

# Operations strategy: a firm boundary-based perspective

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## Abstract

**Purpose** – The purpose of this paper is to advance a firm boundary perspective of operations strategy linking strategic management and business process management.

**Design/methodology/approach** – Relevant operations strategy, business process management and boundary perspective literature is reviewed and critically assessed in order to advance a firm boundary-based approach to operations strategy. Within this perspective, a multi-disciplinary and cross-functional framework is provided with the objective of supporting the process of operations strategy formulation and implementation.

**Findings** – The boundary perspective has the potential to inform a wide range of operations strategies. Strategic management of operations should be increasingly based on boundary operations. The proposed framework clarifies that the adoption of a spanning boundary perspective should improve the operations strategy process and content.

**Practical implications** – This paper offers implications of interest to managers, noting that the adoption of a new perspective in operations strategy should contribute to innovation in operations strategy development and implementation. Specifically, the framework suggests models and tools useful to support the spanning boundary perspective.

**Originality/value** – This paper allows operations and process management scholars to focus on key phenomena, such as boundary management. At the same time, the framework responds to the needs of managers who are engaged in operations management for a new perspective that can assist in the strategic management of operations.

**Keywords** Decision making, Operations management, Strategic management, Firm boundaries, Business processes

**Paper type** Conceptual paper

## Introduction

Environmental dynamics present a continuous stimulus to renew the sources of competitive advantage (Kortmann *et al.*, 2014; Liu and Liang, 2015; Zhang, 2011). To analyse the relevance of operations to the firm's success, prior studies posit the role of operations in a strategic perspective (Adamides, 2015; Lillis and Lane, 2007). An advantage may result from a different mode of performing operational activities and/or the ability to identify and put in place business processes different from competitors (Al-Mashari and Zairi, 1999; Markides, 2008; Porter, 1987; Schoenherr and Narasimhan, 2012). In particular, in the pursuit of a cost leadership strategy, firms must choose between being more efficient than competitors in the management of specific operations and developing a value chain different from competitors to reduce costs (González-Benito and Suárez-González, 2010; Porter, 1987). In pursuit of a differentiation advantage, firms should instead choose between being more effective than competitors in performing operations or reconfiguring business processes differently from their competitors to make product/service features more relevant to customers.

Although the strategic relevance of operations is clear in both management studies and practice (Boyer *et al.*, 2005; Joshi *et al.*, 2003), the models and tools of operations in strategic management are underdeveloped (Gonzalez-Benito and Lannelongue, 2014).



Since the success of the resource-based view (RBV) to the later dynamic capabilities (Barney, 1991; Teece *et al.*, 1997), studies have focussed on the strategic role of resources and skills, although there was a lack of emphasis on the analysis of operations strategy (Schroeder *et al.*, 2002). Scholars and practitioners are highlighting the need to shift increasingly towards a strategic perspective of operations (Dangayach and Deshmukh, 2001). Several studies show that companies are unlikely to turn the environmental dynamics into better financial performance without a systematic breakthrough in operations (González-Benito and Suárez-González, 2010; Wagner *et al.*, 2012).

Current markets are witnessing a rapid increase of activities that were traditionally within companies being realized by outsourcing processes (McIvor, 2009). At the same time, companies have an increasing amount of information about business processes from the use of Enterprise Resource Planning (ERP) and business intelligence systems (Gupta and Kohli, 2006; Karmarkar *et al.*, 2015). The affirmation of the web creates new forms of interactions among companies and among companies and customers (Rosenzweig, 2009). The introduction of new management models and new technologies improves the efficiency of business processes (Hammer and Champy, 1993). The reengineering of business processes and digital technologies push firms towards new “sharing economy” business models (Cohen and Kietzmann, 2014; Sundararajan, 2013). Competition on a global scale, on the one hand, increases the levels of competitiveness among companies and, on the other hand, offers new opportunities to research efficiency and production flexibility (Gereffi *et al.*, 2005). The development of 3d printing systems is forcing the reengineering of manufacturing processes (Holweg and Helo, 2014). There is a shift from a focus on internal and external strategies, in which the dynamics of the firm’s boundaries are indirectly defined, to strategies in which the firm’s boundaries gain autonomous importance and represent a starting point for a rethinking of the structures and strategies of the firm (Holcomb and Hitt, 2007; Parmigiani and Mitchell, 2009; Roh *et al.*, 2013; Santos and Eisenhardt, 2005; Tortoriello and Krackhardt, 2010). The boundary perspective advances a new managerial point of view focussing on the resources, knowledge and activities on the firm’s boundary area (Pfeffer and Salancik, 1978). The attention is given to the neglected connection elements between inside and outside: the boundaries. The boundary strategies become an option to the traditional growth strategies, and an effective means to obtain and sustain competitive advantage (Dyer and Singh, 1998; Garzella, 2000; Quagli, 2001; Wagner, 2003).

Despite the growing interest in managing the firm boundary, there are fragmented experiences in the operations literature, and there is a lack of comprehensive frameworks able to lead practitioners (Askenas *et al.*, 1995; Niehaves and Plattfaut, 2011; Storey *et al.*, 2006). Many boundary management attempts fall short of meeting participants’ expectations (Barringer and Harrison, 2000). An extensive agenda for research into inter-firm processes and boundary operations is needed (Hayes, 2008; Niehaves and Plattfaut, 2011; Spring and Araujo, 2014; Takeishi, 2001; Varsei *et al.*, 2014; Walsh and Deery, 2006).

