

# **THE RELATIONSHIP BETWEEN INTERNAL AND EXTERNAL INTEGRATION OF SUPPLY CHAIN AND OPERATIONAL PERFORMANCE**

**Yandra Rahadian Perdana**

Department of Industrial Engineering - Faculty of Science and Technology  
Sunan Kalijaga State Islamic University  
Yogyakarta, Indonesia

and

Department of Management - Faculty of Economics and Business  
Universitas Gadjah Mada  
Yogyakarta, Indonesia

[yandra.perdana@uin-suka.ac.id](mailto:yandra.perdana@uin-suka.ac.id)

**Wakhid Slamet Ciptono**

Department of Management - Faculty of Economics and Business  
Universitas Gadjah Mada  
Yogyakarta, Indonesia

[wakhidciptono@ugm.ac.id](mailto:wakhidciptono@ugm.ac.id)

**Kusdhianto Setiawan**

Department of Management - Faculty of Economics and Business  
Universitas Gadjah Mada  
Yogyakarta, Indonesia

[s.kusdhianto@ugm.ac.id](mailto:s.kusdhianto@ugm.ac.id)

## **Abstract**

Supply chain integration divided into two dimensions, namely internal integration, and external integration. Internal integration refers to cross-functional intra-firm collaborative processes. External integration consists of supplier integration, customer integration, and logistics service providers integration. Empirically, supply chain integration is more dominant in investigating the relationship between internal, supplier, customer integration, and operational performance. The studies that investigate the relationship between logistics service providers integration and operational performance is still limited in number. Therefore, this paper aims to examine the relationship between internal, supplier, customer and logistics service providers integration and operational performance of the organization in the form of propositions. This paper is a conceptual framework. Supplier integration positively associated with inventory control processes and new product development. Customer integration increases the accuracy of forecasting. The logistics service providers integration positively associated with logistics activities. The dimensions of operational performance can be measured based on variable cost, quality, flexibility, delivery. The organization's operational performance proves to be a positive consequence of internal integration and external integration of supply chain. This paper proposes the proposition that there is a positive relationship between internal and external integration with the operational performance of the organization.

## **Keywords**

Supply chain, internal integration, external integration, operational performance

## **1. Introduction**

Effective supply chain management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations but among supply chains (Christoher, 2011). Integration is the foundation of SCM. Supply chain integration is the alignment, linkage and coordination of people, processes, information, knowledge, and strategies across the supply chain to facilitate the efficient and effective flows of material, money, information, and knowledge in response to customer needs (Stevens and Johnson, 2016). Supply chain management emphasizes system approaches that emphasize the interplay of relationships within a system (Dubois et al., 2004; Lambert et al., 1998). Supply chain integration is critical in creating competitive advantage and improving organizational performance (Leuschner et al., 2013). Therefore, it is necessary to synchronize planning with other organizations (Skipworth et al., 2015).

Supply chain integration is divided into two integration ranges, namely narrow integration, and broad integration. A narrow integration is an internal integration of the focal organization. A broad integration is an internal integration and external integration. Supplier integration and customer integration are forms of external integration (Frohlich and Westbrook, 2001). However, integration of the supply chain is not just limited to internal, supplier and customer. Supply chain integration requires more than an external organizational role, i.e., logistic service providers (Jayaram and Tan, 2010). In concept, supply chain integration involves logistics service providers (Giunipero et al., 2008). The integration of providers of logistics services proved to reduce transaction costs and improve organizational performance (Maloni and Carter, 2006). The result of the systematic literature review of Kamal and Irani (2014) also shows that the study that investigates the relationship between logistics service providers integration is still limited in number. Therefore, this paper aims to examine the relationship between internal, supplier, customer and logistics service providers integration and operational performance of the organization.

