Influence of Information Exchange and Supply Chain Integration on Supply Chain Performance

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Abstract. Supply chain integration is widely used by both practitioners and researchers, because of an essential role to enhance competitive advantage in supply chain. Organizational competences, such as relational competence and information technology (IT) competence, have been recognized as influencing factors to promote supply chain integration for improving supply chain performance. In this paper, we intend to extend the stream of research in supply chain management by empirically identifying the antecedents and consequences of supply chain integration between supply chain partners. The results indicate that relational competence and IT competence in supply chain are positively related to supply chain integration. Information exchange is directly related to supply chain performance. Our results provide strong support for the notion of information exchange and supply chain integration to enhance supply chain performance. Implications for future research and practice are offered.

Keywords: Relational Competence, IT Competence, Supply Chain Integration, Information Exchange, Supply Chain Performance

1 Introduction

As firms begin competing for competitive advantage, supply chain management (SCM) has become a primary concern for achieving differential advantage. The main premise of SCM is that information exchange for goal sharing and process integration between trading partners in a supply chain, can reduce total logistics costs and enhance the value delivered to the customers [3]. The research stream to explain the relationship between organizational competences and supply chain performance has identified important research variables, such as information exchange and supply chain integration, and suggested strong guidelines for developing and maintaining the relationships [5].

With an emphasis on information exchange and supply chain integration, studies on supply chain management have recognized the importance of supply chain
In recent years, supply chain integration has received significant attention from both practitioners and academics. Supply chain integration is the systematic and strategic coordination of entire supply chain, and supply chain integration is one of the most important aspects of SCM [2, 6]. Information exchange is also treated as one component of the overall integration among supply chain [4]. Supply chain managers are constantly mentioned of the essential importance of information exchange to improving supply chain performance.

Information exchange and supply chain integration is useful for reducing operation costs through elimination of waste, as well as improving communication and sustainable competitive advantage for entire supply chain [6]. Based on the resource-based view (RBV) and the dynamic capability theory (DCT), we suggest a theoretical framework. The purpose of this study is to examine how relational competence and IT competence can influence supply chain performance through information exchange and supply chain integration for obtaining supply chain performance. This study contributes to enhance the knowledge on information exchange and supply chain integration by providing theoretical insights and empirical findings.

2 Literature Review and Hypothesis Development

2.1 Resource-based view and Dynamic capability theory

Resource-based view (RBV) disputes that variance in organizational performance can be explained by strategic resources (or assets), such as core competence [1], dynamic capability [8]. According to the RBV, resource and capability are two key constructs applied to explain the sources of gain and sustain competitive advantages. Organizational competence is primarily a function of supply chain integration between and within supply chain partners. Dynamic capability theory (DCT) has emerged to explain how organizations can integrate, build, and reconfigure their internal and external resources or competencies in rapidly changing environments [8]. Wu et al. [9] suggest that supply chain capabilities refer to the ability of an organization to identify, utilize, and assimilate both internal and external resources/information to facilitate the entire supply chain activities.
The organizational capability perspective is related to RBV, which addresses how resources and capabilities achieve competitive advantage [2]. From the theoretical foundations of RBV and DCT in SCM literature, we adopt relational competence and IT competence as two antecedents of information exchange and supply chain integration for achieving common goal between trading partners. We also define comprehensively supply chain performance as the consequence of information exchange and supply chain integration. Based on the above discussion, Fig. 1 provides a research model in this study.

### 2.2 Relational competence and SC capabilities

Relational competence is defined as the extent to which supply chain partners will maintain and strengthen their supply chain relationship. Relational competence influences the pattern of SCM activities and can improve the performance of a supply chain [4]. Moberg et al. [4] proposed that posits relationships between supply chain variables and information exchange. Firms that do not have the ability to develop strategic partnerships and share organizations’ goal, vision with partners can obstruct the supply chain integration, collaboration, and firm performance. Thus, we hypothesize the relationship between relational competence and SCM capabilities such as information exchange and supply chain integration.

\[ H1a \text{ Relational competence is positively related to information exchange.} \]
\[ H1b \text{ Relational competence is positively related to supply chain integration.} \]

### 2.3 IT competence and SC capabilities

IT support for integration competency refers to the extent of IT use in re-engineering business process, improving process flexibility, and support supply chain integration. Moberg et al. [4] found that IT commitment plays a critical role for the information exchange and supply chain integration.
exchange. Rai et al. [7] found that effective IT connection improves the supply chain process integration between supply chain partners. Wu et al. [9] studied the role of supply chain capabilities as a key mediator between IT investment and firm performance. Results indicate that supply chain capabilities are able to transform IT-related resource into higher value for a firm. Thus, we hypothesize the relationship between IT competence and SCM capabilities such as information exchange and supply chain integration.