Starting from the recognition of the strategic importance of operations and, at the same time, of the lack of emphasis on boundary operations, the aim is to provide a new conceptual framework, based on the firm boundary perspective, useful in supporting the strategic management of operations and in stimulating strategic innovation in business process management for the exploitation of opportunities beyond the buyer-supply interface. To achieve this aim, the paper has developed a multidimensional and cross-functional framework for the strategic management of operations based on a structured literature review. Furthermore, the paper analysed the

managerial and theoretical implications of the operations strategy, focussing on potential strategic innovations.

This paper is structured as follows. Second section describes the primary perspectives on operations strategy and the firm's boundaries. Third section proposes an integrated framework aimed at supporting operations strategy formulation and implementation. Fourth section analyses the main implications of a boundary perspective on operations strategy. Finally, fifth section summarizes the main conclusions of the paper and provides implications and ideas for future research.

### Literature review

Operations issues have been studied by scholars of many disciplines (Demeter, 2003; Filippini, 1997). Based on our topic, operations strategy, and the relevant environmental dynamics, we developed a review of strategic management, operations management and the firm's boundaries.

The strategic management studies recognize the relevance of the operations dimension to the formulation and implementation of corporate and business strategies (Brown and Blackmon, 2005). At the business and corporate levels, firms use operations strategies to manage business processes and supply chains (Boyer and McDermott, 1999). In the operations research stream, despite some scholars having developed operations strategy as an autonomous topic (Boyer *et al.*, 2005), the rising importance of the strategic management of operations and the associated environmental dynamics calls for new research perspectives (Adamides, 2015; Gonzalez-Benito and Lannelongue, 2014; Schmenner *et al.*, 2009).

#### *The strategic role of operations*

Scholars have investigated the strategic role of operations in two major dimensions of analysis: the strategic content and the strategic process (Adam and Swamidass, 1989; Boyer *et al.*, 2005; Martin-Pena and Diaz-Garrido, 2008). The authors of the first stream have analysed primarily the critical success factors of operations, the typical decisions with regard to the firm's organization and the main configuration's types of processes and activities. The second stream has focussed primarily on the study of the decision-making process of operations in both the formulation and the implementation stage of operations strategy. Each stream has analysed operations from multiple perspectives.

Some authors have analysed the existence of trade-offs among the main performance aims of operations (Rosenzweig and Easton, 2010). These targets are identified primarily in terms of quality, speed, reliability, flexibility and production costs (Lapre and Scudder, 2004; Slack and Lewis, 2002). These studies, whose results are occasionally ambiguous, have the merit of highlighting the following: "how" the operations strategy may contribute to corporate performance; the need to evaluate potential trade-offs in the decision-making process; and the chance for executives to choose among competing goals.

Another area of research has investigated the underlying factors of operations strategy decisions (Abbey *et al.*, 2013; Hayes and Pisano, 1996). In this area, the results show the existence of two main factors, "technological" factors and "market" factors, which can be related to the "push" and "pull" approaches diffused in strategic management studies (Hamel and Prahalad, 1994). In the "pull" approach, operations are improved starting with perceived customer needs (Brown and Blackmon, 2005). In the

“push” approach, manufacturing and technological expertise allows the creation of products and services that can satisfy the customer’s latent needs (Gagnon, 1999; Lillis and Lane, 2007). These studies have the merit of explicating two important potential sources for the renewal of operations strategy.

Another relevant stream analysed the relationship between performance and operations setting (Joshi *et al.*, 2003; Zahra and Das, 1993). These studies, inspired by the theoretical and practical developments of new and innovative management models, show the possibility of improving corporate performance starting with the redesign of operations.

Indeed, many authors have studied the relationships between resources and operations from the RBV (Barney, 1991; Grant, 1991). The results have identified a reciprocal influence between these elements; if resources and skills affect operations, then operations management affects the portfolio of resources and skills (Hayes and Pisano, 1996; Vickery *et al.*, 1994). The main contribution of these studies can be found in explaining the need to develop resources strategy and operations strategy consistently.

Other scholars, relying on the “contingency theory”, have examined the relationships among corporate performance, operations settings and environmental and context conditions (Gupta and Somers, 1996; Wong *et al.*, 2011). The findings show that it is generally possible to extend operations settings to situations far from the competitive contexts in which they originated and that there are context-specific factors pushing for the adoption of specific operations settings. These results contribute to highlight the relevance of “contingency factors” in operations strategy.

Operations strategy was also analysed with reference to change management, examining how operations are redesigned and the needs of related change processes (Cagliano *et al.*, 2013; Kettinger *et al.*, 1997). Starting from strategic intent, these studies analyse the strategic management of operations, link to the literature on the proactive or reactive nature of strategic changes, and then analyse the redesign of operations in a dynamic approach to strategy. This literature stream is useful to identify “milestones” for effective change management of operations strategy.

