Assessing ISO 14000 Adoption: Towards a Model of Acceptance

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ABSTRACT
The ISO 14000 certification standard is a relatively new development. Based on the highly successful ISO 9000 certification standard in quality, ISO 14000 is oriented towards environmental performance. Since its release, the ISO 14000 standard has generated a great deal of discussion. Its rate of acceptance has not mirrored the rate previously observed for the ISO 9000 standards. In the United States, some firms have announced that they have no interest in being ISO 14000 certified, while others have committed themselves to this standard. To resolve the apparent paradox, this paper attempts to identify the determinants of ISO 14000 adoption, and why those determinants are important. Based on a survey sample consisting of some 1500 respondents, the paper also presents some initial findings.

DEFINING THE ISO 14000 CERTIFICATION STANDARD
Before we can address ISO 14000, we must first understand what it is and the potential advantages of it. To that end, we must clarify the terms that we shall use in this paper. When we refer to ISO 14000, we are referring to "the generic title to a series of environmental management standards that address six distinct but related subjects" (Cascio 1996). That is, we are referring to the larger umbrella of environmental management standards, as defined by ISO, the International Organization for Standards. The narrower term of ISO 14001 refers to the published certification standard, which covers one of the six areas in the ISO 14000 series, the area being environmental management systems. As the ISO 14001 specification is published, a firm can be audited against it to ensure that the firm is meeting all of the requirements.

INTRODUCTION
The year 1996 saw the introduction of a new international standard, ISO 14000. This new standard attempts to build on the success and experience of its predecessor, the ISO 9000 standards and its variants (such as QS 9000). However, while the ISO 9000 series focused on quality and the processes developed within the firm for the definition, implementation, monitoring and assessing of quality-related issues, ISO 14000 focuses primarily on the environmental management systems developed by firms.

There are many unresolved questions regarding the extent to which this certification standard will be accepted within the marketplace. This paper presents a conceptual model of factors affecting the corporate decision to undertake ISO 14000 certification. In addition, this paper will summarize the major features of a major study into ISO 14000 acceptance and implementation. This study, currently consisting of some 1500 returned surveys, focuses on user acceptance and perceptions of not only ISO 14000 but also Total Quality Management, Environmentally Responsible Manufacturing and Environmental Programs. This study has been funded by grants from the National Science Foundation (NSF), the Center for Advanced Purchasing Studies (CAPS) of the National Association of Purchasing Management, and the Education and Research Foundation of the American Production and Inventory Control Society (APICS). Finally, the paper will report some preliminary findings from the survey.

PROPOSED MODEL
The proposed model is predictive in nature. That is, we are attempting to provide a framework for understanding the conditions that may lead a firm to choose to achieve ISO 14001 certification. We believe that this model will prove quite useful to the environmentally responsible manufacturing research stream. This is because our initial research leads us to believe that ISO 14000 is a very good proxy for the idea of environmentally responsible manufacturing as a whole.

The development of our model is based on a series of research projects we are conducting regarding environmentally responsible manufacturing. As part of this research stream, we have visited a number of firms in order to gain an understanding of the issues involved with environmentally responsible manufacturing. These visits
were invaluable in helping us develop the constructs in our model. Our model appears in Figure 1. Note that we intend to analyze the model using structural equation modeling techniques, and have thus used that notation in the figure.

The first construct in our model is “Knowledge of ISO 14000.” Obviously, if a firm knows little about the certification, it is unlikely that they are a prime candidate for undertaking it. As the ISO 14001 certification is still fairly new, it is reasonable to believe that firms that do have a good knowledge of ISO 14000 have more than just a passing interest in achieving certification. This was borne out quite clearly in our plant visits, as a number of managers mentioned that one of the largest obstacles they face in getting ISO 14001 projects approved is a lack of understanding about the certification and its potential impact on the firm.

Rothery (1995) stated that the growth of the ISO 9000 series was customer or market driven. Further, he described ISO 9000 as “voluntary.” On the other hand, he said that ISO 14000 “is totally driven by compliance with environmental regulations.” This view, that ISO 9000 has grown due to customer demand, and that ISO 14000 may grow primarily due to governmental decree, is a oft-expressed idea in articles about ISO 14000 (Hourahan 1996, Boiral and Sala 1998).

Conversely, Begley (1996) offered a different argument. He stated that outside the United States, “regulatory systems are less stringent, less prescriptive and less adversarial,” so ISO 14000 could be used to show a commitment to environmental performance. No matter how this argument is analyzed, the influence of government regulations on the adoption rate of ISO 14000 cannot be denied. Thus, in our model, we have included a proposed construct of “Perception of Regulatory Uncertainty”.

Similarly, all firms must deal with a changing competitive environment. Today’s business environment is so intense, it has been described by the term “hypercompetition” (see D’Aveni 1995; Ilinitch, D’Aveni and Lewin, 1996). A standardized certification allows a firm to cut through the fog of uncertainty, as it is a statement that a firm has adopted a world-wide standard of business practices. Each firm must make a judgment about its business environment uncertainty, and decide how to react to it. ISO 14001 certification is now available as one tool for a firm to deal with its business environment uncertainty. Thus, we included a “Perception of Competitive Environment Uncertainty” construct in our model.

