Factors Influencing Business Implementation of Environmental Management Systems

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Abstract—**This paper aims to explore the factors that influence environmental management systems implementation. It suggests a proposed framework based on primary data obtained from a content analysis of literature. The proposed framework in this study shows that two sets of factors influence the implementation of environmental management systems, namely external influences and internal influences (independent variables). There are also factors that will moderate the implementation of environmental management systems. In addition the framework recognizes that the implementation of environmental management systems can take place in a number of ways namely, formal, informal, energy reduction strategies, recycling practices and environmental management programs.**

Index Terms—**Corporate sustainability, environmental management systems, external factors, internal factors, moderating factors.**

I. INTRODUCTION

There is considerable consensus in all spheres of society about the need to develop in a manner that ensures economic prosperity, that respects the integrity of ecological systems, and that creates socially equitable communities. Nemetz [1] states that *"sustainable development is possibly the greatest challenge that humankind has ever faced"*. This is evident in the fact that since the introduction of the concept of sustainable development by the Brundtland Commission in 1987, there has been an increased awareness and concern amongst the general public [2] as well as organizations [3] about the ability of the planet to sustain human development.

This growing awareness and concern has prompted many businesses around the world to react and commit to corporate sustainability [4]. This new business imperative is indicated by the fact that over 2000 companies have signed up to the ten principles of ''global corporate citizenship of the Global Compact'' launched by the United Nations in 2000, covering human rights, workplace safety, justice, anti-corruption standards, and environmental management [5]. There has been a growth in South African signatories; currently 74 entities (both private and public) are signed up to the United Nations Global Compact in this country [6]. Businesses worldwide are also embracing the concept of corporate responsibility by reporting on their sustainability endeavors. In South Africa, the King III report requires all Johannesburg Stock Exchange-listed companies to produce integrated reports that reflect not only the financial position of these companies, but also their social and environmental impact [7].

The pressure to respond to the demand for more sustainable development poses a number of challenges and, at the same time, provides a myriad of new opportunities for businesses. In order to deal effectively with sustainability challenges, businesses will have to manage their impact on the natural environment, as this forms the basis for both economic and social development.

Businesses have been criticized for their contribution towards the ever-increasing rate of destruction of the natural environment. Although businesses have responded by adapting their management practices, production processes and products, they still face a number of challenges in reducing their environmental impact. One way in which businesses have responded to the environmental crisis is by implementing environmental management systems.

To ensure environmental sustainability, businesses can make use of an environmental management system. This article aims to understand the factors that influence business in environmental management systems implementation. To do this, environmental management and environmental management systems are first defined. Thereafter the driving forces and benefits of environmental management systems are discussed. The research problem, objectives and method is provided, the research results given and a framework proposed to explore the factors influencing the implementation of environmental management systems.

II. DEFINING ENVIRONMENTAL MANAGEMENT AND ENVIRONMENTAL MANAGEMENT SYSTEMS

Many definitions have been proposed for environmental management and environmental management systems. Kirk [8] describes environmental management as *"a broad term"* that deals with different environmental impacts, sustainability, the management of resources, and pollution. Filho [9], in his comparison between environmental education and environmental management, defined environmental management as an emerging body of knowledge concerned with the identification of *"processes, tools and instruments"* through which natural resources may be utilized or managed in a more sustainable manner. Another definition of environmental management is offered by Rowland-Jones, Pryde, and Cresser [10] in which they propose that it is a *"methodology"* used by businesses to ensure the environmental legitimacy of their operations through the use of structured assessments. In order to achieve this, businesses have to define the impacts of their activities on the natural environment [10]. They then propose

mitigating actions constrained by time to offset those impacts that they consider harmful. Strydom and King [11] described environmental management as "*the planning, doing, checking and acting activities*" of various decision-makers as they relate to the environment. Onkila [12] opted for a broad view of environmental management in his assessment of stakeholder interaction, as communicated in environmental reports and in interviews with environmental managers. This author states that environmental management is any action taken by businesses with the aim of minimizing environmental damage. According to Psomas, Fotopoulos, and Kafetzopoulos [13], environmental management should be seen as a vehicle to introduce sustainable development into production processes. In their study of the perceptions of environmental management and employee job attitudes in hotels, Chang-Hua, Chien-Yu and Hsiu-Yu [14] define environmental management as an on-going process initiated by management decisions to monitor activities and take the necessary steps to reduce any negative environmental impacts. Finally, Albertini [15], who performed a meta-analysis of research seeking to establish a link between environmental performance and economic performance, considers environmental management as technical and organizational actions geared toward the reduction of environmental impacts. Notwithstanding the myriad of definitions of environmental management, a brief and precise definition for environmental management remains elusive, and according to Strydom and King [11], the literature on this subject confirms this assertion.

