How Does the Spanish Hospitality Industry Envision Its Eco-Innovation Orientation?

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Abstract This study analyses the key factors in the environmental orientation of innovation processes at hotel companies. Using the model of structural equations and data retrieved from the Technological Innovation Spanish panel, we shed light on how the environmental orientation of companies is proactively affected by the typology of innovations and the existing relationship between the market drivers (customers, competitors, clients and suppliers) and companies' environmental orientation. Based on the results, a validated partial least squares (PLS) graphical model is presented, which clarifies and quantifies established relationships among the different variables. Research gaps and future lines are also highlighted.

Keywords Sustainable innovation · Hospitality industry · PITEC database

JEL Classification Z32 tourism and development · O310 innovation and invention: processes and incentives · L8 industry studies: services · M140 corporate culture · Diversity · Social responsibility

1 Introduction

When looking at strategic aspects and objectives, innovation emerges as a key element in a firm's competitiveness. Similarly, sustainable orientation has become a strategic issue that is valued by the firm's stakeholders as a means of achieving competitive advantage (Esty & Winston, 2009). These two concepts are cross-linked within the concept called eco-innovation.

Kemp and Pearson (2007) defined eco-innovation as the production, assimilation or exploitation of a product, production process, service or management or business method that is novel to the organization and which results in a reduction in environmental impact. Eco-innovation has received considerable attention lately. Since

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Fussler and James (1996), who linked the concepts, studies have focused on identifying the aspects that affect firms' environmental orientation (Gázquez-Abad, 2011). Among these factors are industry characteristics (Peiró-Signes & Segarra-Oña, 2011), external pressure (Kalantari & Asadi, 2010), corporate and marketing strategies (Esty & Winston, 2009; Mitchell & Wooliscroft, 2010), environmental policies (Chappin, Vermeulen, & Meeus, 2009) and implementation of environmental management systems (Johnstone & Labonne, 2009).

Eco-innovative firms find different benefits in this approach, such as cost advantages from the reduction in materials or energy consumption (Kesidou & Demirel, 2012), improved image and reputation (Hart & Milstein, 2003; Pujari, 2006) or an increase in business performance (Cheng, Yang, & Sheu, 2014). However important these aspects are to innovation adoption in organizations, the benefits will depend on the actual capabilities of the firms and the industry in which they operate.

Eco-innovation drivers have been studied widely (Cai & Zhou, 2014; Kesidou & Demirel, 2012; Segarra-Oña & Peiro-Signes, 2013; Triguero & Moreno-Mondéjar, 2014). Most of the studies have focused on manufacturing industries, but the economies in developed countries are based mainly on service and knowledge-based industries (European Commission, 2013).

Gallouj, Weber, Stare, and Rubalcaba (2015) pointed to the environmental challenge as a key driver of change for future development and for innovation in the service industry. Segarra-Oña et al. (2013) found that service companies oriented to innovation, both to product and process innovation, are more likely to be environmentally oriented. Moreover, service firms that rely more on information from the market are more likely to orient their innovation towards environmental aspects.

In service firms, previous studies have shown that a process and product orientation when innovating is positively correlated with greater environmental concern. Peiro-Signes and Segarra-Ona (2014) show that product orientation is much lower in service firms than in manufacturing companies, while the process orientation of service firms doubles the impact on eco-orientation when innovating.

Among services, characteristics such as the technological level, export orientation and knowledge-intensity of the industry can be very different. Therefore, it is of interest to study differences that might appear in certain industries. Nowadays, hospitality is emerging as an important industry based on its contribution to gross domestic product (GDP), especially in Mediterranean countries. The hospitality industry is an operations-based service, with large fixed costs, very dependent on tourism and leisure travel and with different management options. However, this traditional operations structure coexists with the quick adoption of innovations in information technology. Customers have much more information at the time of the purchase of the service due to web-based applications, for example regarding the environmental concern of the hotel.

Taking the diversity of industry characteristics among services, the different sources of information that service firms use in their innovation processes and the different approaches to product and process innovation into account, the relative impact of the drivers on the environmental orientation in a specific service might

justify a different action plan to promote eco-innovation. This study is the first approach in evaluating whether the drivers of the environmental orientation detected in previous studies exist and follow the same patterns in the hospitality industry.

