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# ORGANIZATIONAL STRUCTURE, INTEGRATION, AND MANUFACTURING PERFORMANCE: A CONCEPTUAL MODEL AND PROPOSITIONS

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**ABSTRACT:** One major characteristic of studies in operations and supply chain management literature is a focus on how integration can lead to superior operations and manufacturing outcomes. Most of these studies, however, focus only on internal or external integration and few have been dedicated to understand how both internal and external integration influence performance outcomes. In addition, few studies, if any, have looked to the antecedents of organizational structure as a driver for such forms of integration. To help filling this gap, we draw on organizational structure and resource-based view theoretical perspectives to present a conceptual model that proposes a relationship between organizational structure and integration. The model also considers major antecedents of organizational structure and the manufacturing performance consequences of integration. As a result, we introduce a series of propositions to be subject to empirical scrutiny as well as serve as a reference for future conceptual and empirical models.

**Keywords:** Organization structure, integration, manufacturing performance

## 1. INTRODUCTION

Because of the competitive challenges imposed by globalization, which has made firms adopt practices such as outsourcing and cooperation between companies (Harland, Lamming, & Cousins, 1999), literature in operations management has placed considerable attention in the supply chain phenomenon (Chen & Paulraj, 2004; Ireland & Webb, 2007; Ketchen & Hult, 2007; Krause, Handfeld, & Tyler, 2007; Li, Rao, Ragu-Nathan, & Ragu-Nathan, 2005; Storey, Emberson, Godsell, & Harrison, 2006). Organizations that want to succeed have to enhance their connections with other organizations in order to acquire and mobilize complementary resources for their core activities. In fact, there has been a growing consensus among researchers regarding the importance of integration between a given organization and its customers and suppliers (Bowersox, Daugherty, Droge, Rogers, & Wardlow, 1989; Eloranta & Hameri, 1991; Lee, Padmanabhan, &

Whang, 1997; Morris & Calantone, 1991; Stevens, 1989) and recent studies have empirically demonstrated how integration positively impacts organizational performance (Frohlich & Westbrook, 2001; Koufteros, Cheng, & Lai, 2007; Koufteros, Vonderembse, & Jayaram, 2005; Rosenzweig, Roth, & Dean, 2003; Morgan Swink, Narasimhan, & Wang, 2007; Vickery, Jayaram, Droge, & Calantone, 2003).

One characteristic of studies about supply chain integration is the investigation of its potential effects on organizational performance outcomes. Frohlich and Westbrook (2001) are among the first authors to empirically demonstrate that organizations with high levels of integration with their customers and suppliers achieve superior firm performance when compared to organizations with low levels of integration. Stank et al. (2001) tested a model including not only external integration with customers and suppliers, but also internal integration. Their

results showed that internal and external integration have effects on different firm performance variables. Subsequent empirical studies on internal and external integration have demonstrated their effects on financial performance and competitive capabilities (Rosenzweig et al., 2003), customer service performance (Vickery et al., 2003), product innovation (Koufteros et al., 2007; Koufteros et al., 2005), and customer satisfaction (Swink et al., 2007), and operational performance (Flynn, Huo, & Zhao, 2010; Wong, Boon-itt, & Wong, 2010).

However, few studies have explored the antecedents of supply chain integration. Examining some potential antecedents of supply chain integration, Vickery et al. (2003, p. 535) concluded, "supply chain integration is facilitated by integrated information technologies". Based on a multiple case studies of small and medium enterprise firms of UK, Harland, Caldwell, Powell, and Zheng (2007) explored the potential barriers for adoption of supply chain information integration technologies. Zhao, Huo, Flynn, and Yeung (2008) analyzed the impact of power on customer integration in the supply chain context. These authors contribute to supply chain management literature, but more comprehensive models that explore the potential antecedents and consequences of supply chain management are still needed. In this context, we attempt to answer the following conceptual research questions: *how organizational structure is conceptually related to internal and external integration? How such relationship might influence manufacturing performance?*

