

Action research in supply chain management; investigating the appropriateness from an organisation theory perspective

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Abstract

Several authors have argued for the application of a wider variety of theories, methods and approaches in SCM research. This paper borrows perspectives from organisation theory to show that action research can both generate knowledge and facilitate change in supply chains through its ability to support joint meaning construction, focus on both the technical and social system, build trust and commitment, combine qualitative and quantitative methods, close the gap between industry and academia, open up for longitudinal studies, and integrate perspectives from other research disciplines.

Keywords: supply chain management, action research, organisation theory

Introduction

Over the years there has been little guidance from academia to operations management (OM), logistics and supply chain management (SCM), with academia in general following rather than leading business practice (Westbrook, 1995, Lambert et al., 1998, Chopra et al., 2004, Sachan and Datta, 2005). Research in these fields is also still dominated by quantitative research methods and significantly influenced by the positivist paradigm (Näslund, 2002, Sachan and Datta, 2005, Reichart and Holweg, 2006). To meet the shortcomings of the dominating quantitative research methods, a number of authors in OM, logistics and SCM have called for the application of a larger variety of theories, methods and approaches in studying issues and phenomena in these closely related fields (e.g. Westbrook, 1995, Stock, 1997, Amundson, 1998, Arlbjørn and Halldorsson, 2002, Näslund, 2002, Johannessen, 2005, Sachan and Datta, 2005). It has also been suggested that the most valuable contributions to SCM will involve addressing real problems in real supply chains (Chopra et al., 2004) – a context particularly suited for the application of an action research (AR) strategy.

The aim of this paper is to shed light on why AR is particularly appropriate, and to contribute to defining AR in SCM by borrowing perspectives from organisation theory. The paper claims that AR can increase the understanding of the supply chain phenomenon and open up new areas and strategies for research in SCM. Through the discussion the paper will show how AR can facilitate change and knowledge generation. It is important to note that the argument of the paper is not that AR is the only appropriate research strategy for SCM. Instead, the paper aims to contribute to the methodological debate that will advance the field of SCM, for as Näslund (2002) put it:

“...it will be hard to develop any research field if all researchers belong to the same paradigm and culture, and do the same kind of research with the same kind of research methods”. Thus, the paper discusses and argues for the appropriateness of AR in SCM by addressing the following question: *From an organisation theory perspective, how can an AR strategy facilitate change and knowledge generation in SCM research?*

The paper starts addressing this question by borrowing some perspectives from organisation theory to give an alternative understanding of supply chains. Next, some weaknesses and trends in traditional SCM research are presented, followed by a discussion of how AR can be used to facilitate change and generate knowledge in SCM. Finally some conclusions and implications for future research are outlined.

Methodology of paper

Despite the calls for a larger variety in the theories, methods and approaches used in SCM research, publications about the use of AR in SCM have been few and far between, with a main focus on positioning AR in relation to other methodologies. And the discussion in the academic community regarding its applicability in SCM has been even more absent – indicating that the use of AR in SCM is still not very well defined.

As a contribution to filling this gap, this paper looked to organisation theory where AR has been more widely used and its appropriateness more discussed and better demonstrated. The purpose of this work has not been to make an exhaustive literature review on organisation theory in SCM, but rather to pick out, discuss and apply relevant perspectives from organisation theory that contribute to understanding supply chains as an organisational phenomenon. Based on this more comprehensive picture of supply chains, a review of literature on the current and past use of methods and methodologies in SCM, logistics and OM research was performed – identifying weaknesses and trends in the methodological choices made by researchers within these related disciplines.

The arguments of the paper build on literature in SCM, OM and logistics. The main references from organisation theory used to inspire the alternative understanding of supply chains include the work of Nelson and Winter (1982) on organisations as routines, Berger and Luckman (1967) on social construction of reality, and the socio-technical system perspective of Trist (1981). The approach to AR builds mainly on the perspectives of Greenwood and Levin (2007) and Coughlan and Coughlan (2008).

Defining supply chain management

A dominating paradigm of modern business management is the notion that competition no longer takes place between individual companies but rather between entire supply chains (Lambert et al., 1998, 2000). Such supply chains consist of several organisations acting together, with each organisation dependent on the performance of the others in the chain. The relatively young discipline of SCM refers to the management of these multiple relationships across a supply chain. The origins of SCM can be traced back to logistics which has a narrower, functional scope mainly focusing on the distribution system and related inventory, warehousing, transportation, material handling and packaging. Another important origin of SCM is OM, which traditionally has concerned itself with the planning, scheduling, use and control of inputs, transformation processes and outputs in the pursuit of value creation in manufacturing and service organisations (Chopra et al., 2004) with a main focus on the internal operations of a company.

