

HOW TO MORE HOLISTICALLY UNDERSTAND SUPPLY CHAIN MANAGEMENT?

Vojko Potocan, Ph.D.

Faculty of Economics and Business
University of Maribor
Razlagova 21, 2000 Maribor, Slovenia
Phone: +38622290255, Fax: +38622516681
E-mail: vojko.potocan@uni-mb.si

Abstract

In the global competitive environment, enterprises can survive in the long term by permanently improving their business. Usually, enterprises have limited resources and they face hard conditions; but they can significantly improve their business results if they manage their working better. The new challenges require from them a thorough innovation of management in general, including supply chain management (SCM). Most generally, we can define SCM as concept for managing the entire chain of raw material supply, manufacture, assembly and distribution to the end customer. But under fast socio-economic changes, SCM has faced the demand to develop and adjust continuously in order to contribute to efficient and successful work of the enterprise at stake. The fast development of the theoretical basis and the business practice of SCM open many questions connected to understanding and the definition of SCM. Therefore, in theory and business practice, we can find different approaches to research of SCM and different definitions of SCM. In the same time, the modern management is faced with the dilemma how to more holistically define SCM and how to more holistically understand different definitions of SCM. Based on above mentioned cognitions, our contribution discusses two research questions: 1) How to more holistically understand general framework of SCM, and 2) How to more holistically understand the methodological framework of SCM.

Keywords: content, management, methodology, supply chain management.

1. INTRODUCTION

Organizations in modern environment try to assure their existence and long-term development with the satisfaction of needs and demands of end-customers. Producers can be competitive on the modern global market, when they offer suitable: price, quality, range, uniqueness, and contribution to sustainable development as judged by customers (Etzioni, 1997; Baumol *et al.*, 2007; Daft, 2009; Mullins, 2010; Certo & Certo, 2012).

Entire and innovative (understanding) forming and performing purchasing operations and physical distribution has also an important role in business (Harland, 1996; Cooper *et al.*, 1997; Armstrong, 2006; Naslund & Williamson, 2010). They define the possible level of suitability when assuring the needs and demands of end-users. The use of logistic and material management in an organization enables partly improvement of work, but not (also) “optimization” of the whole production process of products and/or services (in which more organizations collaborate). To deal with the whole supply process many different integrated

concepts of managing across the traditional functional areas of purchasing operations and physical distribution were developed – i.e. materials management, merchandising, logistic, supply chain management - SCM (Lambert *et al.*, 1998; Shane, 2008; Chopra & Meindl, 2012; Deshpande, 2012).

Inside the entire problematic of the management of integrated concepts in the contemporary conditions, we will focus on the consideration of SCM (Potocan, 2009; Christopher, 2012). SCM shares a crucial impact over organizations competitiveness. Thus, SCM must attain the best possible efficiency, effectiveness, and sufficiency.

Management literature define SCM as presents ambitious and strategically significant management concept, which can be defined as “managing the entire chain of raw material supply, manufacture, assembly and distribution to the end customer” (Mentzer *et al.*, 2001; Mullins, 2010; Chopra & Meindl, 2012; Manuj & Pohlen, 2012). SCM is the most developed integrated concept, but by its use, the organization meets some open dilemmas such as how to more holistically understand SCM, 2) how to create unified framework for researching of SCM, 3) how to create appropriate values-, general-, methodological-, content-, and context-related frameworks for consideration of SCM, and 4) how to more holistically examine SCM, etc.

There are many potential issues in tackling the holistic definition of SCM, creation of suitable frameworks of understanding of SCM and development of holistic examination of SCM. Among them, we will focus our attention on conceptualization, formulation, and application of broader and more unified general and methodological frameworks for discussion of SCM.

