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Factors affecting the adoption and implementation of ISO 14001/EMS in Oman: a study of SME sectors

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ABSTRACT

This study intends to observe and examine the various external and internal influences, which are affecting the small to medium-sized enterprises (SMEs) in Oman to accept ISO14001 or reject Environment Management System (EMS). The concept of implementing quality accreditation by small firms is relatively small as compared to bigger firms. Market in general is cynical about the long-term benefits of this quality certification in relation with the costs incurred by the SMEs. The SMEs in Oman are typically focused on a few sectors namely transportation, chemicals, construction, automobile, manufacturing, storage, textiles and food & beverage. This research is an effort to identify and provide solutions and recommendations for successful implementation of ISO 14001 for Omani SMEs.

Contribution/ Originality
The present study identified the gaps in literature in terms of stakeholders' contribution and involvement towards the implementation of EMS in SME's Oman and examined SME's inventiveness in Oman associated with environment to assess the various factors which have influenced/are influencing the stakeholders' regarding the implementation of ISO14001/ Environmental Management System (EMS) in Oman SME's.

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1. INTRODUCTION

According to Christmann (2000), recognition of Small and Medium Enterprises (SMEs) as one of the propellers of country's backbone is agreed and accepted by several governments. Generally SMEs are considered as a prime driver of economic growth and employment. Subsequently contributing in regional development and improving standards. Similarly Bansal and Roth (2000) mentioned that the contribution of SMEs in developed or developing nations is to push economic and social development while significantly affecting a political environment. Same is the case for countries evaluating from expertise to marketing base economy. According to Gerstenfeld and Roberts (2000), there is no immediate or long term benefits in picture, present managers ever so often believe that these environmental issues and concerns are building undue burden on them. In similar lines Anglada (2000) stated that large firm' also feels that to implement these guidelines, the amount of investment and reputation is too overpriced. The SMEs felt that the implementation as part of their "corporate social responsibility" is not a way of guaranteeing success or further enhancement of customer loyalty (Yu, 2001).

Several researchers contradicted it and the ISO 14001 have seen to improve not only environment but also a tool to monitor performance of organizations (Petts *et al.*, 1999). Preliminary assessment of all existing practices for protecting the environment is mandatory first step of all SMEs. According to Worthington *et al.* (2006), one major factor, which will force SMEs to accept EMS / ISO 14001 shall be pushing from government or other, related establishments. It's compulsory for firms to appear authentic and accountable towards stakeholders, thus adopting ISO 14001 showcases the external stakeholders of firms environment obligations. It's a known fact that small firms assumed the relation between business and waste materials generated as proportional and thus do not make concrete efforts to resolve. SMEs will not react if the impact/effect is high in ratio but will swiftly respond if the influence is small (Hillman and Keim, 2001).

It's high time to adapt and embrace new global development regarding this topic. Business policies nowadays have a dedicated section for environment management practices. The approach from purely looking for the economic profit is shifting towards profound management strategies (King *et al.*, 2001). Tilley (2000) observed that instead of sector specific procedures and guidelines, the SMEs only have general information on the environment subject. This is because they take environment compliance as additional work or liability. It's challenging for them to understand & comprehend the government regulations. Without proper instructions in environment management, the SMEs poorly handle environmental topics and concerns (Hitchens *et al.*, 2003).

2. LITERATURE REVIEW

It was noted by Hillary (2004) that SMEs mostly consider environment issues as external to business and an encumbrance. Also business managers have this feeling that in the long term these environmental topics and concerns are baseless with no immediate or further benefits (Simpson *et al.*, 2004). Similarly large organizations believe that it's expensive to implement these environmental guidelines when compared with the magnitude of investment. According to (Anglada, 2000), these regulations can become part of "corporate social responsibility" of large organizations but for sure it cannot assure business accomplishments.

It is hard for government people to reach to SMEs and ironically the SME will also not come forward to ask for guidance (Hitchens *et al.*, 2003). Thus to work towards a development of environment a strong connection between SMEs, government and managers is required. Only visible advantages to their organizations will motivate SMEs to follow guidelines of environment consciousness. It should be highlighted to them that the public image of firms are critical thus prompting them to improve their environmental concerns.

