

**ANTECEDENTS OF ENVIRONMENTAL MANAGEMENT:
THE INFLUENCE OF ORGANIZATIONAL DESIGN AND ITS MEDIATING ROLE
BETWEEN QUALITY MANAGEMENT AND ENVIRONMENTAL MANAGEMENT**

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Abstract:

The analysis of the antecedents or determinant factors of environmental management is an important research topic. In this article we examine the influence of organizational design and quality management. Our main purpose is to analyze the impact of organizational design on environmental management and the mediating role that organizational design may play in the relationship between quality management and environmental management in the hotel industry. The results indicate that organizational design positively influences environmental management and partially mediates the relationship between quality management and environmental management.

Keywords:

Environmental management; organizational design; quality management; hotel industry; decentralization; formalization; informal social relations; link mechanisms; specialization.

Introduction

An important research topic in environmental management is the analysis of its antecedents, motivations, causes or determinant factors (Bansal & Roth, 2000; González-Benito & González-Benito, 2006). In this regard, several variables may influence the decision to implement environmental management practices. In addition, some factors may also impact on the adequate implementation of these environmental management practices.

Although external and internal variables have been studied as antecedents of environmental management, the previous literature has focused mainly on external and institutional factors, specifically pressure from external stakeholders such as government, public administration, customers, suppliers and competitors (Bansal & Roth, 2000; Colwell & Joshi, 2013; Rothenberg & Zyglidopoulos, 2007). Less attention has been paid to internal variables that may act as enablers of an appropriate implementation of environmental management. Some internal variables studied are resource availability, organizational structure, and managerial motivations and attitudes (González-Benito & González-Benito, 2006; Pérez-Valls, Céspedes-Lorente, & Antolín-Lopez, 2013; Russo & Harrison, 2005; Sharma, 2000).

Our work focuses on two internal factors that may influence the implementation of environmental management, namely organizational design and quality management. The main purpose of the article is to examine the impact of organizational design and the mediating role that organizational design may play in the influence of quality management on environmental management.

Some contributions of this work can be indicated. First, few studies have analyzed the relationship between organizational design and environmental management empirically (Atkinson, Schaefer, & Viney, 2000; López-Gamero et al., 2016; Perez-Valls, Céspedes-Lorente, & Moreno-Garcia, 2015; Rivera-Torres et al., 2015; Russo & Harrison, 2005). A

proactive environmental strategy requires changes in operations, the coordination of human and technical abilities and heterogeneous resources in order to reduce environmental impacts (Aragón-Correa et al., 2008). Consequently, organizational design plays an important role as an enabler that may help a company to implement environmental management, since organizational design defines how tasks are allocated, who reports to whom, and the formal coordinating mechanisms and patterns of interaction that will be followed (Robbins, 1990). Therefore, the study of organizational design is important because the implementation of any management system needs an appropriate organizational structure. The present study analyzes some of the main organizational design variables (specialization, link mechanisms, formalization, informal social relations and decentralization). These organizational design variables are relevant to this study because they include variables that have been widely used in earlier research (formalization, specialization and centralization) (e.g. Hage & Aiken, 1967; Reimann, 1974; Khandwalla, 1977) representing formal structure; and, in addition, we have introduced some softer variables (informal social relations and link mechanisms) that are related to flexibility, and that have been included in some recent research. They have been shown to be relevant, in general, for the analysis of organizational structure (Jansen et al., 2009), and especially, for the implementation of a proactive environmental strategy (Huang & Jim Wu, 2010; Martínez-del-Río, Céspedes-Lorente, & Carmona-Moreno, 2012).

Second, few studies have examined quality management and environmental management together. Where these two management systems have been analyzed, the main focus of interest has been their impact on firm performance (Ferrón & Darnall, 2015). To the best of our knowledge, only Pereira-Moliner et al. (2012) and Molina-Azorín et al. (2015) examined the impact of quality management on environmental management. This is a relevant issue as many companies implement both quality management and environmental management systems. In this paper we extend those studies by analyzing not only the direct

influence of quality management on environmental management but also the indirect influence through the organizational design. Therefore, in this study we examine the impact of organizational design on environmental management, and also its mediating role in the relationship between quality and environmental management.

Third, the works that deal with environmental management and those that deal with quality management have mainly focused on manufacturing industries, while less attention has been devoted to the service sector in general, and specifically to the tourism industry. Our study focuses on the tourism industry, specifically the hotel sector in Spain. Spain is the third most important tourist destination worldwide in terms of international tourism receipts (after the USA and China) and the third most important destination in international tourist arrivals (after France and the USA) (UNWTO, 2016). The hotel industry has traditionally been considered to have little impact on the natural environment compared to manufacturing industries. However, it generates much more negative environmental impact than the public perceives, consuming a vast amount of local and imported non-durable goods, energy and water, as well as emitting a lot of carbon dioxide (Bohdanowicz, 2005; Moeller, Dolnicar, & Leisch, 2011).

