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Logistics needs qualitative research – especially action research

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Abstract *This paper describes how qualitative research methods, particularly action research case studies, can contribute to further advance and develop logistics research. The paper also describes limitations with the current dominance of quantitative (especially survey) research in logistics. However, the paper is not a pure criticism of the use of quantitative research methods in general or in logistics in specific. Rather, the argument is that it is necessary to use both quantitative and qualitative methods if we really want to develop and advance logistics research. Logistics problems are often ill-structured, even messy, real-world problems. Modern logistics is based on holistic and systemic thinking and uses multi-disciplinary and cross-functional approaches. Thus action research case studies are especially suited for an applied field such as logistics since they strive to advance both science and practice. This should also be reflected in published logistics research, which it is not. In order to change this situation, we first have to understand paradigms and their influence on how we approach and evaluate research. Second, we have to define what case studies in journal articles mean. Third, we need to develop criteria for evaluating action research case studies.*

Introduction

The purpose of this paper is to describe limitations with the current dominance of quantitative (especially survey) research in logistics, and how qualitative research methods, such as case studies/action research, can contribute to further advance and develop logistics research. This advancement also requires a constructive debate about logistics research, its paradigms and methods.

It is important to stress that the purpose is not to argue that quantitative research should be replaced by qualitative research. On the contrary, both forms of research are much needed since all research questions cannot be solved with the same approach. Issues such as the nature of the problem and the goals of the researcher should guide the research methodology. In this perspective, some logistics research problems are better addressed by quantitative methods, some by qualitative and some, perhaps, by a combination of methods.

Thus, a predominant research paradigm resulting in dominant methods should not exist in a complex and applied research field such as logistics. However, this does not appear to be a correct description of logistics research in published articles. Mentzer and Kahn (1995) reviewed all the articles published in the *Journal of Business Logistics* (*JBL*) between 1978 and 1993. Table I presents their findings on research methods.

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The dominance of surveys indicates that a positivist paradigm and, thus, mainly quantitative methods, are preferred in logistics research in general. A similar investigation was performed by Dunn *et al.* (1993). They looked at methods used in the research presented in four logistics journals between 1988-1992[1]. Only 2 per cent of the published articles were based on case studies/action research, while 36 per cent were based on surveys/structured interviewing and 25 per cent on simulation/modeling. Furthermore, they noticed that the trend seemed to be towards including more survey/modeling research and less case study research (p. 11). A complementary study of 120 articles in three leading logistics journals[2], performed for this paper, showed that only 7 per cent of the articles were based on case studies, while 35 per cent used surveys. Finally, Ellram (1996) also stressed this lack of published case studies in logistics.

Samuel (1997) compared dominating paradigms and methods used in three logistics/supply chain management journals[3]. Her results indicate a difference between methods used in the USA versus Europe. Table II indicates that survey-based research definitely dominates the US research community, while the Europeans tend to include more qualitative research.

Naturally, the above investigations can have many flaws. It is, for example, sometimes difficult to pinpoint the method used by the researchers and sometimes they used more than one method. Still, the general nature of most published logistics research can be identified. Logistics research in general, and perhaps US logistics research in particular, can be characterized as significantly influenced by a positivist paradigm. The research methods are more quantitative than qualitative in nature, with survey/modeling research as predominant methods. There is a significant lack of published case study articles, especially in US journals. I believe the studies above indicate a serious deficiency in logistics research.

Table I.
From Mentzer and Kahn (1995, p. 242)

Category	Per cent of articles published in *JBL*
Survey	54.3
Simulation	14.9
Interviews	13.8
Archival studies	9.6
Math modeling	4.3
Case studies	3.2

Table II.
From Samuel (1997, p. 4)

Paradigm/method	UK/Europe	US
Positivist (e.g. survey)	2	17
Naturalist (e.g. interviews)	9	7

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Logistics problems are often ill-structured, even messy, real-world problems. Modern logistics is based on holistic and systemic thinking and uses multi-disciplinary and cross-functional approaches. This should also be reflected in published research. In order to change this situation, we first have to understand paradigms and their influence on how we approach and evaluate research.

Paradigm is our world-view, the lenses through which we view the world. Checkland (1993) uses the word *Weltanschuungen*. Senge (1990) prefers mental models. The idea is the same. People view the world differently. Unless we understand that different paradigms exist, we cannot embrace different types of research methodologies. The problem is not so much whether the different paradigms, the world-views, are considered right or wrong. The problem is when the paradigms are tacit – when they exist below the level of awareness.

