organizations map stakeholders, and only discard those with no utility or capabilities

value (Garriga, 2014; Laczniak & Murphy, 2014). Garriga (2014) went further and suggested a utilities approach is a subset of the more overarching capabilities approach and that viewing stakeholders from a utility perspective should be replaced by a capabilities perspective.

Another consideration for reducing confusion was to identify stakeholders by classification (Bridoux & Stoelhorst, 2014). Although Bridoux and Stoelhorst (2104) suggested that all stakeholders want to be treated fairly, they also stated fairness is subjective and what appears fair to one stakeholder may not be considered fair by another. A solution offered by Bridoux and Stoelhorst (2014) was to classify stakeholders in two ways to help organizations work through issues of fairness. The first classification included those stakeholders considered to be *self-regarding*. Self-regarding stakeholders tend to care only about personal payoff (an intrinsic reward), and definitions of fair are directly related to definitions of personal payoff. Many unaccredited industrial SDOs and potential adopters fit this description (Brunsson et al., 2012; Farrell & Simcoe, 2012; Lampland & Star, 2009). The second classification included stakeholders considered to be *reciprocating*. Reciprocating stakeholders tend to care about fairness (intrinsic and extrinsic) and will often punish treatment they consider unfair. Bridoux and Stoelhorst (2014) conceded that reciprocating stakeholders may present organizations with a greater challenge because determining what a reciprocating stakeholder defines as fair can be more challenging than determining what a self-regarding stakeholder defines as fair. Regardless of the potential difficulties in defining fair, Bridoux and Stoelhorst (2014) suggested taking an arms-length approach to dealing with stakeholders identified

as self-regarding, and to be more embracing towards stakeholders identified as reciprocating.

Another attempt at classifying stakeholders was to sort stakeholders by groups. Verbeke and Tung (2013) suggested five groups that included suppliers, consumers, employees, competitors, and government/regulators. The assumption, per Verbeke & Tung (2013), was that over time the values of each group of stakeholders would change through isomorphic pressure and become stable. Verbeke and Tung (2013) drew heavily from institutional theory and suggested that normative isomorphic pressures would reveal to organizations what values were most important to various stakeholder groups. The rationale was that although stakeholders are not homogeneous from a motivational perspective, isomorphic pressures would only increase with time (a temporal perspective); allowing organizations to detect patterns that could help an organizations' leaders adjust their approach to different stakeholder groups and also allow time to give voice to more stakeholders. From an isomorphic perspective, Parmar et al. (2010) suggested that stakeholder theory and institutional theory were very similar, but the connection on both sides has largely been ignored. Other researchers supported a temporal view along similar lines to those proposed by Verbeke and Tung (2013) in that stakeholder values would change over time, and successful organizations were those that were aware of the potential for stakeholder value change and could adapt to these changes (Eskerod & Huemann, 2013; Laczniak & Murphy, 2012). Eskerod and Huemann (2013) considered a temporal view as being representative of stakeholder management from a *for* perspective (more inclusive and fair) rather than an *of* perspective

(more superficial and biased). A temporal view was supported by other researchers, but from the perspective of technology change. With the speed at which technology is changing, organizations need to be aware of stakeholder temporal constraints (Parmar et al., 2010; Tashman & Raelin, 2013). This approach was not unlike comments made by researchers focused on industrial SDO motivations who suggested that one of the reasons for the increase in the number of unaccredited industrial SDOs was based on the fleeting temporal relevance of new technology, and the slow speed at which accredited industrial SDOs tended to move (Gadinis, 2014; Timmermans & Epstein, 2010). Researchers who suggested that a temporal aspect was important when dealing with stakeholders agreed that a temporal perspective was missing from current applications of stakeholder theory and needed to be included as a future component of stakeholder theory (Eskerod & Huemann, 2013; Laczniak & Murphy, 2012; Parmar et al., 2010; Tashman & Raelin, 2013; Verbeke & Tung, 2013).

Stakeholder Value

An important and original component to stakeholder theory was that stockholders or shareholders were not the only stakeholders who mattered to organizations, and that other stakeholders could contribute value (Parmar et al., 2010). This concept of value has become a central part of stakeholder theory. An early focus was on the value stakeholders potentially provided for organizations (Bridoux & Stoelhorst, 2014). The definitions of value have since expanded and now include a suggestion that stakeholders have value in their own right (Eskerod & Huemann, 2013), and that stakeholders are real people and not just placeholders (Garriga, 2014). Some researchers also suggested the

value of stakeholders should not be viewed just from an economic return perspective, but more holistically (Harrison & Wicks, 2013). Harrison and Wicks (2013) suggested the economic return focus on value was primarily driven by organizational unwillingness to deal with non-economic intangibles and was in retrospect, short sighted. Harrison and Wicks (2013) also suggested that value is a grey area, which continues to cause disagreement among researchers because of the subjective nature of values (Bridoux & Stoelhorst, 2014).

Some researchers have claimed that there is a current focus on two few definitions of value, not too many (Harrison & Wicks, 2013). According to these researchers, expanding the definitions of value would only enhance the ability to see the potential value presented by different stakeholders. Other researchers suggested that stakeholder theory tries to include too many definitions of value and has resulted in stakeholder theory becoming a dumping ground for any definition of value (Hasnas, 2013). According to these researchers, reducing definitions of value could help organizations move away from the concept that everyone is a stakeholder and encourage organizations to focus on those that should be considered stakeholders (Tullberg, 2013). One point of agreement among many researcher is that all stakeholders have value, but not necessarily the same value (Garriga, 2014; Hasnas, 2013; Harrison & Wicks, 2013; Parmar et al., 2010), and organizations need to spend time understanding stakeholder values. This perspective is also supported by researcher claims that one of the consistent aspects of stakeholders is that stakeholders are not homogeneous and have different claims that must be explored (Bridoux & Stoelhorst, 2014; Garriga, 2014; Hasnas, 2013; Laczniak &

Murphy, 2012). Such exploration would not only help surface different stakeholder values, but could also lead to the discovery of "intersections of interest" (Garriga, 2014, p. 495). Several researchers suggested the best way for organizations to understand stakeholders was not to participate in discussion alone, but to include dialogue (Tashman & Raelin, 2013; Tullberg, 2013; Verbeke & Tung, 2013). These researchers suggested that too often organizations and their leaders attempt to interpret stakeholder values from an arm's length perspective (discussion), and never actually reach the point of getting to know stakeholders (dialogue).

Trust

Organizations must also instill a level of trust among stakeholders. Per Harrison and Wicks (2013), trust is an important aspect of stakeholder theory, but a largely ignored aspect of actually dealing with stakeholders. As part of building trust, leaders must strive for consistency in their dealings with stakeholders (Bridoux & Stoelhorst, 2014). Being consistent does not necessarily mean behaving in the same way. Many researchers suggested that consistency is more about figuring out which stakeholders one is dealing with, how stakeholder values may change over time, and modifying relationships that address differences or potential changes in a consistent fashion (Bridoux & Stoelhorst, 2014; Eskerod & Huemann, 2013; Garriga, 2014; Tashman & Raelin, 2013; Verbeke & Tung, 2013). A suggestion made for building trust with stakeholders was to consider enlisting the aid of arbitrators (Harrison & Wicks, 2013; Tashman & Raelin, 2013). Arbitrators could be in the form of private third parties or government affiliated

arbitrators. Involving arbitrators could help organizations resolve not only external issues, but also internal issues.

Organizations as Stakeholders

So far, stakeholder theory has been discussed primarily from an external perspective regarding how organizations might view stakeholders. However, the literature review also demonstrated that many researchers suggested stakeholder theory could benefit from a more inclusive perspective. Specifically, that when helping leaders understand stakeholder value, power, and legitimacy, leaders must also understand the role they and their own organization play in stakeholder theory (Tashman & Raelin, 2013). Currently when discussing stakeholder theory, organizations tend to be placed at the hub, with external stakeholders forming the wheel (Laczniak & Murphy, 2012; Parmar et al., 2010; Tashman & Raelin, 2013; Tullberg, 2013). Researchers suggested that a large part of understanding stakeholders requires organizations and leaders to understand themselves (Tashman and Raelin, 2013), which makes organizations a part of the stakeholder mix (Bridoux & Stoelhorst, 2014; Eskerod & Huemann, 2013; Hasnas, 2013; Tullberg, 2013). Per Garriga (2014), the rationale for leaders and their organizations to consider themselves as stakeholders assumes that external stakeholders also consider organizations as stakeholders. By inserting themselves into the stakeholder mix, leaders and their organizations may better understand who is a claimant, and who is an influencer (Tashman & Raelin, 2013). The point being made by Tashman and Raelin (2013) is that when organizations and leaders do not include themselves in the stakeholder mix, they may miss important considerations regarding how an organization

is seen by external stakeholders and how internal stakeholders can affect the external stakeholder view. Parmar et al. (2010) were very direct in their suggestion that all organizations should be moved towards the wheel, and away from the hub of stakeholder theory. In this way, organizations are less likely to view stakeholders from an ingroup/outgroup perspective, and realize that their organizations are also stakeholders.

Leadership

Possibly the greatest challenge for leaders of industrial SDOs is the structure of SDOs (Anheier & Krlev, 2015; Pache & Santos, 2013; Schröer & Jäger, 2015). SDOs are incorporated as nonprofit organizations (Coates, 2015; Strauss, 2013), but a review of the literature has indicated that looking at any organization incorporated as a nonprofit from a strictly nonprofit perspective does not present an accurate representation of the organization or the challenges faced by the organizations leaders. As suggested by Smith (2014) and Schröer and Jäger (2015), there is almost no such thing as a purely nonprofit organization because even nonprofit organizations have some financial requirements. The financial requirements then result in most organizations that are incorporated as nonprofit organizations acting as hybrid organizations in that they must address the conflicting logics of forprofit and nonprofit activities. Regarding leadership from an organizational perspective, there has been abundant research regarding leadership needs in forprofit organizations, considerably less research regarding leadership needs in nonprofit organizations, and even less research regarding leadership needs in hybrid organizations. This lack of research into hybrid organization leadership needs represents

a gap in the literature regarding specific challenges faced by leaders of hybrid organizations (Battilana & Lee, 2014; Schröer & Jäger, 2015).

The Nature of Hybrid Organizations and Leadership Challenges

According to researchers, hybrid organizations have existed for some time, but it is only in the last three decades that hybrid organizations have started to become a mainstream phenomenon (Battilana et al., 2012). Originally, hybrid organizations were primarily an outgrowth of nonprofit organizations that needed or wanted to address forprofit issues in addition to their nonprofit missions, and were often the result of unintended consequences of organizational development (Anheier & Krlev, 2015; Pache & Santos, 2013). As suggested by some researchers, the increase in the number of hybrid organizations over the last three decades have become more planned, driven by increasing concerns about internal governance and management challenges (Anheier & Krlev, 2015). Other researchers suggested the increase in the number of hybrid organizations is a result of governments' abdication of responsibility (Smith, 2014). Still other researchers suggested the increase in the number of hybrid organizations are the result of increasing pressure from competition or as a defense mechanism against regulatory intervention (Chadwick-Coule, 2011; Osula & Ng, 2014). Regardless of the reasons for the increase in the number of hybrid organizations, Anheier and Krlev (2015) suggested that hybrids are becoming the norm, with true nonprofit structures fading in popularity.

The overarching feature of hybrid organizations has been their need to address the conflicting institutional logics of forprofit and nonprofit activities (Anheier & Krlev,

2015; Osula & Ng, 2014). Battilana et al. (2012) and Benner and Pastor (2015) have referred to these conflicting institutional logics as a *source of friction* both internally and externally. Originally, these conflicting institutional logics were considered a form of double hybridity, with economic versus mission focus forming the two extremes (Battilana et al., 2012). Other researchers have used different terms to describe double hybridity. Anheier & Krlev (2015) and Schröer and Jäger (2014) use the terms private market (competition) versus civil society (cooperation). Hailey and James (2004) use the terms competitive versus collaborative. McMurray et al. (2012) used the terms competitive mission approach versus collaborative mission approach. Battilana et al. (2012) used the terms market forces versus social forces.

More recently, the term triple hybridity has become popular as legitimacy has been added to the challenges faced by hybrid organizations that try and balance the conflicting institutional logics of forprofit and nonprofit activities (Anheier & Krlev, 2015). While Anheier and Krlev (2015) suggested the appearance of integrity in pursuit of legitimacy most accurately described the legitimacy component, other researchers have simply used the term legitimacy (Battilana et al., 2012; Battilana & Lee, 2014; Benner & Pastor, 2015; Pache & Santos, 2013; Smith, 2014). Anheier and Krlev (2015) described the quest for legitimacy as a form of stability, primarily aimed at convincing stakeholders that dealing with an organization that incorporated forprofit and nonprofit institutional logics was not a threat to a hybrids' legitimacy.

Hybrid organizations are a combination of multiple organizational identities and forms (Battilana & Lee, 2014). Researchers have also described hybrid organizations

more colorfully as a "locus of disorder" (Battilana & Lee, 2014, p. 398) and "arenas of contradiction" (Pache & Santos, 2013, p. 972). Pache & Santos (2013) suggested that hybrids by their very nature are *confused constructs* because of the challenges of dealing with different institutional logics. Dealing with different institutional logics makes hybrid organizations pluralistic, differentiating them from the more unitary structure of organizations that are strictly focused on forprofit or nonprofit activities (Chadwick-Coule, 2011; Pache & Santos, 2013). Battilana et al. (2012) suggested that one of the first challenges hybrid organizations must face because of their pluralistic constructs is one of planning. Hybrid organizations are frequently the result of plugging together unfamiliar activities. Without planning, combining unfamiliar activities can result in mission drift or goal ambiguity, and consequently leadership ambiguity (Battilana et al., 2012; Cho & Perry, 2012). The resulting misalignment of mission and goal values can present a threat to hybrid organizations (Osula & Ng, 2014). Workforce composition can also be a source of tension because hybrid organizations are generally composed of individuals steeped in nonprofit or forprofit traditions (Battilana & Lee, 2014). Hybrid organizations must also deal with a larger and more diverse set of stakeholders (Benner & Pastor, 2015). A larger and more diverse set of stakeholders translates into a greater need for leaders of hybrid organizations to be skilled in the art of collaboration across institutional logics (Hailey & James, 2004; Osula & Ng, 2014; Pinho et al, 2014). Battilana & Lee (2014) suggested "leadership of hybrids may represent an extreme leadership challenge" (p. 422).

A common leadership challenge is the leadership structure of hybrid organizations. Hybrid organizations, regardless of actual function, are generally incorporated as nonprofit entities (Battilana & Lee, 2014). As a result, the board of directors is critical to addressing leadership issues because leadership tends to be more of a group activity than in organizations incorporated as forprofit entities (Battilana & Lee, 2014; Goldkind, 2015). A specific concern mentioned by several researchers is that the board (hereafter referred to as leaders) may not be prepared to deal with the competing institutional logics characteristic of hybrid organizations (Anheier & Krlev, 2015; Benner & Pastor, 2015). Being unprepared to address competing institutional logics could have several causes. The first and overarching cause is that leaders of hybrid organizations collectively tend to come from forprofit backgrounds and therefore have little experience with nonprofit institutional logics (Chadwick-Coule, 2011). Conversely, and of less concern, is that leaders of hybrid organizations collectively may come from nonprofit backgrounds and therefore have little experience with forprofit institutional logics (Dimitrios et al., 2013). A third cause may be the mix of leaders. Depending on the mix of leader backgrounds, blending leaders who come from nonprofit and forprofit backgrounds can be a source of tension, resulting in behavior that demonstrates a lack of competence (Anheier & Krlev, 2015; Osula & Ng, 2014). A forth cause may be the background of the board president. If a president comes from either a nonprofit or forprofit background, they may favor one approach or the other, resulting in ingroup/outgroup tensions (Benner & Pastor, 2015). Regardless of the source of tension, the overarching leadership challenge comes back to how to deal with the conflicting

institutional logics that result from blending forprofit and nonprofit activities (Anheier & Krlev, 2015; Battilana et al., 2012; Benner & Pastor, 2015).

In addition to leadership background issues, the literature review into hybrid organizations revealed several other leadership considerations. First, leaders of hybrid organizations must look at organizational design in order to understand how conflicting logics need to be managed (Battilana & Lee, 2014, Chadwick-Coule, 2011; Pache & Santos, 2013; Walston, 2014)). Understanding how to manage conflicting institutional logics begins with figuring out what a hybrids' mission really is (Brown & Yoshioka, 2003). If the leadership approach to dealing with conflicting institutional logics are at odds with the organizations mission, legitimacy of the organization will be under threat. This type of mismatch is particularly common when leaders try and force nonprofit and forprofit structures together (Battilana et al., 2012). Leaders must also be aware of incentives and what motivates various stakeholders (Battilana & Lee, 2014; Brown & Yoshioka, 2003; Cho & Perry, 2012). Hybrid organizations tend to deal with a relatively larger and more diverse group of stakeholders compared with pure forprofit and nonprofit organizations, making an understanding of different incentives even more important from a collaboration perspective (Benner & Pastor, 2015). At some point, leaders of hybrid organizations will have to address stakeholders who adhere to either forprofit or nonprofit institutional logics, or are themselves hybrid organizations (Anheier & Krlev, 2015). To address specific institutional logics, leaders must be careful not to *compartmentalize* stakeholders, but rather try and integrate stakeholders by understanding the boundary conditions of each group of stakeholders (Battilana & Lee, 2014). A leader's ability to

demonstrate both advocacy and collaborative skills is a necessary leadership skill when dealing with "diverse constituencies" (Benner & Pastor, 2015, p. 308). As suggested by Benner and Pastor (2015), hybrid organizations and their leaders are not able to just ignore or suppress stakeholder that may be seen as problematic. Rather, a mix of coercion and participation skills are a leadership requirement from an internal and external perspective for hybrid organizations to address both business and civil situations (Anheier & Krlev, 2015; Benner & Pastor, 2015). Anheier and Krlev (2015) suggested that the need to collaborate with diverse stakeholders makes leadership in hybrid organizations a more adaptive process compared with leadership processes found in forprofit and nonprofit organizations.

A review of the literature also indicated that researchers tended to suggest volunteer employees represented a class of internal stakeholder that could present special leadership challenges. In hybrid organizations, many if not most of the participants, are volunteers (Bordia et al., 2011). Per Bordia et al. (2011), volunteers tend to want a greater role in how a hybrid organization functions, tend to be motivated by mission rather than money, and are not as easily threatened. Several researchers suggested that getting input from internal stakeholders such as volunteers could be enormously beneficial to creating a collaborative environment within hybrid organizations (Bordia et al., 2011; Chadwick-Coule, 2011; Dimitrios et al., 2013; Hailey & James, 2004; Shiva & Suar, 2010). Another suggestion was to get internal stakeholders to become advocates for specific solutions (Benner & Pastor, 2015). Regardless of how internal stakeholders were asked to become engaged, the rationale for enlisting internal stakeholders was that

getting to know an organizations internal culture was more important for leaders of hybrid or nonprofit organizations than for leaders of forprofit organizations (Pinho et al., 2014). Getting to know an organizations' internal culture may present a special challenge for leaders who come from forprofit backgrounds because getting to know an organizations' internal culture is largely ignored by leaders in forprofit organizations (Chadwick-Coule, 2011). As suggested by Benner and Pastor (2015), the best leaders of hybrid organizations were those who can maintain credibility with internal stakeholders while building ties with external stakeholders.

Although some researchers suggested understanding internal cultures was important for leaders of hybrid organizations (Bordia et al., 2011; Pinho et al., 2014; Walston, 2014), other researchers considered dealing with external stakeholders to be a greater and maybe more important challenge for leaders of hybrid organizations (Anheier & Krlev, 2015; Benner & Pastor, 2015; Dimitrios et al., 2013; Goldkind, 2015). As mentioned, hybrid organizations tend to deal with a relatively larger and more diverse group of stakeholders compared with pure nonprofit and forprofit organizations (Anheier & Krlev, 2015; Benner & Pastor, 2015). Diverse external stakeholders can present a special challenge for leaders of hybrid organizations because it is with external stakeholders that hybrid organizations are most likely to encounter the different institutional logics of nonprofit and forprofit activities (Anheier & Krlev, 2015; Battilana et al., 2012; Battilana & Lee, 2014; Chadwick-Coule, 2011; Dimitrios et al., 2013; Pache & Santos, 2013).

Overall, researchers tended to suggest that hybrid organizations that were successful at achieving legitimacy did so because of leaderships' ability to appropriately address the blending of conflicting institutional logics of nonprofit and forprofit activities. (Anheier & Krlev, 2015; Battilana et al., 2012; Battilana & Lee, 2014; Benner & Pastor, 2015, Chadwick-Coule, 2011; Cooper et al., 2011; Dimitrios et al., 2013; McMurray et al., 2012; Osula & Ng, 2014; Pache & Santos, 2013; Pinho et al., 2014; Schröer & Jäger, 2015; Smith, 2014). Just how leaders could achieve legitimacy through blending was more nuanced. Benner and Pastor (2015) suggested success was based on leaderships' ability to adjust continuously between conflict and collaboration, and know when and how to adjust. Benner and Pastor (2015) also described this leadership skill as the practice of "collaboration during conflict" (p. 308). Pinho et al. (2014) suggested that leaders of hybrid organizations needed to focus on collaboration through conflict reduction, and that an important consideration in establishing collaborative practices was to understand how and why various stakeholders conflict. Vessey, Barrett, Mumford, and Johnson (2014) suggested the ability to collaborate in hybrid organizations was based on leaderships' ability to plan strategically. Other researchers supported this strategic planning approach by suggesting that employing a strategic rather than operational form of management would allow leaders of hybrid organizations to be more successful at addressing multiple stakeholder identities and forms (Anheier & Krlev, 2015; Chadwick-Coule, 2011; Dimitrios et al., 2013). Walston (2014) made a more general suggestion that the solution for leaders of hybrid organizations was to manage better, not lead better. Finally, Goldkind (2015) and Waters, Burnett, Lamm, & Lucas (2009) suggested that

leaders in hybrid or nonprofit organizations needed to also focus on utilizing social media to encourage collaboration, and pointed out that using social media was an under developed skill set in hybrid and nonprofit organizations.

Leadership Styles

Leadership styles deemed conducive to reducing conflict and increasing collaboration included transformational, transactional, transcendent, and servant styles (Benner & Pastor, 2015, Bordia et al., 2011; Cooper & Santora, 2011; McMurray et al., 2012; Shiva & Suar, 2010). McMurray et al. (2012) suggested blending transactional (reward and punishment) and transformational (identification of motives and values) styles, with a transactional style being potentially most appropriate when dealing with external stakeholders. Benner and Pastor (2015) and Bordia et al. (2011) suggested either transformational or transcendent styles might be most appropriate depending on the specific situation. McMurray et al. (2012), Osula and Ng (2014), and Shiva and Suar (2010) suggested a transformational style was best overall, with Osula and Ng (2014) and Cooper and Santora (2011) suggesting a servant leadership style may be more appropriate as the forprofit/nonprofit ratio shifted towards the nonprofit side. Stoker, Grutterink, and Kolk (2012) suggested the importance of leadership style could be greatly reduced by focusing on building a high feedback seeking top management team.

Preparing Leaders for Hybrid Situations

Regardless of leadership style, the common thread regarding why leaders in hybrid organizations seem to face unique challenges came down to leadership background and training rather than style. From a background perspective, researchers

suggested that leaders familiar with only forprofit or nonprofit institutional logics were not qualified to act as leaders of hybrid organizations (Anheier & Krlev, 2015; Battilana & Lee, 2014; Chadwick-Coule, 2011; Dimitrios et al., 2013). The suggestions for how to remedy this situation came down to screening and training. Screening of potential leaders would in theory prevent unqualified individuals from being placed in a hybrid leadership situation in the first place (Cho & Perry, 2012; Hailey & James, 2004; Osula & Ng, 2014; Schröer & Jäger, 2015). While screening might be viable as a preventative measure, training of leaders was considered the best long-term solution (Chadwick-Coule, 2011; Cooper & Santora, 2011; Hailey & James, 2004; Lazurko et al., 2014; Schröer & Jäger, 2015; Smith, 2014; Vessey et al., 2014; Walston, 2014). However, the same researchers who suggesting training as the best long-term solution were not always in agreement regarding how training should be approached and when training should begin. Lazurko et al. (2014) made a firm suggestion that training needs to begin at the college level. Battilana et al. (2012) were more vague and suggested training potential leaders when they were young. Hailey and James (2004) suggested early screening was needed to see if specific individuals were even trainable. The remaining researchers either suggested that training during the early part of a leader's tenure was important, or that more research into hybrid organization leadership challenges might result in better training programs.