2.1. Implementation of ISO14001 environmental management system (EMS)

ISO 14001 is documented to improve environment engagement of organizations (Willard, 2005). According to ISO 14001, primary task for SMEs is to undergo assessment of all existing environment safety procedures by recognizing government responsibilities/duties and identifying/correcting all internal procedures concerning to environment. Secondary task consists of involving external auditors to do audits. This really helps in understanding firm's present standing and drafting future roadmaps. Further improving organization's market standards and industry levels (Potoski and Prakash, 2005).

2.1.1. Reasons for adopting ISO14001/EMS

Prime reason to adopt ISO1 4001 is to avoid penalties and decreased market standing. These are consequences of not following environmental guidelines and regulations. By following ISO 14001 the excess budgets due to fines/penalties are cut and profits looks like increasing. Once a firm is accredited with ISO 14001, encouraging market image is created and the firm is considered as accountable and responsible. This surely provides a competitive edge over competitors. Most SMEs are accepting ISO 14001 because of its reputation & high market value. They market / highlight ISO 14001 accreditation and even post on their firm's website to make sure that customers and government know about their achievements. As per Weerasiri and Zhengang (2012), it was stated that government pressure and different external bodies push or force SMEs to change and adopt ISO 14001 (Potoski and Prakash, 2005). Thus adopting ISO 14001 cannot be avoided and is a symbol of environmental responsibility and commitment.

2.2. SMEs attitudes towards Environmental issues and their awareness levels

Believing that environmental impression is directly proportional to magnitude of their operations and generated industry waste, many SMEs do not make constructive efforts to adopt ISO 14001. They respond swiftly if they feel it is not going to affect too much of their budget and profits but the reaction is slow and unsteady if the equation is high (Hillman and Keim, 2001). In light of beginning of technology era, it becomes important for stakeholders to be conscious and responsible for their environment conventions. It's also known that most of managers have sense of environmental benefits but they are apprehensive only about financial gains for which they are hired (Petts *et al.*, 1999). On the other hand, SMEs have understanding of environmental impacts but are limited due to their financial restrictions. Apart from financial area, there have also restricted manpower, resources, time and technical skills, etc. They also get few opportunities and practices to measure and showcase the actual impact of the environment on businesses. Thus the factors of low motivational levels and unwillingness to change their current situation make it challenging for SMEs to approve new systems (Tilley, 2000).

Similarly, Jenkins (2009) mentioned that various concerns linked with environment regulations and guidelines in different countries have made it extremely difficult for SMEs to adopt new systems. In contrast, according to (Hillary, 2000), it is particularly important and vital that SMEs understand the apparent benefits and approve these changes. Thus it is important to examine SME's inventiveness in Oman associated with environment topics so that the shortcomings can be studied and suitable suggestions are provided to stakeholders.

2.3. Stakeholders and their impact on business

On prima facie it can be deduced that the role of stakeholders is very crucial for successfully applying ISO 14001/EMS to firm. If an organization is ready to pay fines/penalties/damages or is not effected by drop in reputation then only position of stakeholder can be avoided. The stakeholders can be categorized as regulatory stakeholders and organizational stakeholders. Regulatory stakeholders involves government also in setting targets and standards and are involved in various decision making like Ministry, trade collaborations and informal & business networks. Whereas an organizational stakeholder is situation where stakeholders have direct influence on the profits and businesses like employees, suppliers and customers. Thus knowledge of stakeholder's viewpoint is important and critical.

2.4. SMEs and environment compliance

Unlike health and safety legislations, the environment departments in Oman have very less direct contact with the smaller firms. The insignificant pressure from government agencies results in SMEs shying away from ISO14001 certification. Majority of firm's managers are uninformed of environmental guidelines and regulations and without persistent concern they tend not to take volunteer action to understand environmental issues with negligible contribute in environmental matters.