SCM widens the scope of both OM and logistics by focussing on the need for coordinating and integrating the operations of several companies involved in supplying a market with products and services. The Supply-chain Council (2008) defines supply chains and supply chain management in the following way: *“The supply-chain...*

encompasses every effort involved in producing and delivering a final product or service, from the supplier's supplier to the customer's customer. Supply-chain management includes managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer. Due to its wide scope, supply-chain management must address complex interdependencies; in effect creating an "extended enterprise" that reaches far beyond the factory door". Similarly, Simchi-Levi et al. (2008) have defined SCM as: *"...a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right locations, and at the right time, in order to minimize systemwide costs while satisfying service level requirements".* An implicit element of the management aspect of SCM in both these definitions is change and improvement - and to be able to manage or change anything requires an understanding of whatever the object of change is. The argument of this paper is that the traditional definitions and understanding of SCM are insufficient in providing a thorough understanding of the conditions in the supply chain that can facilitate change and improvement efforts. Most definitions of SCM refer to the need for interaction and integration between enterprises in an inter-organisational context. However, it is essential to bear in mind that organisations do not interact – humans do! Thus, supply chains should be viewed in terms of the humans performing activities and interacting with each other across organisational borders. Supply chains can therefore not be separated from the actors that live and work within the supply chains' social system, and thus some perspectives from organisation theory are considered helpful in providing alternative ways of understanding the supply chain phenomenon.

Understanding supply chains

This chapter discusses some perspectives from organisation theory that can contribute to understanding supply chains as an organisational phenomenon. This includes understanding supply chains through their members' routines and behaviour, using trust and commitment to manage power issues, and viewing supply chains as comprising both a technical and a social system.

Routines and behaviour in supply chains

Traditionally, the focus of SCM has been on managing the specific relationships between autonomous organisations in a chain. In an effort to deal with the complexity of coordinating supply chain activities, supply chains frequently adopt various collaborative arrangements and collaboration concepts (Bowersox et al., 2000) like automatic replenishment, vendor managed inventory and other variations of joint planning, forecasting and replenishment. An aim of such concepts is to standardise the exchange relationships with regards to both materials and information. These agreed norms or routines are implemented across organisational boundaries to provide direction to the chain and are aimed at guiding the behaviour of the individuals carrying out the specific activities in the individual organisations.

March and Simon (1993) link an organisation's programs or set of responses with the behaviour of members of the organisation. A person working in an organisation daily faces real-life decision problems that are too complex to comprehend and therefore he or she will have problems maximising over the set of all conceivable alternatives – what March and Simon (1993) call "bounded rationality". One way to overcome this problem is for organisations to devise relatively simple decision rules and procedures to guide action. Nelson and Winter (1982) view such routines or repetitive patterns of activity as

the elements that make up an organisation (in addition to the skills of all employees and the effectiveness of individual or organisational performance). Since routines are a collection of what all employees do, routines only exist on an organisational level. If one takes away the organisational boundaries, one might say that a supply chain is merely a collection of all routines involved in manufacturing and delivering a product to the final customer. This perspective opens up for a new approach to understanding supply chains through their routines – where knowledge of routines is at the heart of understanding behaviour, how supply chains remember, how routines are generated and how change can be implemented (Nelson and Winter, 1982). Thus, understanding supply chains involves understanding individual and organisational behaviour.

A consequence of regarding organisations as a collection of its individual members is the fact that all these individuals are likely to have different perceptions of reality. In the book “The social construction of reality” Berger and Luckman (1967) introduced a social construction process to understanding social systems, where members of a system through a dialectic process between objective and subjective reality create a joint perception of reality. If we accept the notion that for instance two people working in different organisations might have different interpretations of the same supply chain, we might be said to belong to an interpretive, anti-positivistic epistemological paradigm – where the world is perceived as relative and thus must be understood from the inside rather than the outside (Näslund, 2002). The only way to understand a supply chain would then be to bring essential members of the organisations together so that they in collaboration might agree on a joint perception or description of the situation at hand.

Trust and power

Supply chains are built on relationships and interdependence, and the success and survival of a chain depends on managing such relationships well and obtaining the commitment of all supply chain partners. Trust has been found to be a critical factor in fostering the necessary commitment in supply chain relationships (e.g. Kwon and Suh, 2004, Wu et al., 2004, Chu and Fang, 2006, Ireland and Webb, 2007), and balancing a climate of trust and power in supply chains seems to be indicative of successful strategic supply chain relationships (Ireland and Webb, 2007).