Synthesis

The research question is, "what is the level of consensus among a panel of subject matter experts (SMEs) regarding desirable and feasible future-oriented actions leaders of

accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?" Based on the literature review, researchers tended to agree that there are conflicts between accredited and unaccredited industrial SDOs (Allen & Ramanna, 2013; Botzem & Dobusch, 2012; Fransen, 2011; Timmermans & Epstein, 2010). Conflicts are particularly intense in the United States because of the U.S. market-driven, bottom-up approach to the development, adoption, and diffusion of industrial voluntary consensus standards (Ernst, 2013; Strauss, 2013). The literature review also showed that researchers made frequent reference to institutional isomorphism and stakeholders when exploring and explaining the tensions that exist in the battle for industrial voluntary consensus standards legitimacy and accredited and unaccredited industrial SDO legitimacy (Brunsson et al., 2012; Chandler & Hwang, 2015; Garriga, 2014; Tashman & Raelin, 2013. Regarding organizational structure, the literature review showed that organizations like accredited and unaccredited industrial SDOs are hybrid organizations in that they attempt to incorporate the conflicting institutional logics of forprofit and nonprofit activities, and present a special challenge to leaders (Dimitrios et al., 2013; Osula & Ng, 2014; Pinho et al., 2014). Researchers suggested that leaders of hybrid organizations like SDOs may be unprepared to address hybrid organization challenges (McMurray et al., 2012; Schröer & Jäger, 2015; Smith, 2014). The primary gap in the leadership literature which supports the importance of this study was that researchers who concluded leaders of hybrid organizations may not be qualified could only offer vague suggestions regarding potential solutions (Cooper & Santora, 2011; Lazurko et al., 2014; Schröer & Jäger, 2015; Smith,

2014). The selection of a qualitative modified three-round Delphi study design as outlined in Chapter 3 was appropriate because this study is forward looking, and I sought to explore gaps in the literature, provide answers to the research question, and gain insight into the expert panel members' opinions regarding desirable and feasible future-oriented solutions to the challenge of improving collaborative practices and better serving public interests (Linstone & Turoff, 1975).

Summary and Conclusions

Several concepts emerged from the literature review. First, the increase in the number of unaccredited industrial SDOs in the United States is creating conflicts that threaten the legitimacy of what has historically been a deliberative and inclusive democratic process for developing industrial voluntary consensus standards. Second, institutional isomorphism and stakeholder considerations were key lenses for understanding how conflicts are affecting development, adoption, and diffusion of industrial voluntary consensus standards. Third, industrial SDOs represent hybrid constructs that present leaders with unique challenges as leaders attempt to deal with blending the conflicting institutional logics of forprofit and nonprofit activities. The primary result that makes this study valuable is that while researchers generally concluded leaders of industrial SDO are faced with unique challenges, little seemed to be known about what actions could be taken to reduce these challenges, create a more collaborative environment between all significant stakeholders, and better serve public interests.

Chapter 3 contains an analysis of the qualitative method and modified three-round Delphi design selected for this study. Included is a description of the Delphi design in general, the merits of using a modified three-round Delphi design for this study compared with other designs, and details for how a modified three-round Delphi design is anticipated to be applied in this study.

Chapter 3: Research Method

The purpose of this qualitative modified three-round Delphi study was to discover what consensus could be built among a panel of subject matter experts (SMEs) regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial standard development organizations (SDOs) and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. The specific focus was on steps that could be taken to improve collaborative practices to preserve the legitimacy of the U.S. industrial voluntary consensus standards process, ensure occupation/consumer safety and quality control, and protect public interests. In this chapter, I address the research design and rationale, my role as the researcher, methodology, expert panel member selection, instrument development, data collection procedures, ensuring confidentiality (privacy and security), data analysis plans, addressing rigor, ethical issues, and chapter summary.

Research Design and Rationale

Overarching Research Question: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests? The sub-questions that supported the primary question were:

Subquestion (SQ) 1: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions regarding competition that

leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 2: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in deregulation that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 3: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in oversite that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 4: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in organizational structure that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 5: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in leadership training that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

SQ 6: What is the level of consensus among a panel of SMEs regarding desirable and feasible future-oriented actions in market-driven standards that leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests?

The phenomenon of interest was what desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. Industrial voluntary consensus standards developed by unaccredited industrial SDOs are frequently self-serving and are increasingly in competition and conflict with industrial voluntary consensus standards developed by accredited U.S.-based industrial SDOs (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). To date, most conflicts between competing SDOs and the voluntary consensus standards they develop have been limited to commodity or sustainability related issues such as fishing, coffee, timber, and palm oil production (Boiral & Gendron, 2011; Henrik, 2015; Kaplan & Kinderman, 2015; Makiya & Fraisse, 2015). However, the problem is starting to expand to voluntary consensus standards domains that deal with industrial environments where voluntary consensus standards are designed to serve public interests by promoting uniform and harmonized occupational/consumer safety and quality control procedures (Botzem & Dobusch, 2012; Brunsson et al., 2012).

The research approach selected for this study was a qualitative method and a modified three-round Delphi design (Davidson, 2013; Rowe & Wright, 2011). The rationale for selecting this method and design and the approach was four-fold. First, the data used in this study came from the subjective opinions of a group of SMEs. The use of subjective data is a cornerstone of qualitative research (Patton, 2015). Second, the central question being asked was one of future collaborative practices. This is a predictive challenge for which a Delphi design is appropriate (Skulmoski et al., 2007;

Withanaarachchi, Pushpakumara, & Nanayakkara, 2015). Third, multiple rounds are often best for prognostication purposes. In the case of this study, three rounds were selected because fewer rounds may not have been sufficient to explore the problem, and more than three rounds could increase the study complexity and increase the chance of expert panel member drop out (Davidson, 2013; Gill, Leslie, Grech, & Latour, 2013; Green, 2012; Habibi, Sarafrazi, & Izadyar, 2014; Withanaarachchi et al., 2015). Fourth, being forward looking, a Delphi approach did not require the use of established instruments nor that those being questioned participate in the creation of the instrument. In the case of this study, SMEs did not help create the questions for Round 1, and the first round questionnaire was created by me based primarily on literature reviews. This approach of not expecting SMEs to help craft the questions for Round 1 was also recommended for novice researchers and is considered a *modification* to a classic or traditional Delphi design (Asselin & Harper, 2014, Davidson, 2013; Skulmoski et al., 2007).

In comparison with other qualitative designs, a Delphi design was appropriate for conducting the study for several reasons. An ethnographic approach would have been inappropriate because I did not focus on learning about the past or present culture of a group of people (Sunstein & Chiseri-Strater, 2012). A phenomenological approach would have been inappropriate because I was not trying to understand the meaning and essence of the lived experience of the group or groups of people that make up U.S.-based industrial SDOs (Brinkmann, 2012). A grounded theory approach would have been inappropriate because I did not attempt to expand existing theories or create new theories

(Birks & Mills, 2011). A narratological approach would have been inappropriate because I did not attempt to obtain a narrative analysis of one individual in order to understand a past or present life or culture (Holstein & Gubrium, 2012).

An argument could have been made that challenges facing uniformity and harmonization proceedures with regard to occupational safety and quality control might fit into a case study approach (Yin, 2014). However, such an approach would have been a study in how the system currently functions and might not have illuminate how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs approached improving future collaborative practices. Since improving future collaborative practices formed the basis of the primary research question, a case study approach was deemed inappropriate.

Role of the Researcher

My method was qualitative using a modified three-round Delphi design. Based on my method and design, my role as the researcher included research design, selecting expert panel members, creation of the research instrument, administering the research instrument, establishing themes and codes, data reduction and analysis, member checking, providing controlled and timely feedback to expert panel members, controlling or at least addressing personal biases, ensuring confidentiality (privacy and security), interpreting questionnaire results, establishing trustworthiness, and adhering to ethical standards.

Professional Background and Relationships

I have worked for over 16 different organizations with cultural bases in North America and Europe, but all with a global reach. These organizations are for the most part considered suppliers as opposed to end users, and my primary roles involved middle to upper-middle management activities in engineering, marketing, and sales. Many of my responsibilities revolved around making sure products were compliant with existing standards (soft or De facto law) or existing codes (hard or De jure law), and understanding end user requirements. I have also been involved with domestic and international industrial SDOs since the mid-1980s, and my involvement with industrial standards has continued essentially without interruption from the mid-1980s up to the present. I have also worked with governmental regulatory organizations such as the Food and Drug Administration, the National Institute of Standards and Technology, and the Occupational Safety and Health Administration. Governmental regulatory organizations typically deal with codes, many of which have their roots in voluntary consensus standards.

Based on my professional background, there were certainly professional similarities between me and this study's expert panel members, and I expected these professional similarities to be beneficial to my research for several reasons. First, the SMEs I recruited as expert panel members were typically in the middle to upper management roles within their perspective organizations. These are roles I have shared. Second, I shared many of the same experiences regarding industrial voluntary consensus standards development, adoption, and diffusion activities. Third, I was not currently

working for any end user or supplier and functioned as an independent industrial consultant, which placed me in a relatively neutral and therefore trusted position. The combination of similar professional and standards development experiences, in addition to my independent consultant status, created a collegial environment between me and the expert panel members. An abridged description of my career history was included in the package sent to selected expert panel members.

Regarding issues relating to personal and professional relationships, I could not say at the beginning of the recruitment process if I would have any personal or professional relationships with SMEs who would become part of my panel. However, since a SMEs qualifications were of primary importance to this study, personal or professional relationships with SMEs were not considered an obstacle to recruitment. The only potential limitation from a personal and professional relationship perspective were situations where I was known to a potential expert panel member even though I was not aware of this relationship. To the best of my knowledge, this potential limitation never became a reality.

Personal Biases and Power Relations

I anticipated that controlling my own biases would be an important and potentially challenging task based on my past professional experience. Even without the support of literature that suggested industrial voluntary consensus standards development was becoming a political and economic free-for-all in the United States (Timmermans & Epstein, 2010), I was and continue to be of that mind. Other potential personal biases included predilections for some suggestions discovered during the literature reviews

regarding problems and solutions, which included biases related to desirability and feasibility. For example, I tended to agree with some researchers that more government oversight is needed to counteract the effects of deregulation. However, my views of government oversight are a bias that I kept to myself as far as expert panel members were concerned. The literature I reviewed presented another potential bias in how I might have interpreted the literature, or the fact that I did not review every potentially applicable piece of literature ever published (Cheung & Vijayakumar, 2016). Power relations were not an issue as I was retired and not working for or being paid by any industrial organization.

Ethical Issues

Ethical issues were primarily related to maintaining participant confidentiality from one another and anyone other than myself (Paré, Cameron, Poba-Nzaou, & Templier, 2013), securing information (Asselin & Harper, 2014), and following IRB recommendations. The individuals that made up the panel of experts were not considered at-risk populations. However, should potential participants have felt vulnerable (e.g., being pregnant, elderly, or injured), I encouraged them to make their vulnerabilities known to me if they volunteered to become an expert panel member. As previously mentioned, I was retired and did not select expert panel members from an organization where I ever worked, so ethical conflicts of interest or power differentials were never expected to be an issue. A personal ethical issue was my past work history, affiliation with SDOs, and involvement in voluntary consensus standards development. I disclosed my professional history to potential expert panel members in the package I sent to those

who expressed interest. I expected that any potential panel member who was concerned would simply decline to participate.

Methodology

My selected approach used a qualitative method based on a modified three-round Delphi design. The Delphi design was named after the Oracle at Delphi, a character in Greek mythology capable of forecasting future events. One of the first modern applications of a Delphi design was the 1950's study by the RAND Corporation to obtain expert opinion and reach consensus regarding cold war prognostication issues. For security reasons, the Delphi design was not published until 1963 by Dalkey and Helmer (Birko et al., 2015). Since then, Delphi designs have been used with increasing frequency as a forecasting tool in situations such as education, business, and health care (Diamond, Grant, Feldman, Pencharz, Ling, Moore, & Wales, 2014). As suggested by several researchers, a Delphi design is appropriate for situations where the goal is to understand or deal with a complex problem when precise information is not available, or where the goal is to understand opportunities and develop forecasts (Laick, 2012; Sobaih, Ritchie, & Jones, 2012). The term "modified" has been used in many ways to refer to variations on the classic or traditional Delphi design (Davidson, 2013; Gallego & Bueno, 2014; Withanaarachchi et al., 2015). In the case of this study, modified was used primarily to refer to a design where the first round questionnaire is created by the researcher based on literature reviews, and is not a collaborative effort between the researcher and the expert panel members (Asselin & Harper, 2014). A modified Delphi design where the first round questionnaire is created by the researcher based on literature

reviews was also recommended for new practitioners because of the relative ease of study management and general applicability to a wide range of situations (Asselin & Harper, 2014; Davidson, 2013; Green, 2013; Skulmoski et al., 2007). Other features of this modified Delphi design included expert input, selection of experts based on the aims of the research, limiting the study to three rounds, providing controlled feedback after each round, on-line administration of rounds, defining levels of consensus, and protecting the confidentiality of participants (Asselin & Harper, 2014; Sobaih et al., 2012).

Consensus measurements are typically an important feature of Delphi designs, but there is considerable disagreement on definitions of consensus (von der Gracht, 2012). A definition of consensus can be as simple as what the majority selects (von der Gracht, 2012), or can involve more complex definitions such as Kendal's *W* (Skulmoski et al., 2007; Worrell, Di Gangi, & Bush, 2013) or other statistical tests (Ju & Jin, 2013). Researchers often define consensus using simple metrics such as the mean or median of responses (Kalaian & Kasim, 2012; von der Gracht, 2012; Wakefield & Watson, 2014). For Round 1, consensus was not an issue as the Round 1 questionnaire consisted of a short number of open-ended questions created by me (see Table 1) based on the literature review and that were designed to elicit suggested solutions that formed the basis for the Round 2 questionnaire.

Table 1

Main Theme Framework

Themes	Round 1 derived question	Literature references
Competition	In what ways could collaborative practices be improved between accredited U.S.-based industrial standards development organizations and unaccredited industrial standards development organizations in order to reduce conflict?	Ernst, 2013; Fernando et al., 2012; Fransen, 2011; Gadinis, 2014
Deregulation	In what ways could leaders of accredited U.S.-based industrial standards development organizations and unaccredited industrial standards address the effects of deregulation that since the 1980's have resulted in an increase in the number of unaccredited industrial standards development organizations?	Brunsson et al., 2012; Ernst, 2012; Wijen, 2014; Yates & Murphy, 2015
Oversight	In what ways could government or other third party participants help leaders of accredited industrial standards development organizations and unaccredited industrial standards development organizations improve collaborative practices?	Behr & Diaz, 2014; Coates, 2015; Henrik, 2015; Heras-Saizarbitoria & Boiral, 2013
Organizational structure	What changes to standard development organization structures might improve collaborative practices between accredited and unaccredited industrial standards development organizations? Accredited and unaccredited industrial standards development organizations in the United States are currently registered as nonprofit entities, but tend to be considered hybrid organizations in that they pursue both nonprofit and forprofit activities.	Anheier & Krlev, 2015; Battilana et al., 2012; Schröer & Jäger, 2015; Smith, 2014
Leadership training	What training should be required of leaders (or leadership) of accredited U.S.-based industrial standards development organizations and unaccredited industrial standards development organizations to improved collaborative practices?	Battilana et al., 2012; Dimitrios et al., 2013; Hailey & James, 2004; Walston, 2014
Market-driven	How can the unique market-driven, bottom-up U.S. approach to the development of industrial voluntary consensus standards be leveraged to improve collaborative practices between accredited U.S.-based industrial standards development organizations and unaccredited industrial standards development organizations?	Olshan, 1993; Pirard et al., 2015; Reinecke et al., 2012; Sandholtz, 2012

Consensus for Rounds 2 and 3 were reached when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses (Asselin & Harper, 2014). Questions that met this definition of consensus for Round 2 were moved forward to Round 3. Questions that met this definition of consensus for Round 3 were moved to the appropriate place in the results section because completion of Round 3 was the end of this study. To mitigate the risk of not moving a primary question forward because of a tendency to select option 3 (neither agree or disagree), a median score of ≥ 3.5 (a tendency towards consensus) was left as an optional second test of consensus (Ju & Jin, 2013). An odd numbered Likert-type scale was recommended by several researchers to avoid forcing expert panel members to take a stance for or against a position (Asselin & Harper, 2014; Green 2013). Regarding this studies end point, study end-points could be defined by levels of consensus, number of rounds, or some combination of definitions (Laick, 2012; Skulmoski et al., 2007; Withanaarachchi et al., 2015). Three rounds was the definition of end-point for this study. Three rounds was also supported by several researchers as a good balance between having sufficient rounds to explore the problem while maintaining study manageability (Asselin & Harper, 2014; Green, 2013; Habibi et al., 2014; Skulmoski et al., 2007).

Also of potential interest in this study were issues of desirability, feasibility, importance, and confidence of responses. Even if there was consensus regarding a primary question, expert panel member opinions regarding desirability, feasibility, importance, and confidence could be important considerations (Linstone & Turoff, 1975).

Desirability, as defined by Linstone and Turoff (1975) is a worthwhile endeavor that has few deleterious effects and is a choice worth including. Linstone and Turoff (1975) defined feasibility as the ability to easily implement the desired policy or strategy. Importance and confidence were defined by Linstone and Turoff (1975) as an indication of a respondents' belief in the practical importance of a concept, and the confidence the respondent has in their rating of importance. Definitions of consensus for Rounds 2 and 3 primary questions were also applied to questions related to desirability, feasibility, importance, and confidence.

Participant Selection Logic

Per Förster and von der Gracht (2014), the most appropriate type of panel composition for a modified Delphi design continues to be a subject of debate. Critical reflection about a study through the eyes of experts is one of the primary features of a Delphi design, but there can be many ways in which panel selection and study design impacts critical reflection (Förster & von der Gracht, 2014; Kalaian & Kasim, 2012).

The two primary categories of an expert panel are defined as homogeneous or heterogeneous. Gallego and Bueno (2014) defined homogeneous participants as those with similar levels of knowledge, while heterogeneous participants were defined as those who exhibited different levels of knowledge or who possessed unique and different characteristics. Förster and von der Gracht (2014) presented similar definitions of homogeneous and heterogeneous, but expanded on the definition of heterogeneous to include characteristics such as age, gender, culture, knowledge, profession, values, and attitudes. Some researchers suggested a homogeneous panel was best for novice

researchers (Davidson, 2013; Green, 2013; Skulmoski et al., 2007). The primary rationale for this recommendation is that a homogeneous panel generally requires fewer members than a heterogeneous panel, that studies using a homogeneous panel are easier to manage, and that expert panel member dropout is not as serious a threat to trustworthiness. The primary negative of a homogeneous panel is an increased possibility of bias (Förster & von der Gracht, 2014; von der Gracht, 2012). Based on the previous pros and cons, choosing a homogeneous panel was the approach selected for this study.

Size of Panels

Although researchers seemed to agree that homogeneous panels could be smaller in size than heterogeneous panels, the best expert panel member size continued to be a subject of debate (Förster & von der Gracht, 2014; Gallego & Bueno, 2014; Withanaarachchi et al., 2015). There was, however, consensus that between 10 to 15 homogeneous members was sufficient to explore a subject while not adversely affecting manageability or affecting trustworthiness (Birko at al., 2015; Ju & Jin, 2013; Paré et al., 2013). I sought upwards of 20 expert panel members as a buffer against expert panel member dropout or non-response. Active voluntary participants in accredited U.S.-based industrial SDOs were the source for my expert panel members. Per the American National Standards Institute (ANSI), the only congressionally approved U.S. Standards Setting Organization (SSO) authorized to represent the United States internationally regarding industrial voluntary consensus standards and manage the U.S. SDO accreditation process, there are currently over 240 active accredited U.S.-based industrial

SDOs. I began by selecting large accredited SDOs that had been in existance for at least 50 years. This assured that the SDO had a history that extended to a time before deregulation became popular in the late 1970s and early 1980s. I identified 10 SDOs that met this time in existence criteria. Regarding the overall sample population, the number of expert panel members being sought represented a small percentage of the thousands of potential SMEs that are members of accredited SDOs. However, one of the features of this Delphi design, and Delphi designs in general, is that expert panel member selection is based on the assumption that selected expert panel members are experts regarding the subject matter, not that their opinions are statistically representative of the population of potential SMEs (Förster & von der Gracht, 2014). A small number of expert panel members was therefore appropriate.

Participant Selection Criteria

For the purposes of this study, I kept the definition of SME simple and relatively broad in order not to limit the number and type of SME who could function as expert panel members. Selection criteria included:

1. Knowledge of expert panel members who
    - Were familiar with the technical jargon used in the world of industrial voluntary consensus standards.
    - Could describe cases that illustrate good versus poor decisions regarding the development of industrial voluntary consensus standards.
2. Performance of expert panel members who

- Could communicate effectively in the spoken and written U.S. English language.

3. Experience of expert panel members who
    - Were currently active with an accredited industrial SDO on a voluntary basis and have at least five years continuous involvement with developing industrial voluntary consensus standards.
    - Have been employed with or worked with organizations or industries that utilize industrial voluntary consensus standards.

Uncritical adoption was the biggest obstacle and limitation to selecting qualified SMEs for my expert panel. Uncritical adoption occurs when one takes an individuals' claim of expertise at face value (Rowe & Wright, 2011). This was an unavoidable risk based on time and cost restraints associated with this study.

An important consideration for inclusion as an expert panel member, and listed in the preceding panel selection criteria section, was the expert panel members' ability to communicate. Several researchers made a point that good communication skills are an essential component of what defines a SME (Green, 2013; Laick, 2012). If a SME cannot communicate well, especially regarding reading and writing skills, the fact that they are a SME may be a moot point if they cannot adequately understand questions or elucidate their positions. Although the expert panel members were expected to have experience in the accredited U.S.-based industrial voluntary consensus standards process, this does not necessarily mean that their grasp of the writen or spoken U.S. English language would be sufficiently advanced. Unfortunately the same researchers who

advocated the value of good communication skills did not offer much in the way of techniques for gauging how to establish an appropriate level of communications competency. To try and mitigate this concern regarding ability to communicate, I spoke with each potential expert panel member befor accepting them as part of this study. All of the potential expert panel members appeared to communicate verbally very well, and I assumed they could also communicate well in writing.

Participant Selection Process

As stated earlier, the pool from which expert panel members were recruited was a select number of the over 240 ANSI accredited U.S.-based industrial SDOs. ANSI is the only congressionally approved U.S. SSO authorized to represent the United States internationally regarding industrial voluntary consensus standards and manage the U.S. SDO accreditation process. I planned on using a purposive sampling and/or snowballing strategy. To help streamline the selection process, ANSI provided me with a link to their publicly available list of primary contacts at each ANSI accredited SDO. I selected 10 SDOs that had been in existence for at least 50 years so their history extended to a point before deregulation became popular in the late 1970s and early 1980s. Based on ANSI's published contact list, I began the initial recruitment process by contacting individuals or the appropriate department within the selected 10 accredited U.S.-based industrial SDOs. Initial contact was via phone. Each accredited U.S.-based industrial SDO was asked to send the invitation to their member base. Forwarding the invitation would imply an SDOs' approval. As a backup recruitment plan, I reserved the option of contacting specific potential expert panel members directly and asking them to participate or send

the invitation to other potential expert panel members. The backup recruitment plan was the method ultimately used for identifying, contacting, and selecting expert panel members.

Potential expert panel members were given my Walden e-mail address as the point of contact. Interested potential expert panel members were encouraged to contact me using their own personal email in the interest of confidentiality and to avoid crossing any potential expert panel members' company server. All records were kept on my password protected computer and in my locked filing cabinet. The recruitment process continued until 18 potential expert panel members had been identified. I assigned each of the potential panel members a unique identification code ("P" code), and only I had the code key. Each potential expert panel member was informed that this study was about industrial voluntary consensus standards, and not about a given expert panel members company.

