

# Contributing to the Supply Chain Management theory establishment

JOSÉ CRESPO DE CARVALHO

**ABSTRACT:** *The purpose of this paper is to contribute to the development of the SCM theory and practice. First, by revisiting the theories and areas of knowledge that contributed to the emergence of SCM. Secondly, by establishing a set of statements – for discussion – that should constitute the basis of Supply Chain Management as an area of organizational and inter-organizational knowledge, able to create competitive advantages and to be foreseen as an idiosyncratic though pre-paradigmatic area of knowledge.*

**Key words:** Supply Chain Management, Competitive Advantages, Supply Chain Management Strategic Capacity

## **TÍTULO: Contribuindo para o estabelecimento do estado da arte na Gestão da Cadeia de Abastecimento**

**RESUMO:** *O intuito deste artigo é o de contribuir para o desenvolvimento da teoria e prática associadas à Gestão da Cadeia de Abastecimento. Primeiro revisitando as áreas que deram origem ao pensamento e conhecimento estabelecido na Gestão da Cadeia de Abastecimento. Depois estabelecendo um conjunto de proposições simples, a debater, que devem constituir os fundamentais da área de Gestão da Cadeia de Abastecimento como área organizacional e inter-organizacional do conhecimento, capaz de criar e sustentar vantagens competitivas e de ser encarada como uma área idiossincrática do conhecimento, não obstante pré-paradigmática.*

**Palavras-chave:** Gestão da Cadeia de Abastecimento, Vantagens Competitivas, Capacidade Estratégica da Gestão da Cadeia de Abastecimento

---

### JOSÉ CRESPO DE CARVALHO

crespo.carvalho@iscte.pt

Doutorado em Gestão de Empresas – Instituto Universitário de Lisboa (ISCTE-IUL), Lisboa, Portugal. Professor Catedrático no Instituto Universitário de Lisboa (ISCTE-IUL). Tem actividade diversa ao nível da publicação em livro, em revistas científicas e profissionais e em jornais de grande expansão. Tem larga experiência de formação de executivos nas áreas da Logística e Gestão da Cadeia de Abastecimento. Participou e/ou coordenou mais de 50 projectos de consultoria nas áreas da Logística e da Gestão da Cadeia de Abastecimento.

PhD in Business Administration – Lisbon University Institute (ISCTE-IUL), Lisbon, Portugal. Full Professor (Lisbon University Institute – ISCTE-IUL). With varied published books and articles in scientific and professional journals, and in newspapers. Has extensive experience of executive training in Logistics and Supply Chain Management. Participated and/or coordinated more than 50 consulting projects in Logistics and Supply Chain Management.

The organization is a project that is as old as humanity. It has gone through different forms and been subjected to various influences. Observing and foreseeing the future of the organization is the work of various kinds of researcher within different areas of knowledge. The researchers and professionals of Supply Chain Management (SCM) should not leave this type of work to other areas; it is their obligation to draw on the intrinsic characteristics of their knowledge area and contribute to this project with varied and expressive analyses and forecasts of the future organization.

Within this context, the present paper presents two proposals from a SCM perspective to structure a possible approach that can contribute to the analysis and forecast of the organization, namely:

Proposal 1 – The approaches based on an SCM logic have been decisively influenced by other areas of knowledge that may justify it: the military area, the biological area, the economic area, the systems approach area, the psycho-sociological area, the quantitative methods area, the communication area, the creativity and the complex thought areas and the strategic area, among others.

Proposal 2 – The interconnection between different areas of knowledge that benefit and give rise to SCM should, on the one hand, contribute to the sustainability of this area (SCM) and, on the other, feed the continuous need to keep the strategic SCM capacity of the organization alive; in other words, the resulting knowledge should contribute to creating SCM's competitive advantages. Only by developing a proper SCM knowledge can the important and intrinsic competitive advantages emerging from this area be foreseen and, thus, the future of the SCM logic and concept.

The development of these proposals from a conceptual approach will lead to a framework of thought that aims to contribute to the analysis and forecast of the future of the organization. It is then considered that the future of the organization is critical to the future of the SCM concept, logic and knowledge. Thus, without a proper context in terms of organizational knowledge, way of construction and perspectives it is difficult to foresee the future of SCM itself.

The development of the proposals will try to focus, albeit briefly, on the topics suggested below.

