

# Chapter 50

## Two Case Studies on RFID Initiatives: Testing the Impact of IT Infrastructure Integration and Supply Chain Process Integration

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### ABSTRACT

*This paper features the results of an empirical online survey focusing on radio frequency identification initiatives and the revalidation of these results using brief case studies on Charles Voegelé and Vail Resorts. The empirical study investigates the ability of information technology (IT) infrastructure integration and supply chain process integration to moderate the relationships between the importance of the perceived seven adoption attributes and system deployment outcomes, operational efficiency and market knowledge creation in radio frequency identification (RFID)-enabled supply chains. Using the online survey method, data was collected from members of the Council of Supply Chain Management Professionals in North America. The moderated regression procedure suggested by Aguinis (2004) was applied. The three adoption attributes, relative advantage, results, and images turned out to be the most important attributes in these RFID systems. Indeed, both IT infrastructure integration and supply chain process integration moderate the relationships between these three adoption attributes and the RFID system outcomes.*

DOI: 10.4018/978-1-4666-2625-6.ch050

## **INTRODUCTION**

Studying RFID adoption attributes will be a continuing exercise as research uncovers more issues that need to be addressed. Using the online survey method, this study focuses on the seven adoption attributes that are very likely to impact the executive decision to deploy RFID to pursue either operational efficiency or market knowledge creation or both in their supply chains. This study also investigates the influence of information technology (IT) infrastructure integration and supply chain process integration on the relationships between each of the RFID adoption attributes and the two dependent variables, operational efficiency and market knowledge creation. Moderated regression analysis (MRA) is used to undertake this determination. After establishing the findings of the MRA statistical procedure, two case studies will be presented to confirm the findings of the empirical study. Practical lessons for corporate executives will also be offered based on the learning experiences of the two firms, Charles Voegelé and Vail Resorts.

## **BACKGROUND**

This study is part of larger exploration on the importance of RFID in the supply chain on account of its potential to render information visibility that will, in turn, solve a number of supply chain problems such as the “bullwhip effect” or distortion of signals down the value chain due to lack of accurate information. Previous published work on the larger study has featured the relationships between the elements that constitute IT infrastructure integration and supply chain process integration and four system deployment outcomes that are typical of a supply chain: exploitation, exploration, operational efficiency, and market knowledge creation (Angeles, 2009; Angeles, 2008). In another related study, the relationships between absorptive capacity attributes or organizational routines and business processes used by firms to acquire,

assimilate, transform, and exploit knowledge, and two system outcomes, operational efficiency and market knowledge creation were explored (Angeles, 2010). In this second study, the ability of IT infrastructure integration and supply chain process integration to moderate the relationships between the independent and dependent variables was also tested. The study presented in this paper is a piece of the aforementioned more comprehensive inquiry, that focuses on the relationship between the perceptions of study respondents of the importance of seven adoption attributes of RFID and two system outcomes, operational efficiency and market knowledge creation. More importantly once again, the ability of IT infrastructure integration and supply chain process integration to moderate these relationships was investigated.

### **Independent Variables: RFID Adoption Attributes**

Rogers’ (Fichman, 1992; Rogers, 1983) review of more than 3,000 studies on diffusion of innovations has resulted in the identification of five general adoption attributes: relative advantage, compatibility, complexity, observability, and triability. Numerous attempts early on at conceptualization and empirical testing resulted in mixed and inconclusive findings, attributed mainly to the lack of a solid theoretical foundation. To improve on this situation, Moore and Benbasat (1991) developed a refined instrument intended to measure individual and organizational perceptions of adopting an IT innovation. Two more attributes, image and voluntariness of use, were added to the original five constructs by Moore and Benbasat (1991). “Image” refers to “...the degree to which use of an innovation is perceived to enhance one’s image or status in one’s social system” (Angeles, 2010, p. 195) (and “voluntariness of use” refers to “...the degree to which the use of the innovation is perceived as being voluntary or of free will” (Moore & Benbasat, 1991, p. 195). In this study, the Moore and Benbasat formulation was chosen over other rival

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