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Full Length Research Paper

Can sustainable quality management contribute to the organizational performance?

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The purpose of this paper is to investigate the role that sustainable quality management (SQM) can play in achieving higher organizational performance. Specifically, this paper intends to conceptualize the SQM and deepen the understanding if the adoption of SQM significantly affects the organizational performance. A structured questionnaire was developed for collecting data from Slovenian organizations. Based on the factor analysis, the factors of SQM are proposed and defined as a set of determinants, named as: Green development and environmental aspects, top management commitment, employee support, CSR and local community engagement. Using a multiple regression analysis, we assessed the contribution of SQM factors to organizational performance. This analysis accounted for approximately 74% of the variance in non-financial organizational performance and approximately 46% of the variance in financial organizational performance, with two main predictors: Top management commitment and employee support. The effect of green development and environmental aspects as well as CSR and local community engagement on financial performance is also considered as positive, but mainly indirect through non-financial performance from the employee perspective.

Key words: Quality management, green development, sustainability, employee involvement, sustainable quality management, performance indicator, organizational performance.

INTRODUCTION

In recent decades, the term quality has expanded beyond the classical interpretation of "satisfying customer expectations related to the supplied product" to include not only the delivery of excellence to a variety of stakeholders, but also the environmental, safety, financial, and even social aspects of organizational performance (Boys et al., 2005). From the corporate point of view, the environmental protection is a vital management function, it is perceived as being instrumental in the development of a positive corporate image and an important element to the success of a business enterprise (D'Souza et al., 2006). Not only does environmental responsiveness help organizations to remain competitive and increase market share (Chan, 2001; Fitzgerald, 1993; Porter and Van der Linde, 1995a) but also there is some evidence showing increases in customer loyalty (D'Souza et al., 2006). Chang

and Fong (2010) argue that green product quality had positive effects on green customer satisfaction and green customer loyalty.

Nowadays it is widely recognized that corporations need to act in a socially responsible way in order to contribute to social well-being and competitiveness as well as financial success of the firm (Moneva and Ortas, 2010). Green management in organizations has to go beyond regulatory compliance and needs to include conceptual tools such as pollution prevention, product stewardship and corporate social responsibility (Hart, 2005). The needs for efficient use of resources and environment friendly corporate policies and behaviours have now been recognized all over (Das et al., 2006). The performance of an enterprise can no longer be evaluated on the basis of economic parameters alone and it needs to be integrated with environmental performance as well (Saxena et al., 2003). To be successful in this new era of environmental accommodation and adjustment at a global level, the time appears to be right for organizations to integrate their people, planning and

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performance accountability processes to attain their organizational environmental objectives (Dwyer, 2009). In fact, Bansal and Roth (2000) indicate that such integration would lead to higher performance and accountability results.

In the present highly competitive context, designing products which are more respectful for the environment makes sense, if the head of the company has strong environmental convictions or more often, if the company can get an advantage from this engagement (Houe and Grabot, 2009). This involvement can be paid back in terms of image (Seidel et al., 2006) but also in terms of market share: it is now clear that environmental regulations can result in barriers against low cost countries (Gottberg et al., 2006) but may also bring a competitive advantage, in a context of increased customer awareness on environmental issues (Thøgersen, 2002; Teisl, 2002; Mascle and Ping Zhao, 2008). Whereas sound economic performance in the past was expected to guarantee corporate success by companies and its shareholders, business is currently increasingly led by the so-called triple bottom line. Economic and financial results need to be accompanied by the minimization of ecological footprints and increased attention to social aspects (Lee, 2009). Moving towards sustainable development, therefore, is now a major concern in most of the developed countries, resulting in stricter regulations concerning the impact of the products during their manufacturing, use and end of life including the obligation to define reverse logistics strategies and systems (Gou et al., 2008; Hong et al., 2008; Kumar and Putnam, 2008). Whereas sustainable consumption targets consumers, sustainable production is related to companies and organizations that produce products or offer services (Veleva and Ellenbecker, 2001). Moreover, sustainability is often seen to require the adoption of an integrated view of innovation that brings together economic, environmental and social concerns as a basis for system changes (Roome and Cahill, 2001).

The purpose of the paper is to investigate the role that sustainable quality management (SQM) system can play in achieving higher organizational performance. Specifically, this paper intends to deepen the understanding if the adoption of sustainable quality management significantly affects the organizational performance and what are the key determinants of sustainable quality management that could contribute to the organizational performance.