An underlying assumption in SCM is that cooperation across organisational boundaries brings benefits to all involved. However, recent research has found support for Foucault’s view that power is present whenever and wherever social relations exist (Lukes, 2005). Studies have demonstrated that inter-organisational relationships between trading partners are often characterised by considerate power asymmetries (Ke and Wei, 2007), and many of the commonly cited barriers to effective SCM are still power related issues (Benton and Maloni, 2005). Despite this fact, power play in a supply chain setting is usually labelled politically incorrect, and issues of power, influence and domination are seldom discussed openly. A reason for this ducking of power issues might stem from the assumption that power is a negative influence – being detrimental to sustaining business relationship (Gummesson, 1999, in Hingley, 2005). However, it can be argued that power and power imbalance in supply chains are issues that organisations must live with and therefore need to manage in order to achieve efficient collaboration.

Supply chains as social and technical systems

In a 2002 article on logistics knowledge creation, Arlbjørn and Halldorsson (2002) can be said to argue for a narrowing of the scope of logistics and SCM research. For instance, they state that the systems thinking approach to supply chains does not mean

that the scope should be broadened, but instead that the disciplines should be divided in a “hard core” and a “protection belt”. The hard core focuses on the flow of materials, information and services, where the unit of analysis is the flow, while “everything” that does not directly relate to this flow is categorised as belonging to the protection belt and should therefore not be included in “pure” logistics or SCM research (e.g. motivation, impact of IT, organisational structure etc.). However, it is difficult to see how new knowledge on the complex phenomenon of supply chains can be generated by narrowing the scope. This view, together with the definitions of SCM quoted earlier, are indicative of a traditional lack of focus on the primary work system among SCM professionals and researchers – a focus on the arena where all activities are carried out and which thus forms the organisation’s social system. In contrast, Lambert et al. (1998) present a more holistic view by highlighting the importance of balancing and aligning the physical and technical management components with the managerial and behavioural management components for successful SCM. A useful tool for analysing these complementary aspects of the supply chain is the socio-technical systems (STS) perspective. Through a framework for socio-technical analysis, Trist (1981) proposes an approach where the design and study of organisations or systems – or in our case supply chains – captures the relations between the social and technical systems involved. In the socio-technical perspective, the technical system can be said to mark the boundary between the enterprises in the supply chain and the external environment through the materials, machines and territories that typically “belong” to an enterprise (Trist, 1981) or in this case the enterprises in the chain. What this perspective adds to the traditional understanding of supply chains is the focus on the interaction between the technical system (reflected in traditional definitions of supply chains) and the social system made up of the individuals that belong to the primary work system – in other words the interaction among technology, organisation and humans - and the need for joint and simultaneous optimisation of the social and technical system.

Research methodology in SCM

The origins of OM and later SCM are difficult to pinpoint. However, the problems that OM practitioners and researchers are typically concerned with first came into focus following the Industrial Revolution and the rise in popularity of the ideas of Frederick Taylor and Scientific Management (Taylor, 1911, 2006). At that time, managers of large businesses faced practical coordination problems of unprecedented scope, and organising, measuring and managing production became the topics of treatises published by professionals from business and industry (Chopra et al., 2004). World War II saw the emergence of Operations Research – a field dominated by mathematicians concerned with efficient allocation and control of industrial resources. The management issues of a tactical nature stemming from Taylor’s time were ideally suited for the positivist methodologies that had been developed up to that point (Chopra et al., 2004). For decades, OM’s research focus was on mathematical analysis, algorithms and modelling techniques for optimisation of well-defined tactical problems, and with improvements in the cost and speed of computing from the 1970s and onwards, the industry sector envisaged great contributions from academia. However, academia did not live up to the promises made to industry, leading practitioners to question the value and relevance of research results which were unable to keep pace with the quickly evolving business challenges and practice (Chopra et al., 2004). The resulting “identity crisis” with regards to research agenda and methods sparked debates particularly between proponents of the positivistic and non-positivistic paradigms (Westbrook, 1995, Näslund, 2002, Coughlan and Coughlan, 2008). Also, a refocusing of research

questions back to using theory to inform current practice was attempted in the 1990s, shifting focus from tactical execution to more managerial issues (Chopra et al., 2004). However, the success of this reorientation can be questioned. Although the positivist methods may have been considered well suited for solving the relatively well-defined, tactical and quantitative issues of the past, the dissatisfaction with conventional approaches has only led to slow and fairly limited increase in the application of more non-positivist methods like case studies and AR (see for instance reviews of SCM, logistics and OM research by Mentzer and Kahn, 1995, Sachan and Datta, 2005, Reichart and Holweg, 2006).