A number of interesting deductions can be made from the different definitions of environmental management. Firstly, environmental management can be seen as a philosophical concept ("*a field of knowledge*" or "*a methodology*") [9], [10]. This kind of philosophical interpretation can be observed in the early stages of the development of environmental management theory. Secondly, environmental management is also used as a collective term describing a number of issues, actions, processes, and tools [8], [11], [12], [14], [15]. Thirdly, some authors [8], [13] have linked environmental management to the broader concept of sustainability, where others [12] see it as an opportunity to create a competitive advantage. Finally, the most common trend in most definitions of environmental management is that its objective is seen as reducing or preventing harm to the environment.

Given these observations, environmental management is defined as an organizational philosophy geared toward the protection and preservation of the natural environment by identifying relevant environmental issues, creating and implementing appropriate processes, and taking the necessary action.

Berry and Rondinelli [16] identified three distinct phases of environmental management development as:
- A passive stage during the 1960s and 70s, characterised by business activities aimed at coping with environmental problems as they occur, and controlling the resultant environmental damage;
- A reactive stage during the 1980s that saw businesses struggle to comply with environmental legislation and reduce the cost of compliance; and

- A proactive stage, starting in the 1990s when businesses started to anticipate their environmental impact and to reduce waste and pollution ahead of regulatory measures, while capitalising on opportunities associated with environmental management.

Garrod and Chadwick [17] identified a number of environmental management tools used by organizations. These tools include environmental reviews, environmental policies, environmental audits, clean technology, and product or process life-cycle assessments. Moreover, Berry and Rondinelli [16] asserted that businesses that adopt a proactive environmental management approach make use of waste minimization and prevention, demand-side management, design for environment, product stewardship, and full-cost (environmental) accounting as part of a structured approach to addressing their environmental impacts. Fresner [18], on the other hand, suggested cleaner production as a vehicle for effective environmental management. According to this author, cleaner production focuses on:
- Good housekeeping with materials and energy;
- Training of employees, better logistics, improvement in data availability, and communication between departments;
- Substituting raw and auxiliary materials with less harmful ones, or ones that can be used more efficiently or can be recycled internally or externally;
- Modifying products to eliminate production steps with large environmental impacts;
- Process modifications to minimise waste and emissions;
- Internal recycling; and
- Introducing waste into external recycling networks.

However, the most popular tool used in environmental management is an environmental management system. Spellerberg, Buchan and Englefield [19] define an environmental management system as a formalized, coordinated process or structure that assists businesses to address their environmental effects by way of policy development and implementation, allocation of responsibilities and resources, and the continual improvement of practices and performance based on monitoring and evaluation. Darnall, Jolley, and Handfield [20] support this definition by asserting that an environmental management system consists of a collection of internal policies, assessments, plans, and implementation actions that affect the business as a whole and its relationships with the natural environment.

Rowland-Jones *et al.* [10] state that an environmental management system requires a business to identify and register its environmental effects, while promoting continual environmental improvement. Stated differently, an environmental management system is a management system that is intended to encourage a business to control its environmental impacts and reduce such impacts on an on-going basis. Sadgrove [21] reiterates this by defining an environmental management system as a comprehensive, methodical, premeditated, regular, and documented system for managing a company's environmental impacts. Darnall, Gallagher, Andrews and Amaral [22] state that the goal of an environmental management system is to assist businesses with legal compliance and the identification, minimization,

and management of environmental risks, liabilities, and impacts.

An environmental management system has become an essential part of the daily activities of a business and is an important tool to guide the implementation of environmental planning, tasks, and operational, management, and conformance standards in businesses. It is also increasingly becoming a legal requirement [23]. A different view is held by Spellerberg *et al.* [19], who believe that a formal environmental management system is not vital to attain enhanced environmental performance. They argue that only an environmental policy that is supported, implemented, and continuously improved by a committee or task force is essential, suggesting a far less formal approach to an environmental management system.