SUSTAINABLE QUALITY MANAGEMENT AND ORGANIZATIONAL PERFORMANCE: THEORETICAL FRAMEWORK

Operationalization of the sustainable quality management construct

Here an approach of sustainable quality management

(SQM) is described and discussed to stimulate and trigger further debate and exploration of SQM conceptualizations and evaluations. The term “sustainable quality management” is used for this purpose. According to the literature review, there have not been too many attempts to define and operationalize construct that is in this paper used by the term “sustainable quality management” (SQM). We define the SQM as a set of determinants that support systematic integration of environmental issues as well as broader sustainability issues into processes/product quality characteristics aimed at achieving higher overall organizational performance.

Three axioms proposed by Bendell et al. (2010), learnability, innovability and sustainability are presenting good starting point to discuss and operationalize SQM.

In that respect SQM possesses some of the characteristics of the quality management, sustainable development, employee capabilities and innovation capabilities. In order to explain and support the concept of SQM further, the following section encompasses the related literature.

Contemporary quality management approach

Foster and Jonker (2003) suggest that the quality movement has passed through its first and second generations and is moving into a third generation which among others includes a social perspective. Taking into account this point of view, Garvare and Johansson (2010) argue that organisational excellence, in terms of promoting both organisational and global sustainability, implies that the organisation should aim to satisfy, or preferably exceed the wants and expectations of its stakeholders without compromising the ability of other parties to meet their needs. Likewise, Foley (2005) argues that if the organisation can continue to meet the needs and expectations of the stakeholders, the aim of organisational sustainability will be accomplished. Moreover, Foley (2005) argues that the customers, as they provide the funding necessary to satisfy the needs and expectations of the other stakeholders, should be regarded as the foremost stakeholder among equals.

Foley and Zahner (2009) have used the definition of the stakeholder to construct an organisation sustainability model, which in its consideration of quality as one of the wants and expectations of stakeholders, and as a strategy for guiding the organisation to sustainable success generates a form of quality management. In addition, the concerns and objectives of the stakeholders are important aspects to consider, in order to integrate corporate social responsibility (CSR) into business operations and activities of a company (Guadamillas-Gómez et al., 2010). Specifically, the strategic management literature opens the question whether CSR may be a source of a competitive advantage by differentiating

products, processes or the firm itself from its competitors (McWilliams and Siegel, 2001). This perspective gives a rationale for the firm to integrate CSR into corporate and business strategy. Sharp and Zaitman (2010) examine the process of strategization of CSR and indicate that CSR is a substantive strategic activity for the corporation.

Green development and sustainability

Green product attributes may be an environmentally sound production processes, responsible product uses, or product elimination, which customers compare with those possessed by competing conventional products (Meffert and Kirchgeorg, 1993; Peattie, 1995). However, the literature does not yet offer an objective definition of what makes a product "environmentally friendly". Fuller (1999) defined sustainable products as a form and function alternatives that possess positive ecological attributes that are nothing more than enhanced waste management factors (eco-attributes) that have purposely been designed-in (embedded) through decisions concerning how products are made/manufactured, what they are made of, how they function, how long they last, how they are distributed, how they are used, and how they are disposed of at the end of useful service life.

In particular, organizations involved in ecodesign activities are generally subject to the same influencing factors. One frequently mentioned factor is management commitment and support (Ehrenfeld and Lenox, 1997; Ritzén, 2000; Pujari et al., 2004; Boks, 2006). Essential responsibility for management is to establish clear environmental goals not only for the development of an organisation as a whole, but for the individual product development projects as well (Ehrenfeld and Lenox, 1997; Frei, 1998; Magnusson and Johansson, 1999; Ritzén, 2000). This implies that environmental considerations should be addressed as a business issue that is the environmental considerations must be balanced with commercial aspects (Keldmann and Olesen, 1994; Ritzén, 2000). It also implies that ecodesign should not only be treated on an operational level, but also on a strategic level (Charter, 1997).

The strategic level relates to how a company wants to position itself concerning environmental issues and includes, among other things, the establishment of an environmental product development policy (Johansson, 2002). Strategic plan and orientation is also one of the main phases of the enterprise sustainability risk model proposed by Yilmaz and Flouris (2010).

Innovation and employee capabilities

In order to survive and compete successfully, the organization needs innovation-friendly business strategy, organizational structure, top management style, middle

management practices and effective modes of managing innovation for innovational success and competitive excellence (Khandwalla and Mehta, 2004). It is important to encourage creativity by the means of the ability to create or to be original, expressive and imaginative where as creativeness is the creative potential or the capacity to be creative (DiLiello and Houghton, 2008). It is important to encourage a culture favourable to innovation in the organizations' innovative behaviour (Dhandler et al., 2000). In the context of innovation von Kleef and Roome (2007) provided extended literature review regarding developing capabilities and competence for sustainable business management. They developed a framework for a better understanding of the capabilities that foster the competence by business to innovate in ways that are more sustainable.