Conveying the importance of the study was another important aspect of the participant selection process and for supporting claims of trustworthiness. Expert panel member dropout or non-response is a potential problem regarding trustworthiness (Green, 2013; Kalaian & Kasim, 2012; Wakefield & Watson, 2014). Expert panel members that are passionate about a topic of investigation are more likely to stay throughout the necessary rounds, provide thoughtful answers, and enhance claims of trustworthiness (Cafiso, Di Graziano, & Pappalardo, 2013). Another consideration was to note now many of those who were contacted to be expert panel members actually accepted the invitation. A low response rate could be indicative of an invitation that was not getting

the message across regarding the importance of the study in a way that excited potential expert panel members (Paré et al., 2013). Every effort was made to communicate the importance of this study to potential expert panel members.

Potential expert panel members were notified individually by e-mail, provided with an informed consent form, told of my intention to provide them with a unique identification code, and given more detailed information about me and how the study would proceed. An important component of this notification was a statement that during the feedback portion of the study after each round, changes to answers from a previous round would be included in the results and analysis, but would not be incorporated into current rounds. Notification also included a statement that while suggestions and/or general comments from expert panel members were encouraged and would be included in the results, suggestions and/or general comments might not be included in subsequent rounds. The rationale I offered was that to incorporate changes or comments may invalidate the questions in current or subsequent rounds, may not support the research questions, may slow down the entire process, and may place an additional burden on expert panel members. Although I had plans to notify potential expert panel members who were not selected and thank them for their interest, this never became an issue as the total number of potential expert panel members never exceeded the cutoff point of 20 expert panel members. Of the 18 potential exert panel members who were contacted, 15 eventually responded to the informed consent form, "I consent".

Instrumentation

The instrument used during this study consisted of three independent questionnaires. A well-designed instrument can help remove majority biases and let strong opinions show through (Rowe & Wright, 2011). A well-designed instrument can also help remove or at least control panel member and researcher biases (Davidson, 2013, Skulmoski et al., 2007). Before addressing the various questionnaires that comprised the instrument, it is important to point out some overarching considerations. First, the nature of Delphi designs generally requires that instruments be created based on the specific goal of the study (Hasson & Keeney, 2011; Sobaih et al., 2012). Using a custom instrument is a potential problem regarding issues of rigor and a common criticism of the Delphi design (Hasson & Keeney, 2011; Sobaih et al., 2012). One of the primary considerations then when creating a specific instrument is to include details regarding how rigor will be addressed (Habibi et al., 2014; Kalaian & Kasim, 2012; Laick, 2012; Paré et al., 2013). Questions for Round 1 were reviewed by me for clarity. Questions deemed ambiguous, redundant, or double barreled (e.g., "we believe in X and Y") were modified or eliminated (Schmiedel, Vom Brocke, & Recker, 2014).

Researchers suggested the first round questionnaire is potentially the most significant (Ju & Jin, 2013; Paré et al., 2013; Wakefield & Watson, 2014). The questionnaire for Round 1 is the starting point of data gathering and tends to be different than the questionnaires for Rounds 2 and 3 which build off previous rounds. An important consideration in developing the Round 1 questionnaire is how well the questions support the primary research question (Laick, 2012; Sobaih et al., 2012;

Worrell et al., 2013). If the research question is not properly defined or the Round 1 questionnaire does not support the research question, the instrument that results over the span of rounds may be flawed from the beginning. Another important consideration for Round 1 is the questionnaire form. The questionnaires for Round 1 tend to take on two forms. The first form is basically that of encouraging a brainstorming session among expert panel members. Some researchers suggested that upwards of 100 questions may comprise a Round 1 brainstorming questionnaire (Paré et al., 2013). Other researchers suggested as few as 30 questions are sufficient (Birko et al., 2015). Regardless of the number of questions, the questions should be posed as broadly as possible to maximize the potential for identifying topics that are most important (Cafiso et al., 2013), and are primarily open-ended. The second form tends to be more focused and the questionnaire is created by the researcher based primarily on the results of literature reviews. For this form of questionnaire, Kalaian and Kasim (2012) recommended "a small number of open-ended questionnaire questions" (p. 3). The idea behind the second form is that a review of the literature and gaps in the literature would help create a questionnaire that is more focused and potentially shorter (Kalaian & Kasim, 2012). In the second form, the literature review derived questions would replace much of the brainstorming approach suggested for the first form. Questions created following the second form approach are also primarily open-ended. Several researchers recommended a Round 1 questionnaire developed using form two (a modified Delphi design) is best for novice researchers (Davidson, 2013, Skulmoski et at., 2007), and was the form used for this study.

In the case of this study, the Round 1 questions were based on the six primary themes discovered during the literature review, and that supported the research question. Expert panel members were asked to suggest possible solutions that addressed the six Round 1 questions. Responses to the Round 1 questionnaire were evaluated by me using word frequency and interpretation of concepts using traditional text analysis to create questions for the Round 2 questionnaire.

Round 2 and 3 questionnaires were based on closed-ended questions derived from responses to the previous rounds. The form of responses to Round 2 and 3 questionnaires were based on a five-point Likert-type scale. In addition to primary questions included in the Round 2 and 3 questionnaires, there were also secondary questions based on desirability, feasibility, importance, and confidence in relation to the primary questions. All secondary questions were rated using the same type of five-point Likert-type scale applied to the primary questions. Desirability and feasibility comprised the secondary questions in Round 2, and importance and confidence comprised the secondary question in Round 3. Responses to the Round 2 questionnaire were evaluated by me and responses that met the test of consensus were moved forward to the Round 3 questionnaire. Responses to the Round 3 questionnaire were evaluated by me and responses that met the test of consensus were moved to the final results. Consensus regarding primary questions in Round 2 and 3 were used as metrics for moving a primary question to the next round or to the final results. Consensus regarding secondary questions was part of the data analysis but was not used as a metric for moving a primary question forward.

Another consideration when designing the instrument was the potential for fatigue on the part of the expert panel members (Förster & von der Gracht, 2014). As suggested by Green (2013), experts will only spend the minimum amount of time on a questionnaire or may drop out completely. Even if expert panel members do not drop out, a complex questionnaire can increase fatigue that promotes answers that do not represent critical reflection from the expert panel member in order to get through the questionnaire as quickly as possible. Birko et al. (2015) suggested designing questionnaires that take no more than 30 to 45 minutes to complete. Time between providing feedback and next round questionnaires can also affect panel participation (Green, 2013). An overly complicated questionnaire can slow down data analysis and timely feedback, and could potentially affect panel member fatigue, dropout, and response rate (Asselin & Harper, 2014; Wakefield & Watson, 2014; Worrell et al., 2013). Another aspect of time is simply the pace of modern life and the need for controlling complexity in the interest of timeliness (Wakefield & Watson, 2014). Per one study, *life happens,* which can cause response problems for expert panel members because of time conflicts (Asselin & Harper, 2014). Every effort was made to create questionnaires that did not violate the 30 to 45 minute suggestion to reduce the potential for fatigue, drop out, and non-response. Each questionnaire was tested by me and an information technology individual I employ to assure each questionnaire could be completed in 30 to 45 minutes. I also relied on tools provided by SurveyGizmo that measured test time, fatigue, and accessibility. While some expert panel members chose to spend more than 45 minutes completing the questionnaires, the average time per SurveyGizmo never exceeded 35 minutes.

In the following sections, I address specific considerations for the creation of the instrument. These considerations include the questionnaires used in each round, and how each round built on the previous round, and the ultimate goal of the instrument.

Round 1

Once the panel was assembled and the Round 1 questionnaire was ready, the Round 1 questionnaire was distributed via e-mail to the expert panel members along with Round 1 instructions. Each panel member was provided a link to the questionnaire created in SurveyGizmo and instructed to log on. Expert panel members were not able to access any other expert panel members' questionnaire or responses.

The purpose of the Round 1 questionnaire was to elicit thoughts and possible solutions from the expert panel members for each question. These suggested solutions were then used to create the Round 2 questionnaire. The Round 1 questionnaire was comprised of six questions based on the six themes that emerged from the literature review and only questions that supported the primary themes identified during the literature review were part of the Round 1 questionnaire. A seventh question was also included but was only included to give expert panel members a platform for providing additional information if they felt the need. Each expert panel member was encouraged to include explanations for question responses, but that these explanations should be short in the interest of completing the questionnaire in 30 to 45 minutes. Each expert panel member was requested to provide between three and five responses for each of the questions. The feedback report from Round 1 included the questionnaire results,

interpretation of the results, and the Round 2 questionnaire along with Round 2 instructions.

The protocol for converting responses to the Round 1 questionnaire to Likert-type items for Round 2 was to create a small number of closed-ended primary questions based on Round 1 responses. This small number of closed-ended primary questions was designed to support the original six themes and resulting range of subthemes that emerge from evaluating the results of Round 1 and that supported the research question (Gallego & Bueno, 2014; Laick, 2012; Withanaarachchi et al., 2015). The number of questions selected for the Round 2 questionnaire was based on the recommendation that no questionnaire should take longer than 30 to 45 minutes to complete (Birko et al., 2015), while at the same time covering the range of subthemes that emerged from Round 1.

Round 2

The Round 2 questionnaire was created based on the results of Round 1. The primary difference between the Round 1 questionnaire and subsequent round questionnaires was the fact that questions presented in subsequent rounds were closed-ended and rated on a five-point Likert-type scale. The goal for Round 2 was to determine which primary questions created from Round 1 met the definition of consensus and should move to Round 3. The feedback report from Round 2 included the questionnaire results, interpretation of the results, and the Round 3 questionnaire along with Round 3 instructions. Log on procedures used in Round 1 to access the questionnaire were duplicated for Round 2 to assure confidentiality.

The protocol for moving a Round 2 primary question forward was based on consensus defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. To mitigate the risk of not moving an item forward because of a tendency to select option 3 (neither agree or disagree), a median score of ≥3.5 (a tendency towards consensus) was kept as an optional second test of consensus to justify moving an item forward. This second test of consensus was never used as the primary test of consensus was deemed sufficient.

While the same tests for consensus were applied to secondary questions regarding desirability and feasibility of responses to primary questions, consensus regarding secondary questions was only part of data analysis and not used to determine if a primary question moved forward.

Round 3

The Round 3 questionnaire was created based on the results of primary questions that were moved forward from Round 2. As with Round 2, Round 3 primary questions were closed-ended and rated on a five-point Likert-type scale. The goal for Round 3 was to determine which primary questions that moved forward from Round 2 met the definition of consensus and should be moved to the final results. The feedback report from Round 3 included the questionnaire result and interpretation of the results. The final report was sent to the expert panel members once the study was complete. Log on procedures used in Round 2 to access the questionnaire were duplicated for Round 3 to assure confidentiality.

The protocol for moving a Round 3 primary question forward was based on consensus defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. To mitigate the risk of not moving an item forward because of a tendency to select option 3 (neither agree or disagree), a median score of ≥3.5 (a tendency towards consensus) would be kept as an optional second test of consensus to justify moving as item forward. This second test of consensus was never used as the primary test of consensus was deemed sufficient.

While the same tests for consensus was applied to secondary questions regarding importance and confidence of responses to primary questions, consensus regarding secondary questions were only part of data analysis and not used to determine if a primary question moved forward.

Procedures for Data Collection

A homogeneous panel of SMEs provided the data for this study. Data collection began with the first round of this three-round study. All communication regarding questions were between the individual expert panel members and me either by phone, video conference, web based tools such as SurveyGizmo, or e-mail. A log on password (unique identification code) was sent to all expert panel members to access the online questionnaire for each round created through SurveyGizmo, and all panel members were identify on the online questionnaires by their unique identification code to protect confidentiality. The online questionnaires were the primary method used for data collection. Expert panel members did not have access to any other expert panel

members' on-line responses. A secondary method of data collection was through member checking. All communications between expert panel members and me were kept confidential, documented, and kept on my password protected computer and in my locked filing cabinet.

For Round 1, each expert panel member was asked to answer a small number of open-ended questions relating to the research question and based on the six primary themes that resulted from the literature review. For Rounds 2 and 3, each expert panel member was asked to rate a small number of closed-ended questions developed based on the results of the previous round. Instructions for each round were included with that rounds questionnaire link. Each questionnaire was submitted to each expert panel member via individual e-mail that included a link to the questionnaire and a unique log on code. Each expert panel member was given an opportunity to comment on the results of the previous round, but was reminded that changes to responses or additional comments would only be included in the results. Log on procedures used in Round 1 were followed for Rounds 2 and 3 to assure confidentiality.

For each primary question in Round 2 and 3 where the expert panel members were asked to rate their responses, there was a set of secondary questions where the expert panel members were asked to rate their responses to the primary question based on desirability and feasibility in Round 2, and importance and confidence in Round 3 (Linstone & Turoff, 1975). Each expert panel member was given a fixed amount of time to respond to each questionnaire which did not exceed 3 weeks from the time the questionnaire was sent. Expert panel members that did not respond in the required period

could be removed from the panel. At least two attempts were made by me to contact non-respondents before they were removed. Valid explanations for late responses or non-responses were duly considered. Answers to the questionnaires that were deemed incomplete by me were addressed in a follow up communication between me and the expert panel member before evaluating the data. Once any issues were resolved, the data collection process for that round was complete. Data from each round, including expert panel member comments, were entered into an appropriate computer aided qualitative data analysis system (CAQDAS). The total time between rounds did not exceed 6 weeks, and time between the last round feedback report and distribution of a final report did not exceed 6 weeks.

Data Analysis Plan

Data Analysis was an ongoing process starting with the results of the first round. Major themes were determined a priori for Round 1 based on the literature reviews. Major themes were selected that supported the research question (Vaismoradi, Turunen, & Bondas, 2013). Codes for major themes were created a priori using an open coding approach (Vaismoradi et al., 2013). From the Round 1 data, additional subthemes and codes were developed. Codes for subthemes were developed using open coding or axial coding techniques (Vaismoradi et al., 2013). All data from Round 1 was nominal, and word count and interpretation of the responses using traditional text analysis was the primary statistical approach (Bright & O'Connor, 2007). For Rounds 2 and 3, all rated data was ordinal. In addition to the primary questions that resulted from Round 1, there were two additional rated questions in Round 2 and 3. Additional rated questions for

Round 2 were based on desirability and feasibility of the primary question, and for Round 3 were based on importance of the primary question and confidence of response to the primary question (Linstone & Turoff, 1975).

Round 2 and 3 were focused on consensus. Consensus for Rounds 2 and 3 were reached when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses to the primary question (Asselin & Harper, 2014). Primary questions that met the definition of consensus for Round 2 were moved forward to Round 3. Primary questions that met the definition of consensus for Round 3 were moved to the final results section because completion of Round 3 was the end point of this study. To mitigate the risk of not moving a primary question forward because of a tendency to select option 3 (neither agree or disagree), a median score of ≥3.5 (a tendency towards consensus) was kept as an optional second test of consensus (Ju & Jin, 2013). The same definitions of consensus were applied to secondary questions in Rounds 2 and 3, but consensus regarding secondary questions was only recorded and not used to determine if a primary question moved forward.

Issues of Trustworthiness

This study used a qualitative method and a modified three-round Delphi design. Several studies have focused on rigor through the lens of the *methodological trinity of reliability, trustworthiness, and validity* (Hasson & Keeney, 2011; Rowe & Wright, 2011). However, according to other studies, the implication of blending reliability, trustworthiness, and validity is that there is also a blending of quantitative and qualitative

paradigms. Per Wakefield and Watson (2014) for example, validity and reliability are characteristic of quantitative research while credibility and trustworthiness are characteristic of qualitative research. This differentiation was supported by other researchers (Asselin & Harper, 2014). Ju and Jin (2013) argued that when using a Delphi design, rigor is the umbrella under which all definitions fit, regardless of whether a study is qualitative or quantitative; while Diamond et al. (2014) claimed there is so much variation in the settings in which a Delphi design can be applied that there is no definition of validity, and that the best a researcher can hope for is to establish credibility by clearly defining how rigor was established. These differences in opinion may explain why in addition to discussions of reliability, trustworthiness, credibility, and validity; there are studies that also employed terms such as transferability (Rowe & Wright, 2011), and confirmability and dependability (Green, 2013) without specifying whether the research was qualitative or quantitative. Rounds 1 through 3 of this study did not extend beyond collecting ordinal date, which qualified this study as qualitative research (Elo, Kääriäinen, Kanste, Pölkki, Utriainen & Kyngäs, 2014; Houghton, Casey, Shaw, & Murphy, 2013). The same researchers suggested trustworthiness is the defining feature of qualitative research under which fall all other terms such as credibility, dependability, conformability, confirmability, transferability, and authenticity. From a Delphi design perspective, trustworthiness is a function of rigor, and lack of rigor continues to be a major criticism of Delphi designs (Gallego & Bueno, 2014; von der Gracht, 2012; Hasson & Keeney, 2011; Meijering, Kampen, & Tobi, 2013; Paré et al., 2013).

Credibility

Common strategies for establishing rigor under the definition of credibility include prolonged engagement and observation, triangulation, peer debriefing, and member checking (Houghton et al., 2013). This study employed three rounds of engagement with the expert panel members that included controlled feedback or member checking between rounds. The entire process took approximately 4 to 6 months once data collection began, which included communication on a regular basis. I submit this regular communication and the length of the study supported the concept of prolonged engagement and observation. Triangulation was addressed through a combination of literature review, committee involvement, and feedback from the expert panel members (Laick, 2012). Peer debriefing was an ongoing process with my doctoral committee. Member checking was a built-in feature of this Delphi design from the perspective of providing feedback and allowing expert panel members to comment on their own input (von der Gracht, 2012). Although no changes resulted from member checking, a clear audit trail was still proved to support claims of rigor (Paré et al., 2013).

Transferability

Transferability as noted by Green (2013) and Gallego and Bueno (2014) can be a strength and a weakness of a Delphi design, and is typically a function of study uniqueness. In the medical profession for example, transferability can be relatively high because of similarities in operations. Ju and Jin (2013) suggested transferability was enhanced when there were clusters of similar studies looking at similar situations. While studies regarding standards development are not new (Behr & Diaz, 2014; Brunsson et

al., 2012; Ernst, 2013; Hopper, 2013), this study's focus on accredited U.S.-based industrial SDO and unaccredited SDO leadership challenges may be unique enough to limit transferability. A detailed account of events along with an a priori establishment of methodology, a specific focus on establishment of rigor, and the use of triangulation were used to improve transferability (Gallego & Bueno, 2014; Rowe & Wright, 2011), but I submit transferability was a potential limitation of this study.

Dependability

Dependability has been defined as the "stability of data over time and under different conditions" (Elo et al., 2014, p. 4). Houghton et al. (2013) suggested that a robust audit trail combined with reflexivity can enhance dependability. The robust audit trail began with detailed descriptions of panel selection criteria and a priori definitions of how rigor would be addressed. Several researchers suggested that a priori definitions of consensus and under what circumstances the study would be terminated can support rigor, and therefore dependability (Kalian & Kasim, 2012; Meijering et al., 2013). Throughout the process, I maintained a robust audit trail. The feedback process between rounds aided in establishing the audit trail. Reflexivity was addressed by clearly disclosing my involvement with SDOs and SDO processes, along with my personal biases. As suggested by Houghton et al. (2013), the researcher is part of the research process and demonstrating the researcher's ability to be self-aware can enhance perceptions of dependability. Demonstrating self-awareness was accomplished by recording my rationale for decision making and personal challenges faced by me during

the study. My primary goal was to demonstrate transparency with regard to my involvement in the entire process.

Confirmability

Confirmability often refers to neutrality of the researcher and the accuracy of the data (Houghton et al., 2013). Some researchers have also suggested that confirmability and dependability are closely related and that the processes for ensuring confirmability and dependability are similar (Houghton et al., 2013). A robust audit trail was essential for supporting accuracy of the data, including a detailed description of the qualifications of all the selected expert panel members. Another important consideration I addressed was the potential for ulterior motives on the part of the expert panel members. Birko et al. (2015) suggested that consideration must be given to who panel members may be beholding too, and emphasized how assurances of confidentiality can reduce beholding biases. Regarding neutrality of the researcher, Elo et al. (2014) suggested it is impossible for the researcher to be totally neutral, and the best way to support confirmability is to make sure the researchers interest in the study (including biases) are clearly stated. My interest and biases were presented to the expert panel members before and during the study.

Ethical Procedures

Throughout this study, I adhered to the ethical guidelines as approved by IRB (approval number 06-10-17-0159246). The ethical guidelines included:

- Participant recruitment
- Participant selection

- Data collection
- Privacy and security
- Data storage
- Sharing results
- Addressing risks
- Conflicts of interest
- Participant exclusion
- Estimated time commitment
- Informed consent

Greater detail can be found in Appendixes A – H.

The pool from which I selected my panel of SMEs are legally considered nonprofits. One way to support ethical procedures was to only select panel members who were volunteer members of accredited SDOs and not paid SDO employees. There were two potential advantages to this approach. The first potential advantage was that none of the panel members would be at financial risk should their involvement become known to paid members. The second potential advantage was that I would not need to get a letter of cooperation from selected SDOs because all I was asking of the SDOs was to send my invitation to their members. There was the potential disadvantage that an expert panel members' involvement might become known to their employer, but these issues were brought to potential expert panel members' attention during the initial direct contact phase, along with steps I proposed to limit exposure. I did not expect the potential for employee discovery to be a significant concern for potential expert panel members, and

none of the expert panel members expressed concern. There was always the risk that an expert panel member might become concerned about employer discovery during the study, which could contribute to dropout. Through experience, I have learned that what an expert panel member may say in private versus what they would tell their employer can be very different. Assurances of confidentiality (privacy and security) were provided throughout the study to allay any expert panel members' concerns regarding employer discovery.

An ethical concern I did and still do have is how the results of the study may affect SDO nonprofit status. The primary research question asks what desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. Part of what I hope is a partial answer to the research question is how leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDO will deal with the hybrid nature of SDOs (blending nonprofit and forprofit activities). I believed the best way to assure these legally incorporated nonprofits that my study posed no external threat was to point out that, in addition to preserving expert panel members confidentiality, the final report would be distributed only to expert panel members, and if approved by all exert panel members, relevant stakeholders. Names of the SDOs would also be stored so as to assure confidentiality not only of the expert panel members, but of the SDOs as well. As part of the initial panel selection process, I included a statement that the expert panel members should not share their involvement or the results with anyone. Since responses from expert panel members were be coded and kept completely

confidential by me, there should be no way for paid members of the SDOs to know who panel members were and what a particular panel member contributed to the study unless an expert panel member decided to make that information known. I also established and made known how data would be archived, and that records would only be kept for a predetermined amount of time. At the end of this time (five years currently), all physical and electronic records would be destroyed. SDOs and expert panel members did not express concerns regarding threats to nonprofit status.

In the informed consent form, each expert panel member was also informed of their ability to withdraw at any time and should they chose to withdraw, any records of their involvement would be securely stored until destroyed. While I expected drop out to be primarily a function of a members' inability to commit to the full study, there could have been other reasons. Again, each expert panel member was informed of their right to drop out at any time regardless of the reason. Expert panel members were also informed that non-response to questionnaires within the allotted period could be grounds for elimination from the panel.

A final ethical concern was that expert panel members might become known to each other through third party means. Sobaih et al. (2012) suggested this is generally only a concern when the pool from which experts is drawn is so small that maintaining confidentiality is virtually impossible. This concern was addressed during the initial contact with potential expert panel members, and that part of the selection process included such considerations. Potential expert panel members that, for example, worked

for the same company at the same location, were not considered appropriate choices for inclusion.

Summary

In Chapter 3, I started with a restatement of the research question. I then addressed the phenomenon of interest and central concepts, along with the research method and design, and rationale for the research method and design. This section included comparisons with other research methods and why the specific design was selected. The next section addressed the role of the researcher. Attention was paid to explaining how claims of rigor would be supported. Following the section on the role of the researcher, I described the methodology. The next section focused on participant selection rationale, the pool from which expert panel members would be selected, and participant qualifications. I then addressed the data collection instrument and how each section of the instrument would be constructed and vetted so that each section of the instrument would support the research question. Since the instrument was composed of three sections (three separate questionnaires), I also discussed how the feedback process worked. The next section addressed specifics of the data analysis plan, which included themes, subthemes, coding, and data analysis. I then addressed issues of trustworthiness, transferability, dependability, and confirmability. I finished Chapter 3 with a review of ethical procedures. Chapter 4 will cover the actual study, how data was collected and analyzed, how each round built upon the previous round(s), approaches to data analysis, and any changes to the approaches outlined in Chapter 3.