In following are the general four strategies which are followed by SMEs so as to be environment compliant:

- Resistant strategy – In this strategy, the SMEs have very less knowledge and awareness of environment topics because of minimal pressure to assume change the SME take no action to improve leading to ignorance towards environmental management.
- Proactive strategy – Contrasting above, in this case the SMEs put up intended effort to accept change leading to enhanced environmental management. They are inclined towards law, society and environment and the initiatives are often perpetual.
- Reactive strategy – This case is a patch up or a quick fix solution. Reacting to increasing pressure to adopt change and improve environmental performance, the firm put in place provisional solution which is short lived.
- Sustainable strategy – As part of this strategy the SME prepares and organizes full integration of environmental compliances with business management as his planned vision.

Further, Ajzen and Fishbein (1980) highlighted that SMEs use these compliances as a tactical tool to cut ahead of their competitors and capture market share. They exhibit their environmental compliance to gain customer loyalty. International firm's SME who deals in high degree of exports were noted to be more exposed and positive towards environmental compliance, which in turns provides increased confidence and huge benefit while doing business in other countries which demands acceptance of regulations, guidelines and compliance. Thus this international pressure guarantees that the SMEs should have all the certifications, accreditations and working practices which are in line with international standards and environmental protocols. The SMEs need to realize that the benefits are immense and it can improvise their public loyalty, increase organizational proficiency and to improve public image (Ajzen and Fishbein, 1980). Generally if the implementation is done by systematic assessment, the results are positive and even economically beneficial because the decreased wastes indirectly help in reduction of complete cost.

3. RESEARCH METHODOLOGY

3.1. Research problem and research objectives

In Oman SMEs are propellers for jobs and also contribute towards economic performance. They are affected by the any changes in the global market and economic depression. With the importance to Oman's economy SMEs need to respond to the environmental issues and also should be able to handle different challenges and required legal norms. Present research is an effort to understand and gauge the factors positive or negative affecting implementation of ISO14001/ Environmental Management System (EMS) in Oman. Select SME sectors in and around Muscat region have been taken for the present study due to time and other resource constraints. In the light of the research problem, the following research objectives has been framed.

- To find out the various processes of environmental practices and how they influence implementation at the different level at various levels in the select SME sectors in Oman.
- To understand the challenges, barriers and various environmental issues of SMEs in Oman in adopting ISO 14001.
- To know the propellers(if any) for implementing ISO 14001/Environment Management Systems in Oman for selected SME sectors.

3.2. Research design
To understand environmental problems, issues and challenges faced by SMEs a structured questionnaire is prepared which is both quantifiable and qualitative in nature. This questionnaire is distributed among selected group of SMEs.

3.3 Target population and sample size
Most of the Oman's SMEs are focused in seven sector namely manufacturing, trade and services etc. From given complete list from the Ministry of commerce and above mentioned seven sectors, this study has shortlisted and will use 60 registered companies which will comprise as study unit.

3.4 Conceptual model
For SME to adopt EMS and procure ISO 14001, researchers have listed influences which acts as obstacles/hindrances and/or instigators. The following model comprises of all these factors influencing EMS implementation.

