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## ANALYSIS THE RELATIONSHIP BETWEEN QUALITY MANAGEMENT AND ENVIRONMENTAL MANAGEMENT ON COMPETITIVE ADVANTAGE

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### ABSTRACT

Quality management and competitive advantage are the factors which are effective in promotion of employees' productivity, and its goal is to develop human beings through motivating and expanding standard information. Gaining a unique competitive advantage from the quality of a product can either have the negative or positive impact on the environment of that product and its output. Economic and social changes necessitate the need for continuous improvement in the quality and sustainability of competitive advantage in the environmental industries. The purpose of this study is to investigate the relationship between quality management and environmental management on the competitive advantage of waste management in Shiraz. There are three components of research in this organization. The research method is applied in term of purpose and it is a descriptive-correlative-survey research in term of data collection. We analyzed the path using Laser software. Linear fitness model showed quality management and environmental management as independent variables which were generally fitted with goodness indexes of competitive advantage as a dependent variable. Also, environmental management and quality management are predictive of competitive advantage.

**Keywords:** Quality Management, Environmental Management, Competitive Advantage.

### INTRODUCTION

Gaining a competitive position and advantage for management of Shiraz waste organization is a strategic challenge. In this regard, the provision of services that can attract customers' attention and make them a permanent customer is considered as an important issue. Quality management is a smart, slow and continuous activity that can effectively impact the organization's objectives and ultimately results in customer satisfaction, increased efficiency, and increased ability to compete in the market. Quality management is improvement in traditional ways of doing business, and it is a proved technique. Quality is now one of the largest and most diverse pillars of the world. (Taqavi, Gholi Pour Soleimani, 2009) On the other hand, environment and environmental management have created economic and social changes that have led to more uncertainty. Such developments necessarily require continuous improvement in quality sustainability and service systems. Particularly the most interesting issue is the analysis of the impact of the quality and environmental management on the competitive advantage of manufacturing and service companies (Molina-Azorín et al., 2009). The impact of environmental management on the damaged advantage of waste may also be verifiable through its impact on costs (González –Benito, González-Benito, 2003). Environmental support management may allow a company to save costs, input materials, and energy (Hart, 1997). According to the increasing competition and cases such as seasonality of demand, high customer

turnover and high cost of attracting new customers in the recycling industry, identification of factors associated with the efficiency of the environmental services has always been one of the main concerns of the these industries owners. Today, the garbage industry is also considered as a very dynamic sector in the waste industry. Competitive facilities are very important in the success of transportation plans for people (customers) garbage in each region. The waste management organization of Shiraz meets the expectations and demands of customers based on physical facilities, mechanized air pollution and cleanness control with the appropriate quality. Obviously, if the quality of services and facilities is reduced, demand will also be reduced and environmental issues and industries in that area will be negatively affected (Zargham Boroujeni, Mir Fakhreddin, 2012). Organizations gain their competitive advantage through two dimensions of quality differentiation and cost management. The competitive advantage is a cost or differentiation to provide superior service over competitors (Molina-Azorín et al., 2009). This research studies the relationship between (if there is a relationship or the lack of relationship) quality management and environmental management on the competitive advantage of the Waste Management organization in Shiraz; therefore, achieving the necessary answers to research questions can highlight and reflect the current strengths and weaknesses of the recycling industry so as to provide the necessary opportunity to promote or enhance the level of competitive advantage in the industry by adopting appropriate policies and actions.

## RESEARCH BACKGROUND

Ansari and Salehi Sedghiani (2005) conducted a study entitled "Total Quality Management and Information Technology: Relationships and Functions." Using scientific-reviewing method and explaining the relationships and functions, they found that production with optimal quality requires a clear definition of objectives, work plan, and specific instructions for each section of the work and each stage of the process. Mosaferi et al. (2007) conducted a study entitled "Environmental management of solid waste of stone cutting industries: case study of Qom". In their research, 55 industrial units were selected as statistical population and evaluated considering their location. It was found that the capacity of these factories should be expanded at least five times, and it is necessary to take collective actions by the authorities, including the municipality, to develop recycling and organizing the collection and true disposal of these wastes. Also, Pithenevi and Abdollahi (2010) conducted a study entitled "Evaluating the Impacts of Product quality and environmental management accounting on the competitive advantage of companies". The research findings support the important role of environmental management accounting in companies; using a correlation method, the research mentions that product quality contributes to the competitive advantage of a company when there is a high level of trust on environmental management accounting.