We attempt to fill this gap in literature by conceptually exploring how organizational structure may enhance supply chain integration, since organizational structure is recognized for influencing organizational behavior, and how supply chain integration is related to manufacturing performance. Saying it differently, the objective of this paper is to introduce a theoretical model that relates organizational structure constructs and supply chain integration and explore its influence on manufacturing performance. More specifically, we theoretically explore how the level of centralization, flatness, and horizontal integration influences the supply chain integration. Then, we theoretically conceptualize the effects of supply chain integration on manufacturing performance outcomes, since improvements in supply chain integration tends to be related with manufacturing competitive capabilities (Rosenzweig et al., 2003). For the purpose of this research,

we conceptualized supply chain integration as three distinct constructs: internal integration, supplier integration, and customer integration. Understanding the relationships between organizational structure constructs and integration can be essential for academicians and practitioners interested in developing theories and strategies to achieve outstanding manufacturing performance.

The paper is organized as follow. The next section presents a theoretical background on organizational structure and resource-based view. These two theoretical lenses set the basis for our understanding and explanation of how constructs in our model relate to one another. Then, we present our model, define its constructs, and present formal propositions relating them. Finally, we conclude our paper discussing the model and summarizing its contributions as well as limitations and opportunity for future research.

## 2. LITERATURE REVIEW

### 2.1. Organizational structure

Organizational structure can be viewed as the way responsibility and power are allocated inside the organization and work procedures are carried out by organizational members (Blau, 1970; Dewar & Werbel, 1979; Germain, 1996; Gerwin & Kolodny, 1992; Ruekert, Walker, & Roering, 1985; Walton, 1985). For Thompson (1965), organizational structure is the organization's internal pattern of relationships, authority, and communication. Similarly, Goldhaber et al. (1984, p. 44) define organizational structure as "the network of relationships and roles existing throughout the organization".

The primary relationships that have been studied by organizational theory scholars are those relating strategy and structure, structure and performance, and the congruence of strategy and structure with performance (Jeminson, 1981). The general conclusions are that organizations must fit structure and processes if the strategy wants produce positive results (Chandler, 1962; Channon, 1971). The relationship between structure and performance, however, is more tenuous and is mediated by many other organizational constructs. For this reason, we believe that a linkage between organizational structure and communication may improve communication capabilities, resulting in different levels of integration. Many authors argue the existence of this relationship. Porter and Roberts (1976) and Frederickson (1986) theorizes that organizational structure strong-

ly influences communication and facilitates the flow and processing of information, while Koufteros et al. (2007) and Kim (2005) provide empirical evidence about the relationship between organizational structure and internal communication. However, as organizational structure has many dimensions (Damanpour, 1991), and some of them affect communication, we drawn on a limited number of variables to study their relationships.

## 2.2. Resource-based view

The resource-based view (RBV) has its roots back to Penrose (1959) who views organizations as bundles of resources that are managed, deployed, and reorganized in ways to provide unique form and value. During the 1980's, Wernerfelt (1984) defined resources as tangible and intangible assets that an organization possesses, while other authors also made significant contributions to this theoretical perspective (Dierickx & Cool, 1989; Rumelt, 1984). In 1991, Barney (1991) provided a more concise framework to understand how resources can provide sustainable competitive advantage. His rationale is based on two major assumptions. First, resources are heterogeneous, which means that organizations have different resources, routines, capabilities and other assets that differentiate one organization from another. This differentiation among organizations' resources helps to create different strategies and sustained competitive advantage. By pursuing different resources and creating different strategies, organizations may achieve different levels of performance. The second assumption is that resources have some degree of immobility. This means that some resources have high degree of mobility and can be "purchased" in the market, while other resources have low degree of mobility and are more difficult to be "purchased". Based on these different degrees of resource mobility, organizations can develop their unique resources and create strategies difficult to be imitated by competitors.

