IMPLEMENTING EMERGING TECHNOLOGIES IN PROCUREMENT AND SUPPLY CHAINS

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ABSTRACT

Emerging technologies such as artificial intelligence (AI), robotic process automation (RPA), internet of things (IoT), and blockchain are being deployed in organizations to execute and facilitate supply chain and procurement activities. Yet knowledge is lacking with respect to the effectiveness of the implementation of these technologies. This study investigates the justification, use cases, practical applications and effectiveness of emerging technologies implementation in supply management. Based on cases of Emerging Technologies' implementation in several organizations, we develop and empirically validate a framework that links drivers, applications, contextual implementation variables and processes and effectiveness of various emerging technologies in supply management.

INTRODUCTION

Organizations are adopting and implementing new technologies such as Artificial Intelligence (AI), Robotic Process Automation (RPA), Internet of Things (IoT) and Blockchain [1] to execute and facilitate operational and supply chain activities. However, little is known about the implementation process, applicability and effectiveness of emerging technologies for procurement activities. Managers and organizations' perspectives about which technology can be considered as 'emerging' differs. For example, while most companies generally view Blockchain, Internet of Things (IoT) and Analytics as emerging, technologies such as Robotic Process Automation (RPA), Contract Analytics, Procure-to-Pay, Spend Analytics, Optical Character Recognition and Radio Frequency Identification technology are viewed as emerging by some and as basic by others.

The critical point, however, is not about how technologies are classified. What is more important is whether an organization is adopting and effectively implementing a technology that fits its purpose and whether that technology delivers value for the organization. Indeed, literature argues that emerging technologies have a significant impact on the procurement function of a company particularly facilitating the important function of managing the relationships among buyers and suppliers.

Previous research findings about emerging technologies in procurement and supply chains [2] identify emerging technologies in supply chains and procurement. What is missing, however, are the implementation factors — specifically how organizations actually implement the technologies, including the process or temporal sequence of implementation as well as the scaling of such technologies. Recognizing the fast-changing landscape of technologies and the potential of emerging technologies in procurement, the primary objectives of the research were to:

- Identify the emerging technologies being used in procurement and understand how companies justify the implementation of the technologies
- Investigate how the technologies are actually implemented including the barriers to implementation and key success factors.

METHODS

We carried out interviews with 21 practitioners from 18 companies. The interviews generally ranged from 60 minutes to about 90 minutes on video conferencing platforms; two researchers took turns asking the questions. Interviews were recorded if it was agreeable to the interviewee. The interviews were transcribed, and the researchers coded, synthesized and analyzed the data based on the key themes of the study: justification of the emerging technology and implementation of the technology.

FINDINGS, DISCUSSION AND CONCLUSION

Companies implemented various technologies in procurement including Blockchain, Internet of Things (IoT), Analytics (Descriptive, Predictive & Prescriptive), Robotic Process Automation (RPA), Contract Analytics, Procure-to-Pay, Spend Analytics, Optical Character Recognition (OCR) and Radio Frequency Identification technology (RFID). Both internal and external drivers play important role in emerging technologies implementation in procurement. Operational efficiency appears to be a major internal driver of most emerging technologies implementation. In addition, technologies like Blockchain, IoT, and Analytics were needed to provide visibility in spend analysis, process and data integration, and standardization in the supply chain. However, some technologies were implemented to keep up with the company's culture of change or orientation towards emerging technologies. In terms of external drivers for implementing emerging technologies, the need to keep pace with or stay ahead of competition, market demand and the changing technological landscape provided the justification for implementing many of the technologies.

In general, the implementation processes and strategies adopted by companies to implement the technologies depended on the technology itself, the technology maturity level of the company, its legacy systems, resources and skills availability and several other factors. Theoretically, the study provides the understanding of how different pathways for implementing technologies in supply chains relates to drivers of and the effectiveness of such technologies, thus filling a gap in the literature. In terms of practical implications, understanding the implementation factors for different technologies enables managers to plan for and implement the technologies more effectively.

REFERENCES

[1] Handfield, R., & Linton, T. *The LIVING supply chain: The evolving imperative of operating in real time.* John Wiley & Sons. 2017.
[2] Handfield, R., Jeong, S., & Choi, T. Emerging procurement technology: data analytics and cognitive analytics. *International journal of physical distribution & logistics management*, 2019, 49(10), 972-1002.