



# Customer integration and operational performance: The mediating role of information quality



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## ARTICLE INFO

### Article history:

Received 21 July 2014

Received in revised form 21 August 2015

Accepted 1 October 2015

Available online 18 October 2015

### Keywords:

Customer integration

Operational performance

Information quality

## ABSTRACT

Much supply chain integration literature tends to be biased towards its positive impact on operational performance. However, inconclusive results demand investigation of the mechanisms through which supply chain integration can lead to superior operational performance. The purpose of this study is to identify empirically the mediating role of information quality on the relationship between customer integration and operational performance, and the direct relationship between customer integration and operational performance. The study is based on a questionnaire sent to 228 manufacturing companies in the Republic of Ireland, and the relationships between the constructs are analyzed through regression analysis. The results indicate that information quality partially mediates the relationship between customer integration and quality, delivery and flexibility. Further, information quality was found to fully mediate the relationship between customer integration and cost.

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## 1. Introduction

Supply chain (SC) integration is a fundamental principle of supply chain management (SCM), and represents a departure from traditional functional business processes to integrated structures of processes [21]. While the SC integration literature describes various integration characterizations and dimensions (e.g. [97,120]), customer integration emerges as a critical integration competency [116]. Customer integration refers to the collaboration and information sharing practices, between a focal firm and its critical customers, in order to become more responsive to customer needs and requirements [128]. It has been suggested that the literature on SC integration tends to be biased towards its positive impact on operational performance; however inconclusive results (e.g. [29,114]) demand investigation of the mechanisms through which SC integration can lead to improved performance [117].

Information quality has been implicitly proposed by the literature as such mechanism; which can largely determine the success of the SC integration effort [76]. Information quality refers to information richness, rather than the amount, and thus it emphasizes the quality and nature of information shared between buyers and suppliers [135]. Despite this, studies that address the mediating role of information quality on the SC integration literature are mostly exploratory (e.g. [6,70]).

Empirical studies that investigate the mediating role of information quality on the SC integration–operational performance link are rather scarce and have produced mixed results (e.g. [26,48]). For instance, while Cousins and Menguc [26] did find support for supplier's communication performance mediating the relationship between SC integration and operational performance, Gulati and Sytch [48] did not find sufficient evidence to support the mediating role of information quality for the relationship between buyer–supplier joint dependence and operational performance. This mixed support calls to further establish the mediating role of information quality on the SC integration–operational performance link. In addition to the proposed mediating role of information quality, the literature suggests a direct relationship between SC integration and operational performance (e.g. [32,39,44,104,122,128]), which has offered inconclusive and, sometimes, contradictory results (e.g. [29,33,114]), which suggests the need to further investigate the mechanisms through which SC integration leads to superior performance.

The mixed support in the SC integration literature has been attributed to operational performance being often measured as an aggregated construct, which not only disregards the individual performance dimensions, but also builds on the assumption that integration has “universal” effects on performance [117]. In view of this argument, this present research extends and complements the existing studies by explicitly investigating the indirect (through information quality) and direct relationships between customer integration, as an important dimension of SC integration, and four key individual dimensions of operational performance [20], namely quality, delivery, flexibility and cost.

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We have adopted social capital theory to explain the relationship between the constructs. Social capital has been regarded as the “relational glue” between suppliers and manufacturers, and thus the underling component that facilitates collaboration between trading partners in the SC [80]. Social capital theory posits that social structures constitute a valuable asset, which enables social actors to generate and exchange social assets [62,88]. Furthermore, like any other form of capital, social capital (i.e. social structures and social assets) creates value, and thus it makes possible the achievement of benefits [24]. Based on social capital theory and the SCM literature, we represent social structures such as buyer–supplier relationships [5,84] in the form of customer integration. Social structures (such as customer integration) enable interaction between buyers and suppliers, which generates social assets such as information quality [58,62]. Finally, this process of interacting and exchanging information quality can generate an understanding of the parties’ mutual needs, and the necessary adjustments to improve operational performance [5,26].

In view of the previous argument, this research adds to the body of knowledge on SC integration, operational performance and social capital theory by addressing two research questions:

- (1) To what extent is the relationship between customer integration and operational performance mediated by information quality, and
- (2) To what extent does customer integration associate directly with operational performance (partial mediation).

