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## Significance of ISO 9000 Quality Management System for Performance Improvement in the Developing Countries

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### Abstract

*The objective of this paper is to analyze the significances of ISO 9000 Quality Management System implementation for performance improvement. Two consecutive cases are studied cascaded one over the other. Harar Brewery Share Company (HBSC), one of the Ethiopian Quality Award winners in 2009 is taken as the first case. The company's six years annual report has been analyzed to justify the significance of implementing ISO 9000. In addition, Ethiopian Plastic Share Company (EPSC) is studied to find out the relationship between certification and process variability. In both the cases, in spite of their ISO 9000 certificate possession, internal processes are not statistically controlled. Variations still exist which is anomaly in the quality management viewpoint.*

**Keywords:** ISO 9000 Certification, Quality Management System, Variation

### INTRODUCTION

The number of ISO 9000 Quality Management System (QMS) certifications in developing countries is increasing, particularly, in Africa. Most of the organizations are certified because of either internal motives or external pressure from the international trade. Internally motivated companies' are those that demand continuous organizational improvement. However, there is still a debate whether QMS increases organizational performance or not. In some cases, since organizations or nations may put certification as a prerequisite to their purchasing decision, those companies engaged in certification process to fulfill the buyers requirement are known as externally motivated.

Proponents of ISO 9000 QMS Certification argue that proper implementation leads to better organizational performance, an increase in production volumes, a decrease of customer complaints, a reduction of variance in the production process, and an elevation in competitiveness are among the benefits (Rusjan and Alic, 2010; Kim, Kumar, & Kumar, 2011. ; Lee, To, and Yu, 2009; Wu and Liu, 2010; Srivastav, 2010. On the contrary, the opponents

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argue that ISO 9000 certification has not brought as such substantial improvement on overall performance of organizations (Franceschini, Galetto, Maisano, and Mastrogiacomo, 2010 and 2011; and Sampaio, Saraiva, Rodrigues, 2010). Therefore, this research is an attempt to diagnoses the significance of ISO 9000 QMS certification for organizational performance improvement in the African context to justify the investments made.

### **Background of the Case Companies**

To achieve the objective of this research the company performance before and after the implementation of ISO 9000 Quality Management System was analyzed. Harar Brewery Share Company is among the best from the process industries and Ethiopian Plastic Share Company from the manufacturing industries in their quality management practice in Ethiopia. Since, both of these companies were ISO 9000 certified organization, they are selected for this study. In order to see the effect of the certification the case companies were analyzed both at macro and micro level. In addition to the background of these two companies, macro level performance of Harar including profit, sales volume, capacity utilization, training, defects, down time and promotion were examined based on the company's seven years annual report. At micro level, process variability of key performance indicators were evaluated based on the classical statistical quality control tools – X bar and R charts to measure the changes observed in the process stability of both cases – Harar Brewery and Ethiopian Plastic. The research assumed that the performance of ISO 9000 certified organizations will improve just after the implementation at macro level and the process variability will be minimized at micro level as it is stated in the literature. Analyses of each case are presented as follows.

The Harar Brewery Share Company (HBSC) was established in 1984 in the town of Harar, Ethiopia. The brewery's initial design capacity was 200,000 hectoliter (60,000,000 bottles) per annum and it was producing only Harar lager and draught beer. After a period of ten years i.e., since 1994 the brewery diversified its products and introduced two new brands to the market, namely, Hakim Stout—alcohol content 5.5 %W/v (Dark beer), and Harar Sofi—alcohol Free (Malt drink). Since 2005, the Brewery initiated and implemented ISO 9000 Quality Management System and gate certified. The efforts made helped HBSC to be the winner of Ethiopian Quality Award in 2009 under manufacturing industry category. Ethiopian Privatization, Public Enterprise and Supervisory Agency recognizing HBSC success in international system implementation and maintenance is often requested it to share the experience. Moreover, individual public and private companies also frequently visited the company to take lessons from its achievements.

