

# Enhancing Supply Chain Agility by Deploying Competence Management and the Supply Chain Operations Model

N. Sefiani, L. Chraibi, K. Reklaoui, Y. Sefiani

**Abstract**—Currently, business environment is characterized by pressure caused by stiff competition, constant changes (e.g., product/ technological innovations, decreasing product lifecycles, and product proliferation), and a high level of market uncertainty and unpredictability. The agility of the Supply Chain Management (SCM) is clearly identified as a key factor for success and a strategic essential lever. This paper explores the impact of deploying competence management and Supply Chain Operations Reference (SCOR) model on firm performance. Our approach is based on a systemic view by considering the SCOR reference model as the heart of competence management system.

**Keywords**—Competence, competence management, performance, SCOR model and agility.

## I. INTRODUCTION

**I**N a highly competitive environment, the enterprise must show more flexibility, proactivity and innovation to improve its global performance. In fact, controlling a supply chain, that involves many actors and operations in interaction, requires an integrated competence management adapted to the company's specific objectives and expectations. Which is why competence management has been the subject of many researches since a long time with different perceptions of the concept according to different contexts of a company [1].

Competence management is becoming a strategic issue at all company levels for an industrial performance improvement. Therefore, improving the supply chain's performance plays an important role when it comes to building competitive advantage and when it might contribute significantly to both a firm's growth and profitability. Currently, companies are aware of competence management's importance as a tool, in order to improve the individual, but also collective, skills and abilities of their employees, which gives rise to debate on the evolution of work and social relationships. Therefore, the agility approach can only succeed if it takes into account the dimension of competence at both

individual and collective levels in order to ensure an efficient global supply chain.

Although the importance of competence management activities is widely recognized as a potentially vital source of competitive advantage, firms still struggle to find efficient and effective processes and management activities to accomplish competence management [1].

## II. REVIEW OF RELATED WORKS

### A. Competence Management

The earlier works on managing competencies have been focused mainly on the individual aspect [3]. Regarding the complexity of work situations and the necessity to implement human resources policy for team projects lead researchers to give more interest to collective competencies. Later on, the evolution of organizations' missions and challenges in a complex and volatile environment has been required a more holistic and integrated vision about management competence. Competencies may be thus examined at three levels: Individual, collective and organizational. Individual competence refers to a person, collective competence describes the emerging competence of a team in a work situation, and organizational competence is introduced to describe an enterprise's organizational ability. It represents what the company can do by mobilizing its resources [2]. These levels are interconnected and enhancing each other [3].

A literature's review about the competence's concept has been done in [4], we may consider the following definition: "Competence is the ability of an actor (an individual, a collective) to act and react with the required relevance to perform an activity or set of activities in a given type of work situation. In the latter, the actor is at the heart of a process of selecting, combining and mobilizing knowledge, skills, abilities and behaviors on the one hand, and environmental resources on the other. In so doing, the actor is able to achieve the expected performance".

Competence management requires implementation and use of various methods and tools to realize qualitative and quantitative competence's measurements. This assessment should be concerned with the different supply chain's processes involved in the creation of product(s) or service(s). Which allows a company to increase its supply chain's efficiency by identifying and allocating the necessary core competencies.

N. Sefiani is with the Faculty of Sciences and Techniques of Tangier, Abdelmalek Essaadi University, Morocco (corresponding author to provide phone: (+212) 667-984-883; e-mail: tsefiani@gmail.com).

L. Chraibi is with ENSA-Tangier, Abdelmalek Essaadi University, Morocco (e-mail: lotfichraibi@gmail.com).

K. Reklaoui is with the Faculty of Sciences and Techniques of Tangier, Abdelmalek Essaadi University, Morocco (e-mail: kamal.reklaoui@gmail.com).

Y. Sefiani is with Prince Mohammad Bin Fahd University, KSA (e-mail: yassine\_sefiani@hotmail.co.uk).

According to [5] and [6], competence management involves four kinds of process:

- Competence identification, i.e. when and how the required competencies are identified and defined (in the present or in the future) to carry out tasks, missions, strategies;
- Competence assessment, i.e. (i) when and how to identify competences acquired by individual and/or (ii) when and how a company can recognize that an employee (or an individual) has acquired specific competencies; this process describes also the different connections between individuals and required competencies.
- Competence acquisition, i.e. how a company can decide for its employees about how and when to acquire some specific competencies in a planned way;
- Competence usage, i.e. how to use information and data collected about competencies produced and transformed through the three previous processes. Which allows to identify gaps between required and acquired competencies, who should attend required training, how to find key employees and so on.