Successful organizations constantly enhance employee capabilities through a variety of special programs (McCowan et al., 1999). Employee capabilities reflect an individual's perception of his or her own knowledge, skills, experience, network and abilities to achieve results, and room for potential growth. Effective, appropriate, and successful training experience serves as an indication that an organization is voluntarily willing to invest in its human capital that both builds employee capabilities and increases their degree of job satisfaction (Bontis and Serenko, 2007).

Organizational performance

Uyar (2009) stressed out the importance of quality performance measures in the context of financial and non-financial measures. The author implies that organizations have begun to use new performance measures (non-financial measures) other than traditional measures. Antony and Bhattacharyya (2010) suggest that organizational performance needs to be measured along multiple levels:

The organizational level, the key process level and the work unit level, requiring complementary dimensions.

This is consistent with the findings of Tangen (2003), who indicate that in some cases different performance dimensions may have to be combined to get a balanced and complete view of the situation. Carmeli and Tischler (2004) discovered that intangible organizational elements like managerial capabilities, human capital, internal auditing, labor relations, organizational culture, and perceived organizational reputation each influenced organizational financial performance positively. Likewise, Fulmer et al. (2003) found that positive employee relations were powerful predictors of financial performance. Moreover, Ferguson and Reio (2010) suggest that human resource management has positive influence on firm performance,

Table 1. Apportionment of the used sample.

Size of the organization	Valid percent
< 5	13.0
5 to 50	37.7
50 to 250	33.8
250 to 500	7.8
> 500	7.8
Total	100.0

mainly through human employee skills and motivation facets, human resource management practices and human resource processes. Also, Lee and Yu (2004) found out that corporate culture has impact on a variety of organizational processes and performance. Rolstadas (1998) highlighted another point of view, indicating that innovation is a key element in sustaining and improving organizational performance.

A sustainable organizational advantage may be built with tacit assets that derive from developing relationships with key stakeholders (Hillman and Keim, 2001). When studying the relationship between stakeholder management and a firm's financial performance, Berman et al. (1999) found that fostering positive connections with key stakeholders (customers and employees) can help a firm's profitability.

RESEARCH METHODS

A random sample of 1000 organizations was included in the survey on the basis of the Slovenian business register "bizi.si" database. In total, 171 responses were collected (response rate 17.1%) during the given time window. Among the received responses 77 were used as input data for the further statistical analysis, due to the fact that not all returned questionnaires were completely filled out. The population for this study constitutes of large, medium-sized and small Slovenian organizations. The questionnaire was responded by manufacturing, service as well as manufacturing/service type of industry, in portion of 33.8, 41.6 and 24.7%, respectively. In Table 1 the apportionment of the used sample is presented. Several topics (related to quality management, sustainability and environmental performance) were conceptualized to formulate a list of 50 statements, each tested on five-point Likert scale (1 = "strongly disagree", 5 = "strongly agree"). As discussed in the literature review, our understanding of sustainable quality management relates to the quality management (Lakhal et al., 2006; Nilsson-Witell, 2005; Kaynak, 2003), green development (Pujari et al., 2003; Pujari et al., 2004; Johansson, 2002), environmental performance (Moneva and Ortas, 2010; Rao and Holt, 2006; Melnyk et al., 2003), sustainability (von Kleef and Roome, 2007; Veleva and Ellenbecker, 2001), CSR (Guadamillas-Gómez et al., 2010; McWilliams and Siegel, 2001) as well as employee capabilities (Govindarajulu and Daily, 2004; DiLiello and Houghton, 2008; Bontis and Serenko, 2007). Hence, we started developing our questionnaire by building on the previous theoretical basis, and composed 50 statements in order to measure various aspects of sustainable quality management.

Some of these 50 statements were incorporated in our survey from the literature, some of them, especially in the sections green development and employee capabilities were thematically joint and

developed for the purpose of this study. A set of 25 statements (named as sustainable quality management determinants) was taken for further analysis. The selection of the 25 out of 50 statements was based on estimated mean values and standard deviation for each statement as they were ranked by the respondents (which reflects the importance from organizations' point of view) while considering theoretical basis in order to ensure content validity. In general, both convergent and discriminant validity were confirmed. For the organizational performance construct, fourteen statements were developed and tested on a five-points scale (1 = "not at all", 5 = "to a great extent").

The organizational performance construct encompasses financial (Hart and Ahuja, 1996; King and Lenox, 2000) as well as non-financial performance measures (Antony and Bhattacharyya, 2010; Boys et al., 2005; Hillman and Keim, 2001; Uyar, 2009).