In research, this means that we have to express and explain our world-view, we have to make our paradigm clear. In order to see both the limitations and potentials of different forms of research, we need to first discuss the paradigm issue. In other words, to have a concrete discussion about different forms of logistics research methods, we first have to understand the philosophical fundamentals of research, i.e. paradigm.

Paradigm

Traditional quantitative researchers, knowingly or not, tend to belong to the positivist paradigm[4]. Yet, the positivist paradigm is only an option among possible paradigms. A paradigm includes three elements: epistemology, ontology, and methodology (Denzin and Lincoln, 1994, p. 99). Epistemology deals with how we perceive the world, and the relationship between the researcher and the known. According to Burrell and Morgan (1985), epistemology deals with how one might understand the world and communicate this as knowledge to others. Ontology deals with basic questions about the nature of reality – whether an objective reality exists or not. Epistemological and ontological assumptions consequently influence methodological decisions. Basically, methodology deals with how we gain knowledge about the world. Somewhat simplified, the difference between positivist and non-positivist paradigms can be illustrated by the framework developed by Burrell and Morgan (1985, p. 3), which is based on a subjective-objective dimension (Figure 1).

Positivists believe that an "objective" world – an objective reality – exists. Consequently, reality can be studied using "objective" methods. In many ways, positivist research is based on procedures used in natural sciences. Typically, quantitative methods, such as surveys and mathematical/statistical analysis are used (Benbasat *et al.*, 1987). This quantitative research seeks general laws. Studies tend to emphasize the measurement and the analysis of causal relationships between variables. The growth of knowledge is a cumulative process. New knowledge is added to existing knowledge and false hypotheses are eliminated. Furthermore, positivists try to explain and predict by searching

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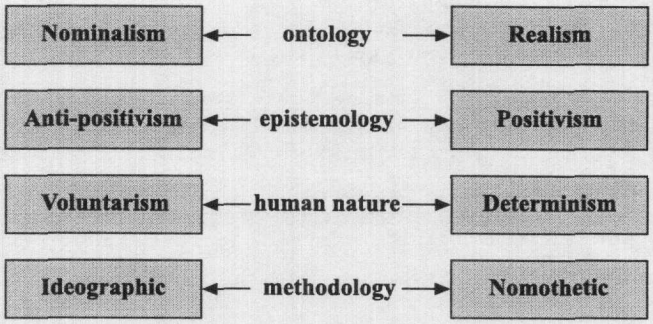

Figure 1.
The subjective-objective dimension

Source: Burrell And Morgan (1985)

for regularities. Positivists apply four criteria to "good" research (Denzin and Lincoln, 1994, p. 100):

(1) *internal validity*, the degree to which findings correctly map the phenomenon in question;

(2) *external validity*, the degree to which findings can be generalized to other settings similar to the one in which the study occurred;

(3) *reliability*, the extent to which findings can be replicated, or reproduced, by another inquirer; and

(4) *objectivity*, the extent to which findings are free from bias.

Qualitative researchers, on the other hand, belong to many different paradigms[5]. However, a common theme is the rejection of positivism and its perception of objectivity. Thus, in general, qualitative researchers are more interpretive and subjective in their approach. This anti-positivist approach states that the world is essentially relativistic and thus one must understand it from the inside rather than the outside. It can only "be understood from the point of view of the individuals who are directly involved in the activities which are to be studied" (Denzin and Lincoln, 1994). Using this approach, it is therefore hard to generate objective knowledge. In a simplistic view, qualitative researchers would be "subjective", while quantitative (positivist) researchers would be "objective".

Problems with quantitative research

There are problems with quantitative research methods, especially surveys. Silverman (1993, p. 20) states: "... the critique of purely quantitative research has a long history beginning in the 1950s". The main criticism stems from the dissatisfaction with the type of research information as well as results provided by quantitative techniques. The information can be clouded due to the complexity of methods, the large sample sizes needed, and the difficulty in understanding and interpreting the results from complex quantitative studies (Van Maanen, 1982).