A major weakness of current methodologies is that the traditional positivist methods have an overwhelming focus on the structural and technological factors of SCM and thus fail to consider the important social aspects of supply chains which considerably add to the complexity of supply chains. Also, many of the traditional quantitative methods are based on historical data or snap shots – making them past oriented and therefore inappropriate for studying the dynamic nature of supply chains. In general, many of the quantitative approaches are aimed at providing simple answers to complex problems – with little benefit for practitioners facing complex, dynamic managerial problems (Näslund, 2002).

Following from the descriptions above, it can be concluded that non-positivist methods have a potential for generating knowledge in SCM. Since this is a field characterised by complex, unstructured, real-world, managerial and organisational problems, the supply chain's problems cannot be modelled but must be managed (Westbrook, 1995, Näslund, 2002). An essential feature of qualitative, non-positivistic methods is that qualitative researchers: *"...study things in their natural settings, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them"* (Denzin and Lincoln, 2005, p. 3). A 2005 review of SCM and logistics research revealed that research in the period 1999 – 2003 largely failed to look at the inter-organisational level of supply chains. However, signs of a beginning shift could be observed - away from the "what" questions of traditional positivistic research towards more "how" and "why" questions involving behavioural issues and factors such as culture, relationships, trust and power (Sachan and Datta, 2005). The authors' view that broadening the perspectives used in SCM research could contribute to advancing theory within the field also coincides with a number of other authors who have also called for studies on the concept of SCM that attempt at theory building (Westbrook, 1995, Lambert and Cooper, 2000, Bichou and Gray, 2005, Middel et al., 2005, Müller, 2005, Prockl, 2005). However, theory building should not come at the expense of relevance for practitioners, particularly if one agrees with Mintzberg who said about the choice of scientific method in organisation behaviour theory that *"... choice...is not between true and false theories so much as between more or less useful theories"* (Mintzberg, 1979). Also, any theory building should not lose sight of what the theories are actually theories on, and that theories are not "abstract" objects that exist independently of the elements they tie together (Latour, 1987).

Action research in SCM

The origins and basic ideas of AR can be traced back to the psychologist Kurt Lewin, who has been attributed with the coining of the term "action research". However, AR is not so much one methodology as a collection of approaches that aim to: *"...contribute both to the practical concerns of people in an immediate problematic situation and to the goals of science by joint collaboration within a mutually acceptable ethical framework"* (Rapoport, 1970, in Middel et al., 2006). The three crucial elements of AR

are thus action, research and participation. The research questions typically aim to describe actions and changes in a particular organisational setting over time – while they happen. Also, research projects aim to contribute both to the specific organisation and academia, and are in essence change processes in which one seeks to develop a holistic understanding of a complex dynamic system (Coughlan and Coughlan, 2008). Another key characteristic is that action researchers are actively involved in the change initiative in the organisation or client system and thereby directly contribute to the results of the project. An AR project can therefore be said to have two parallel objectives: an improvement objective to solve a specific problem and a research objective to contribute to the generation of new knowledge.

A major strength of an AR project is that it is based on dialectical theory (Müller, 2005, Greenwood and Levin, 2007), in other words context bound and strongly linked to practical problem solving (Greenwood and Levin, 2007). Thus, local knowledge is contrasted with research-based knowledge, and the theoretic understanding that is developed is evaluated on its ability to make sense of the situation at hand, ensuring that theory has the capacity to explain the phenomena under study (Greenwood and Levin, 2007). The results of an AR project are immediately visible, proving the workability of the implemented solutions, and are as such the true test that something works in practice and not just theory – as Kurt Lewin stated as he coined the phrase “*Nothing is as practical as a good theory*”.

Action research as facilitator of change

Most change efforts in supply chains are initiated by top management through strategic discussions among two or more partners regarding topics like supply chain structure, objectives and principles for cooperation, and assignment of roles and responsibilities between the individual organisations. However, if we accept the proposition that an organisation is a collection of the routines carried out by its members, any such top management decision is unlike to have any effect until new strategies have been broken down into new functional routines by the people who will actually have to change the way they work. A thorough understanding of individuals and the organisations’ social system, in addition to the technical system, is therefore an essential prerequisite to any change effort. By involving problem owners in a change initiative, AR can contribute to successful implementation of changes through early involvement, commitment and empowerment in a collaborative problem definition and search for alternative solutions.