Theory and Hypotheses

As stated above, the main purpose of this work is to examine the impact of organizational design on environmental management and the mediating role of organizational design in the relationship between quality management and environmental management. Next, we provide definitions of these three variables. Environmental management is defined as the equipment, methods, procedures and practices which save energy and natural resources, minimize the environmental problems generated and protect the natural environment (Shrivastava, 1995). Proactive environmental management has been described as systematic patterns of voluntary

practices that go beyond regulatory requirements, for instance in terms of waste reduction and prevention of pollution at source (Aragón-Correa & Rubio-López, 2007). Organizational design refers to the construction and change of an organizational structure to achieve the organization's goals. As noted above, organizational structure defines how tasks are allocated, who reports to whom, and the coordinating mechanisms and patterns of interaction (Robbins, 1990). Quality management is a way of managing an organization, and includes a set of principles that are applied to all aspects of the organization and are integrated with the key business processes and activities to satisfy different stakeholders, especially customers. Quality management emphasizes a balance between technical, managerial and people issues (Dale, Van der Wiele, & Van Iwaarden, 2007).

Regarding the link between environmental management and organizational design, previous research states that firms that want to manage environmental problems successfully should implement an appropriate organizational structure that can facilitate change and cooperation between organizational units of the firm (Atkinson, Schaefer, & Viney, 2000; Aragón-Correa & Sharma, 2003; López-Gamero et al., 2016). In this section, we analyze the influence of several organizational characteristics on environmental management, specifically specialization, link mechanisms, formalization, informal social relations, and decentralization.

Through environmental proactivity companies implement actions that improve environmental performance. To identify this kind of environmental actions, it may be convenient that employees are specialized in their jobs. Moreover, organizational members from different departments must also work in groups to share information and identify possible opportunities. Therefore, specialization and interfunctional link mechanisms could be two organizational design variables that may favour environmental management.

Specialization may improve the competence of the individuals in their jobs, since they are focused in those tasks, and it can encourage the development of methods that can be used

to improve environmental performance. Thus, specialization helps increase expertise and knowledge that may lead to solve environmental problems. In this regard, addressing an environmental problem may engage several employees from different departments who are specialized in different tasks, because environmental problems are usually solved through the involvement of many workers, and not only the environmental manager (López-Gamero et al., 2016; Reverdy, 2006).

Therefore, environmental management not only needs job specialization, but also organizational link mechanisms, like cross-functional work groups. Workers from different departments can share key information about environmental issues (Perez-Valls, Cespedes-Lorente, & Moreno-Garcia, 2015). The coordination and integration of their skills and knowledge can help to improve environmental and economic performance (López-Fernández, & Serrano-Bedia, 2007). Organizations with environmental proactivity are founded on teams because the group may have more precise knowledge about specific environmental problems and about specific actions to solve them (Fernández, Junquera, & Ordiz, 2006). Boiral (2002) and Rothenberg (2003) show that cross-functional teams can help to reduce pollution since environmental managers would work together with managers and employees from several departments to determine and implement appropriate environmental practices.

Another relevant organizational design variable is formalization, that is, the degree to which rules, procedures, instructions, and communication are formalized or written down (Khandwalla, 1977). According to Reverdy (2006), to reduce pollution and resource use, an organization should share knowledge and coordination throughout the firm. Formalization may promote this coordination and a flow of knowledge about environmental practices. Moreover, organizations can formalize its best environmental practices to facilitate its application (López-Gamero et al., 2016; Perez-Valls, Cespedes-Lorente, & Moreno-Garcia, 2015). Formalization may also reduce conflicts in the development of environmental practices

(Sampaio, Thomas, & Font, 2012), by improving task coordination and reducing ambiguity with regard to procedures. Therefore, formalization can facilitate the coordination of activities related to environmental improvements that involve several organizational units working together.

Together with formal coordination mechanisms (for example, cross-functional teams and formalization), informal interactions can also play an important role in environmental management (Reverdy, 2006). Informal interactions are based on oral transfer of information. Sharing information through informal interactions may promote the development of environmental practices, aligning different possible perspectives in the interpretation of formal rules. Environmental management requires information of the internal activities and their influence on the natural environment, and informal relations could facilitate the exchange of this kind of information (Jansen et al., 2009). Moreover, actions to reduce pollution can generate conflicts of interest between different units. Informal social relations can reduce the likelihood of conflict regarding environmental goals and activities, by fostering collaborative conflict resolution (López-Gamero et al., 2016).

Another important variable in organizational design is centralization. Centralization refers to the extent to which decision making is concentrated at the top of an organization (Hage & Aiken, 1967). Therefore, decentralization alludes to the distribution of power and decision-making capacity to lower levels of the organization. Some studies emphasize that having a specific environmental management department and manager can facilitate the development of environmental initiatives (Park & Boo, 2010). However, other studies point out that organizations should extend environmental responsibilities to all employees (Hart, 1995). Proactive environmental companies must provide an appropriate context by changing patterns of authority to allow operating managers and employees discretion to experiment and make decisions. Environmental proactivity requires involvement of every member of the firm

and organizational unit throughout the company. Everyone must be committed to improving environmental performance (Hart, 1995) and decentralization may facilitate this commitment (López-Gamero et al., 2016). Furthermore, environmental decisions will be easily deployed when employees take part in these decisions (Miller, 1987). Thus, firms with decentralized organizational structures could be more environmentally proactive (Fernández et al., 2006).