## **PROPOSAL 1**

The military area of knowledge gives consideration to dimensions such as the critical components of cost and information in war as well as the right moment and means

(quantity and adequacy) to develop war. Relationships should be established between military knowledge and that developed by SCM approaches, particularly at the original level of the seven Rs (the right product to the right client, in the right quantity and right condition, at the right place, the right time and the right cost) subjacent to the first steps of Logistics knowledge (Sun Tzu, 1972) (Clausewitz, 1832).

Thus, as we know that the military Logistics area combines variables that were later used to develop business Logistics, namely the seven Rs approach, why not propose an approach that can combine and add both the military and business dimensions, presenting (and recognizing) it more as a desirable state than a possible or an achievable result? Realistically, the Supply Chain is the best possible aggregation of a series of variables and dimensions which may unfortunately be in opposition and even contrary in nature. In fact, the Supply Chain somehow represents a high service proposal at minimal cost. In light of this paradox, it can be said that no company is able to achieve this position as an optimum and certainly not for itself alone. By recurring to trade-off management, companies should try to propose the best equilibrium between service and cost and be consistently open to new paradigms and frontiers, namely those that may be established through some degree of collaboration such as SCM, and not only instigating isolation and rivalry between companies.

Thought within the area of the biological knowledge involves dimensions like the adaptability of species, thus organizations, and also the availability of resources that can ensure the survival of such species. The idea of the designing and/or evolving organization will be the basis to foresee this reality and consequently the way the evolution of SCM should be developed, planned or searched for (Darwin, 1859), (Malthus, 1798), (Hannan and Freeman, 1977), (Capra, 1983).

In fact, if business variables are added to military Logistic dimensions, namely when viewed through market eyes (seven Rs perspective), it is easy to foresee and conclude for the need for companies to adjust and adapt in order to achieve degrees of collaboration that may provide the necessary balance between service at a minimal cost. This balance may be achieved when companies' boundaries are more volatile, with few vertical integration degrees and more open to collective survival than to individual prosperity. Just as in species, biologically their survival and adaptability is mainly due to the collective desire of a number of individual beings that belong to a particular species.

The economic area of knowledge carries the ideas of organizational arrangement (e.g. formation, development and structure) and establishes "liaisons" to the SCM knowledge mainly through the classical "make or buy" dilemma (Arrow, 1974), (Coase, 1937), (Penrose, 1959), (Williamson, 1985), (Simon, 1947).

Moreover, the question may be raised and maintained to a higher economic level, i.e., to what point does the economy that explains the classical businesses arrangements, with strong degrees of internalization, limited rationality and high levels of opportunism, namely when facing specificity of actives (Transaction Cost Analysis), may be complemented or even substituted, somehow, for a different company arrangement view, more based in networks and not in forces, individualism and power. The ARA approach to networks – Actors, Relations and Activities – as proposed by the Industrial Marketing and Purchasing Group, namely by Gadde and Håkansson (2001) is an example of this.

The systems thinking area of expertise brings the logic of interdependent and dynamic knowledge in order to provide the connection between product flows, the ups and downs of inventory levels, the out of stock problems and the bullwhip effect in Supply Chains (Bertalanffy, 1968), (Boulding, 1956), (Forrester, 1958; 1961), (Sterman, 2000), (Checkland, 1981), (Le Moigne, 1977).

Additionally, what should be said if more collaborative companies in a Supply Chain mean that higher levels of visibility within and between companies are foreseen and lower levels of stockouts, low inventory levels, improved planning activities (including collaborative planning) and reduced bullwhip effects?

The psycho-sociological area of knowledge explores the organizational rationality and its evolution and tries to explain how culture, values, practices and major rules in organizations will influence the course of action, and consequently the greater or lesser tendency to develop and initiate CM approaches (Weber, 1925), (Habermas, 1981), (Crozier, 1963), (Crozier and Friedberg, 1977).

In fact, collaboration is a question of mindset as it is searching for higher service levels with minimal costs. Therefore, it can only be influenced by a proper culture, values and collaborative practices.

The quantitative methods area of knowledge fundamentally appeals to the game theory, notably to the collaborative or win:win games which are essential when searching for internal integration between different silos or vertical/functional areas, and external integration in thinking organizations under a SCM approach (Shubik, 1959), (Morgenstern and von Neuman, 1944), (Nash, 1950).

Yet again, the SCM approach can pave the way to a new organizational paradigm, one that may be sustained by collaborative dimensions instead of just rivalry and

force dimensions. For example, Porter's (1980) five forces may be complemented by the value net approach due to Bradenburger and Nalebuff co-opetition approach (1997).

The communication area of knowledge explores the way the institutional speech and the communication of the organization and its practices will lead the markets and generally all the stakeholders, along with the media, to guarantee and be favorable to the organization practices and emphasize the results achieved by the efforts of SCM (Maingueneau, 1991).