Zareie Mahmoud Abadi et al. (2012) believe that the Environmental Management System is an instrument which enables the organization to achieve a specific level of environmental performance it requires and systematically control it. Establishing and applying an environmental management system alone does not necessarily result in immediate reduction of adverse environmental impacts. Therefore, we should not expected that all environmental issues are addressed immediately after the establishment of the environmental management system based on ISO 14001, but the man focus should be on proper deployment and continuous

improvement. In their research, they have reviewed the standards of the environmental management system and considered the main elements including the way of deploying it and its benefits, the way of implementing and maintaining and upgrading the environmental management system. Mehregan Far (2014) has evaluated the subject of management science as a green management and studied measurement criteria, principles and types of green management models. The result of the research suggests that green management can achieve sustainable success based on the green competitive advantage through its comprehensive attitude towards all processes, organizations' resources, existing national laws, reduced resource consumption, the role of senior management, and the assessment of criteria and focus on social, environmental, and economic responsibilities.

Moradi and Yarahmadi (2015) investigated the relationship between the quality of automatic banking services and competitive advantage. The statistical population of this research consisted of entire customers of branches of Sina Bank in Hamedan, which a sample of 388 subjects were selected from the entire population. Data were collected using a questionnaire. Spearman correlation coefficient was used to analyze the data. The findings show that all five dimensions of the automatic banking services quality, including the quality of ATM services, the quality of Internet banking services, the quality of telephone banking services, and the main automatic services and perceived price have a significant relationship with competitive advantage. Rouhalamin *et al.* (2015) conducted a study entitled: The role of quality management and environmental issues in gaining the competitive advantage in hotel institutions (Case Study: hotel Institutions in northern areas of Iran). According to the Cochran formula, 224 hotel managers were selected randomly, and data were collected through library and field methods. They used inferential statistical method based on structural equation modeling. The findings of the research in general showed that the intensity of the relationship between environmental performance and the competitive advantage is different from the significant relationships governing the structural model of research. Also, environmental performance and qualitative performance of hotel services have a significant positive correlation with competitive advantage of costs. On the other hand, hotel quality management has a significant relationship with the quality of hotel services and environmental management of the hotel.

Miri and Moradi Aliabadi (2015) studied the factors affecting competitive advantage, including: reputation, human resources, service quality, customer orientation, technology, advertising and innovation with the aim of identifying the factors affecting the achievement of competitive advantage of manufacturing companies. To test the hypotheses, a closed questionnaire with a value of 0-100 and a total of 24 questions was designed and distributed among the statistical population of 155 employees and managers (Zamzam Company). The path analysis method was used to test the hypotheses and the Amos software was used for statistical analysis of the data. The results of the research showed the positive and significant effects of the variables on the competitive advantage and among these variables, fame and innovation has had the most impact on competitive advantage and the customer-orientation variable has had the least impact on the competitive advantage. Zalli and Abdollahi Senno Kesh (2016) evaluated the competitive advantage in organizations. By analytical method and with Absolute advantage and Recovery Theory through providing the concept of comparative advantage from the pioneers and definitions provided on related issues by the competitive advantage viewers suggest that the



central focus of the competitive advantage is on having superiority compared to competitors in one or more of the factors considered by the customer.

Ranjbarian et al. (2016) evaluated the effects of the dimensions of competitive advantage such as quality, radical innovation of the product, radical innovation of the process, gradual innovation of product, gradual innovation of process, production speed and delivery to the customer, Flexibility and cost reduction on financial and non-financial performance of export companies of Isfahan by adopting from the theory of quality management as well as the method Balanced scorecard. In order to study the hypotheses of the research, the field method and the questionnaire technique were used along with the interview and the data were analyzed using SPSS and SmartPLS statistical software. The reliability coefficient of interview questions was calculated based on Cronbach's alpha which was equal to 0.82. According to the results, all dimensions of competitive advantage except the radical innovation of the process and the cost have had a positive effect on the export performance. Chang and Liu (2009) published an article titled "Temple Fairs in Taiwan: Environmental Strategies and Competitive Advantage for Cultural Tourism". Analytical results indicate that energy conservation and pollution prevention can increase the financial performance and reputation of temple fairs; however, environmentally friendly products do not improve temple reputation. Therefore, reducing pressure on people and maximizing competitive advantage show this feature.