Factor analysis

Factor analysis was applied with the aim of data reduction and therefore simplification of a large number of intercorrelated measures of SQM to a few representative constructs or factors.

Correlation analysis

According to the presumption of the proposed linkages between SQM determinants and organizational performance, the test of measuring the association of variables is Pearson correlation, because it tests the "interdependency" of the variables discussed in the model.

Multiple regression analysis

Multiple regression analysis was used in order to analyze the relationship between a dependent variable (organizational performance measures) and a set of independent or predictor variables (SQM constructs).

RESULTS

To test the reliability, the internal consistency of the questionnaire was measured using Cronbach's alpha coefficient. Reliability analysis showed satisfactory result (Cronbach's alpha coefficient = 0.962).

Sustainable quality management determinants

Table 2 shows the factor analysis results. The results show four factors with eigenvalues >1 accounting for

Table 2. Factor analysis of sustainable quality management determinants.

Determinants of SQM	Factor 1	Factor 2	Factor 3	Factor 4
We strive to improve energy efficiency (SQM 23).	0.763			
During the product development we consider the principles of sustainable development and product life cycle (SQM 29).	0.743			
Top management accepts responsibility for environmental protection (SQM 15).	0.724			
We incorporate different environmental protection practices (waste separation and recycling, reducing energy consumption/water, introducing the principles of sustainable development, etc.) (SQM 27).	0.704			
We strive to improve efficiency of material consumption (SQM 22).	0.650			
We have developed a strategy for environmental protection (SQM 11).	0.629			
We follow-up on environmental legislation and other requirements (SQM 12).	0.603			
Environmental protection is conceived as an incentive to create new market opportunities (SQM 8).	0.590			
We introduce the concept of clean technology (SQM 26).	0.549			
Top management is committed to promoting a concept of sustainable development (SQM 18).		0.786		
We are aware of customer requirements and expectations (SQM 2).		0.738		
Top management is committed to promoting a culture that encourages innovation and risk-taking (SQM 17).		0.729		
Top management is committed to an open, participatory process of continuous improvement, focused on the long-term economic performance of the organization (SQM 16).		0.709		
We encourage and develop the ability to create and acquire the internal source of knowledge (SQM 6).		0.691		
Top management accepts responsibility for quality (SQM 14).		0.611		
Security and employees' well-being is a priority of our organization (SQM 44).			0.848	
Our employees are encouraged to continuously develop their talents and capacities (SQM 45).			0.824	
Employees are loyal to our organization (low turnover and absenteeism rate) (SQM 41).			0.771	
Workers are valued and their work is organized to conserve and enhance their efficiency and creativity (SQM 20).			0.700	
We use tools for continuous improvement and employees' innovation enhancement (SQM 4).			0.476	
We have developed a strategy for corporate social responsibility (SQM 38).				0.741
Our organization is involved in the local community (SQM 39).				0.651
We develop and implement incentive mechanisms to promote sustainability initiatives (SQM 7).				0.582
We are committed to continuous improvement in the field of health, safety and environment in a way that reflects the concerns for the public (SQM 13).				0.511
We are aware of the importance of the corporate social responsibility (SQM 37).				0.509
% of Variance.	53.108	7.848	5.972	4.421

75.754% of the variance (KMO statistic 0.725; Bartlett statistic 1299.167, significance 0.000). Table 2 contains the rotated factor loadings, which are analogous to the correlations between the variable and the factor, and are used here for the

interpretation of given factors. A cut-off of 0.6 was made on the rotated factor loadings in order to get reliable factors (meet a criterion for statistical significance) regarding the interpretation and further analysis. Hence, the first factor shows the variables

having a common underlying dimension of "green development and environmental aspects". The main variables, which load heavily on this factor, are related to the improvement in energy and material efficiency, principles of sustainable

Table 3. Correlation coefficients between constructs of SQM and organizational performance.

Construct	Correlation matrix					
	1	2	3	4	5	6
1. Factor 1	1					
2. Factor 2	0.697**	1				
3. Factor 3	0.609**	0.734**	1			
4. Factor 4	0.640**	0.572**	0.513**	1		
5. Non-financial performance	0.501**	0.761**	0.820**	0.403**	1	
6. Financial performance	0.449**	0.660**	0.588**	0.343*	0.780**	1

Correlation is significant at the **0.01 level (2-tailed) and *0.05 level (2-tailed).

development, top management responsibility for environmental protection, environmental protection practices, strategy for environmental protection and consideration the environmental legislation.