The need to manage organizational issues in an operations redesign (Hammer, 1990) has prompted several studies to examine behavioural factors and human resources in operations strategy (Gavetti, 2012; Youndt *et al.*, 1996). The decision-making process and the implementation of strategies involving organizational structure generally require the involvement of many actors and organizational units with regard to the cross-organizational corporate functions of operations. In this sense, the importance of change management is clear.

Finally, a majority of research has focussed, in a border area between management and industrial engineering, on the “physical-technical” features of operations in manufacturing (Jack and Raturi, 2003; Subramanian and Ramanathan, 2012). Operations has been analysed in relation to the technological issues. These studies suggest integration of the contributions of “production theory” with operations.

These literature streams have the merit of highlighting the strategic importance of operations and the most relevant dimensions to take into consideration for the strategic management of operations. Furthermore, the literature review suggests that there is a lack of studies extending models to operations management and that perspectives developed in strategic management face new growth strategies in addition to the traditional internal and external growth.

*The boundary perspective in management studies*

The rise of new growth strategies characterizes managerial issues and makes the management of firm boundaries a key variable (Foss *et al.*, 2013; Swink *et al.*, 2007). Firm strategies are increasingly providing features difficult to associate with the traditional “internal growth” and “external growth” strategies. The search for success pushes frequently towards partnerships and strategic alliances (Boddy *et al.*, 2000). In this sense, the boundary perspective should represent a favoured point of view for the strategic management of operations.

Studies from disciplines such as economics, strategic management, organizational behaviour and general management have focussed on boundary issues (Villalonga and McGahan, 2005). Theories of the firm generally examine how firms set boundaries by choosing whether to make or buy individual components (Coase, 1937; Williamson, 1975). The traditional theories in the study of firm boundaries have involved transaction cost economics and RBV of the firm. The transaction cost economics (TCE) analyse the properties of the transactions to find the main factors producing benefits and costs in hierarchy and market decisions (Williamson, 1975). This theory accepts production costs as given and focusses on the governance benefits and costs of different boundary decisions. Outsourcing can be risky due to lack of proprietary information, loss of control and a low likelihood of gaining knowledge (Collis and Montgomery, 1997). The main contribution of TCE is to specify the conditions under which firms should manage activities inside or outside the boundaries. Resource-based scholars analyse the firm as a system of distinctive resources and competences that can create competitive advantage (Barney, 1991). In the RBV, firm boundaries influence production costs and learning opportunities. Specifically, internal growth decisions provide cost reduction and future development ability. The main contribution of the RBV of the firm was to clarify the determinants of internal and external growth strategies. Despite the reasons for a better means of evaluating firm boundaries of one theory against the other, the traditional conclusion of these literature streams is that firms tend to manage activities through outsourcing choices when alternatives require higher investments (Coase, 1937; Williamson, 1975) or when external resources have substantial capability advantages (Barney, 1999). The findings of theories have influenced prior operations management studies (e.g. Hayes *et al.* 2005; Holcomb and Hitt, 2007; Vivek *et al.*, 2008). However, because firms are increasingly making joint decisions for resource, knowledge and activities management due to synergies that stem from interrelated operations (Foss, 1996; Milgrom and Roberts, 1990; Parmigiani and Mitchell, 2009; Santos and Eisenhardt, 2005; Tortoriello and Krackhardt, 2010), new arguments have emerged in the literature. TCE formerly argued that between the two ends of governance, integration and market, there are the firm’s boundaries. The questioning on the value of “ownership” and recognition of potential benefits has come because the joint use of skills and knowledge has highlighted boundary management (Alexander, 1997). A relational or social network view has emerged in which the boundary concept is used to embrace resources and activities that can be controlled and influenced by the organization. Firm boundary decisions are generally the answer to the pressure to extend and complement internal resources and the need for risk control (Yang and Lin, 2010). The “control” is assumed necessary to develop the most effective strategy. A firm boundary should be set with regard to operations control: “the organization ends where its discretion ends and another begins” (Pfeffer and Salancik, 1978, p. 32). However, environmental dynamics increasingly push towards the interpretation of the term boundaries as a continuum area that represents an intermediate form of hybrid governance (Normann and Ramirez, 1993;

Håkansson and Snehota, 2006). The firm boundary should be defined more broadly to include the critical connected operations that can be mobilized as the result of ongoing relationships with other actors. This literature posits that the management of resource, knowledge and activities on the firm boundary should be an option, an alternative to the traditional dichotomy of “make or buy”. Scholars of this literature stream, focussed on inter-organizational relationships, argue that boundary management should be a means of combining resources to obtain and sustain competitive advantage (Dyer and Singh, 1998; Garzella, 2000; Wagner, 2003).

Boundary strategies emerge as a potential solution to the tensions that arises between the strengths of integration and the benefits of outsourcing (Hargadon, 2002; McEvily and Zaheer, 1999; Takeishi, 2001). As Steensma and Corley (2001) argue, boundary decisions should be motivated by opportunities for sustainable advantages. The “boundaries” studies suggest that the decisions of managing business processes on the firm boundary should help in hedging against demand uncertainty and in learning and developing new capabilities from partners (Cao and Zhang, 2011; Cassiman and Veugelers, 2006; Parmigiani and Mitchell, 2009). The boundary strategies should lead to solving the trade-off between coordination and flexibility because they make possible both activities (Park *et al.*, 2004; Lavie, 2006). The focus on boundary operations should allow avoiding the full outsourcing of key activities, of preserving core competences and of learning by doing. A virtuous cycle may exist in which the management of boundary operations enhances the firm’s ability to outsource partially, thereby increasing the resource and knowledge portfolio from the relationship with external actors. These findings lead strategic management scholars to move from the analysis of the firm boundary to researching the best methods of boundary management (Blocker *et al.*, 2012; Troilo *et al.*, 2009).