### B. SCOR Reference Model

#### 1. The Supply Chain

A supply network (supply chain) is a complex set of arcs and nodes, interconnected by information flows, material flows, and cash flows. SCM is allowing to bring order into this complex system. To be able to manage a supply network, there is a need for knowledge about the network and the business aspects of network operations. Supply chain has become a critical component of competitiveness since it takes place beyond the company integrating some of its stakeholders as customers, suppliers and institutional partners.

#### 2. SCOR Model

To explore the SCM, we will focus on the SCOR Model (Supply Chain Operational Reference-Model) developed by the Supply Chain Council [7] as shown in Fig. 1. The SCOR model is considered as a reference standard which provides a consistent SCM framework for all actors, including business process, performance evaluation and the best practice. At its origin, a simple story, based on the will of 69 American managers from various sectors of activities. SCOR is both an efficient management tool and a toolkit which provides the company with relevant solutions to better balance its supply chain.

The SCOR model is also a diagnostic tool for SCM enabling users to understand the processes involved in a business organization and to identify the vital features that lead to customer satisfaction. As supply chain performance evaluation model, SCOR model is helping all actors of a supply chain, (manufacturers, first-tier and second-tier suppliers, downstream retailers/distributors/logistics service providers and customers), to improve the efficiency of SCM thereafter by communicating effectively via the reference model.

In practice, SCOR enables companies to examine the configuration of their supply chains [8]. It allows to identify and eliminate redundant and wasteful practices and activities along a supply chain. As for the business process architecture, SCOR defines the way these processes are interacting and how they can be performed from a supplier to a customer [9]-[11].

The SCOR's architecture is organized around five management processes (Plan, Source, Make, Deliver, and Return); each management process is subdivided into process categories, elements, tasks and activities [12]-[16]. Moreover, these five management processes are supported by ten support processes.

Let us describe summarily the SCOR's five management process: "To plan" process plays a fundamental role, it is planning the supply chain, procurement, fabrication, delivery and returns. "To supply" process is subdivided in three supply subprocess (supply to stock, to order and to demand); it is dealing with the identification and selection of suppliers, delivery, transfer of raw materials, subsets, products and/or services and payment. "To produce" process, is focused on the production's planning as well as the necessary resources, production and testing, packaging, storage and output of the commodity, it involves three production sub-process (production to stock, to order and to demand). As for "To deliver" process, there are four delivery sub-process (delivery from stored products, on command, on demand and retail), "To deliver" process examines the offer, the receipt of an order, shipment, receipt by the customer and billing. Incorporated recently into the model from version 4.0 [17], "To Return" process is concerned with three types of products (defective, in need of technical assistance and in excess of needs). It examines identification, authorization and conditions for return, the schedule of shipments and finally the product's return.

#### 3. The Agility and Competence

Agility is the ability to change and reconfigure the company's internal and external parts (strategies, organizations, technologies, people, partners, suppliers, distributors and customers), in response to changes, unforeseen events and uncertainty of the environment. Agility allows companies to have more reactive and adaptive practices at the different management and operational levels (the organizational structures, information systems, and logistics processes).

A key feature of an agile organization is flexibility [18], which should be a state of mind shared by the organization's actors. For this, raising agility can only succeed if it takes into account both individual and collective competencies in order to ensure an efficient global supply chain.

### III. PROPOSED METHOD

The proposed systemic view about competence management approach will allow the company to manage its competencies in order to achieve the required performance.