Based on the reflections above, we suggest the following hypothesis regarding the relationship between organizational design and environmental management:

H1: An organizational design characterized by a high level of specialization, formal link mechanisms, formalization, informal social relations and decentralization positively influences the implementation of environmental management.

In order to analyze the mediation of organizational design in the relationship between quality management and environmental management, next we examine the influence of quality management on organizational design. Regarding specialization, a high level of specialization of organizational members may suppose more knowledge and information about their job. This may facilitate the solution of quality issues (Brkic et al., 2011). Specialized workers know how to perform their tasks well and attain high levels of quality. Therefore, quality management may increase the degree of specialization, as organizational members will be experts in their jobs, understanding the relevance of their work for the quality offered to customers.

Formalization increases when quality management practices are implemented (Escrivá-Moreno, Canet-Giner, & Moreno-Luzón, 2008; Moreno-Luzón & Valls-Pasola, 2011). In this regard, the definition of procedures is a requisite for the application of quality management. Formalization allows employees to share knowledge, promoting quality management (Germain & Spears, 1999). Procedures are designed and written down in order

to improve efficiency and regularity in the execution of processes required by quality management (Pereira-Moliner et al., 2016).

Regarding formal link mechanisms and informal social relations, the implementation of quality management may promote relationships and interactions between employees from several departments of the firm, as these interactions will help to develop ideas to improve the quality of services and products. In this regard, formal and informal cross-functional relations facilitate responsiveness to customers in terms of quality (Kohli & Jaworski, 1990). Workers in different areas can use formal and informal interactions to analyze and solve quality aspects. Rees, Harris and Lit (1989) point out that quality may be improved using group interactions. Group cohesion and team interactions are required to identify and implement actions to solve customer issues. Therefore, quality management is related to formal and informal information exchange between organizational members from different areas.

Finally, with regard to decentralization, Kim, Kumar and Kumar (2012) indicate that quality management can be implemented when responsibility for quality is extended to all workers and areas in the company (Kim, Kumar, & Kumar, 2012). Therefore, as noted by Shea and Howell (1998), the implementation of quality management will promote decentralization, providing workers with autonomy to make decisions and to solve quality issues. Companies that implement quality management must promote motivation and empowerment of all organizational members (Pereira-Moliner et al., 2016).

All these ideas about the characteristics of organizational design related to the implementation of quality management lead us to propose the following hypothesis:

H2: The implementation of quality management positively influences an organizational design characterized by a high level of specialization, formalization, formal link mechanisms, informal social relations and decentralization.

Organizational design may play a mediating role between quality management and environmental management, because the knowledge acquired through the implementation of quality management may promote changes in organizational design that support the adoption of environmental management. Both quality management and organizational design characteristics can be antecedents of environmental management. As reported in previous research (Molina-Azorín et al., 2009; Molina-Azorín et al., 2015), the similarities between quality management and environmental management facilitate the implementation of environmental management practices in firms that have already implemented quality management. This may be due to the fact that these firms already possess the resources, capabilities, competences and an organizational context needed for the adoption of environmental management. The skills and practices required to adopt quality management are complementary to the capabilities required for the adoption of environmental management. For example, employees are already accustomed to working with quality records and to filling in documents, and know what a procedure is. It will be easier for them to perform these tasks for environmental management (Molina-Azorín et al., 2015).

Quality management practices may help to develop competences that will also facilitate the adoption of environmental practices, through the use of the appropriate organizational design characteristics, such as specialization, formalization, link mechanisms, informal social relations and decentralization of decision-making, as set out in the preceding arguments. Therefore, firms implementing quality management may find it easier to implement environmental management as they possess the organizational structure required for its development.

Taking into account the previous hypotheses and ideas about the relationship between quality management and environmental management, organizational design may be expected to play a role as mediator in the relationship between quality management and environmental

management. However, based on a review of the literature, it is difficult to anticipate whether the relationship of mediation will be total or partial, so the hypothesis that we propose is the following:

H3: Organizational design plays a mediating role in the influence of quality management on environmental management.

Methods

Population, Sample and Data Collection

The population is formed of 3-, 4-, and 5-star Spanish hotels (4,770 hotels). A questionnaire was sent by post to this population. Before this, several managers and experts in the hotel industry reviewed the questionnaire. 350 hotels sent us their responses. We checked non-response bias (Armstrong & Overton, 1977) in terms of (a) the number of rooms and beds between responding and non-responding firms; (b) all variables in the survey between early and late responding firms. We do not found evidence of non-response bias.

We indicated in an introductory letter that the questionnaire had to be filled in by several people in each hotel: the person responsible for environmental issues had to answer questions on that topic; the hotel manager had to answer the questions related to organizational design; and the person responsible for quality issues had to answer questions on quality management.