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Understanding and interpreting questionnaires

If statistical analysis is performed on data which we do not fully understand, or even worse, data which we do not know how to interpret, then how useful will the results from the analysis be? In addition, the questions may be misinterpreted by the respondents. Then, the analysis could even lead to incomplete results. Thus, Alvesson (1996, p. 455), discussing from the perspective of leadership research, claims that: "Recently there has been a strong dissatisfaction with conventional approaches to leadership research". These conventional approaches have been dominated by positivist or neo-positivist assumptions and, consequently, by mainly quantitative research. Alvesson (p. 461) writes:

> Questionnaires may be appropriate in order to get information about simple and relatively fixed issues, where the meaning can be standardized and quantified, such as physical length, biological sex, income, formal education, chronological age and year of employment. When it comes to more complex issues, respondents usually interpret formulations and response alternatives in varying ways, far beyond the control of the researcher.

Past, not future oriented, or "snapshots"

Another problem is that survey research, almost always, is past oriented. Thus, it is not especially strange that academia is following rather than leading in many research fields, including logistics (Cooper *et al.*, 1997). Arndt (1985, p. 21) exemplifies this problem in marketing:

> ... since data are only defined for the past and not for the future, it is no wonder that marketing thought has been much past oriented, supporting and legitimizing past and current practices.

Consequently, such studies may lead to a lack of novelty and fresh perspectives as well as over-emphasizing the testing of already established theories and ideas (Deetz, 1995).

In organizations, in human activity systems, history always changes the agenda (Checkland, 1993). These systems are subject to numerous different influences which means that time will almost always modify the perception of the problem. Thus, if we want to study change in organizations, which is a frequent logistics research problem, then surveys may not be the most appropriate form. At best, the survey can provide a snapshot of the current condition. Furthermore, the content of human activity systems are so multivarious that perceptions of problems tend to be very subjective. If being very critical, the snapshot approach of surveys then is another example of reductionism – the pursuit of simple answers to complex problems.

No interest for practitioners

The attempt to simplify complex "real-world" problems may also explain that the benefits to practitioners seem to be small, if at all, from traditional survey research, at least when it comes to managerial/organizational research. Alvesson (1996, p. 455) writes:

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> Practitioners seem to view the abstraction of quantified material and statistical correlations as very remote from everyday practice and therefore of little use.

Arndt (1985, p. 20) criticizes traditional marketing research with the same argument, writing "... only to a small extent had marketing practitioners found the knowledge produced useful". Hopper and Powell (1985, p. 455) add similar arguments about the limited success of traditional research in accounting:

> It is ironical, given the managerialist bias of so much accounting research and its reflection in leading textbooks, that "advanced" techniques have had so little impact upon practice.

A cultural difference?

Why then is logistics research dominated by a positivist paradigm and mainly quantitative methods? This dominance in leading logistics journals could partly be explained by a cultural difference noticeable in other disciplines. In strategy research, for example, US dissertations and articles are dominated by quantitative research (Shrivastava and Lim, 1989; Schwenk, 1989). Arndt (1985, p. 14) indicates that there is a difference in approach between the Anglo-American world and what he calls the Continent:

> Modern empiricism is a part of the Anglo-American philosophy of science tradition, emphasizing explanation and control and placing the scientist in a spectator, observer role. In contrast, what may be called the Continental tradition, focuses on understanding and views the scientist as a participant in a historical process.

Bengtsson *et al.* (1997) investigated whether reviewers of management research journals used a predominantly positivist approach when reviewing potential articles. In their study, eight journals were investigated: four American and four European. The authors found that 71 per cent of the case studies and 77 per cent of the qualitative studies published in any of these journals during 1993, were in fact published in one of the European journals. Bengtsson *et al.* (1997, p. 4) state that the predominant positivist approach in the USA is remarkable, since US research and literature has a world-wide impact within the field of management. Samuel's (1997) as well my own investigations tend to indicate the same for logistics research. Quantitative research dominates in general and especially in US research. The "most American" of the journals (*JBL* – with almost exclusively US editors) was also the most "positivist" of the journals in my study.

Tradition rules (or publishing bias)

Another explanation for the positivist domination may be that authors believe it is easier to publish using a positivist paradigm. Since publishing is a key component in US job placement and tenure-track evaluation, researchers tend to follow the established path. Guba and Lincoln (1994, p. 116) support this idea:

> Postpositivists (and indeed many residual positivists) tend to control publication outlets, funding sources, promotion and tenure mechanisms, dissertation committees, and other sources of power and influence.