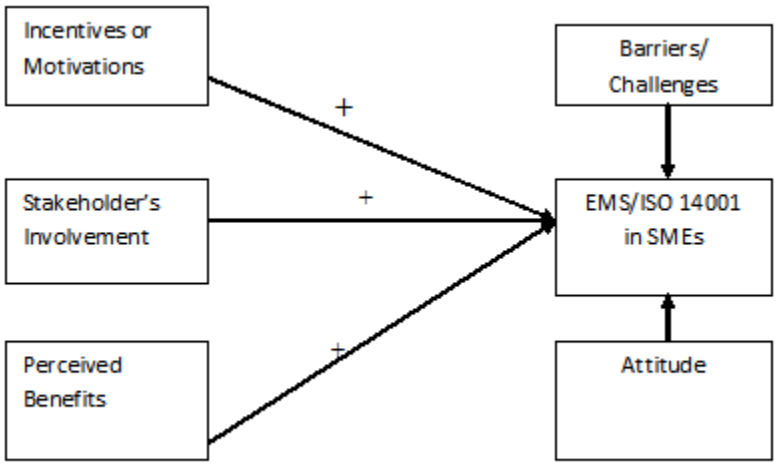

Figure 1: Research model for the study

3.5. Questionnaire design
The questionnaire is qualitative and quantitative in nature. The questionnaire purposefully contains organized questions enabling us to understand management issues, concerns and obstacles in implementing EMS standards. In three sections, set of questions will determine motivations, attitude, and apparent benefits with obstacles. The questionnaire is distributed to study unit as mentioned above which are 60 registered companies.

3.6 Data analysis
A statistical program named SPSS 16.0 is used to analyze data. The numerically coded collected data is enables the use of this program. The uncompromising data is divided into two parts independent and dependent variables. The independent variables comprises of ownership type, size of industry and market whereas dependent variables consists of obstacles, drivers etc. Further to analyze and draw interpretation, the study uses one way ANOVA and Garret Ranking Method.

4. ANALYSIS AND INTERPRETATION

4.1. One way analysis of variance analysis
With the background of these factors, Analysis of Variance (One way) was used to identify whether there are any significant variations across the group of selected factors are given in this part.

Table 1: Environmental performance and nature of industry

		Sum of Squares	df	Mean Squares	F Value	Significance Level
Amount of energy consumption	Between Groups	27.998	6	4.666	6.785	0.000
	Within Groups	17.881	26	0.688		
	Total	45.879	32			
Amount of water consumption	Between Groups	7.939	6	1.323	1.308	0.289
	Within Groups	26.304	26	1.012		
	Total	34.242	32			
Amount of recyclable waste is used	Between Groups	27.530	6	4.588	5.012	0.002
	Within Groups	23.804	26	0.916		
	Total	51.333	32			
Number of identified environmental impacts	Between Groups	15.370	6	2.562	2.627	0.040
	Within Groups	25.357	26	0.975		
	Total	40.727	32			
Commitment to pollution prevention	Between Groups	9.708	6	1.618	1.171	0.352
	Within Groups	35.929	26	1.382		
	Total	45.636	32			

Sources: Survey data, 2016

The SPSS used to analyse the probability value (p) from the analysis of performance (ANOVA) was used from the collected primary data from the lower level of significance (0.05) in the identified factors regarding recyclable wastage used, amount of energy consumption and environmental facts. The study depict that the Null hypothesis is rejected at 95% level of confidence and the alternative hypothesis may be accepted.

In further, the study shows that the probability value from the above table (ANOVA) p value is > 0.05 at the 5% level of significance. Hence, it can be concluded that there is no identified significant difference regarding the pollution prevention commitment and water consumption. Therefore, the test is not significant at the 5% level of confidence.

Table 2: Regulatory performance and nature of industry

		Sum of Squares	df	Mean Squares	F Value	Significance Level
Total cost of regulatory fines	Between Groups	26.212	6	4.369	3.217	0.017
	Within Groups	35.304	26	1.358		
	Total	61.515	32			
Total cost of regulatory compliance	Between Groups	64.170	6	10.695	162.774	0.000
	Within Groups	1.708	26	0.066		
	Total	65.879	32			
Number of regulatory agency inspections	Between Groups	22.589	6	3.765	6.505	0.000
	Within Groups	15.048	26	0.579		
	Total	37.636	32			
Management's commitment	Between Groups	11.422	6	1.904	2.102	0.088
	Within Groups	23.548	26	0.906		

	Total	34.970	32			

Sources: Survey data, 2016

The SPSS used to analyse the probability value (p) from the analysis of performance (ANOVA) was used from the collected primary data from the lower level of significance (0.05) in the identified factors regarding cost of regularity compliances, cost of regularity of fines and the number of regulatory agency inspection. The study depict that the Null hypothesis is rejected at 95% level of confidence and the alternative hypothesis may be accepted.

In further, the study shows that the probability value from the above table (ANOVA) p value is > 0.05 at the 5% level of significance. Hence, it can be concluded that there is no identified significant difference regarding the management commitment towards environmental management system and the test is not significant at the 5% level of confidence.