Chapter 4: Results

Purpose of the Study

Industrial voluntary consensus standards development was originally a relatively informal process on the part of the scientific community to establish common practices. Today the use of industrial standards has expanded greatly and tends to affect all aspects of life (Timmermans & Epstein, 2010). However, the legitimacy of industrial standard development organizations (SDOs) in the United States and the industrial voluntary consensus standards they develop are being threatened by contentious political and economic processes driven by an increase in the number of unaccredited industrial SDOs (Botzem & Dobusch, 2012). The Delphi design was appropriate based on the need for significant stakeholders to develop more collaborative practices in the United States and for reducing industrial voluntary consensus development conflicts and maintaining the legitimacy of the U.S. industrial voluntary consensus development process (Allen & Ramanna, 2013; Fransen, 2011). Focusing on the need for more collaborative practices, the following research question guided this qualitative Delphi study: What is the level of consensus among a panel of subject matter experts (SMEs) regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial SDOs and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests? This chapter provides information on the research setting, participant demographics, data collection, data analysis, and study results.

Field Test of Round 1 Questionnaire

The six questions ultimately submitted to the expert panel members in Round 1 were field tested and modified from the original list of questions shown in Table 1. Modifications included the following:

1. Shortening some questions to improve consistency regarding interpretation and reduce fatigue. The rationale was that shortening the questions would reduce the chances of expert panel members having different interpretations of the questions. Shortening the questions could also decrease expert panel member fatigue, resulting in a decrease in dropout rate and a tendency towards central response.
2. Reducing the description of accredited and unaccredited SDOs to simple acronyms. The rationale was that the descriptions of accredited and unaccredited SDOs was too long to be used repetitively without causing unnecessary fatigue. A suggestion was made to use ASDOs as the acronym for accredited U.S.-based industrial standard development organizations and UASDOs as the acronym for unaccredited industrial standard development organizations.

The revised Round 1 questions are listed in Appendix I.

Research Setting

The research setting was industrial voluntary consensus SDOs in the United States, with data collection occurring by electronic means. Selected SMEs (hereafter referred to as experts) were given a list of requirements by electronic means that would qualify them as expert panel members and as viable candidates to participate in this study. Expert panel members were also provided by electronic means with an outline of

the study and an informed consent form. Aside from statements provided by participants that they did qualify as expert panel members and agreed to participate in the study, no other personal demographic information was requested. The instruments used in this study did not ask expert panel members to divulge personal or organizational information. At the time of the study, and based on the electronic nature of data collection and data sharing, I was not able to observe directly any personal or organizational conditions. Consequently, I had no knowledge of any personal or organizational conditions on the part of expert panel members that may have influenced their responses or my interpretation of the data.

Demographics

Each expert panel member in this study claimed to possess the following characteristics: (a) familiarity with the technical jargon used in the world of industrial voluntary consensus standards, (b) could describe cases that illustrate good versus poor decisions regarding the development of industrial voluntary consensus standards, (c) could communicate effectively in the spoken and written U.S. English language, (d) were currently active with an accredited industrial SDO on a voluntary basis and had at least 5 years continuous involvement with developing industrial voluntary consensus standards, and (e) had been employed with or worked with organizations or industries that used industrial voluntary consensus standards. These five characteristics represented expert panel member eligibility criteria. No additional personal demographic was required, and each expert panel member acknowledged meeting these eligibility criteria.

Recruitment

My original plan for identifying expert panel members involved contacting selected accredited U.S.-based industrial SDOs and asking them to forward my request for expert panel members to their volunteer members. My rationale was based on contacting the International Society of Automation (ISA) and the American Society of Mechanical Engineers (ASME) membership departments prior to completing Chapter 3. The response from these two accredited U.S.-based industrial SDOs was very positive. The secondary plan was to contact potential expert panel members directly using contact lists I had developed over many years. After receiving IRB approval, I approached the International Society of Automation and the American Society of Mechanical Engineers before contacting other accredited U.S.-based industrial SDOs. At least 6 months had passed since my initial contact and I reminded each organization of our original conversation. This time, both organizations declined to forward my request for expert panel members to their volunteer members. In both cases, I was told that sending a request that was not directly related to accredited SDO business was not appropriate. Rather than pursue this original plan, I decided to switch to my secondary plan that involved contacting potential expert panel members directly. Contacting potential expert panel members directly worked well in that responses were timely and allowed for greater control over diversity of expert panel members. Although I had identified 200 individuals I could contact directly, I decided not to do a group invitation of all 200 and instead identified 20 individuals who represented a broad spectrum of experience. Of the 20 individuals contacted, two did not respond, three declined, and 15 agreed to participate

in this study. Recruitment began on June 28, 2017 and was complete by July 13, 2017.

Data Collection

This qualitative modified Delphi study was built around three rounds of questionnaires with each round questionnaire being sent sequentially. Each questionnaire was created using SurveyGizmo. For each round, expert panel members were provided with a unique link to the questionnaire. I had originally envisioned assigning each expert panel member with a unique log on code to gain access to the questionnaires. However, during the Round 1 questionnaire creation phase, both SurveyGizmo and my information technology person convinced me that creating a unique link to each round for each expert panel member was an easier approach and would still result in the same level of security and confidentiality. The results from each questionnaire were downloaded to my personal password protected computer and analyzed by me. This protocol was followed for each of the three rounds.

Round 1 Data Collection

The Round 1 questionnaire was comprised of six primary questions and an optional seventh question (See Appendix I). All questions were open-ended, and the resulting data were nominal. The six primary questions were developed based on themes that emerged from the literature review. The six themes included competition, deregulation, oversight, organizational structure, leadership training, and market-driven. The seventh question allowed expert panel members to provide additional comments if they felt the need. The Round 1 questionnaire instructions asked each panel member to provide at least three but no more than five suggestions/comments/opinions for the six

primary questions and stated question seven was optional. None of the questions were mandatory (the questionnaire would let the expert panel members leave a question blank of they so desired). No limits were placed on the length of an expert panel members' response.

Each expert panel member was given 3 weeks to complete the questionnaire. The Round 1 questionnaire was sent to each expert panel member on July 14, 2017. On July 30, 2017, a first reminder was sent to panel members who had not completed the questionnaire. On August 3, 2017, a second reminder was sent to expert panel members who had not completed the questionnaire. The questionnaire was closed on August 7, 2017.

During Week 1, several expert panel members commented that the questionnaire link was slow and timed out. Potential problems of this nature were verified by SurveyGizmo, but SurveyGizmo anticipated this being a "short term" problem (3-5 days maximum). In the interest of not frustrating the expert panel members, I sent a word-version of the Round 1 questionnaire to each expert panel member on July 18, 2017 and gave them the option of completing the questionnaire in word. One expert panel member did use the word document and emailed me the document upon completion. The word document was downloaded to my personal computer and the data was analyzed by me along with the data obtain via SurveyGizmo.

Of the 15 expert panel members who were sent a questionnaire link, 14 responded. Of the 14 responses, 11 were complete and three were partially complete. The number of responses and response rate were sufficient to meet minimum

requirements and support claims of rigor (Asselin & Harper, 2014; Birko et al., 2015; Cafiso et al., 2013). I did speak with the non-responding expert panel member by phone after the close of the Round 1 questionnaire. They explained they were too busy, but expressed a desire to continue as an expert panel member. I felt their continued participation was valuable and they were not removed from the study. Three expert panel members who had responded to the Round 1 questionnaire asked to be removed from the study after Round 1 was complete. Their requests were honored and noted in an e-mail sent to each of the three expert panel members acknowledging and accepting their request to be removed. This e-mail was sent individually to all three expert panel members on August 24, 2017.

Round 2 Data Collection

In Chapter 3, the original plan was to ask expert panel members to rate each question in Round 2 on a five-point Likert-type scale. Questions that met the definition of consensus would be passed to Round 3. Expert panel members would also be asked to rate each Round 2 question based on desirability and feasibility separately although consensus regarding desirability and feasibility would not be used as a basis for moving a question to Round 3. Since asking the expert panel members to rate the questions based on desirability and feasibility would not impact which questions move to Round 3, I decided to eliminate the request that expert panel members also rate the questions based on desirability and feasibility.

The Round 2 questionnaire was comprised of 54 questions developed on the basis of the Round 1 answers (See Appendix J). Each question was closed-ended and expert

panel members were asked to rate their responses on a five-point Likert-type scale. All data resulting from rating questions was ordinal. Each of the 54 questions included a section for comments. All data resulting from comments was nominal. None of the rating requests or the comment requests were mandatory (the questionnaire would let the expert panel members leave a rating or comment blank if they so desired).

Expert panel members were given 3 weeks to complete the questionnaire. The Round 2 questionnaire was sent to each expert panel member on August 22, 2017. On August 31, 2017, a first reminder was sent to panel members who had not completed the questionnaire. On September 6, 2017, a second reminder was sent to expert panel members who had not completed the questionnaire. The questionnaire was closed on September 9, 2017.

Of the remaining 12 expert panel members who were sent a questionnaire link, 11 responded. Of the 11 responses, all were complete based on the rating request. The number of responses and response rate were sufficient to meet minimum requirements and support claims of rigor (Asselin & Harper, 2014; Birko et al., 2015; Cafiso et al., 2013). Not responding to one or more optional comments sections was not counted towards the questionnaire being complete. I did speak with the non-responding expert panel member by phone after the close of the Round 2 questionnaire. They explained they were too busy, but expressed a desire to continue as an expert panel member. I felt their continued participation was valuable and they were not removed from the study. None of the responding expert panel members asked to be removed from the study.

Round 3 Data Collection

In Chapter 3, the original plan was to ask expert panel member to rate each question on a five-point Likert-type scale. Question ratings that met the definition of consensus would be passed to the final results. Expert panel members would also be asked to rate each Round 3 question based on importance and confidence separately although consensus regarding importance and confidence would not be used as a basis for moving a question to the final results. Since the research question focused on the desirability and feasibility of future-oriented actions, and since Round 3 terminated the questionnaires for this study, I decided to ask the expert panel member to only rate each question based on desirability and feasibility (two ratings for each question).

The Round 3 questionnaire (See Appendix K) was comprised of the 31 questions from Round 2 that met the definition of consensus from the original 54 questions. Each question was closed-ended and expert panel members were asked to rate their responses on a five-point Likert-type scale regarding desirability and feasibility. Desirability and feasibility were separate questions. All data resulting from rating questions was ordinal. Each of the 31 questions included a section for comments. All data resulting from comments was nominal. I made rating each question regarding desirability and feasibility mandatory. My rationale was that during the creation and testing of the Round 3 questionnaire by me, I found it was easy to miss a response and once the questionnaire was submitted, there was no way to go back and fill in ratings that had been missed. I surmised the issue was in Round 3, two rating responses (desirability and feasibility) on a five-point Likert-type scale were being sought for each question, making it easier to

unintentionally miss a response. Each expert panel member was notified of my decision and rationale for making rating responses mandatory and told to select the neutral response if they did not wish to answer all or part of a question regarding desirability and feasibility. There were no objections. Providing comments remained optional (the questionnaire would let the expert panel members leave a comment blank if they so desired).

Each expert panel member was given 3 weeks to complete the questionnaire. The Round 3 questionnaire was sent to each expert panel member on September 21, 2017. On October 5, 2017, a first reminder was sent to panel members who had not completed the questionnaire. On October 10, 2017, a second reminder was sent to expert panel members who had not completed the questionnaire. The questionnaire was supposed to be closed on October 13, 2017, but I was out of town and the questionnaire was closed on October 16, 2017.

Of the 12 expert panel members who were sent a questionnaire link, 11 responded. Of the 11 responses, all were complete based on the rating request. The number of responses and response rate were sufficient to meet minimum requirements and support claims of rigor (Asselin & Harper, 2014; Birko et al., 2015; Cafiso et al., 2013). Not responding to one or more optional comments sections was not counted towards the questionnaire being complete.

Data Analysis

This qualitative modified Delphi study was comprised of three separate questionnaires administered over a 4-month period. This was an iterative process where

data analysis built on the results of the previous round. Data was nominal in Round 1. In Rounds 2 and 3, rating data used to determine consensus was ordinal. Any data based on comments in Rounds 2 and 3 was nominal and only used to support interpretations of ordinal data. The following sections explain how data was analyzed.

Round 1 started with open-ended questions (See Appendix I) that were derived from the literature review and fit under one of six themes developed from the literature review. Expert panel member were asked to comment on questions, and those responses were used to create closed-ended questions for Round 2. In Round 2, expert panel members were asked to rate each question on a five-point Likert-type scale, and provide additional comments as appropriate. Questions whose ratings met a predetermined definition of consensus passed on to Round 3. Consensus was defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. In Round 3, expert panel members were asked to rate each question on a five-point Likert-type scale regarding desirability and feasibility separately, and provide additional comments as appropriate. Questions whose ratings for both desirability and feasibility met the same definition of consensus used in Round 2 passed to the final results. The following sections describe the processes used to move inductively from the initial themes used for Round 1 to subthemes, and how subthemes were used to create questions that appeared in Rounds 2 and 3.

Round 1 Data Analysis

All data from Round 1 was nominal. From the responses to the Round 1 questionnaire, I looked for concepts either shared or stand alone. I then generated a list of potential subthemes under each main theme using traditional text analysis (Bright & O'Connor, 2007). Subthemes were based on my interpretation of comments made by the expert panel members and the frequency of concepts. From these subthemes, I then created over 300 initial closed-ended questions. Many of the 300 initial questions were redundant by design as I experimented with a consistent way to present questions. I then reduced the over 300 closed-ended questions to 54 closed-ended questions.

Round 2 Data Analysis

The data resulting from Round 2 that determined if a question moved to Round 3 was ordinal. Expert panel members were asked to rate each of the questions based on a five-point Likert-type scale. Questions whose ratings met the definition of consensus were passed to Round 3. Consensus was defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. There was also an option for each question where the respondent could enter a comment. Comment data was nominal. Comment data was only used to support interpretation of ordinal data.

Round 3 Data Analysis

The data resulting from Round 3 that determined if a question moved to the final results was ordinal. Expert panel members were asked to rate each of the questions based on desirability and feasibility. Desirability and feasibility were separate questions for

each of primary questions (two ratings for each primary question). Questions whose desirability and feasibility ratings both met the definition of consensus were passed to the final results. Consensus was defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. There was also an option for each question where the respondent could enter a comment. Comment data was nominal. Comment data was only used to support interpretation of ordinal data.

Evidence of Trustworthiness

Credibility

The strategy I used throughout this study was constant communication. During the data collection phase, I was in contact with each panel member at least three times via e-mail during each round. The first contact was to present the round instructions and provide a link to each round questionnaire. The second contact was to remind expert panel members about completing the study if they had not already. This second contact generally occurred twice during the third week of data collection. The third contact was to close each round questionnaire. During each contact, expert panel members were encouraged to ask questions. In some cases, I spoke with expert panel members either by phone are face-to-face. I submit that this approach to interacting with expert panels members satisfied prolonged engagement and observation requirements. Questionnaire questions were based on the literature review, my own personal understanding of how standards development works, input from the expert panel members, and input from my chair. I submit that this approach to organizing the study met triangulation requirements.

In between data collection phases, I was in contact with the expert panel members at least twice to advise them of data analysis progress and when they could expect a full report of the particular round, and again with a recap of the preceding round. Contact in between data collection period also gave expert panel members an opportunity to comment, and gave me the opportunity to question any responses. Each contact I made with expert panel members always included an invitation to contact me.

Transferability

Transferability as noted by Green (2013) and Gallego and Bueno (2014) can be a strength and a weakness of a Delphi design, and is typically a function of study uniqueness. I submit that this study was relatively unique for the following reasons. First, the study addressed the development of industrial voluntary consensus standards from a U.S. perspective and may not be applicable to voluntary consensus standards development processes outside of the United States. Second, the organizations focused on during this study represented U.S. SDOs and may not be representative of SDOs outside of the United States. The most transferable component of this study may be that understanding the scope and motivations of what are often competing organizations could be beneficial to other types of organizations and could also be beneficial across cultures. I mentioned in Chapter 3 that transferability could be a weakness of this study, and I still maintain that position.

Dependability

Dependability has been defined as the "stability of data over time and under different conditions" (Elo et al., 2014, p. 4). I submit that the stability of the data is high

if the current U.S. approach to deregulation is stable. Per Coates (2015) and Wijen (2014), deregulation is the primary reason for the rise in the number of unaccredited industrial SDOs in the United States and the primary reason the legitimacy of the industrial voluntary consensus standards process in the United States is under threat. As long as the deregulation landscape in the United States remains stable, then the data should remain stable. Should the deregulation landscape in the United States change over time, then the stability of data over time may suffer.

Houghton et al. (2013) also stated the researcher is part of the research process and demonstrating the researcher's ability to be self-aware can enhance perceptions of dependability. I tried to be transparent to all expert panel members regarding my own involvement with industrial voluntary consensus standards development and biases that existed prior to and during this study. The reader is left to determine how well I addressed transparency.

One note of importance was that several expert panel members felt the questions in Round 1 may be leading. I shared these concerns with all my expert panel members after the concerns were voiced and explained the Round 1 questions were based on themes derived from the literature review, not my own personal perspectives. There were no more apparent concerns.

Confirmability

Confirmability often refers to neutrality of the researcher and the accuracy of the data (Houghton et al., 2013). Regarding neutrality of the researcher, I do (as already stated) believe there is a problem to be researched. Based on my belief that there is a

problem, one could argue that I am not neutral in that I have effectively taken a stance. As I stated in the dependability section, I have tried to address the potential neutrality concern by being transparent.

What I submit is a larger concern regarding confirmability is accuracy of the data based on the number of expert panel members, the makeup of the expert panel, and the diversity of the expert panel members. The expert panel members were for the most part suppliers or consultants. Only two expert panel members were actual end users, and only one of these expert panel members who represented end users had experience with being a supplier. The end users tended to respond in ways similar to non-end users, but many statements that either demonstrated consensus or not only did so by a few percentage points. A different expert panel make up could have changed some of the outcomes. Similarly, I tried to select panel members I felt would provide honest answers. While I believe this goal was achieved, I cannot say with certainty that all results would have been the same had the panel been made up of a different group of expert panel members. Finally, although the size of this homogeneous panel of experts was determined to be acceptable for the purposes of claiming trustworthiness (Birko at al., 2015; Ju & Jim, 2013; Paré et al., 2013), a cannot say with certainty that a different panel size would not have produced different results.

Study Results

The six themes that emerged from the literature review included competition, deregulation, oversight, organizational structure, leadership training, and market-driven. Each theme was based on what researchers had determined were specific issues related to

the current conflict between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. The first six questions in the Round 1 questionnaire were based on these six themes and were designed to explore the overarching question of how collaborative practices could be improved between accredited U.S.-based industrial SDOs (ASDOs in the questionnaires) and unaccredited industrial SDOs (UASDOs in the questionnaires). A seventh open-ended question was presented that gave the expert panel members an opportunity to comment as they wished, and not be constrained by any particular theme. The responses that resulted from expert panel members formed the basis for the iterative process that culminated in the study findings.

Round 1

Expert panel members were asked to provide at least three but no more than five responses to each of the six questions that were based on literature deduced themes. Data provided in the seventh question was used be me to gain a deeper understanding of expert panel members' responses to the six theme based questions. The questionnaire was created using SurveyGizmo and the resulting data was entered into an Excel spreadsheet. In one case, data was collected from a word doc because the expert panel member was having issues with the online questionnaire, and then entered into the Excel spreadsheet. A partial set of responses from each expert panel member is shown in Appendix L. A document showing all responses is available upon request.

From the data collected in Round 1, subthemes were created that were used to create the 54 closed-ended questions that formed the Round 2 questionnaire. Some responses that informed the creation of subthemes are showed in Table 2.

Table 2

Sample of Round 1 Reponses

Themes	P Codes	Responses
Competition	P20	"ASDOs and UASDOs need to align on the intent and purpose of both types of organizations, and focus on benefits of the end user (consumer) of the products and services they provide to the relevant market. If they only focus on their own interests, without genuine collaboration, end users will suffers [*sic*] and industry progress will slow."
Competition	P8	"ASDOs should/could provide representation within applicable UASDOs for the purpose of cross-pollination and an-fact, adoption of best practices. The inverse should be in-place also. The goal is to provide the best consensus standards and then facilitate the conformity assessment systems needed to maintain their integrity."
Deregulation	P6	"Setting legal requirements for ASDOs and UASDOs to be recognized and legally referenced."
Deregulation	P8	"Deregulation should be tailored to intent and not letter so that improvements to industrial (or other) standards will continually be encouraged."
Oversight	P6	"Require referenced bodies to be peer-reviewed by non-members of the standard."
Oversight	P2	"Third party (non-governmental) oversight could sponsor collaborative efforts (i.e. joint conferences), at which representatives from the two types of standards groups could meet and discuss their concerns."
Organizational structure	P8	"As the collaborative links between ASDOs and UASDOs are strengthened, consideration should be given to either scheduled joint sessions, or at a minimum, invitations to leadership of opposite numbers to attend meetings."
Organizational structure	P6	"Review of collaboration by organizational leadership – regular evaluation of the status of collaboration can be added to committee agendas."

(table continues)

Themes	P Codes	Responses
Leadership training	P20	"Leadership training should be focused on the development of collaborative organizations."
Leadership training	P2	"Leverage internal ASDO and UASDO members to determine which internal members are trainers in their respective field(s) of expertise. The utilization of internal trainers would be more cost effective, and would likely be more well received by the other members."
Market-driven	P7	"Since these standards are beneficial to the industry, the industry should push bottom up to the ASDOs and the UASDOs. They should demand standards that will help the industry with safety, lowering operating costs and increasing profits."
Market-driven	P8	"Market reaction and acceptance is critical to the establishment of collaborative practices. The effort will be self-correcting in the sense that widespread industry adoptions based on collaborative ASDO-UASDO efforts are the ultimate report card."

A complete list of themes, theme codes, subthemes, subtheme codes, and frequencies created from the responses to the Round 1 questionnaire are shown in Table 3.

Table 3

Themes & Codes From Round 1 & Resulting Subthemes, Subtheme Codes, & Frequency

Themes	Theme codes	Subthemes	Subtheme codes	Frequency
Competition	101	• Regular and Formalized Communication	1011	5
		• Advanced Planning	1012	2
		• Alignment of intent and purpose/Assignment of Responsibilities	1013	17
		• Industry Expectations	1014	1
		• Liaisons Between Organizations	1015	5
		• Joint Meetings/Cross Training/Shared Information	1016	10
		• Industries/Trade Groups/Guidance	1017	4
		• Incentives	1018	7
		• Coordination of Activities	1019	6
Deregulation	102	• More Laws	1021	5
		• Less Laws	1022	6
		• State Laws	1023	1
		• Federal Laws	1024	6
		• Laws Do Not Matter (with regard to collaboration)	1025	8
		• Laws Do Matter (with regard to collaboration)	1026	15

(table continued)

Themes	Theme codes	Subthemes	Subtheme codes	Frequency
Oversight	103	• Consumer Based	1031	13
		• Government Based (note: most comments were negative)	1032	10
		• Mandatory	1033	6
		• Voluntary	1034	9
		• Active	1035	12
		• Passive	1036	5
		• External	1037	14
		• Internal	1038	2
		• Value	1039	13
Organizational structure	104	• Charters/Collaboration/Appreciation	1041	12
		• Size	1042	4
		• Form	1043	4
		• Sub-Committees	1044	4
		• Formalized Liaison Functions (charter)	1045	9
		• Political Differences (charter)	1046	8
		• Protocols	1047	5
		• Joint Reviews	1048	8
		• Shared Leadership	1049	1
Leadership training	105	• Voluntary	1051	2
		• Mandatory	1052	4
		• In Collaboration	1053	5
		• In Empowerment	1054	1
		• In Leading by Example	1055	2
		• In Servant-Leadership	1056	1
		• In Feedback	1057	2
		• In Emotional Intelligence	1058	1
		• Clarity of Function	1059	12
		• In Understanding Other	10510	7

(table continued)

Themes	Theme codes	Subthemes	Subtheme codes	Frequency
		Organizations		
		• Function of Standards	10511	4
		• Familiarity with Nonprofit Organizations	10512	2
		• Training at all Levels	10513	4
		• Joint Training	10514	4
Market-driven	106	• Consumer Needs	1061	4
		• Industry Needs	1062	9
		• SDO Needs	1063	6
		• Industries/Trade Groups/Guidance	1064	10
		• Fragmentation Issues	1065	5
		• Joint Activities/Meetings	1066	6
		• Market Forces (drivers)	1067	10
		• Reward Structures/Incentives	1068	10

Round 2

Subthemes generated from the results of Round 1 were then used to create 54 closed-ended questions that were presented to the expert panel members in Round 2. The 54 closed-ended questions are shown in Appendix J. Expert panel members were asked to rate each of the 54 closed-ended questions on a five-point Likert-type scale. A partial list of responses to the Round 2 questionnaire are showed in Appendix M. A document showing all responses is available upon request. Questions that demonstrated consensus with consensus being defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses were moved to the next round. Of the original 54

questions, a list of questions that met the definition of consensus along with the corresponding question number are shown in Table 4.

