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ISO 9001 overall performance dimensions: an exploratory study  
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# ISO 9001 overall performance dimensions: an exploratory study

ISO 9001  
overall  
performance  
dimensions

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## Abstract

**Purpose** – The purpose of this paper is to validate and assess the performance dimensions reflecting ISO 9001 benefits in service companies and to determine their relationships.

**Design/methodology/approach** – A research study was carried out in 198 ISO 9001:2008 certified Greek service companies. Data were obtained through a structured questionnaire and have been analyzed with exploratory and confirmatory factor analyses.

**Findings** – Four performance dimensions reflecting ISO 9001 benefits are extracted and validated, namely, product/service quality, operational, market and financial performance.

**Research limitations/implications** – The research sample is limited to small and medium-sized enterprises operating in a specific European country. Further research may confirm the findings of this study to other countries as well.

**Practical implications** – By determining and evaluating the performance dimensions and their inter-relationships, the ISO 9001 certified service companies are assisted to select an appropriate strategy to further improve their performance and competitiveness. The suggested model can be also used as a self-assessment and benchmarking tool for managers and practitioners alike.

**Originality/value** – The present study provides a comprehensive model of performance dimensions reflecting ISO 9001 benefits in service companies.

**Keywords** ISO 9001, Service company performance

**Paper type** Research paper

## Introduction

The economies of developed and developing nations are dominated by services, while the need and ability of ISO 9001 certified companies to provide high-quality services is significantly increasing in today's competitive landscape (Oliveira and Roth, 2012). Managing and evaluating service company performance is not only a vital strategy for success (Parameshwaran *et al.*, 2009) but also a useful tool to understand the benefits and drawbacks of implementing a Quality Management System (QMS) according to the ISO 9001 standard (Wu and Chen, 2012). Performance measurement is also useful to identify areas of improvements (Martinez-Caro and Cegarra-Navarro, 2010) in companies' management or decision-making systems (Sousa and Aspinwall, 2010; Bell and Omachonu, 2011). Given that the detailed and current performance effects of ISO 9001 is difficult to be determined and measured (Wu and Chen, 2012), the measurement of performance in companies should be an ongoing task (Tung *et al.*, 2011).

Numerous research studies have been dedicated to service performance analysis (Parameshwaran *et al.*, 2009) and the determination of the ISO 9001 benefits in the services sector (Psomas *et al.*, 2013a). However, it seems that there is no consensus among them as far as the derived benefits are concerned (Singh, 2008; Martinez-Costa *et al.*, 2008; Prajogo, 2011; Sampaio *et al.*, 2011, 2012; Ilkay and Aslan, 2012). In other words, while



some authors claim that certification has benefits and increases performance, others claim that it has no benefits or effect on performance (Ilkay and Aslan, 2012).

Even though many research projects have been conducted so far regarding ISO 9001 benefits, there is a broad consensus that there is a need for further indepth research on this subject (Sampaio *et al.*, 2011; Ab Wahid *et al.*, 2011; Ilkay and Aslan, 2012). Rusjan and Alic (2010) and Gotzamani (2010), for example, suggest to focus on the last release of the standard (ISO 9001:2008), as possible new benefits of this release may have not been recognized or emphasized. Especially for the services sector there are very few empirical studies defining or examining service company performance dimensions that reflect ISO 9001 benefits (in terms of the services provided, the internal business processes, the market share and profits) (Parameshwaran *et al.*, 2009). So, more conceptual and empirical work is suggested to clarify and validate the relationships among ISO 9001 and other theoretical constructs (Yasin and Gomes, 2010) such as operational and business performance (Yaya *et al.*, 2011; To *et al.*, 2011; Wu and Chen, 2012; Psomas *et al.*, 2013a).