2. ORIGINS FOR CONSIDERATION OF SUPPLY CHAIN MANAGEMENT

In management literature authors reported about existence of many different definitions of SCM (Simchi-Levi *et al.*, 2007; Naslund & Williamson, 2010; Connelly *et al.*, 2012). This leads to the questions of how one should simultaneously learn to know and define similarities and differences between knowing definitions from more broader and unified consideration of SCM ((Douglas *et al.*, 1997; Potocan, 1998; Kannan & Tan, 2005; Potocan & Mulej, 2012).

Management theory and practice determine elementary environment for consideration of SCM (Mentzer *et al.*, 2001; Monczka *et al.*, 2008; Christopher, 2011; Bowersox *et al.*, 2012; Chopra & Meindl, 2012). On their basis we continue with discussion and development of a general framework for consideration of SCM. Authors try to attain unification of consideration of the tackled problems by using of different criteria, from which management literature primarily focused consideration on four criteria: (a) Prevailing theoretical perspectives – like functional, personality, behavior, etc., (b) Driving forces – like opportunity, resources, interests, etc., (c) Explaining theories – like social, technical, economic, etc., and (d) Important (selected) domains - like technological, socioeconomic, research, pedagogical, etc.

Mentioned criteria must be used as a synergetic entity for definition of the general framework, and hence, for support to a more unified consideration of any problem. The ways of taking the criteria into account depends also on considering persons. The results of application of the above four criteria are, therefore, additionally impacted by the following factors related to personal working and behavior (Armstrong, 2006; Buchanan & Huczynski, 2010; Lafley & Johnson, 2010; Thun, 2010).

Researchers must, before they use criteria, define the chosen contents, values and weight of selected criteria. Thus, they define their own content framework. This defines their own unified basis for definition of various ways of consideration and enables them to compare single ways of consideration with the others. The level of holism and behavior of considering persons has a crucial impact on the definition of contents.

The considering persons can use the above unified criteria for consideration of their problems at stake and though formulate different outcomes (i.e., several different, but correct) inside the selected criteria and values for general definitions of the problem. Every single potential solution reflects the definition of the problem from a selected viewpoint enabling a relatively objective basis for further specific consideration of the problem at stake. The considering persons select one from the set of possible solutions that is deemed to best match the values-, methodological-, content-, and context-related basis for consideration of the selected problem in a synergetic style.

We face with the questions of how to – inside the definition of the/a general framework for consideration of SCM – clarify differences between several insights in SCM in both theory and practice. This clarification can result from understanding and definition of the existing values-, methodology-, contents-, and context-related differences of SCM as consequences of many objective and subjective factors and reasons behind them (Buchanan, Huczynski, 2010; Mullins, 2010; Chopra & Meindl, 2012, Deshpande, 2012; Manuj & Pohlen, 2012). For our work we clarify possible factors of differences in consideration of SCM in a most general approach into two groups: professional orientations and interest reasons (Potocan, 1998; Potocan *et al.*, 2005; Potocan, 2009; Potocan & Mulej, 2009).

SCM can be viewed as a professional issue tackling many sciences and making them interdependent. But their findings are enabled, authored, and applied by decision makers and their teams. Hence, the scientific orientations and political (i.e., interest) viewpoints of SCM and orientations and interest in SCM are interdependent, too (Etzioni, 1997; Mulej *et al.*, 2004; Potocan *et al.*, 2005; Mulej, 2007; Buchanan & Huczynski, 2010).

The scientific/professional viewpoint includes attempts of attain a holistic definition of the basic attributes of SCM in terms of contents, methodology, and values if all crucial sciences cooperate. They depend on knowledge, experience, and professional orientations; this makes them (seem) quite objective and rational, if professionals act and behave holistically. For specialists without capacity and practice of interdisciplinary creative cooperation this is very difficult to attain.

The political viewpoint includes interests to be defined and concerted concerning the basic starting points. It should assure general preconditions for SCM to be implemented everywhere. Mostly, it depends on the network of different values and knowledge expressed as interests in a given period of time. Therefore, as a rule, the political aspect is rather subjective and irrational, because the western practice is rather one-sidedly argumentative rather than synergetic.