Of course, the changes in the regulatory climate are a big part of the overall business environment. Thus, we need to show a relationship between the constructs of “Perception of Regulatory Uncertainty” and “Perception of Competitive Environment Uncertainty”, and we have done so in our model.

Naturally, a firm will also base its decision on whether or not to pursue ISO 14001 certification on the cost/benefit ratio that it perceives the certification to have. As mentioned previously, perhaps the firm is in a market where ISO 14001 certification will be required. In this case, the cost/benefit ratio is quite clearly in favor of achieving certification. In other situations, the cost/benefit calculation may be more complicated. For instance, ISO 14000 series may offer a firm lower compliance and operating costs (Hourahan 1996).

We have included this cost/benefit analysis in our model as “Perceived Performance Implications”. Obviously, this will have a direct bearing on the firm’s decision about ISO 14000. Of course, part of the calculation for the cost/benefit ratio will have to include the current business climate. That is why we show a relationship between “Perception of Competitive Environment Uncertainty” and “Perceived Performance Implication” in our model.

Given the early reports on ISO 14000, it appears that a firm’s experience with ISO 9000 has a direct bearing on the decision on whether or not to achieve ISO 14001 certification. As Begley (1996) reported, DuPont’s interest in ISO 14000 came about because its ISO 9000 program was longer-lasting and more beneficial than other programs the company initiated. Thus, it appears that a positive ISO 9000 experience would encourage a firm to obtain ISO 14001 certification. As some authors have noted, there may be advantage to obtaining both certifications. Due to a foundation of similar principles, firms that have achieved an
ISO 9000 certification should be familiar with the requirements for ISO 14001 certification. In any case, the firm’s ISO 9000 experience must be taken into account, so it is a construct in our model.

The firm’s stakeholders must also be considered in making this decision. For the purposes of this research, the primary stakeholders that we will be including are customers, stockholders and the local community. Obviously, pressure from any of these groups could influence the ISO 14000 decision. Thus, these groups must be accounted for in our model, and they appear as the construct “Stakeholder Demands.”

METHODOLOGY
An extensive survey was developed which covered not only the constructs involved in this model, but other issues relating to environmentally responsible manufacturing as well. The survey begins by asking for background information about the respondent. The next section asks for general information about the company’s business and uses a series of 11 point Likert scales to help describe the firm’s competitive environment. For those firms that were implementing or had implemented ISO 9000 or QS 9000, the next section used a series of 11 point Likert scales to describe their experience with this certification. The next section of the questionnaire asked the respondent about his/her knowledge about ISO 14000 and uncertainties surrounding ISO 14000. The final section asked about the firm’s environmental management system, environmental activities within the firm, and the product and process options that could be used at the firm. At the very end of the questionnaire, respondents were given some free-form space to describe any obstacles, potential or realized, to their firm implementing ISO 14000.

The survey was developed by the research team and pre-tested by 15 respondents in a three-round process over a period of two months. This group was represented a variety of positions and functions within various firms. The primary potential problem with the survey that pre-testers identified was concern over the length of the survey. We believed that the length of the survey was justified by the need to establish valid measures for the concepts that were included in the survey. Another reason for the length of the survey was the desire on our part to avoid socially desirable responding (SDR).

Three professional associations provided mailing lists of 5,000 names each. The constituency of each of the associations was different enough that only a handful of names were found on more than one list. A modified Dillman (1978) approach was used to mail out the survey. A first wave was sent to all the names on our mailing list. This mailing included the survey and letters of support from the sponsoring groups. A reminder postcard was used for the second wave. The third wave contained another copy of the survey. For each wave, a mailing was sent to each name on our mailing list, as the survey was conducted anonymously. The mailings were conducted in the fourth quarter of 1997.

RESULTS
To date, we have received approximately 1,500 responses. From these, we have made the following preliminary observations:

- First, it appears that the knowledge level that U.S. firms have about ISO 14000 is rather low. This may indicate that the amount of firms that are attempting to achieve ISO 14001 certification is also low.

- Also, there appears to be a backlash brewing against the idea of international standards. To a certain degree, this backlash is embodied by such works as Seddon’s (1997) recent book In Pursuit of Quality: The Case Against ISO 9000.

- The perceived cost of undertaking the certification process appears to be a large obstacle to its acceptance. This is not surprising, but this cost may change in the future, as firms and consultants grow more adept at working their way through the certification process.

- In the current business climate, there appears to be a lack of pressure from stakeholders to achieve certification. This may be very interesting to watch in the future. Will customers start to press for ISO 14001 certification? So far, at least in the U.S., that answer appears to be “no”.

We continue to receive responses, thus, we are still entering data. We expect to be able to hold a discussion of results at the National conference.

CONCLUSION
In this paper, we have proposed a model of ISO 14000 adoption. This new certification series, which deals with environmental performance, has generated a lot of discussion in practitioner publications, but not much research work. As its predecessor, ISO 9000, became quite popular, it appears that ISO 14000 may also become so. We described a study that we are conducting to determine if this will be the case. Early returns lead us to believe that ISO 14000 may have a tougher time gaining acceptance than its predecessor. We look forward to discussing the results of the study at the conference in order to understand why this may be the case.

REFERENCES AVAILABLE UPON REQUEST