The present study follows two main research streams that are significantly prominent in the research arena: the performance measurement (Garengo and Biazzo, 2013) and the ISO 9001 QMS (Karthi *et al.*, 2012). More specifically, the present study contributes to the existing literature by assessing the type and the interrelationships of valid performance dimensions reflecting ISO 9001 benefits in service companies. The fact that the evaluation of the business results of implementing a QMS is not a requirement of the ISO 9001 standard (as it is a criterion of the quality awards' framework, e.g. the European Foundation of Quality Management framework), meaning that the certified companies do not really measure the effects of the QMS on their performance, enhances the contribution of the present study to the literature as well as the practical implications.

The rest of the paper is structured as follows: in the first part, the relevant literature is reviewed and the research hypotheses are presented. In the next parts of the paper, the methodology, the data analysis and the respective results are presented. Finally, the results are discussed, and the conclusions, the practical implications, the limitations and the future research recommendations are presented.

## Literature review and research hypotheses

### *Service company performance*

Traditionally, business organizations evaluate their performance in terms of quantifiable measures such as profits, turnover (e.g. sales, employee turnover) and financial ratios. In recent decades, there has been a growing concern that companies should also address quality-related aspects of performance in their business goals and performance measurements (Zairi and Alsughayir, 2011). These performance aspects and their relevant measurements should be balanced between both financial and operational measures and internal and external measures (Alsmadi *et al.*, 2012). The right business performance measures can help the QMS implementation be more efficient and effective (Bell and Omachonu, 2011).

The adoption from service companies of the ISO 9001 standard has been proved to improve company's image, national or international market share (McAdam and Fulton, 2002; Zaramdini, 2007; Heras *et al.*, 2008) and internal administration efficiency (Lee *et al.*, 2009). The ISO 9001 implementation also reduces the cost of poor quality (Lee *et al.*, 2009) and increases the organization's chances of gaining work in the public sector through the creation of better internal management systems and service quality improvement (McAdam and Canning, 2001). Singh *et al.* (2006) studying ISO 9001

certified service small and medium-sized enterprises (SMEs) identified benefits including improved service quality, improved documentation, fewer mistakes and defects/non-conformities and benefits from the use of the certification as a marketing tool. Finally, reduced waste and number of customer complaints, less rework, enhanced efficiency and greater competitive advantage have been recognized by Augustyn and Pheby (2000), as distinct benefits in performance from the application of ISO 9001 in small tourism enterprises.

In general, the majority of the research studies carried out in the field of service quality management show that certification in a quality system enhances the financial results of the enterprise in terms of improvement in income, pre-tax benefits, returns on investment and cost reduction (Rodriguez-Anton and Alonso-Almeida, 2011). Other research studies have also advocated for non-financial benefits such as operational process improvement, productivity enhancement, error reduction, increased operational reliability and innovation (Rodriguez-Anton and Alonso-Almeida, 2011) and increased added value as perceived by the customers (assessed through the quality of services, in other words through the level of the services' conformation to expected norms) (Xu *et al.*, 2006). Based on the above literature review, it is obvious that:

- (1) product/service quality (in terms of service consistency, reliability, conformance to specifications) (Rusjan and Alic, 2010);
- (2) operational performance (in terms of productivity, efficiency, effectiveness) (Benner and Veloso, 2008; Jang and Lin, 2008);
- (3) market performance (in terms of market share, company competitive position and penetration to the market) (Dick, 2009; White *et al.*, 2009); and
- (4) financial performance (in terms of financial results such as profits) (Benner and Veloso, 2008).

are often recorded as performance dimensions reflecting benefits from ISO 9001 in service companies. Bearing this in mind as well as the purpose of the present study and the future research proposals, the following research hypothesis is formulated:

*H1.* Performance benefits in ISO 9001 certified service companies can be described by product/service quality, operational, market and financial dimensions.