The dynamics of evolution of SCM provide for a further important reason for many different insights in SCM to exist (Wren, 2004; Armstrong, 2006; Mullins, 2010; Certo & Certo, 2012). Attributes of these dynamics can be clarified if we understand SCM as depending on time, the development level of science and knowledge, and the prevailing attributes of both the social and natural environments of SCM. It has paralleled changes in the perspectives and level of development of attributes of single time periods in societal development – like prevailing values, culture, ethics and norms, the important sciences for SCM working - especially knowledge about production, management, industrial

engineering, etc., and prevailing conditions and preconditions of environments in which SCM works. The dynamics of development of SCM enable also an insight in, explanation, understanding, and consideration of the concept of how various scenarios of working of SCM can be applied. Thus, we can find out inconsistencies between the current understanding of SCM and the prevailing understanding of SCM in a given environment, discover the positive and/or negative gaps between them, and formulate the necessary measures to overcome these gaps.

Application of the presented insights enables us to define, in the most general terms, the general content framework of SCM. This framework provides a basis for the further development of a relatively, perhaps even holistic and unified, framework for the understanding of SCM as a base for a unified and sufficiently comparable consideration of different insights into SCM.

There are many potential issues in tackling the definition of the framework and its use for SCM research. Among them, we will focus on the bases and basic attributes of the conceptualization, formulation, and application of a holistic and unified methodological framework for SCM.

3. METHODOLOGICAL FRAMEWORK OF CONSIDERATION OF THE SUPPLY CHAIN MANAGEMENT

We continue with discuss about different methodological approaches for research of SCM. Most of these approaches have dealt with complicated rather than complex SCM constructs; they tried only recently to stress relations between parts of reality, which mostly used to be considered in separation and, hence, one-sidedly rather than holistically and with synergies earlier (Bertalanffy, 1950; Wiener, 1956; Beer, 1979; Foerster, 1987; Checkland, 1999; Mulej *et al.*, 2004; Wallis, 2009).

Management authors for definition of methodological framework use several approaches from the traditional approaches to systems approach, and according to their selected viewpoints (Etzioni, 1997; Armstrong, 2006; Daft, 2009; Mullins, 2010; Buchanan & Huczynski, 2010; Certo & Certo, 2012). Generally, they take either any one of the traditional approaches or the systems approach.

Management theory emphasizes systems approach as most interesting and promising, and necessary preconditions for sustainable development of humankind (Baumol *et al.*, 2007; Potocan & Mulej, 2009; Mullins, 2010). If one adds, in order to be less abstract and closer to reality, the consideration of the influential role of the selected viewpoint/s and of humans defining them, one can closer to an array of the different, less traditional systems theories. In this case, interdependence between relations inside the entity under consideration is visible, but it is extended to the relations between the object under consideration and the humans dealing with it. This applies to working of organizations in general and in SCM, too.