2 Hypothesis Development

In a previous study, we showed that being process oriented when innovating in service companies is correlated to higher environmental awareness and eco-innovative activities (Segarra-Oña & Peiro-Signes, 2013). Process-oriented companies will focus on materials, energy and water savings as this will reduce product or service costs. Moreover, they will be focused on increasing the efficiency of their processes, which is also a cost-related aspect. Moreover, perceived factors, including benefits and cost savings, are important for innovation adoption in organizations (Sharma & Thomas, 2008). On the other hand and according to the American green hotel association[1], "green" hotels are environmentally friendly properties the managers of which are eager to institute programmes that save water, save energy and reduce solid waste—while saving money. Therefore, we can expect that process-oriented companies, understood as those companies that are oriented to cost reduction and to increases in capacity and flexibility (Reichstein & Salter, 2006), are simultaneously looking to reduce impact and to improve their environmental performance. We state the first hypothesis as follows:

H1 Process orientation has a positive effect on the environmental orientation of hospitality firms when innovating.

Foster and Sampson (2000) results showed that the hospitality industry is under pressure to be green, especially due to their customers' increasing demand. But far from being a threat, environmental awareness should be considered an opportunity based on studies that recount improved competitiveness and differentiation (Vastag, Kerekes, & Rondinelli, 1996). Hospitality firms have to consider the variables that affect the decisions taken by their clients as they need to create value-added services in order to acquire and retain loyal clients. On the other hand, product-oriented companies are those companies that focus on increasing the quality or the number of services, to penetrate new markets or to increase market share. Thus, the green niche represents a large and increasing market gap to be tapped into and is one that cannot be ignored. We can expect that hospitality companies that are focusing on their products (services) are more likely to be environmentally oriented as they will try to reach green customers. Thus:

H2 Product orientation has a positive effect on the environmental orientation of hospitality firms when innovating.

[1] http://greenhotels.com.

Worldwide, hotel managers are considering how to improve their sustainable operations from the operational-managerial perspective, but also from the client perspective. Nevertheless, it remains unclear which real actions influence the clients' decisions related to the firm's environmental orientation (Delmas & Toffel, 2004). Many authors have studied issues regarding consumer perceptions of green practices in hospitality (Kassinis & Soteriou, 2003). The lesson of these studies is that environmental practices are positively related to better performance through the mediating effect of higher customer satisfaction and loyalty (Kassinis & Soteriou, 2003) and that eco-labels and environmental certifications lead to enhanced customer awareness of restaurants' and hotels' environmental efforts and act as differentiating assets over those that do not engage in eco-certification schemes (Schubert, Kandampully, & Solnet, 2010; Zhang, Joglekar, & Verma, 2012). Furthermore, competitors' attitudes to environmental aspects might condition firms' environmental behaviour.

Thus, we can expect that those hospitality firms that rely on market information sources, that is, information from customers, suppliers and competitors, are more likely to be environmentally oriented. We can expect there to be a mediating effect of both process and product orientation in this relationship. Hospitality firms which consider market information important will be more sensitive to market demands to reduce water, energy and waste consumption and to increase operational efficiency (process orientation). Moreover, they will be more sensitive to the "green" demands of their customer or to the "green" actions of their suppliers or competitors. Consequently, we hypothesize that:

H3 The importance of market information sources in the innovation process positively affects the product and process orientation of hospitality companies.

In another vein, the higher cooperation and more intense relationships that eco-innovative firms establish with suppliers, sharing resources and knowledge and creating value in terms of absorptive capacity, are characteristics that should be considered in achieving greater competitiveness. Knowledge sharing and transfer between research and technological centres, universities and private organizations and companies is increasing, having a positive effect on their innovation activity (Revilla, Dodd, & Hoover, 2001). Indeed, information sources affect the way companies innovate (Amara & Landry, 2005). Thus, we can expect that companies that rely more on these information sources will be more receptive in applying new knowledge and thus improve their product and their processes, that is they will be product and process oriented when they are innovating. We also expect these companies to be more sensitive to market information sources as they are a primary source of information. Thus, we hypothesize:

H4 The importance of knowledge-based information sources in the innovation process positively affects the product and process orientation of hospitality companies.

H5 The importance of knowledge-based information sources positively affects the importance of market information sources in the innovation process of hospitality companies.

3 Methodology

3.1 Data Collection

For this study we used the Technological Innovation Panel (PITEC), a statistical survey that follows Spanish firms' innovation activities over time. It is performed by the National Statistics Institute (INE) with advice from experts and university researchers.

In the PITEC database, a set of variables was subjected to anonymization to avoid the disclosure problem. Anonymization in this study only affected the segmentation done to obtain our sample. Original 4-digit NACE codes were replaced with a 44-industry breakdown. We used the variable ACTIN to select data from the hospitality industry.