#### *Interrelationships between performance dimensions*

Many scholars have supported that ISO 9001 adoption improves operational performance, establishes a continuous improvement culture, reduces waste and thus, improves product/service quality (Dick *et al.*, 2008; Kim *et al.*, 2011). Others (Jang and Lin, 2008; Su *et al.*, 2008) argue that, regardless if the company produces services or goods, it is not ISO 9001 implementation alone which improves market performance but it is rather the associated improvement of all aspects of the operational process, which in turn improve customer perceptions of product/service quality, reduce production cost and finally enhance market and financial performance. In the same line of argument, Tsekouras *et al.* (2002) and Dimara *et al.* (2004), support that operational performance, product quality and market share define a broad conceptualization of organizational performance that ultimately lead to financial performance improvement. Capkun *et al.* (2012) note that operational improvement in cost or quality can help a firm achieve a competitive advantage in the market, and thus increase its sales and profitability. Similarly, Barnes *et al.* (2004) state that improved product/service quality leads to

increased customer satisfaction and consequently to increased market share and profitability. So, the following research hypothesis is formulated:

- H2. ISO 9001 certified service companies have all four previously identified performance dimensions (product/service quality, operational, market and financial performance) present and interrelated.

## Methodology

### *Questionnaire development*

In order to test the above formulated research hypotheses, a research study was conducted in ISO 9001 certified Greek service companies. Based on a comprehensive literature review an initial version of a questionnaire was developed which was then revised taking into consideration the recommendations of academics and experts in the field. Furthermore, based on a pilot study, the questionnaire items were improved and modified in terms of clarity (Stouthuysen *et al.*, 2012). The final version of the questionnaire includes questions on the companies' profile and the performance indicators (reflecting ISO 9001 benefits) identified in the literature. Based on a seven-point Likert scale (1 represented "strongly disagree" and 7 represented "strongly agree"), the respondents were asked to indicate the degree of agreement or disagreement with these statements.

### *Sample*

The paper questionnaire was addressed through e-mails to a population of about a thousand ISO 9001:2008 certified service companies in Greece. It was requested to be answered by the company's quality manager. Two follow-up reminder e-mails were sent two and four weeks after the initial e-mailing (Singh, 2008). Finally, 198 completed questionnaires were received – a response rate of 19.8 percent, similar to the responses and the respective response rates of the studies of Prajogo *et al.* (2008) and Stouthuysen *et al.* (2012). The number of the responding companies in the present study is deemed, according to Hair *et al.* (2005), large enough for multivariate data analysis.

Comparing the responses from early and late responding companies and approaching several non-responding companies (Singh, 2008; Singh *et al.*, 2011; Kim *et al.*, 2012), it was confirmed that non-response bias is not a cause for concern in this study. Moreover, since the questionnaire was completed by a single respondent from each company, the common method variance was checked by applying the single-factor test (Martinez-Costa and Martinez-Lorente, 2008). This method produced poor results, confirming that the common method variance is not a substantive problem.

The vast majority of the responding ISO 9001 service companies are SMEs given that 90.9 percent of them employ less than 250 employees. Based on the Commission Recommendation 2003/361/EC concerning the definition of SMEs (European Commission, 2006), they can be further categorized as follows: 30.8 percent as micro enterprises (< 10 employees), 40.9 percent as small enterprises (10-50 employees), 19.2 percent as medium enterprises (50-250 employees) and 9.1 percent as non-SMEs (> 250 employees). The service companies participating in the present study are private companies and belong to several sectors such as wholesale/distribution, retail, banking/finance, repair/maintenance, communications, insurance, food and beverage catering. The majority of the responding service companies had also been certified according to the previous version of ISO 9001:2000. Finally, 85 percent of the company quality managers are at least university graduates, while 80 percent have more than five years' experience in the services sector and the quality management field.