As in the case of environmental management, the concept of an environmental management system has been defined in different ways by different authors. However, a closer investigation of these definitions reveals certain observable patterns. Firstly, unlike environmental management, which is a philosophy, an environmental management system is a framework, structure, or system that can be used to operationalize environmental management within businesses. Given this relationship between environmental management and an environmental management system, one could deduce that these concepts have the same objective: reducing or preventing the harm caused to the environment. Secondly, an environmental management system is not ad hoc in nature: it is a planned, formalized, methodological, integrated, and structured approach to addressing the environmental impacts of businesses. Thirdly, the cornerstone of an environmental management system seems to be an environmental policy, and the aim of the system is to ensure policy development, execution, and maintenance. Other key aspects of an environmental management system include the allocation of resources and responsibility, assessments and monitoring, and ultimately, continuous environmental improvement.

There are considerable differences in the types of environmental management systems that have been implemented by businesses over the years; and there are even environmental management systems that are suited to the needs of specific businesses, as suggested in Savely, Carson, and Delclos [24]. According to Spellerberg *et al.* [19], some of the options available are:
- The ISO 14001 framework;
- The European eco-management and audit scheme (EMAS);
- Total quality environmental management (arising in the USA from the global environmental management initiative (GEMI));
- Environmark (a registered trademark);
- Greenglobe 21; and
- The natural step (TNS) framework.

It should be noted that none of the above-mentioned environmental management system frameworks is an ideal model for any business. Each environmental management system still needs to be adapted to the specific circumstance within which it is implemented. In other words, a business has to consider both its internal capabilities and its external pressures when designing and implementing an environmental management system.

While a clear, uniform definition for environmental management still eludes researchers, more consistency can be observed in terms of the steps of developing an environmental management system. Developing an environmental management system was seen as consisting of five steps: an environmental policy, environmental planning, implementing and operating the environmental management system, checking and taking corrective actions, and management's review of the environmental management system.

III. DRIVING FORCES AND BENEFITS OF AN ENVIRONMENTAL MANAGEMENT SYSTEM

Sadgrove [21] states that an environmental management system reduces the business' environmental risk by controlling its impacts in a comprehensive and systematic manner. Furthermore, an environmental management system can be used to exhibit legal compliance to regulatory authorities. Other benefits of an environmental management system relate to its contributions to continuous improvement and cost reduction. An independently verified environmental management system demonstrates a business' environmental integrity to the outside world and can help win contracts.

The main driving forces for the implementation of an environmental management system in industry are to satisfy customer requirements, to ensure legal compliance, to improve risk management (e.g. reduce risk for uncontrolled emissions), to improve public image, and to use the potential to save money and natural resources in a systematic way [25]. Spellerberg *et al.* [19] point out the following operational and conformance benefits of implementing an environmental management system:
- help a business to set and meet environmental objectives;
- enable co-ordination;
- assist with compliance at national and international levels; and
- improve continuity in environmental management if there are any changes in key staff.

Arvidsson [26] states that environmental initiatives can also be important marketing tools. Implementation of an environmental management system can also have a positive effect on employee morale. As employees are often the initiators of environmental practices, having their voices heard will boost staff morale and productivity. Staff will feel that they are part of the business and that they have a hand in what happens to it [27].

Taking it a step further, Noeke [28] reported on the benefits of a certified environmental management system. This study emphasized the following advantages:
- A complete, documented, environmental management system offers complete transparency.
- Responsibilities and competencies are communicated clearly and completely.
- The risk of penalties and punishments can be reduced by the transparency, the documentation, and the routine check of the environmental management system.

- A good relationship is fostered with authorities by ensuring compliance through an effective environmental management system.
- This effect of a positive relationship permeates through to other important stakeholders such as communities and environmental groups.
- Costs are reduced because operations and management are performed more efficiently.
- Employees are more motivated because they work in a safe and environmentally friendly business.

Darnall *et al.* [20] reiterate some of these benefits by stating that "*organizations that adopt environmental management systems, regardless of their form, can benefit from improving their regulatory compliance, which in turn can enhance their corporate image and increase profits.*" Similarly, Rowland-Jones *et al.* [10] report that advocates of the link between environmental and financial performance have argued that pollution reduction provides future cost savings by increasing efficiency, reducing compliance costs, and minimizing future liabilities.