Zhou et al. (2012) conducted a study entitled "Quality management of B2C e-commerce service based on human factors engineering". In this paper, firstly, screen credible quality requirements and their weights were determined by integrating Kano's model with previous work, including the model of B2C website service quality. Then, quality characteristics were extracted according to image words and credible customer requirements. The weights of the quality characteristics were deduced by refining characteristics through a house of quality reconstruction and mapping customer requirements to characteristics. Empirical results of research show that operating practices can help managers understand e-commerce service quality and have useful implications for companies in the management of e-commerce service quality. Somala et al. (2014) conducted a research entitled "Customer satisfaction analysis by the implementation of Quality Management System in public institutions". The method used to achieve this report was a case study. The quantitative and qualitative research techniques and documentation, application of questionnaires and by observation were used for data collection and analysis by studying researches. The purpose of this study is to identify the perception clients of public institutions on performance officials after the implementation of the Quality Management System and the benefits of implementing a system to improve service quality, are in support of managers, employees and secondly by the customers.

Molina-Azurin et al. (2009) in a combined study have investigated quality management and environmental management and their impacts on competitive advantage in hotel industry. Their research reports were the results of interviews with 13 managers which 355 other managers were added to them. Data in this study have been analyzed using partial least squares method. The research question relates to the relationship between environmental management and quality management in a hotel. The results show that quality management and environmental management allow for the improvement of competitive advantage in terms of cost and differentiation. But achieving to quality management is less challenging than environmental management in hotels. Pena et al. (2015) conducted a study entitled "Analysis of benefits and



difficulties associated with firms' Environmental Management Systems: the case of the Spanish automotive industry". The Data were obtain via a questionnaire from 228 firms including manufacturers and suppliers and it was found that environmental performance and access to technology would overcome the requirements of a system, where organizational structure and commitment of human resources and environmental information are effective in creating the goal, calculating the results, and creating environmental responsibilities. These analyzes are based on homogeneous data.

## THEORETICAL FRAMEWORK AND CONCEPTUAL MODEL

The functions of the theory are diverse in research, but one of the most important functions of the practical theory is that the researcher guides and organizes his research on a specific path by referring to and applying theories. This means that scientific theory is a practical and theoretical guide for researcher. By defining and explaining the theoretical framework, in fact, the ideas of different theories are taken into account in the research and support practical work, and ultimately the credibility and comprehensiveness or adequacy of the theories are measured and evaluated in the explanation of the laws governing the behavior and social life of organizations in the given place and time. In this research, the main purpose of the research is to investigate the impact of the relationship between quality management and environmental management on competitive advantage. Therefore, we will analyze the information of conceptual model using the Laser software. According to the figure the relationship between management and environmental management; quality management and competitive advantage; and environmental management and competitive advantage are analyzed. To illustrate the fitness of this model, the structural equation analysis method (SEM) was studied.

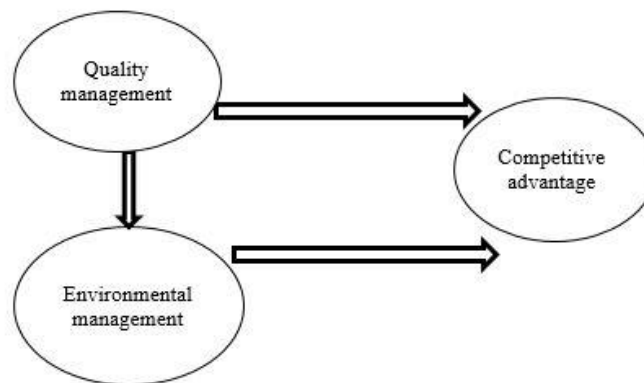


Figure 1. The relationship between quality management, environmental management and competitive advantage (Azurin *et al.*, 2015)