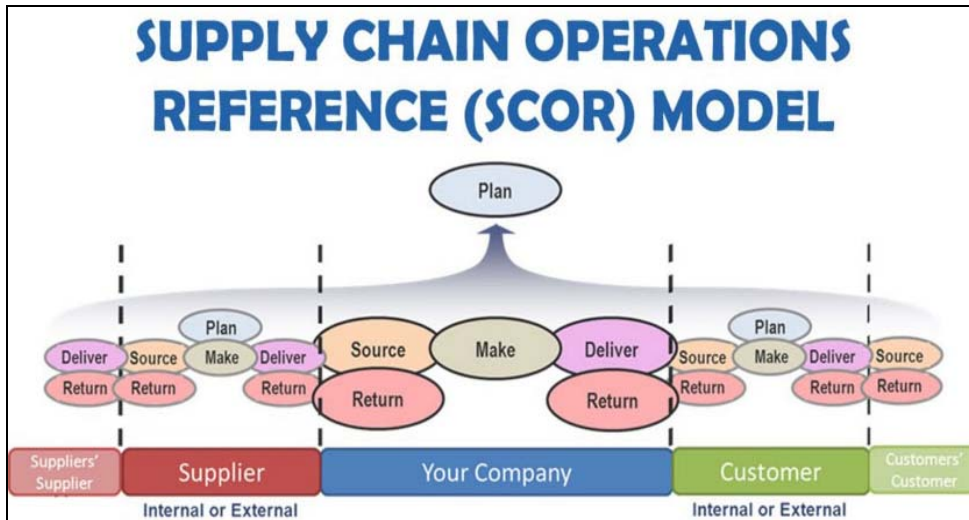


Fig. 1 Ref SCOR Model

The systemic approach [19], offers an extremely rich theoretical framework and a variety of powerful tools for the study and analysis of the issues encountered in most companies.

*A. The Systemic View*

In this systemic context, we consider competence management as a sub-system of enterprise management, designed by the O-D-I model (Operating - Decision Information Model). As shown in Fig. 2, The O-D-I Model involves three main modules:

- Operating Module: processes the information needed to ensure the transformations allowing inputs to be translated into competence management.
- Decision Module: prepares decisions that determines behavior and adjusts the operating module in accordance with objectives and expected performance.
- Information module: ensures the coupling between the operating module and the decision module.

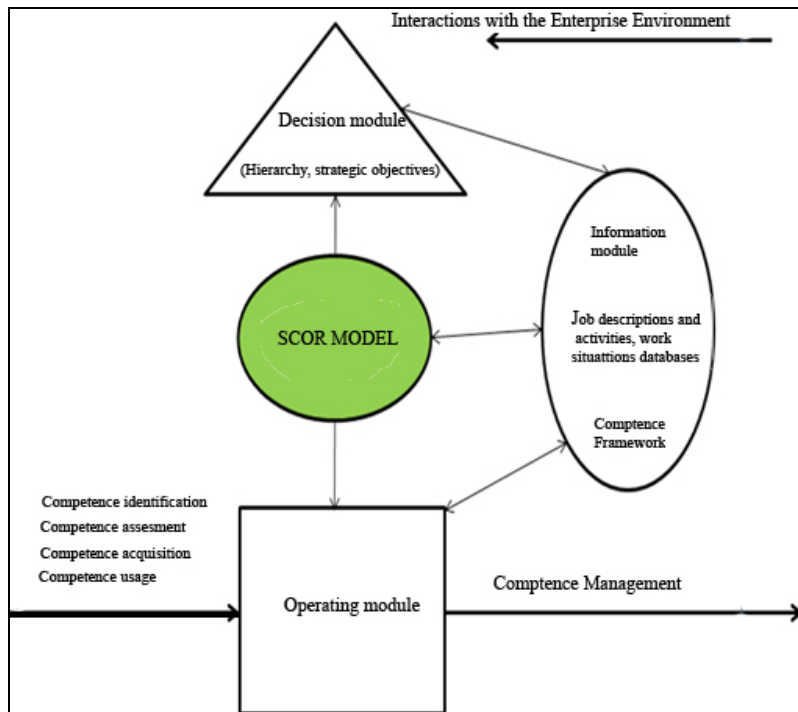


Fig. 2 Systemic view of competence management

Our systemic view follows the steps of:

- Define strategy (SCOR model).
- Define Processes (SCOR model).
- Define activities.
- Formalize acquired competence.
- Assess required competence.
- Analyze Gap between acquired and required competence
- Plan for action

#### IV. CONCLUSION

To sum up, improving performance and agility has become a strategic need for any company. Implementing a competence management process will necessarily lead to identify the required elements for a successful performance in a competition market place. The aim of this paper was to develop a model to enhance supply chain agility by deploying competence management and the SCOR model.