We used the latest data available (2010) to analyse a total of 41 firms from the hospitality industry included in the database. We disregarded those cases with a lack of data for the variables that we used in the study (see Table 1).

As we were dealing with latent constructs, covariance structure analysis needed to be undertaken through structural equation modelling, in which a priori theoretical knowledge is incorporated in the empirical analysis (Tenenhaus, Vinzi, & Chatelin, 2005).

3.2 Measurement and Assessment of the Model

We used a partial least squares path modelling (PLS-PM) approach implemented in SmartPLS 3.0. (Ringle, Wende, & Will, 2005) to analyse the data. We consider this approach appropriate for the following reasons. First, this study is more exploratory than confirmatory, which is a strength of PLS (Leimeister, Leimeister, & Knebel, 2009). Second, it requires no presupposition of normality in the variables and is geared to research models that predict the effects of some variables on others. Third, an initial data set can be resampled and enlarged and therefore we can test smaller sample sizes. Furthermore, SmartPLS is able to evaluate the reliability and validity of the measurement instrument simultaneously. Finally, Anderson and Gerbing (1988), Bagozzi and Yi (1988), Barclay, Higgins, and Thompson (1995) and Chin et al. (2003) recommend it over other techniques when theory is not firmly established.

Table 1 Selected variables from the PITEC database

PITEC variables	Explanation
$FUENTE_i$ (i = 1, …,10)	Importance of information sources when innovating (internal sources, suppliers, clients, competitors, consultants, universities, government or public research institutions, conferences, scientific journals and professional or industrial associations)
$OBJET_i$ (I = 1, …,10, 12)	Importance of some objectives (increasing the range of products or services, replacing outdated products or processes, entering new markets, increasing market share, improving quality, increasing flexibility, increasing capacity, reducing labour costs, reducing the material costs per unit, reducing the energy costs per unit, reducing environmental impacts, improving health or safety, meeting environmental and H&S regulations) to develop innovations

Categorical variables 1 high; *2* medium; *3* low; *4* not considered or not important

The first issue we faced was the sample size. Wold (1989) and Chin and Newsted (1999) studied PLS with small samples and demonstrated the appropriateness of PLS indicators with sample sizes as low as 20. Thus, we consider our sample size large enough to run the model.

We used item reliability, internal consistency and discriminant validity (Chin, 1998) to test the reliability and validity of the measurement instrument. First, we used individual item loadings to evaluate individual item reliability. According to Chin (1998), individual items with loadings greater than 0.7 are acceptable because they explain about 50% of the variance in a specific measure. This also ensures that the items are measuring the same construct. However, weak loadings (0.5 or less) are acceptable when using newly developed scales (Hulland, 1999). All the items exceeded the suggested threshold for item reliability, indicating that the survey instrument was adequate for measuring each construct individually.

Second, we used Cronbach's alpha and composite reliability to evaluate the internal consistency of each endogenous variable (construct). The minimum acceptable alpha or composite reliability value is 0.7 for each construct (Bernstein & Nunnally, 1994). All constructs showed values greater than the suggested threshold of 0.7 (see Table 2).

Finally, we tested discriminant validity using the average variance extracted (AVE), which measures the variance captured by the indicators relative to the measurement error. Discriminant validity confirms the lack of a relationship between constructs. It requires an AVE greater than 0.5 (Chin, 1998; Fornell & Larcker, 1981) and that the squared intercorrelations among the latent variables do not exceed the AVE. The results in Table 2 demonstrate discriminant validity and indicate that the structural model can be assessed with confidence.

Table 2 Reliability measurements and matrix of correlation between latent variables

	Eco-orientation	Market information sources	Process orientation	Product orientation	Other information sources
AVE	0.906	0.634	0.610	0.591	0.564
Composite reliability	0.967	0.836	0.885	0.876	0.885
Cronbach's alpha	0.948	0.711	0.837	0.820	0.861
Eco-orientation	**0.952**				
Market information sources	0.397	**0.796**			
Process orientation	0.677	0.473	**0.781**		
Product orientation	0.632	0.715	0.644	**0.768**	
Other information sources	0.556	0.582	0.412	0.606	**0.751**

Note Square root of AVE on diagonals in bold

3.3 Structural Model Assessment

The structural model proposed to test our six basic assumptions was estimated by the PLS method, using the SmartPLS application. The results are set out in Fig. 1, which shows (observable) questionnaire items from the PITEC database in rectangles and unobservable latent factors with circles. The arrows indicate regression relationships, showing the relationships of items with latent factors (measurement model) and between latent factors (structural model). Corresponding partial regression coefficients are indicated next to the arrows and within the circles corresponding to endogenous variables, the coefficient of determination (R^2) for the corresponding regression is presented.