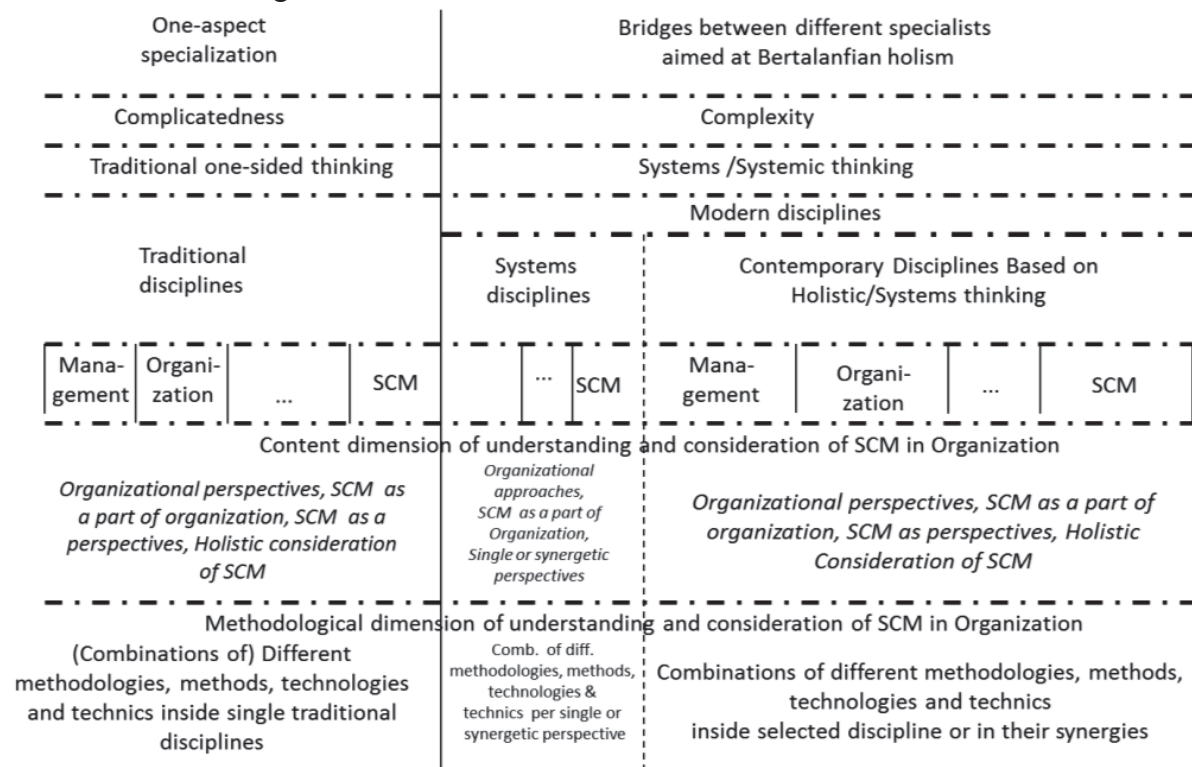
Holistic understanding and researching of SCM in organizations is also related with understanding of interdependence and synergetic working of: 1) The working reality of organizations, 2) Systems thinking – as the methodological approach enabling more or less holism of understanding the organization practice, and 3) SCM construct – as methodology of impacting the working reality.

At the same time, there is a need for a requisitely holistic consideration of organization as an entity/system made of the network/system of: (a) general, (b) group-specific, and (c) individual attributes. On these terms, one can formulate SCM a specification of the general and the group-specific attributes of working and behavior of organizations related to the individual operational part of their activity.

In terms of methodology, SCM can be defined on the basis of its (a) specific area, and (b) specific methods of dealing with this area. This means application to organizations and adding to it the organizations-related specifics in order to holistically deal with working issues of organizations from the crucial viewpoints inside the selected systems of crucial viewpoints. In terms of methodology, SCM applies selected content to organizations based on selected (systems of) viewpoints, purposes, goals, methods, methodologies, context of use, and characteristics of its users.

Our understanding of possible ways for creation of different SCM constructs is presented in Figure 1.

Figure 1 Our way to understanding of the traditional and modern SCM in the methodological framework of modern science



Source: our own work

Presented figure expose several issues related to different approaches for methodological consideration of SCM.

One-aspect specialization is the most usual type of education, because there is so much knowledge that every individual unavoidably focuses on a small fragment of it – as stated different authors (e.g. - Checkland, 1999; Francois, 2004; Mulej, 2007; Potocan & Mulej, 2009; Wallis, 2009). This is no problem if a transition to over-specialization does not result, making its owner incapable of interdisciplinary creative cooperation and, therefore, of holism reaching beyond a single viewpoint. Thus, the entanglement of single parts of the entity under consideration can be studied well (i.e., complicatedness) while complexity is left aside because it covers relations between an entity's parts and between the given entity and its environments. Many important synergies may, therefore, become victims of oversight, including crucial ones. This outcome can be ascribed to the traditional approaches of the industrial period and paradigm. Crises are caused by the traditional, one-

sided behavior of humans, although reality is full of interdependencies rather independencies. On such a basis, the traditional scientific disciplines arose covering many details much better than the big pictures. Their approach causes many important insights and equally many important oversights. Related scientific methodologies are equally specialized and only exceptionally applied in combination or even synergies.