Measures

Environmental management was operationalized in terms of three multi-item scales (operational systems, information systems and strategic systems) used by Curkovic et al. (2000). We also used a fourth multi-item scale (technical systems) for environmental management that includes good environmental practices that are appropriate for the hotel

industry (Curkovic et al., 2000 studied the automotive industry). These four dimensions and their items are shown in Table 1. The operational systems mainly measure environmental training for all CEOs and employees, and environmental issues in the services offered by hotel. Information systems show the collection and analysis of environmental information/data and environmental communication between the staff and the managers. Strategic systems refer to environmental planning, procedures and customers. Finally, technical systems measure the use of environmental techniques to reduce environmental impact. When hotel managers adopt a proactive approach to environmental management, they introduce preventive technologies and practices that can reduce pollution or even remove it completely by investing in clean technologies. The literature on environmental management in the hotel industry reports that the environmental practices that are most widely used by hotels are related to reduced consumption of water, energy and other resources, choosing products with low environmental impact, introducing disposal/treatment/storage of waste, and techniques for re-using/recycling (Álvarez-Gil, Burgos-Jiménez, & Céspedes-Lorente, 2001; Carmona-Moreno, Céspedes-Lorente, & De Burgos-Jiménez, 2004; López-Gamero, Claver-Cortés, & Molina-Azorín, 2008).

Insert Table 1 about here

Regarding organizational design, specialization was measured with two items about the number of tasks that, in general, employees carry out. To measure link mechanisms we used three items about the use of cross-functional workgroups and liaison personnel in the hotel. The measurement of formalization included five items about written rules, procedures, and job descriptions in the hotel. Informal social relations were measured with four items mainly related to informal communications between employees from different areas. To

measure decentralization we used three items about freedom of action and participation in decision-making processes by employees. The specific items of these organizational design variables have been used in previous studies (Miller & Dröge, 1986; Jansen et al., 2006; Jansen et al., 2009; Menon et al., 1997; Olson et al., 2005) and are included in Table 2.

Insert Table 2 about here

With regard to quality management, four dimensions or systems were measured based on Curkovic et al. (2000). These four dimensions and their items are shown in Table 3. Strategic systems measure main principles of quality management: leadership, planning and customer/stakeholder focus. Operational systems include people, supplier and process management principles of quality management. Information systems refer to the collection and analysis of data/information. Technical systems indicate the use of quality tools. These systems cover the principles of quality management used in the existing excellence models of MBNQA (Malcolm Baldrige National Quality Award) and EFQM (European Foundation for Quality Management).

Insert Table 3 about here

We have employed reflective constructs for the first order environmental management systems, organizational design dimensions and quality management systems, as there is a strong correlation among indicators and the variables which form these constructs are perceived as the effects of the indicators (Gruber et al., 2010). Three second order constructs were created (environmental management, organizational design and quality management) with formative indicators, as items for the three constructs are perceived as their cause and

each item may occur independently of the others. Therefore, a formative measurement model represents the best option for the measurement of these three second order constructs (MacKenzie et al., 2005; Podsakoff et al., 2006).

Analysis

Hypotheses were tested using a partial least square (PLS) approach. We chose PLS because it can accommodate models that combine formative and reflective constructs in the same model, and also first and second order constructs (Chin, 1998). As noted above, our model includes three second order formative constructs (environmental management, organizational design and quality management) and their respective first order constructs (operational, technical, strategic and information systems for environmental and quality management, and specialization, link mechanisms, formalization, informal social relations and decentralization for organizational design).

Results

The measurement model

For reflective constructs, individual item reliability (λ), construct reliability, convergent validity and discriminant validity have been analyzed:

- Individual reliability of reflective items. This reliability is considered adequate when an item has a loading over 0.7 in its construct (Carmines & Zeller, 1979). The analyses show that the items meet this condition (see Tables 1, 2, 3).
- Construct reliability. Construct reliability is checked through an internal consistency measure called composite reliability (ρ_c) and its values should also be higher than 0.7 (Werts, Linn, & Jöreskog, 1974). In this case, this requirement is satisfied by all constructs (see Tables 1, 2, 3).

- Convergent validity. For the assessment of convergent validity, the average variance extracted (AVE) was used, whose values must exceed 0.5 (Fornell & Larcker, 1981).

This condition is met in all cases (see Tables 1, 2, 3).

- Discriminant validity. For this assessment, the square root of the AVE should be greater than the correlation coefficients between the constructs (Fornell & Larcker, 1981), as is the case for all measures in this study (see Table 4).

Insert Table 4 about here

Formative constructs should not exhibit multi-collinearity among items. For the environmental management construct, the results showed minimal collinearity with the variance inflation factor (VIF) of all items ranging between 1.08 and 4.83, below the common cut-off threshold of 5-10. For the organizational design construct, the VIF of all items ranged between 1.07 and 1.55. For the quality management construct, the results showed minimal collinearity with the VIF of all items ranging between 1.08 and 4.22. In addition, all condition indexes of all items are below 30. Therefore, VIF and condition indexes did not indicate multi-collinearity problems. Factor weights were also examined for these formative measures through canonical correlation analysis. Table 1, 2 and 3 show the weights of the items for the second order formative constructs.