### Data analysis

The distributional properties of each variable were reviewed and no significant departures from normality were observed which indicates although does not guarantee, multivariate normality (Agarwal and Selen, 2011; Singh *et al.*, 2011). In order to extract the latent factors of the performance indicators, exploratory factor analysis (EFA) is initially applied using the principal component factor extraction method and the Orthogonal Varimax rotation method. The factor analysis is based on 13 measured variables and 15.2 cases per variable, a ratio that is acceptable according to Hair *et al.* (2005), who suggest that the more acceptable sample size should have a minimum of ten cases for each variable. Confirmatory factor analysis (CFA) is also applied to refine the resulting scales in EFA (Sadikoglu and Zehir, 2010) and to provide evidence for the construct validity of the performance dimensions (Avella and Vazquez-Bustelo, 2010). The score level of the performance dimensions is determined through descriptive statistics.

## Results

### EFA

The performance indicators reflecting ISO 9001 benefits identified in the literature are used as measured variables of an EFA (Psomas *et al.*, 2013b). The result is the establishment of four latent factors (Kaiser-Meyer-Olkin = 0.826, Bartlett's test of sphericity = 1,503.889,  $p = 0.00$ , eigenvalue > 1, measures of sampling adequacy > 0.767, factor loadings > 0.613, cumulative variance = 75.47 percent). The extracted latent factors (performance dimensions) are explained using the measured variable loadings and can be labeled as follows: product/service quality, operational, market and financial performance. The mean values of the performance dimensions reflecting ISO 9001 benefits range between 4.16 and 5.91. It is worth mentioning that the highest level belongs to "product/service quality" (5.91), followed by "operational performance" (5.14) and "market performance" (5.02), and finally, "financial performance" (4.16).

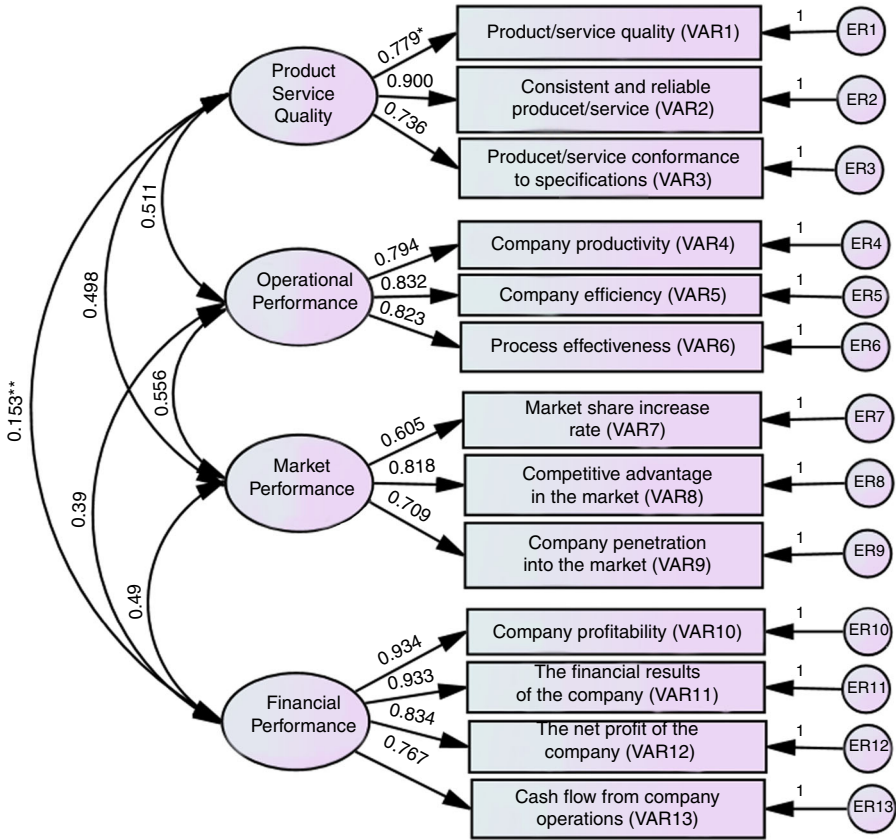
### CFA

In order to further validate the measures for all the factors considered in this study and to support the structure of the latent factors (performance dimensions) revealed, CFA is applied (Figure 1). Based on the goodness-of-fit measures (Table I), the goodness of fit of the formulated model to the measured data is established.