## RESEARCH METHOD

In terms of the purpose this is an applied research and in term of data collection this is a case-field research. The case study has two parts. The first part of definition studies a phenomenon in the real world, especially when the boundary between a phenomenon and the social context in which it occurs is not transparent. The second part of it relates design features and data collection method. This is a case study because the researcher has no control over behavioral

issues and we are studying a particular phenomenon in a particular case. In summary, it is due to two important reasons: 1. recognizing the whole reality. 2. Achieving a unique totality of this method. The statistical population consists of managers and employees employed in Shiraz's waste disposal unit who are about 100 subjects; since the statistical population is  $100 = N$ , we selected the sample from whole population, so  $100 = n$  is considered. Considering that the sample consisted of 100 people, to determine the relationship between quality management and environmental management on the competitive advantage, theoretical foundations and library method were used (documentary), and to determine the relationship between them and how they are, we used a field study method. The Azercon questionnaire in 2015 consisted of 65 questions and three dimensions: quality management, environmental management, and competitive advantage, each of which was equal to 0.87, 0.85, and 0.83 respectively. The contribution of quality management was related to the questions 1 to 28, the contribution of environmental management was related to questions 29 to 57, and the contribution of competitive advantage was related to questions 58 to 65. The questionnaire also has a 5-point Likert scale (5 = very high, 4 = high, 3 = average, 2 = low, 1 = very low). The reliability of the researcher is as follows:

**Table 1. Reliability Report**

Variable	Cronbach's alpha	Sum
Quality management	0.87	0.87
Environmental management	0.85	0.85
Competitive Advantage	0.83	0.83



## FINDINGS

The mean and standard deviation of the indicators were presented in the table.

**Table 2. The mean and standard deviation of the indicators**

	Min	Max	Mean	Standard deviation
Quality management	51	109	81.25	12.32
Environmental management	47	119	89.48	15.8
Competitive Advantage	11	36	24.48	3.54

The Kolmogorov-Smirnov test was used to test the normality of data distribution. The results are presented in the table.

**Table 3. Results of Kolmogorov-Smirnov test**

Indicators	Kolmogorov-Smirnov test	
	statistic	Significance level
Quality management	0.88	0.58
Environmental management	0.23	0.83
Competitive Advantage	0.716	0.481

Regarding the insignificant result of the test for all the variables under the study ( $p\text{-value} < 0.05$ ), the hypothesis of the normality of data distribution is confirmed. LISREL calculates good fitness indicator (the ratio of the sum of the squares being explained by the model to the total sum of the estimated matrix squares in statistical population). These indicators are similar to correlation coefficient in terms of desirability. Both of these criteria vary from zero to one, although they

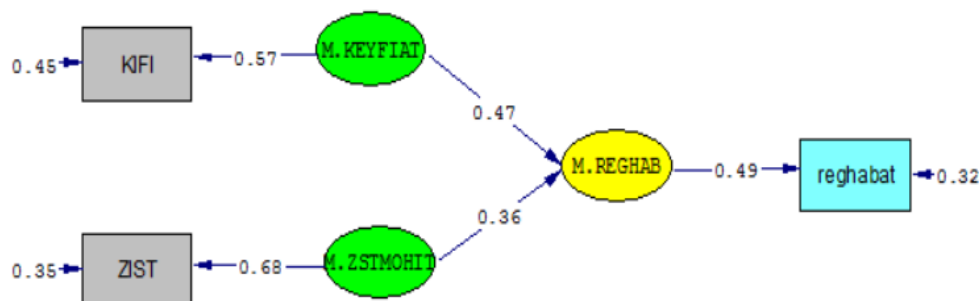
may theoretically be negative (of course, this should not happen, because it implies the lack of absolute fitness of the model with the data). The more the AGFI and the GFI are closer to the number one, the more the fitness goodness of the model will be observable data. So, these tests answer the question about the amount of the goodness and the fitness of the model on research data. The table 4 shows the results of these tests.