## **2. Theoretical background**

### **2.1 Resource-Based View and Resource Dependence Theory on Supply Chain Management**

Resource-Based View (RBV) suggest that firms need valuable and rare resources to gain a competitive advantage, and the resources must also be difficult to imitate and non-substitutable by other firms' resources. RBV describe, explain, and predict how firms can achieve a sustainable competitive advantage through an acquisition of and control over resources (Barney, 1991). Resources include both tangible and intangible assets that facilitate the production and delivery of goods and services (Olavarrieta and Ellinger, 1997). The RBV explained that each activity along the supply chain requires resources and capabilities to gain a competitive advantage (Hitt et al., 2016; Rungtusanatham et al., 2003). SCM is crucial for organizations to achieve customer satisfaction. For example, purchasing department plays a role in getting raw materials at a price by following the organizational strategy. The availability of cheap and quality raw materials will help the organization in creating competitive advantage from the price aspect (Barney, 2012). However, critics point out that internal resources alone will not be enough for organizations to gain a competitive edge. Organizations require other resources from outside the organization (Gligor and Holcomb, 2014).

The supply chain is a complex process involving multiple organizations. Organizations will not be able to compete without support from other organizations. Complexity leads to interdependency relationships between organizations. Resource Dependence Theory (RDT) is a theory that can be used to explain that in the supply chain there is a mutual relationship (Pfeffer and Salancik, 1978). Manufacturers will rely on suppliers' ability to provide quality raw materials, quantity, and timely. Suppliers will also rely on other suppliers. Manufacturers will rely on distributors' ability to distribute finished products to customers (Paulraj and Chen, 2007). Thus, RBV and RDT are used in this paper as the basis for the preparation of propositions.

### **2.2 Supply Chain Integration**

Mentzer et al. (2001) stated that supply chain management divided into three categories, namely philosophy, application of philosophy and process. As a philosophy, supply chain management uses a system approach as a whole and not as a separate set of parts or each performs its function. The philosophy of supply chain management is not only a form of partnership between two organizations but also a multi-organizational collaboration in managing the flow of goods from suppliers to customers. So that supply chain management is a set of beliefs that every organization in the supply chain, directly and indirectly, affects the performance of all other supply chain members as well as the overall supply chain performance. SCM aims to create a synchronization of the organization's internal strength with the inter-organizational environment to strengthen operational and strategic capabilities.

Mentzer et al. (2001) argue that supply chain consists of a set of activities that run the philosophy. These activities are coordinated between supply chain partners such as suppliers, logistics service providers, and producers who dynamically respond to end-customer needs. Information sharing is a requirement in applying the philosophy of SCM especially in the process of the planning process and monitoring as a requirement for efficient and effective performance. Simchi-Levi et al. (2003) stated that information becomes a strategic and tactical force for other supply chain members. Such information includes inventory level information, forecasting, sales promotion strategies, and marketing strategies to reduce uncertainty among partners in the supply chain. SCM as a process will be created if the process of risk-sharing is done for mutual benefit. Cooperation among supply chain members is essential. Cooperation refers to coordinated or complementary activities undertaken by an organization within the scope of a business relationship to generate mutual benefits. The cooperation involves cross-functional coordination across supply chain members (Wu et al., 2014). Collective decision making is realized through cooperation and coordination. Cooperation begins with joint planning and ends with coordination activities of joint controls to evaluate the performance of supply chain members as a whole. Cooperation and coordination are also needed to reduce inventory and improve cost efficiency. Supply chain management can work if all members of the network have the same goal and focus on serving the customer (Li and Wang, 2007).

Implementation of supply chain management requires integration of processes from raw material sources, focal organization, and distribution. Effective supply chain management consists of a series of partnerships and long-term relationships (Done et al., 2011). An organization can do not all activities in the supply chain. Therefore, a strategic alliance is needed with suppliers, customers, and logistics service providers to provide a competitive advantage (Panayides and So, 2005). Supply chain management as a process is seen as a form of relationship, information, and material management that flows across organizational boundaries through synchronizing the flow of goods and information from upstream to downstream. The linked organization in the supply chain should be aware that its activities are governed through a process that includes customer relationship management, demand management, order fulfillment, production management, procurement, product development, and commercialization (Whipple and Russell, 2007). Integration is a broad term that includes both tangible and intangible elements that are different from organizational operations, both internally and externally to develop efficiency in the supply chain. Integration enables organizations to achieve competitive advantage by streamlining business processes and by coordinating activities with business partners. The movement of goods, information, and financial in the supply chain requires coordination from upstream to downstream (Chen et al., 2009). The literature review shows that terms such as supply chain coordination (Jayaram et al., 2011) and supply chain collaboration (Vereecke and Muylle, 2006) are also used in supply chain integration operations.