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The result is, as Arndt (1985) argues, that in many disciplines paradigms are taken for granted and thus usually not questioned, especially since these paradigms normally reflect the values and opinions of the dominant researchers within the field. For younger researchers it is also easier to get dissertations accepted if they follow the paved way. In logistics, the situation seems to be similar. Leading US logistics academics were interviewed by Gammelgaard concerning doctoral education. Although few of the interviewed professors were completely opposed to the use of qualitative methods:

> ... it is also anticipated that the job market is demanding professors with quantitative background (Gammelgaard, 1996, p. 17).

Lack of academic vision and development

An interesting question is: if researchers within a certain academic discipline do the same kind of research as everyone else within the discipline then how useful will that research be? Monieson (1981) claims that when science becomes concerned with its own methodology and consequently isolates itself, then the result can in the worst case scenario be that:

> ... a discipline which earlier was characterized by breadth of vision may be transformed into a narrow, isolated and unidimensional research area.

Similarly, Dunn *et al.* (1993, p. 2), who discuss logistics, operations, and marketing research, state that:

> ... a given field may be underachieving if all of its research is being conducted within a narrow methodological domain.

In particular, they criticize operations research which is "overwhelmingly artificial in nature", yet both logistics and marketing research receive criticism for being one-dimensional. Marketing research is also criticized by Arndt (1985, p. 11) for being dominated by " ... the logical empiricist paradigm stressing rationality, objectivity and measurement". Hopper and Powell (1985, p. 429) discuss accounting research which, despite its sometimes multidisciplinary nature, "tend to stem from similar perspectives towards society and the social sciences". Naturally, 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. Someone has to break the barrier and try new methods and new perspectives.

Result: need for qualitative research also

Survey (positivist) research is definitely one method to use to address some research problems; however, it cannot solve all research problems. Different problems need different methods and sometimes a multi-method approach is required. Dunn *et al.* (1993, p. 3) also claim that the support for using multiple methods in (all) research disciplines is found among numerous authors. With the problems mentioned above, survey research is hardly the most appropriate method to capture all complex phenomena that exist, for example, in

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organizations. The inadequacies of survey research have perhaps paved the way for increased acceptance of qualitative research methods. Furthermore, if we truly want to develop logistics, to develop new theories and ideas, then we need to question our paradigms, methodologies and choice of methods. Perhaps we first need to increase our knowledge about these issues, and then we need to debate them with open minds.

For logistics researchers, this means that a positivist paradigm and mainly quantitative methods should not automatically be the obvious choice. Rather, logisticians should reflect upon whether complementary research is needed. If logistics academics want to lead rather than to follow practitioners then we must also gain "extreme relevance"[6] in our research. The best way, perhaps the only way, to gain extreme relevance is to understand what is going on within organizations. Therefore some logistics research should include that the researcher spend time in organizations and research logistics in action. Only by being out "in the real world" can we gather first-hand information to develop knowledge and gain extreme relevance. Thus, we need to include more qualitative case studies in logistics research. However, such a developed approach to logistics research will influence not only the research performed but also the underlying assumptions about research as well as how we perceive the world around us.

Qualitative versus quantitative research

Somewhat surprisingly, it is not obvious what qualitative research is (Alvesson and Sköldberg, 1994, p. 10). One way of describing qualitative research is to identify how it differs from quantitative research. The differences between qualitative and quantitative research include:

- the rejection of quantitative, positivist methods by qualitative researchers;
- qualitative researchers believe they can get closer to the actor's perspective through detailed interviewing and observation;
- qualitative researchers are more likely to confront the constraints of everyday life, while quantitative researchers tend to abstract themselves from this world and consequently they seldom study it directly; and
- qualitative researchers tend to believe that rich descriptions are valuable while quantitative researchers are less concerned with such detail.

Denzin and Lincoln (1994) argue that the word qualitative implies an emphasis on processes and meanings. These processes and meanings are not rigorously examined, or measured, in terms of quantity, amount, intensity, or frequency. Similarly, Alvesson (1996, p. 455) states that the arguments for qualitative research are based on its increased possibility for broad and rich descriptions and its sensitivity for the ideas and meanings of the individuals concerned. There is also an increased likelihood of developing empirically-supported new

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ideas and theories and, finally, its increased relevance and interest to practitioners.

