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The Impact of Inter-Organizational Information Systems on Capabilities of Buyer-Supplier Dyads

Abirami Radhakrishnan
Morgan State University
Email: abirami.radhakrishnan@morgan.edu

Dessa David
Morgan State University
Email: dessa.david@morgan.edu

ABSTRACT

Using empirical data from 154 buyer–supplier dyads, we conducted an investigation of direct and indirect effects (through external integration) of IOS usage on capabilities of buyer–supplier dyads. We found that external integration plays a mediating role in the relationship between IOS usage and capabilities of buyer–supplier dyad.

KEYWORDS: Supply chain management, Empirical Methods, MIS / OM Interface

INTRODUCTION

Supply chain integration (SCI) can improve supply chain performance (Srinivasan, Mukherjee, & Gaur, 2011). SCI is comprised of internal integration within a firm and external integration with key supply chain partners (Frohlich & Westbrook, 2001; Schoenherr & Swink, 2012). Firms have gained significant benefits by using various inter-organizational information technology systems (IOS) to collaborate with their supply chain partners (Wang & Wei, 2007; Saeed, Malhotra, & Grover, 2011). IOS is defined as an information system shared by two or more organizations (Cash & Konsynski, 1985).

This study investigates the benefits of IOS enabled external integration at the buyer-supplier dyadic level. Investigating this issue is important because prior researchers have reported inconsistent results.

So, this study addresses the following major research questions:

1. Does IOS usage have a significant direct and indirect (through external integration) impact on capabilities of buyer–supplier dyad?
2. Does external integration with supply chain partners have a significant direct impact on capabilities of buyer–supplier dyad?

We restrict our study to external integration with the largest buyer unit. The largest buyer unit refers to the external customer unit that purchases a major end product in terms of dollar value (adapted from Dong, Carter and Dresner, 2001).

LITERATURE REVIEW

There are two streams of research – the operations management stream and the MIS stream.

The Operations Management Stream

Studies on SCI recognized two types of integration – internal integration within firms and external integration with supply chain partners. Findings are mixed. Several studies showed that integration is beneficial for focal (i.e.) buyer firms (E.g. Frohlich & Westbrook, 2001; Flynn, Huo, & Zhao, 2010; Schoenherr & Swink, 2012; Wiengarten et al., 2014). Some researchers argue that SCI is not an effective strategy for improving performance (E.g. Bask & Juga, 2001, Bagchi et al., 2005; Power, 2005). Some studies found only one firm may realize most or all of the benefits of integration (E.g. Holmberg, 2000; Cousins & Menguc, 2006; Nyaga, Whipple, & Lynch, 2010).

The MIS Stream

IOS systems include EDI, Internet based EDI, supply chain management systems, SRM, CRM, e-procurement systems, open standard IOS and other inter-organizational process automation systems (Croom, 2005; Bagchi et al., 2005; Craighead et al., 2006; Zhu et al., 2006; Magal & Word, 2012; Qrunfleh & Tarafdar, 2014). Prior research points out at asymmetrical distribution of benefits from IOS usage in a buyer-supplier dyad (E.g. Kekre & Mukhopadhyay, 1992; Barua & Lee, 1997; Hart & Saunders, 1998; Ghosh & John, 1999; Mukhopadhyay and Kekre, 2002).

HYPOTHESES

We have three hypotheses.

H1: There is a direct positive relationship between IOS usage and external integration.

H2: There is a direct positive relationship between external integration with buyer and capabilities of a dyad.

H3: There is a direct positive relationship between IOS usage and capabilities of buyer–supplier dyad.

METHODS

We tested hypotheses with data collected through an internet-based survey that collected information about extent of IOS usage (in a buyer–supplier dyad), external integration with buyer unit and capabilities of buyer–supplier dyad. The constructs were defined, operationalized and measured based on items from the prior research. We used purposive sampling because it was not practical to select buyer-supplier dyads by random probabilistic sampling of supply chain partners. We followed the four-stage method proposed by Dillman (2000) to pretest and pilot test the survey instrument. We received usable data from 154 dyads.

RESULTS

We tested the relationship between constructs using structural equations modeling using EQS 6.2 software. Our results supported hypotheses 1 and 2. We did not find any support for Hypothesis 3.

(For the complete paper, please contact the first author).

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