**Table 4. Summary of model fitness tests in structural equations**

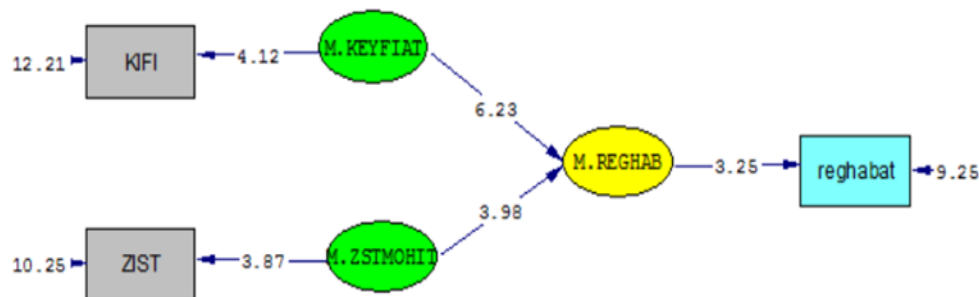
No	The name of indicator tests	Main criterion	Model fitness indicator	Explanations
١	RMSEA	Sum of squares mean error	If it is less than 0.1	Root Mean Square Error of Approximation
٢	NNFI	Comparing the model with the model without its relationships	It must be more than 0.9.	Non-Normed Fit Index
٣	NFI	Comparing the model with the model without its relationships	It must be more than 0.9.	Normed Fit Index
٤	CFI	Adaptive fitness index	It must be more than 0.9.	Comparative Fit Index
٥	AGFI	Mean squares instead of sum of squares in above model	Between 0 and 1, it must be equal or more than 0.9	Adjusted Goodness of Fit Index
٦	GFI	Evaluation of relative variance and covariance	Between 0 and 1, it must be equal or more than 0.9	Goodness of Fit Index



At the followings, the findings related to path analysis findings are presented.



**Figure 2. Results of the research model validation for the overall model**



**Figure 3. The values of t for the estimated coefficients for the overall model**

For fitness of the structural model of the research model, a number of goodness indicators of fitness have been used. One of the general indicators for considering free parameters in calculating fitness indicators is the normal chi square index, which is calculated from the simple chi square division on the freedom degree of the model. If this value is between 1 and 5, it is optimal:

$$\frac{\chi^2}{df} = \frac{545.4}{247} = 2.209$$

To determine the fitness of the model, a number of goodness indicators of fitness have been used, which are presented in the table. Since the RMSEA indicator is less than 0.1, the model has a good fitness. Also, other goodness indicators of fitness are also within the acceptable range.

**Table 5. Goodness Indicators of the Structural Model fitness**

Fitness indicator	SRMR	RMSEA	GFI	AGFI	NFI	NNFI	IFI
Acceptable value	<0.1	<0.1	>0.9	>0.9	>0.9	>0.9	0-1
Calculated value	0.036	0.028	0.93	0.97	0.94	0.95	0.96

## CONCLUSION

In the process of each research, the results of the research are important because the conclusions of the research can be considered as a basis for solving existing problems or improving the situation towards the desired situation. It can be said that the findings from this study are completely new and such research has not been done in this way. The purpose of this research is to provide a unified picture without any statistical complexities from information analysis that took place last chapter. This is examined in the form of hypotheses and along with other researches. The most basic criterion for measuring the relationship between structures in the structural part is the t-significant values. Quality management and environmental management have fitted the competitive advantage using the goodness indicators as independent variables; this showed that the structure has good fitness. Accordingly, it can be stated that the quality management and environmental management of the waste organization can have positive effects on the competitive advantage of each type. Considering the two factors, quality management and environmental management can have positive effects on the target market and attracting customers. On the one hand, the waste organization can create a good reputation in the community and adhere to its social responsibility; on the other hand, by increasing the quality level of services, it can also compete with other competitors and gain a position; it can also have an up-to-date performance. Since all the indicators show good fitness, it can be said that the model has a good fitness.

### *Suggestions to future researchers*

During each research, a broader and more recent dimension emerges from the subject, which can be a starting point for further studies:

1. Assessing the satisfaction of staff with the waste management organization in Shiraz along with evaluating the overall quality of provided services.
2. Evaluation of the quality of service comparison in each of the public and private sectors.
3. Adaptive study of standards and total quality for competitive strategies.
4. Using these research elements in peer companies.

5. Reviewing social responsibilities for improving environmental issues.
6. Technical and expert assessment of the individuals' health in the community from product contamination and pollutions.