Thus, qualitative research is often described as idiographic from a methodological approach. The idiographic approach requires that one must get first-hand knowledge of the subject under investigation (Burrell and Morgan, 1985, p. 5). Research is focused on understanding a phenomenon in its context.

The researcher intensively examines a particular case(s), a single entity or a specific event with qualitative methods. Yet, there is no standard approach among qualitative researchers (Silverman, 1993, p. 23). Silverman (pp. 8-9) claims that four primary methods are used by qualitative researchers:

(1) observation;

(2) analyzing text and documents;

(3) interviews; and

(4) recording and transcribing.

Furthermore, as Silverman points out, these methods are often combined. The multi-method approach is also stressed by Denzin and Lincoln (1994, p. 2) in their "initial" and "generic" definition of qualitative research:

> Qualitative research is multimethod in focus, involving an interpretive, naturalistic approach to its subject matter. This means 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. Qualitative research involves the studied use and collection of a variety of empirical materials – case study, personal experience, introspective, life story, interview, observational, interactional, and visual texts – that describe routine and problematic moments and meanings ... Accordingly, qualitative researchers deploy a wide range of interconnected methods, hoping always to get a better fix on the subject matter at hand.

Criticism of qualitative research

In all fairness, qualitative research has been, and perhaps still is, questioned, especially by the quantitatively focused research world. Silverman (1993, p. 20) writes:

> In traditional, quantitatively oriented texts, qualitative research is often treated as a relatively minor methodology to be used. Viewed from this perspective, qualitative research can be used to familiarise oneself with a setting before the serious sampling and counting begins.

Denzin and Lincoln (1994, p. 4) provide additional ammunition, claiming that many (traditionalists) regard qualitative researchers as soft scientists or even journalists. Qualitative research is described as unscientific, or only exploratory, or entirely personal and full of bias.

While it is important to take this criticism seriously, it is not enough to simply reject all forms of qualitative research. There is no reason why good, scientific research could not be performed using qualitative methods. However, they will not automatically provide better research than quantitative research (Silverman, 1993; Alvesson and Sköldberg, 1994; Alvesson, 1996). What we

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need to do is to look at the strengths and weaknesses of all research forms and to try to use the most appropriate method given the particular research problem. Silverman (1993, pp. 26-7), who seems somewhat tired of the strong polarization between positivist (quantitative) versus interpretive (qualitative) approaches, argues that we need to understand the similar issues faced by any systematic attempt at description and explanation, whether quantitative or qualitative. The fundamental criteria for good research should not differ between the two.

Case studies

Although case studies are typically considered to be qualitative studies, they are not necessarily only qualitative. Quantitative methods may be appropriate as well. Thus, case studies can be based on both qualitative and quantitative evidence – sometimes only quantitative (see e.g. Yin, 1981, 1994; Eisenhardt, 1989; Ellram, 1996). Yin (1981, p. 58) claims that the case study does not imply the use of a particular data collection method. What the case study does represent is a research strategy. Eisenhardt (1989, p. 534) takes this discussion one step further when she writes: "The case study is a research strategy which focuses on understanding the dynamics present within single settings". Yin (1994, p. 6) claims that the case study is particularly suitable when the research questions are "why" and "how" as opposed to the survey strategies research questions of "who, what, where, how many and how much". In addition, Yin (1994, p. 8) concludes that the case study as a research strategy is preferred when we are examining contemporary events.

Furthermore, a case study can be used to accomplish various aims: from providing a rich description to testing or generating theories (Eisenhardt, 1989). There is also a discussion whether to use one or multiple cases and what generalizations can be made from case studies. Both Eisenhardt (1989, p. 534) and Yin (1994) mean that one or many cases can be included in a case study. Yin, for example, gives three different rationales for using only one case and also states that many more exist (1994, p. 41). On the other hand, both Eisenhardt and Yin seem to prefer many cases, at least for theory building. Other traditional researchers, like Ellram (1996, p. 100), claim that a single case is used to "test a well-formulated theory, an extreme or unique case, or a case which represents a previously inaccessible phenomenon". Multiple cases, on the other hand, "represent replication that allow for development of a rich theoretical framework" (Ellram, 1996, p. 102). Benbasat *et al.* (1987, p. 387) summarizes the discussion with the following characteristics of case studies:

(1) Phenomenon is examined in a natural setting.

(2) Data are collected by multiple means.

(3) One or few entities (person, group or organization) are examined.

(4) The complexity of the unit is studied intensively.