Bertalanffy (1950), therefore, felt as if he were talking “uncommon sense” when he established his General Systems Theory (Bertalanffy, 1968; Davidson, 1983; Checkland, 1999; Mulej, 2007; Wallis, 2009). He perceived the dangers resulting from one-sidedness for humankind and, as he said he had created his General Systems Theory against overspecialization—that is, as the worldview and methodology of wholeness (Bertalanffy, 1950; Bertalanffy, 1968; Davidson, 1983). However, we did not find in his writing that wholeness of insights and other outcomes of human work depend on holism of approach, which can be attained by interdisciplinary creative cooperation. Similarity, called isomorphism, that he mentioned serves well in the case of transfer of knowledge from one specialized discipline of science or profession to another, but less so for interdisciplinary creative cooperation. In particular, it does not support complementary relationships of mutually different specialists. Thus, disciplines and professions can remain isolated from each other. Therefore, complexity of reality remains outside scientific and practical observation if the Bertalanffian values of wholeness do not receive more methodological support than from the General Systems Theory and if it is used only for a formal description of an object under consideration under the name of a system.

In decades after the creation of the General Systems Theory, many systems theories and Cybernetics were created (Beer, 1979; Foerster, 1987; Checkland, 1999; Lewin, 2000; Francois, 2004; Wallis, 2009). They can be grouped into three groups. First group includes Hard systems theories (and Cybernetics), applicable in engineering and natural sciences and practices. Second group includes Soft systems theories (and Cybernetics), applicable in social and humanistic sciences and practices. Third group includes Integrative systems theories (and Cybernetics), applicable for integration of mutually different and, hence, complementary sciences and practices. The 1 and 2 groups support the requisite holism and wholeness when single viewpoints of single disciplines and practices are deemed sufficient. They do contribute to good outcomes, but less so to mastering of the real-life complexity and complicatedness rather than complicatedness only. Thus, the group 3 is essential for humans to control complexity (Mulej et al., 2004; Potocan et al., 2005; Mulej, 2007; Mulej & Potocan, 2009). This applies to SCM, too.

SCM is worked on, if we take a look at various authors referenced here, with either one or the other of the three approaches (Mentzer *et al.*, 2001; Bowersox et al., 2012; Chopra & Meindl, 2012). Some authors still see SCM as an engineering topic, such as the followers of Taylor’s scientific management, Fordism, or Weberism in SCM – different authors discuss about this problem like Simchi-Levi and Simchi-Levi (2007), Monczka et al. (2008), Naslund and Williamson (2010). Other authors feel closer to the soft systems approach, such as the followers of social relations, human relations, or human resources concepts in SCM. Concepts incorporated in the modern, non-bureaucratic applications/concepts are close to the integrative systems theories in SCM.

Once we define the methodological framework for the understanding of SCM, we face new dilemmas. They tackle the content of SCM, such as: which steps have constituted the contents framework of SCM; what is the contents framework of SCM like; what are the links between methodological and contents framework like, etc. But detailed discussion

about content-related framework of SCM exceeds selected limitations of our consideration in this article.

4. SOME CONCLUSIONS

SCM is in forefront of majority of management discussion in theory and in business practice in last twenty years was. But attempts of a holistic consideration of SCM with a unified framework for understanding of it in the modern environments are relatively new. Under the fast socio-economic changes, SCM has faced the demand to develop and adjust continuously in order to contribute to efficient and successful work of the organization at stake. The fast development of the theoretical basis and the working practice of SCM open the questions connected to its understanding and definition.

In working reality, organizations try to simultaneously learn to know and define similarities between different definitions of SCM in order to define the unification of consideration, and learn to know and objectively clarify differences among definitions as a basis for understanding the potential differences in consideration of SCM.

