Management and Production Engineering Review
Volume 5 • Number 3 • September 2014 • pp. 9–13
DOI: 10.2478/mper-2014-0022

UNDERSTANDING THE IMPACT OF 'HARD' AND 'SOFT' ELEMENTS OF TQM IN SOUTH-EAST EUROPEAN FIRMS

Shpend Imeri[1], Tauno Kekäle[2], Josu Takala[3], Yang Liu[3]

[1] *High Level Training Institute, Gostivar, Macedonia*
[2] *Vaasa University of Applied Sciences (VAMK) Wolffintie 30, FIN-65200, Vaasa, Finland*
[3] *Department of Production, University of Vaasa, Vaasa, Finland*

Corresponding author:
Shpend Imeri
High Level Training Institute
Bulevard Braka Ginovski Nr.46/office 3, 1230 Gostivar, Macedonia
phone: +389 42 222 032
e-mail: shpend.imeri@hlti.org or shpend 85@hotmail.com

Received: 6 June 2014
Accepted: 8 July 2014

Abstract
The study emphasizes on the understanding of the impact of 'hard' and 'soft' elements of TQM in South-Eastern European (SEE) firms in Albania, Bulgaria, Bosnia-Herzegovina, Greece, Macedonia, Montenegr, Serbia and Romania. Thus, 350 questionnaires were collected out of 1000. From different industry sectors in order to have reliable statistical measurements of the 'hard' and 'soft' side of TQM. Hence, this study adopts an exploratory rather than a confirmatory research approach. This approach seeks not only to investigate firms' awareness and perception to TQM but also explores to what extent are firms' familiar with TQM tools techniques, and systems as well as TQM philosophies and principles. Therefore, it can be noted TQM is this SEE firms is neither resisted nor directly accepted, rather they tend to see it from a technical aspect, being familiar and understanding only the essential of its 'hard' elements and less the 'soft' elements.

Keywords
TQM, 'Hard' elements, 'Soft' elements, South-Eastern Europe.

Introduction

TQM originated early 1970s in Japan and has been further developed in USA and other Western European countries. Many authors now see it as having been superseded by Business Process Reengineering (BPR), whereas others argue that TQM is still one of the most promising management approaches, and the underlying codes of the two are rather similar. During 1980s and 1990s TQM drifted to influence countries as well as regions and was seen as revolution in management methods and organizations recognized the need for a deeper focus, where TQM mainly spread to Europe. Its emergence generated enormous quantities of literature and journals that have been focusing on the analysis and principles of how TQM should be implemented in firms. According to Oakland [1] TQM requires to gain ground continuously and become a way of life in many firms. Therefore, TQM cannot become a way of life by night or immediately. Time is the most important factor in order to align the proper TQM philosophies and concepts as well as tools, techniques and systems into firm's culture [2].

Time, resources, experience are not the only imperative that TQM requires. Human resources are as much required for TQM in order to succeed; by this we mean specifically Top management and Middle management. Hence, it could be noted that firms understanding of TQM is focal point within a firm and spreading information around. As Morgan and Murgatroyd [3] point out from their evidence that TQM understanding is sometimes limited in firms'. For this reason, TQM can be understood differently by managers and employees working within the firm. The issue that arises is that, how can TQM become

"a way of everyday life" within a firm when managers and employees do not understand it totally? Hence, the purpose of this study is to explore firms understanding of TQM extent in wider approach such as the SEE region.

This research provides insights of a qualitative study that was conducted in the firms in South-East European Countries (Albania, Bulgaria, Bosnia-Herzegovina, Greece, Macedonia, Montenegro, Serbia and Romania). Basically, one hundred (100) interviews were conducted with top and middle managers form these firms. The rationale of using qualitative approach was in order to dig underneath the quantitative data, testing the meaning of TQM concept from firms' top and middle managers and their view of linkages to wider individual and firm processes.

Theoretical view

According to Fotopoulos and Psomas [4] gurus such as Juran's quality of trilogy, Deming's 14 points as well as plan, do, check, act cycle, Crosby's quality management absolutes, Garvin's dimensions of quality, Ishikawa's cause and effect diagram, Feigenbaum's steps of quality, Taguchi's effort to turn firms into using statistical process control, and many other gurus respectively have represented the most vital elements of the TQM framework. There is no unique or specific model for implementing TQM, since it is a network of interdependent elements consisting of tools, techniques, systems, philosophies and concepts [5]. However, TQM implementation is nearly never 100 percent because some firms implement some elements, where as some implement other elements.