Because research has argued that operations play a key role in inter-organizational relationships and boundary management to create competitive advantage, studies should integrate the boundary perspective with operations strategy. The focus on boundaries operations could help managers overcome the traditional trade-offs among goals and competitive strategies.

### **A boundary perspective of operations strategy**

Based on the literature review, our framework should provide a strategic role for operations. The strategic relevance originates in the relationship among operations, the development of a quantitative and qualitative superiority in firm activities and processes, and the acquisition of a competitive advantage (Chase, 2006). The acquisition of competitive advantage leads to value creation (Rappaport, 1986). To create value, an operations strategy may achieve performance targets in terms of quality, i.e., making processes free from error as much as possible; speed, i.e., reducing activity times; reliability, i.e., reducing the risks of variances between targets and achieved results; flexibility, i.e., increasing the capacity to change and/or adapt processes to needs; and production costs, i.e., optimizing standard costs and their sources. The literature review showed how companies should generally address trade-offs by making a choice in the pursuit of corporate targets, moving towards selected targets and not towards others. These decisions should be oriented by assessing the importance of performance objectives within overall corporate strategies (Slack *et al.*, 2009). Some objectives are necessary for competition, whereas others should be useful to achieve dominance over competitors. Similarly, some targets, such as production costs and flexibility, are predominantly oriented to the acquisition of a cost advantage,

whereas others, such as quality and reliability, are primarily oriented towards achieving the advantage of differentiation (Chase, 2006). In any case, firms should set operations goals by considering each business process not individually but as part of the overall strategic management of operations; by identifying the contribution of each business process to achieve competitive superiority; and by defining a hierarchy of priorities among various operations objectives consistent with corporate goals.

Starting with the value creation aim, a framework for strategic management of operations should be developed in relation to the two main dimensions of analysis that have emerged in prior studies: content and process (Niehaves and Plattfaut, 2011). The process dimension concerns the various stages through which strategic management achieves the operations settings. The content dimension relates to the articulation of operations in the corporate operational setting.

With reference to the “content dimension”, the current environmental dynamics and the review of prior studies, push to assign a significant role to the “boundary perspective”. The boundaries represent, in fact, the transition area between inside and outside (Håkansson and Snehota, 1989). The boundaries circumscribe the operations over which the firm extends its governance and control (Pfeffer and Salancik, 1978). The basic criteria for the identification of the boundaries of the firm (Sarkis, 2012) can be found in the autonomy of the firm’s governance, whereas an “instrumental role”, useful to understand the strength and extent of said action, can be attributed to other factors such as legal (Coase, 1937; Williamson, 1975), physical (Scott, 2003), communication and organizational elements (Weber, 2002). The boundary perspective implies an understanding of variables by their subjective and intangible nature. In this sense, when there are the traditional “parameters” of the firm’s activities and processes – referring to legal and contractual rights, barriers of space and time, co-division of interests, sharing of language and coding of activities – the operations are “internal”, within the corporate boundaries. In the opposite case, the operations should be considered external because in the process of selection of the activity and processes, management have decided not to extend their “governance” over operations. In current corporate business models, it is often possible to find a plurality of intermediate possibilities that shows how the transition from internal to external operations is gradual and progressive (Spring and Araujo, 2014). This continuum constitutes a “border area” in which it is not easy to distinguish the firms from the external environment. Consequently, it is increasingly necessary to use the concept of boundaries and the “boundary zone” as a central element in the management of operations. Different from a “boundary-less” perspective (Askenas *et al.*, 1995) which neglect the factual existence of the firm’s boundaries, this view recognizes the existence of boundaries and acknowledges the autonomous relevance of boundaries in operations management. Boundary strategies can improve firm performance by giving benefits that could not be generated by the firm with its own processes and activities. Furthermore, boundary strategies should limit the risk, inherent in outsourcing, of losing the ability of differentiating itself from competitors (Takeishi, 2001). In this sense, the adoption of the “boundary perspective”, which allows one to analyse, select and design operations based on the extension of the governance autonomy or on the inter-firm articulation of activities, favours strategic management of operations.

The process dimension needs the development of a framework able to appraise the strategic role of operations by the management of processes and activities in a more effective and/or more efficient manner than competitors, contributing to the acquisition of competitive advantage (Melan, 1993). The ability to contribute to the achievement of

quantitative and qualitative superiority states the strategic role of operations. This superiority derives from, on the one hand, costs, revenues, income and expenses and, on the other hand, from operations activities. Thus, the strategic relevance of operations strategy can be analysed according to the two perspectives: contribution to the value creation process and operations performance. Consequently, the main steps that may characterize the process of strategic management of operations should be the analysis, the selection and the redesign of operations (Kettinger *et al.*, 1997). The “analysis” stage is useful in identifying the underlying assets regarding a potential corporate superiority. The following “selection” stage is useful to choose the operations to outsource, the operations to manage independently and the operations to manage the firm’s boundaries. Indeed, the search for the best options to set the operations leads to a “redesign” stage (Chan and Choi, 1997; Reijers and Limam Mansar, 2005).