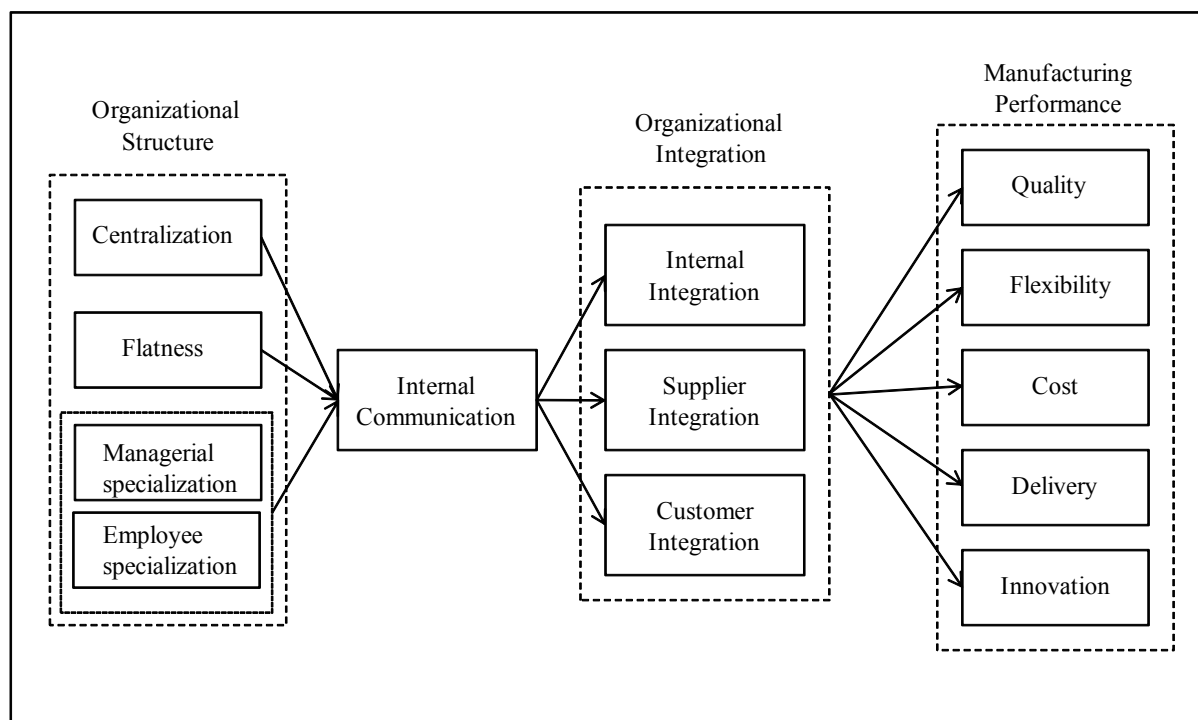
In order to create a sustainable competitive advantage, resources must have four attributes (Barney, 1991). First, resources must be valuable. Valuable

resources are those that enable an organization to create a differentiated strategy, that is, that help the organization to create value for its stakeholders. Second, resources must be rare, assuring that a specific resource is difficult to be developed by other competitors. Third, resources must be imperfectly imitable. In other words, resources must be difficult to imitate, enabling firms to create strategies based on resources that are difficult to imitate. Perhaps competitors can try to replicate firm's strategy based on imperfectly imitable resources, but it is not possible to fully imitate and acquire the same advantage. Finally, resources must not be substitutable. Saying it differently, organization's resource cannot have similar or equivalent resources in the market.

## 3. THEORETICAL DEVELOPMENT

The theoretical model of the relationship between organizational structure, internal communication, integration, and performance is presented in Figure 1. This model is based on the resource-based view assumption that integration allows organizations to mobilize and acquire complementary resources from their partners, improving their activities and achieving a better manufacturing performance (Teece, Pisano, & Shuen, 1997). Previous studies have shown that integration its related to product development performance (Hoopes & Postrel, 1999; Koufteros et al., 2007; Koufteros et al., 2005), manufacturing performance (Frohlich & Westbrook, 2001; M. Swink & Song, 2007), competitive capabilities (Rosenzweig et al., 2003), distribution performance (Mohr & Nevin, 1990), customer service performance (Vickery, Droge, Stank, Goldsby, & Markland, 2004; Vickery et al., 2003), partnership performance (Mohr & Spekman, 1994), enterprise resource planning adoption (Masini & Van Wassenhove, 2009), and innovation (Ettlie & Reza, 1992). In our theoretical model, integration is a broader construct composed of three parts: supplier integration, customer integration, and functional integration. Each one of these constructs is hypothesized to have effects on different manufacturing performance measures.