Table 4

Round 2 Questions That Resulted in Consensus

Question No. from Round 2	Questions	% Agree or strongly agree	Theme(s)
1	Regular communication between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	Competition
2	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by clarifying jointly to both ASDOs and UASDOs what industry expects of both groups.	100.0%	Competition
3	Collaboration between ASDOs and UASDOs could improve if both groups were incentivized to support each other's work.	72.8%	Competition
4	Having formal liaisons (reciprocal representation) between ASDOs and UASDOs could improve collaboration.	81.9%	Competition
5	Defining clear areas of responsibility could improve collaboration between ASDOs and UASDOs.	81.8%	Competition
6	Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDOs and UASDOs.	100.0%	Competition
7	Better coordination of meetings could improve collaboration between ASDOs and UASDOs.	100.0%	Competition
9	Collaboration between ASDOs and UASDOs could be improved by introducing regulations that promoted collaboration.	72.8%	Deregulation
17	Oversight could only improve collaboration between ASDOs and UASDOs if both organizations were willing to accept oversight.	90.9%	Oversight
21	Honoring ASDO and UASDO work in references, contracts, etc..., could improve collaboration between ASDOs and UASDOs without the need for oversight.	81.8%	Oversight

(table continued)

Question No. from Round 2	Questions	% Agree or strongly agree	Theme(s)
24	Oversight that encouraged collaboration with innovators could improve collaboration between ASDOs and UASDOs.	90.0%	Oversight
26	Flattening organizational structures (less hierarchical) could improve collaboration between ASDOs and UASDOs.	72.7%	Organizational structure
27	Collaboration between ASDOs and UASDOs could improve if ASDOs and UASDOs shared similar protocols.	81.8%	Organizational structure
28	Collaboration could improve between ASDOs and UASDOs if both types of organizations changed their charters to include a department whose function was to collaborate with other organizations.	100.0%	Organizational structure
29	Collaboration between ASDOs and UASDOs could improve if both types of organizations changed subcommittee mandates to include a specific venue to present findings.	72.7%	Organizational structure
30	Charters that included specifics for working with other organizations could improve collaboration between ASDOs and UASDOs.	81.8%	Organizational structure
31	Shared leadership could improve collaboration between ASDOs and UASDOs.	72.7%	Organizational structure
32	Joint reviews of collaborative efforts between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	90.9%	Organizational structure
35	Leaders trained in the concept of "leading by example" could improve collaboration between ASDOs and UASDOs.	72.7%	Leadership training
38	Collaborative leadership training could improve collaboration between ASDOs and UASDOs.	72.7%	Leadership training
42	Leadership training that included a focus on understanding the scopes and goals of similar ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	81.8%	Leadership training
43	Mandatory training of new members at all levels could improve collaboration between ASDOs and UASDOs.	72.8%	Leadership training
45	Increased training for leaders on the benefits of standards	90.9%	Leadership

(table continued)

Question No. from Round 2	Questions	% Agree or strongly agree	Theme(s)
	to both society and business, with a focus on similarities of ASDOs and UASDOs, could improve collaboration between ASDOs and UASDOs.		training
46	Joint leadership cooperation training between ASDOs and UASDOs in the form of workshops could improve collaboration between ASDOs and UASDOs.	80.0%	Leadership training
47	Including relevant Industries and Trade Groups in a more broad discussion with ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	Market-driven
49	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if such groups made collaboration beneficial to both types of organizations.	90.9%	Market-driven
50	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they promoted both types of organizations.	100.0%	Market-driven
51	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they encouraged joint participation at trade shows and other venues.	72.8%	Market-driven
52	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by publishing the benefits of both organizations types of work.	100.0%	Market-driven
53	Collaboration could improve between ASDOs and UASDOs if both types of organizations agreed upon joint and/or shared articles of legitimacy.	72.7%	Market-driven
54	Collaboration between ASDOs and UASDOs could improve if ASDOs were more inclined to accept input from UASDOs and use this input to establish priorities.	81.8%	Market-driven

Note. Consensus Definition = "Agree" & "Strongly Agree" are ≥70% of Responses

Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) UASDOs (Unaccredited Industrial Standard Development Organizations)

Thirty-one of the 54 questions in Round 2 met the definition of consensus and were moved to Round 3.

Round 3

In Round 3, the expert panel members were asked to rate each question on a five-point Likert-type scale based on desirability and feasibility. Desirability and feasibility were separate ratings. A partial set of responses from each expert panel member is shown in Appendix N. A document showing all responses is available upon request. None of the statements that demonstrated consensus with regard to feasibility failed to demonstrate consensus with regard to desirability. Consensus was defined as when the frequency of responses for options 4 and 5 (agree and strongly agree) on a five-point Likert-type scale accounted for ≥70% or more of the expert panel members' responses. A list of questions that met the definition of consensus regarding desirability regardless of whether or not they met the definition of consensus regarding feasibility are shown in Table 5. The question numbers were carried over from the Round 2 questions.

Table 5

Round 3 Questions That Resulted in Consensus Based on "Desirability" Only

Question No. from Round 3	Questions	Desirability (% agree or strongly agree)	Feasibility (% agree or strongly agree)	Themes
1	Regular communication between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	72.7%	Competition
2	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by clarifying jointly to both ASDOs and UASDOs what industry expects of both groups.	100.0%	90.9%	Competition
3	Collaboration between ASDOs and UASDOs could improve if both groups were incentivized to support each other's	91.0%	63.6%	Competition

(table continued)

Question No. from Round 3	Questions	Desirability (% agree or strongly agree)	Feasibility (% agree or strongly agree)	Themes
	work.			
4	Having formal liaisons (reciprocal representation) between ASDOs and UASDOs could improve collaboration.	81.8%	100.0%	Competition
5	Defining clear areas of responsibility could improve collaboration between ASDOs and UASDOs.	91.0%	81.8%	Competition
6	Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDOs and UASDOs.	100.0%	90.9%	Competition
7	Better coordination of meetings could improve collaboration between ASDOs and UASDOs.	100.0%	90.9%	Competition
21	Honoring ASDO and UASDO work in references, contracts, etc..., could improve collaboration between ASDOs and UASDOs without the need for oversight.	81.8%	72.7%	Oversight
24	Oversight that encouraged collaboration with innovators could improve collaboration between ASDOs and UASDOs.	81.8%	63.6%	Oversight
27	Collaboration between ASDOs and UASDOs could improve if ASDOs and UASDOs shared similar protocols.	72.7%	45.5%	Organizational Structure
28	Collaboration could improve between ASDOs and UASDOs if both types of organizations changed their charters to include a department whose function was to collaborate with other organizations.	81.8%	54.6%	Organizational Structure

(table continued)

Question No. from Round 3	Questions	Desirability (% agree or strongly agree)	Feasibility (% agree or strongly agree)	Themes
29	Collaboration between ASDOs and UASDOs could improve if both types of organizations changed subcommittee mandates to include a specific venue to present findings.	72.7%	54.6%	Organizational Structure
30	Charters that included specifics for working with other organizations could improve collaboration between ASDOs and UASDOs.	81.8%	63.6%	Organizational Structure
32	Joint reviews of collaborative efforts between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	63.6%	Organizational Structure
35	Leaders trained in the concept of "leading by example" could improve collaboration between ASDOs and UASDOs.	90.9%	54.6%	Leadership Training
38	Collaborative leadership training could improve collaboration between ASDOs and UASDOs.	81.9%	81.8%	Leadership Training
42	Leadership training that included a focus on understanding the scopes and goals of similar ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	81.9%	63.6%	Leadership Training
43	Mandatory training of new members at all levels could improve collaboration between ASDOs and UASDOs.	90.9%	45.5%	Leadership Training
45	Increased training for leaders on the benefits of standards to both society and business, with a focus on similarities of ASDOs and UASDOs, could improve collaboration between ASDOs and UASDOs.	100.0%	54.6%	Leadership Training

(table continued)

Question No. from Round 3	Questions	Desirability (% agree or strongly agree)	Feasibility (% agree or strongly agree)	Themes
46	Joint leadership cooperation training between ASDOs and UASDOs in the form of workshops could improve collaboration between ASDOs and UASDOs.	72.8%	36.4%	Leadership Training
47	Including relevant Industries and Trade Groups in a more broad discussion with ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	72.7%	Market-driven
49	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if such groups made collaboration beneficial to both types of organizations.	100.0%	81.8%	Market-driven
50	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they promoted both types of organizations.	100.0%	90.9%	Market-driven
51	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they encouraged joint participation at trade shows and other venues.	91.0%	54.5%	Market-driven
52	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by publishing the benefits of both organizations types of work.	100.0%	72.7%	Market-driven
53	Collaboration could improve between ASDOs and UASDOs if both types of organizations agreed upon joint and/or shared articles of legitimacy.	72.8%	45.5%	Market-driven
54	Collaboration between ASDOs and UASDOs could improve if ASDOs were more inclined to accept input from UASDOs and use this input to establish priorities.	90.9%	54.5%	Market-driven

Note. Consensus Definition = "Agree" & "Strongly Agree" are ≥70% of Responses

Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)

UASDOs (Unaccredited Industrial Standard Development Organizations)

Twenty-seven questions met the definition of consensus for desirability. As already mentioned, none of the questions that met the definition of consensus for feasibility failed the definition of consensus for desirability. For this reason, I believe Table 5 is important because it demonstrates that questions that were deemed desirable based on consensus were not always considered feasible based on the same definition of consensus. A list of questions that met both the definition of consensus for both desirability and feasibility are shown in Table 6. The question numbers were carried over from the Round 2 questions.

Table 6

Round 3 Questions That Resulted in Consensus Based on "Desirability" & "Feasibility"

Question No. From Round 3	Questions	Desirability (% Agree or Strongly Agree)	Feasibility (% Agree or Strongly Agree)	Themes
1	Regular communication between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	72.7%	Competition
2	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by clarifying jointly to both ASDOs and UASDOs what industry expects of both groups.	100.0%	90.9%	Competition
4	Having formal liaisons (reciprocal representation) between ASDOs and UASDOs could improve collaboration.	81.8%	100.0%	Competition
5	Defining clear areas of responsibility could improve collaboration between ASDOs and UASDOs.	91.0%	81.8%	Competition

(table continued)

Question No. From Round 3	Questions	Desirability (% Agree or Strongly Agree)	Feasibility (% Agree or Strongly Agree)	Themes
6	Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDOs and UASDOs.	100.0%	90.9%	Competition
7	Better coordination of meetings could improve collaboration between ASDOs and UASDOs.	100.0%	90.9%	Competition
21	Honoring ASDO and UASDO work in references, contracts, etc..., could improve collaboration between ASDOs and UASDOs without the need for oversight.	81.8%	72.7%	Oversight
38	Collaborative leadership training could improve collaboration between ASDOs and UASDOs.	81.9%	81.8%	Leadership Training
47	Including relevant Industries and Trade Groups in a more broad discussion with ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs.	100.0%	72.7%	Market-driven
49	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if such groups made collaboration beneficial to both types of organizations.	100.0%	81.8%	Market-driven
50	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they promoted both types of organizations.	100.0%	90.9%	Market-driven
52	Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by publishing the benefits of both organizations types of work.	100.0%	72.7%	Market-driven

Table Notes: Consensus Definition = "Agree" & "Strongly Agree" are ≥70% of Responses
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) UASDOs (Unaccredited Industrial Standard Development Organizations)

Twelve questions met the definition of consensus for both desirability and feasibility and were passed to the final results.

Summary

The answers to the research questions indicated the expert panel members did believe there were solutions to improving collaborative practices, however, there were caveats. Answers generally focused on solutions that did not require an increase in regulations, did not involve increased governmental participation, and did not disregard a SDOs motivations. Solutions were also not considered to be primarily the responsibility of accredited and unaccredited industrial SDOs, and the potential role of industry and trade groups was pronounced. Harmonization of motives was the overarching suggestion for improving collaboration, and until that happened, organizations would continue to do what they perceived to be in their best interests.

Chapter 5 contains my evaluations of the expert panel members' responses to the questions posed, my attempts to conclude what solutions were considered promising based on consensus, which suggestions may be better than others, and why some solutions were not considered viable. In Chapter 5, I also address the limitations of this study, recommendations, and implications.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to discover what consensus could be built among expert panel members (previously called subject matter experts or SMEs) regarding desirable and feasible future-oriented actions leaders of accredited U.S.-based industrial standard development organizations (SDOs) and unaccredited industrial SDOs may take to improve collaborative practices and better serve public interests. This study was conducted using a qualitative method and modified three-round Delphi design. Qualitative research is consistent with the goal of exploring how leaders of industrial SDOs approach industrial voluntary consensus standards development, adoption, and diffusion, and what changes might be conducive to improving collaborative practices between accredited and unaccredited industrial SDOs in the United States. The selection of a Delphi design was deemed appropriate because of the desire to compare expert opinions regarding desirable and feasible future-oriented actions (Hasson & Keeney, 2011). Gaining insight into activities that may improve collaborative practices was important because industrial voluntary consensus standards are a critical social function that affects all members of society (Timmermans & Epstein, 2010). If lack of collaborative practices in the United States is threatening the legitimacy of the U.S. industrial voluntary consensus standards process, then what has traditionally been a democratic and inclusive process designed to serve public interests is also at risk (Brunsson et al., 2012; Osula & Ng, 2014; Sandholtz, 2012).

The results of this study demonstrated consensus on 12 approaches that may improve collaborative practices and alter what is becoming a more contentious process in

the United States. These 12 approaches could affect how leaders of industrial SDOs work internally and externally to improve collaborative practices, and how external stakeholders participate in improving collaborative practices. The 12 final consensus items consisted of (a) formalizing communication processes – statements related to establishing liaison and communication functions within SDOs and communication between SDOs and external entities; (b) defining clear areas of responsibility – statements related to clarifying accredited and unaccredited industrial SDO functions, expectations of industry and trade groups, and expectations of third party participants such as government; (c) better coordination of activities – statements related to publication of agendas, coordination of meetings, honoring work, and general improvements in communication; (d) leadership training – statements related to training leaders and participants in the art of collaboration; and (e) industry and trade group involvement – statements related to communicating to SDOs what industry expects, extoling the benefits of both accredited and unaccredited industrial SDOs, and helping all stakeholders understand the benefits of collaboration.

The key findings of this study indicate that more regulation was not considered a viable solution to improving collaborative practices in the United States and that significant stakeholders had it within their power to improve collaborative practices without the necessity of forced intervention. In this chapter, I compare my findings with the peer-reviewed literature presented in Chapter 2, consider the implications based on my findings and in the context of stakeholder and institutional theory, identify

limitations, and communicate recommendations. I end this study with a final message that captures the importance of this study.

Interpretation of Findings

Researchers agreed that industrial voluntary consensus standards are critical to promoting communication between significant stakeholders and that voluntary consensus standards are vital to servicing public interests (Behr & Diaz, 2014; Ponte & Cheyns, 2013; Timmermans & Epstein, 2010). Researchers also agreed that industrial voluntary consensus standards processes in general are becoming more contentious as various organizations fight for legitimacy (Osula & Ng, 2014). The challenge is of importance in the United States because of the unique U.S. market-driven, bottom-up approach to industrial voluntary consensus standards development, adoption, and diffusion (Strauss, 2013). None of the expert panel members appeared to disagree with these findings, but opinions varied regarding potential solutions, and potential solutions did not always match with opinions expressed by researchers. My interpretation of the results of this study are presented based on the 12 final suggestions and within the confines of the six themes that emerged from the literature review.

Deregulation

Deregulation was considered by some researchers to be the primary reason for the increase in the number of unaccredited industrial SDOs in the United States and the resulting increase in competition and conflict between accredited and unaccredited industrial SDOs (Allen & Ramanna, 2013; Coates, 2015; Fransen, 2011; Wijen, 2014). Reinecke et al. (2012) suggested that the increasing tendencies of accredited and

unaccredited industrial SDOs to "sell their brand" (p. 798) should not be an unexpected outcome given the current state of deregulation and lack of oversight that has contributed to a more crowded field of industrial SDOs, each fighting for legitimacy. As suggested by some researchers, seeking improvements in collaborative practices may be a moot point without reengagement on the part of legislative bodies (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). Most expert panel members were not in favor of legislative solutions, and none of the final 12 suggestions included a legislative solution. As suggested by one expert panel member,

> I don't think the collaborative practices, good or not good are affected in any way by regulation laws, nor by deregulation laws so I cannot believe that leveraging or changing regulation laws will make any impact at all on the collaborative practices. (P4)

This perspective was echoed by other expert panel members. My interpretation is that expert panel members felt efforts to improve collaborative practices would be better served by helping significant stakeholders realized the benefits of collaboration, and not by trying to force collaboration. As suggested by one expert panel member, "Convince ASDOs and UASDOs that collaborative practices are to their benefit. Identify the problem" (P10).

Oversight

A potential solution suggested by researchers was that as a result of deregulation in the United States, participation or oversight on the part of legislative or third party entities needed to be increased because any state or industry consortium can create an

SDO (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). The rational offered was that from an economic perspective, unaccredited industrial SDOs are often motivated by business related objectives more so than accredited industrial SDOs (Reinecke et al., 2012). An increase in oversight could help mitigate the differences in motivations and protect a process that has historically favored a deliberative and inclusive democratic approach. While increased oversight was not generally rejected by the expert panel members, there tended to be consensus that passive oversight in the form of recognition of contributions could improve collaborative practices and was more desirable that a controlling type of oversight. This perception was supported by one of the 12 final suggestions that focused on oversight in the form of honoring SDO activities as a desirable and feasible approach to improving collaborative practices. My primary interpretation is that expert panel members felt active oversight had the potential for producing winners and losers and that passive oversight that recognized contributions was a more desirable approach to improving collaborative practices. As one expert panel member suggested, "too much stick—need more carrot" (P8). A secondary interpretation regarding oversight was potential concern on the part of expert panel members regarding oversight qualifications. Although researchers often suggested oversight could improve collaboration, I could not find any suggestions in the literature for how an oversight function could be qualified. As one expert panel member suggested regarding legislative oversight, "The government does not have the technical expertise or organizational structure to enact or enforce clear and non-conflicting [*sic*]

standards" (P10). Expert panel members may have similar concerns regarding other types of oversight organizations.

Organizational Structure

Researchers pointed out that SDOs are generally incorporated as nonprofits, but that even as nonprofits, there is still an economic component to their structure (Pache & Santos, 2013). Researchers referred to this type of structure as a *hybrid* structure, and suggested this could be a particular challenge for leaders of SDOs because leaders of SDOs typically came from forprofit backgrounds and might not be familiar with or qualified to address organizational situations where there is no single goal (Benner & Pastor, 2015; Osula & Ng, 2014; Smith, 2014). Also mentioned by researchers was that organizations incorporated as nonprofits tend to have a leadership structure that relies more heavily on a board of directors than in forprofit organizations. As a result, boards of nonprofits are more critical to addressing leadership issues because leadership tends to be more of a group activity in organizations incorporated as nonprofits than in organizations incorporated as forprofit (Battilana & Lee, 2014; Goldkind, 2015). Expert panel members acknowledged these potential problems, but none of the final 12 suggestions supported improving collaborative practices by changing U.S.-based industrial SDO organizational structures. The closest suggestion to improving collaborative practices within the confines of existing organizational structures was consensus on the part of expert panel members that establishing liaison functions within and between industrial SDOs could improve collaboration. As suggested by one expert panel member, "All organizations, ASDOs and UASDOs alike, would need an office or

directorate to perform the formal liaison functions with their opposite numbers" (P8). My interpretation is that expert panel members felt improving collaborative practices was more a function of reward structures, and that reward structures could be modified without the need for changing organizational structures. The formation of liaison functions was not a solution suggested by researchers per se.

Leadership

Researchers made numerous references to the challenges of leadership in nonprofit or hybrid organizations and three overarching observations surfaced. First, understanding desirable characteristics of leaders of hybrid organizations could illuminate potential collaborative practice improvements (McMurray, Islam, Sarros, & Pirola-Merlo, 2012). Second, collaboration was not the norm within forprofit organizations leaders of industrial SDOs tended to come from (Benner & Pastor, 2015; Cho & Perry, 2012). Third, leaders of hybrid organizations may need to be specifically selected or trained to do justice to a hybrid organization's unique leadership challenges (Schröer & Jäger, 2015). Expert panel members acknowledged that SDO leaders in the United States may not have the skill sets required for a collaborative environment and one of the 12 final suggestions focused on the need for collaborative training of SDO leaders and leadership. As suggested by one expert panel member, "Leadership training should be focused on the development of collaborative organizations" (P20). My interpretation is that while expert panel members were in agreement with researchers that leaders of industrial SDO may not be qualified, collaborative training was considered more desirable and feasible than other types of training or special selection criteria.

Market-Driven

Some researchers suggested that what helped give rise to the increase in unaccredited industrial SDOs in the United States as a result of deregulation was the unique U.S. market-driven, bottom-up approach to the development, adoption, and diffusion of voluntary consensus standards (Ernst, 2013; Kaplan & Kinderman, 2015; Lampland & Star, 2009; Strauss, 2013). Researchers tended to focus on two aspects of the market-driven, bottom-up environment. These included the role of politics and economics (Allen & Ramanna, 2013; Fransen, 2011) and the supposition that once formed, organizations like SDOs were reluctant to let go of what was publicly claimed to have added value, and privately perceived to be more about power (Fransen, 2011). Expert panel members did not appear to disagree with researchers with regard to the importance of market drivers within the U.S. context. Five of the 12 final suggestions from expert panel members focused on the importance of market drivers and generally put the burden on industry and trade groups to provide the guidance that would allow market drivers to generate the type of collaborative behavior that would be beneficial to all stakeholders. My interpretation is that expert panel members agreed with researchers that behavior in the U.S. market-driven, bottom-up environment is largely about profit and power. However, I believe the consensus among expert panel members was that, rather than try and change the system, provide incentives that would encourage market-driven solutions. As one expert panel member suggested, “Since these standards are beneficial to the industry, the industry should push bottom up to the ASDOs and the

UASDOs. They should demand standards that will help the industry with safety, lowering operating costs and increasing profits" (P7).

Competition

Increased competition and resulting conflict tended to be the overarching concern of researchers and the reason that more collaboration was needed, especially in the United States. A reduction in competition and conflict was deemed critical by researchers for protecting public interests and promoting positive social change by maintaining a deliberative and inclusive democratic process that supported the legitimacy of industrial SDOs and the U.S. industrial voluntary consensus standards process (Behr & Diaz, 2014; Brunsson et al., 2012; Hopper, 2013; Olshan, 1993; Sandholtz, 2012; Timmermans & Epstein, 2010; Yates & Murphy, 2015). Expert panel members did not disagree with researchers and felt communication was a key component to finding a solution. Three of the final 12 suggestions focused on the benefits of communication within and between accredited and unaccredited industrial SDOs. As suggested by expert panel members, "Liaisons should be assigned between the two organizations, allowing for the open and honest transfer of ideas" (P2), "Have more joint meetings. First each organization must now [*sic*] it's purpose and then they must come to the table and agree what each organization is best suited to publish" (P5), and "Providing liaisons regular scheduled time in regular meetings of related standards organizations enhances collaboration and promotes both groups" (P6). My interpretation is that promoting communication was considered a more desirable and feasible solution to reducing conflict based competition than a more forced reduction in conflict. Several of the final

12 suggestions that focused on industry and trade group particiaption also included a communication component within and between accredited and unaccredited industrial SDOs.

