A Knowledge-Based Reference Model to Support Demand Management in Contemporary Supply Chains
Sotiris Gayialis, Stavros Ponis, Ilias Tatsiopoulos, Nikolaos Panayiotou and Dimitrios-Robert Stamatiou
National Technical University of Athens, School of Mechanical Engineering, Sector of Industrial Management and Operational Research, Athens, Greece
sotga@central.ntua.gr
staponis@central.ntua.gr
itat@central.ntua.gr
panayiot@central.ntua.gr
drstam@central.ntua.gr

Abstract: Supply Chain Management (SCM) has been in the epicenter of numerous research efforts for, at least, the last two decades. One of the most prominent issues identified in literature, directly related with Supply Chain Integration and Collaboration, is information sharing between supply chain entities, especially for planning and monitoring purposes. The establishment of efficient mutual information sharing mechanisms and the transformation of meaningful information into actionable knowledge is an object of continuous research amongst academics and supply chain practitioners all over the world. The scrutiny of literature sources not only leads to the identification of a specific thematic area dealing with the applications of Knowledge Management (KM) to support decision making and enhance Supply Chain integration, planning and coordination, but also brings to light a significant gap regarding the application of KM for demand variability management and demand – supply alignment purposes. This paper aims to bridge the identified gap by providing a methodology for developing a knowledge enhanced reference model for supply chain operations, focusing on demand management across the supply chain network. The resulting reference model will be able to indicate critical activities and decision points for demand variability and to monitor demand variations through intra- and inter-organizational processes. For this purpose, reference model integrates different modeling views for the various business process perspectives, such as decision view, risk view and knowledge view. The proposed methodological approach utilizes a set of process modelling methods for the construction of the reference model, consisted of a set of reusable business process models, which can be applied and specialized in various industries to support decision making for demand management. The generic reference model resulting from the application of the methodological approach incorporates and transfers insights and experiences from other well-established process reference models and case studies to those organizations that adopt the model in order to design or redesign their supply chain business processes.

Keywords: demand management, supply chain, reference model, knowledge management, business processes