Consequently, communication and its effects may be used in a SCM effort not only to clarify and reduce "gossip" within and between companies but also, to motivate and adjust companies to a consensual and additional focus in final markets' service needs (at a minimal cost).

The creativity and complex thought areas are replacing the traditional dichotomy of the «or/or» thought with the inclusive «and/and» thought. The latter way of thinking, in either controlled and unstable or chaos conditions (frontier of maximum creativity conditions), may be essential for organizations that are striving to foresee the right product, at the right place. At the right time and into the right quantity, accompanied by a low cost approach is an impossible equation or an insolvable paradox that is a legacy of Logistics thought and knowledge. Thought on the contrary, as a dynamic frontier that should not have a formal end (a continuous way that never ends) (Stacey, 1991), (Morin, 1982).

One can see the inclusive way of thought, or the «and/and» approach, as the necessary approach to explore the collaboration and creation of networks of companies and a SCM perspective.

Finally, and without exhausting all the possible influences and areas of knowledge that contribute to the SCM logic, there is strategic knowledge which presents the holistic, global and also pre-paradigmatic field of management (such as the SCM knowledge). Strategy should be seen as holistic and supra-functional knowledge that it enables the balance between the different legitimacies or organizational paradigms, i.e., the shareholder legitimacy, the internal organization legitimacy and the market or client legitimacy. Complementarily, the SCM area may assume the role of integration between those different legitimacies or paradigms and its formal representations in organizations, the so called vertical or functional silos (Khun, 1983), (Popper, 1989), (Porter, 1980; 1985), (Mintzberg, Ahlstrand and Lampel, 1998).

Essentially, SCM should be seen as a strategic weapon when companies are trying to collaborate and overcome the old competitive paradigms of isolation, power and forceful rivalry. Yet again, collaboration enables good service with a low cost perspective balance from a trade-off management perspective. See the sum of influences explored in proposal 1 – Figure 1 – Circle of Influences, SCM Construction.

## PROPOSAL 2

Even when it is understood that SCM knowledge is emergent and built around other areas of knowledge, it should develop its own idiosyncrasies that can be used to make it autonomous and capable of sustaining competitive advantages. The types of argument that are presented in SCM knowledge are simply explored so that SCM knowledge appears as a creator and able to sustain competitive advantages for organizations (Mentzer, Min and Bobbitt, 2004) (Bowersox and Daugherty, 1995):

- Intra-organizational collaboration/integration is vitally important to transform stakeholders' goals' participating in supply chains into competitive advantages;

Whether in business or in life, the first step always begins within boundaries. Somehow, one should work with one's self, where everything begins: self awareness and self management. The objective is to apply this not only to individuals but also to companies with their own idiosyncrasies, own nature, personality and culture. It is no different in SCM. The first step in a SCM approach is to destroy internal walls, vertical silos and to create a horizontal and flat organization, focused on and driven by the market.

- Inter-organizational collaboration/integration is a way of creating joint competitive advantages for the organizations participating in supply chains;

Once the internal steps have been taken, once the self is assessed, known and properly managed, companies should look outside their boundaries to the possible collaborative companies (co-opetition approach) in the network of supply chains.