Sammalisto and Arvidsson [25] take a different approach to classifying driving forces behind environmental management system implementation. They identify internal and external driving forces. The following is a discussion of both:

- The most popular internal driving forces include interest and engagement from staff, management and board members, and customers. Customers include both present as well as future consumers of a business' products or services.
- The most popular external driving forces identified were government directives, co-operative partnerships with local communities or regional and national networks, and upholding the 'green' reputation of a business.

In addition to environmental performance and compliance improvements, most of the facilities participating in a survey reported that an environmental management system provided several other benefits that included improvements in management efficiency, operational efficiency (such as energy, water, materials, and waste reduction), and reduced liability. The study results also showed that the benefits were the same at ISO-certified facilities and non-ISO facilities. This supports the notion that a formal environmental management system is not necessary to implement environmental management principles. [29].

IV. PROBLEM INVESTIGATED

Despite the numerous benefits a business can experience when implementing an environmental management system, it must be noted that there are also many obstacles in the process. Spellerberg *et al.* [19] reported the following obstacles:

- few employees with commitment;
- lack of time;
- focus on monetary rather than environmental costs;
- confusion regarding 'environmentalism' and environmentally sound behavior;

- apathy; and
- the complexity of management structures.

Arvidsson [26] also identified the following as obstacles to implementing an environmental management system: a lack of resources with regard to both time and money; organizational structure and changes within the business; legislation concerning public purchasing that makes it hard to make environmental demands; lack of indicators that can be used to identify problem areas; and short-term economic thinking. Arvidsson [26] also goes on to state that the complexity and size of a business can contribute to the difficulty experienced when implementing an environmental management system.

Considering the benefits and the obstacles to implement environmental management systems, the question can be posed which factors influence businesses to implement environmental management systems?

V. RESEARCH OBJECTIVES

The primary objective of this study is to investigate business implementation of environmental management systems.

To give effect to the primary objective, the following secondary objectives are deemed to be important:

- To provide a literature review on the definition of environmental management and on general models to investigate environmental behaviour.
- To review the existing research on environmental management implementation so as to identify the factors that may influence it.
- To propose a framework of factors which influence the implementation of environmental management systems.

VI. RESEARCH METHOD

Many researchers have concentrated on the question of why businesses choose to implement environmental management systems. The research on the implementation of environmental management systems mostly focused on identifying and testing external influences, internal influences, moderating variables, and the implementation of environmental management practices in businesses.
To investigate business implementation of environmental management systems, a comprehensive literature search was conducted to identify as many factors influencing environmental management system implementation.

International and national data searches were conducted by the Nelson Mandela Metropolitan University library; to date they include Sabinet databases; ISAP (National Library of South Africa); and SAe Publications; EBSCO: MasterFile Premier, Business Source Premier, Academic Source Premier; FS Articles First; Kovsidex; SA Cat and FS Worldcat; ScienceDirect; UPECAT; Google searches; Dialog; Dissertation Abstracts database, and the database of Nexus.

Once the literature had been retrieved and saved into a database, it was critically evaluated and content analysed using the following process.

The following process was used to content-analyze the printed information.

- Downloading and printing a copy of the article or literature output. Only literature published after 2000 was printed. Relevant information was marked while reading through the information and brief notes were made in the margins about the nature of the information.
- Identifying information by studying the margin notes.
- Eliminate those literature that does not focus on factors influencing environmental management system implementation
- Categorizing the list of items extracted from the text so that factors influencing the implementation of environmental systems can be identified. At this stage, as many categories as possible were identified, since the number of categories could be reduced at a later stage if necessary.
- Considering the list of categories identified from the transcript (information from literature). It was determined whether any of the categories were linked in some way (categories and sub-categories).
- Establishing a final list of categories. The list was finalised when no new categories emerged, and all information had been accommodated in the existing categories. At this stage, the different categories were colour-coded with a highlighter pen for each category, to emphasize items of data in the transcripts (information from literature).
- Ensuring that information that was not highlighted at all (because it did not appear relevant at the time) was checked once again for relevance.
- Triangulating the finalized categories with another researcher to see if they identified the same categories and agreed with the list produced.

Trustworthiness of the research was enhanced by involving more than one researcher to analyze the data, as recommended by Struwig and Stead [30]. Inter-rater reliability was also achieved in that another researcher verified the categories and ensured that the data was correctly analyzed. The researcher who verified the categories was an experienced researcher in the field of environmental management and had used content analysis as a methodology before. As the information was obtained from public literature sources and was part of the public domain, no ethical clearance was needed.