Dimensions of integration include internal and external integration. External integration is the integration of focal organization with customer and supplier. Internal integration is defined as the organization's internal cross-functional collaboration through an interrelated and synchronized process. Internal integration is a narrow integration. Internal integration deals with the collaboration between various organizational functions, such as parts production, logistics, marketing, and sales to achieve organizational goals (Ataseven and Nair, 2017). Customer integration is a collaboration with key customers that provide strategic information to the focal organization about the expectations and market opportunities that enable the focal organization to respond more efficiently and effectively to customer needs. Customer integration addresses the aspects of demand and the organization's efforts to meet customer needs. Supplier integration is a coordination activity, sharing information between the focal organization with critical suppliers of processes, capabilities, and constraints. Supplier integration is done with the aim that planning and forecasting activities, product and process design, and transaction management are created more effectively and efficiently (Ataseven and Nair, 2017).

There is a debate about whether organizations should collaborate with all parties. There is a statement that organizations need to conduct intensive collaboration first, by focusing on a small number of close relationships rather than trying to collaborate with all parties (Horvath, 2001). The approach is considered the most likely to be realized. It can not be dismissed the view that organizations have higher control over internal resources, but the real organization has its limitations. Integration or collaboration is perceived as the answer that the importance of the organization is connected to a broader network. Organizations have limited resources and capabilities. Most of the organizations in the supply chain have their plans and do not realize that planning is interconnected across functions, so it needs supply chain integration (Fawcett and Magnan, 2002). Collaboration model is divided into two categories, namely horizontal and vertical. Horizontal integration includes collaboration with competitors and internally through sharing of production capacity. While vertical collaborations include collaboration with customers, internal (cross-functional)

and suppliers (Barratt, 2004). Vertical collaboration involves downstream decisions, namely customer relationship management, collaborative demand planning, and shared distribution. While from the upstream side includes supplier relationship management, supply planning and production scheduling, collaborative product design. Vertical collaboration is not just about developing a relationship of information exchange between the focal organization with supplier and customer but also needs to be applied to supply chain organizations. Vertical collaboration can be expanded by involving logistics service providers. Fabbe-Costes et al. (2009) stated that the logistics service providers are part of the supply chain members.

### **3. The span of Supply Chain**

#### **3.1 Internal Integration**

The RBV assumed that the resources of the organization determine the difference in competitive advantage between organizations. However, in today's competitive environment, it takes a capability other than the capital of internal resources. Organizations can enhance their capabilities by acquiring and utilizing external resources (Fujun Lai et al., 2012; Arya and Lin, 2007). Supply chain integration is needed to ensure that the raw materials required for the production process are acceptable to the focal organization with the right quality, the right amount, and at the right time (Sun and Ni, 2012). Supply chain integration becomes one of the requirements for the organization to be competitive (Chen et al., 2009). Supply chain integration proved to be significantly positively associated with supply chain performance (Li et al., 2006).

Supply chain integration requires synchronization of internal and external organizational resources (Chang et al., 2016). The characteristics of supply chain integration are a mutual commitment, dedicated relationships, enhanced inter-organizational processes, knowledge sharing, and product design and development systems (Zhao et al., 2008). The supply chain is a collaboration of various parties to create the effective and efficient process and product or service quality. This goal can be realized if the internal conditions of the focal organization can create efficiency, quality, speed, flexibility, and ability to innovate (Hui et al., 2015). Internal integration refers to cross-functional intra-firm coordination and information sharing. Internal integration focuses on intra-organizational aspects while external integration measures relationships with business partners from upstream to downstream (Foerstl et al., 2013).