The second factor, named “top management commitment” includes the variables relating to management commitment to promoting a concept of sustainable development, focus on customer requirements and expectations, commitment to quality and to promoting a culture that encourages innovation and risk-taking and focus on the establishing an environment that support knowledge creation. The third factor, “employee support” describes the issues relating to employees. Variables loading heavily on this factor are security and employees’ well-being, employees’ encouragement to continuously development their talents and capacities, employee loyalty and establishing an environment that encourages employees’ efficiency and creativity. The fourth factor, “CSR and local community engagement” captures the common underlying dimension of variables, regarding a strategy for corporate social responsibility and organization’s involvement in the local community.

SQM performance

An exploratory factor analysis was performed on all fourteen performance variables using principal component analysis (varimax method). Results produced a two-factor solution, with eigenvalues greater than one, accounting for 75.2% of the variance (K-M-O statistic 0.730; Bartlett statistic 154.803, significance 0.000). Factor 1 is named as “non-financial performance measures” (NONFINAPERF), which include variables relating to employee involvement, satisfaction of stakeholders, ability to acquire and to share new knowledge, efficiency and effectiveness of processes, employees’ trust in top management, employee satisfaction rate, relationships with suppliers. The second factor (FINAPERF) shows variables having a common dimension of financial performance, primarily relating to ROE - return on equity, ROA – return of assets, ROI - return on investment, value added per employee, investment in new processes and

products and market value added. Variable “growth in stocks value” was excluded from the results due to missing values.

The results of the correlation analysis indicate that there is a significant relationship between observed variables (Table 3). As shown in Table 3, all SQM factors are positively correlated with organizational performance. The Pearson correlation matrix shows that Factor 1 is positively and significantly related with non-financial performance ($r = 0.501$, $p < 0.001$) and financial performance ($r = 0.449$, $p < 0.003$). Results indicate strong relationship between Factor 2 and non-financial performance ($r = 0.761$, $p < 0.000$) and also financial performance ($r = 0.660$, $p < 0.000$). Furthermore, our results support a strong positive relationship between Factor 3 and non-financial performance ($r = 0.820$, $p < 0.001$). Factor 3 is also positively related to financial performance ($r = 0.588$, $p < 0.000$). Factor 4 is positively and significantly related with non-financial performance (0.403 , $p < 0.007$) but less than other factors. This is also the case with financial performance ($r = 0.343$, $p < 0.024$).

Correlations between SQM factors and non-financial performance measures

Further correlation analysis revealed that Factor 1 is moderately positively related (correlation coefficients are between 0.4 and 0.7) to all non-financial performance measures. The strongest relationship was found between Factor 1 and measure defined as employee involvement ($r = 0.621$, $p < 0.000$). Factor 1 is also significantly related to ability to acquire and to share new knowledge ($r = 0.581$, $p < 0.000$), relationships with suppliers ($r = 0.577$, $p < 0.000$) and satisfaction of stakeholders ($r = 0.555$, $p < 0.000$). As far as Factor 2 is concerned, results indicate strong relationship between trust in top management ($r = 0.723$, $p < 0.000$), ability to acquire and to share new knowledge ($r = 0.721$, $p < 0.000$), satisfaction of stakeholders ($r = 0.714$, $p < 0.000$), employee involvement ($r = 0.684$, $p < 0.000$), efficiency and effectiveness of processes ($r = 0.669$, $p < 0.000$).

Analysing the relationship between Factor 3 and

Table 4. Impact of sustainable quality management determinants on non-financial and financial organizational performance measures: Results from regression analysis.

Factors	Non-financial organizational performance				Financial organizational performance			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
1	0.501(0.001)	-0.058(0.685)	-0.172 (0.141)	-0.134(0.290)	0.449(0.003)	-0.020(0.905)	-0.065(0.701)	-0.032 (0.862)
2		0.801(0.000)	0.438 (0.002)	0.453 (0.002)		0.674 (0.000)	0.530 (0.010)	0.543 (0.010)
3			0.603(0.000)	0.613 (0.000)			0.238 (0.187)	0.246 (0.179)
4				-0.084(0.443)				-0.073(0.652)
R ²	0.251	0.581	0.742	0.746	0.202	0.435	0.460	0.463
Adjusted R ²	0.233	0.561	0.723	0.720	0.182	0.407	0.419	0.407
F	14.045	28.440	38.396	28.660	10.373	15.423	11.092	8.202

individual non-financial performance measures, results imply strong positive relationship between employee involvement ($r = 0.820$, $p < 0.000$), employee satisfaction rate ($r = 0.742$, $p < 0.000$), satisfaction of stakeholders ($r = 0.735$, $p < 0.000$), efficiency and effectiveness of processes ($r = 0.707$, $p < 0.000$), ability to acquire and to share new knowledge ($r = 0.706$, $p < 0.000$), relationships with suppliers ($r = 0.704$, $p < 0.000$) and trust in top management ($r = 0.689$, $p < 0.000$). The correlation analysis revealed the positive relationship between Factor 4 and employee involvement ($r = 0.507$, $p < 0.001$), ability to acquire and to share new knowledge ($r = 0.422$, $p < 0.005$), relationships with suppliers ($r = 0.407$, $p < 0.007$), satisfaction of stakeholders ($r = 0.406$, $p < 0.006$) and employee satisfaction rate ($r = 0.401$, $p < 0.008$).

