



# Integration of management systems as an innovation: a proposal for a new model



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## ABSTRACT

The aim of this research is twofold: first, to classify the integration of management systems (MSs) as a type of innovation; and, second, to propose a model to analyze the relationship between the integration of MSs and the innovation management performance. Through a review of the literature, the integration of MSs, innovation management and previous relationships established between quality and total quality management and innovation are analyzed. The findings, although tentative, allow classifying the integration of MSs as a form of organizational and incremental innovation, which is initiated internally and which has an internal impact. Integration also adheres to three specific perspectives of innovations: institutional, cultural and rational. The results enable to propose a model to test empirically the impact of the integration of MSs into innovation management performance. Integration can be measured in terms of the strategy and the methodology adopted in the process, the maturity of the integrated MS and the organization's motivation to integrate. Innovation management performance can be measured in terms of benefits obtained, capabilities development, improvement of efficiency and financial results. The present study is one of the first to identify integration as an organizational innovation and to relate it to innovation management performance.

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## 1. Introduction

Organizations are constantly adapting to changes in the economy, and those that adapt best have the greatest possibilities of surviving in the market. A key factor in their success is innovation, which is critical to sustaining customer satisfaction, reducing costs, and enhancing competitiveness in the long term (Andreasen, 1997; Birkinshaw et al., 2008; BSI, 2008; Dosi, 2000; Hammer and Champy, 1995; Howells, 2005; OECD, 2005; Porter, 1985).

According to the British standards for managing innovation, published as BS 7000-1 (BSI, 2008), the main reasons for innovating are to (a) improve the current situation (achieved by, for example, reducing costs, raising margins and providing stability for the

workforce), (b) open new horizons (by, for example, repositioning perceptions of an organization and gaining a competitive advantage), (c) reinforce compliance (by complying with legislation and fulfilling social and environmental responsibilities), and (d) enhance the organization's profile (by attracting extra funding and potential alliance partners for example). In short, organizations innovate to improve their performance, for example by increasing demand or reducing costs (OECD, 2005).

Organizations can implement a variety of managerial practices to innovate and achieve competitive advantage. One such example would be the implementation of management systems (MSs) and management system standards (MSSs), also referred to as meta-standards (Heras-Saizarbitoria and Boiral, 2013), as a strategic decision to improve companies' performance. Examples of such standards include those published by the International Organization for Standardization (ISO): the quality management system (QMS) standard based on ISO 9001, and the environmental management system (EMS) standard based on ISO 14001, both of which have experienced a marked increase in certification worldwide (more than a million in the case of the QMS and more than 285,000 in the case of the EMS: see, ISO, 2013). But the growth rate has slowed in recent years and is expected to fall in countries with a strong tradition of certification as they begin to introduce

*Acronyms' list:* BIC, Business Innovation Capability; BS, British standard; EFQM, European Foundation for Quality Management; EMS, Environmental management system; IMS, Integrated management system; ISO, International Organization for Standardization; MSs, Management systems; MSSs, Management system standards; OHSMS, Occupational, health and safety management system; PDCA, Plan-Do-Check-Act; QMS, Quality management system; R&D, Research and development; TIM, Technology/R&D management; TQM, Total quality management.

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certifications according to sector-specific MSSs (Casadesús et al., 2008; Llach et al., 2011; Marimon et al., 2011). The impact and benefits of standards have been analyzed in depth in the literature (see, for example, Gotzamani and Tsiotras, 2002; Karapetrovic et al., 2010) and identified as improved internal organization, improved customer satisfaction, and improved personnel motivation, among others. Another example of managerial practice is the total quality management model, that in previous studies such as Ahire and Ravichandran (2001), Hoang et al. (2006), Kim et al., (2012) and Prajogo and Sohal (2001) have been identified as a type of innovation, mainly organizational innovations. Thus, the first research aim is to classify the integration of MSs as a type of innovation as has been done previously with other quality management practices.

Conti (2010) advocates a new systems-based management model. This 'new' model would involve the integration of MSs (also proposed for the future in Heras-Saizarbitoria and Boiral, 2013), as it is preferable for an organization with multiple MSs to manage them as a single system (as an Integrated Management System, or IMS) rather than as separate systems (Douglas and Glen, 2000; Karapetrovic and Casadesús, 2009; Karapetrovic and Willborn, 1998a, 1998b; Rocha et al., 2007; Wilkinson and Dale, 1999). The main benefit of applying this model is the improvement obtained in efficiency through cost reduction and better internal organization (Beckmerhagen et al., 2003; ISO, 2008; Simon et al., 2012; Zutshi and Sohal, 2005). Thus, the second aim is to propose a model to analyze the relationship between the integration of MSs and the innovation management performance.