On the other hand, a number of 'soft' elements were introduced in order to increase the awareness of TQM philosophies and concepts for firms' overall improvement. 'Soft' TQM elements incorporate the following: total employee involvement, continues improvement, strategic quality planning, continues training, teamwork, empowerment, customer satisfaction, information and analysis, supplier management, top-management commitment and support, democratic management style, culture change.

A high number of firms around the world have adopted some elements of TQM and continually demonstrate significant benefits. Also it is noted that there is a high demand for improved measures of firms' performance in relation to TQM. Yet an interesting study conducted by Psychogios et al. [6] on the impact of TQM on Middle Managers working in the Greek service industry provided some insights how they perceived TQM and its both elements, however this was done only for the service industry and in a particular country that did not fulfill the requirements of a region.

Table 1
The 'Hard' (left column) and 'Soft' (right column) TQM elements identified in the Total Quality Management Literature.

Statistical Process Control	Total Employee Involvement
ISO 9000 series	Continuous Improvement
HACCP	Strategic Quality Planning
Kaizen Approach	Continuous Training
JIT	Teamwork
Six Sigma	Empowerment
EFQM	Customer Satisfaction
5S	Information & Analysis
Scatter Diagrams	Supplier Management
Benchmarking	Top-Management Commitment and Support
Quality Function Deployment	Democratic Management Style
Run Charts & Control Charts	Culture Change
Pareto Analysis	
Matrix Diagram	
Histograms & Process Charts	
Tree Decision Diagram	
Critical Path Analysis	
Fishbone or Ishikawa Diagram	

There are many studies on analyzing 'hard' and 'soft' elements of TQM, however, one can argue that they all have focused on statistical analysis such as the study of Fotopoulos and Psomas [4] as well as Psychogios et al. [6] that focused on constructing validity through confirmatory analysis. Yet, Talib et al. [7] developed a study in order to priorities the practices of TQM through an Analytical Hierarchy Process (AHP) focusing on service industry. Therefore it is an interesting point to research such kind of relationship in region which has not been explored yet and crosscheck similar studies such as that of Psychogios et al. [6] for reliability and validity not only in the service industry or in a particular country rather than in region such as SEE where no light has been shade on TQM in qualitative method.

Methodology

The research was conducted in SEE region through questionnaire. Based on the above men-

tioned 'hard' and 'soft' TQM elements and the results from their familiarity and adoption, a questionnaire was designed and reviewed by quality management academics and professionals and tested though a pilot study. Initially, the present research was designed on the basis of received 350 questionnaires (respondents) out of 1000 that were sent to firms, visits, e-mail, fax and posted. This survey method has three interrelated advantages. The first is that through this method we aimed to come up with conclusions referring to firms in SEE region and the impact of TQM. The interest and familiarity of firms with the hard and soft side of TQM is another point that from the methodological perspective firms from different sectors answered the survey and that were mainly middle and top level manager. Therefore, the survey obtained a variety of responses that include different views on TQM; it was important and feasible for such as TQM issues to have access to this middle and high level managers.

Findings

As mentioned earlier, this study is interested to identify the impact and familiarity of the hard and 'soft' aspect of TQM. One way would be to explore the effect from each of these 'hard' and 'soft' aspects of TQM on individual attitudes. However, this would result to miss the whole picture of TQM we intend to explore. In other words, this study was interested to analyze the soft side and the hard side as a whole and not as separate entities. Thus, two types of measures of 'soft' and 'hard' TQM were developed. We start in this case with the 'soft' elements since it got lower.

The first or the 'soft' side of TQM is based on philosophies and concepts and this is done through the summation of variables, which is formed by combining several individual variables into a single composite measure (Hair et al., 1998). Therefore in our case regarding the soft side of TQM, the sum of 10 TQM elements can form one single variable. There are two basic arguments for following this method. The first one is related to the theoretical notion that these concepts together compose what 'soft' TQM is all about explained in chapter three. Thus, by adding these concepts together we can represent the multiple aspect of 'soft' TQM in a single measure. The second argument is related to the statistical reliability of these concepts, which allow us to add these items together. More specifically, the diagnostic measure that has been used is Cronbach's Alpha, which is the most widely used to test of reliability coefficient and construct validity [8]. The lower value of Cronbach's Alpha that is generally agreed is 0.7. However, this may decrease to 0.6 in exploratory research [9]. Thus the ten identified items that compose the summated variables Soft TQM presented a moderate level of reliability with alpha coefficient over 0.6. This level of reliability is accepted since our research is an exploratory one.