The results indicate how well the structural model predicted the hypothesized relationships.

First, the path coefficients (standardized betas) denote the strength of the causal relationships between two constructs (Wixom & Watson, 2001). Figure 1 supports the existence of positive relationships for the hypotheses proposed.

Table 3 shows the regression coefficients between latent factors, their t-statistics and p-values, estimated by bootstrapping with 5000 samples. We confirmed that the proposed relations have significant values, confirming our basic hypotheses.

Process orientation and product orientation are shown to have a positive effect on eco-orientation. The path coefficient between process orientation and eco-orientation is 0.461, which is significant at $p < 0.001$. In addition, product orientation is significantly related to eco-orientation ($\beta = 0.335$, $p < 0.01$). Thus, H1 and H2 are supported.

With regard to the market information sources construct, the results show that this variable contributes to a significant positive effect on both product orientation and process orientation. In other words, the importance of the information from suppliers, competitors and clients in the innovation process has a significantly

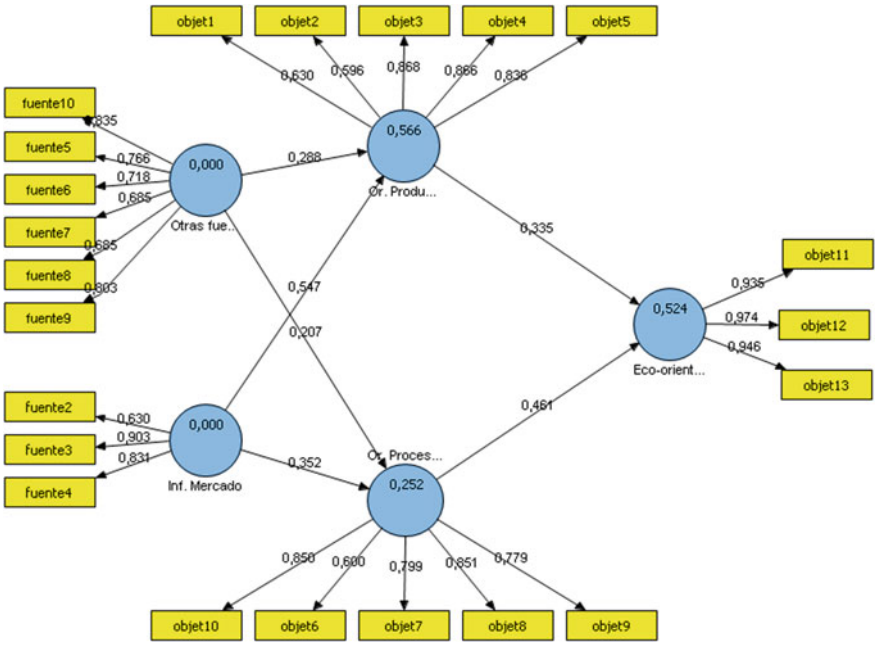

Fig. 1 Estimated structural equation model

positive effect on the product orientation ($\beta = 0.547$, $p < 0.001$) and on the process orientation ($\beta = 0.352$, $p < 0.001$) of the hospitality firms when innovating. Therefore, H3 and H4 are supported. As a result, we confirm the positive effect of market information sources when innovating on eco-orientation ($\beta = 0.346$, $p < 0.001$).

The variable representing other information sources is found to be significantly related to process and product orientation. The path coefficients are significant ($\beta = 0.207$, $p < 0.05$; $\beta = 0.207$, $p < 0.05$, respectively). Thus, H5 and H6 are supported.

Second, the squared multiple correlation (R^2) for each endogenous variable measures the percentage of variance explained by each construct in the model. The R^2 coefficients associated with the latent variable regressions are significant, with values greater than 0.1 (see Fig. 1) in all cases (Falk & Miller, 1992).

The independent construct representing the importance of market information sources and other information sources in firm's innovation explains 56.6% of the variance in product orientation and 25.2% in process orientation. On the other hand, product and process orientation explain 52.5% of the variance in the eco-orientation of the hospitality firms in the sample. Figure 1 shows the standardized path coefficients and variance explained.

