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Open organizational structures: A new framework for the energy industry[☆]Arsalan Nisar^a, Miguel Palacios^{b,*}, Mercedes Grijalvo^c^a Chair of Energy and Innovation Management, Enterprise Institute, University of Neuchâtel, A-L Breguet 2, Neuchâtel 2000, Switzerland^b ESCP Europe Business School, Madrid, Spain^c ESCP Europe Business School, Madrid Campus, c/ Arroyofresno, 1 28035 - Madrid, Spain

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ABSTRACT

Innovation and organizational design is central to how organizations manage their structures and boundaries for greater engagement to an increasing number of users as potential partners for increased value creation. Open organizing is prominent in industries where the locus of innovation can be extended to users leading to a burgeoning literature on concepts like co-creation, open innovation, and collaborative efforts. However, the current body of scholarship offers little insight into how organizations establish open organizational structures, specifically in more traditional industries like the energy industry, calling for a renewed focus on organizational structures and boundaries that is not merely related to reducing transactional costs or gaining efficiency. For the energy industry, open organizing remains paradoxical as it is not entirely driven by low communication cost and increased virtual connectivity. The energy industry is localized, performing under a broader industry framework subjective to a list of exogenous and endogenous factors. This study synthesizes the cases of 8 energy companies to produce a theoretical framework building on a checklist of the exogenous and endogenous factors that are central to the innovation process. Most importantly, this study reconciles the work on organizational boundaries and open structures to produce such theoretical framework. This framework can act as an evaluation tool for energy companies to assess the transition between existing structures to an open structure.

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1. Introduction

In the seminal work on organizational structure and innovation, Sapolsky (1967) explains that organizational design and its redesign remains a challenge for most organizations. Similarly, Abernathy and Utterback's work on dominant design examining organizational boundaries and design remain central for future work on how organizations align their structures for innovation (Abernathy & Utterback, 1978). Lakhani and Tushman, building on the work of March and Simon (1958), Chandler (1977) explain that organization theory scholars consider that core to the innovation process is the production of complex goods and services requiring continuous knowledge development and creation and transfer among diverse settings that often lie outside the boundaries of the organization. The literature often associates knowledge creation with high coordination costs. For example, prior literature has posited managerial hierarchy as a way of minimizing costs to the

detriment of a more open and distributed approach (Kogut & Zander, 1992; Tushman & Nadler, 1978) leading scholars to examine how organizations arrange and structure themselves to minimize costs and to gain efficiency. Accordingly, Tushman, Lakhani, and Lifshitz-Assaf (2012: 24), citing the work of Thompson (1967), Pfeffer and Salancik (1978/2003), Aldrich (1979), and Santos and Eisenhardt (2005), posit that “a considerable body of literature is rooted in setting a firm's boundaries in a way that protects it from dependencies in its task environment and puts boundaries around critical tasks, power, and competence contingencies.”

Lakhani, Lifshitz-Assaf, and Tushman (2012) indicate that some scholars have also explored the interactions between an organization's boundaries, its organizational structure, and its ability to innovate (see Thompson, 1967; Lawrence & Lorsch, 1967). Dahlander and Gann (2010) understand that the interactions between organizational boundaries and structure has stimulated questions about the role of openness emphasizing the permeability of firms' boundaries where ideas, resources, and individuals flow in and out of organizations. Dahlander and Gann (2010) explain that various forms of relationship with external actors partly define openness and is thus in close relation to a broader debate on the boundaries of the firm. External actors can leverage a firm's investment in internal R&D through expanding opportunities of combinations of previously disconnected silos of knowledge and capabilities (Nickerson and Zenger, 2004; Fleming, 2001; Hargadon & Sutton, 1997; Schumpeter, 1942). Users that lie outside the firm can

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be a source of novel innovations (von Hippel and Katz, 2002; Von Hippel, 1988, 2005; Franke and Piller, 2003). Through open organizational structure as a source of knowledge and distribution tools, many more actors outside traditional firm boundaries have access to rare solutions or answers that managerial hierarchy in the more traditional model may overlook, and this knowledge may be applicable to innovation tasks within firms (Jeppesen & Lakhani, 2010). “The rise – and occasional dominance – of community/user innovation, with its distinct loci of innovation and nonhierarchical bases of organizing, poses a challenge to the received theory of innovation, and organizational boundaries” (Tushman et al., 2012, p. 24). Further, firms simultaneously practice a range of boundary options that involve “closed” vertical integration, strategic alliances with major partners, and “open” boundaries characteristic of various open innovation methods. The practice of boundary options in turn has stimulated research on the role of openness in innovation, emphasizing the permeability of firms’ boundaries where ideas, resources, and individuals flow in and out of organizations (Dahlander & Gann, 2010; Chesbrough, 2003). Various forms of relationship with external actors partly define openness; thus, openness closely relates to the study of firm boundaries.