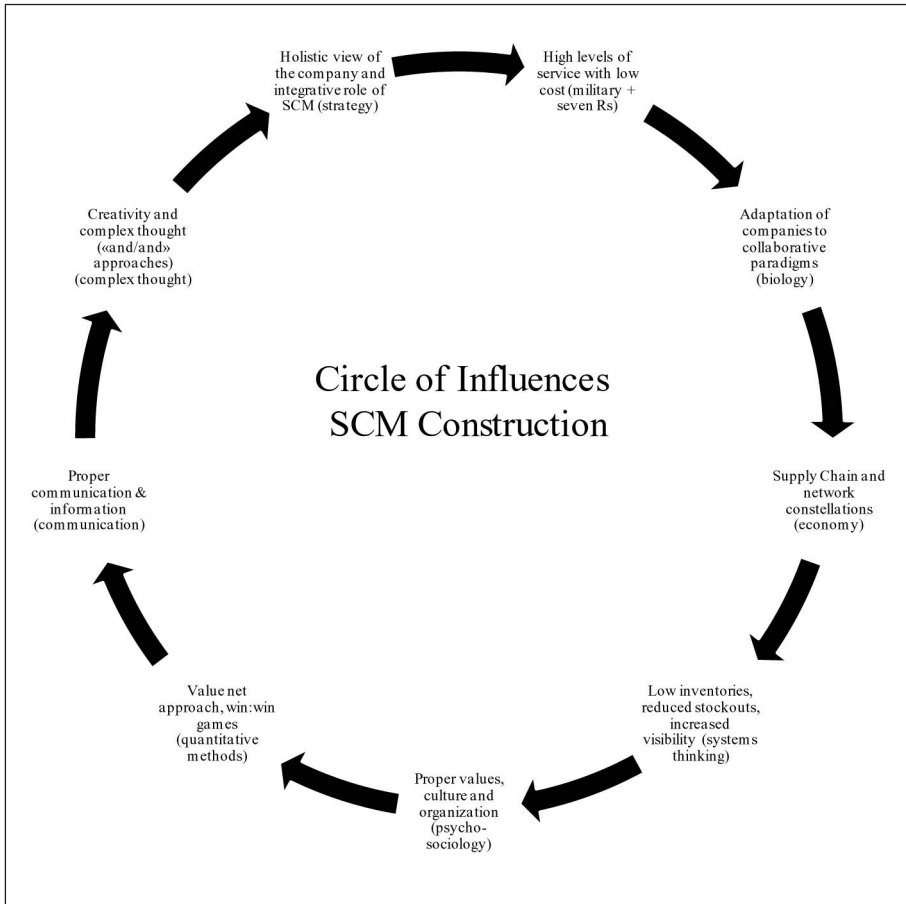
- Process efficiency in the supply chain is a way of reducing costs;

Doing the right things is the first step to cost reduction so that the complex SCM approach can be adopted and high service standards at low cost levels reached.

- Results efficacy in the supply chain is a way of providing availability/service, in a broader sense, or the right product at the right place, at the right time and in the right quantity, in a limited sense; it is an approach to differentiation;

**FIGURE 1**

**Circle of influences for SCM approach construction (resulting from Proposal 1)**



Doing things right is a step ahead of doing the right things. It aims to add service to the low cost perspective. If both cost and service are added, high service levels at low cost levels can be foreseen.

- Gains in productivity can be achieved in supply chains through cost reduction in inputs when considering the results obtained with the enlargement of the client service package through the effectiveness obtained with the outputs;

Productivity gains are intrinsically related with doing the right things and doing the things right simultaneously. The proper level of efficacy with appro-

appropriate efficiency means high levels of productivity. High levels of productivity are important to better serve clients or to have high service standards with low cost levels.

- Competitive advantages for organizations that participate in supply chains can be obtained with a good articulation and balance of the «make or buy» dilemma;

If correctly managed, the «make or buy» dilemma is a real weapon to gain and enlarge collaborative competitive advantages and not only individual, isolated and forceful competitive advantages.

**FIGURE 2**

**SCM approach as a competitive advantage weapon (resulting from Proposal 2)**





- Competitive advantages created for supply chain participants can be achieved when correctly combining supply chain competences and resources;

Collaborative competitive advantages are the result of core competences with threshold resources. However, in this circumstance or from an SCM approach, threshold resources and core competences may be obtained by the proper combination of shared resources and common competences in the companies participating in supply chains.

- Competitive advantages created for supply chain participants can be achieved with the correct use of the information that derives from the order cycle process or other supply chain origins;

Information is a key resource (threshold resource) that should flow within and between companies trying to develop a supply chain approach. Information sharing together with proper and clear communication are SCM enablers and, simultaneously, key drivers for enlarging the collaboration mindset, namely stimulating confidence between companies.

Competitive advantages obtained through adequate service and general quality provided to customers can be achieved with the development of strategic capacity in companies, which means getting the right combination of unique supply chain resources and competences.

In sum, like pipeline or network information, threshold common or shared resources and common core competences emerge in supply chain integrated companies when one is prepared to develop collaborative strategic capacities within and between each company.

The future of the supply chain and of SCM will result both from the development of knowledge areas that influence SCM knowledge creation and anticipate new chapters and from the idiosyncrasies that can be obtained within the body of knowledge created around the concept and applications of SCM.

## REFERENCES

- ARROW, K. (1974), **The Limits of Organization**. Fels Lectures in Public Policy Series.
- BERTALANFFY, L.V. (1968), **General Systems Theory**. Penguin Books. French Translation, Dunod, Paris.
- BOULDING, K. E. (1956), «General systems theory – the skeleton of a science», *Management Science*, vol. 2, pp. 197-208.
- BOWERSON, D. J. & DAUGHERTY, P. J. (1995), «Logistics paradigms: the impact of information technology», *Journal of Business Logistics*, vol. 16, no. 1, pp. 65-80.