However, one could claim that this is quite arbitrary approach since there is no confirmed theoretical basis that these ten concepts are parts of a single phenomenon. In respond to this criticism we have chosen to develop a second type measure of 'soft' TQM, which now includes most of the concepts described earlier. Once again the purpose was to explore the 'soft' side of TQM as a whole and not to use each item separately. In contrast, we can select those that they seem to represent most this complex concept. One basic method of achieving this is through the Exploratory Factor Analysis (EFA) [10].

These analyses provide variables that seem to be the most representative of 'soft' TQM. According to the standard practices of EFA with rotation to an orthogonal solution by variemax method was used [11].

After the purification procedure the following factor structure emerged as shown in the table below. *Quality Driven Culture* as the first factor of 'soft' TQM concepts. *Management Commitment and Customer Satisfaction* was the second factor, whereas *Continues Improvement* the third one. The first factor is composed of the concepts *of training, teamwork, employee empowerment and quality culture*, the second factor is composed of *strategic quality, customer orientation & management commitment* and the third by the concepts of *continues improvement, scientific decision making & quality improvement.*

The table below shows that alpha coefficient for each emerged factor that confirms the statistical reliability of the three new variables. Thus, the measurements of the new variables can be obtained by a simple summation of the items included in each factor. From the three identified factors, one (Factor A – Quality Driven Culture) and second (Factor C – Continues Improvement) present regular levels of reliability with alpha coefficient values over 0.7. The other factor (Factor B – Management Commitment and Customer Satisfaction) presents also alpha factors greater than 0.7 but are lower in comparison to other two factors. In addition, moderate and accepted level of reliability with coefficient alpha is between 0.6 and 0.7 [8, 9].

Table 2
Names of the emerged components and reliability testing results of 'Soft' elements.

Factors	TQM Philosophies & Concepts	Name of new variables	Alpha coefficient
A	Training and education on the job is promoted by the management Teamwork is favored Employees are empowered to get involved on the decision concerning work Quality driven culture	Soft TQM 1 Quality Driven Culture	0.758
B	Quality is strategically based The organization is customer oriented Top Management commitment	Soft TQM 2 Management Commitment and Customer Satisfaction	0.704
C	Continues improvement Scientific approach is used for decision making and problem solving There is a long-term commitment towards quality improvement	Soft TQM 3 Continues Improvement	0.740

Significant when alpha coefficient > 0.6.

Based on the above test we notice that Soft TQM 1 or factor A gained higher alpha coefficient but also worthy to mentioned that it consisted of four items/principles of TQM that are closer and belong to Quality Driven Culture with alpha coefficient 0.785. The second factor that emerged in 'soft' side or with other words the second most familiar factor is Continues Improvement, with 0.740 alpha coefficients. Finally the lowest factor in this case gained Management Commitment and Customer Satisfaction, with 0.704.

The next step in our analysis is to examine how we can measure the 'hard' side of TQM. As mentioned this side consists of a variety of management practices that can be found in many Quality Management books, they are globally accepted as useful quality improvement techniques.

Again a purification procedure was needed for the 'hard' side in order to classify the emerged factors. The first factor that emerges from the 'hard' side is Quality Systems. Lean Operations and Quality Planning & Control emerged as the second and third factors. Now, the first factor is composed of HACCP. ISO 9000 series and EFQM. The second factor is composed of Benchmarking, Kaizen Approach, Scatter Diagrams, Fishbone Diagram, Pareto Analysis, Just In Time, 5 S's and Histograms & Process Charts. Finally, the third factor is composed of Statistical Process Control, Run & Control Charts, Six Sigma and Critical Path Analysis.

Accordingly, from the tests shows in the table below, we can automatically notice that 'hard' side gained higher alpha scores compared to 'soft' side of TQM. Thus, the alpha coefficient for each emerged factor as said earlier confirms the statistical reliability of each variable. The summations of each factor provided the following reliability based on from the greater one from the three identified factors and that, first (Factor B – Lean Operations), second (Factor C – Quality Planning & Control) presented high level of reliability and validity as well, the cronbach's alpha for both factors is higher than 0.9. The other factor (Factor C – Quality Systems) presents also reliable coefficient 0.8 which solid in this case.

Table 3
Names of the emerged components and reliability testing results of 'Hard' elements.

