



Environmental management systems (EMS) for small companies: a study in Southern Brazil

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ABSTRACT

Environmental Management Systems (or EMSs) have become an important tool for those organizations looking to manage their environmental issues such as pollution prevention, legal compliance, and minimizing the impacts their activities cause to the environment. Indeed, the benefits of having an EMS and ISO 14001 certification are mainly realized by large organizations, as small to medium enterprises (SMEs) have smaller turnover rates and thus a correspondingly smaller return on the costs of certification. This paper presents the results of a study aimed to check the views of small and large companies in the Southern Brazilian state of Santa Catarina on which should be the 17 requirements of an EMS that best suits the needs and realities of small businesses, according to ISO 14001. Given its objectives, this study is classified as exploratory research. As to its approach, this study represents quali–quantitative research, as it utilizes techniques and methods which are both quantitative and qualitative. With respect to the nature of this study it is classified as applied research, using bibliographic and field research as procedural techniques. The survey was conducted in two phases, the first of which researched the view of small businesses and the second, the view of big businesses. A *T*-test for independent samples was used to examine the hypothesis test. The small companies pointed out nine requirements with high levels of importance while the large companies pointed out only seven requirements. The results of both samples showed similar views, but with some differences for each set of companies surveyed.

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1. Introduction

Questions related to the environment receive greater highlight on companies' agendas with every day, whether they are large, medium, or small-sized enterprises. The vision that pollution is merely an undesirable consequence has gone beyond being endorsed by many organizations and has thus brought a tone of importance to firms that manage their environmental issues. In the face of this challenge, one of the actions companies have taken has been to opt to implement and certify environmental management systems, also known as EMSs. These in turn have been gaining ground, especially among large organizations, as a form of showing concern for the environmental issue and deal with the demands of more conscious markets and consumers.

An Environmental Management System (EMS) considers a company's organization through a thorough review of operations, and analyzes how a company's actions affect the environmental issues (ISO 14001, 2004). The 1990s were particularly rich both in

publications on EMS standards (such as BS 7750, EMAS, or ISO 14001) and books about the implementation process for these systems in companies in different sectors (Lamprecht, 1996; Tibor and Feldman, 1997; Hunt and Johnson, 1995; Kuhre, 1995).

Numerous studies have been conducted around the world on the implementation of EMS and their benefits (Hillary, 2004; Ávila and Paiva, 2006; Gavronski et al., 2008; Ridolfi et al., 2008; Heras-Saizarbitoria et al., 2011; and Jabbour, 2010). Among others, authors such as Porter & Van der Linde (1995), Bonifant and Ratcliff (1994), Klassen and McLaughlin (1996), and Melnik et al. (2003) have presented studies which have shown that organizational improvements in environmental performance are beneficial not only for the environment, but also for a positive relationship between improved environmental and corporate performance.

However, it is known that implementing an EMS demands important company resources such as time, money, and significant human resources involvement (Boudouropoulos and Arvanitoyannis, 1999; Hillary, 2004; Šelih, 2007; Pombo and Magrini, 2008; Seiffert, 2008; Heras and Arana, 2010). As such, there is a noticeable predominance among large companies involved in the management systems certification process in Brazil and around the world (Pombo and Magrini, 2008). Small companies which do not have the financial or

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human resources are left by the wayside in this process, in order to meet the minimum demands of the EMS implementation process.

The importance of micro and small companies upon Brazil's economic structure and employment can be verified through analyzing data from RAIS-*Relação Anual de Informações Sociais* (Annual Social Information Report) (BRASIL/MTE, 2008). Such data demonstrates that in 2008 close to 5.8 million establishments were responsible for 13.0 million formal jobs.

There are several existing studies in development which examine the main theme of small enterprise operations (Farah, 2004; Chavan, 2005; Longenecker et al., 2006; Silva and Pereira, 2006; Machado and Espinha, 2007; Šelih, 2007; Ramos et al., 2011; and Grapeggia et al., 2011). Currently, the importance of small companies as sources of employment and local development for the regions in which they are inserted has been widely discussed. In other words, the infinity of their important contributions to the economy has been widely discussed.

Motivated initially to identify forms of adapting the implementation of an EMS to the needs and possibilities of a small company, the present research was planned. The scope was to carry out this study together with a set of companies from the state of Santa Catarina, located in the southern region of Brazil, seeking to identify which of the 17 requirements of the ISO 14001 would be the most important in order to best adapt an Environmental Management System to the needs of small companies, according to the minds of small company managers. The results of this study generated information that contributed above all to better understand how an environmental management system must be built, given the reality of this kind of company.