The adopted perspective allows advancing the following definition of operations strategy: the integration of operations into corporate strategic processes by systematically defining “what” operations should be carried out by the firm and what should be left to other companies, “how” operations should be organized into business processes, and “how” to connect, integrate and coordinate internal and boundary operations with one another, and with those operations performed outside the company.

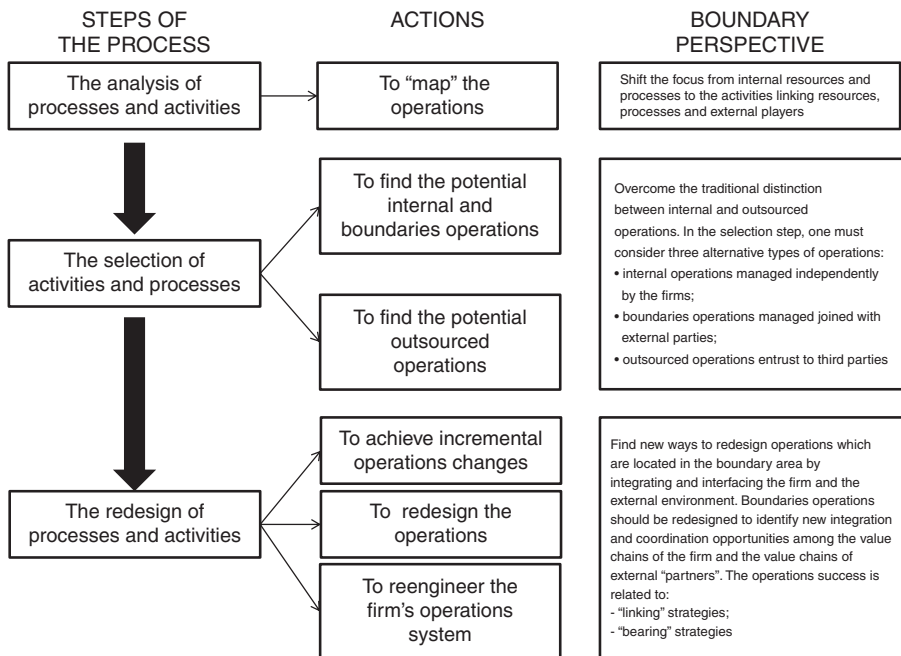
This definition lead to two relevant characterizations: operations strategy is a complex phenomenon implying a multidimensional approach; and the importance of the selection step leads to focussing on operations boundaries. Furthermore, several strategic decisions should be analysed in the strategic management of operations, from product development to production capacity, from “make or buy” decisions to inventory management, from the design of manufacturing processes to networking choices, from human resource management to quality management, from procurement to sustainability, up to performance measurement.

### **A framework for the strategic management of operations**

The theoretical development of an operations strategy framework showed that the strategic management process of operations can be divided into three main phases: the “analysis” of processes and activities of current operations; the selection of activities and processes by distinguishing internal and boundary operations from outsourced operations; and the redesign of processes and activities previously selected. The “analysis” step should be directed to the diagnosis of processes and activities in place to identify needs and/or opportunities for change (Melan, 1993). The following “selection” step should identify processes and activities to be managed strategically (Hanafizadeh and Osouli, 2011). In the final “redesign” step, the selected operations should be reorganized to improve efficiency and value creation (Hammer and Champy, 1993) (Figure 1).

The analysis step should aim to break out the current setting of operations and should represent the complex business processes management. Companies should perform the “process and activities mapping” aimed at identifying all the main operations and circumscribing their boundaries (Porter, 1987). The size of the processes can differ in relation to the choices made within the operations strategy. Strategic choices affect the size of operations with reference to the degree of aggregation of processes and activities (Soliman, 1998). The mapping step should start with the joint analysis of the firm’s strategic management and corporate structure (Hines and Rich, 1997). By crossing these dimensions, it is possible to identify the single activities of each organizational unit and to aggregate them in business processes. Firms should





**Figure 1.**  
A framework for the strategic management of operations

proceed to identify the overall business processes from inputs to outputs and then analyse the relationships among each activity with regard to the organizational units involved, the responsibility for individual activities, the resources required and the services expected. Later, firms should analyse the relationships among the processes.

The adoption of a firm's boundary perspective shifts the focus from the traditional analysis of internal links among resources, organizational units and activities to the activities linking operations to external players. The following selection step should identify operations governance decisions by the choice, traditionally defined as "make or buy", which determines the degree of vertical integration (Besanko *et al.*, 1996). If the suppliers of the activities fail to develop economies of scale and scope, outsourcing of activities may allow enjoying benefits such as incurring lower costs; however, these may be partially or wholly negated by potential coordination problems (Espino-Rodriguez and Rodriguez-Diaz, 2014). The boundary perspective aims to overcome the traditional distinction between internal and outsourced operations. In the selection step, one must consider three alternative types of operations:

- (1) internal operations managed independently by the firms;
- (2) boundaries operations managed joined with external parties; and
- (3) outsourced operations entrust to third parties.