From Figure 1 we observe that all but one of the standardized regression weights are above 0.7. Thus, the respective squared multiple correlations are satisfactorily high. This means that a high amount of measured variable's variance is explained by a latent factor.

Reliability analysis is applied calculating the Cronbach's  $\alpha$  coefficients and the composite/construct reliability indices (Yang *et al.*, 2009). Table II shows that all the Cronbach's  $\alpha$  coefficients and the construct reliability indices are above 0.7, while it is worth noting that all but two are above 0.84. So, these exceed the minimum threshold level of 0.7 (Oliveira and Roth, 2012). Therefore, the selected items reliably estimate the latent factors.

Moreover, Table II supports the construct validity of the latent factors. More specifically, the construct validity is confirmed, according to Hair *et al.* (2005), by evaluating the convergent validity (AVE > 0.513) (Kim, 2009; Sadeh *et al.*, 2013); discriminant validity (AVE >  $\text{Corr}^2$ ) (Kim *et al.*, 2012; Sadeh *et al.*, 2013); face-content validity (questionnaire review by experts in the field) (Li *et al.*, 2005); and nomological validity (significant correlations among the extracted latent factors) (Singh *et al.*, 2011).



**Figure 1.**  
Confirmatory factor  
analysis (CFA)

**Notes:** \*Standardized regression weights; \*\*correlation coefficient

According to the CFA findings (Figure 1), product/service quality is significantly correlated to operational performance, while market performance is significantly correlated by operational performance and product/service quality. Furthermore, financial performance is significantly correlated primarily by market performance but also (at lower level) by operational performance and product/service quality.

## Discussion

### *Discussion on the sample characteristics*

In line with the dominant entrepreneurial structure in the services sector of the European Union countries that is mainly composed of SMEs (Rubio-Andrada *et al.*, 2011), the present study employs a sample of 198 ISO 9001 certified companies, mainly SMEs (based on the number of employees). The sample characteristics follow similar studies made by Singh *et al.* (2006), Zaramdini (2007), Lee *et al.* (2009) and Psomas *et al.* (2010, 2013a) on SMEs. All companies in the sample have ample experience in implementing ISO 9001 providing thus a strong indication that the ISO 9001 certified Greek service companies have adopted the quality management philosophy for at least ten years now.

Goodness-of-fit measures	CFA model	ISO 9001 overall performance dimensions	
<i>The basics of goodness-of-fit</i>			
$\chi^2$	125.414	<b>525</b>	
df	59		
Probability level	0.00		
<i>Absolute fit indices</i>			
Chi-square/degrees of freedom ( $\chi^2/df$ )	2.126		
Root mean square of approximation (RMSEA)	0.076		
Root mean square residual (RMR)	0.048		
<i>Incremental fit indices</i>			
Normed fit index (NFI)	0.919		
Incremental fit index (IFI)	0.955		
Tucker-Lewis coefficient (TLI)	0.940		
Comparative fit index (CFI)	0.955		
<i>Parsimony fit indices</i>			
Parsimony comparative fit index (PCFI)	0.722*	<b>Table I.</b> Goodness-of-fit measures	
Parsimony normed fit index (PNFI)	0.695*		
<b>Note:</b> *Relatively high values represent better fit of the model – given that the respective values for the saturated model are 0.0			

Latent factors – performance dimensions	Reliability – Cronbach's $\alpha$	Average variance extracted <sup>a</sup>	Construct reliability <sup>b</sup>	(Corr) <sup>2c</sup>
Product/service quality	0.842	0.653	0.848	0.261
Operational performance	0.857	0.667	0.857	0.309
Market performance	0.710	0.513	0.757	0.309
Financial performance	0.926	0.757	0.929	0.240
<b>Notes:</b> <sup>a</sup> AVE = $\sum \lambda_i^2/n$ (number of items $i = 1, \dots, n$ , $\lambda_i$ = standardized factor loading); <sup>b</sup> CR = $(\sum \lambda_i)^2 / [(\sum \lambda_i)^2 + (\sum \delta_i)]$ (number of items $i = 1, \dots, n$ , $\lambda_i$ = standardized factor loading, $\delta_i$ = error term); <sup>c</sup> the highest squared correlation between the factor of interest and the remaining factors				