A. Results of the Content Analysis

By using the procedure explained, various categories of green initiatives reported on the website were identified. This identification of green initiatives did not focus only on green building guidelines, but on all green initiatives reported.

By analyzing the content, the following categories emerged:

- External influences
- Internal influences
- External moderating factors
- Internal moderating factors
- Environmental management system implementation

Table I provides a summary the factors retrieved on the implementation of environmental management systems.

TABLE I: RESULTS OF THE FACTORS ON THE IMPLEMENTATION OF ENVIRONMENTAL MANAGEMENT SYSTEMS

Factors	Sub-category of factors	Source
External Influences	Customers	McKeiver and Gadenne [31]
	Suppliers	McKeiver and Gadenne [31]
	Legislation	McKeiver and Gadenne [31]
	Local community	McKeiver and Gadenne [31]
	External stakeholder pressures	Cordano, Marshall and Silverman [32]
	Institutional environment	Roxas and Coetzer [33]
	Regulatory	Roxas and Coetzer [33]
	Cognitive	Roxas and Coetzer [33]
	Normative	Roxas and Coetzer [33]
	External barriers	Kehbila, Jurgen and Brent [34]
Internal Influences	Attitudes	
	Owner-manager attitudes	McKeiver and Gadenne [31]
	Attitude toward the natural environment	Roxas and Coetzer [33]
	Attitude about the benefits of improved environmental management performance	Cordano *et al.* [32]
	Attitudes about organic viticulture	Cordano *et al.* [32]
	Attitudes toward government regulation	Cordano *et al.* [32]
	Awareness	
	Awareness of environmental impact	McKeiver and Gadenne [31]
	Benefits	
	Benefits of implementing EMS	McKeiver and Gadenne [31]
	Internal Stakeholders	
	Organizational benefits	Kehbila *et al.* [34]
	Employee concern	McKeiver and Gadenne [31]
	Internal stakeholder pressures	Cordano *et al.* [32]
	Integration of environmental criteria into employee performance evaluation systems	Sharma [35]
	Managerial interpretations of environmental issues	Sharma [35]
	Strategy	
	Environmental strategy	Sharma [35]
	Corporate identity	
	Issue legitimation as an integral aspect of corporate identity	Sharma [35]
	Expectations	
	Expectations about adopting environmental practices	Sampaio *et al.* [36]
	Orientation	
	Environmental sustainability orientation	Roxas and Coetzer [33]
	Knowledge	
	Knowledge	Roxas and Coetzer [33]
	Practices	
	Practices	Roxas and Coetzer [33]
	Commitment	
	Commitment	Roxas and Coetzer [33]
	Norms	

Factors	Sub-category of factors	Source
	Norms	Cordano *et al.* [32]
	Goals	
	Goals and managerial approaches	Sampaio *et al.* [36]
	Internal barriers	
	Internal barriers	Kehbila *et al.* [34]
External Moderating Factors	Size	McKeiver and Gadenne [31]
	Industry	McKeiver and Gadenne [31]
Internal Moderating Factors	Lack of time	McKeiver and Gadenne [31]
	Lack of information	McKeiver and Gadenne [31]
	Lack of financial resources	McKeiver and Gadenne [31]
	Owner-manager characteristics	McKeiver and Gadenne [31]
	Size	Sharma [35]
	Scope of operations	Sharma [35]
	Organisational size	Cordano *et al.* [32]
Environmental Management System Implementation	Formal	McKeiver and Gadenne [31]
	Informal	McKeiver and Gadenne [31]
	Implementation of energy reduction strategies	Cordano *et al.* [32]
	Implementation of recycling practices	Cordano *et al.* [32]
	Environmental management program	Cordano *et al.* [32]

Source: Researcher's own construct

In terms of external influences, many researchers adopted a stakeholder approach to identifying important role players that would influence businesses to implement environmental management systems [31], [32]. Other researchers concentrated on the influence of other factors, such as the institutional environment and external barriers to environmental management system implementation [33], [34].

With regard to internal influences, the most popular factor investigated is attitudes toward the environment [31]-[33]. The influence of environmental awareness was also considered by McKeiver and Gadenne [31], while other researcher considered the benefits of environmental management system implementation, employee concerns, and internal stakeholder pressure [31]-[32], [34]. Lastly, Sharma [35] considered the influence of environmental strategy, issue legitimation as an integral aspect of corporate identity, and integration of environmental criteria into employee performance evaluation systems. Other internal influences that have been seen as affecting environmental management system implementation include expectations about adopting environmental practices, environmental sustainability orientation, knowledge, commitment, norms, goals and managerial approaches, and finally, internal barriers to environmental management system implementation [32]-[34], [36].