Figure 1 - The proposed theoretical framework



Furthermore, we attempt to explore and understand how organizations use their organizational structure as-

sets to improve their ability to integrate and acquire complementary resources from their partners. Organizational structure can be a source for competitive advantage as well as a determinant position for acquisitions of other resources. Then, the configuration and relationship among organizational resources allow the development of new resources that may lead to competitive advantage (Black & Boal, 1994). We believe that a organization's ability to internally and externally integrate, acquiring and mobilizing resources from its partners, is partially influenced by its organizational structure. Some organizational structure configurations might permit a better integration between organizations while others might not. In our model, the relationship between organizational structure and integration is mediated by organizational communication because organizational structure influences communication between departments (Porter & Roberts, 1976) which, in turn, affects the degree to which a organization can develop social relations with other organizations, like customers and suppliers.

### 3.1. Organizational structure

Our theoretical model has three organizational structure constructs. First, centralization of decision making process can be defined as the degree to

which the right to make decisions and evaluate activities is concentrated on the top hierarchy levels of organizations (Fry & Slocum, 1984; Hall, 1977). Centralization can be seen as an increase of decisions make at higher hierarchical levels within organizations and a decrease of participation of employees in the decision making process (Daft, 1995; Doll & Vonderembse, 1991; Germain, 1996; Walton, 1985; Zaltman & Duncan, 1977). It can also be conceptualized as a locus of authority and decision-making in the organization. Environment plays an important role for locus of authority since organizations in uncertainty environments should delegate decisions to lower hierarchy levels in order to quickly adjust to changing situations (Doll & Vonderembse, 1991).

Second, flatness of organization hierarchy is conceptualized as the degree to which an organization has many or few levels of management hierarchy (Burns & Stalker, 1961). Walton (1985) argues that a traditional command and control model is characterized by an expanded hierarchy that may be a by-product of the systems and is justified by the need to control employee behavior. On the other hand, a commitment model is characterized by a management system that tends to be flat, relies upon shared goals for control and lateral coordination, bases influence on expertise and information rather than position,

and minimizes status differences. Organic organizations tend to have few levels of hierarchy and be characterized by more efficient and effective flows of information and decision-making. A flat organization can reduce problems of information delays, distortion and corruption as information flows from one level to another.

Third, specialization of departments and employees refer to the level of horizontal integration existent within an organization. In other words, it is the degree to which departments and employees are functionally specialized or integrated. Low levels of horizontal integration reflects an organization in which the departments and employees are functionally specialized, whereas high levels of horizontal integration reflects an organization in which departments and employees are integrated in their work, skills, and training (Davenport & Nohria, 1994; Doll & Vonderembse, 1991; Gerwin & Kolodny, 1992; Vonderembse, Ragunathan, & Rai, 1997). Given that cross-trained employees tend to be responsive to changes in customers' needs (MacDuffie, 1995; Vonderembse et al., 1997), managers can use horizontal integration to address fast changing environments. At the same time, a great variety of specialists in a horizontally integrated organization may provide a broader knowledge base (Kimberly & Evanisko, 1981), increasing cross-fertilization of ideas (Aiken & Hage, 1971). For example, Wiersema and Bantel (1992) found that educational specialization heterogeneity of top management team was a significant predictor of organizational change.

### 3.2. Internal communication

According to communication theory, communication can be viewed as a transmission process through a channel (mode) that includes messages (content), the channel (mode), feedback (bidirectional communication), and communication effects (Krone, Jablin, & Putnam, 1987). Conceptualizing communication inside organizations, Grunig, Grunig, and Dozier (2002, p. 486) define internal communication as a "specialized sub-discipline of communication that examines how people communicate in organizations and the nature of effective communication systems in organizations". In a comprehensive literature review, Goldhaber (1999) found that, although there are quite few differences, there are a number of common elements that led to definition of internal communication as the flow of messages within a network of independent relationships. For other au-

thors (Putnam, Philips, & Chapman, 1996; Walton, 1985), the level of communication can be conceptualized as the degree to which vertical and horizontal communication is slow, difficult, and limited versus fast, easy, and abundant.