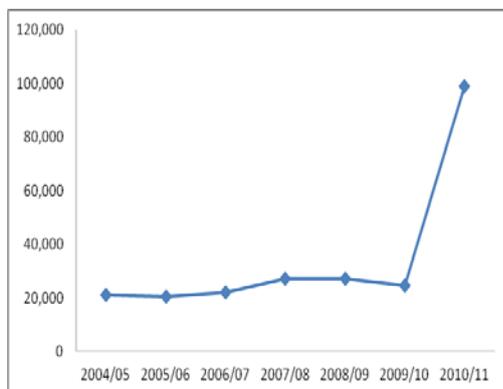
The Ethiopian Plastic Share Company (EPSC) is a government-owned company

established in 1960's by a few Italian entrepreneurs. It was the first of its kind in the country in the sector. Currently the company is under Basic Metals and Engineering Corporation (BMEC) and has a capital of 29,670,000 ETB. It has about 361 permanent employees engaged in production and sales of Electric Wires and Cables, PVC Pipes, Conduits, Garden Hoses, Polyethylene Packaging Materials, and some household items. The company constitutes five manufacturing sections: Polyethylene, Conduit and Hoses, Pipes, Household items, and Wires and Cables section. The main processing systems in EPSC are film-blowing, extrusion, injection and blow molding.

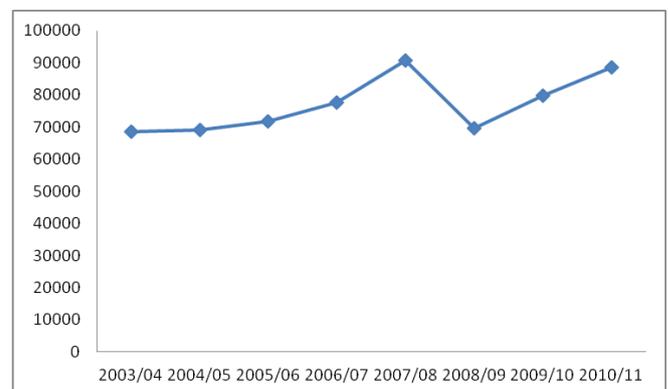
## RESULT AND DISCUSSION

Key business performance indicators including profit before tax, sales volume, capacity utilization, training, defects, down time and promotion are analyzed as follows to find out the correlation between certification and business performances. (Harar Brewery Share Company, 2005 – 2011). Although profit in 2004/05 was a little bit higher than the 2005/06, starting from 2005/06 up to 2008/09 HBSC's profit before tax increased continuously and decreased by about 10% in the year 2009/10. In the year 2011, as figure 1 below reveals, HBSC's profit increased dramatically. Sales in the last two years were progressive. Minimum sales were registered in the year 2008/09 due to chronic power shortage in the country.