After selecting activities and processes, the company should adequately focus on the redesign of operations that may provide a process improvement; a business process redesign; or the radical "reengineering" of business processes. The first option needs only incremental changes for the rationalization of business processes that do not upset the activities in which the processes are articulated. The search for small improvements

can be pursued through the adoption of specific management techniques. Examples of these include “Six Sigma” (Kwak and Anbari, 2006), which is aimed at quality control by reducing the margin of error in processes, or “Total Quality Management”, a management philosophy geared to the creation of a culture of total quality (Currie, 1999). The second alternative, generally defined as “Business Process Redesign”, provides for the rethinking of joint activities in operations (Davenport, 1993; Limam Mansar and Reijers, 2007). Operations, by which inputs are combined to obtain an output (internal or external), are redesigned in terms of involved activities, in their sequence, in the actors involved and in the responsibilities assigned. The third option addresses the overall restructuring of an operations system by redesigning corporate business processes in a unified framework (Davenport, 1993; Hammer and Champy, 1993; O’Neill and Sohal, 1999; Yang and Lin, 2010). The changes involve all business processes; this reengineering should represent the input for innovation and strategic changes (Hamel, 2006).

Following a boundary perspective, firms should find new ways to redesign operations located in the boundary area by integrating and interfacing the firm and the external environment.

The complexity of operations management should lead to the analysis of activities and processes, increasingly cross-functional and inter-firm, within a unified framework based on a strategic approach. In this sense, “corporate boundaries” can facilitate this ambitious goal. Adopting a firm boundary perspective, the set of operations, which the company selects to “design, manufacture, sell, deliver and assist products”, will require strategic management of internal operations, in which the company has autonomy and “discretion” of governance; conversely, the strategic management of boundary operations may be characterized by a shift of firm boundaries. As a result, the typical operations should be either “internal” or “boundary” based on extension of the autonomy of governance that each firm considers preferable.

Strategic management of internal operations includes decisions about “how” the activities are organized into business processes and “what” should be the relationship between the various internal operations. The success of the strategic management of internal operations depends on the ability of the firm to design and perform business processes differently from its competitors. The ability to develop innovative business processes with rules different from rules established in the same industry should push the firm to a radical redefinition of its business model (Baden-Fuller and Haefliger, 2013). In this sense, the strategic management of internal operations should have the aim of increasing the degree of coordination among business processes to maximize productivity, quality, flexibility and reducing costs. The goal is to achieve the full potential of synergies among internal operations.

Conversely, the strategic management of boundary operations includes the decisions about “how” to define the operations, playing a key role in integrating and interfacing the firm and the external environment, which are located in the boundary area. The strategic management of boundary operations often involve many subjects each one with strategic autonomy and, in fact, generally affects business processes that cannot be considered neither fully internal nor fully external. The strategic importance derives from the firm ability to design and manage operations in a wider perspective in which the internal and external operations are continually analysed to identify new integration and coordination opportunities among the value chains of the firm and the value chains of external “partners” (Boddy *et al.*, 2000; Pil and Holweg, 2006; Porter, 1987).

The success of the strategic management of boundary operations is related to the ability to activate appropriate “linking” and “bearing” strategies for managing relationships with suppliers and customers (Scott, 2003). Boundary strategies lead to collaborative advantage and better firm performance. To gain competitive advantage, firms should try to create win-win operations in which all involved parties collaborate to compete with other chains. The “linking strategies” seek to internalize the resources and skills of the partners. Firms, pursuing the information sharing and the alignment of internal and external business processes, should allow redesigning the entire supply chain innovatively to satisfy the customer more effectively and improve the overall operating efficiency. At the same time, however, firms need to supervise business processes and operations by developing “bearing” strategies that allow protecting operations from the risk that external actors of the supply chain should acquire key information by the relationship with the firm. Competitive expectations should lead other parties of boundary operations to promote their own interests at the expenses of firm interests.

Strategic management of boundary operations should aim to strike the best balance in actual competitive contexts between the ever-increasing needs of flexibility, productivity and manufacturing efficiency and to coordinate the relationships and the tangible and intangible flows among operations along the overall chain from suppliers to end consumers to push firm to gain a competitive advantage against competitors. The strategic management of boundary operations aims to create value by focussing on business processes and activities that occur in the boundary area between inside and outside the firm.

### Implications

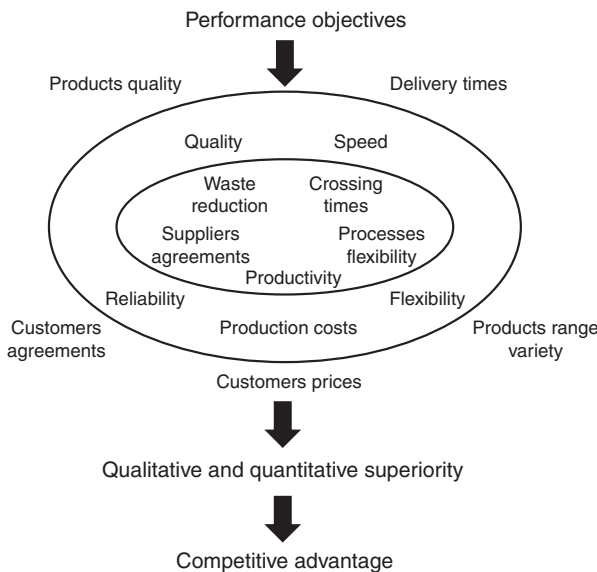
The “boundary perspective” opens new scenarios in the strategic management of operations by offering an alternative point of view to scholars and practitioners. This perspective, shifting the focus on the boundary activities, can allow reinterpreting the typical objectives of the operations, designing operations based on common objectives among all the actors involved in the management of boundaries operations, and stimulating an innovative rethinking of processes and supply chains pushing performance goals “on the boundaries”.