## References

- Ansari, m; Salehi Sadighani, J. (2005). "Total Quality Management and Information Technology: Relationships, Functions". *Quarterly Journal of Industrial Studies*, Volume 2, No. 5, pp. 71-89.
- Chang, l., Lin, w (2009). Temple fairs in Taiwan: Environmental strategies and competitive advantage for cultural tourism. *Journal: Tourism management*, volume 39, issue 6, pp:9000-904.
- González -Benito, J; González-Benito, O."Environmental proactivity and business performance: an empirical analysis". *Omega*, 33,2003, 1-15.
- Hart, J."Beyond Greening: strategies for a sustainable word", *Harvard Review* 75(1),1997,66-76.
- Mehregan Far, M. (2014), "The Impact of Green Management on Organizational Performance Improvement", *International Management Conference*, Tehran, Institute of Mobin Cultural Ambassadors
- Miri, M.; Moradi Aliabadi, B. (2015), "Identifying the Effective Factors on Competitive Advantage of Manufacturing Companies (Case Study - Zamzam Company)", *Fourth National Conference on Management and Accounting*, Tehran, Narcish Informing Institute.
- Molina-Azorín, J. F., Tarí, J., Claver-Corte's, E., & Lo'pez-Gamero, M. D. (2009). Quality management, environmental management and firm performance: a review of empirical studies and issues of integration. *International Journal of Management Reviews*, 11(2), 197-222.
- Molina-Azorín, J; F, Tarí; Claver-Corte's, E; Lo'pez-Gamero, M. D. "Quality management, environmental management and firm performance: a review of empirical studies and issues of integration". *International Journal of Management Reviews*, 11(2), 2009,197-222.
- Moradi, M; Yarahmadi, F. (2015), "Investigating the relationship between the quality of automatic banking services and gaining competitive advantage in Sinai Bank branches in Hamedan" *National Conference on Management and Education*, Malayer, Malayer University.
- Mosaferi, M. Fahiminia, M; Nabi Zadeh, R. (2007). "Environmental Management of Solid Wastes of stone: Case Study of Qom Province". *Quarterly Journal of Environmental Science and Technology*, Volume 90, No. 2, pp. 65-74.



- Pena, m., Garrido, E & Lopez, j. (2015). Analysis of benefits and difficulties associated with firms' Environmental management systems the case of the Spanish automotive industry. *Journal of cleaner production*, vol,70, pp:220-239.
- Ranjbarian, B.; Barati, R.; Abedini, A.; Bagheri Tadi, Sh. (2016), "Investigating Effective Factors on Achieving the Competitive Advantage in Export Companies Performance (Case Study: Export Companies of Isfahan City)", *Sharif Scientific-research Journal*, Online Publication, pp. 21-35.
- Rezaei Pite Noie, and Abdollahi A. (2010). "Assessing the impact of product quality and environmental management accounting on the competitive advantage of companies". The conference on reviewing collaborative effort to promote the management accounting in the industry.
- Roholamini; M. Shekarchi, Aghosi, M; Hakimi, A. (2015). "The role of quality management and environmental issues in gaining the competitive advantage of hotel institutions (Case of Study: hotel institutions in northern areas of Iran)". *Global Conference on New visions in the Human science, Future of Studies and Empowerment*, Shiraz, Research Group of Green Industry market idea company. No3, pp. 210-230.
- Somla, I., Marian, & Ferencz, I. (2014). customer satisfaction analysis by the implementation. Fanality management system in a public institution. *Procedia Economics and finaace*, Vol.15, pp:1071-1076.
- Taqavi, Mahdi; Gholi Pour Soleimani, Scientific. "Factors Influencing the Growth of the Tourism Industry of Iran". *Economy Journal*, 6 (7), 2009, 525-517.
- Zalay, A. And Abdollahi Senukash, F. (2016). "Reviewing the Competitive Advantage in Organizations". *International Conference on Industrial Engineering and Management*, Tehran, No. 4, pp. 123-131.
- Zarei Mahmoudabadi, H. Momeni Asl, M.; Barati, F (2012), "The Environmental Management System; the Most applicable tools in Management" 6th National Conference on Environmental Engineering, Tehran, Tehran University, Faculty of Environment.
- Zargham Boroujeni, Hamid; Mir Fakhreddin, Fayeze Sadat. "Ranking the assessment indicators of Hotel Service Performance by Balanced Scorecard (BSC) and Fuzzy TOPSIS; *Journal of Tourism Planning and Development*", Year 1, No. 5, 2012, pp. 16-12.
- Zhang, D., Linderman, K., & Schroeder, R. G. (2012). The moderating role of contextual factors on quality management practices. *Journal of Operations Management*, 30, pp 12-23.