Internal integration creates cross-functional interaction through ERP and is proven to increase productivity (Akkermans et al., 2003). The results show that internal integration positively affects business performance (Narayanan et al., 2011). Measures of supply chain performance can be measured based on quality, delivery, flexibility and cost aspects as the supply chain operation reference / SCOR (Schoenherr and Swink, 2012). Internal integration is positively related to flexibility, cost efficiency, and delivery (Mackelprang et al., 2014). Based on the description of this literature review, the proposition (**P**) in this paper can be formulated as follows:

**P1:** Internal integration is positively correlated to (a) costs, (b) quality, (c) delivery and (d) flexibility.

#### **3.2 External Integration**

##### **3.2.1 Supplier Integration**

RDT assumes that organizations rely on other organizations in the acquisition to use of resources. Such dependence can be reciprocal. The organization's external dependence on other organizations occurs because of increased competition in product markets, limited raw material supply, fluctuation of production demand. Interdependency encourages companies to improve control over the external environment (Fink et al., 2006). The RDT explains that supply uncertainty encourages organizations to share information and involve specific suppliers in purchasing activities (Kembro et al., 2014). A strategic partnership relationship between buyers and suppliers can ensure a stable resource. Under conditions of uncertainty, organizations in the supply chain will take collective action to make the environment stable. A collective form of policy is just-in-time (JIT) for purchasing activities. Purchasing activities with the JIT system emphasize collaboration between focal organization and suppliers to reduce demand and supply uncertainty. The form of collaboration is done by sharing information on raw materials, production plans, and schedules. Collaboration is done to reduce uncertainty (Handfield, 1993). The interdependence in the supply chain illustrates that every actor contributes to the creation of optimal performance. The relationship is symmetrical (Dubois et al., 2004). The partnership relationship with suppliers has a positive effect on organizational performance (Gulati and Sych, 2007).

Delke (2015) stated that vertical integration is a strategy to reduce supply uncertainty. Vertical integration is a form of purchasing decisions or make-or-buy of resources. There are three assumptions of the decision. First, an

organization must make resources, if resources are critical to organizational action and few suppliers are available. Second, the organization must acquire activities or resources that are not important to the organization's performance, and many of these resource suppliers are available from external suppliers. The third assumption includes non-critical resources for the organization, but few suppliers can provide these resources. Based on these assumptions, the organization can partner with suppliers to obtain supply certainty.

RBV considers that suppliers have specific resources that focal organization can use to enhance their competitiveness. The form of such resources is the availability of technology from suppliers used to manage inventory (Prajogo et al., 2016). Supplier integration is a form of external integration (Devaraj et al., 2007). Supplier involvement in production planning positively affects the supplier's ability to supply raw materials on a timely basis through managed inventory vendors (Mittal et al., 2012). Supplier involvement is required in product design (Sjoerdsma and van Weele, 2015). Supplier integration involves coordinating and sharing information with key suppliers that give the focal organization the ability and knowledge (Srinivasan and Swink, 2015). Suppliers must be able to ensure the availability and quality of raw materials for the production process to run optimally. There is a positive relationship between supplier performance to operational performance (Flynn et al., 2010). Integration between the focal organization and supplier contributes positively to cost, quality, delivery, and flexibility (Wong et al., 2011).

**P2:** Supplier integration is positively correlated to (a) cost, (b) quality, (c) delivery and (d) flexibility.

### **3.2.2 Customer Integration**

Customer integration deals with the interaction activities between the focal organization and customers embodied in the form of service or product evaluation and feedback on customer demand information (Derrouiche et al., 2008). The concept of information sharing has two aspects, namely quantity, and quality. The quantitative aspect relates to the amount of information distributed, while the qualitative aspect refers to the type of information shared between integration partners in the supply chain. The quality of information includes aspects such as accuracy, timeliness, completeness, currency, easy to access and compatibility of information. Supply chain integration is a form of information exchange mechanism (Chavez et al., 2015). The accuracy of information about customer demand allows the focal organization to improve forecasting and ultimately aims to lower total inventory costs (Kim et al., 2006). Also, the sharing of demand information from customers allows suppliers to know which orders will arrive first and immediately follow up. This information will reduce the uncertainty and transaction costs (Lee et al., 2000). The involvement of customers in the design of new products capable organizations launching a product that is effective and commercially successful. The expected output from customer integration is getting feedback (Danese et al., 2013). Customer involvement is proven to reduce total costs in the supply chain significantly. It shows that customer integration affects operational performance improvement (Zhao et al., 2002). Customer integration proved to have a positive impact on cost performance, quality, delivery and flexibility (Upeven and Nair, 2017).