Table 3: Competitive advantage and nature of industry

		Sum of Squares	df	Mean Squares	F Value	Significance Level
Improved public image	Between Groups	7.113	6	1.185	1.552	0.201
	Within Groups	19.857	26	0.764		
	Total	26.970	32			
Gaining Marketing opportunities	Between Groups	29.779	6	4.963	6.090	0.000
	Within Groups	21.190	26	0.815		
	Total	50.970	32			
Access to new markets	Between Groups	26.759	6	4.460	10.151	0.000
	Within Groups	11.423	26	0.439		
	Total	38.182	32			
Access to international markets	Between Groups	37.116	6	6.186	10.676	0.000
	Within Groups	15.065	26	0.579		
	Total	52.182	32			

Sources: Survey data, 2016

The SPSS used to analyse the probability value (p) from the analysis of performance (ANOVA) was used from the collected primary data from the lower level of significance (0.05) in the identified factors like gaining marketing opportunities, access to new markets and access to international markets. The study depict that the Null hypothesis is rejected at 95% level of confidence and the alternative hypothesis may be accepted.

In further, the study shows that the probability value from the above table (ANOVA) p value is > 0.05 at the 5% level of significance. Hence, it can be concluded that there is no identified significant difference among respondents for the improved public image. Therefore, the test is not significant at the 5% level of confidence.

Table 4: Environmental performance and number of years

		Sum of Squares	df	Mean Squares	F Value	Significance Level
Amount of water consumption	Between Groups	8.509	3	2.836	3.196	0.038
	Within Groups	25.733	29	0.887		
	Total	34.242	32			
Commitment to pollution prevention	Between Groups	5.176	3	1.725	1.237	0.314
	Within Groups	40.461	29	1.395		
	Total	45.636	32			
Gaining Marketing opportunities	Between Groups	15.855	3	5.285	4.365	0.012
	Within Groups	35.115	29	1.211		
	Total	50.970	32			
Access to new markets	Between Groups	7.055	3	2.352	2.191	0.110
	Within Groups	31.127	29	1.073		
	Total	38.182	32			
Energy efficiency is important,	Between Groups	2.109	3	0.703	4.195	0.014
	Within Groups	4.861	29	0.168		
	Total	6.970	32			
Responsibility to protect the environment	Between Groups	3.491	3	1.164	3.938	0.018
	Within Groups	8.570	29	0.296		
	Total	12.061	32			

Sources: Survey data, 2016

The SPSS used to analyse the probability value (p) from the analysis of performance (ANOVA) was used from the collected primary data from the lower level of significance (0.05) in the identified factors like gaining marketing opportunities, good environment management essentiality and waste minimization. The study depict that the Null hypothesis is rejected at 95% level of confidence and the alternative hypothesis may be accepted.

In further, the study shows that the probability value from the above table (ANOVA) p value is > 0.05 at the 5% level of significance. Hence, it can be concluded that there is no identified significant difference among respondents for the amount of waste consumption, access to new markets and commitment to pollution prevention and the test is not significant at the 5% level of confidence.

4.2. Rank analysis (Garret Ranking Method)

The scores earned by the selected factors are added together and it is divided by total value calculated for which the scores are added. This ranking method is converted scores from the ranks obtained.

Table 5: Implementation of ISO 14001 and environmental management system and stakeholder's engagement

Factors	Garret value	Mean score	Rank
Communication on Community engagement	3600	36.00	1
Implementation and customer requirement	3598	35.98	2
Support from top and middle management	3581	35.81	3
Demand/ need from the customers	3573	35.73	4
Environmental stewardship demonstration among public	3474	34.74	5
Demand from the company employees	3257	32.57	6

Sources: Survey data, 2016

From the above analysis using Garret ranking method the Communication on Community engagement is attained the top rank with value of 3600 and the next position occupied by the factor Implementation and customer requirement with 3598. There is no much difference identified between these two factors. The Support from top and middle management holds the third position with the garret value of 3581. The fourth position holds by customer demand with a garret value of 3573. The 5th and 6th ranks are obtained by the last two positions such as 5th and 6th rank holds by Environmental stewardship demonstration among public with the garret value of 3474 and Demand from the company employees with the garret value of 3257. So it inferred that the stakeholders are paying attention in communicating their corporate social responsibility to the society and the needs and wants of fulfilling the customer requirements.