Upon presenting these results in events in the areas of administration and production engineering, discussions emerged concerning the need to verify opinions surrounding the same question (more applicable ISO 14001 requirements to a small company EMS) within certified large companies. Thus, we opted to continue the research and apply the survey sent to small companies to the large EMS-certified companies (according to the ISO 14001) within the state of Santa Catarina.

There were two main questions which guided this second stage of the study: The first was, "Based on the fact that small companies normally supply their products and services to large companies, what would be the view of the large companies concerning the main requirements of an EMS for small companies?" The second was, "Would large companies agree or disagree with the small companies about the most important requirements for an EMS in a small company?"

Therefore, the main objective of this article is to present the results of a study which sought to identify which of the 17 ISO 14001 (version 2004) requirements would be the most applicable in elaborating an Environmental Management System (EMS) for small companies, using comparative analysis among data collected from small and large companies from Santa Catarina, Brazil.

However, it is very important to highlight that it was not the intention of this study to create an implementation model for small companies, since it is known that an implementation of an EMS containing only the ISO 14001 requirements selected herein would not lead to EMS certification.

Beyond this introduction, the article presents four more sections. The second section outlines the theoretical framework involved, presenting environmental management and small business themes. The third section presents the research methods, an item which is sub-divided into three sub-topics: i) methods of stage 1 of the study (small companies); ii) methods of stage 2 of the study (large companies); and iii) comparative analysis. This article also presents the research results and comparisons made, concluding with final considerations.

2. Environmental management and Brazilian small business

The term, "environmental management" is rather inclusive, frequently used to designate environmental actions in determined geographic areas, such as; environmental management of watersheds, environmental management of parks and forest reserves, environmental protection management, environmental management of biosphere reserves, and many other management modalities including environmental aspects, for example. One might say that environmental management is inserted into all human activities (Shigunov Neto et al., 2009).

However, the main focus of this article, environmental business management, is essentially linked to organizations, companies, corporations, firms, businesses, or institutions. In this sense, environmental management can be defined as a set of administrative and operational policies, programs, and practices which take into account protecting the environment through eliminating or minimizing the environmental impacts and damages which result from planning, implementing, operating, expanding, relocating, or closing down businesses or market-related activities – the operation and production of goods and services – including all the phases of the product life cycle (Selig et al., 2008).

2.1. Environmental management systems (EMS)

Among the diverse environmental management practices that large companies have resorted to in the recent years (cleaner production, eco-efficiency, life cycle assessment, among others), certified Environmental Management Systems (EMSs) have been receiving attention (Link and Naveh, 2006; Salomone, 2008; Viadiu et al., 2006; Albuquerque et al., 2007).

The first version of ISO 14001 (Environmental Management System: Requirements with guidance for use), the EMS standard from the International Organization for Standardization (ISO) was launched in 1996. Although since then it has become the most widely known EMS standard, is not the only one. According to Boudouropoulos and Arvanitoyannis (1999) the principles stated within the ISO 14001 environmental management system are not new. Most of them had already been stated by other programs, often with greater clarity and more rigor. The authors cite for example, the ten guiding principles of the Process Safety Code of Management Practices specified by the Chemical Manufacturers Association's (CMA) which were formally released by Responsible Care Initiatives. So, the ISO 14001 has been developed in the context of other EMS initiatives, such as the BS 7750 EMS standard and the European Union's Eco-Management and Audit Scheme Regulation (EMAS). Nevertheless, this paper will focus only in the requirements of ISO 14001 in its 2004 version.

An EMS is a part of an organization's management system which seeks to manage the environmental aspects related to the organization's activities, products, and services (Perotto et al., 2008; Campos and Melo, 2008). Under the normative point of view, ISO 14001 (ISO 14001, 2004) defines an EMS as a set of inter-related elements which are part of an organization's management system utilized to develop and implement its environmental policy and to manage its environmental aspects.

Using an EMS according to ISO 14001 permits an organization to formulate the policies and objectives which take into account legal requirements and information referring to significant environmental impacts through the implementation and fulfillment of 17 requirements.

It is also important to highlight that ISO 14001 is the only norm within the ISO 14000 set liable to certification. Since the first version of ISO 14001 in 1996, the number of certified companies throughout the world has continuously grown through this norm (Bansal and Hunter, 2003; Balzarova and Castka, 2008).

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