Determining underlying key factors to eco-innovation at the telecom industry: an approach to the service economy

Roda-Llorca, Carmela, Segarra-Oña, Maria-del-Valb, Peiró-Signes, Angelc
aPhD student, UPV, carmel.roda@ono.es, bManagement Department, Business School, UPV, maseo@omp.upv.es, cManagement Department, Business School, UPV, anpeisig@omp.upv.es

Abstract
Several studies have pointed out the importance of eco-innovation at the manufacturing industry. Some of them have been developed to unravel the variables that help companies to better target their innovations towards sustainability, but, although the services industry is increasing its economic importance globally, the research carried out on this subject is still scarce. Thus, taking into account that policies of eco-innovation in the EU countries are a key part of sustainable development and also the need to study and understand the different environmental strategies as a key sector in the technological development, in this work we focus in the understanding of the patterns that explain the eco-innovative orientation in the telecommunications industry. We also analyze the similarities and differences among the variables that have been previously studied at the manufacturing industry (ceramic, automotive, etc.) through a detailed state of the art approach.

Keywords: Service industry, eco-innovation, state of the art, telecom industry.

Introduction
At the manufacturing sector, several studies have been developed to unravel the variables that help companies to better target their innovations towards sustainability, but, although the service industry is increasing its economic weight, the research carried out on this subject is still scarce.

In this work, the current situation of eco-innovation at the telecommunications industry will be studied through an analysis of the state of the art.

Theoretical background
The relationship between being environmentally sustainable and business competitiveness has been demonstrated in the academic literature (Pujari, 2006, Cheng, 2014). Since then, there are many works that have deepened the study of firm’s performance and environmental sustainability (Da Silva et al. 2009, Segarra-Oña et al., 2013a), in order to understand why some companies go beyond the legislation adopting a proactive environmental attitude and what are the characteristics that define the companies that take into account the environment as a priority in terms of innovation (Segarra-Oña et al., 2014, Triguero et al., 2013, 2014).

The "eco-innovation" concept has emerged with force in recent years (Demirel and Kesidou, 2011, Fussler and James, 1996, Hellström, 2007) and, although the definition is not unique, it is generally understood as any innovation that reduces environmental damage (Carrillo-Hermosilla et al. 2009) although research in this field, in relation to the type of industry is still limited.

Despite the importance that has the sector services in today's economy, there are few papers that have analyzed the eco-innovator behavior in this sector (Gallouj, et al., 2014, Peiró-Signes et al., 2014, Segarra-Oña et al., 2013b). However, when a general perspective has been adopted it has not usually
taken into account the great diversity among subsectors (hotel sector, hospital sector, banking, consulting or telecommunications, for example). In this study, we address the key aspects that drive the activities of service companies, particularly in the telecommunications sector, where one of the authors has developed his professional career for the last 15 years, when envisioning eco-innovation.

Thus, taking into account that policies of eco-innovation in the EU countries are a key part of the sustainable development (see e.g. http://ec.europa.eu/environment/eco-innovation/) and the need to study and understand the different environmental strategies that implement a key sector in the technological development (Peiró-Signes 2011, 2013). Therefore, in this work we advance in the understanding of the patterns that explain the orientation of eco-innovation in the telecommunications companies and if the variables studied previously and that have been probed to influence in the orientation of the manufacturing sector (ceramic, automobile, etc. can be extrapolated to the telecommunications industry.

We will use a PLS analysis (applied on already tested dataset. Conclusions regarding which are the variables involved and how they influence in the sector, will have implications on management actions, as they may gain competitive advantages to make better use of the resources and have the information available.

**Objectives and methodology**

We aim to develop a model of eco-innovative orientation applied to telecommunications to help decision-making at the enterprise level sector.

The specific objectives of the study are:

1) To identify the variables that underlie the eco-innovative behavior in the telecommunications sector.
2) To develop a model of eco-innovative orientation applied to the telecommunications sector.
3) Segmenting the sector on the basis of the environmental strategy of companies.

We will use a Partial Least Square, PLS, analysis (Chin, 1998, Tenenhaus et al., 2005).

Empirical data for this study will be retrieved from the Spanish Technological Innovation (PITEC1) database, which consists of a statistical tool to monitor the technological innovation activities of Spanish companies.

The database was built by the INE (Spanish National Statistics Institute) with the advice of academics and experts. The first data came from 2004 and have been updated yearly to include a comprehensive list of Spanish companies which are characterized by the type of innovation (classified by the Oslo Manual 2005) that they undertake, by industry (in line with the Spanish National Activities Classification, CNAE) or by geographical location.

A total of 255 variables are analyzed in the database. Affiliate level information is not available as data are taken from an anonymous macroeconomic survey.

**Contributions of the study**

Conclusions regarding which are the variables involved and how they influence in the sector, will have implications on management actions, as they may gain competitive advantages to make better use of the

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1 [http://icono.fecyt.es/PITEC/Paginas/por_que.aspx](http://icono.fecyt.es/PITEC/Paginas/por_que.aspx)
resources and have the information available.

The main academic contribution of this work is to identify how to go from idea generation to implementation and diffusion of environmental innovations in a key strategic level and non-industrial sector.

The contribution to the enterprise level will improve the information and decision-making more efficiently achieving competitive advantages in business. Finally, in terms of public policy, knowledge of the inner workings of eco-innovative orientation in companies as well as the different types that exist in the sector will develop more efficient industrial policy actions vertical type.

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References


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