OPEN INNOVATION AND ORGANIZATION DESIGN

MICHAEL TUSHMAN • KARIM LAKHANI • HILA LIFSHITZ-ASSAF

Abernathy's (1978) empirical work on the automotive industry investigated relationships among an organization's boundary (all manufacturing plants), its organizational design (fluid vs. specific), and its ability to execute product and/or process innovations. Abernathy's ideas of dominant designs and the locus of innovation have been central to scholars of innovation, R&D, and strategic management. Similarly, building on March and Simon's (1958) concept of organizations as decision making systems, Woodward (1965), Burns and Stalker (1966), and Lawrence and Lorsch (1967) examined relationships among organizational boundaries, organization structure, and innovation in a set of industries that varied by technology and environmental uncertainty. These and other early empirical works have led a diverse group of scholars to develop theories about firm boundaries, organization design, and the ability to innovate.

In organizational economics, the notion of organizational boundaries has been rooted in transaction cost logic (Coase, 1937). Economists favor explanations based on minimizing transaction costs. Many activities related to innovation and the design and production of goods and services are difficult to contract on the open market. Transaction costs make it efficient for the emergence of firms that reduce such costs by integrating market activities inside the firm (Williamson, 1975, 1981). The transaction cost research tradition has helped to clarify relationships among innovation, the firm, and its environment (or market). This literature has focused on understanding which sets of activities should be inside or outside the firm's boundaries.

Organization theorists and strategic management scholars have noted that value creation involves the production of complex goods and services requiring ongoing knowledge development and transfer across diverse settings (Chandler, 1977; Nickerson & Zenger, 2004). The burden of continuous knowledge creation imposes high coordination costs that are best minimized through a managerial hierarchy. For anything but the simplest problems, the visible hand of a firm's management is required to define and select problems to solve for value creation. Lastly, a significant body of research in organization theory is rooted in how firms set boundaries in a way that protects them from dependencies in their task environment and reduces uncertainty around critical task, power, and competence contingencies (e.g., Santos & Eisenhardt, 2005; Thompson, 1967).

However, customers and other users outside the firm are also an important source of valuable innovations (von Hippel, 1988, 2005). Users include self-organizing communities that freely share knowledge. The open source software movement crystallized an alternative innovation ecosystem where external-to-the-firm user communities design, develop, distribute, and support complex products on their own or in alliance with (and in some cases opposition to) incumbent firms. The rise – and sometimes prevalence – of community innovation, with its contrasting loci of innovation and nonhierarchical bases of organizing, poses a challenge to the received theory of innovation, the firm, and organizational boundaries.

The organization design community must reconcile these divergent scholarly perspectives on the relationship between firm boundaries and the locus of innovation (Gulati, Puranam, & Tushman, 2012). The innovation and organization design literatures must move beyond debates between open vs. closed boundaries and instead embrace the notion of complex organizational boundaries where firms simultaneously pursue a range of boundary options that include "closed" vertical integration, strategic alliances with key partners, and "open" boundaries characteristic of various open innovation approaches. The simultaneous pursuit

Journal of Organization Design
JOD, 1(1): 24-27 (2012)
DOI: 10.7146/jod.6336

of multiple types of organizational boundaries results in organizations that can attend to complex, often internally inconsistent, innovation logics and their structural and process requirements.

With the democratization of both the tools of knowledge production and dissemination, many more actors outside traditional firm boundaries have access to unique solution knowledge that may be applicable to innovation tasks within firms (Jeppesen & Lakhani, 2010). Such task decomposition and the fact that widely distributed actors have access to differentiated knowledge push the locus of innovation outside traditional firm boundaries. We suggest that task decomposition and knowledge distribution provide a framework for the choice of firm boundaries. These strategic contingencies lead to a different set of design and boundary choices than the traditional topics of asset specificity, information processing, or strategic core. Lastly, we suggest that firm-centered innovation logic is fundamentally different from open innovation logic, and that open innovation logic is increasingly gaining momentum as new multi-actor organizational forms emerge. If so, our theories of innovation, organization design, and organizational change must capture and resolve the tensions between these contrasting innovation modes.

Open innovation, enabled by low-cost communication and the decreased costs of memory and computation, has transformed markets and social relations (Benkler, 2006). In contrast to firm-centered innovation, open innovation is decentralized, peer based, and includes intrinsic and pro-social motives. While the community nature of peer innovation is developing its own literature, and we are rapidly gaining an understanding of the nature and social structure of these communities, the impact of this innovation mode on the firm is not well understood. We do not yet have a theory of the firm, either for incumbents or new entrants, which takes into account community innovation. Thus far, the impact of open innovation on the organization theory and strategic management literatures has been minimal (Argote, 2011).

As open and firm-based innovation are based on contrasting assumptions of agency, control, motivation, and locus of innovation, emerging theories of organizing for innovation must reflect these paradoxical and internally inconsistent innovation modes. Innovation and organization design research must move to macro levels of analysis as we explore how communities inform and shape the firm, and how the firm shapes and leverages its communities in service of its innovation processes and objectives (e.g., Jacobides & Winter, in press; O'Mahony & Lakhani, 2011). Similarly, if open and market-based innovation processes are complements, and the firm's boundaries are contingent on the product's degree of modularity and knowledge distribution, multiple types of boundaries will be employed to manage innovation. Those boundaries will range from traditional intra-firm interfaces to complex inter-firm relations (e.g., ambidextrous designs), to webs of interdependence with partners, to interdependence with potentially anonymous communities. Just how are the mechanisms associated with complex intra-firm boundaries and relations with partners different from shaping relations in open communities? The theory of innovation and complex organizational boundaries can build on extant literature on paradox (e.g., Andriopoulos & Lewis, 2009) and extend this work to contradictory innovation modes. As so much of this research on dynamic boundaries involves senior leaders making choices involving contrasting innovation modes in the context of the firm's history, it is also important to understand how managers think about innovation and organization designs in a way that admits these contradictions (e.g., Smith & Lewis, 2011; Smith & Tushman, 2005).