Researchers of organizations' SCM create a general contents framework of SCM as a conceptual basis by consideration of: the prevailing theoretical perspectives, driving forces, explaining theories, and important and selected domains. On the other hand, researchers also try to clarify differences between many different insights in SCM on the basis of understanding: the objective and subjective factors of SCM and reasons/forces behind them and dynamics of the evolution of SCM. They do so, on the basis of research of SCM as a function of time, a development level of science and knowledge, and the prevailing attributes of important environments of SCM.

We used the general, content-related framework to investigate the creation of a general methodological framework. On the basis of conceptual starting points, theoretical cognitions and our experiences from business practice we can define three basic groups of methodological understanding and consideration of SCM - i.e., basic methodological frameworks, such as earlier research of SCM, the earlier systems researches of SCM, and modern holistic researching of SCM.

The suggested "holistic definition of methodological framework of SCM" for research of the role and importance of SCM in modern organizations opens some new managerial dilemmas connected with the terminology of SCM, and especially about an actually holistic understanding of systemic and process understanding and content of SCM.

5. REFERENCES AND SOURCES OF INFORMATION

1. Armstrong, M.: A Handbook of Management Techniques, Kogan Page, London, 2006.
2. Baumol, J.; Litan, E.; Schramm, J.: Good Capitalism, Bad Capitalism and the Economics of Growth and Prosperity, Yale University Press, London, 2007.
3. Beer, S.: The Heart of Enterprises, John Wiley, London, 1979.
4. Bertalanffy, L.: Theory of Open Systems in Physics and Biology, Science, Vol. 111, 1950, pp. 23-31.
5. Bertalanffy, L.: General Systems Theory: Development, Applications, Braziller, New York, 1968.
6. Bowersox, D.; Closs, D.; Bixby-Cooper, M.: Supply Chain Logistics Management, McGraw-Hill/Irwin, New York, 2012.

7. Buchanan, F.; Huczynski, A.: *Organizational Behaviour*, Pearson, Harlow, 2010.
8. Certo, S., Certo, T.: *Modern Management*, Pearson, New York, 2012.
9. Christopher, M.: *Logistics and Supply Chain Management*, FT Press, Upper Saddle River, 2011.
10. Checkland P.: *Systems Thinking, Systems Practice: Includes a 30-Year Retrospective*, Wiley, New York, 1999.
11. Chopra, S., Meindl, P.: *Supply Chain Management*, Prentice Hall, New York, 2012.
12. Connelly, B.; Ketchen, D.; Hult, T.: *Global Supply Chain Management: Toward a Theoretically Driven Research Agenda*, *Global Strategy Journal*, Vol. 3, No. 3, pp. 227–243, 2013.
13. Cooper, M.; Lambert, D.; Pagh, J.: *Supply Chain Management: More than a New Name for Logistics*, *International Journal of Logistics Management*, Vol. 8, No. 1, 1997, pp. 1 – 14
14. Daft, R.: *The New Era of Management*, South-Western College, Cincinnati, 2009.
15. Davidson, M.: *Uncommon Sense: The Life and Thought of Ludwig von Bertalanffy*, Tarcher, Los Angeles, 1983.
16. Deshpande, A.: *Supply Chain Management Dimensions, Supply Chain Performance and Organizational Performance: An Integrated Framework*, *International Journal of Business and Management*, Vol. 7, No. 8, 2012, pp. 1-19
17. Etzioni, A.: *Modern Organizations*, Prentice-Hall, New York, 1997.
18. Foerster, H.: *Cybernetics*, McGraw-Hill, New York, 1987.
19. Francois, C. (ed.): *International Encyclopedia of Systems and Cybernetics*, SAUR, Munchen, 2004.
20. Harland, C.: *Supply Chain Management: Relationships, Chains and Networks*, *British Journal of Management*, Vol. 7 (Special Issue), 1996, pp. S63-S80
21. Kannan, V.; Tan, K.C.: *Just in time, Total quality management, and Supply chain management: Understanding their linkages and impact on business performance*, *OMEGA: The International Journal of Management Science*, Vol. 33, No. 2, 2005, pp. 153-162
22. Lafley, A.; Johnson, M.: *Seizing the White Space: Business Model Innovation for Growth and Renewal*, Harvard Business Press, Boston, 2010.
23. Lambert, D.; Cooper, M.; Pagh, J.: *Supply Chain Management: Implementation Issues and Research Opportunities*, *International Journal of Logistics Management*, Vol. 9, No. 2, 1998, pp. 1–20
24. Lewin, R.: *Complexity: Life at the Edge of Chaos*, University Press, Chicago, 2000.
25. Manuj, I.; Pohlen, T.: *A reviewer's guide to the grounded theory methodology in logistics and supply chain management research*, *International Journal of Physical Distribution & Logistics Management*, Vol. 42, No. 8/9, 2012, pp. 784–803
26. Mentzer, J.; DeWitt, W.; Keebler, J.; Min, S.; Nix, N.; Smith, C.; Zacharia, Z.: *Defining supply chain management*, *Journal of business logistics*, Vol. 22, No. 2, 2001, pp. 1–25
27. Monczka, R.; Handfield, R.; Giunipero, L.; Patterson, J.: *Purchasing and Supply Chain Management*, Cengage Learning, Stamford, 2008.
28. Mulej, M.: *Systems Theory*, *Systems Research and Behavior Science*, Vol. 24, No. 3, 2007, pp. 347-357
29. Mulej, M. (et al.): *How to Restore Bertalanffian Systems Thinking*, *Kybernetes*, Vol. 33, No. 1, 2004, pp. 48-61
30. Mullins, L.: *Management and Organisational Behaviour*, Prentice Hall, New York, 2010.