Correlations between SQM factors and financial performance measures

The correlation analysis among financial performance measures indicate that Factor 1 is positively related to investment in new processes

and products ($r = 0.618$, $p < 0.000$), ROE - return on equity ($r = 0.400$, $p < 0.016$), value added per employee ($r = 0.374$, $p < 0.017$) and market value added ($r = 0.333$, $p < 0.039$). On the contrary, correlations between Factor 1 and ROA – return of assets ($r = 0.151$, $p < 0.380$) and ROI - return on investment ($r = 0.252$, $p < 0.126$) were not found to be significant. According to the results, Factor 2 is positively related to all financial performance measures. The strongest correlation was found between Factor 2 and investment in new processes and products ($r = 0.734$, $p < 0.000$). Results also showed positive relationship between Factor 2 and value added per employee ($r = 0.626$, $p < 0.000$), market value added ($r = 0.588$, $p < 0.000$), ROI - return on investment ($r = 0.484$, $p < 0.002$), ROA – return of assets ($r = 0.454$, $p < 0.001$) and ROE - return on equity ($r = 0.406$, $p < 0.014$).

Factor 3 was found to be positively related to investment in new processes and products ($r = 0.647$, $p < 0.000$), value added per employee ($r = 0.611$, $p < 0.000$), market value added ($r = 0.502$, $p < 0.000$), ROI - return on investment ($r = 0.463$, $p < 0.003$), ROA – return of assets ($r = 0.415$,

$p < 0.012$) and ROE - return on equity ($r = 0.338$, $p < 0.044$). Factor 4 is also positively related to investment in new processes and products ($r = 0.427$, $p < 0.005$), but was not found to be significantly related to other measures.

SQM and organizational performance: Results of regression analysis

In this study, a hierarchical regression method is applied for analyzing specified regression models (Table 4). Assuming that all of the predictors have significant correlations with the dependent variable and that their intercorrelations are all below 0.80, multicollinearity may not be a big problem. Table 4 shows that the linear model (Model 1) tested is significant ($p < 0.05$). The regression analysis accounted for 25% change is caused by Factor 1 to non-financial organizational performance which is dependent variable. Value of beta also shows the positive rate of change by dependent variables (Beta = 0.501, $p = 0.001$). The first model (Table 4) with Factor 1 in the equation shows an adjusted R² of 23% with an F

value of 14.045 ($p < 0.001$).

The second model (Model 2) adds factor 2 such as top management commitment. The net increment in the variance of factor 2 over the Factor 1 is 31%. The adjusted cumulative R^2 has gained from 0.233 to 0.561, which means that variables in Model 2 account for 56% of the variation in non-financial organizational performance. According to the results, Factor 2 seems to be significant predictor of non-financial organizational performance ($\beta = 0.501$, $p = 0.001$). The results show that Factor 1 was not found to be significant though the overall model was significant ($F = 28.440$, $p < 0.000$). The Model 3 adds the Factor 3 in addition to the Model 2. The results show a cumulative adjusted R^2 of 0.742 with an F value of 38.396 ($p < 0.000$). These results suggest that the Model 3 represents a significantly more powerful set of predictors than the set of variables in Model 2. The results indicate that the Factor 2 ($\beta = 0.438$, $p = 0.002$) and Factor 3 ($\beta = 0.603$, $p = 0.000$) are found to be significant for predicting the dependent variable (non-financial organizational performance). Factor 1 does not appear to add unique predictive power when the effects of the other predictors are held constant ($\beta = -0.172$, $p = 0.141$). Entry of the Factor 4 variable (Model 4) resulted in a ΔR^2 0.004. This increase is not significant by the F Change test ($\Delta F = 0.601$, $p < 0.443$).