### 3.3. Organizational integration

The value chain framework developed by Porter (1985) is one of the first theoretical foundations in the context of strategy to advocate in favor of linkages among and across supply chain activities connecting buyers and suppliers as well as linkages among organization's activities, integrating supporting and core organizational functions. For Lawrence and Lorch (1968, p. 1), integration is "the quality or state of collaborations that exists among departments that are required to achieve unity of effort by the demands of the environment". This definition is narrow and exclusively related to internal integration. However, integration can also happen outside the boundaries of organizations, as proposed by Porter. Recent studies in the context of the supply chain management, on the other hand, have proposed a broader concept of integration that includes not only integration of buyers, but also integration of suppliers in the chain (Frohlich & Westbrook, 2001; Swink et al., 2007; Vickery et al., 2004; Vickery et al., 2003). As a consensus among many scholars (Bowersox et al., 1989; Koufteros et al., 2005; Morris & Calantone, 1991), such definition reflects the external orientation of organizational integration and, together with the concepts proposed by Porter (1985) and Lawrence and Lorch (1968), it enriches the concept and the strategic importance of integration. Thus, for the purpose of this research, we define integration as the collaboration and linkages between and across organizational functions as well as organizational partners, including customers and suppliers.

Internal integration refers to the cross-functional team orientation reflecting the linkages within organizational functions and teams, also known as horizontal linkages (Bishop, 1999; Guzzo & Dickson, 1996; Henke, Krachenberg, & Lyons, 1993). High degree of cross-functional integration implies a richness collaboration and communication environment among people and departments, increasing mutual feedback and the probability to solve problems. Internal integration through the use of cross-functional teams is commonly used by organizations interesting in achieving a better performance in terms of quality, innovation, and new product development

(Clark & Wheelright, 1992; Olson, Ruekert, & Bonner, 2001; Song & Benedetto, 2008).

Supplier integration refers to the collaborative involvement of suppliers with the buyer organization, providing operational (Sahin & Robinson, 2002) as well as strategic information (Shah, Goldstein, & Ward, 2002) and supporting activities, such as new product development processes (Koufteros, Nahm, Cheng, & Lai, 2007). In comparison to cross-functional integration, supplier integration refers to external linkages, also known as vertical linkages (Porter, 1985) between organizations and their suppliers (Frohlich & Westbrook, 2001). Because of its strategic nature, supplier integration can be characterized by the collaborative and long-term relationship between buyer and supplier (Narasimhan & Kim, 2002; M. Swink, Narasimhan, & Kim, 2005), involving high levels of trust, commitment and information sharing (Heide & John, 1990; Heide & Stump, 1995).

Customer integration is defined as the collaborative involvement of customers with the buyer organization, strategically sharing information and knowledge about their needs and buyer organization's product performance, such as quality, delivery time, and cost. Similarly conceptualized by other authors (Frohlich & Westbrook, 2001; Swink & Song, 2007; Vickery et al., 2003), customer integration is also part of external and vertical linkages of buyer organizations, in this case, linkages between a given organization and its customers. Close and collaborative relationships with customers may be an important factor influencing supply chain performance (Stank et al., 2001), market performance (Swink & Song, 2007), and innovation (Koufteros et al., 2005; Urban & von Hippel, 1988).

### ***3.4. The relationship between organizational structure and internal communication***

Organizational structure is recognized by many authors to have effects on the level of internal communication (Grunig, 2002; Hall, 1977; Klauss & Bass, 1982). According to Robbins (1990), organizational structure determines the pattern of communication as well as the formal lines of interaction between individuals within organizations. In a research conducted by Holtzhausen (2002), organizational structural changes results in information flow and face-to-face communication improvements. Grunig et al. (2002) show that organic structures have sym-

metrical systems of internal communication while mechanical structures have asymmetrical systems of internal communication. Similar results were found in the study conducted by Kim (2005), in which organic structure is positively correlated with symmetrical communication and negatively correlated with asymmetrical communication.