31. Naslund, D.; Williamson, S.: What is Management in Supply Chain Management? - A Critical Review of Definitions, Frameworks and Terminology, *Journal of Management Policy and Practice*, Vol. 11, No. 4, 2010, pp. 11-28
32. Potocan, V.: Synergy and Integration Processes, *Management*, Vol. 3, No. 2, 1998, pp. 45-65
33. Potocan, V.: Organizational viewpoint of the relationship in supply chains, *JAABC*, Vol. 14, No. 2, 2009, pp. 181-187
34. Potocan, V.; Mulej, M.; Kajzer, S.: Business Cybernetics, *Kybernetes*, Vol. 34, No. 9/10, 2005, pp. 1496-1516
35. Potocan, V.; Mulej, M.: Business Cybernetics – Provocation Number Two, *Kybernetes*, Vol. 38, No. 3/4, 2009, pp. 93-112
36. Potocan, V.; Mulej, M.: Challenging managerial dilemmas of operations management, *Cybernetics and systems*, Vol. 43, No. 6, 2012, pp. 493-514
37. Powell, D.; Riezebos, J.; Strandhagen, J.: Lean production and ERP systems in small- and medium-sized enterprises: ERP support for pull production, *International Journal of Production Research*, Vol. 51, No. 2, 2013, pp. 395-409
38. Simchi-Levi, D.; Simchi-Levi, E.: *Designing and Managing the Supply Chain*, McGraw-Hill/Irwin, New York, 2007.
39. Shane, S.: *The Handbook of Technology and Innovation Management*, Wiley-Blackwell, New York, 2008.
40. Thun, J.: Angles of integration: An empirical analysis of the alignment of internet-based information technology and global supply chain integration, *Journal of Supply Chain Management*, Vol. 46, No. 2, 2010, pp. 30-44
41. Wallis S.: *Cybernetics and Systems Theory in Management: Tools, Views, and Advancements*, Information Science Reference, Hershey, 2009.
42. Wiener, N.: *The Human Use of Human Beings: Cybernetics and Society*, Doubleday Anchor, New York, 1956.
43. Wren, D.: *The History of Management Thought*, Wiley, New York, 2004.