5. FINDINGS AND CONCLUSION

5.1 Implication of the research

After interpreting the findings, various inferences can be derived from this research. The prime discussion is about factors and influencers of Oman market which impacts the implementation of ISO 14001/EMS. The study brought forward the real challenges and obstacles faced by SMEs while implementing ISO 14001/EMS. SMEs have special place in Oman economy and they contribute significantly toward growth of economy. Thus it is desirable to understand the benefits of adopting ISO 14001.

By saving energy and reducing water wastages the SME will save money and apparently increase profits. Also the reduce waste disposals will help and cut cost. To achieve these benefits SME should be far sighted and focus on longer forecasts in contrast to shorter gains. SMEs are the ones who can push their employees to go for workshops and trainings keeping them up-to-date with the latest developments in environmental management. Customer pressure to accept ISO 14001 on SMEs is also significant. The factors SMEs should consider before adopting ISO 14001 includes resource management, change management, manpower and cost.

Among other factors which can influence & motivate SME to adopt ISO 14001, pressure from supply chain shall be the front runner together with pressure from large corporations to smaller companies to shown their environment certificate before taking up their projects. Public pressure can also be effective, reputation damage if public know that a firm is doing business without proper accreditations can be major driving factor which can eventually leads to financial loss.

This study showcased strong need of support mechanism for SMEs like the directives from ministry should be crystal clear. Other examples can be technical know how, better marketing etc. SMEs perception should match with market scenarios. Whether trade associations or Oman government will take initiative to encourage SME adopt & implement environment management systems, will remain a question.

5.2. Suggestions

For effective adoption and implementation of ISO 14001/EMS, following suggestions for the stakeholders should be ensured.

- General awareness campaigns and workshops should be organized in Oman so that even a common man together with SMEs understands the significance of environmental issues and impacts. This should be organized by chamber of commerce.
- School & college text books should include chapters including environmental management and compliance. Even some professional course should be lined up by Ministry of higher education.
- Apart from finances, technical support and manpower are other two major concerns of SME before implementing environmental management. The government should take steps in direction of resolving this.

- The SMEs should be self-motivated and self-directed to protect environment and adopt green & clean environment.
- Survey showed that most of the SMEs were unaware of informative programs launched by government (Ministry in Oman) thus miscommunication should be avoided.

5.3. Conclusion

The current study addressed and answered the key and basic research question "what factors enable or obstacle adoption & implementation of ISO 140001/EMS in Oman linking to SME sector". Further we discussed factors & parameters which forces SMEs to implement ISO 14001, some of them are customer/public requirements, stakeholder pressure etc. However, no such evidence was found about regulatory compliance being driving factor of SMEs adopting ISO14001/EMS.

5.4 Limitations of the Study

Following listed are the limitations:

- The sample size is fixed and hence the results cannot be generalized to the larger sample size or population of the SMEs. The study is geographically restricted / limited to Oman.
- Only few key parameters are concentrated namely Environmental Issues, Challenges & Management Practices, Resource Conservation, Competitiveness, Pollution Prevention and Economic Performance only
- Not all participated; some participants were hesitant to answer.
- To cover all selected SME and personally approaching them requires lots of time and money. Thus these were also important constraints.

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Appendix

Hypotheses

H1: There is positive impact on EMS/ISO14001 implementation and environmental performance and practices.

H2: There is positive impact on EMS/ISO14001 implementation and Stakeholders involvement.

H3: Barriers and challenges have negative impact on EMS/ISO14001 implementation.

H4: Competitive advantages and its positive impact on EMS/ISO14001 implementation.

H5: Regulatory performance and its impact on EMS/ISO14001 implementation.