Limitations of the Study

This study had several limitations. One of the features of this Delphi design, and Delphi designs in general, is that expert panel member selection is based on the assumption that selected expert panel members are experts regarding the subject matter, not that their opinions are statistically representative of the population of potential experts (Förster & Von der Gracht, 2014). This feature brings into question the trustworthiness of this study. Different expert panel members could have produced a different set of suggestions. A second limitation is my use of purposive sampling to selected expert panel members. Such an approach could have produced a panel that resulted in biases that skewed the results. I attempted to address this concern by selecting expert panel members who represented different stakeholders and potentially different perspectives. A third limitation was non-response error. As already mentioned, expert panel member selection is based on the assumption that selected expert panel members are experts regarding the subject matter, not that their opinions are statistically representative of the population of potential experts (Förster & Gracht, 2014). Non-response error has the potential to exacerbate the potential problem of statistical representation (Hsu & Sandford, 2007). Hsu and Sandford (2007) recommended contacting non-responders as soon as possible in order to promote participation in subsequent rounds. I did contact non-responders and none asked to be removed from the panel. This approach was used at

the end of Round 1 and Round 2 in an effort to reduce statistical representation error. A forth limitation was participant drop out. Drop out is a potential problem in a Delphi study due to the iterative nature of the Delphi design (Green, 2013; Kalaian & Kasim, 2012). Every effort was made to reduce drop out by expressing the importance of this study and creating instruments that could be completed in 30 to 45 minutes (Birko et al., 2015). Three expert panel members asked to be removed after the completion of Round 1. No expert panel members asked to be removed during or after subsequent rounds. A fifth limitation is that this study appears to be unique. Transferability is therefore a potential weakness. There was nothing I could do about study uniqueness, and all I could do was focus on establishing rigor.

Recommendations

Industry and Trade Groups

This study was primarily focused on collaborative practices between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. Several of the 12 final suggestions for improving collaborative practices included more industry and trade group participation. The rationale per the expert panel members was that standards greatly impact industry, and industry and trade groups would benefit by supporting collaborative practices. As suggested by one expert panel member, "Since these standards are beneficial to the industry, the industry should push bottom up to the ASDOs and the UASDOs. They should demand standards that will help the industry with safety, lowering operating costs and increasing profits" (P7). Researchers also suggested that trade benefited from industrial voluntary consensus standards (Heras-Saizarbitoria & Boiral,

2013; Hopper, 2013; Pirard at al., 2015). Per Timmermans and Epstein (2010), even if standards do not directly harmonize or globalize interchanges, they can help lead in that direction. Considering the importance expert panel members placed on industry and trade group participation, researchers may wish to conduct studies focused specifically on industry and trade group perceptions regarding improving collaborative practices in the area of industrial voluntary consensus development, adoption, and diffusion.

Legislative Bodies

None of the 12 final suggestions included intervention by legislative bodies as desirable or feasible for improving collaborative practices in the United States. However, converting industrial voluntary consensus standards to code though a process known in the United States as *inclusion by reference* (IRB) has become popular with legislative bodies (Abrams, 2014; Ernst, 2013; Ringsberg, 2015; Strauss, 2013). The IRB process can reduce cost and accelerate codification processes. Even if not codified, some researchers suggested that industrial voluntary consensus standards can benefit society when governmental regulations are weak or incompatible (Brunsson et al., 2012), or can act as viable substitutes for regulations (Timmermans & Epstein, 2010; Vogel, 2010; Wijen, 2014). Other researchers suggested that reengagement on the part of legislative bodies might be necessary in order to maintain the legitimacy of industrial voluntary consensus standards processes (Botzem & Dobusch, 2012; Brunsson et al., 2012; Timmermans & Epstein, 2010). Based on researcher suggestions, legislative bodies have a vested interest in how the U.S. industrial voluntary consensus process works. The more legitimate the process, the more confidence legislative bodies have in

allowing standards to substitute for regulation (code), and the more confidence legislative bodies have in the codes that result from industrial voluntary consensus standards. Researchers may wish to conduct studies that focus on the U.S. industrial voluntary consensus standards process from a legislative perspective. The results could encourage greater participation by legislative bodies, or at least help legislative bodies gain greater understanding of the U.S. industrial voluntary consensus standards process. Research of this nature may also help motivate non-governmental stakeholder to take a greater interest in improving collaborative practices.

Accredited and Unaccredited Industrial SDOs

In this study, expert panel members were asked to comment on questions related to improving collaborative practices between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs. This study did not focus on gathering input from accredited or unaccredited industrial SDOs, especially paid SDO members. As suggested by researchers, accredited industrial SDOs typically have different motivations from unaccredited industrial SDOs. As suggested by one researcher, the increase in competition between accredited U.S.-based industrial SDOs and unaccredited industrial SDOs could be leading to conflicts that are not politically and economically neutral, and threaten public interests (Fransen, 2011). More specifically, some researchers suggested that moral responsibility of industrial SDOs to serve public interests primarily by promoting uniform and harmonized occupational/consumer safety and quality control procedures was in danger of being replaced by political and economic motivations that placed special interests ahead of public interests (Ponte & Cheyns, 2013). The rationale

offered by some researchers was that unaccredited industrial SDOs are often motivated by business related objectives more so than accredited industrial SDOs (Reinecke et al., 2012). This difference in motivation could result in a standards war as each side competes for legitimacy (Behr & Diaz, 2014; Botzem & Dobusch, 2012; Ernst, 2013; Farrell & Simcoe, 2012; Pirard et al., 2015). This potential difference between accredited and unaccredited industrial SDO motivations in the United States was encapsulated by one expert panel member who suggested,

> "It ends up being about politics in the end and who has the leverage. Is it the accredited organization because they have governmental backing as law or the industry consortium because they have the money and power of the market?". (P9)

Researchers should consider studies that attempt to gain greater understanding of how U.S.-based accredited industrial SDOs and unaccredited industrial SDOs see the role each type of organization plays. Research that focused on the perceptions of accredited and unaccredited industrial SDOs could increase external understanding of what motivates each type of SDOs. Such research could also help SDOs understand their own internal motivations. Understanding internal motivations could be especially helpful because some researchers suggested organizations benefit from knowing themselves as well as other stakeholders (Tashman & Raelin, 2013). The focus of research could be on senior volunteer members, paid members, or a combination of both. Research that focused on paid members could be particularly enlightening because of the financial implications.

Leaders of Hybrid Organizations

During this study, I tended not to focus just on leaders of U.S.-based industrial SDOs and broadened the scope of research to include other organizational components. My rationale was that while some researchers suggested leading hybrid organizations could present leaders with special leadership challenges (Bordia et al., 2011), the role of leaders was considered by researchers to represent a specific component of voluntary consensus standards development processes and was not representative of all challenges. Only one of the 12 final recommendations by expert panel members focused on leadership training as a way to improve collaborative practices in the United States. Research that focused more specifically on leaders in hybrid organizations like industrial SDO could be very useful. As suggest by some researchers, there has been abundant research regarding leadership needs in forprofit organizations, considerably less research regarding leadership needs in nonprofit organizations, and even less research regarding leadership needs in hybrid organizations. Researchers also pointed out that leadership of hybrid organizations tend to rely on boards, and that leadership is more of a group activity than in organizations incorporated as forprofit (Battilana & Lee, 2014; Goldkind, 2015). This lack of research into hybrid organization leadership needs represents a gap in the literature regarding specific challenges faced by leaders of hybrid organizations (Battilana & Lee, 2014; Schröer & Jäger, 2015). Further research that focused more specifically on leadership skills required in hybrid organizations such as U.S.-based industrial SDOs could contribute to improving collaborative practices as well as expanding the understanding of hybrid leadership needs in general.

Different Experts and Researchers

In the limitations section, one of the limitations I mentioned was that a feature of Delphi designs in general is that expert panel member selection is based on the assumption that selected expert panel members are experts regarding the subject matter, not that their opinions are statistically representative of the population of potential experts (Förster & Von der Gracht, 2014). Researchers also suggested that instruments often had to be created based on the uniqueness of the study (Hasson & Keeney, 2011; Sobaih et al., 2012). Research that used a different set of experts and different researchers could make two important contributions to the body of knowledge. First, opinions of different experts familiar with the U.S. industrial voluntary consensus standards process could result in different recommendations for improving collaborative practices. Second, different researchers may create instruments that guide the experts in different directions. Both changes could support or bring into question the trustworthiness of the current study.

Open Question Evaluation Techniques

The interpretation of responses to Round 1 questions were made by me using traditional text analysis versus computer text analysis. These interpretations formed the basis for questions used in subsequent rounds. As suggested by Bright and O'Connor (2007), traditional text analysis has both strengths and weakness compared to computer text analysis. One of the primary strengths of traditional text analysis is that the researcher can bring unique perspectives to the analysis process. One of the primary weaknesses of traditional text analysis is the potential for inconsistent analysis. Based on

the iterative nature of Delphi designs and potential uniqueness of a study, additional research into traditional text analysis versus computer text analysis could help future researchers select the best way to analyze nominal data, and add more credibility to qualitative Delphi studies.

Implications

Positive Social Change

The overarching implication for positive social change as a result of improving collaborative practices regarding the U.S. industrial voluntary consensus standards process is that all of society would benefit because all of society is affected by industrial voluntary consensus standards (Timmermans & Epstein, 2010). Regarding how positive social change might be realized in tangible ways, I submit that organizational and societal/policy benefits are the most likely to surface as a result of this study, with organizational benefits being the most obvious. From an organizational perspective, reduced conflict between accredited and unaccredited industrial SDOs through communication and understanding is the most important implication drawn from the expert panel members' final 12 recommendations. Industrial SDOs tend to be where voluntary consensus standards development starts. This is not to say that industrial SDOs create the need for a voluntary consensus standard, but industrial SDOs are where concepts are often first given tangible form. In some respects, the role of industrial SDOs may be compared to the first round of a Delphi study in that the first round tends to set the tone for the iterative processes that follow. Defining responsibilities, improving agreement on standards development priorities, reducing the number of conflicting

standards, faster standards development time, better working relationships with industry and government, an increase in communication, and less government incentive to interfere with market processes are all positive implications as a result of improving collaborative practices between accredited and unaccredited industrial SDOs.

Industry could enjoy many of the benefits of improved collaborative practices between accredited and unaccredited industrial SDOs. As suggested by several expert panel members, industry is directly impacted by voluntary consensus standards. When a voluntary consensus standards process is not in harmonization, there is a cost associated with lack of harmonization. This cost is often passed on to the public and may not be beneficial to society. This may be why at least five of the 12 final recommendations for improving collaborative practices between accredited and unaccredited industrial SDOs involved industry and trade group participation. The implication is that industry would benefit if they were to actively help with collaborative practices, and that this benefit would then pass to the public and benefit society. By helping to improve collaborative practices between accredited and unaccredited industrial SDOs, industry may help reduce legislative burdens. Legislative burdens are another form of cost that industry must absorb or pass on to others. The implication is that if the legitimacy of the U.S. industrial voluntary consensus standards process benefits from improved collaborative practices, there would be less incentive for government to impose regulatory solutions, which could reduce cost to industry and benefit society.

Government could also benefit from more collaborative practices between accredited and unaccredited industrial SDOs. Legislative solutions are not free and the

U.S. market-driven, bottom-up approach to developing industrial voluntary consensus standards has kept legislative solutions in check by supporting a deliberative and inclusive democratic process that allowed the market to drive the process. The implication is that improving collaborative practices between accredited and unaccredited industrial SDOs would reduce cost to both government and industry. Government would benefit from not having to incur the cost of creating legislative solutions, and industry would not have to deal with the cost of addressing increased legislation. Cost savings to government and industry would ideally benefit society who would not have these costs passed to them. Codification of industrial voluntary consensus standards by Government could also benefit from improved collaborative practices. The implication is that maintaining the legitimacy of the U.S. industrial voluntary consensus standards process would give the government more confidence in industrial voluntary consensus standards that government wished to codify. Increased confidence could result in more codification, reduce bureaucracy, reduce cost, and benefit society through a more streamlined and consistent process.

Another implication of the 12 final recommendations provided by expert panel members is that by improving collaborative practices in the United States, there would be a reduction in winners and losers. SDOs, industry, and government would be motivated to improve collaborative practices because each organization would be inclined to see collaboration as being in their best interests. The implication for society is that society would benefit, although maybe more indirectly than with organizations, by not being the victim of standards wars created by lack of collaboration between SDOs, industry, and

government. Benefits to society could be in the form of reduced monetary costs, fewer conflicting standards, less fragmentation regarding adoption of standards, and more rapid access to technology.

Theoretical Implications

Regarding theory, the 12 final suggestions of expert panel members supported both stakeholder theory and institutional theory. In the case of stakeholder theory, the results of this study tended to confirm that expert panel members believed understanding one's own organization as a stakeholder is important for understanding other stakeholders. This perception was supported by researchers who claimed mutual understanding would improve if stakeholders included their own organization in the stakeholder mix (Tashman and Raelin, 2013). Expert panel members also acknowledged that while society benefits from a functioning industrial voluntary consensus standards process, there was a tendency to focus on SDOs, industries, and governments as the most valuable stakeholders. This perception of value was supported by researchers who suggested that stakeholders are not homogeneous, and have different claims to value (Bridoux & Stoelhorst, 2014; Garriga, 2014; Hasnas, 2013; Laczniak & Murphy, 2012). Implications for stakeholder theory are support for the belief that stakeholder value varies, and that understanding one's own organization can improve stakeholder relations.

In the case of institutional theory, the results of this study showed a preference among expert panel members for normative and memetic isomorphic solutions as being more desirable and feasible than coercive isomorphic solutions. This perspective was supported by researchers who suggested desirable behavior was more likely to occur if

compliance was voluntary rather than coerced (Chandler & Hwang, 2015; Grob & Benn, 2014, Guerreiro et al., 2012). The implications for institutional theory are that coercive isomorphic pressure should be a last resort if voluntary collaboration is the goal.

A More Collaborative Process

Figure 2 in Chapter 2 presented a visual interpretation of the current situation based on the literature review. In Figure 2, accredited U.S.-based industrial SDOs and unaccredited industrial SDOs were shown in competition with each other in a battle for legitimacy with other significant stakeholders being the prize. Figure 3 shows the situation that could be realized if accredited U.S.-based industrial SDOs and unaccredited industrial SDOs where working together, guided by industry and trade groups. The American National Standards Institute (ANSI), the key player in representing the United States on the world stage, would still occupy an important role. However, I submit ANSI's role would now be more focused on presenting the best of U.S. developed industrial voluntary consensus standards locally and globally rather than playing the role of referee in regard to bridging the gap between accredited and unaccredited industrial SDOs, industry, and government. This role would now be assumed more by industry and trade groups, and could result in a less continuous process that promoted organizational cooperation, did not produce winners and losers, and ultimately served public interests more effectively.

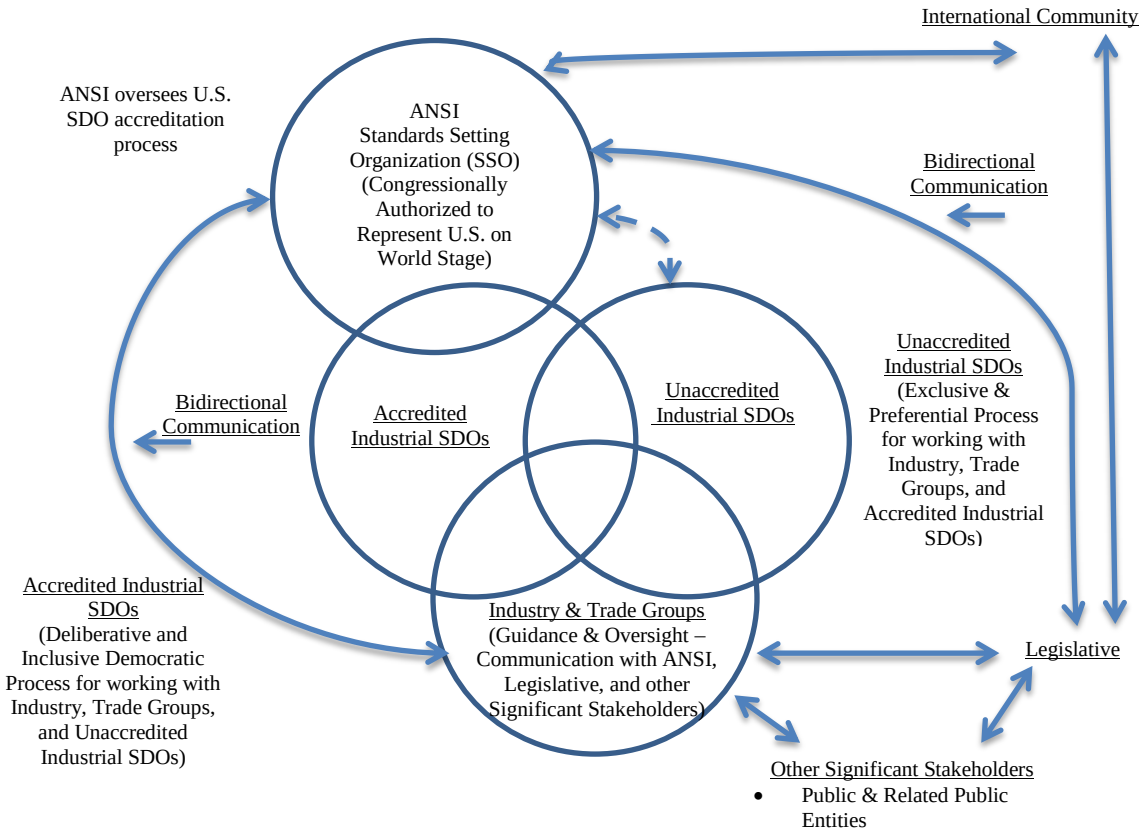

Figure 3. Reduced tensions and greater collaboration.

Conclusions

The market-driven, bottom-up approach to the U.S. industrial voluntary consensus standards process has served the United States, the world, and public interests well over the past two centuries. However, over that time the world has changed, and old approaches may no longer be viable. One solution is to try and roll back certain events so that previous ways of accomplishing tasks that historically were beneficial to society could still be viable. Another solution is to consider new ways of accomplishing tasks

that are more in alignment with current and future realities, but that still keep social interests at the forefront.

If positive social interests are to prevail while not being perceived as threats to significant stakeholders, the focus needs to be on finding the right reward structures that promote desirable behavior. In the case of industrial voluntary consensus standards in the United States, an improvement in collaborative practices whose aim is to find the right balance of rewards could be a viable solution. By focusing on establishing the right balance of rewards by gaining understanding of all significant stake holders, and possibly led by industry and trade groups, the legitimacy of the U.S. industrial voluntary consensus standards process may be preserved and produce results that are ultimately in the best interests of society.

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Appendix A: Request to SDOs to Forward the Invitation to Their Volunteer Members

Dear :

Thank you for agreeing to consider my request to send this invitation to your members. As per our conversation, I am looking for people who are familiar with Industrial Standards Development Organizations (SDOs) and Voluntary Consensus Standards (VCS) processes to answers questions about the dynamics that exist between Accredited U.S.-based Industrial SDOs (ASDOs) and Unaccredited Industrial SDOs (UASDOs). Participation will help pave new ground in research that may improve collaborative practices between Accredited and Unaccredited Industrial Standards Development Organizations. Interested parties can contact me directly at XXX@waldenu.edu.

I have also attached a document that explains what I am doing in more detail so potential volunteers can make a more informed decision. If your organization agrees to forward this invitation, simply reply to this email with your intentions, and include me on the email list when you send it out so I know it has been done.

If there are any questions, please do not hesitate to contact me. Thank you for your time and consideration.

Appendix B: Detailed Attachment to SDO Request/Invitation E-mail

(The same information was sent to potential expert panel members I contacted directly)

My name is Joel Blumenthal. I am an engineer who has spent many years working with industrial instrumentation. I am also a doctoral student at Walden University pursuing a PhD in management with a specialization in leadership and organizational change. My dissertation is focused on exploring the dynamics between Accredited U.S.-based Industrial Standards Development Organizations (ASDOs) and Unaccredited Industrial Standards Development Organizations (UASDOs).

I am seeking subject matter experts (SMEs) in the field of Industrial Voluntary Consensus Standards (VCSs) to answer questions related to how ASDOs and UASDOs interact. This study is being conducted separate from any of my other roles.

If you participate in this three-round Delphi study, you and other members of the study panel will be asked to complete three separate electronic questionnaires (one questionnaire per round) over approximately a four month period. You will have 3 weeks to complete each questionnaire, with an expectation that each questionnaire will take no more than 30 to 45 minutes to complete.

Inclusion criteria includes familiarity with technical jargon used in the world of industrial voluntary consensus standards, ability to describe cases that illustrate good versus poor decision regarding the development of industrial voluntary consensus standards, ability to communicate effectively in the spoken and written U.S. English language, currently active with an accredited industrial SDO on a voluntary basis with a least five years continuous involvement, and have been employed with or worked with organizations or industries that utilized industrial voluntary consensus standards.

Your participation will help pave new ground in research that may improve collaborative practices between ASDOs and UASDOs. I hope that you will be willing to provide your insight and expertise to my study. Given the importance of Industrial VCSs to industry and society, I believe that learning from the shared wisdom of experts will continue to expand knowledge in this important field. All participant information including identities will be kept anonymous from other participants.

If you are willing to participate in this study, please reply to me at XXX@waldenu.edu. If you know someone else who may qualify as an expert and be interesting in participating, please forward this message to him or her.

If there are any questions, please do not hesitate to contact me. Thank you kindly for your time and consideration.
Sincerely,

Joel Blumenthal
MS, MBA
Doctoral Student, Walden University

Appendix C: Notification to Potential Expert Panel Members Accepted Invitation

Dear :

Thank you for showing an interest in participating in this study. As per the original invitation, I am a Doctoral Student at Walden University. This qualitative Delphi study is directly towards U.S.-based industrial standards development organizations (SDOs), with a specific focus on exploring leaderships role in addressing how accredited and unaccredited industrial SDOs could collaborate in the creation of voluntary consensus standards (VCSs). Your role would be that of a Subject Matter Expert (SME) and you would be asked to answer questions related to the state of industrial standards development processes in the United States. The attached informed consent letter describes the research in more detail. For more information on Delphi study designs, the following link may be useful (https://en.wikipedia.org/wiki/Delphi_method).

Regarding my background, I have an engineering degree from the University of Washington and an MBA from the University of Phoenix. After spending several years selling specialty chemicals to the Pulp & Paper Industry, I found myself becoming increasingly involved in the marketing and sales side of industrial instrumentation. Over the years, I have worked with and for a variety of instrumentation companies and also become heavily involved in a variety of standards organizations, either contributing content or developing VCSs. My past and current work with SDOs helping to develop VCSs is what led me to this dissertation topic.

You should review the attached informed consent letter. If you are satisfied with what is being requested, please respond to this e-mail. A simple "I Consent" will do. Assuming you consent, and after I have finished identifying expert panel members, I will send you and the other expert panel members the first round questionnaire. This communication will also include your individual identification code which you will use to protect confidentiality.

Industrial VCSs are an important way in which the world communicates and one of the primary mechanisms for protecting public safety and serving public interests. I look forward to working with you on this important subject.

If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you.

Appendix D: Notification to Potential Expert Panel Members Not Selected

Dear :

Thank you for showing an interest in participating in this study. However, I currently have a sufficient number of volunteers.

I will certainly keep your name on file until I have confirmation that those who have already expressed an interest do in fact follow through. If not, I may contact you again and see if you are still available.

Again, thank you for your interest. I hope that the results will point to areas of future research, and maybe some actionable items! In my experience, the Industrial Voluntary Consensus Standards process is just too important to take for granted.

If you have any further comments or questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you.

Appendix E: First Reminder to Complete Questionnaire

Dear :

Just a friendly reminder that the round [select round] questionnaire is due in one week. If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you.

Appendix F: Second Reminder to Complete Questionnaire

Dear :

Just a friendly reminder that the round [select round] questionnaire is due in three days. If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you.

Appendix G: Notification to Expert Panel Member of Removal From Panel

Dear :

Thank you for agreeing to participate in this study. However, it is important for demonstrating study rigor that all panel members participate. Non-participation is potentially harmful to the study as it leaves data gaps, could delay data analysis and timely data feedback to other panel members, and could place additional burden on other panel members by extending the length of this study.

This e-mail serves as notice of your removal from the study. No one will treat you differently as a result of being removed from the study. Any data you may have provided including your identity will remain confidential and will be destroyed at the end of the five-year period that began with the start of this study.

If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you for your understanding.

Appendix H: Acknowledgement of Expert Panel Member Resignation

Dear :

I am sorry to hear of your decision to resign from this study. However, I understand and thank you for agreeing to participate in this study in the first place.