The flow of information and intensity of communication as well as horizontal and vertical integration depends on the level of centralization, flatness, and horizontal integration, among other organizational structure variables. An organization structure can stimulate or inhibit the flow of communication by developing mechanisms to encourage participation and information sharing. Aiken, and Hage (1971) found that, in less complex, less formal, and decentralized organizations, communication is greater than in complex, formal, and centralized ones. Locus of decision-making tends to increase communication because a participatory work environment facilitates the involvement and communication among employees, whereas centralization reduces participation of employees, decreasing communication. Participative decision making stimulates communication and information flow in the entire organization (Kanter, 1983). Few hierarchy levels reduces the number of people involved in the communication process, increasing its speed and accuracy (Damanpour, 1991; Hull & Hage, 1982). Thus, vertical communication tends to be more developed in flatness organizations when compared to organizations with numerous hierarchy levels. Because of increase in the knowledge sharing and training of employees, high levels of horizontal integration tends to increase the level of internal communication (Damanpour, 1991; Vonderembse et al., 1997). Specialized employees are more likely to share their ideas in a high horizontally integrated organization. Therefore, we conceptualize that:

Proposition 1a: Centralization is negatively related to internal communication.

Proposition 1b: Flatness is positively related to internal communication.

Proposition 1c: Horizontal integration is positively related to internal communication.

### ***3.5. The relationship between internal communication and integration***

Internal communication is assumed to enhance inter-

nal and external organizational integration because it increases the interaction and flow of information between employees, allowing them to improve coordination of activities. Because of the richness communication between cross-functional teams, departments and functions, employees can develop closely relationships and collaborative behaviors to one another. At the same time, these internal linkages allow employees in the entire organization to have a better and fast understanding about suppliers' and customers' needs.

Empirical studies have found positive effects of internal communication on a variety of organization outcomes, including inter-functional integration (Gupta, Raj, & Wilemon, 1985), harmony between functions (Souder, 1988), coordination (Gupta & Wilemon, 1990), and market orientation (Kohli & Jaworski, 1990). Much research in supplier integration is also based on the assumption of internal communication as a way to properly make use of suppliers' knowledge and achieve superior performance (Koufteros et al., 2007; Swink & Song, 2007; Vickery et al., 2003). Conceptualizing about customer integration competence, Jacob (2006) demonstrates that communication is an important competence that organizations must possess in order to successfully integrate with their customers. We, then, conceptualize:

Proposition 2a: Internal communication is positively related to internal integration.

Proposition 2b: Internal communication is positively related to supplier integration.

Proposition 2c: Internal communication is positively related to customer integration.

### ***3.6. The relationship between integration and manufacturing performance***

Literature has strongly suggested the relationship between organizational integration and organizations' performance outcomes (Ettlie & Reza, 1992; Frohlich & Westbrook, 2001; Koufteros et al., 2007; Koufteros et al., 2005; Paulraj & Chen, 2007; Sarah & Stock, 2003; Tesarolo, 2007). Organizations with high levels of internal and external integration are more likely to regularly examine their performance compared to other competitors that are not integrate because they are constantly interacting and receiving information from their external partners. Also, these organizations can identify customers' needs more quickly because they are more likely exposed

to feedback. In addition, integration with suppliers helps improvement of innovation, cooperation, and problem solving (Frohlich & Westbrook, 2001), allowing organizations to acquire and mobilize complementary knowledge resources (Koufteros et al., 2007). In fact, the lack of internal and external supply chain integration has been recognized by many authors as sources of potential problems such as cost increase as well as quality and delivery problems (Clark 1996; Flynn, Schroeder, & Flynn, 1999; Wheelwright & Bowen, 1996).

Internal integration reduces uncertainty by improving communication between departments. Cross-functional teams composed of specialized employees with different background and knowledge can share information and improve the decision making process. Because of the early involvement of participants, this enriched decision making process helps to clarify product requirements before money has been invested on a new product (Gupta & Wilemon, 1990). Information sharing and technology help teams to develop better product and new features, enhancing product performance (Rosenthal & Tatikonda, 1992). For example, interactions between marketing and manufacturing tend to have strongly effects on product design quality (Swink & Song, 2007). Other studies have demonstrated the positive impact of internal integration on delivery time performance (Brown & Eisenhardt, 1995; Clark & Fujimoto, 1991; Swink et al., 2007; Tesarolo, 2007).