Even though the current literature offers a greater insight into what open innovation means, there is little understanding on what organizational structures can support open innovation. Organizations cannot implement open innovation without the right organizational structure in place, which means that open innovation can be temporary at best or take a form of experimentation. This study identifies and develops what an open organizational structure constitutes and how that structure is the foundation from which various organizations can develop open innovation initiatives. This study particularly focuses on organizational structures that can provide the basis for open innovation where organizations engage with external partners. This study also examines the little research that exists on which organizational structures are likely to favor or support open innovation. From these perspectives on organizational structure and openness, the study tries to incorporate them into a framework and aims to develop a typology of open organizational structure that builds on various external and internal factors that contribute to degree of openness.

2. Background

The rise and strength of external innovation coming from communities or users with distinct loci of innovation and nonhierarchical bases of organizing poses a challenge to the traditional theory and practice of innovation and displaces the focus to organizational boundaries (Tushman et al., 2012). External actors, for example, can leverage a firm’s investment in its internal R&D by expanding opportunities to combine previously disconnected silos of knowledge and capabilities (Fleming, 2001; Hagedoorn & Sutton, 1997; Hagedoorn and Duysters, 2002; Schumpeter, 1942); similarly, users of products and services can be a source of innovations (Von Hippel, 1988, 2005). The large number of actors outside traditional firm boundaries can have access to rare solutions and knowledge that organizations with tight and more traditional hierarchies may overlook, but which may be applicable to innovation tasks within firms (Jeppesen & Lakhani, 2010). Firms have begun to simultaneously practice a range of boundary options, including closed innovation inside vertically integrated firms, strategic alliances with major partners, or even fully opening their boundaries through open innovation. However, which structures are more malleable and receptive to such external solutions and content requires more consideration. Gassmann, Enkel, and Chesbrough (2010) suggest that the attention of management scholars to open innovation has increased, thus developing open innovation as an established research field. Further, Gassmann et al. (2010) allocate the research on open innovation in nine perspectives: spatial perspective, tool perspective, institutional perspective, structural perspective, user perspective, supplier perspective, leveraging perspective, process perspective, and cultural perspective. This study focuses

on structural perspective and user perspective as the basis for arguing open organizational structures.

Gassmann et al. (2010), building on the work of von Hippel (1986), indicate that, within the user perspective research, “users are included into the innovation process to utilize the freedom available in its early phases in order to understand potential customers’ latent requirements and to integrate users’ hidden application knowledge.” Structural perspective indicates that work division increases in innovation. Gassmann et al. (2010) posit that more and more organizations are outsourcing R&D activities through alliances where value chains are becoming disaggregated driven by cost reduction and specialization brought upon by complex technologies.

3. Research design

This study makes use of the multiple case study design by constant comparison of the cases to the checklist of exogenous and endogenous factors. Case studies remain rich, empirical descriptions of particular instances of a phenomenon that typically draw on a variety of data sources (Yin, 1994) and as a method excels at bringing an understanding of a complex issue by detailed contextual analysis of a limited number of events or conditions and their relationships (Dooley, 2002). Dooley (2002) describes “theory building requires the on-going comparison of data and theory (Glaser & Strauss, 1967) and the continuous refinement between theory and practice (Lynham, 2000).”

To support this claim, Eisenhardt and Graebner (2007) understand that scholars have used case studies to progress theory about subjects as diverse as group process (Edmondson, Bohmer, & Pisano, 2001), internal organization (Galunic & Eisenhardt, 2001; Gilbert, 2005), and strategy (Mintzberg & Waters, 1982). Classic scholars (Chandler, 1962; Whyte, 1941) and other authors in business and management research (Dutton & Dukerich, 1991; Sutton & Rafaeli, 1988) have used the method. Further, studies that build theory from cases are often the most interesting research (Bartunek, Rynes, & Ireland, 2006).

Additionally, Eisenhardt and Graebner (2007) describe that central to building theory from case studies is replication logic, where each case can function as a distinct experiment that stands on its own as an analytic unit. “A major reason for the popularity and relevance of theory building from case studies is that it is one of the best (if not the best) of the bridges from rich qualitative evidence to mainstream deductive research” (Eisenhardt & Graebner, 2007, p. 25). Table 1 shows the pluralistic approach that the study uses by bridging positivism and interpretivism for the eight case studies. (See Table 2.)

3.1. Case selection

This study identified a set of typical cases and from a total population of 15 cases, 8 cases are selected that fit the typology based on the use of literal replication (Yin, 1998), where the cases are designed to corroborate with each and detail a similar pattern. Our study does not account

Table 1
Pluralistic approach using a multiple case study method (adapted from Ron, 2004).

Meta-theoretical assumptions	Positivism	Interpretivism
Ontology	Researcher and reality are separate	Researcher and reality are inseparable
Method	Case studies, statistics, content analysis.	Case studies, hermeneutics, phenomenology
Research object	Research object has inherent qualities that exist independently of the researcher	Research object is interpreted in light of meaning structure of person’s (researcher’s) experience.
Know-how	Laboratory experiments, field experiments	Subjective/argumentative, reviews
Conclusions	Forecasting	Future research

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