No one will treat you differently as a result of your decision to resign. Any data you may have provided including your identity will remain confidential and will be destroyed at the end of the five-year period that began with the start of this study.

If you have any questions, please feel free to contact me at XXX@waldenu.edu. Thank you.

Appendix I: Round 1 Questions

Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) UASDOs (Unaccredited Industrial Standard Development Organizations)

- In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

- How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

- In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

- What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

- What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

- In what ways could the market-driven, bottom-up U.S. approach to the development of industrial voluntary consensus standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market-driven)

- Additional comments and/or suggestions regarding how to improve collaborative practices between ASDOs and UASDOs? (Optional Question)

Appendix J: Round 2 SurveyGizmo Instrument and Questions

Round 2 Questionnaire

Round 2 Questionnaire

The following statements were created based on responses to the Round 1 questionnaire. In this round, the primary goal is to see which statements generate consensus on the part of panel members. Some statements fit into multiple themes (listed at the end of the statement). None of the statements require an answer, but if you wish to abstain answering any statement, checking option 3 (Neutral) would be preferable rather than no answer at all - your call. Comments are also optional. In the interest of time, I would suggest you not provide comments unless you feel the comments are necessary.

Theme Codes Legend (Theme Codes at end of statement)

C = Communication

DE = Deregulation

OV = Oversight

OS = Organizational Structure

LT = Leadership Training

MD = Market Driven

Statement 1: Regular communication between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [C]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 2: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by clarifying jointly to both ASDOs and UASDOs what industry expects of both groups. [C]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 3: Collaboration between ASDOs and UASDOs could improve if both groups were incentivized to support each other's work. [C]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 4: Having formal liaisons (reciprocal representation) between ASDOs and UASDOs could improve collaboration. [C][OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 5: Defining clear areas of responsibility could improve collaboration between ASDOs and UASDOs. [C][DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 6: Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDOs and UASDOs. [C]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 7: Better coordination of meetings could improve collaboration between ASDOs and UASDOs. [C]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 8: Deregulation of laws that hinder cooperation between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 9: Collaboration between ASDOs and UASDOs could be improved by introducing regulations that promoted collaboration. [DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 10: Regulations that establish clear lines of demarcation (boundaries and responsibilities) for ASDOs and UASDOs could reduce duplication of effort and improve collaboration between ASDOs and UASDOs. [DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 11: Government actions that could help set goals for ASDOs and UASDOs through accreditation and legal reference could improve collaboration between ASDOs and UASDOs. [DE]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 12: Deregulation could improve collaboration between ASDOs and UASDOs because deregulation would encourage development of new standards or adoption of other standards to fill the regulatory void. [DE]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 13: Non-Government Based Oversight Committees could improve collaboration between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 14: Government Based Oversight Committees could improve collaboration between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 15: Passive government oversight that rewarded joint results could improve collaboration between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 16: Collaboration between ASDOs and UASDOs through oversight could only improve if oversight committees were willing to use the court system if collaboration was not being observed. [OV][DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 17: Oversight could only improve collaboration between ASDOs and UASDOs if both organization were willing to accept oversight. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 18: Facilitation of collaboration rather than oversight of collaboration would improve collaborative between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 19: Greater oversight with at least the specter of authority could improve collaboration between ASDOs and UASDOs. [OV][DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 20: Making ASDOs and UASDOs realize that regulated oversight is potentially a common enemy could improve collaboration between ASDOs and UASDOs. [OV][DE]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 21: Honoring ASDO and UASDO work in references, contracts, etc..., could improve collaboration between ASDOs and UASDOs without the need for oversight. [OV]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 22: Oversight that changed ASDO and UASDO attitudes could improve collaboration between ASDOs and UASDOs. [OV]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 23: Some form of regulatory oversight would be required to improve de jure (by entitlement or law) collaboration between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 24: Oversight that encouraged collaboration with innovators could improve collaboration between ASDOs and UASDOs. [OV]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 25: Reducing ASDO size or splitting ASDOs into smaller organizations could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 26: Flattening organizational structures (less hierarchical) could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 27: Collaboration between ASDOs and UASDOs could improve if ASDOs and UASDOs shared similar protocols. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 28: Collaboration could improve between ASDOs and UASDOs if both types of organizations changed their charters to include a department whose function was to collaborate with other organizations. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 29: Collaboration between ASDOs and UASDOs could improve if both types of organizations changed subcommittee mandates to include a specific venue to present findings. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 30: Charters that included specifics for working with other organizations could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 31: Shared leadership could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 32: Joint reviews of collaborative efforts between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 33: Including a statement in the charter and/or bylaws that an organization values the work performed by other organizations could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 34: Charters that reduced political differences between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [OS]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 35: Leaders trained in the concept of "leading by example" could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 36: Making leadership training a mandatory component of accreditation could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 37: Leadership training that emphasized the necessity to demystify the "black box" of standards could improve collaboration between ASDOs and UASDOs. [LT]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 38: Collaborative leadership training could improve collaboration between ASDOs and UASDOs. [LT]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 39: Leadership training that emphasized the importance of "empowerment" at all levels could improve collaboration between ASDOs and UASDOs. [LT]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 40 "Servant-Leadership" training could improve collaboration between ASDOs and UASDOs. [LT]

( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):

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Round 2 Questionnaire

Statement 41: Feedback training at all levels could for improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 42: Leadership training that included a focus on understanding the scopes and goals of similar ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 43 Mandatory training of new members at all levels could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 44: Leadership training (both leaders of ASDOs and UASDOs) on the concept of "emotional intelligence" could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 45: Increased training for leaders on the benefits of standards to both society and business, with a focus on similarities of ASDOs and UASDOs, could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 46: Joint leadership cooperation training between ASDOs and UASDOs in the form of workshops could improve collaboration between ASDOs and UASDOs. [LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 47: Including relevant Industries and Trade Groups in a more broad discussion with ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 48: ASDOs that are responsive to how market forces motivate UASDOs could improve collaboration between ASDOs and UASDOs. [MD][LT]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 49: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if such groups made collaboration beneficial to both types of organizations. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 50: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they promoted both types of organizations. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 51: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they encouraged joint participation at trade shows and other venues. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 52: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by publishing the benefits of both organizations types of work. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 53: Collaboration could improve between ASDOs and UASDOs if both types of organizations agreed upon joint and/or shared articles of legitimacy. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Round 2 Questionnaire

Statement 54: Collaboration between ASDOs and UASDOs could improve if ASDOs were more inclined to accept input from UASDOs and use this input to establish priorities. [MD]
( ) Strongly disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly agree

Comments? (Optional):
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Thank You!

Thank you for taking our questionnaire. Your response is very important to us.

Appendix K: Round 3 SurveyGizmo Instrument and Questions

Third & Final Questionnaire

Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
UASDOs (Unaccredited Industrial Standard Development Organizations)

Statement 1: Regular communication between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 100%. Theme = Competition)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 2: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by clarifying jointly to both ASDOs and UASDOs what industry expects of both groups. (Consensus from Round 2 = 100%. Theme = Competition)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 3: Collaboration between ASDOs and UASDOs could improve if both groups were incentivized to support each other's work. (Consensus from Round 2 = 72.8%. Theme = Competition)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 4: Having formal liaisons (reciprocal representation) between ASDOs and UASDOs could improve collaboration. (Consensus from Round 2 = 81.9%. Theme = Competition & Oversight)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 5: Defining clear areas of responsibility could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 81.8%. Theme = Competition & Deregulation)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 6: Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 100%. Theme = Competition)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 7: Better coordination of meetings could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 100%. Theme = Competition)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 9: Collaboration between ASDOs and UASDOs could be improved by introducing regulations that promoted collaboration. (Consensus from Round 2 = 72.8%. Theme = Deregulation)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 17: Oversight could only improve collaboration between ASDOs and UASDOs if both organization were willing to accept oversight. (Consensus from Round 2 = 90.9%. Theme = Oversight)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 21: Honoring ASDO and UASDO work in references, contracts, etc..., could improve collaboration between ASDOs and UASDOs without the need for oversight. (Consensus from Round 2 = 81.8%. Theme = Oversight)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 24: Oversight that encouraged collaboration with innovators could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 90.0%. Theme = Oversight)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 26: Flattening organizational structures (less hierarchical) could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 72.7%. Theme = Organizational Structure)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 27: Collaboration between ASDOs and UASDOs could improve if ASDOs and UASDOs shared similar protocols. (Consensus from Round 2 = 81.8%. Theme = Organizational Structure)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 28: Collaboration could improve between ASDOs and UASDOs if both types of organizations changed their charters to include a department whose function was to collaborate with other organizations. (Consensus from Round 2 = 100%. Theme = Organizational Structure)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 29: Collaboration between ASDOs and UASDOs could improve if both types of organizations changed subcommittee mandates to include a specific venue to present findings. (Consensus from Round 2 = 72.7%. Theme = Organizational Structure)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 30: Charters that included specifics for working with other organizations could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 81.8%. Theme = Organizational Structure)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 31: Shared leadership could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 72.7%. Theme = Organizational Structure)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 32: Joint reviews of collaborative efforts between ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 90.9%. Theme = Organizational Structure)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments
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Statement 35: Leaders trained in the concept of "leading by example" could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 72.7%. Theme = Leadership Training)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 38: Collaborative leadership training could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 72.7%. Theme = Leadership Training)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 42: Leadership training that included a focus on understanding the scopes and goals of similar ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 81.8%. Theme = Leadership Training)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 43: Mandatory training of new members at all levels could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 72.8%. Theme = Leadership Training)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 45: Increased training for leaders on the benefits of standards to both society and business, with a focus on similarities of ASDOs and UASDOs, could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 90.9%. Theme = Leadership Training)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 46: Joint leadership cooperation training between ASDOs and UASDOs in the form of workshops could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 80.0%. Theme = Leadership Training)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 47: Including relevant Industries and Trade Groups in a more broad discussion with ASDOs and UASDOs could improve collaboration between ASDOs and UASDOs. (Consensus from Round 2 = 100%. Theme = Market Driven)

It is Desirable*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*
( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 49: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if such groups made collaboration beneficial to both types of organizations. (Consensus from Round 2 = 90.9%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 50: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they promoted both types of organizations. (Consensus from Round 2 = 100%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 51: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs if they encouraged joint participation at trade shows and other venues. (Consensus from Round 2 = 72.8%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 52: Industry/Trade Groups could improve collaboration between ASDOs and UASDOs by publishing the benefits of both organizations types of work. (Consensus from Round 2 = 100%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 53: Collaboration could improve between ASDOs and UASDOs if both types of organizations agreed upon joint and/or shared artifacts of legitimacy. (Consensus from Round 2 = 72.7%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Statement 54: Collaboration between ASDOs and UASDOs could improve if ASDOs were more inclined to accept input from UASDOs and use this input to establish priorities. (Consensus from Round 2 = 81.8%. Theme = Market Driven)

It is Desirable*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

It is Feasible*

( ) Strongly Disagree ( ) Disagree ( ) Neutral ( ) Agree ( ) Strongly Agree

Optional Comments

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Thank You!

Thank you for taking our questionnaire. Your response is very important.

Appendix L: Sample of Raw Round 1 Results

Round 1 - Themes and Expert Panel Member Responses

P Code	Questionnaire ID Number	Themes	Themes	Themes	Themes	Themes	Themes	Themes
		Competition	Deregulation	Oversight	Organizational Structure	Leadership Training	Market-Driven	Optional Seventh Question - No Theme
P20	ID 8	SG1. ASDOsSDOs and UASDOsSDOs need to align on the intent and purpose of both types of organizations, and focus on benefits of the end user (consumer) of the products and services they provide to the relevant market. If they only focus on their own interests, without genuine collaboration, end users will suffers and industry progress will slow. SG2. ASDOsSDOs and UASDOsSDOs should continuously communicate with industry users to understand their needs and challenges, and come up with realistic plan to improve industry practices and standards to reduce bureaucracy. Knowledge sharing between ASDOsSDOs and UASDOsSDOs will benefit both organizations. SG3. Both types of organizations should "market" their benefits to the end user in front of federal and states regulators.	SG1. Deregulation laws should focus on current industry practices and reduce regulations that stopping progress. SG2. Deregulation laws should focus on prevention of the competition between ASDOsSDOs and UASDOsSDOs by giving them flexibility to apply standards based on specific applications.	SG1. Third party oversight should come from independent consumer organizations, not government. SG2. Independent consumer organizations should work with federal and local government departments to ask for support in the promotion of collaborative practices between ASDOsSDOs and UASDOsSDOs. SG3. Government should periodically audit ASDO and UASDO practices to prevent potential conflict of interest.	SG1. ASDO or UASDO organizational structures should be simplified to minimize autocracy and support democracy, so everybody's opinion can be heard and count. SG2. ASDO or UASDO organizational structures should be of a manageable size.	SG1. Leadership training should be focused on the development of collaborative organizations. SG2. Leadership training should be focused on "leading by example". SG3. Leadership training should be focused on sustaining organizational health.	SG1. ASDOsSDOs and UASDOsSDOs should focus on the consumer needs in specific market, collaborate with other relevant industries governing organizations to prevent legal conflicts between different types of standards. SG2. ASDOsSDOs and UASDOsSDOs in one industry should learn best practices from other industries ASDOsSDOs and UASDOsSDOs.	Both type of organization should prevent creating "special interest groups" within themselves.
P4	ID 9	SG1. I will have to make the argument that an 'unaccredited standard' is not a standard. A group of companies can join a trade organization; for membership, payment is required. They can all agree on putting out publications that further their agenda; they might represent some big players in the industry but not necessary the smartest or with the most engineering expertise; and they benefit directly. They write publications to make their lives easier which saves them money. An accredited standard such as ASME, membership is based primarily on expertise. You cannot pay to be a voting member. While being a member, might give your company some exposure, you are primarily there to ensure the good design of equipment so that the industry does better, for the public's benefit. However, to help the industry, the UASDOs, as you call them, need to bring their information to the ASDOsSDOs, and be open to the fact that the Standard organization have experts and voting in place, and only the information that has consensus on, will be published. Publishing on their own will only go so far, because as I said earlier, they are not standard organizations and thus their publications are not standards.	SG1. I don't think the collaborative practices, good or not good are affected in any way by regulation laws, nor by deregulation laws so I cannot believe that leveraging or changing regulation laws will make any impact at all on the collaborative practices.	SG1. I think UASDOsSDOs are too far down the food chain so to speak, to be impacted or bring any action from any government. A standard organization by definition has oversight; that is why it is accredited. You are comparing apples and oranges with these ASDO/UASDO see my 1st suggestion to Question 1	SG1. A publication from a UASDO is a wishful thinking, protecting themselves guideline. Their organization structure will be equal representation by all companies. I don't think they are open to change and the organizational structure of a ASDO is critical and inherent to be able to call itself a standard organization	SG1. Leadership qualities do not define expertise. A document that will help the industry do their work correctly and help the public, needs to be based on expertise. Leadership, in a ASDO, is voted on by the Standards Committee. The UASDOsSDOs leadership is simply voted on by the participating, money/paid members. However, leaders from ASDOsSDOs could familiarize themselves with the UASDOs so that when information is brought to them from these organizations, they understand the limitations of that information and encourage their own members to evaluate the information strictly on science.	SG1. Standards will always be market driven initially, but I believe many members of ASDOs care about the general public as well. And while market drive is inevitable, there are enough protocols in place to ensure that most of the time, the Standards can be relied on sufficiently to protect the public, more than if they were not published. The more that the UASDOs recognize the importance of these protocols, which keeps market driven initiatives from tainting the final publishing, the more UASDOs will realize that they need ASDOS to give more value to the information they produce.	I again reiterate that to call an organization unaccredited but still call it a standard development organization is simply wrong. And it confuses the issue. A standard is there for a very different reason, than a guideline by a UASDO. Collaboration is important if it brings value to the industry and all parties are interested in collaborating. You cannot improve collaboration unless both types of organizations have strong interest and see the value of collaboration.

Appendix M: Sample of Raw Round 2 Results

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3											
4					Results From Round Two 9-13-2017						
5											
6	Themes	Statement No.	Statement	Comments	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree	Consensus (based on 67% Agree & Strongly Agree)
7	Competition	1	**Regular communication between ASDO's and UASDO's could improve collaboration between ASDO's and UASDO's.**		0.0%	0.0%	0.0%	36.4%	63.6%	100.0%	Yes
8	Competition	2	**Industry/Trade Groups could improve collaboration between ASDO's and UASDO's by clarifying jointly to both ASDO's and UASDO's what industry expects of both groups.**	1. Policing inside is always good . (P11)	0.0%	0.0%	0.0%	54.5%	45.5%	100.0%	Yes
9	Competition	3	**Collaboration between ASDO's and UASDO's could improve if both groups were incentivized to support each other's work.**	1. This is the only way it will work. Politics and turf protection will otherwise work to thwart working together (P8)	0.0%	9.1%	18.2%	36.4%	36.4%	72.8%	Yes
10	Competion	4	**Having formal liaisons (reciprocal representation) between ASDO's and UASDO's could improve collaboration.**		0.0%	0.0%	18.2%	36.4%	45.5%	81.9%	Yes
11	Competition	5	**Defining clear areas of responsibility could improve collaboration between ASDO's and UASDO's.**	1. I don't think it would be helpful to try to micromanage two herds of cats. (P10) 2. who sets the definitions? Al Haig is in charge... (P11)	0.0%	9.1%	9.1%	27.3%	54.5%	81.8%	Yes
12	Competition	6	**Publishing Agendas well before an event (including schedules of events) could help collaboration between ASDO's and UASDO's.**		0.0%	0.0%	0.0%	81.8%	18.2%	100.0%	Yes
13	Competition	7	**Better coordination of meetings could improve collaboration between ASDO's and UASDO's.**		0.0%	0.0%	0.0%	72.7%	27.3%	100.0%	Yes
14	Dergulation	8	**Deregulation of laws that hinder cooperation between ASDO's and UASDO's could improve collaboration between ASDO's and UASDO's.**	1. Anarchy cannot rule. (P11)	0.0%	9.1%	45.5%	36.4%	9.1%	45.5%	No

Appendix N: Sample of Raw Round 3 Results

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2														
3														
4						Results From Round Three 10-15-2007									
5														
6	Theme(s)	Statement No.	Statement	Comments	Desirability and Feasibility	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	Agree + Strongly Agree (Desirable)	Consensus (Desirable)	Agree + Strongly Agree (Feasible)	Consensus (Feasible)
7	Competition	1	Regular communication between ASDO's and UASDO's could improve collaboration between ASDO's and UASDO's.	1. It is feasible with strong commitment by both organizations (P12) 2. The real issue is turf, and ownership of content. The organizations behave like they are bigger than the industry, and their goals (mostly making money and looking good to potential member) come before the industry's needs. (P13) 3. Re feasibility--incentives to both organizations will be needed to maintain regular communications (R8)	Desirable	0.0%	0.0%	0.0%	36.4%	63.6%	100.0%	Yes		
8					Feasible	0.0%	0.0%	27.3%	72.7%	0.0%			72.7%	Yes
9	Competition	2	Industry/Trade Groups could improve collaboration between ASDO's and UASDO's by clarifying jointly to both ASDO's and UASDO's what industry expects of both groups.	1. The real issue is turf, and ownership of content. The organizations behave like they are bigger than the industry, and their goals (mostly making money and looking good to potential member) come before the industry's needs. (P13) 2. what industry group will provide expectations? perhaps a steering group comprised of ASDO & UASDO representatives? (R8)	Desirable	0.0%	0.0%	0.0%	54.5%	45.5%	100.0%	Yes		
10					Feasible	0.0%	9.1%	0.0%	63.6%	27.3%			90.9%	Yes
11	Competition	3	Collaboration between ASDO's and UASDO's could improve if both groups were incentivized to support each other's work.	1. this will be key to any successful collaboration (R8) 2. Both groups could have collaborative events. A conference could be held where they would work on related sections of their respective standards. (P5) 3. Egos and politics are the obstacles. (P10)	Desirable	0.0%	0.0%	9.1%	45.5%	45.5%	91.0%	Yes		
12					Feasible	0.0%	9.1%	27.3%	63.6%	0.0%			63.6%	No
13	Competition Oversight	4	Having formal liaisons (reciprocal representation) between ASDO's and UASDO's could improve collaboration.	1. I do not think it has worked in the past. It does ensure agenda items are covered, but most behavior is not true partnership. (P13) 2. provide a forum at each others stated meetings for the liaisons to report on current activities, conflicts and trends (P8) 3. Volunteers from each group could liaison and report on progress from either side. (P5)	Desirable	0.0%	0.0%	18.2%	18.2%	63.6%	81.8%	Yes		
14					Feasible	0.0%	0.0%	0.0%	54.5%	45.5%			100.0%	Yes
15	Competition Deregulation	5	Defining clear areas of responsibility could improve collaboration between ASDO's and UASDO's.	1. This would help. Even knowing the Venn Diagram. We have done this in the past, and most time it disputing that the other group is not better covering what they say they do. (P13) 2. provide a forum at each others stated meetings for the liaisons to report on current activities, conflicts and trends (P8) 3. This has to be done. As both groups work together, clearly defined boundaries must be developed so they don't step on each others toes and get frustrated. (P5)	Desirable	0.0%	0.0%	9.1%	45.5%	45.5%	91.0%	Yes		
16					Feasible	0.0%	0.0%	18.2%	63.6%	18.2%			81.8%	Yes

Appendix O: Round 1 Instructions

Dear :

Again, thank you for agreeing to be part of this important study. Your unique identification code is [Code]. Please do not share this code with anyone. This code will be used throughout the study.

When you are ready to answer the Round 1 questionnaire, please click on the following link [link], or copy and paste this link into your browser. When prompted, please enter your unique identification code. The questionnaire is designed so that you can save your work at any time. When you have finished and reviewed your answers, please click on the "submit" button. Once you submit your answers, you will not be able to change them, so please review your answers carefully.

To recap, the basic research question is how could collaborative practices be improved between Accredited U.S.-based Industrial Standards Development Organizations and Unaccredited Industrial Standards Development Organizations?

The Round 1 questionnaire is composed of seven questions. The first six questions are based on the major themes that emerged from the literature reviews. Please provide between three and five suggestions for each of the first six question, and add any comments you would like. Question seven presents an opportunity for other suggestions such as additional themes. Answers and comments should be short if at all possible in order for you to complete this questionnaire quickly (30 to 45 minutes) and not burden your time.

Any responses are acceptable – positive, negative, or merely commentary. Answers and comments that may appear extreme are just as valuable as more mainstream answers and comments. If you are not sure how to respond to a particular question, please do the best you can. This study is designed to seek your opinion with as little influence as possible from me as the researcher. Even so, if you feel there is need for clarification, please contact me at XXX@waldeu.edu.

Please complete the questionnaire in 3 weeks. During the third week, I will send out two reminder e-mails, unless you have already completed the questionnaire. Failure to respond could result in being removed from the panel. To protect confidentiality, it is recommended that you do not share your involvement or results with anyone.

Thank you again for your participation and I look forward to seeing your responses.

Appendix P: Round 1 SurveyGizmo Instrument

First Round Questionnaire - Accredited vs Unaccredited

Standard Development Organizations in the U.S.
Competition
Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 1: In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

1st Suggestion *

Competition

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 1: In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

2nd Suggestion

Competition

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
& UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 1: In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

3rd Suggestion

Competition

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 1: In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Competition

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 1: In what ways could collaborative practices be improved between ASDOs and UASDOs in order to reduce competition and conflict? (Theme - Competition)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

5th Suggestion

Deregulation

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 2: How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

Question 2
1st Suggestion *

Deregulation

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 2: How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

2nd Suggestion

Deregulation

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 2: How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

3rd Suggestion

Deregulation

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 2: How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Deregulation

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 2: How could deregulation laws be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Deregulation)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

5th Suggestion

Oversight

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 3: In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

Question 3
1st Suggestion *

Oversight

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 3: In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

2nd Suggestion

Oversight

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
& UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 3: In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

3rd Suggestion

Oversight

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
& UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 3: In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Oversight

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 3: In what ways could government or other third party oversight improve collaborative practices between ASDOs and UASDOs? (Theme - Oversight)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

Question 4
5th Suggestion

Organizational Structure

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
& UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 4: What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

1st Suggestion *

Organizational Structure

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 4: What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.
2nd Suggestion

Organizational Structure

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 4: What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.
3rd Suggestion

Organizational Structure

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 4: What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Organizational Structure

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 4: What changes to either ASDO or UASDO organizational structures might improve collaborative practices? (Theme - Organizational Structure)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

Question 5
5th Suggestion

Leadership Training

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 5: What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

1st Suggestion *

Leadership Training

Page description:

Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 5: What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

2nd Suggestion

Leadership Training

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 5: What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

3rd Suggestion

Leadership Training

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 5: What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Leadership Training

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 5: What leadership training could improve collaborative practices between ASDOs and UASDOs? (Theme - Leadership Training)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

Question 6
5th Suggestion

Market Driven

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 6: In what ways could the market-driven, bottom-up U.S. approach to the development of standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market Driven)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

1st Suggestion *

Market Driven

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 6: In what ways could the market-driven, bottom-up U.S. approach to the development of standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market Driven)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

2nd Suggestion

Market Driven

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 6: In what ways could the market-driven, bottom-up U.S. approach to the development of standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market Driven)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

3rd Suggestion

Market Driven

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 6: In what ways could the market-driven, bottom-up U.S. approach to the development of standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market Driven)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

4th Suggestion

Market Driven

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations)
& UASDOs (Unaccredited Industrial Standard Development Organizations)

Question 6: In what ways could the market-driven, bottom-up U.S. approach to the development of standards be leveraged and/or changed to improve collaborative practices between ASDOs and UASDOs? (Theme - Market Driven)

Please try and provide at least 3 suggestions. Up to 5 suggestions are permitted. There is no limit to the length of a response. However, keep responses succinct in the interest of completing the questionnaire quickly.