[H2a] IT competence is positively related to information exchange.
[H2b] IT competence is positively related to supply chain integration.

2.4. Information exchange and SCM performance

Information exchange refers to the capability of a firm to share information and knowledge with its entire supply chain partners in an effective and efficient management [9]. Research on the role of information exchange in SCM has investigated two areas. First, SCM theory has clearly established that information exchange is a key component of successful supply chains. Second, there has been supported for the relationship between information exchange and supply chain performance [4]. Thus, we hypothesize the relationship between information exchange, supply chain integration, and supply chain performance.

[H3a] Information exchange in supply chain is positively related to supply chain integration.
[H3b] Information exchange in supply chain is positively related to supply chain performance.

2.5 Supply chain integration and SCM performance

Supply chain integration is enhanced by sharing information, knowledge and supply chain performance about key processing activities. The fundamental of supply chain integration is well-coordinated flow of materials and information from supply chain partners which allow firms to have a smooth production process. Prajogo and Olhager [6] suggested that long-term relationships can result in improved firm performance, and logistics integration is significantly related to supply chain performance. Huo [2] argue that the diverse dimensions of supply chain integration can ultimately be collapsed into three dimensions: customer, supplier and internal integration. Thus, we hypothesize the relationship between supply chain integration and supply chain performance.

[H4] Supply chain integration is positively related to supply chain performance.
3 Research Methodology

3.1 Sampling and data collection

The constructs and measurement items used in this research were adopted from previously validated measures, or developed on the basis of literature review. Since the unit of analysis in this study was at the organizational level, data for this study were collected from a survey, which was conducted for manufacturing companies enrolled in specific supply chain industry in South Korea. The survey questions consisted of five-point Likert-type scale with end points of “strongly disagree” and “strongly agree”. A total of 600 firms were mailed. Of 131 replied questionnaires, 122 were usable with approximately 22% of the response rate.

3.2 Measurement Model

Although we used a relatively small sample for this analysis, the partial least squares (PLS) method can model latent constructs with small to medium-sized data sets that do not necessarily follow a normal distribution. The results for the Cronbach’s alpha, CR, and AVE indicate sufficient convergent validity for all constructs. The results of the comparison between the value of the square root of the AVE (from 0.794 to 0.882) of each construct and the correlation of the construct (from 0.383 to 0.639) with all other constructs demonstrate sufficient discriminant validity among all constructs. Thus, these results show a highly acceptable level of reliability, convergent and discriminant validity.

3.3 Hypothesis Testing

We assessed the proposed research model by examining the significance of the paths in the structural model. Results of the analysis for the structural model are presented in Table 1.

Table 1. Result of Hypotheses Test

<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Path Coefficients</th>
<th>T-value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1a Relational competence → Information exchange</td>
<td>0.549</td>
<td>6.768**</td>
<td>Accepted</td>
</tr>
<tr>
<td>H1b Relational competence → Supply chain integration</td>
<td>0.219</td>
<td>2.086*</td>
<td>Accepted</td>
</tr>
<tr>
<td>H2a IT competence → Information exchange</td>
<td>0.221</td>
<td>2.781**</td>
<td>Accepted</td>
</tr>
<tr>
<td>H2b IT competence → Supply chain integration</td>
<td>0.342</td>
<td>4.589**</td>
<td>Accepted</td>
</tr>
<tr>
<td>H3a Information exchange → Supply chain integration</td>
<td>0.283</td>
<td>2.776**</td>
<td>Accepted</td>
</tr>
</tbody>
</table>
4 Discussion and Conclusion

This study tried to suggest a theoretical framework to explain how relational competence and IT competence, as major dimensions of organizational competence, facilitate supply chain capabilities and supply chain performance. Given the theoretical foundations of RBV [1] and DCT [8], we thus define comprehensively relational competence and IT competence, as the antecedents of information exchange and integration in supply chain. And supply chain performance was defined as the consequence of information exchange and integration in supply chain.

The results of this study have highlighted the critical role of organizational competence and supply chain capabilities in achieving supply chain performance. First, relational competence and IT competence, as theoretical underpinning of RBV, influence the pattern of supply chain capabilities and shared values in successful business-to-business relationships. Second, information exchange and supply chain integration, as major supply chain capabilities, as a theoretical underpinning of DCT can influence supply chain performance leading to sustainable competitive advantage for supply chain partners. Third, this study proved that the dynamic capability theory complements the RBV by providing that critical supply chain capabilities span firm boundaries with competitive.

This study contributes to suggest the empirical evidence that relational competence in SCM provides positive influence on supply chain integration through information exchange to gain sustainable competitive advantage, and that information exchange influences positively on supply chain performance through supply chain integration.

References