The traditional performance targets can acquire a new and broader meaning specifying their relevance in view of the different parties involved in supply chain management. In the company’s view, the efficiency of the production costs could mean an increase in the productivity of operations. From boundaries perspective, firms are pushed to analyse efficiency from the perspective of related actors, such as customers. Consequently, firms can encompass a broad view of efficiency, which may coincide with the lowest price that customers could pay (Shank and Govindarajan, 1993). Reliability will be specified, for example, together with the ability to meet commitments with suppliers inside and with clients outside (Slack *et al.*, 2009). Flexibility should be analysed over the narrow internal perspective as the flexibility of production processes. From the boundary perspective, firms should integrate external actors’ view. Flexibility also includes the ability to adapt the range of products to customer needs (Chase, 2006). Speed could be understood as rapidity in the realization of crossing times and, from the boundary perspective, as better distribution times for customers (Brown and Cousin, 2004). Finally, quality could, from the traditional view measure, for example, the reduction of waste from operations and, from the boundary perspective, the best attributes of the product (Molina Azorin *et al.*, 2009).

Adoption of the boundary perspective can stimulate the companies to ask themselves new questions such as how can boundary activities be redesigned to

address these objectives simultaneously. Who should participate in the process to achieve these goals? To achieve these objectives, what are the operations on which firms should extend their governance? (Figure 2).

These questions have the chance to overcome the issues of the performance objectives to affect strategic changes and innovation (Alegre-Vidal *et al.*, 2004; Seo *et al.*, 2014). The focus on the firm's boundaries can facilitate a creative and innovative rethinking of operations (Byrne *et al.*, 2007; Chesbrough, 2003; Gibbert and Valikangas, 2004; Menor *et al.*, 2007; Tortoriello and Krackhardt, 2010). The features of the boundary perspective can be related to the following dimensions: "where" are identified boundaries, the identification of the boundary area of operations; the operations on which the governance autonomy of companies is limited by external parties, and, therefore, "what" occurs on the boundaries; the beneficiaries of operations outputs and therefore "who" is the customer of the business processes (Gibbert and Valikangas, 2004) (Table I).



**Figure 2.** Pushing performance goals "on the boundaries"

Dimensions of analysis	Focus on	Alternatives	Illustrative questions
Where?	The identification of the boundary area of operations	Objective boundaries Subjective boundaries	Why other companies differently find operations boundaries? How the company should bypass the boundaries?"
What?	The effects of rethinking operations boundaries	Internal operations Boundaries operations	What are the effects of putting internal operations on the boundaries or boundaries operations inside?
Who?	The beneficiaries of operations outputs	Internal customers External customers	Who should be new external customers of operations having actually only internal customers?

**Table I.** A thinking-process to facilitate a creative and innovative rethinking of operations

A first approach to stimulating innovation should include the comparison between the boundaries subjectively identified by the different actors participating in the process. The boundaries of operations are not always objectively identifiable (Håkansson and Snehota, 2006). Because the definition of boundaries is naturally quite arbitrary and depends on the intentions and aims of the observer (Hall and Fagen, 1956), the existence of a boundary area often requires a subjective individuation of the boundary and, consequently, of the actors participating in the same operations.

Companies can ask themselves questions such as: why other companies differently find operations boundaries? How the company should bypass the boundaries? For example, this perspective should encourage many firms to differently set the “boundary area” of information systems management. Thinking differently about the boundary area could encourage the integration of ERP with key suppliers. The information sharing with suppliers who receive “real time” sales data could favour the speed of procurement activities.

However, it is occasionally possible to identify objectively the boundaries by the presence of specific “parameters”. In these cases, another useful approach to innovation should start from the identification of the limits difficult to modify in the current configuration of operations. Starting from these limits, companies should identify solutions of operations reengineering able to make the previous limits irrelevant (Markides, 2008). For example, in the past, the success of information services to customers in the banking sector was based on the presence of many employees in a broad branch network. These operations were generally internal, and banks tried to increase the branch network in order to better satisfy customers’ needs. However, innovative “home” banks reengineered these operations from a boundaries perspective by using call centres. The employees of the call centres, who were generally outsourced, made irrelevant branches. The success of operations depends on the ability to manage boundary resources, that is, call centre employees, through third parties. The performance of operations can result in the better performance of banks by cost reduction and in better customer satisfaction by convenient information at home. A second path for innovative processes should start from an analysis of the effects that may produce wearing internal operations on the boundaries, or on the contrary, wearing the boundary operations inside (Andrew and Sirkin, 2006). In this case, the rethinking of operations arise by the displacement of the artificial boundaries “downstream” or “upstream”, and the analysis of the effects that this change could have on the value chains of the company. Companies should find two paths of innovation starting alternately from internal or boundary operations. For example, consider the operations decisions of the emerging transportation network company, Uber (Christensen *et al.*, 2015). This company has realized an innovative business model. Uber considers drivers, traditionally an internal resource, as a boundary resource. The company, from one side, set up a limousine company and its drivers with a lucrative revenue-sharing contract (so that Uber does not have to incur the expenses involved in car ownership, licenses, insurance and day-to-day operational costs), and, from the other side, analysed information from drivers and customers to make smarter decisions, to minimize pickup times and to maximize utilization. The success factors are based mainly on the management of boundaries operations linking the company, drivers and customers. A third approach could move from the search for new ways of extracting value from current operations, assessing their attractiveness for entities other than the existing customers (Cummings and Holmberg, 2012; Sawhney *et al.*, 2006). In particular, this could push to identify new external customers, partners or end-users, for processes that currently have internal customers. From a boundaries perspective, the managers’ thinking process switches from