For the financial organizational performance model, Factor 1 was entered as first (Model 1). In the first model, Factor 1 was found to be significant ($\beta = 0.449$, $p = 0.003$). The first model accounts for 20.2% of the variation in the financial organizational performance. In the Model 2, Factor 2 was added ($p < 0.000$) to the Factor 1 showing an increment of 23.3% in R^2 . F test on ΔR^2 is significant, indicating that Factor 2 added in the regression model significantly improved the prediction for the financial organizational performance ($\Delta F = 16.541$, $p < 0.000$). Factor 3 was not found to be significant in any of the models. To test the presumption that Factor 3 positively influences the financial organizational performance, "Factor 3" was added to the equation after entering the first two factors.

The results show that this variable was not found to be significant ($\beta = 0.238$, $p = 0.187$) though the overall model was significant ($F = 11.092$, $p < 0.000$), with cumulative adjusted R^2 of 41.9%, showing a net increment of variance of 1.2% over variables entered in Model 2. As the fourth factor was added in the model (Model 4), results show that this variable is not considered as significant independent variable for predicting the financial organizational performance ($\beta = -0.073$, $p = 0.652$).

DISCUSSION

This study is supported by other studies indicating that total quality management improves efforts at pollution reduction (Curkovic et al., 2000), that the link between

quality management system and environmental management exists (Giancarlo, 2005), by studies that indicate that environmental management systems improve environmental and (corporate) economic performance (Rao and Holt, 2006; Melnyk et al., 2003), and by studies that imply that quality management has a positive impact on organizational performance (Lakhal et al., 2006; Nilsson-Witell, 2005; Kaynak, 2003). An exploratory factor analysis was performed in order to reduce the number of independent variables (sustainable quality management determinants), by combining two or more variables into a single factor. Factor analysis results showed that the sustainable quality management determinants are characterized by the four factors:

Green development and environmental aspects, top management commitment, employee support, CSR and local community engagement.

These findings are consistent with the literature used in this paper, mainly regarding the argumentation that these aspects contribute to the organizational performance. Therefore, all the aspects covered by the results, should not be neglected when conceptualizing the SQM. From the first regression model using non-financial organizational performance as the criterion variable, the independent variable green development and environmental aspects (Factor 1) was found to be statistically significant (Beta = 0.501, $p = 0.001$). However, the results do not support statistically significant role of Factor 1 in other regression models. On the contrary, at the bivariate level we found that "greening" the organization will be positively reflected in the organizational performance, especially in terms of non-financial measures. Hence, we can conclude that proactive environmental behaviour of the organization will improve employee performance and relationship with stakeholders.

According to the literature used in this paper (Bontis and Serenko, 2007; McCowan et al., 1999; Carmeli and Tischler, 2004; Fulmer et al., 2003; Ferguson and Reio, 2010; Lee and Yu, 2004; Berman et al., 1999), we can argue that these improvements can lead to overall organizational performance enhancement. Considering financial performance measures, we found that green development and environmental aspects could be beneficial to investment in new processes and products ($r = 0.618$, $p < 0.000$), ROE - return on equity ($r = 0.400$, $p < 0.016$), value added per employee ($r = 0.374$, $p < 0.017$) and market value added ($r = 0.333$, $p < 0.039$). The findings can be supported by the study of empirical "pays to be green" (King and Lenox, 2000) which supported the positive relationship between pollution reduction and financial gain by relying on correlative studies of environmental and financial performance. Greening of production results in the minimization of pollution (Porter and van der Linde, 1995), re-use of materials and

recycling initiatives. This leads to savings in raw materials, water and energy usage and thus leads to competitiveness and economic performance (Rao and Holt, 2006). Likewise, there is also evidence to suggest that good environmental performance can help enterprises to achieve better economic result (Iraldo et al., 2009).

Hart and Ahuja (1996) report that efforts to prevent pollution and reduce emissions drop to the “bottom line” (ROI, ROA, and ROE) within 1 to 2 years of initiation:

Operating performance (for example: resource productivity or savings leading to efficiency) is benefited in the following year, while at least 2 years are needed before financial performance is affected.

As shown by the regression results (Table 4), the variance of the third model is explained mainly by the factor “top management commitment” and “employee support” ($R^2 = 0.742$ in the case of non-financial organizational performance as the criterion variable and $R^2 = 0.460$ in the case of financial organizational performance as the criterion variable). Hence, it can be argued that top management commitment and employee support can be an important SQM factors for overall organizational performance. Findings of this study are consistent with the work of Pujari et al. (2004), who highlighted the importance of the top management, by indicating that the integration of environmental concerns into key business processes can be a major challenge to the existing culture and can require changes that will not occur without clear leadership and active support from the company's top management. Commitment from top management is like a framework for environmental improvement (Govindarajulu and Daily, 2004). Hence, top management decides the environmental policies to establish, the level of training and communication required.