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(5) Case studies are more suitable for exploration, classification and hypothesis development stages of the knowledge building process; the investigator should have a receptive attitude towards exploration.

(6) No experimental controls or manipulation are involved.

(7) The investigator may not specify the set of independent and dependent variables in advance.

(8) The results derived depend heavily on the integrative powers of the investigator.

(9) Changes in site selection and data collection methods could take place as the investigator develops new hypotheses.

(10) Case research is useful in the study of "why" and "how" questions because these deal with operational links to be traced over time rather than frequency or incidence.

(11) The focus is on contemporary events.

With their approach to case studies and their strong emphasis on validity and reliability, Yin, Eisenhardt and Ellram all seem to belong to a positivist paradigm, although they definitely have contributed greatly regarding the acceptance of case studies within the US research world. However, other less positivist researchers have a somewhat different opinion (see e.g. Silverman, 1993; Stake, 1994; Van Maanen, 1995). Stake's main perspective is that a case study is mainly about what can be learned from the single case. Although we may simultaneously carry on more than one case study, each case study is a concentrated inquiry into a single case. Consequently, Stake states:

> Generalizations from differences between any two cases are much less to be trusted than generalizations from one (Stake, 1994, p. 242).

This arises because there can be so many reasons, explicit or not, why the two cases differ. A case study is more about the object to be studied than it is a methodological choice. It is an interest in individual cases – not an interest in the method *per se*. Furthermore, a case study can also be both a process of learning about a case as well as the result from the research/learning process. Thus, it is far from obvious how case study research should be performed.

Case studies in logistics

The lack of consensus regarding case study research is perhaps an explanation why case studies have not been frequently used in logistics research, as indicated by my own investigation as well as by other authors (Mentzer and Kahn, 1995; Ellram, 1996). Ellram also states that:

> The case study method is one of the least understood and most often criticized research methods today (Ellram, 1996, p. 93).

Furthermore, the few case studies performed in logistics seem to be primarily based on a positivist paradigm, and as Ellram (1996) clearly shows, they are

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used in the initial steps in positivist research. To some extent, case studies in logistics can thus mainly be interpreted as minor surveys. Typically, many cases are compared and the information is not gathered by researchers who spend a longer period of time in the organization/company, observing and collecting other forms of data using multiple methods. Ellram, for example, used 11 cases in her "case study" and made a specific point in mentioning that: "All of the case studies involved on-site visits" (Ellram, 1996, p. 105). Gaining "extreme relevance" is hardly possible without spending a significant amount of time in the organization.

If we want to really develop the field then these traditional, almost positivist forms of case studies are not enough. We must learn from social research with its greater experience of real-world research. Dingwall (1997), for example, claims that there are only two basic methods in social research. One is "asking questions", the other one is "hanging out". Logistics researchers have to gain extreme relevance by spending more time in organizations – by "hanging out". This means that our research methods have to change as well and we have to use more ethnographic research and also perform action research.

Ethnography

To some extent, ethnography is based on the rejection of positivism, and particularly the rejection of the view that (social) research should adopt scientific methods consisting of rigorous testing of hypotheses utilizing quantitative measurements. Atkinson and Hammersley (1994) state that this positivistic view fails to capture the true nature of human behavior, especially since it relies on what people say rather than on what they do. They claim that ethnography usually refers to forms of research having the following features:

- A strong emphasis on exploring the nature of particular social phenomena, rather than setting out to test hypotheses about them.
- A tendency to work primarily with "unstructured" data; that is, data that have not been coded at the point of data collection in terms of a closed set of analytical categories.
- Investigation of a small number of cases, perhaps just one case, in detail.
- Analysis of data that involves explicit interpretation of the meaning of functions of human actions, the product of which mainly takes the form of verbal descriptions and explanations, with quantification and statistical analysis playing a subordinate role at most.

It is important to notice that a simple one-to-one relationship between ethnography and any given theoretical perspective does not exist. Atkinson and Hammersley (1994, p. 258) state:

> It is not the case that all ethnography has been undertaken under the auspices of one epistemological orthodoxy.

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Thus, for some, ethnography refers to a method used when appropriate while others claim that it is better characterized as a philosophical paradigm (Atkinson and Hammersley, 1994, p. 248).

Although the most common form of ethnographic method is that of the participant observer, other forms exist, namely:

- complete observer;
- observer as participant;
- participant as observer; and
- complete participant.