The structural model

Next, the structural model, which employs the formative constructs, was assessed. A multiple indicators and multiple causes (MIMIC) model was examined, together with the external validity of the formative constructs. A MIMIC model serves to check the appropriateness of a set of formative indicators (Diamantopoulos & Winklhofer, 2001). The constructs in the

formative version were related to those in the reflective version. In this test, all R^2 were close to 1, all β were above 0.7 ($p < 0.001$) and the Stone-Geisser statistic (Q^2) reached a minimum value of 0.50. Regarding external validity, environmental management, organizational design and quality management, – measured from a reflective and from a formative point of view – revealed that all R^2 between the different variables decreased when the formative construct was treated as though it was reflective. The path coefficients were also examined using a bootstrapping test with 500 subsamples (Chin, 1998) and all path coefficients turned out to be bigger when the constructs were treated as formative. This provides a justification for the assumption that these constructs should be treated as formative rather than reflective.

Findings

Figure 1 shows the findings about our hypotheses regarding the impact of organizational design on environmental management (H1) and the influence of quality management on organizational design (H2). Although we have not included a specific hypothesis about the impact of quality management and environmental management, Figure 1 also shows this relationship which is used to examine the mediating role of organizational design in the linkage between quality management and environmental management (H3).

Regarding organizational design variables, we must first point out that this construct is formed by a positive weight of specialization, formalization, link mechanisms and informal social relations. However, decentralization has a negative weight and its influence is not statistically significant.

An organizational design characterized by a high degree of specialization, formalization, link mechanisms and informal social relations has a positive and significant effect on environmental management, so hypothesis 1 is partially supported because decentralization is not significant in the construct of organizational design. Quality

management has a significant, positive effect on the construct of organizational design; therefore, it has a positive and significant effect on an organizational design characterized by the characteristics indicated above. Therefore, hypothesis 2 is also partially supported, as decentralization cannot be considered.

Figure 1 also shows that quality management has significant, positive effects on environmental management. According to these findings, organizational design may play a mediating role in the relationship between quality management and environmental management. However, in order to test hypothesis 3 (mediating effect), an additional analysis is required: the effect of quality management on environmental management must decrease when the mediating variable (organizational design) is included in the model (Baron & Kenny, 1986; Bontis, Booker, & Serenko, 2007; Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010).

The model was estimated eliminating the construct of organizational design in order to test the relationship between quality management and environmental management (Molina-Azorín et al., 2015). In this model without organizational design, the effect of quality management on environmental management increased from $\beta=0.49$ ($p=0.000$) in Figure 1 to $\beta=0.685$ ($p=0.000$). Given that the effect of quality management on environmental management was lower when the mediating variable organizational design was included in the model, but the effect was still significant, we can conclude that the mediating effect is partial (Baron & Kenny, 1986; Bontis, Booker, & Serenko, 2007; Sarkis, Gonzalez-Torre, & Adenso-Diaz, 2010). That is, organizational design partially mediates the relationship between quality management and environmental management.

Insert Figure 1 about here

Discussion and Conclusions

This paper has examined the impact of organizational design on environmental management and the mediating role that organizational design plays in the relationship between quality management and environmental management in the hotel industry. Our findings show these direct and mediating relationships. As theory suggests, hotels may find it easier to first implement a quality management system and subsequently an environmental management system because the organizational changes that are involved with quality management benefit and give support to the subsequent implementation of environmental management.

According to the results of this study, the organizational changes that may occur with the implementation of quality management would include greater specialization of jobs, a higher level of formalization of procedures and activities, and an increase in interdepartmental coordination, both formally through working groups, committees and other link mechanisms, and informally through informal social relations between members of different departments in the hotel. Although theory seems to suggest that it is appropriate to decentralize decision-making in quality and environmental management systems, this study did not confirm it. This may be because delegation of responsibility for making decisions does not extend to front line employees, but only goes as far as some middle managers.

If jobs are specialized, workers are better able to master the skills necessary for the performance of their tasks and that can facilitate the introduction of certain changes in their jobs to improve quality, as well as to prevent pollution, reduce the consumption of resources, and other changes that may impact the environment. Furthermore, the improvement of a process from an environmental perspective may involve different employees specialized in different functions, and not only the environmental manager. In the context of hotels, changing hotel operations to improve environmental performance may involve different

experts, like the staff of the maintenance department or the cleaners of the housekeeper department.

Regarding formalization derived from quality practices, the hotel may create the organizational capability to put in writing certain rules, procedures, activities or methods, so that formalizing new practices or activities related to environmental management may be easier. Moreover, the results of this study show that formalization is the organizational design variable with the greatest impact on the implementation of quality management system, and therefore when an environmental management system is implemented. This may be due to the fact that quality management and environmental management require written procedures and job descriptions as a starting point to implement quality and environmental practices.

Greater use of different link mechanisms, as well as informal social relations between the members of different departments, can avoid some of the problems that are sometimes associated with specialization, such as the loss of the global vision of work procedures when employees carry out only partial and isolated tasks (Menon et al., 1997; Shea & Howell, 1998). This is because specialized workers meet together frequently to exchange information about their respective jobs, both formally or informally. In this way, hotels that implement an organizational structure based on cross-functional teams or committees that meet regularly to address issues of quality can also easily address issues of environmental improvement.

Similarly, if workers have the freedom to interact and informally address any member of the hotel (employees or managers) they will have an increased predisposition to approach them with ideas in order to, for example, resolve problems that affect the quality of the hotel or suggest environmental improvements.