**Figure 1a**  
**Profit before Tax ('000)**

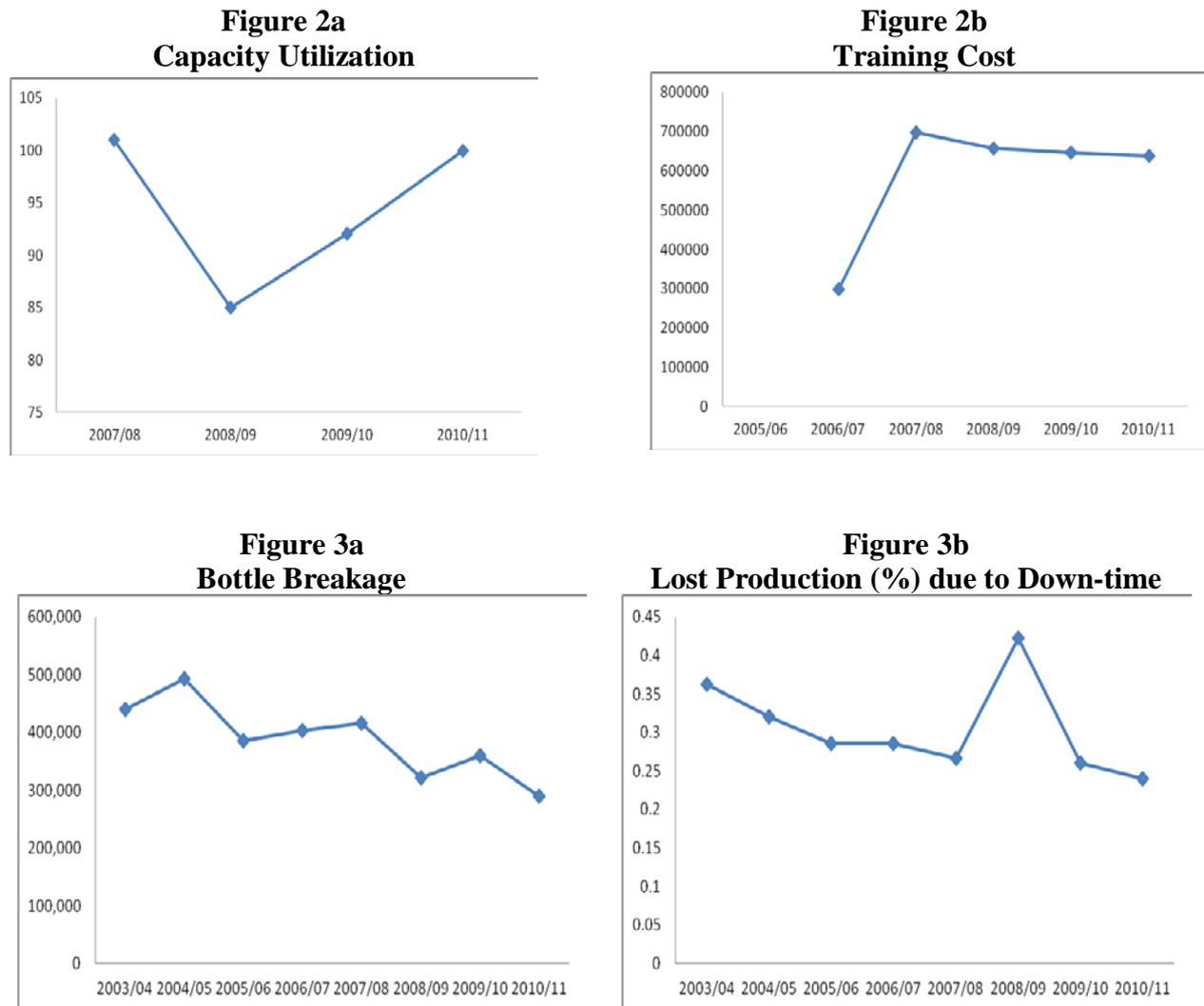


**Figure 1b**  
**Bottle Sales ('000)**



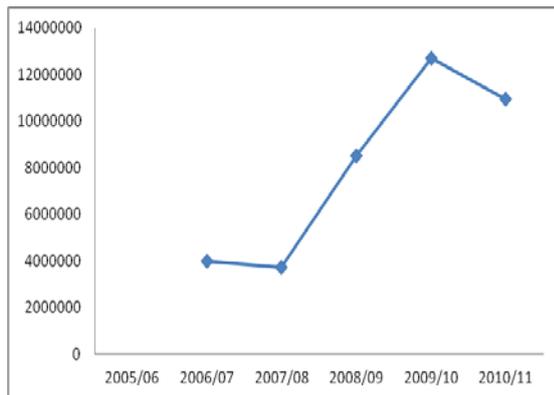
As it is also seen in figure 2, the least utilization was in the same period i.e. 2008/09. Although there were profit decline in the year 2009/10, the sales volume and capacity utilization had increased considerably. If the 2008/09 failure is associated with an external factor beyond the control of HBSC, then the organization's efforts in implementing improvement tools shows a positive correlation with the organization's growth. HBSC is spending significant amount of money for employee's continuous training both locally and internationally. In effect, the bottle breakage decreases continuously since 2005, and the production loss due to down-time also continuously decreases except the year 2008/09 where power interruption was common. See

Figure 3.