In addition, structured forms of data collection and quantitative data analysis can very well be used when appropriate. Furthermore, although most ethnographic data are based on observation of what people are saying and doing, written accounts are also important (Silverman, 1993). Another aspect is that although most ethnography has focused on contributing to disciplinary knowledge rather than towards solving practical problems, there has also been a growing application of ethnographic methods in applied fields. These applied approaches have often been designed to address and contribute directly to the solution of practical problems. In this perspective, ethnography is both relevant and useful for logisticians who strive to get extreme relevance.

Action research

With the contribution to the solution of practical problems, ethnographic case studies could perhaps be defined as action research. The difference, if there is one, between action research and ethnography is the level of participation. In ethnography the key is to observe (Silverman, 1993, pp. 47-55). Action research, on the other hand, does not limit the scope to observation. On the contrary, the core idea of action research is that the researcher does not remain an observer outside the subject of investigation. Instead, she/he should actively participate in the project, often a change process in an organization (Checkland, 1993).

Action research is, furthermore, intimately connected to systems thinking (Checkland, 1993; Senge, 1990). Systems thinking embodies a world-view which implies that the foundation for understanding lies in interpreting interrelationships within systems. These interrelationships are responsible for the manner in which systems work. Systems thinking is thus, more than anything else, a mindset for understanding how things work. In systems thinking, researchers look for patterns of behavior, not necessarily cause-and-effect relationships, but interrelationships. Senge (1990) states that system thinking can help organizations learn to better understand interdependency and change, and thereby to deal more effectively with the forces that shape the consequences of our actions.

In this perspective, action research is a research approach for tackling real-world, managerial and organizational problems. Problems that organizations face are often unstructured. Such problems may be recognizable but they are

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seldom easily defined. It is more of a problem situation than a well-defined and structured problem. There is a sense of mismatch, which eludes precise definition. Research should include these problems as well, since it is the reality of many managerial fields, such as logistics and supply chain management. In order to handle these problems, both academia and practitioners have to understand them first. Once understood, possible solutions can be identified.

Yet, research into these kinds of problems must not be forced into a traditional, structured form of research. Research of these problems must be tackled in the absence of a firm definition of the problem. Perhaps, they can be regarded as conditions to be alleviated rather than problems to be solved (Checkland, 1993). Once alleviated, the possible research results may not be those first intended. Naturally, to understand organizations, and to understand the problems faced in the organizations, the researcher needs to spend time in the(se) organization.

This has also been my own experience in using action research based on systems thinking (Näslund, 1999). The close connection between logistics and systems thinking is yet another reason for the logic of using action research in logistics. In Näslund (1999), using action research facilitated organizational improvement programs (quality and process related) for the practitioners. Research results were, for example, different perspectives on the process. Instead of regarding the process as mainly an operational instrument, the research led to the use of the process as a bridge between strategy and operations. In that perspective, the most important organizational processes constitute the tactical level of the organization. Furthermore, the action research led to a specific focus on middle managers – their roles and competencies – in the change effort as well as in the process organization. Similar to the most important processes, the middle managers constitute the tactical level in the organization. These results would not have been achieved without spending significant amount of time within the organization, gaining extreme relevance in the research. Thus, action research could contribute to developing research within an applied field such as logistics. It can also help practitioners in the real-world solving problems. Consequently, action researchers strive to advance both science and practice (Foote Whyte, 1991; McKernan, 1991).

Concluding discussion

Unfortunately, articles using an action research approach largely remain to be published in logistics journals. Logistics research would benefit from more case study articles based on action research. For this to happen, three things must change. First of all, we need a fundamental discussion of paradigms and their influence, not only on the research we perform but also on how we judge performed research. Second, we have to define what case studies in journal articles mean. Third, we need to develop criteria for evaluating action research case studies.

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The influence of paradigm on research

In spite of the boundary spanning, evolutionary, and applicable nature of logistics research, most published research articles are based on quantitative methods and the researchers, at least in the USA, seem to be influenced, not only by a positivist approach to research but also by a strict research tradition. We must question the dominance in management research in general as well as in logistics research of the positivist approach and quantitative methods, primarily surveys. How useful is such an approach in advancing an academic discipline? If everyone conducts similar types of research, guided by the leading academics' choice of paradigm, and guided by academic history and an "established path", then will the discipline really evolve and develop academically and theoretically? The conclusion is that the discipline, unfortunately, will most likely not evolve. Furthermore, which perhaps is worse, the research may not be useful for the practitioner either. Thus, although logisticians demand the academic advancement of the field including development of theory, and more academic rigor, it is questionable if this will be achieved if we do not also question our fundamental belief systems, including paradigms, ontological and epistemological stance as well as choice of method.