Regarding implications for practice, hotel managers should be aware that a suitable implementation of quality management may imply some organizational changes, like more formalization, specialization, and use of formal and informal link mechanisms. Once these

organizational changes have been implemented, the new organizational structure may favour the implementation of an environmental management system with little additional effort. Therefore, the implementation of both quality management and environmental management may be interesting for hotel companies. Hotels may benefit from the knowledge acquired through the implementation of quality management in the adoption of environmental management, as quality management includes the implementation of certain organizational practices, resources and capabilities which may support the development of environmental management (Darnall & Edwards, 2006). Specifically in the hotel industry, environmental management can help hotels to reduce their environmental impacts, protecting the natural environment of the destination where they are located. This aspect, together with the implementation of quality practices, can increase the satisfaction of customers and other important stakeholders in this hotel industry and the destination. Environmental management and quality management may improve the competitiveness of hotels (Molina-Azorín et al., 2015). A key organizational aspect where hotel managers can act in order to obtain all these benefits is organizational design. Our paper highlights some important organizational variables that hotel managers must manage to support the implementation of environmental management.

Some implications for other stakeholders can also be indicated. For example, as environmental management is important for both hotel companies and the destination where they are located, there is a need to share environmental information between hotels and other stakeholders, such as hotel associations and public administrations. Multi-stakeholder environmental networks, research centers, state environmental agencies and other public policy bodies may help firms progress in environmental management by creating channels to provide them with information about environmental impacts, standards, benchmarking, indicators and technologies (Sharma, 2009). Specific training about environmental

management practices in this industry and organizational design requirements would be relevant. Moreover, public policy makers should encourage and promote the implementation of environmental management because of its positive benefits for firms and destinations. The findings of our study may be useful to these stakeholders as they can take into account the antecedents analyzed in this article to develop useful environmental information to help firms develop better environmental management.

Concerning the limitations of this study and ideas for future research, the measurements in this study are based on manager perceptions. One solution to address this issue is to use archival data in those industries where these data are available. Another limitation is that our research focuses on the hotel sector (a specific industry) in Spain (a particular geographic area). Then, it seems prudent to limit the generalizability of our findings and conclusions. Future research can examine these relationships in other industries and countries. Moreover, the analysis is based on a cross-sectional study, which means that it is impossible to know the evolution of the variables and their effects on the studied linkages between variables. Longitudinal research could help solve this problem.

As noted in the introduction, few studies have analyzed the relationship between organizational design variables and environmental management. Therefore, future research could add more knowledge about this link, and could include other organizational design variables. For example, researchers could examine the influence of the number of hierarchical levels and span of control in the hotel. In addition, our paper has focused on the organizational level. An analysis of design at the inter-organizational level would be also interesting. For example, it would be possible to study organizational characteristics of alliances between different companies, the environmental management systems in hotel chains, or relationships with intermediaries in promoting environmental management.

It would also be interesting for future research to study the microfoundations of environmental management, examining the role of individuals, their characteristics, actions and interactions in implementing environmental management. Our paper examines organizational design and quality management as organizational antecedents of environmental management. Together with this analysis at the organizational level, the study of the microfoundations of environmental management would focus on the individual level, following insights proposed by the microfoundations of strategy (Felin & Foss, 2005). The analysis of other levels in organizations may be important in advancing the analysis of determinants of environmental management. The study of its microfoundations, examining individual actions, decisions, motivations and other characteristics, could provide key ideas to advance research in the field with important implications for theory and practice. Bansal and Gao (2006) indicated that environmental issues have emotional, cognitive and value-based elements that pertain to the individuals. Linking this individual level with organizational design, future research could examine the changes in organizational design that would empower and motivate employees to implement environmental management.

Future research could also analyze the relationship between ambidexterity and environmental management. Along with sequential and structural ambidexterity, O'Reilly and Tushman (2013) identify a third type of ambidexterity, contextual ambidexterity, where a firm tries to develop exploitation and exploration activities through a supportive organizational context that encourages individuals to integrate these two types of activities. Some authors have examined ideas about the relationship between quality management and ambidexterity (Moreno-Luzón & Valls-Pasola, 2011), and it may be useful to study the link between environmental management and ambidexterity through the role of organizational design and individuals as key determinants.

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Table 1: Assessment of the Measurement Model (Environmental Management).