asking “what output we can offer to current operations customers?” to “who would want to buy the output of our operations?”. An example is the amount of information about customers that websites and social media originally acquired for internal reasons. This information could be generally shared with external customers. An exemplary case is Edmunds.com, a popular automotive website. This firm generates revenues from boundaries operations, including the licensing of its tools and content to partners; advertising through links to websites for insurance, warranty and financing partners; selling to third parties data on customers’ buying behaviour collected through its website (Sawhney *et al.*, 2006). Finally, the firm boundaries perspective suggests the use of new models and tools to support operating strategy by combining value creation and supply chain views (Hanafi *et al.*, 2008, Holweg and Helo, 2014), and by encouraging green and sustainable management (Srivastava, 2007): e.g., the value system, (Porter, 1991), value grid (Pil and Holweg, 2006) and reverse supply chain (Govindan *et al.* 2015).

### Conclusions

This paper aims at developing, employing a firm boundary perspective, a framework of operations strategy driving both the research of scholars and the decisions of practitioners. The operations play an important role in the strategic management and operations should increasingly become the sources of firm’s success in a strategic view. Operations management should contribute to the acquisition of a competitive advantage and stimulate companies towards strategic innovation by allowing to a more effective and/or efficient manufacturing systems. The success of operations strategy is increasingly related to the management of boundary resources and processes.

This research extends current knowledge in several ways. It analyses operations strategy using a systematic approach to the main dimensions emerging from prior studies. The framework joins findings of several literature streams such as operations management, supply chains management, organizational behaviour and strategic management. The framework development follows insights from the most relevant emerging trends in the study and practice of operations management. The boundary perspective, even more important in the strategic management and organizational literature, is integrated into operations management research. Finally, our findings push towards integrating RBV and TCE, which in prior studies traditionally were conflicting views.

The framework analyses both the process and the content of operations strategy. Specifically, the process is articulated in three main steps: analysis of operating processes and activities; selection of operations; and design or redesign of operating processes and activities. According to the boundary perspective, external operations are distinguished from internal operations, i.e., the activities over which companies have governance autonomy, and boundary operations, i.e., the activities in which the companies choose joint relationships for operations. Consequently, the framework introduces a third option to internal operations and external operations: boundary operations.

This advanced taxonomy opens new scenarios in operations management by providing an alternative view to scholars and managers. Operations management will require a shift in focus towards how the firm relates its own operations to the resources and processes of the other parties involved on the firm’s boundaries. Prior studies traditionally focus on the relationships with the parties at the beginning, the suppliers, and at the end, the customers, of operations. This study leads to analysing all potential parties involved in boundary operations (La Rocca and Snehota, 2014). The focus on the firm’s boundaries suggests that operations success depends on the ability to design

and manage operations in a wider perspective, continuously rethinking internal and external activities to identify new potential integration and coordination solutions between value chains and external subjects. Specifically, two new strategies emerge: “linking strategies”, which pursue sharing and alignment of internal and external business processes; and “bearing strategies”, which protect operations from the risk that actors external to the supply chain might acquire key information from the firms.

Finally, starting from the operations boundaries, this study identifies several pathways that can facilitate innovation in operations management. These solutions can integrate “new trends” emerging in studies and practice into the strategic management of operations. The boundary perspective supports the search for new trends in operations management and pushes firms to stay on the “boundaries” of knowledge, identifying the most useful and recent strategic models and tools as the reverse value chain (Jayaraman and Luo, 2007); on the “boundaries” of competitive dynamics, trying to guess the most important management philosophies such as green management (Molina Azorin *et al.*, 2009; Sarkis, 2012); on the “boundaries” of value creation, evaluating opportunities to draw value from what traditionally is considered worthless as waste (Fearne *et al.*, 2012; Srivastava, 2007); and on the “boundaries” of strategic management, interpreting in a “strategic view” what is traditionally considered the subject of an “operating view” such as the operations (Garzella, 2000; Schoenherr and Narasimhan, 2012). In this manner, the framework provides new insights by systematically relating operations, competitive advantage and success factors. These insights should be the starting point of extended future research on boundary operations. It will be important to test the relationship between the use of boundary strategies and firm performance, to search for the explanatory variables of boundary perspective adoption, and to analyse the several types of adoption of boundary operations in companies.

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