Proposition 3a: Internal integration is positively related to product innovation performance.

Proposition 3b: Internal integration is positively related to quality performance.

Proposition 3c: Internal integration is positively related to delivery time performance.

Proposition 3d: Internal integration is positively related to flexibility performance.

Proposition 3e: Internal integration is positively related to cost performance.

Because suppliers can be viewed as strategic collaborators, supplier integration can stimulate the long-term commitment and collaboration and enhance information sharing and trust with the buyer organization. Under these circumstances, suppliers can provide information feedback about materials, pricing, and process capabilities for improvement of quality, as recently demonstrated by empirical

studies (Koufteros et al., 2007; Koufteros et al., 2005; Swink & Song, 2007; Swink et al., 2007). Such information feedback can also help organizations to early detect product quality problems and design better product and production processes. Suppliers' involvement in early stages of new product development can also shorten and speed it up (Clark 1989; Tesarolo, 2007). Moreover, the benefits of external integration can be exemplified through the work of Rosenzweig et al. (2003). These authors demonstrate the positive effects of supplier and customer integration on product quality, delivery reliability, process flexibility, and cost. Other example is the work of Vickery et al. (2003) that show how external integration leads to a better customer service performance, measured in terms of pre-sale customer service, product support, responsiveness, delivery speed, and delivery dependability. Therefore, we conceptualize:

Proposition 4a: Supplier integration is positively related to product innovation performance.

Proposition 4b: Supplier integration is positively related to quality performance.

Proposition 4c: Supplier integration is positively related to delivery time performance.

Proposition 4d: Supplier integration is positively related to flexibility performance.

Proposition 4e: Supplier integration is positively related to cost performance.

By providing valuable information, customers can also be perceived as strategic collaborators and be integrated in the organization. Customer integration, in this case, can yield many benefits to organizations because customers can provide information such as their needs as well as organizations' product performance. The evaluation of products and the feedback provided by customers can reduce uncertainty and help organizations to develop better quality products (Stump, Athaide, & Joshi, 2002). Such information is fundamental for new product development that meets customer expectation. In their study, Stank et al. (2001) found positive relationship between customer integration and multiple organization performance variables, including delivery speed, responsiveness, and flexibility. These authors conclude that "customer integration is the most critical competency associated with improved performance" (Stank et al., 2001 p. 39). Other authors also found positive impact of customer integration

on organization performance outcomes (Frohlich & Westbrook, 2001; Swink et al., 2007). However, there is little evidence on customer integration effects on quality. For instance, Koufteros et al. (2005) and Swink et al. (2007) did not find a statistically significant relationship between customer integration and quality. We, therefore, conceptualize:

Proposition 5a: Customer integration is positively related to product innovation performance.

Proposition 5b: Customer integration is positively related to delivery time performance.

Proposition 5c: Customer integration is positively related to flexibility performance.

#### 4. DISCUSSION

Our theoretical model attempts to integrate antecedents and consequences of supply chain integration. In doing so, the model gives a step further in terms of looking the supply chain concept in a more integrative, comprehensive, and realistic manner. Firms are constrained by their organizational structures and may have limited options for integration with their customers and suppliers. For example, a large firm that centralize its decision making process tends to lower the speed to which information flows inside the organization because it has to follow all hierarchical levels from bottom to up and vice-versa. In this case, we can argue that the larger the firm, the lower tends to be the speed to which the information flows. Another example is the case of multi-functional employees who perform multiple tasks simultaneously. In this case, the organization may increase integration because employees have a much broader view about organizational processes and may be aware that the result of their tasks has impact for other parts of organization. Thus, from this perspective, our theoretical model tries to include these nuances by viewing some aspects of organization as antecedents for integration through the lens of communication.