The paper is structured as follows. Next, a review of the literature examining the integration of MSs, innovation management and the relationship between innovation and quality management and total quality management, as the relationship they have with innovation gave a starting point for this study, is presented. The methodology employed in the study is then outlined, followed by a summary of the main results and the conclusions that can be drawn from them.

## 2. Literature review

The following literature review comprises three subsections: first, it examines the integration of management systems; second, a review is undertaken of innovation management; and third, the relationship between innovation and quality management and total quality management (TQM) is explored as antecedents for the present research.

### 2.1. Integration of management systems

The integration of management systems is considered the best management practice when an organization has multiple MSs in place. Integration can be defined as 'putting together different function-specific management systems into a single and more effective IMS' (Beckmerhagen et al., 2003) as it capitalizes on the synergies between the integrated MSs (Douglas and Glen, 2000; Karapetrovic and Casadesús, 2009; Karapetrovic and Willborn, 1998a, 1998b; Rocha et al., 2007; Wilkinson and Dale, 1999).

Five main aspects should be considered during the integration process (Bernardo et al., 2012a): (a) the integration strategy, (b) the integration methodology, (c) the level of integration of the management system, (d) the integration of audit systems and, (e) the benefits and difficulties faced from integration.

The integration strategy refers to the sequence, order or alternatives of implementation of the organization's MSs. The best known strategies have been proposed by Karapetrovic and Willborn (1998a) who posited establishing: (a) the quality

management system first, followed by the environmental management system; (b) the EMS first, followed by the QMS; and (c) the two MSs simultaneously (adaptations of these strategies when implementing additional MSs can be found in Karapetrovic, 2002; Karapetrovic and Jonker, 2003). The results of existing empirical studies indicate that the majority of organizations that integrate their MSs adopt the first strategy, i.e., they implement the QMS or ISO 9001 first, and then the EMS or ISO 14001 (Bernardo et al., 2012a; Douglas and Glen, 2000; Karapetrovic et al., 2006; Zeng et al., 2007). A detailed analysis of the empirical studies is presented in Table 1. Note that some of the aforementioned studies claim that the order followed is conditioned by the publication order of the MSSs, as QMS appeared first than EMS (see, for example, Bernardo et al., 2012a), and the latter was adapted to be compatible with QMS; and also because QMS were related to cost more explicitly than EMS.

The second aspect to be considered is the integration methodology, i.e., the tools or models adopted to achieve an IMS. The literature does not identify a single, standardized methodology and so each organization implements the one that suits it best (Bernardo et al., 2009). In fact, a number of methodologies have been proposed both by academia and by certification bodies.

Among the former, several authors have proposed their own theoretical framework, identifying the specific steps to be followed, from the definition of goals to the adoption of a continuous improvement model. They include, among others, Asif et al. (2009), Karapetrovic (2003), Karapetrovic and Willborn (1998b), Lavodová (2004), Puri (1996), Renfrew and Muir (1998), and Wright (2000). Scipioni et al. (2001) and Mir and Bernardo (2012) present guidelines for integrating QMS, EMS and other MSSs. Other authors have analyzed the methodology from a different perspective. Thus, Karapetrovic and Jonker (2003) propose the audit as the central point for integration, and Tari and Molina-Azorin (2010) propose adopting the European Foundation for Quality Management (EFQM) model as a basis for integrating the QMS and EMS. Jonker and Karapetrovic (2004) argue that the model should be: (a) able to incorporate all the common elements of function-specific MSs, (b) generic, (c) flexible, (d) fully compatible with specific models of existing MSSs and (e) able to support the implementation methodology, evaluation, improvement and maintenance of an IMS in an organization. Karapetrovic (2005) argues that different models can be applied: (a) the initial model, in which the MSs form the framework of the IMS (which might, for example, be a process map or the Plan-Do-Check-Act also known as PDCA or continuous improvement model); (b) the combined model, which links the MS models that form part of the IMS in a single model, and (c) the complacent model, which accommodates existing and future MSs. However, several empirical studies (see Table 1 for more detailed information) conclude that common-element analysis is a straightforward, clear methodology (Bernardo et al., 2011a, 2011b; Karapetrovic et al., 2006; Mir and Bernardo, 2012).

Among the certification bodies, a number of national organisms have published their own guidelines (see, for example, AENOR, 2005; BSI, 2006; Dansk Standard, 2005; SAI Global, 1999) and although ISO does not seek to serve as an international guideline, it has published a handbook (see ISO, 2008).

The integration level of the IMS is another important aspect of the integration process. Here, again, various levels are discussed in the literature (Beckmerhagen et al., 2003; Jørgensen et al., 2006; Karapetrovic, 2003; Kirkby, 2002; Pojasek, 2006; Seghezzi, 1997) but they can be usefully grouped into three: no integration, partial integration and full integration. No integration implies that the MSs implemented are managed separately; partial integration means that some elements of the MSs are common; and, full integration indicates that all the elements of all the MSs are managed as an IMS.

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