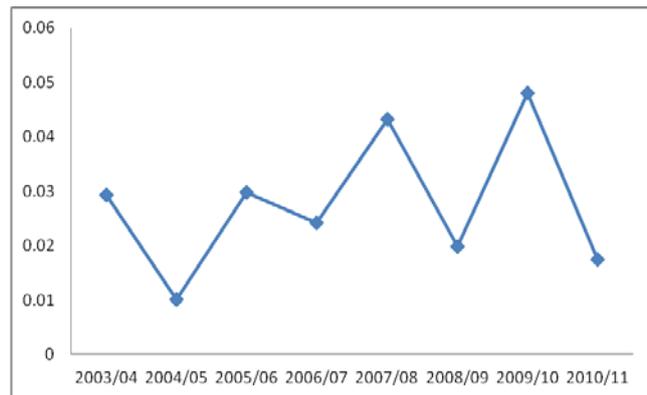


Compared to the advertising cost, we note from figure 2 above, that the training cost is very low. In the year 2007/08 where the training cost was the highest and the advertising cost was the lowest, the training cost constituted only less than 20% of the advertising cost. From the five year average, it can be deduced that the training cost was not more than 8% of the advertising cost. Moreover, the advertising cost is more than 21% of the company's profit. Therefore, international certifications could incur advertising cost. It implies that exhaustive marketing and promotion through advertising could be the reason for HBSC financial growth or Furthermore, defect level does not show any pattern in the study period from 2003/04-2010/11. Had the improvement been through quality management system implementation, the defect percentage should have decreased continuously.

**Figure 4a**  
Advertising Cost



**Figure 4b**  
Percentage defects

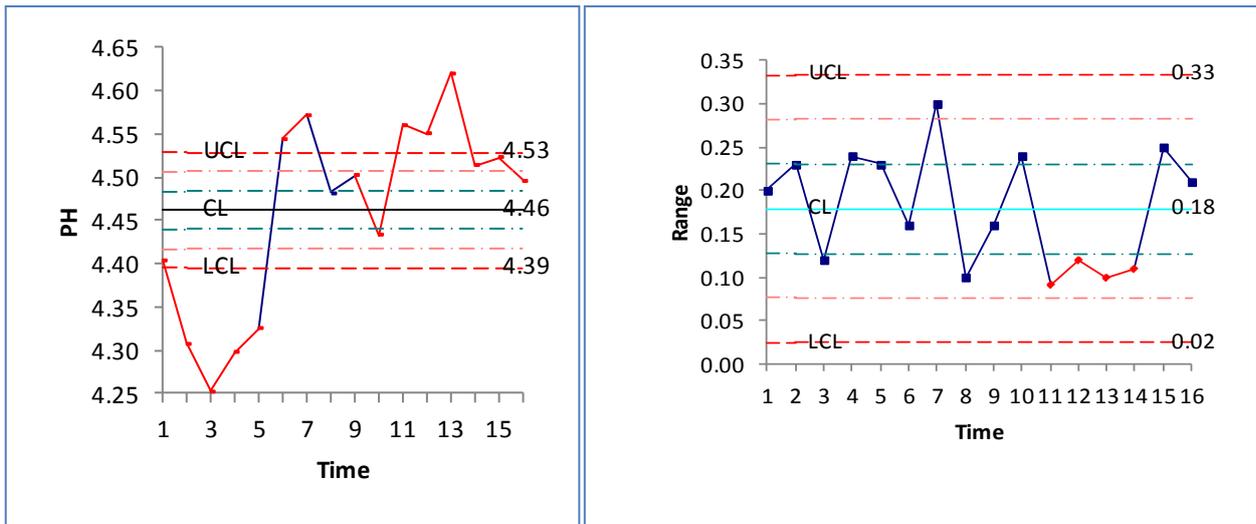


The overall outcome is ambiguous. The first outcome is that quality management implementation increases HBSC's financial performance and the second one reveals that the financial performance could be attributed to the extensive marketing and promotion strategy. Thus, in order to resolve this ambiguous result, additional investigation and analyses has been conducted.

As stated in the literature review, ISO 9000 Quality Management System, among other things, enables an organization to reduce variation in the performance parameter of a product or a process. This research assumed that if Quality Management System implementation was critical in HBSC's financial performance improvement, it should have also improved the production processes and key parameters of the product.