Pujari et al. (2003) also found a positive relationship between top management support and eco-performance of environmental new product development. Moreover, the top management of the organization is directly responsible for determining an appropriate organization culture, vision, and quality policy (Demirbag and Sahadev, 2008). Management commitment must include a “green” culture that encourages innovation and risk-taking. Values, norms, attitudes, and behaviors that promote environmental improvement efforts have to be supported (Ramus, 2001). According to Kitazawa and Sarkis (2000) cultural change is necessary to support the implementation of environmental source reduction. Top management within an environmentally-conscious organization should strive for a strong culture that allows its employees the freedom to make environmental improvements (Mallak and Kurstedt, 1996). Top managers should also determine objectives, and develop specific and measurable goals to satisfy customer expectations and improve their organizations' performance (Demirbag

and Sahadev, 2008). This is also supported by the work of Lakhal et al. (2006), who provided empirical evidence that quality management practices have a positive impact on organizational performance.

In our study, top management commitment also consists of commitment to promoting a concept of sustainable development. Therefore, this factor should also be considered while discussing the contribution of each of the SQM factors to environmental performance of an organization. It is quite likely that for many respondent organizations, the sustainable development also included the issue of managing its environmental impacts. Given this assumption, it is plausible that both predictor variables (Factor 1 and 2) might to some extent contribute similar information toward the prediction of organizational performance. Ferguson and Reio (2010) reported that human resource practices, particularly organizational practices like training and employee selection, may be linked moderately to job and firm performance. Thus, organizations employing human resource practices may experience higher levels of organizational performance than those organizations that do not use such practices.

The results of our study also indicate positive relationship between employee support (Factor 3) and organizational performance. The results of regression analysis indicate that employee support is a significant predictor of non-financial performance (Beta = 0.603, $p = 0.000$). In addition, the correlation analysis revealed positive relationship between this factor and several measures related to employee, stakeholders, processes and financial performance. According to results of this study, CSR and local community engagement (Factor 4) was not found to be significant in any model, indicating that this factor may be critical but not sufficient to achieve a greater organizational performance. Nevertheless, bivariate statistics revealed the positive relationship between Factor 4 and employee involvement ($r = 0.507$, $p < 0.001$), ability to acquire and to share new knowledge ($r = 0.422$, $p < 0.005$), relationships with suppliers ($r = 0.407$, $p < 0.007$), satisfaction of stakeholders ($r = 0.406$, $p < 0.006$) and employee satisfaction rate ($r = 0.401$, $p < 0.008$) as well as investment in new processes and products ($r = 0.427$, $p < 0.005$). These results are also consistent with the work of Ali et al. (2010), who found highly significant positive relationship between CSR and employee organizational commitment, CSR and organizational performance, and organizational commitment and organizational performance. These findings are very meaningful for decision makers and researchers.

It depicts that organizations can enhance their employee organizational commitment through involving themselves in social activities for instance, identifying needs of the community and fulfilling them, working for better environment, involving in employee welfare, producing quality products for customers and complying with government rules and regulations and working within legal ambiance. Furthermore, research on the link

between social responsibility and financial performance, suggested a positive correlation between the two in the long run (van Beurder and Gössling, 2008).

Conclusion

The essential purpose of this study was to test empirically some of the presumptions derived from the review of the relationship between quality management and sustainability in the context of organizational performance. To summarize the main findings, our results implicate four primary factors accounting for most of the variance: green development and environmental aspects, top management commitment, employee support, CSR and local community engagement. Apart from determining the sustainable quality management construct, this study also reveals statistically significant relationships between SQM factors and organizational performance (in terms of non-financial and financial measures). Hierarchical regression analysis was applied and the results mostly supported empirically the theoretical assertions made in the study. A statistically significant relationships between the non-financial performance and independent factors such as top management commitment and employee support was found. Top management is also significantly related to financial performance. The bivariate statistics revealed statistically significant positive relationships between SQM factors and several non-financial and financial performance measures.

The effect of green development and environmental aspects as well as CSR and local community engagement on financial performance is also considered as positive, but mainly indirect through non-financial performance from the employee perspective. The findings of this study reinforce the importance for organizations in terms of being proactive in integrating of SQM aspects into their business. Clearly, more attention has to be paid to developing an organizational learning culture and thus allowing the organization to maximize their sustainability capabilities which could lead to overall organizational performance.

Our conclusions are based on the survey performed among Slovenian organizations and to strengthen our research findings, we plan to extend the study internationally in distinct European countries in order to examine the influence of "sustainable quality management culture", its stage and development as well as achieved organizational performance. Further we intend to carry out some case studies in selected national and international organizations (interested partners are welcome).

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