

Proceedings of the 13th IFAC Symposium on
Information Control Problems in Manufacturing
Moscow, Russia, June 3-5, 2009

Understanding Supply Chain Complexity with Performance Measurement

Anna C. Cagliano*. Antonio Carlin** Carlo Rafele***

Department of Production Systems and Business Economics, Politecnico di Torino, Torino, Italy

* Tel: +39 0110907206; e-mail: anna.cagliano@polito.it

**Tel: +39 0110907249; e-mail: antonio.carlin@polito.it

*** Tel: +39 0110907286; e-mail: carlo.rafele@polito.it

Abstract: Despite the great number of complex systems existing in the real world, complexity is currently a poorly explored topic. In organizational settings, managers regularly apply to complex contexts classical approaches developed for simple systems, just because they do not know how to take into account companies' internal and external complexity. Nevertheless, before developing new managerial models, a deep knowledge about drivers and effects of complexity is needed.

After defining the characteristics making supply chains complex systems, this paper discusses performance measurement as a methodology to analyze the effects of complexity on supply chain behavior. The results of a survey highlight that manufacturing companies usually evaluate isolated aspects of their supply chains, without considering the relationships between different performance indicators or dimensions. This work suggests System Dynamics as a valuable approach to understand the cause and effect connections among metrics and system elements affecting their values, thus clarifying the structure leading to a complex behavior.

This research is the first step of a larger project aimed at providing companies with innovative tools to understand and manage supply chain complexity.

Keywords: Complex Systems, Supply Chains, Performance Evaluation, System Analysis, System Dynamics