BRANDENBURGER, A. M. & NALEBUFF, B. J. (1997), **Co-Optition: A Revolution Mindset that Combines Competition and Cooperation: The Game Theory Strategy that's Changing the Game of Business**. Broadway Business.

- CAPRA, F. (1983), **Le Temps du Changement**. Éd. Du Rocher.
- CARVALHO, J. C. & FILIPE, J. C. (2008), **Manual de Estratégia**. Edições Sílabo.
- CHECKLAND, P. (1981), **Systems Thinking, Systems Practice**. John Wiley and Sons, Ltd.
- CLAUSEWITZ, C. (1832), **Vom Kriege**. Dümmlers Verlag, Berlin.
- COASE, R. (1937), «The nature of the firm». *Economica*, vol. 4, pp. 386-405.
- CROIZER, M. (1963), **Le Phénomène Bureaucratique**. Éditions du Seuil, Paris.
- CROIZER, M. & FRIEDBERG, E. (1977), **L'Acteur et le Système**. Éditions du Seuil, Paris.
- FORRESTER, J. W. (1961), **Industrial Dynamics**. The MIT Press, Cambridge, MA.
- FORRESTER, J. W. (1958). «Industrial dynamics: A major breakthrough for decision makers». *Harvard Business Review*, vol. 36, pp. 37-66.
- GADDE, L.E. & HAKANSSON, H. (2001), **Supply Network Strategies**, John Wiley and Sons Ltd., UK.
- HABERMAS, J. (1981), **Theorie des Kommunikativen Handelns** (Bd.1: Handlungsrationalität und gesellschaftliche Rationalisierung; Bd. 2, Zur Kritik der funktionalistischen Vernunft), Frankfurt am Main.
- HANNAN, M. & FREEMAN, J. (1977). «The population ecology of organizations». *American Journal of Sociology*, vol. 82, pp. 929-964.
- KUHN, T. S. (1983), **La Structure des Révolutions Scientifiques**, Éditions Flammarion.
- LE MOIGNE, J. L. (1977), **La Théorie du Système Général: Théorie de la Modélisation**. Presses Universitaires de France.
- MAINGUENEAU (1991), **L'Analyse du Discours**. Éd. Hachette.
- MALTHUS, T. (1798), «An Essay of the Principle of Population, as it affects the future improvement of society with remarks on the speculations of Mr. Godwin, M. Condorcet, and other writers». J. Johnson, in Paul's Churchyard, London.
- MATHÉ, J.C. & RIVET, A. (1992), **Les Doctrines Stratégiques d'Entreprise**. Les Éditions D'Organisation Université.
- MENTZER, J. T.; MIN, S. & BOBBIT, L. M. (2004), «Toward a unified theory of logistics». *International Journal of Physical Distribution & Logistics Management*, vol. 34, no. 8, pp. 606-627.
- MINTZBERG, H.; AHLSTRAND, B. & LAMPEL, J. (1998), **Strategy Safari**. Prentice Hall.
- MORIN, E. (1982-2004), **La Méthode**. 6 Vols., Éditions Seuil. Paris.
- NASH, J. (1950), «Equilibrium points in n-person games». *Proceedings of NAS*.
- PENROSE, E. (1959), **The Theory of the Growth of the Firm**. Oxford University Press.
- POPPER, K. (1989), **La Quête Inachevée**. Ed. Press-Pocket.
- PORTER, M. (1980), **Competitive Strategy**. The Free Press.
- PORTER, M. (1985), **Competitive Advantage**. The Free Press.
- SHUBIK, M. (1959), **Strategy and Market Structure**. John Wiley, New York.
- SIMON, H. (1947), **Administrative Behaviour**. The Free Press.
- STACEY, R. (1991), **Chaos Frontier: Creative Strategic Control for Business**. Butterworth-Heinemann.
- STERMAN, J. D. (2000), **Business Dynamics: Systems Thinking and Modeling for a Complex World**. Irwin – McGraw-Hill.
- SUN TZU (1972), **The Art of War**. Translated and with an introduction by Samuel B. Griffith, Penguin Books, London.
- VON NEUMAN, J. & MORGENSTERN, O. (1944), **Theory of Games and Economic Behavior**. Princeton University Press.
- WEBER, M. (1925), **Wirtschaft und Gesellschaft**. Tübingen.
- WILLIAMSON, O. E. (1985), **The Economic Institution of Capitalism**. The Free Press.