We have focused here on the challenges faced by incumbent firms having to respond to increasingly open innovation requirements. Much work needs to be done on the characteristics of new entrants that are born in a context already rooted in open innovation. It may be that the founding of firms anchored in open innovation is fundamentally different from that of traditional entrepreneurial start-ups. It may also be that firms such as LuLuLemon or Threadless build their initial business models and supporting organizational forms based on open innovation logic and only deal with more traditional innovation and organizational dynamics when they increase their scale (Lakhani & Kanji, 2009).

As the theoretical and research implications of contrasting innovation modes and complex boundaries are substantial, so too are the implications for managerial choice and agency. If open and firm-based innovation processes are complements, then management must choose

which tasks will be executed in each innovation mode. We suggest that these choices are contingent on the extent to which critical tasks can be decomposed and the extent to which the tasks' knowledge requirements are concentrated. Strategic choices need to be executed with systems, structures, incentives, cultures, and boundaries tailored to open and firm-based innovation modes. Further, if the firm is ever more dependent on open communities, how do leaders act to influence these external communities? Finally, management teams must build their own personal capabilities to deal with contradictions as well as their firm's ability to deal with contradictions. Building architectures to attend to contrasting innovation modes will be particularly challenging, requiring an updated and expanded theory of organization design.

REFERENCES

Abernathy WJ. 1978. *The Productivity Dilemma: Roadblock to Innovation in the Automobile Industry*. Johns Hopkins University Press, Baltimore.

Andriopoulos C, Lewis MW. 2009. Exploitation-exploration tensions and organizational ambidexterity: managing paradoxes of innovation. *Organization Science* 20(4): 696-717.

Argote L. 2011. Introduction to the Special Issue. *Organization Science* 22(5): 1121-1122.

Benkler Y. 2006. *The Wealth of Networks: How Social Production Transforms Markets and Freedom*. Yale University Press, New Haven, CT.

Burns T, Stalker GM. 1966. *The Management of Innovation*. Tavistock Publications, London.

Chandler AD Jr. 1977. *The Visible Hand: The Managerial Revolution in American Business*. Harvard University Press, Cambridge, MA.

Coase RH. 1937. The nature of the firm. *Economica* 4(16): 386-405.

Gulati R, Puranam P, Tushman M. 2012. Meta-organization design: rethinking design in interorganizational and community contexts. *Strategic Management Journal* 33(6): 571-586.

Jacobides MG, Winter S. In press. Capabilities, structure, and evolution. *Organization Science*.

Jeppesen LB, Lakhani KR. 2010. Marginality and problem-solving effectiveness in broadcast search. *Organization Science* 21(5): 1016-1033.

Lakhani KR, Kanji Z. 2009. Threadless: the business of community. Harvard Business School Multimedia/Video Case 608-707, Boston.

Lawrence PR, Lorsch JW. 1967. *Organization and Environment: Managing Differentiation and Integration*. Irwin, Homewood, IL.

March JG, Simon HA. 1958. *Organizations*. Wiley, New York.

Nickerson JA, Zenger TR. 2004. A knowledge-based theory of the firm – the problem-solving perspective. *Organization Science* 15(6): 617-632.

O'Mahony S, Lakhani KR. 2011. Organizations in the shadow of communities. In C. Marquis, M. Lounsbury, and R. Greenwood (Eds.), *Communities and Organizations*, Research in the Sociology of Organizations 33: 3-35. Emerald Group Publishing, London.

Santos FM, Eisenhardt KM. 2005. Organizational boundaries and theories of organization. *Organization Science* 16(5): 491-508.

Smith WK, Lewis MW. 2011. Toward a theory of paradox: a dynamic equilibrium model of organizing. *Academy of Management Review* 36(2): 381-403.

Smith WK, Tushman ML. 2005. Managing strategic contradictions: a top management model for managing innovation streams. *Organization Science* 16(5): 522-536.

Thompson JD. 1967. *Organizations in Action*. McGraw-Hill, New York.

von Hippel, E. 1988. *The Sources of Innovation*. Oxford University Press, New York.

von Hippel, E. 2005. *Democratizing Innovation*. MIT Press, Cambridge, MA.

Williamson OE. 1975. *Markets and Hierarchies, Analysis and Antitrust Implications: A Study in the Economics of Internal Organization*. Free Press, New York.

Williamson OE. 1981. The economics of organization: the transaction cost approach. *American Journal of Sociology* 87(3): 548-577.

Woodward J. 1965. *Industrial Organization: Theory and Practice*. Oxford University Press, New York.

MICHAEL TUSHMAN

Paul R. Lawrence MBA Class of 1942 Professor of Business Administration
Harvard Business School
E-mail: mtushman@hbs.edu

KARIM LAKHANI

Assistant Professor of Business Administration
Harvard Business School
E-mail: k@hbs.edu

HILA LIFSHITZ-ASSAF

Doctoral Candidate
Harvard Business School
E-mail: hlifshitz@hbs.edu