Finally, Barclay et al. (1995), Tenenhaus et al. (2005) and Henseler et al. (2009) proposed strengthening the analysis using the cross-validated redundancy index

Table 3 Direct effects, explained variance and Q2 test for the endogenous variables

Effects on endogenous variables	Mean	Standard error	t-statistics	Explained variance
Effects on eco-orientation				$R^2 = 0.524/Q^2 = 0.474$
Process orientation → eco-orientation	0.461	0.114	4.058***	0.312
Product orientation → eco-orientation	0.335	0.115	2.908**	0.212
Effects on process orientation				$R^2 = 0.252/Q^2 = 0.137$
Market information sources → process orientation	0.352	0.096	3.657***	0.166
Other information sources → process orientation	0.207	0.092	2.26*	0.065
Effects on product orientation				$R^2 = 0.566/Q^2 = 0.137$
Market information sources → product orientation	0.547	0.063	8.701***	0.391
Other information sources → product orientation	0.288	0.065	4.441***	0.174

***Significant at $p < 0.001$, **significant at $p < 0.01$

(Q^2) or Stone–Geisser test (Geisser, 1974; Stone, 1974). The Q^2, which is a measure utilizing a blindfolding procedure (Tenenhaus et al., 2005), gives us a measure of goodness with which the values observed are reconstructed by the model and its parameters (Chin, 1998). Q^2 values greater than zero indicate that the model has predictive relevance (Henseler & Ringle, 2009). Table 3 shows the Stone–Geisser test (Q^2) using the blindfolding procedure. The results show that the model has predictive relevance as the Q^2 results for each construct are greater than zero.

4 Conclusions

The purpose of this study was to identify some determinants behind the environmental orientation of hospitality firms when innovating. Specifically, this research proposed product and process orientation and the importance of market and other information sources as the key factors determining eco-orientation. We confirmed the reliability and validity of the measurement model and we demonstrated that all the relations were statistically significant and directionally supported.

The results provide support for the greater likelihood that companies will be environmentally oriented when innovating if they are process oriented when

innovating. That is, looking for more flexibility, an increase in services and reductions in the costs (labour, materials and energy) per service when innovating positively affects the environmental orientation of hospitality firms. Second, hospitality organizations tend to be environmentally oriented if in the innovation process they are oriented to increasing the quality or the number of services with a view to penetrating new markets or increasing market share. Therefore, the more inclined to product oriented they are when innovating the more eco-orientated they are.

Hypotheses 3 and 4 assessed the relationship between the importance of market information sources and product and process orientation. Both hypotheses were supported, suggesting that hospitality organizations that rely on information from suppliers, competitors and clients in the innovation process are more likely to orient their innovation to products or the processes. Consequently, this relation will also affect the environmental orientation of the innovation process.

Finally, dependence on other information sources, for example institutional (universities, technology centres and public institutions) or technical (expositions, conferences, scientific and technical journals), also promotes product and process orientation and therefore environmental orientation.

In this study, we highlighted the relation between eco-orientation and firms' innovative characteristics in the hospitality industry. Our model provides a frame for understanding why some organizations may or may not be environmentally oriented when innovating. Rather than focusing on firms' characteristics, like size, export orientation or technological level, which have been shown to influence the eco-orientation of firms, our model assesses innovative characteristics, such as product and process orientation and the importance of market and other information sources in the innovation process.

Furthermore, this study contributes to the understanding of some of the key constructs predicting the eco-orientation of the firm. This approach was our attempt to explain the determinants of environmental orientation in hospitality companies.

Finally, we have shown that firms with a clear product and process orientation in the innovation process have a better understanding of the benefits of an environmental approach. Moreover, these organizations rely heavily on the market, institutional or technical information sources when they are innovating. In other words, hospitality companies need to seize opportunities for innovation activities and orient the innovation process properly in an attempt to become more environmentally oriented and gain competitive advantage over their competitors.

5 Limitations and Future Research

This study has some limitations that we should account for. We used data at one point in time, which could limit the strength of our findings. To mitigate this limitation, we ran the model for the same 41 companies with data for 2009 and the model led to similar results. Moreover, the use of a single database to collect data

may not be representative of an entire industry. However, the use of the PITEC database, which is the reference statistical instrument for studying Spanish firms' innovation activities, overcomes this liability to a large degree. We can expand this study to other countries or to specific hospitality sectors in order to generalize the conclusions or account for sector-specific relationships. We adopted the available measures in PITEC, limiting this study to a few factors influencing eco-orientation. Hence, other potential factors may affect or moderate the eco-orientation of the firms when innovating, offering opportunities for future research.

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