Moderating factors influence the relationship between two variables. External moderating factors that have been considered in empirical studies of environmental management system implementation include organizational size and industry type [31]. However, organizational size has

also been considered as an internal moderating factor by Sharma [35] and Cordano *et al.* [32]. A lack of time, information, and financial resources, as well as owner-manager characteristics and the scope of operations have also been identified as internal constraints to implementing environmental management systems [31], [35].

In terms of the implementation of environmental management practices, McKeiver and Gadenne [31] have made a distinction between formal and informal environmental management system implementation; Cordano *et al.* [32] concentrated on energy and recycling practices as well as the implementation of an environmental management program. Figure 1 proposes a framework that can be used to explore the factors influencing the implementation of environmental management systems.
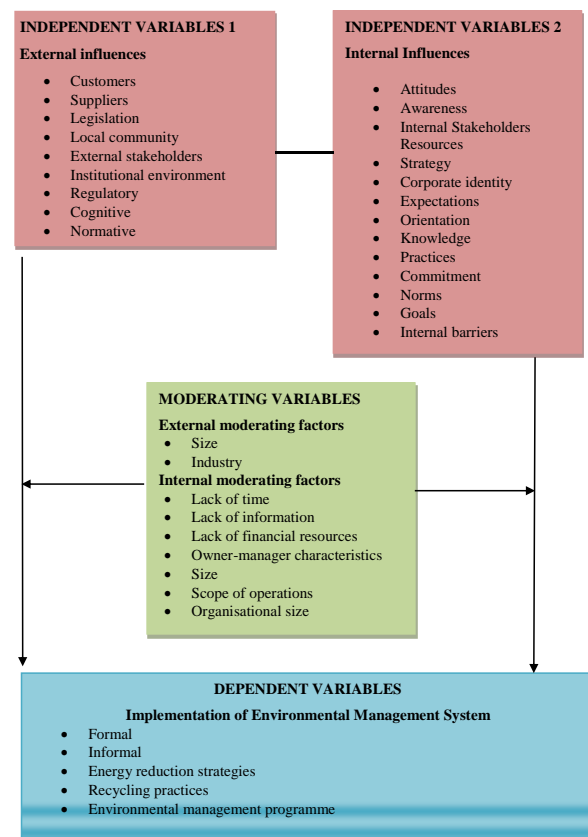

Fig. 1. A proposed framework to explore the factors influencing the implementation of environmental management systems.

VII. CONCLUSION

This paper outlined environmental management and, more specifically, the factors influencing environmental management systems implementation. It also included a discussion on the drivers and advantages of implementing an environmental management system, as well as the obstacles that businesses might face in this process. The most prevalent benefit of environmental management system implementation is regulatory compliance. Other benefits include cost reductions, meeting customer requirements, improving employee morale, and enhancing business reputation. The major obstacles that could be encountered by businesses are a lack of commitment and resources as well as

the complexity and size of a business.

The proposed framework in this study shows that two sets of factors influence the implementation of environmental management systems, namely external influences and internal influences (independent variables). There are also factors that will moderate the implementation of environmental management systems. These moderating factors include external moderating factors and internal moderating factors. The framework highlights that these moderating variables will have a moderating effect on the implementation of environmental management systems. In addition the framework recognizes that the implementation of environmental management systems can take place in a number of ways namely, formal, informal, energy reduction strategies, recycling practices and environmental management programs. The framework can be used as a blueprint to explorer the implementation of environmental management systems.

The proposed framework can also be used to develop new means of data collection and re-think environmental management system implementation. The use of the proposed framework can prepare businesses to what factors will influence the implementation of environmental management systems and how to attend to these.

This paper contributes to the body of knowledge on environmental management systems. From a practical perspective, this paper is beneficial to management in positioning their businesses advantageously in an increasing volatile and competitive environment. The paper created an awareness of the potential for using environmental management systems to create, amongst others, a competitive advantage for the business. The paper is beneficial to researchers and educators in creating an awareness of the factors that will influence environmental management implementation which could lead to required reductions in environmental impact of businesses.

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