The answer to these questions will contribute to supplement previous studies by explaining some mechanisms through which customer integration promotes operational performance. Further, through disaggregating operational performance into its individual components, this paper will be able to identify the potentially different effects of customer integration, and thus elaborate more on inconclusive empirical results. The above research questions will potentially illuminate the “black box” of the relationship between SC integration efforts and performance [48]. Furthermore, our study contributes to the building of social capital theory in the SCM context since there is little research that draws on this view in the area [27]. Finally, this paper is also important for practitioners to understand how their SC integration efforts can be more effective for the operational performance measures that they choose to compete.

## 2. Theoretical background and hypotheses development

### 2.1. Social capital theory and SCM

The central position of social capital theory suggests that social structures constitute a valuable asset in themselves, which in turn facilitate the creation of “collectivity-owned” social assets [62,88]. Social capital thus refers to both social structures that enable actions between social actors, e.g. individual persons or groups, and social assets that can be generated through the interaction between social actors [58,88]. Based on social structures and social assets, the literature describes various characterizations of social capital. For instance, Coleman [24] describes three dimensions of social capital: trustworthiness, information sharing and relational norms and sanctions. Note that these three forms of capital are consistent with factors associated with SC integration [59]. Nahapiet and Ghoshal [88] propose three forms of social capital: cognitive capital (resources that provide parties with shared representations, i.e. type of language), structural capital (social capital that results from relationship network configuration, i.e. information sharing) and relational capital (e.g. social capital that emerges from relationships that develop through time, i.e. trust and norms). Koka and Prescott [62] decided to differentiate between social structures and social assets, arguing that the literature has often confused social assets with social structures. Specifically, Koka and Prescott [62] argued that social structures

in the form of buyer–supplier relationships or strategic alliances enable firms to exchange social assets such as information richness, which emphasizes the nature of information (i.e. information quality). This latter view is also shared by various studies that suggest that firms in close relationships are more likely to obtain and generate richer information since the parties involved perceive more cooperation and mutual benefit in the relationship (e.g. [28,50,57,92,119]).

In addition to social structures and social assets, the literature has also conceptualized social capital using a broader view, which includes the expected benefits resulting from the social actors leveraging their relationships. According to Coleman [24], like any other form of capital, social capital creates value, and thus it makes possible the realization of benefits. In other words, social actors who decide to invest in social structures obtain benefits through the process derived from social structures and social assets [5]. This broader view of social capital has been applied recently to the context of SCM since relationships across the supply chain refer essentially to relationships between social actors, who ultimately leverage their relationships to improve performance [5,62]. For instance, Cousins et al. [27] and Cousins and Menguc [26] examined the association between socialization process (between buyers and suppliers) and the creation of relational capital, which, in turn, led to improved supplier performance. Studies have also incorporated the structural and cognitive aspects of social capital, and investigated their association with buyer and supplier performance (e.g. [15,63,69,123]).

Our study adopts this broader view of social capital theory and represents social structures such as the buyer–supplier relationship [5,84] in the form of customer integration. It has been argued that SC integration (i.e. customer integration) and collaboration practices represent a higher level of buyer–supplier relationship [54]. Accordingly, customer integration could represent a form of social structure. Social structures (such as customer integration) enable firms to generate and exchange social assets such as information quality [58,62]. According to Cousins and Menguc [26], integrated SC structures and socialization structures are linked closely together, which could represent the means through which SC actors interact with one another. This interaction can reduce in turn the perceived risk between buyers and suppliers, and thus increase information flow and information richness [26]. Finally, it is through the process of interacting and exchanging information quality that an understanding of the parties’ mutual needs can be generated and operational performance improved [5,26]. Accordingly, drawing from the logic expressed in social capital theory and the SCM literature we present a conceptual framework that models customer integration as antecedent to information quality and operational performance. We then add that information quality can be antecedent to operational performance, which is also consistent with the tenants of social capital theory.

### 2.2. Customer integration and information quality

SC integration refers to the fundamental shift away from managing individual functional processes, to managing integrated processes in the SC [101]. The literature on SC integration is extensive and provides various dimensions such as horizontal integration, vertical integration [100], internal integration and external integration [104]. Another characterization of SC integration suggests two major interrelated forms: forward and backward integration [14,44]. Forward integration involves integrating the forward physical flow of delivery schedules, capacity and product information from suppliers and customers. Backward integration is instead aimed at the backward integration of information (through information technology), and the flow of information such as customer orders and demand forecasts from customers to suppliers. A further classification of integration involves the intent of integration, which ranges from arm’s length relationships to more strategic and collaborative activities [114]. Furthermore, some authors have described SC integration at multiple levels: customer integration, information

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