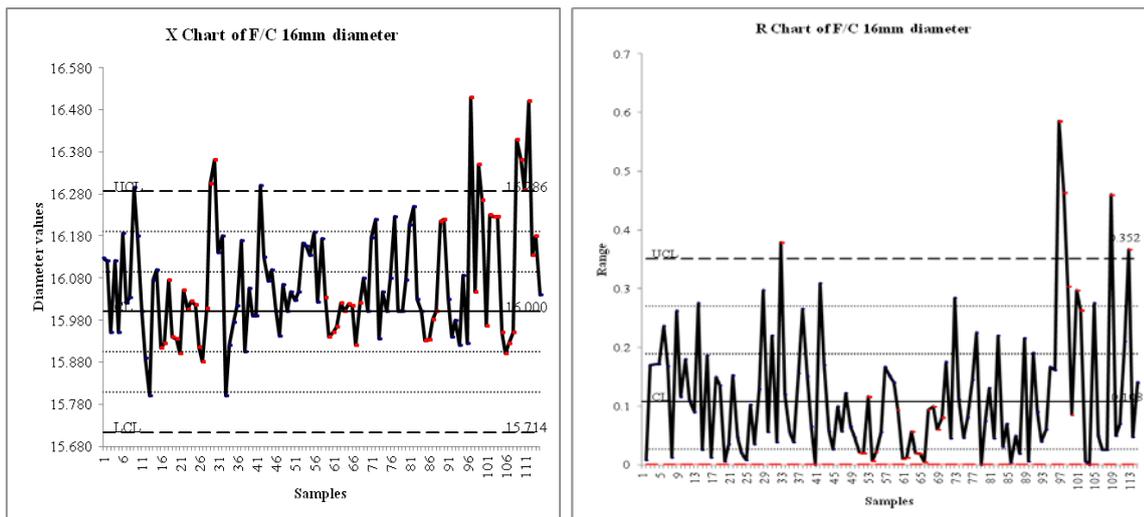
HBSC always take sample from Brew-houses, Storage Cellars and Bottling sections of the production process. In the bottling section parameters including hardness, color, PH, CO<sub>2</sub>, apparent extract, alcohol, and real extract, are tested and controlled. "PH" is the most important parameter in a brewery industry. HBSC's beer PH level is analyzed by using an X-chart and R-chart to measure the product variability and stability. The control charts in figure 5, indicate that the process is out of control in both the X-chart and R-chart. However, all the PH values fall under the specification limit of the company — 4.2—4.6 (see figure 5 below). ISO 9000 certified organization that have uncontrolled processes are anomaly in the panorama of quality management. To further clarify the significance of certification, Ethiopian Plastic Share Company's processes variation are presented as follows.

**Figure 5**  
**X-chart and R-chart of HBSC bottles PH**



In order to support the finding in the Harar Brewery, additional case, Ethiopian Plastic Share Company, were examined to study the variation on the following four products selected from each section of the production process. These are Conduits (F/C Ø 16mm and R/C Ø 19mm), Polyethylene (P/S 38cm/160µm) and Wires and Cables (S/I/W 2.5mm<sup>2</sup>). Records show that the main quality parameters in this product types are diameter and wall thickness. Therefore, these parameters' variation was examined. Based on data collected from the company, X- bar charts and R-charts are plotted to check the process variability (see figure 6 below). As a result, except Polyethylene (P/S 38cm/160µm) all products are out of process control.

**Figure 6**  
**X-chart and R-chart of EPSC's products**



According to Kim et al (2011) motivations for ISO 9000 certification might be quality-related; operations-related; competitiveness-related; external pressure-related; organizational image-related factors which varies from one organization to the others. This study, therefore,

implies that the cases studied in this research might not be engaged in the process of certification to increase the performance of the organizations in the key indicators considered for the evaluation of the ISO Quality Management System.

### **CONCLUSION**

From the case study on HBSC, the relationship between ISO 9000 certification and business performance was not clearly seen. However, with the assumption that a certified organization's improvements should be first seen at the processes, the company's bottle PH value is plotted on X bar and R charts. The result shows that HBSC's processes are not statistically controlled. Based on the X bar chart, the upper and lower control limits are 4.53 and 4.39 respectively. Majority of the data fall outside the control limits thought they are within the company's specification limits. The R chart upper and lower control limits are 0.33 and 0.02 respectively which also show that there are uncontrolled parameters in the production processes. By implication it proves that the certifications did not have significance for the organization's performance improvement. In addition, a recently ISO 9000 certified organization, Ethiopian Plastic Share Company is studied to further clarify the case. The result confirmed that process variability exists despite the possession of the certificate. Therefore, the research concludes certification may not be necessarily associated with process and performance improvement. The fact is, however, additional research should be conducted either by taking more cases or by surveying representative sample.

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