Action research for knowledge generation

Much of the body of knowledge of OM stems from the engineering sciences – areas which traditionally have been dominated by an objectivist ontological position where reality is objective and therefore can be sensed by humans (Meredith et al., 1989). Further, its positivistic epistemological perspective means that a phenomenon under study can be isolated from its context, and that facts or observations are independent of the theories used to explain them (Meredith et al., 1989). As a result of this, knowledge generation in traditional research has largely been driven by a focus on development of solutions to well-defined problems in order to understand and explain phenomena under study. This breaks with the systems thinking basis of SCM, where by definition the whole differs from the sum of its parts. Yet SCM is still dominated by OM’s methodological tradition. In comparison to traditional research, AR is based on a subjectivist or constructivist ontological position, where reality and truth are not defined by nature but by those who experience it. This means that AR is suitable for generating shared understanding and definition of the problem at hand. However, the

epistemological basis for AR is in many ways similar to that of the engineering sciences as both traditions focus on developing workable solutions that address the issues of the involved organisations. A main difference is however that the problems in AR are generated and defined collectively, focusing on improvement potentials. Thus the main focus of AR is to understand and change.

Another important characteristic of AR is that it is situational and thus does not generate universal knowledge – and that theory generated through AR therefore is very hard to replicate or test. Theory emerges incrementally during the project – based on the theoretical understanding that grows through the reflection on the planning, implementation and evaluation phases of the AR cycle (Coughlan and Coughlan, 2008). Generalisation from qualitative studies like AR and case studies takes place towards theory and not towards samples and universes (Yin, 2003). Thus the value of the findings will lie in the ability to achieve “extreme relevance” and practical applicability, leaving the question of generalisation up to the practitioners’ evaluation of whether or not the findings apply to their particular situation.

Challenges of action research in SCM

Despite the advantages of AR described above, there are also some challenges related to the use of AR in a supply chain context. In general, AR puts fairly high requirements on the involved researchers in terms of skills. In addition to typical skills required of any researcher in generating new knowledge, an adept action researcher needs to be skilled in diagnosis, intervention, learning in action and journal keeping (Coughlan and Coughlan, 2008), as well as having well-developed social skills (Greenwood and Levin, 2007). In addition, uncertainty related to the direction and unfolding of the project means the involved researcher also needs to be adept at handling a number of complex issues simultaneously. Due to the demanding skills requirement, AR teams should always involve experienced action researchers, and several authors recommend instituting a master-apprentice relationship as a key means to improving the skills of lesser experienced researchers and better capture the tacit dimensions of AR practice and skills (e.g. Schön, 1991, Greenwood and Levin, 2007, Coughlan and Coughlan, 2008). Other challenges in carrying out AR projects are related to the need for spending an extended period of time in the context under study – which in supply chain terms will involve researchers staying with a number of companies. This puts resource constraints on projects both in terms of time, cost and personnel. In addition, gaining access to companies is frequently an issue in any AR project and might be particularly difficult in supply chain projects where success of the project depends on obtaining the commitment of and gaining access to a number of companies simultaneously.

Conclusions and further research

The aim of this paper was to shed light on the potential contribution of AR in SCM. The paper has used perspectives from organisation theory to provide an alternative to the traditional understanding of supply chains. The paper has demonstrated how AR can address a number of central characteristics and challenges associated with the SCM discipline and research, particularly in terms of facilitation of joint meaning construction, simultaneous focus on both the technical and social system, building trust and commitment through participation and close interaction, combining qualitative and quantitative methods depending on the issues at hand, closing the gap between industry and academia, capturing the dynamic aspects of supply chains through longitudinal AR studies, and finally, since AR is not restricted to any particular scientific field, it can easily incorporate theories, perspectives and tools from other disciplines.

The paper's contributions to theory include an increased understanding of the SCM phenomenon, thus advancing the academic dialogue and expanding the boundaries of SCM. In addition, the paper has pointed out how the cooperation with practitioners can ensure relevance and applicability of new knowledge. In terms of contributions to research methodology, the paper has demonstrated the appropriateness of AR in SCM and opened up some new research areas. Contributions to practice include the demonstration of how AR can close the gap between industry and academia, in addition to demonstrating how AR can provide practitioners with new knowledge of the local situation, which can be converted into action in the future.

However, due to the challenges associated with AR, it is particularly important to be rigorous in its implementation. It is embedded in the nature of AR that it should be justified within its own terms, and instead of assessing the classical quality criteria of quantitative research (objectivity, validity and reliability), a separate set of standard for measuring the quality of AR is preferred (Reason and Bradbury, 2006). Therefore, further investigation into the research design and implementation of AR projects in SCM is still needed. This will hopefully contribute to establishing AR as a more recognised and applied tradition in SCM, as well as develop criteria for the evaluation of the quality of AR projects.

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