Factors	TQM Philosophies & Concepts	Name of new variables	Alpha coefficient
A	HACCP ISO 9000 Series EFQM	Hard TQM 1 Quality Systems	0.837
B	Benchmarking Kaizen Approach Scatter Diagrams Fishbone Diagram Pareto Analysis Just in Time 5 S's Histograms & Process Charts	Hard TQM 2 Lean Operations	0.945
C	Statistical Process Control Run & Control Charts Six Sigma Critical Path Analysis Quality Function Deployment	Hard TQM 3 Continues Improvement	0.909

Significant when alpha coefficient > 0.6.

Therefore, the results show that firms in SEE region general are familiar and in particular more with Hard TQM 2 or Factor B – Lean Operations tools with 0.945 alpha coefficient and then comes the Hard TQM 3 or Factor C – Quality Planning & Control with alpha coefficient 0.909. Finally in this test Hard TQM 1 or Factor A – Quality Systems gained less alpha score 0.837 but this is also considered to higher than the normal scores.

Conclusions

Based on the overall findings TQM seems to be important in the region. The majority of the respondents also said that quality improvement is one of the top priorities within their companies or putting it in other words TQM is one of the popular initiatives in SEE region.

TQM seems to play an important role in the region. The great majority of our respondents stated that quality improvement is one of the top priorities within their organizations. In addition, findings show that TQM is one of the most popular quality initiatives in SEE region.

However, despite firms familiarity of 'soft' TQM concept and ideas, their level of understanding and knowledge towards these concepts is skeptical. Without any doubt TQM has become a substantial issue on the SEE firms agenda. Firms in SEE region have undertaken many steps towards the TQM approach before it could be said to be a core organizational principle.

Moreover, there is evidence that TQM has got somewhere in the SEE region. In other words, TQM has affected their perception on several aspects of their everyday work, such as empowerment and work effort. However, this effect came mainly from the familiarity with 'hard' management practices rather than from their awareness of 'soft' concepts. This fact suggests that firms hold a realistic view of TQM. Although the 'soft' TQM side is something good and useful in their minds, it has little to do with organizational reality. The one that really matters is the 'hard' side.

To sum up, firms in SEE region are more familiar with 'hard' side than with the 'soft' side of TQM. This might also mean that firms in SEE region are not implementing and working on 'soft' side as much as they work on the 'hard' side. Nevertheless, the 'soft' side incorporates people and it is more difficult to manage, for this reason it is recommendation that SEE firm focus more toward the 'soft' side of TQM in the future.

References

[1] Oakland J., *Total quality management*, Oxford, UK: Heinemann, 1989.

[2] Goetsch L.D., Davis B.S., *Quality Management for Orgnisational Excellence: Introduction to Total Quality Management*, 6th ed., Upper Saddle River, New Jersey, Prentice Hall, 2010.

[3] Morgan C., Murgatroyd S., *Total quality management in the public sector*, Buckingham, UK: Open University Press, 1997.

[4] Fotopoulos C.B., Psomas E.L., *The impact of "soft" and "hard" TQM elements on qualitymanagement results*, International Journal of Quality & Reliability Management, 26, 2, 150–163, 2009.

[5] Imeri S., Kekäle T., *Towards an understanding of the impact of TQM in firms in south east europe – a qualitative approach*, Business Excellence and Management, 3, 3, 1–17, 2013.

[6] Psychogios G.A., Wilkinson A., Leslie T. Szamosi, *Getting to the heart of the debate: TQM and middle managers autonomy*, Total Quality Management & Business Excellence, 20, 4, 445–466, 2009.

[7] Talib F., Rahman Z., Qureshi, *Prioritizing the practices of Total quality management: Ananalytic hierarchy process analysis for the service industries*, Total Quality Management & Business Excellence, 22, 12, 1331–1351, 2011.

[8] Nunnaly J., *Psychometric Theory*, New York, McGraw-Hill, 1979.

[9] Robinson J.P., Shaver P.R., Wrightsman L.S., *Criteria for Scale Selection and Evaluation* in Robinson J.P., Shaver P.R., Wrightsman L.S. [Eds.], *Measures of Personality and Social Psychology Attitudes*, San Diego, 1991.

[10] Lewis-Beck S.L., *Factor Analysis and Related Techniques*, Sage Publication, London, 1994.

[11] Hair J., Anderson R., Tatham R., Black W., *Multivariate Data Analysis*, 5th ed. London, Prentice Hall, 1998.