Also, the model proposes a more holistic view of supply chain management because it provides a perspective that begins and finishes inside the organization but encompasses other organizations. In other words, the perspective provided here starts with the organizational structure, passes through customers and suppliers, and goes back to organization performance. In doing so, the model calls attention constructs not usually discussed in supply

chain management literature, like internal communication. Internal communication is a construct that serves as a bridge to the theoretical gap existent between organization structure variables and integration. It is through the internal communication process that employees talk to each other and communicate managers about information captured from customers and suppliers. It is the internal communication the managers can design procedures and policies to take advantage of closeness to customer and suppliers. Such closeness and information are, then, worked by managers, which create and modify tasks to allow for reconfiguration of resources and improvement of performance.

However, our model becomes complex to empirically work with since many constructs and variables come into play to portray this more realistic and detailed perspective of supply chain integration. Perhaps this is the reason why such models are not commonly presented in the literature. That is, the fact that our theoretical model attempts to provide a more comprehensive nature of supply chain integration becomes also its potential weakness since it is not so parsimonious to be easily operationalized. For instance, there are multiple propositions to be tested, which in turn may affect the degrees of freedom necessary to empirically test all these propositions. A general model, like the one proposed in this study, needs some contextual variables that help to delimit the findings according to other variables like the industry or type of product, like in the study developed by Flynn et al. (2010) and Wong et al. (2010). In other words, this model needs some moderator variables that help us distinguish results in firms with distinct characteristics not included here, like size and technology, for example. However, inclusion of additional moderator variables may result in a large number of additional propositions that may impede the model to be empirically tested. For this reason, the model can be viewed a starting point for other models attempting to encompass a more realistic perspective of supply chain phenomenon.

Finally, it is important to mention that the model and propositions are more appropriate for analysis of large and older firms than for analysis of small and new ones. Large and older firms already passed through the process of structuring themselves and are more likely to be mature in terms of organizing their processes internally. That is, organization structure of large and older firms tends to be stable and has only minor changes along the years. Small

and new firms, on the other hand, may not have an organizational structure that is stable and complete because they may still be in a growing process and many changes are yet to come. Thus, stability of organizational structure may be an assumption pertaining our proposed model because it allows for organizational structure variables have an effect on internal communication and, subsequently, on integration and performance.

## 5. CONCLUSION

This paper proposed a comprehensive conceptual model to understand how organizational structure may be related to organization integration. We viewed organizational structure resulting from three major constructs: centralization of decision making process, flatness of organization, and specialization. We conceptualized organization integration as a multi-dimensional construct encompassing internal as well as customer and supplier integration. In addition, by using internal communication as an intermediate construct, we explored how such internal and external integration may affect manufacturing performance. To help us understand and explain how all these variables are related, we follow the organizational structure literature and resource-based view perspective. We presented a series of propositions that summarize the conceptualized relationships.

One contribution of our paper is to come up with a model that conciliate organizational and supply chain integration and theorize about their impact on manufacturing performance. Most studies literature in operations and supply chain management investigate only part of these two forms of integration, but not both. We attempted to organize previous studies into a coherent framework that include both forms of integration. Other contribution is to propose a model that takes into account the major antecedents of organizational integration and how they impact on internal integration. By doing this, we bring some of the already established variables existent in the organization theory to operations and supply chain literature. Finally, our paper discusses and theorizes about factors influencing manufacturing performance, a critical issue for studies in operations and supply chain management, since they need more theory building approach.

This paper presents some limitations and opportunities for future research. First, as a conceptual work, this paper has to be subject to empirical scrutiny in

order to verify whether the propositions presented here hold in practice. In this sense, future research could collect empirical data from different manufacturing sectors to test the validity of this model. Second, because our model is a first step to understand the effects of organizational and supply chain integration on performance, it is not exhaustive and some variables and relationships is not included in it. For this reason, future studies could contribute to the literature by proposing new variables as well as new relationships not previously discussed. Finally, our model is limited to manufacturing firms and our propositions may not hold in the case of service firms. We suggest other scholars to use our model as a first step toward the construction of a theoretical model to better understand how organizational and supply chain integration can also have an impact on performance of service firms. That is, our model can be used as a basis for development of other models that employ some of our insights and ideas to evaluate performance of service firms.

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