Only by having a philosphical discussion about paradigms, and how our world-view influences the research we perform and how we judge and evaluate research, can we open our eyes for non-traditional forms of research. Unless we understand, for example, that action research is based upon a different paradigm, a different world-view, we will not be able to understand the benefits of that approach to research. If we do not understand the paradigmatic difference, we will keep judging and evaluating action research using our positivist glasses. We will then see the limitations, but not the benefits with different forms of science. Burrell and Morgan state (1985, p. 2):

> The possible range of choice is indeed so large that what is regarded as science by the traditional "natural scientist" covers but a small range of options.

From that perspective, this paper should not be interpreted as pure criticism of the use of quantitative research methods in general or in logistics in specific. Rather, the argument is that it is necessary to include qualitative methods, such as action research case studies, if we really want to develop and advance logistics research. All research problems can not be solved with the same approach or research strategy. Some research problems are better approached by quantitative methods, some by qualitative and some, perhaps, by a combination of both. As Dunn *et al.* (1993, p. 3) state:

> We are not advocating that each researcher take on all methods in their research portfolio ... What we advocate is that each researcher appreciate and encourage the diversity of various methods dedicated to the growth and understanding of logistics as a whole. In other words, it is the sum of all research methods that serves to help and continually improve the domain and contribution of logistics.

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Different forms of case studies and evaluating action research

The second issue is how to include action research case studies as published articles in scientific journals. In order to do that we have to understand that different forms of case study articles exist. Benbasat *et al.* (1987) identified three different forms of case studies as they can appear in journal articles: "normal" case studies, application descriptions and action research. There are differences in both approach and objective in these three forms of case studies.

(1) In "normal" case studies, the clear objective is the conduct of research. One could argue that the approach is research in a traditional, positivist form – yet, one step in the direction of including relevant real-world information into the research.

(2) In application descriptions, practitioners typically report success stories of their experience implementing a particular application for a given assignment. Often they also provide a list of "dos" and "don'ts". Thus, the author's objective is not to conduct a research study. Consequently, this cannot be described as case study research.

(3) In action research the process of change becomes the main subject of research. The researcher is a participant in the change process, but simultaneously she/he wants to evaluate e.g. a certain intervention technique. Authors of action research articles have the objective to conduct research while effecting change. Action research aims to contribute both to the practical concerns of organizations in a problematic situation and to the goals of science by joint collaboration within a mutually acceptable ethical framework (Checkland, 1993).

Most discussions about case studies in logistics refer to the first type. However, we need more articles involving action research case studies. A problem is that we do not have an established framework for evaluating these kinds of articles from a scientific perspective. While the benefits from action research case studies can be proven, we still need to establish criteria for what good action research case studies should include in order to be published. This work is challenging. However, it cannot begin unless we understand the importance of paradigm and the potential benefits from using different forms of research in logistics. Once we open our eyes, we can also discuss the criteria needed.

Notes

1. *Journal of Business Logistics*, *Transportation Journal*, *International Journal of Purchasing and Materials Management*, and *Logistics and Transportation Review*.
2. *Journal of Business Logistics*, *The International Journal of Logistics Management*, and *International Journal of Physical Distribution* and *Logistics Management*.
3. *The International Journal of Logistics Management*, *The International Journal of Purchasing and Materials Management*, and *The European Journal of Purchasing Supply Management* (see Samuel, 1997).
4. One could debate if any hard-core positivists still exists. Yet, for the purpose of clarity, I have chosen the approach of identifying a positivist paradigm.

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5. This is a topic which would be too time consuming to cover here. For more information, see e.g. Burrell and Morgan (1985) and Denzin and Lincoln (1994).
6. Dr Donald J. Bowersox, John H. McConnell Professor, Business Administration, Michigan State University, gave an inspiring speech during the CLM – the Council of Logistics Management's PhD class/seminar in Orlando, Florida, 1996. During the seminar, Dr Bowersox frequently mentioned the importance of extreme relevance.

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