5th Suggestion

Additional Suggestions (If Any)

Page description:
Definitions: ASDOs (Accredited U.S.-based Industrial Standard Development Organizations) & UASDOs (Unaccredited Industrial Standard Development Organizations)

If you have any additional suggestions that might fit under themes not covered, please make them here.

31. Additional Suggestions
Thank You!

Thank you for taking this questionnaire

Appendix Q: Results From Round 1 and Round 2 Instructions

Dear :

Again, thank you for agreeing to be part of this important study. Attached you will find the results of Round 1.

When you are ready to answer the Round 2 questionnaire, please click on the following link [link], or copy and paste this link into your browser. When prompted, please enter your unique identification code. The questionnaire is designed so that you can save your work at any time. When you have finished and reviewed your answers, please click on the "submit" button. Once you submit your answers, you will not be able to change them, so please review your answers carefully.

To recap, the basic research question is how could collaborative practices be improved between Accredited U.S.-based Industrial Standards Development Organizations and Unaccredited Industrial Standards Development Organizations?

The Round 2 questionnaire is composed of [ ] primary questions, each potentially with two secondary questions. Please rate each question using the five-point Likert-type scales provided. Like the Round 1 questionnaire, the Round 2 questionnaire should not take you more than 30 to 45 minutes to complete. Comments are welcome but should be kept short in order not to burden your time.

If you are not sure how to respond to a particular question, please do the best you can. Please complete the questionnaire in 3 weeks. During the third week, I will send out two reminder e-mails, unless you have already completed the questionnaire. Failure to respond could result in being removed from the panel.

To protect confidentiality, it is recommended that you do not share your involvement or results with anyone.

If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you again for your participation and I look forward to seeing your responses.

Appendix R: Round 1 Results Cover Letter

Dear :

Attached is a document that presents the overview of the results from Round 1. The primary value of this document is that it indicates trends in responses. Reading the entire document closely is probably not required, however, you are welcome to do so. I would tend to focus on the short summary at the end of the document as this lays out the path for rounds two and three.

My plan is to provide each of you a link to the second round questionnaire by the end of today or early tomorrow.

If there are any questions, please let me know. Thank you.

Joel Blumenthal
Walden University

Appendix S: Round 1 Results Overview - Included as Attachment of Results

Results Cover Letter (See Appendix N)

Preface

Definitions: ASDOs = Accredited Standard Development Organizations (under ANSI). UASDOs = Unaccredited Standard Development Organizations. Acronyms for UASDOs include but are not limited to "Industry Consortiums", "User Groups", and "Vendor Groups".

The basic premise of the research question is that collaboration between U.S.-based Industrial ASDOs and UASDOs is a good thing. The "good" aspect of collaboration will continue to be the premise of this study.

Please keep these definitions and comments in mind as you review the following.

Overview of Round 1

The primary themes that resulted from the literature review are listed below and formed the basis for the first round questions:

1. Competition
2. Deregulation
3. Oversight
4. Organizational Structure
5. Leadership Training
6. Market-Driven

These are very broad terms and subject to interpretation. My intention was to generate thoughts and suggestions so I did not attempt to define these terms outside of the context in which the questions were written. Highlights based on feedback from Round 1 are as follows:

Competition

There was general agreement that ASDOs and UASDOs could be doing a better job of collaborating. While improvements in communication tended to be the central theme for improving collaboration, there was considerable diversity regarding what steps could be most effective. Highlights related to improved collaboration included:

1. Assignment/Alignment of Responsibility and Goals

2. Liaisons between different groups
3. Joint Meetings
4. Better Meeting Planning
5. Role of Industry/Trade Groups
6. Joint Training
7. Joint Presentations
8. Sharing of Information
9. Shared Protocols

Deregulation

There were definitely differences of opinion regarding the value and impact of regulations. Some panel members felt that regulations simple added layers of bureaucracy to an already over regulated process and really did not help collaboration. Others felt that regulations were needed to encourage or even force collaboration. Still others felt that more or less regulations would have little effect on collaboration. Highlights related to improved collaboration included:

1. Types of Regulations
2. Effects of Regulations
3. Value of Regulations
4. Regulations at the State level
5. Regulations at the Federal level
6. Navigation of Regulations

Oversight

There was general agreement that oversight could be a good thing. Several members pointed out that ASDOs already agree to some form of oversight by agreeing to follow ANSI's "Essential Requirements". Most panel members felt that if oversight were to be put in place, a consumer-type group would probably be best. While government oversight was not uniformly dismissed as a possibility, there was general agreement that government organizations lacked the technical skills to really provide any sort of meaningful oversight. Whether oversight should be mandatory or voluntary was a point of contention. Highlights related to improved collaboration included:

1. Consumer Group Oversight
2. Government Oversight
3. Mandatory Oversight
4. Voluntary Oversight
5. Responsibilities of an Oversight Organization

6. Value of Oversight

Organizational Structure

There was general agreement that charters of ASDOs and UASDOs which were more in alignment with one another could promote collaboration. Several panel members also felt that some organizations (ASDOs in particular) were simply too large, and restructuring them could improve collaboration by making them more responsive to industry and consumer needs. Formalizing liaison functions in particular seemed to be a general point of agreement with regard to improving collaboration. There was little disagreement that goals of ASDOs and UASDOs tended to be different, but that having different goals was not necessarily an impediment to collaboration. Rather, understanding different goals and focusing on changing organizational structures (charters) to work with as opposed to against another set of goals could improve collaboration. Highlights related to improved collaboration included:

1. Charters
2. Organizational Size
3. Sub-committee Responsibilities
4. Training (internal and external)
5. Formalizing Liaison Functions

Leadership Training

Some form of formal leadership training was recommended by most panel members, if for no other reason, than most leaders of ASDOs and UASDOs come from forprofit backgrounds and ASDOs and UASDOs tend to be incorporated as nonprofits. Training was also recommended, not just for leaders, but for all volunteer members. There seemed to be a general opinion that many volunteer members are just thrown into their roles and must learn as they go. Joint training of leaders of different organizations was also suggested by several panel members as a way to improve collaboration by getting everyone on the same page (so to speak). Highlights related to improved collaboration included:

1. Collaboration Training
2. Empowerment Training
3. Leading-by-Example Training
4. Servant-Leadership Training
5. Feedback Training
6. Joint Training
7. Emotional Intelligence Training

Market-Driven

There was general agreement that changing market drivers/forces was probably not a good way to approach collaboration. Market drivers/forces are what they are, and finding better ways to work within existing structures was probably a better approach to improving collaboration. Industry/Trade Groups were often singled out as organizations that could improve collaboration by making more of an effort to inform ASDOs and UASDOs what was expected to support industry and consumer needs. Several panel members suggested formalizing involvement by Industry/Trade Groups could improve collaboration. Highlights related to improved collaboration included:

1. Consumer Needs
2. Industry Needs
3. Reducing Complexity and Duplication of Effort
4. Industry/Trade Group Involvement
5. Reward Structures
6. Healthy Competition

Summary

Although standards tend to be a Domestic and International issue, this study is narrowly focused on steps that could be taken to improve collaboration between ASDOs and UASDOs in the United States. Of the suggestions made, I expect that some are deemed more practical than others. Suggestions from Round 1 will be consolidated into statements for Round 2. For Round 2, panel members will be asked to cast a vote for each statement. Only statements that pass the "consensus" test (frequency of responses for options 4 and 5 [agree and strongly agree] on a five-point Likert-type scale account for ≥70% of the panel members' responses) will pass to Round 3. In Round 3, panel members will be asked to vote on the desirability and feasibility of statements that pass the consensus test from Round 2. The results will be tabulated in the final report and then presented to significant stakeholders.

Appendix T: Round 2 Questionnaire – Proposed Template

The following primary statements were identified by participants in this study in response to the first round questionnaire. **In addition to rating the primary question, please rate each statement as to both desirability and feasibility.** Comments are optional.

Primary Statement	**Desirability** (Is the primary statement option desirable or undesirable?)	**Feasibility** (Is the primary statement option feasible or infeasible)
1.Strongly Disagree	1 Highly Undesirable	1 ☑ Highly Infeasible
2.Disagree	2 ☑ Undesirable	2 Infeasible
3. Neither Agree or Disagree	3 Neither Desirable nor Undesirable	3 Neither Feasible nor Infeasible
4. Agree	4 Desirable	4 Feasible
5. Strongly Agree	5 Highly Desirable	5 Highly Feasible
Comments? (Optional)		

More Primary Statements following a similar format.

Appendix U: Round 2 Questionnaire – Actual Template

The following primary statements were identified by participants in this study in response to the first round questionnaire. Comments are optional.

Primary Statement
1.Strongly Disagree
2.Disagree
3. Neither Agree or Disagree
4. Agree
5. Strongly Agree
Comments? (Optional)

More Primary Statements following a similar format.

Appendix V: Round 2 Results and Round 3 Instructions

Dear :

Again, thank you for agreeing to be part of this important study. Attached you will find the results of Round 2.

When you are ready to answer the Round 3 questionnaire, please click on the following link [link], or copy and paste this link into your browser. When prompted, please enter your unique identification code. The questionnaire is designed so that you can save your work at any time. When you have finished and reviewed your answers, please click on the "submit" button. Once you submit your answers, you will not be able to change them, so please review your answers carefully.

To recap, the basic research question is how could collaborative practices be improved between Accredited U.S.-based Industrial Standards Development Organizations and Unaccredited Industrial Standards Development Organizations?

The Round 3 questionnaire is composed of [ ] primary questions, each potentially with two secondary questions. Please rate each question using the five-point Likert-type scales provided. Like the Round 2 questionnaire, the Round 3 questionnaire should not take you more than 30 to 45 minutes to complete. Comments are welcome but should be kept short in order not to burden your time.

If you are not sure how to respond to a particular question, please do the best you can. Please complete the questionnaire in 3 weeks. During the third week, I will send out two reminder e-mails, unless you have already completed the questionnaire. Failure to respond could result in being removed from the panel.

To protect confidentiality, it is recommended that you do not share your involvement or results with anyone.

If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you again for your participation and I look forward to seeing your responses.

Appendix W: Round 2 Results Cover Letter

Dear :

Attached are two word documents. The first word document (Overview of Round 2 Results) provides an overview of the results from Round 2. The second word document (Consensus Results of Round 2) presents specific data for those statements where panel member responses met the definition of "consensus". I am very encouraged that panel members did believe, in one way or another, improved collaboration between all stakeholders was a possibility.

In the third and final round, I will be asking panel members to weigh in on what they believe is the desirability and feasibility of acting upon statements that met the definition of consensus from Round 2. You should receive a link to the third and final questionnaire before the end of this week.

If there are any questions, please do not hesitate to contact me.

Joel Blumenthal
Walden University

Appendix X: Round 2 Results Overview

Included as Attachment of Results Cover Letter (See Appendix U)

Dear :

The following is an overview of the results of Round 2.

Preface
(ASDOs vs UASDOs)

Experts (per the literature) tend to agree that the role of Accredited Standards Development Organizations (ASDOs) is relatively well understood. In the case of this study, the focus is on organizations accredited by ANSI. The role (and definition) of Unaccredited Standards Development Organizations may not be so well understood. Unaccredited organizations (generally referred to in the literature as "Consortia") often provide many of the same functions as accredited organizations in that they develop concepts that if widely adopted, are often utilized by regulatory bodies and other stakeholders. The following link may be of interest for those that wish to know more about how unaccredited organizations can or do participate in the development of standards (http://www.consortiuminfo.org/essentialguide/creating.php).

An Overview of the Results From Round 2
(By Theme)

Competition

Under the umbrella of Competition, improved cross-pollination in the form of more discussion and dialog between ASDOs and UASDOs garnered the most support from panel members as a way to improve collaboration. One interpretation is that the panel members were suggesting that reducing silo mentalities and encouraging productive interaction could improve collaboration between ASDOs and UASDOs.

Deregulation

The use of regulations to improve collaboration between ASDOs and UASDOs was often met with skepticism. While some statements that fit under the theme of deregulation did meet the definition of consensus, opinions varied greatly. Some felt more regulations had too much of a "stick" feel and would not improve collaboration. Concern was also expressed that more regulations could complicate what is already a regulated process. One the other hand, some panel members felt that more deregulation might simple result in greater chaos.

Oversight

Oversight to improved ASDOs and UASDOs collaboration was generally viewed as potentially positive. However, even those statements that met the definition of consensus came with caveats from the panel members. As a general rule, "carrots" were preferred to "sticks". The real questions seemed to revolve around which carrots were most effective, and how to deploy these carrots. Government oversight was generally not viewed in a favorable light, and there was also general consensus that ASDOs and UASDOs would have to buy in to oversight if oversight was to be effective in improving ASDO and UASDO collaboration.

Organizational Structure

Statements under the theme of organizational structure were often closely related to those under the theme of competition. The most popular statements were those that addressed how changes to organization structures might improve discussion and dialog between ASDOs and UASDOs. In general, changes to organizational structures that still supported organizational goals while improving communication were viewed in a positive light.

Leadership Training

Several panel members pointed out that focusing on just leadership training was not by itself going to promote better collaboration. However, training in general regarding a variety of topics and at various levels was often supported as a way to improve collaboration by encouraging understanding of the larger picture.

Market-driven

Industries and Trade Groups were generally viewed by panel members as a potentially positive force for improving collaboration between ASDOs and UASDOs. Again, many of the opinions were focused on improving understanding and communication. Statements that received the greatest support were those that suggested Industries and Trade Groups could play a larger role in getting all stakeholders to work more closely and productively.

Conclusion

Please keep the previous impressions in mind when reviewing the actual consensus results from Round 2.

Appendix Y: Third Round Questionnaire - Proposed Template

The following primary statements were identified by participants in this study in response to the second round questionnaire. **In addition to rating the primary question, please rate each statement as to importance and confidence.** Comments are optional.

Primary Statement	**Importance** (In Comparison with other Statements)	**Confidence** (In your assessment of the primary statement and the importance you assigned to the primary statement in comparison with other statements)
1 Strongly Disagree	1 Highly Unimportant	1 Very Unconfident
2 Disagree	2 Unimportant	2 Unconfident
3 Neither Agree or Disagree	3 Neither Important nor Unimportant	3 Neither Confident nor Confident
4 Agree	4 Important	4 ☑ Confident
5 ☑ Strongly Agree	5 ☑ Highly Important	5 Highly Confident
Comments? (Optional)		

More Primary Statements following a similar format.

Appendix Z: Third Round Questionnaire - Actual Template

The following primary statements were identified by participants in this study in response to the second round questionnaire. P**lease rate each statement as to desirability and feasibility.** Comments are optional.

Primary Statement	**Desirability** (Is the primary statement option desirable or undesirable?)	**Feasibility** (Is the primary statement option feasible or infeasible)
	1 Highly Undesirable	1 ☑ Highly Infeasible
	2 ☑ Undesirable	2 Infeasible
	3 Neither Desirable nor Undesirable	3 Neither Feasible nor Infeasible
	4 Desirable	4 Feasible
	5 Highly Desirable	5 Highly Feasible
Comments? (Optional)		

More Primary Statements following a similar format.

Appendix AA: Round 3 Recap and Overview of Study Results

Dear :

The following is an overview of the results of Round 3. I have attached a spreadsheet that includes the results as well as comments, and a table that shows only statements where feasibility met the definition of consensus. My focus tended to be on what the panel members felt was feasible, and from this perspective the attached table is much easier to read.

Round 3 was by far the most interesting in that the results provided a glimpse of what might be possible as far as improved collaboration is concerned. Overall, the results were as follows:

1. 27 of the 31 statements from a "desirability" perspective met the definition of consensus (agree & strongly agree ≥70% of responses). I am not terribly surprised that most of the statements met the definition of consensus because the statements from Round 2 that passed to Round 3 had already been culled by the panel members for ideas that were considered bad.

2. 12 of the 31 statements from a "feasibility" perspective met the definition of consensus (agree & strongly agree ≥70% of responses). I think feasibility of ideas is the real heart of this study. Ideas that are not considered feasible, even if desirable, are probably non-starters.

3. No statements that failed the desirability consensus test passed the feasibility consensus test. I actually would have been surprised if an idea (a good idea anyway) was considered feasible, but not desirable.

There is much room for additional research, but there were many opinions that indicated improved collaboration could be achieved without draconian measures. As was often pointed out, organizations will tend to respond to what they believe is in their best interests, and finding the right carrots would probably be more effective than finding the right sticks.

Comments by panel members also shed light on what approaches could make feasibility a reality. Some of the comments also pointed out weaknesses in this study. However, this too was valuable information because future research could improve on the approaches used in this study. Of note (in my opinion) were the following:

1. Silos between various stakeholders (primarily ASDOs, UASDOs, and End Users) need to be broken down if collaboration is to improve (OK, pretty obvious).

2. There are ways to break down silos that do not create clear winners and losers and generally revolve around incentivizing communication and cooperation.

3. Industries and Trade Groups could play a much larger role in getting ASDOs and UASDOs to collaborate more effectively (especially by incentivizing communication and cooperation), and all stakeholders could potentially benefit from a less bureaucratic and contentious environment.

4. Changing organizational structures and/or changing regulations (although in some cases considered desirable) are not necessarily required to get ASDOs and UASDOs to collaborate more effectively in a market-driven environment as long as power structures are not threatened.

5. Leadership training, while maybe desirable, is probably not going to create the incentives required to promote collaboration.

Specific suggestions that garnered support included:

1. Creating liaisons and/or divisions within both ASDOs and UASDOs tasked with improving communications between ASDOs and UASDOs through sharing of information, training, and increasing understanding.

2. Industry and Trade Groups need to become more active participants in providing guidance as to what they expected from ASDOs and UASDOs.

3. Oversight in some form could have a positive impact upon collaboration, but I think this gets back to the whole issue of improving communication and providing guidance.

The underlying theme behind these suggestions was, how to come up with the incentives that would encourage collaboration. Virtually no one felt that creating such incentives could happen without some serious mind-set recalibrations, but that mind-set recalibrations could be accomplished if there were the proper incentives to do so.

Possibly the most important suggestion I got out of this study was that Industry and Trade Groups could improve collaboration by taking a more active role in providing guidance to ASDOs and UASDOs. If Industry and Trade Groups are not on the same page, then how can ASDOs and UASDOs be expected to work together?

What the final study will look like is still very much a work in progress. At the moment I can only state that I was more encouraged than I thought I would be, and thank you all for your time and input. It will probably be several months before the final study is blessed, and you will all be provided a copy. The “Holy Grail” (so-to-speak) is to create a study that everyone can at least agree was done well, even if not everyone agrees with the results. We shall see. Thank you again for your time and input.

Appendix AB: Final Results

Dear :

Thank you for agreeing to be part of this important study. Attached you will find the final results of this study.

If there are any questions, please do not hesitate to contact me at XXX@waldenu.edu. Thank you again for your participation.

Appendix AC: Permission to Cite

Hi, Joel—

You may certain cite the paper—since it is a working paper, it shouldn't require authors' permission to cite. And I'd love to know more about your dissertation. Craig Murphy and I are currently revising a book manuscript on the history of private, voluntary standard setting from the late 19th century to the present. I'd love to know about your findings, and perhaps to cite them.

Best,

JoAnne

From: Joel A. Blumenthal [mailto:joel.blumenthal@waldenu.edu]
Sent: Wednesday, January 24, 2018 10:38 AM
To: JoAnne Yates <jyates@mit.edu>
Cc: Karla S. Phlypo <karla.phlypo2@mail.waldenu.edu>
Subject: Permission to Cite

Hello Dr. Yates:

My name is Joel Blumenthal and I am a Doctoral Student at Walden University. I am hopefully about a month from graduation. My dissertation is focused on Industrial Voluntary Consensus Standards, and what I will call the growing battle between Standard Development Organizations accredited by ANSI, and those that are not. I have been involved with Industrial VCSs since the mid-80s starting with 3A. The working paper authored by you and Dr. Murphy has been key to my research, but I noticed as I was doing a final links check that your paper now requires authors permission to cite.

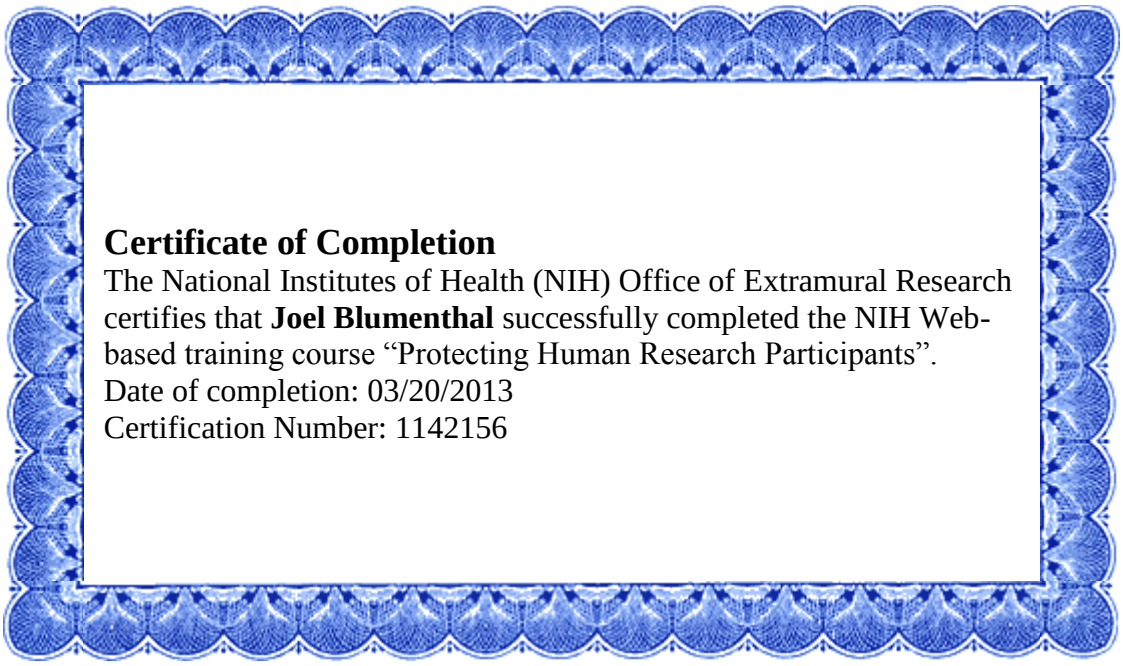
So this is a formal request to obtain permission to cite this paper. For your information, I have included what Google Scholar currently lists as the citation reference. If permission is granted, I would appreciate any guidance as to how you would like me to include the citation in the reference section of my Dissertation. I have included my chair, Dr. Phlypo, on this e-mail. Thank you for your time.

Sincerely,

Joel Blumenthal

Yates, J., & Murphy, C. N. (2015). *The Role of Firms in Industrial Standard Setting: Participation, Process, and Balance*. Working Paper 5124–14, Sloan School of Management, Massachusetts Institute of Technology

Appendix AD: National Institutes of Health (NIH) Extramural Research Certificate



Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Joel Blumenthal** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 03/20/2013

Certification Number: 1142156