

POST GRADUATE RESEARCH OPPORTUNITIES IN QUALITY MANAGEMENT

Version 1 December 2014

Wynand P. Breytenbach¹

Department of Industrial and Systems Engineering, University of Pretoria, South Africa, 0002

Abstract

Quality Management, defined as the collection of philosophies, theories, practices, tools and techniques associated with achieving and improving quality in all its manifestations, has, and still provides many opportunities for conducting research and attaining a post graduate qualification. This document provides an open invitation and lists some specific topics to students wanting to do post graduate research in quality related matters from a systems engineering perspective.

1 INTRODUCTION

The domain of Quality Management (QM) can be delineated, from a systems perspective, in the following study fields: Product and Process QM, Company-wide QM, Supply chain QM, Industry-wide QM, Country-wide QM and World-wide QM. Although the bulk of QM related philosophies, theories, practices, tools and techniques (hereafter referred to as quality constructs) have developed on the lower system levels, opportunities for research exist in all study fields regarding

1.1 Theory

Theory related studies attract students interested in explaining observed phenomena, proving or disproving fundamental principles and/or solving problems by discovering scientifically acceptable new theoretical knowledge, conceptual models and/or principles/models. For example, a general perception exists that implementing ISO 9000 has a positive impact on organisational performance. Is this perception true? Students interested in theory related studies can review the article by Martínez-Costa, et al (2009) as an example of how such a study can be conducted. Many such research opportunities exist in the study fields of Company-wide QM and Supply chain QM.

1.2 Modelling/Methods/Problem solving

Students interested in advancing theory through the discovery of methods/models may find support in Greenwald, A. G. (2012) postulating that there is a much greater frequency of Nobel science awards for contributions to method than for contributions to theory. However, students must be aware that the application or implementation of existing constructs (for example, implementing ISO 9000 at a particular company) does not qualify for post graduate certification; there must also be some generation of new knowledge (see Buys, 2007:5). Many such research opportunities exist in the study fields of Product and Process QM, Company-wide QM and Supply chain QM.

Students interested in conducting research and attaining a post graduate qualification with regards to the QM are requested to contact the author for more information. The following provide examples of specific research opportunities that students may consider. The author will add new opportunities from time to time.

¹ Contact details: wynand.breytenbach@up.ac.za; +27 82 900 5889, +27 12 420 2376

2 STRATEGIC QUALITY PLANNING

Strategic planning (SP) is an essential element of management and business engineering. Classical work suggests that SP comprises Environmental assessment, Strategy development and Actions plans. Quality perspectives suggest that strategic quality planning (SQP) is a deliberate, definable undertaking that supports SP as an integral or particular intervention. SQP directly impacts Environmental assessment with regards to market environment, competitive environment and corporate capability assessments, Strategic deployment with respect to product design, process engineering, supply chain management and human resource development, and Action plans with respect alignment, operation control, measurement, analysis, improvement and reengineering. In spite of impact, SQP attracts little attention in research. Opportunities for focussed research on the theory, models/methods and application of SQP exist with regards to all the above-mentioned QM study fields.

3 SPC FOR TIME-DEPENDENT (AUTOCORRELATED/DETERMINISTIC) VARIABLES

The fact that Time-dependent (TD) variables are autocorrelated (and not random, individual and identically distributed) necessitates re-evaluation of the application of Statistical Process Control (SPC) when working with TD variables. The fact that SPC for TD variables furthermore demands that the researchers have to consider the dimensionality (One, two or three dimensions) of the variable, the phase of SPC application (Phase I or II) and the longitudinal characteristics (insistent/batch-like existence, non-/profiled and non-/adjustable) provides opportunities to develop novel models/methods for specific types of TD variables, especially if they are supported by a case study.

References

Buys, A. (2007). Research guide for post-graduate students. *University of Pretoria*.

Greenwald, A. G. (2012). There is nothing so theoretical as a good method. *Perspectives on Psychological Science*, 7(2), 99-108.

Martínez-Costa, M, Choi, TY, Martínez, JA, and Martínez-Lorente, AR. (2009). ISO 9000/1994, ISO 9001/2000 and TQM: the performance debate revisited. *Journal of Operations Management*, 27(6), 495-511.

Rakich, JS. (2000) Strategic Quality Planning, *Hospital Topics*, 78:2, 5-11. Link to this article: <http://dx.doi.org/10.1080/00185860009596547>.