**Table II.**  
Performance dimensions – model reliability and validity

### *Discussion on the performance dimensions*

The present study introduces and validates the dimensions of a service company's performance reflecting ISO 9001 benefits which are related to product/service quality, operational, market and financial results, confirming thus the first research hypothesis. So, according to the findings, the ISO 9001-based QMS indeed improves many dimensions of the performance of a service company, even though there is no a guarantee for performance improvement from the ISO 9001 implementation and certification. The findings of the present study are in line with those of Augustyn and Pheby (2000), McAdam and Canning (2001), Zaramdini (2007), Calisir (2007), Lee *et al.* (2009) and Rubio-Andrada *et al.* (2011).

The relationships among the performance dimensions (reflecting ISO 9001 benefits) revealed through the data analysis are worth discussing. Based on the factor model examined (Figure 1) it is apparent that all the discrete performance dimensions revealed are present and interrelated in the service business environment. Thus, the second research hypothesis is confirmed.



By selecting experienced ISO 9001 certified companies it is apparent that they possess ample knowledge of implementing a QMS in their internal processes and operations which further results in improving the quality of their products/services. Establishing and maintaining a robust QMS based on the ISO 9001 requirements, means that the quality parameter will definitely characterize not only the services provided but also the internal processes and operations. Thus, based on improvement in operational performance and product/service quality, fertile ground is created which results directly in improved market performance. This, in turn, results in increased financial performance. However, the direct impact of improved operational performance and product/service quality on financial performance should not be devalued.

### **Conclusions**

The ISO 9001 certified service companies constitute a suitable research sample to conduct this research study and fill the gap as suggested in the relevant literature. Thus, by identifying and validating the performance dimensions and exploring their relationships, the present study differentiates from similar studies carried out worldwide so far. The value of the present study is also enhanced bearing in mind that company performance is not commonly assessed by the ISO 9001 certified companies (since it is not required by the standard). This is the direction which the present study is focussed on.

The performance dimensions reflecting ISO 9001 benefits of service companies related to product/service quality, operational, market and financial performance are strongly validated and supported through the framework suggested in the present study. The service SMEs participating in the present study, having followed the worldwide trend with regard to implementing the ISO 9001 QMS for many years now, have all the four performance dimensions present and interrelated.

### **Practical implications**

The suggested valid framework including interrelated performance dimensions reflecting ISO 9001 benefits can be used as a self-assessment tool by service companies and a benchmarking tool as well. By determining the level of the performance dimensions through the procedure of self-assessment and furthermore by determining the existing performance gap through benchmarking the best of the best service companies, an ISO 9001 certified service company can be guided to select its quality strategy. In other words, a feedback is provided to service companies to further improve not only the performance dimensions but its QMS. This, in turn, can help a service company survive and improve its competitiveness.

### **Limitations and future research recommendations**

Many research studies suffer from limitations and the present study is no exception. The sample of the service companies is limited to Greek SMEs and does not include companies operating in other European countries. Moreover, large-sized service companies are not adequately represented in the sample. Since the data includes answers from company representatives, there is a risk of receiving biased responses regarding company performance.

From the above limitations, many research proposals arise. More specifically, it is suggested that future research studies be carried out in a larger research sample incorporating more large-sized service companies. Moreover, it is worth examining the company status regarding company performance through the opinions of more than

one company representative. Future studies should also be based on objective business evidence coming from company documents and the documents of the QMS. Finally, it is suggested that similar studies be conducted in other countries, in order to examine if the results differ from those obtained through the present study.

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