Based on a systemic view and performance metrics suggested by the SCOR® approach, our model provides a useful instrument improving the company's performance and can offer significant possibilities for future development and research in the competence management field.

Further generalization of the model and validation with real data may allow us to develop an expert system for business performance measure.

#### REFERENCE

- [1] Campisi D, and Costa R (2012). Intellectual capital and competitive advantage: an analysis of the biotechnology industry, *World Academy of Science, Engineering and Technology*, vol 71, 163–168.
- [2] Bogaert L et al. (1994). Strategics a situational puzzle: the lit of component, In G. Hanel, A. Heene, John Wiley, competence-based competition, 57–73.
- [3] Nordhaug O (1996). Collective Competence in Organizations, In J. S. Fakenberg and S. Haugland (ed), *Rethinking the boundaries of strategy*, Copenhagen Business Scholl Press, 193–217.
- [4] Sefiani N., A. Boumane, J.P. Campagne, and D. Bouami, 2012. "Process of identifying competencies based on a functional approach", *International Journal of Engineering Science and Technology* 4, pp.265-275.
- [5] Stenlund KL and Hörte, S.A (1999). Competence Accounting: Methods for Measuring and Valuing Key Competencie, in: *European Operations Management Association VI International Annual Conference "Managing Operations Networks"*, June 7-8, Venice.
- [6] Berio G, and Harzallah M, 2007. Towards an integrating architecture for competence management, *Computers in Industry*, vol 58, 199–209.
- [7] Supply Chain Council, (2008), *Supply Chain Operations Reference Model, Overview of SCOR Version 9.0*.
- [8] Li, L., Su, Q., Chen, X., 2011. Ensuring supply chain quality performance through applying the SCOR model. *International Journal of Production Research* 49(1), 33-57.
- [9] Min, H., Zhou, G., 2002. Supply chain modelling: past, present and future. *Computers & Industrial Engineering* 43(1-2), 231-249.
- [10] Huang, H.S., Sheoran, K.S., Kestar, H., 2005. Computer-assisted supply chain configuration based on supply chain operations reference (SCOR) model. *Computers and Industrial Engineering* 48, 377-394.
- [11] Supply Chain Council., 2010. *Supply Chain Operations Reference Model Version 10.0*. The Supply Chain Council, Inc. 856p.
- [12] Huang, H.S., Sheoran, K.S., Kestar, H., 2005. Computer-assisted supply chain configuration based on supply chain operations reference (SCOR) model. *Computers and Industrial Engineering* 48, 377-394.
- [13] Hwang, Y.D., Wenb, Y.F., Chen, M.C., 2010. A study on the relationship between the PDSA cycle of green purchasing and the performance of the SCOR model. *Total Quality Management* 21(12), 1261-1278.
- [14] Kasi, V., 2005. Systemic Assessment of SCOR for Modeling Supply Chains: In *Proceedings of the 38th Hawaii International Conference on System Sciences*. Centre for Process Innovation, Georgia State University. 03-06 January 2005, 10P. ISSN: 1530-1605.
- [15] Schnetzler, M.J., Lemm, R., Bonfils, P., Thees, O., 2009. The supply chain operations reference (SCOR) model to describe the value-added chain in forestry. *Allgemeine Forst und Jagdzeitung*, 180(1/2), 1-14.
- [16] Supply Chain Council., 2008. *Introduction to GreenSCOR: Introducing environmental considerations to the CSOR Model*. Proceedings of the North America conference and exposition March 17-19, 2008, Minneapolis, MN. 18p.
- [17] Supply Chain Council, (2000), *Supply Chain Operations Reference Model: Overview of SCOR Version 4.0*.
- [18] Christopher M (2000). The agile supply chain: competing in a volatile market, *Industrial Marketing Management*, vol 29, 37–44.
- [19] Le Moigne, J L (1999). *The modeling of complex systems*, (2th ed.). Dunod, Paris.