**P3:** Customer integration is positively correlated to (a) costs, (b) quality, (c) delivery and (d) flexibility.

### **3.2.3 Logistics Service Providers Integration**

Logistics services providers play an essential role in the collaboration. The role of logistics service providers has grown by including after-sales support, warehousing services, transportation services, packaging services and reverse logistics as a value-added services function for the focal organization (Fabbe-Costes and Roussat, 2011). Aguezzoul (2014) stated that integration of focal organization with logistic service providers provides positive benefits to aspects of cost, quality, flexibility, and delivery. Benefit from cost aspect refers to total logistic cost. While the quality aspect becomes a positive consequence of supply chain interaction, i.e., consistency provides quality products and services. Flexibility signifies the ability to adapt to changing customer needs and conditions. These attributes include the ability to meet future needs, capacity to accommodate and grow the customer business, system flexibility, responsiveness to market demand or service, ability to address specific business needs, and time response capabilities. While the delivery illustrates the benefits of supply chain integration based on time indicators, i.e., timely performance, timely delivery and delivery, delivery speed, transit timeliness or delivery. The partnership relationship between the focal organization and logistic service providers contributes positively to logistics performance (Chen et al., 2015). Based on the description of this literature, the propositions in this paper are as follows:

**P4:** Logistics service providers integration is positively correlated to (a) costs, (b) quality, (c) delivery and (d) flexibility.

#### **4. Conclusion and Future Research**

The development of the current business model is illustrated in the form of competition between supply chains. Supply chain integration becomes the key to an organization's competitive advantage. An important point of integration is a mutually beneficial relationship for supply chain members from upstream to downstream. Integration is carried out in the management of material, information, and financial flows with the aim of creating process efficiency and output effectiveness. Integration is realized through integration with suppliers, internal, customer and logistics service providers. Supply chain integration in SCM can theoretically be explained by using RBV and RDT. The difference in organizational performance is determined by the organization's ability to manage internal resources. The ability of an excellent organization is determined by the appropriateness of planning and implementation. Therefore, internal integration becomes the key to the management of internal resources. Internal integration is a synchronization decision of the department's cross-functional planning. The propositions drawn up in this paper suggest that internal integration positively affects the operational performance of the organization.

Resource ownership becomes the main assumption of RBV. However, RBV is criticized for ignoring the influence of the external environment. The organization cannot depend on the management of internal resources. Organizations have an alternative to acquire and utilize external resources. External factors of the organization are the assumptions of RDT. Manufacturers have interdependent relationships with the supplier, customer, and logistics service provider. Complexity and uncertainty are challenges in supply chain management. These challenges can be minimized through external integration. Based on the proposition, it is known that external integration is positively related to the operational performance of the organization. This paper is still limited in the preparation of propositions, so further empirical research is needed to prove the propositions that have been prepared. This paper integrates RBV and RDT in the preparation of propositions. Further research may develop other theories such as transaction cost economics (TCE) to test supply chain integration. TCE also explain how organizations collaborate with each other.

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## **Biographies**

**Yandra Rahadian Perdana** is currently the Ph.D. student in Department of Management, Faculty of Economics and Business, Universitas Gadjah Mada. He is a researcher in Center for Transportation and Logistics Studies, Universitas Gadjah Mada. He is also a senior lecturer in Department of Industrial Engineering, Faculty of Science and Technology, Universitas Islam Negeri Sunan Kalijaga. His research interest includes logistics, supply chain, manufacturing, and lean management.

**Wakhid Slamet Ciptono** is an Associate Professor and currently a full-time senior lecturer in Department of Management, Faculty of Economics and Business, Universitas Gadjah Mada. He is also a secretary of Department of Master of Economics Development. His research interest includes logistics, supply chain, innovation, operations, lean, and behavioral science.

**Kusdhianto Setiawan** is an Associate Professor and currently a full-time senior lecturer in Department of Management, Faculty of Economics and Business, Universitas Gadjah Mada. He is also a Vice Dean for Finance, Asset, and Human Resources, Faculty of Economics and Business, Universitas Gadjah Mada. His research interest includes finance, project management, logistics, supply chain, innovation and organizational studies.