Scale items	Second order construct weight (formative constructs)	Loadings (item reliability) (λ)	Composite reliability (ρ_c)	Average Variance Extracted (AVE)
ENVIRONMENTAL MANAGEMENT (second order, formative)			n.a.	n.a.
Operational systems (reflective)	0.15		0.93	0.78
1.Environmental training courses are offered for all CEOs and area managers		0.92		
2.Environmental training are offered to all employees		0.92		
3.Environmental issues are taken into account when offering the various services available at the establishment		0.84		
4.The environmental record of suppliers is assessed		0.85		
Information systems (reflective)	0.34		0.95	0.83
1.Environmental information/data are periodically reviewed and updated		0.92		
2.Environmental communication is fostered between the staff and the managers at the establishment		0.91		
3.An environmental report is prepared in order to disseminate the environmental activities carried out by the establishment		0.92		
4.Financial and operational indicators are used in order to measure and inform on the establishment's environmental impact and its costs		0.91		
Strategic systems (reflective)	0.13		0.95	0.76
1.The policy of the establishment and its environmental strategy are formally communicated to all its employees		0.87		
2.Procedures are defined and documented for all activities, products and processes which have, or may have if not controlled, a direct or indirect, significant impact on the environment		0.91		
3.There is an assessment of the results obtained by employees related to environmental impact reduction		0.88		
4.The necessary resources are provided in order to carry out environmental improvements in the establishment		0.88		
5.Customers' complaints and suggestions are assessed in order to improve environmental practices		0.82		
6.Indicators are developed in order to gauge the customers' degree of satisfaction with environmental practices		0.87		
Technical systems (reflective)	0.53		0.91	0.62
1.Low environmental impacts products are chosen		0.76		
2.A suitable disposal/treatment/storage of waste is performed		0.79		
3.Practices are implemented in order to reduce water consumption		0.82		
4.Techniques are used to reduce energy consumption		0.80		
5.Practices are implemented towards lower resource intensity		0.81		
6.Product re-use/recycling is encouraged		0.74		

Table 2: Assessment of the Measurement Model (Organizational Design)

Scale items	Second order construct weight (formative constructs)	Loadings (item reliability) (λ)	Composite reliability (ρ_c)	Average Variance Extracted (AVE)
ORGANIZATIONAL DESIGN (second order, formative)			n.a.	n.a.
Specialization (reflective)	0.20		0.85	0.73
1. Most of the employees are specialized, because they carry out a limited number of tasks		0.82		
2. The employees are experts in their respective areas		0.89		
Decentralization (reflective)	-0.02		0.83	0.61
1. Few actions are implemented without a supervisor approving of the decision (inverted)		0.79		
2. Even issues of little significance need consultation with a supervisor for a final decisions to be made (inverted)		0.79		
3. Employees must ask their supervisors before doing anything (inverted)		0.77		
Formalization (reflective)	0.65		0.91	0.67
1. For any situation that may arise, there are written procedures available in order to deal with the matter		0.87		
2. Rules and procedures play central role in the organization		0.87		
3. Employees' work is registered in forms		0.77		
4. There are periodic checks on whether employees comply with rules and procedures		0.81		
5. There are job descriptions written for all positions		0.75		
Informal social relations (reflective)	0.20		0.85	0.60
1. It is easy to speak with any person, independently of his/her position		0.77		
2. Usually informal discussions arise between employees from different areas		0.78		
3. Employees from different areas can be called freely when they are needed		0.85		
4. Employees of an area are always available to those in other areas		0.69		
Link mechanisms (reflective)	0.24		0.86	0.68
1. Inter departmental groups to allow different areas to engage in joint decision making		0.85		
2. Temporary workgroups that facilitate the collaboration between areas in a specific project		0.87		
3. Liaison personnel whose specific job is to coordinate the tasks of different areas		0.75		

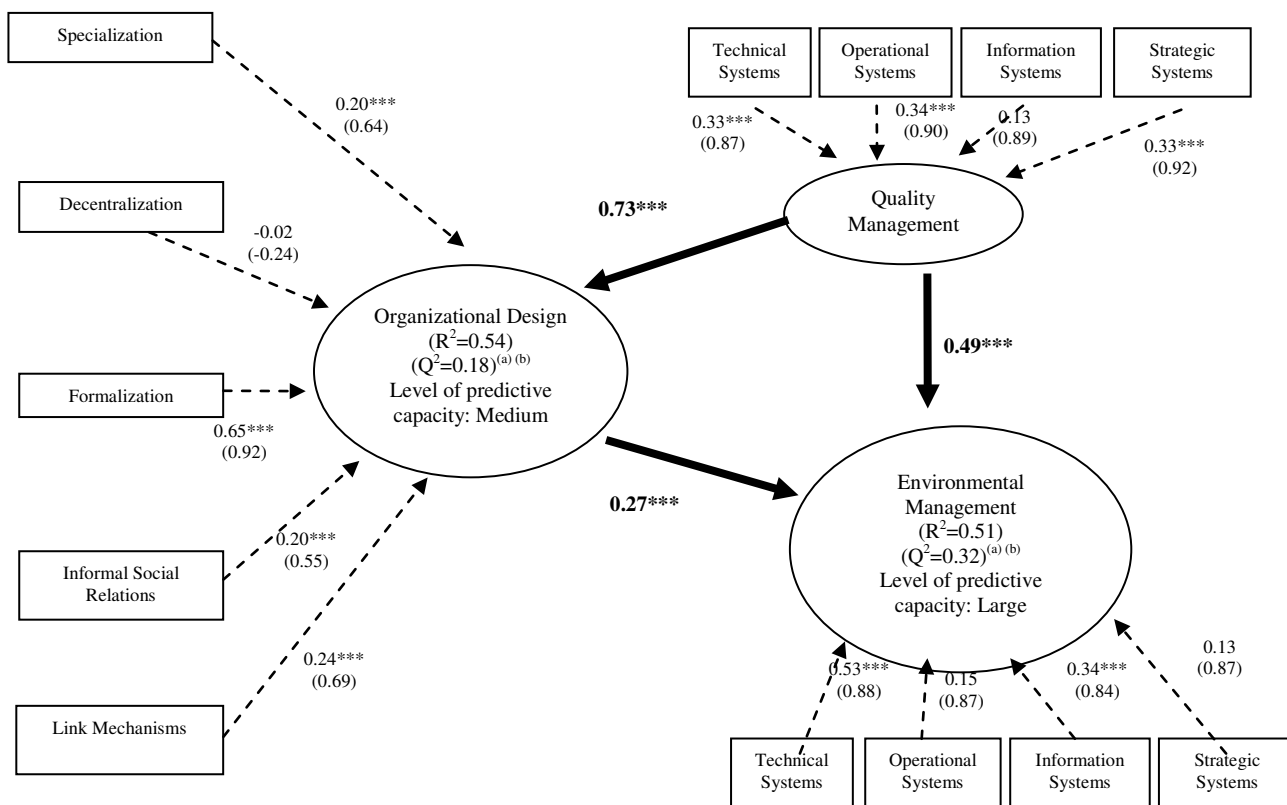
Table 3: Assessment of the Measurement Model (Quality Management).

