

Towards a strategic innovation framework to support supply chain performance

Measuring
performance in
a supply chain

Milton M. Herrera

*Economic Sciences Research Centre, Universidad Militar Nueva Granada,
Bogotá, Colombia, and*

Johanna Trujillo-Díaz

*Ingeniería Industrial, Escuela Colombiana de Ingeniería Julio Garavito,
Bogotá, Colombia and*

Ingeniería Industrial, Universidad Nacional Abierta y a Distancia, Bogotá, Colombia

Received 5 April 2020
Revised 22 December 2020
Accepted 23 January 2021

Abstract

Purpose – This paper aims to determine how a strategic innovation framework that integrates the concepts of innovation function, dynamic performance management (DPM) and system-dynamics (SD) modelling can measure performance in a supply chain (SC).

Design/methodology/approach – The paper provides a strategic innovation framework for an SC by considering three steps. First, a systemic intervention is presented based on the innovation functions that influence SC performance. Second, an analysis of the system's performance is proposed. Third, a model SD-based simulation is designed. The developed framework is explained by employing a case study of the Colombian pig sector SC.

Findings – The results reveal that identifying and synchronising the system's performance drivers associated with the innovation functions could improve the inventory in the SC.

Practical implications – On the one hand, managers can use the proposed framework to evaluate the innovation investments and understand their impact on operation performance (e.g. on inventories). On the other hand, policymakers may support decision-making to improve policy design (e.g. through investment in R&D).

Originality/value – Few studies discuss the impacts of innovation functions on SC performance. This paper aims to fill this theoretical gap and to contribute to the literature by suggesting a novel framework which includes innovation functions.

Keywords Supply chain, Management, System dynamics, Innovation system, Performance, Simulation

Paper type Research paper

1. Introduction

Supply chains (SCs) have been defined as complex networks of agents interacting, characterised by many performance measure and motivated by multiple interests that influence the strategic level of decision-making (Gunasekaran *et al.*, 2001, 2004). The generation, diffusion and utilisation of technology for SCs involve a variety of types of innovation, in numerous interrelated societal domains, creating a business environment with a higher level of uncertainty for decision-making. In today's business environment, innovation plays an essential role in improving SC performance (Afshari *et al.*, 2019; Balfaqih *et al.*, 2016; Orji and Liu, 2020). Although innovation is a significant component of a

Funding: The paper has been written within the framework of the project "Knowledge management model to increase the competitiveness in the swine supply chain". The authors would like to acknowledge Universidad Militar Nueva Granada (INV-ECO-3008) and Escuela de Ingeniería Julio Garavito (DII/C008 CIIJ2019) for the financial support in carrying out this work. The authors also thank the editors and the anonymous referees for their valuable comments and suggestions. The authors are also grateful to Dr. Penny Ann McKeon for editorial work.



International Journal of
Productivity and Performance
Management
© Emerald Publishing Limited
1741-0401
DOI 10.1108/IJPPM-03-2020-0131