Scale items	Second order construct weight (formative constructs)	Loadings (item reliability) (λ)	Composite reliability (ρ_c)	Average Variance Extracted (AVE)
QUALITY MANAGEMENT (second order, formative)			n.a.	n.a.
Operational systems (reflective)	0.34		0.89	0.57
1. Quality training courses are offered for all hotel managers and area managers		0.74		
2. Quality training is offered to all employees		0.73		
3. Employee motivation is encouraged		0.76		
4. Quality issues are considered when the services are offered		0.77		
5. The firm collaborates with intermediaries in order to improve the product offered in the establishment		0.73		
6. The firm collaborates with suppliers in order to improve the product offered in the establishment		0.79		
Information systems (reflective)	0.13		0.92	0.75
1. Quality information / data is used in day to day in different areas		0.89		
2. Quality information / data is available for all employees		0.87		
3. Quality information / data is used to improve the quality of the service		0.90		
4. Financial and operational indicators are used to measure quality effects		0.81		
Strategic systems (reflective)	0.33		0.92	0.70
1. Quality policy is formally communicated to all employees		0.83		
2. Quality is highlighted by a well defined set of policies and procedures		0.86		
3. Required resources are provided to improve quality service		0.85		
4. The needs of customers are used to improve the quality		0.84		
5. Complaints and suggestions from customers are evaluated to improve the service quality		0.79		
Technical systems (reflective)	0.33		0.90	0.69
1. Internal audits are performed		0.76		
2. Satisfaction surveys are conducted		0.83		
3. Complaints and suggestions system is employed		0.85		
4. A system of quality indicators is used for continuous improvement		0.89		

Table 4: External Validity of the Measurement Model

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. QM Operative systems	(0.75)												
2. QM Information systems	0.74	(0.87)											
3. QM Strategic Systems	0.70	0.79	(0.83)										
4. QM Technical systems	0.68	0.77	0.73	(0.83)									
5. EM Operational system	0.62	0.56	0.54	0.53	(0.88)								
6. EM Information system	0.52	0.57	0.57	0.52	0.83	(0.91)							
7. EM Strategic system	0.53	0.56	0.60	0.53	0.85	0.83	(0.87)						
8. EM Technical system	0.48	0.56	0.53	0.52	0.58	0.60	0.54	(0.79)					
9. Specialization	0.41	0.40	0.44	0.38	0.32	0.31	0.37	0.44	(0.86)				
10. Decentralization	-0.20	-0.17	-0.15	0.10	-0.20	-0.19	-0.19	-0.12	-0.21	(0.78)			
11. Formalization	0.56	0.63	0.63	0.68	0.49	0.52	0.53	0.48	0.46	-0.21	(0.82)		
12. Informal social relations	0.39	0.35	0.42	0.30	0.24	0.28	0.29	0.35	0.31	-0.07	-0.21	(0.77)	
13. Link mechanisms	0.31	0.44	0.44	0.42	0.41	0.41	0.35	0.41	0.31	-0.19	0.47	0.34	(0.82)

Note. Square roots of AVE are on the diagonal, and the correlations between constructs are off-diagonal.



*** $p \leq 0.001$, ** $0.001 < p \leq 0.01$, * $0.01 < p \leq 0.05$, † $0.05 < p \leq 0.10$ (based on $t_{(499)}$)

$t_{(0.001; 499)}=3.1066$; $t_{(0.01; 499)}=2.3338$; $t_{(0.05; 499)}=1.6479$; $t_{(0.10; 499)}=1.2820$

- (a) Q2 values larger than zero for a certain reflective endogenous latent variable indicate the path model's predictive relevance for this particular construct.
- (b) Q2 values of 0.02, 0.15, and 0.35 indicate that the exogenous construct has a small, medium, or large predictive relevance for a certain endogenous construct (Hair et al., 2014, p. 184).

Figure 1: Relationships between environmental management, organizational design and quality management