IMPLEMENTATION OF SUPPLY CHAIN MANAGEMENT THEORY IN PRACTICE: A QUESTIONNAIRE SURVEY IN BRITAIN

Mr. Witold Bahr, Prof. Edward Sweeney
Engineering Systems and Management (ESM) Group, Aston University, Birmingham, UK
Email: bahrw2@aston.ac.uk, e.sweeney@aston.ac.uk

Abstract

Purpose: The purpose of the research described in this paper is to disentangle the rhetoric from the reality in relation to supply chain management (SCM) adoption in practice. There is significant evidence of a divergence between theory and practice in the field of SCM.

Research Approach: The authors' review of the extant SCM literature highlighted a lack of replication studies in SCM, leading to the concept of refined replication being developed. The authors conducted a refined replication of the work of Sweeney et al. (2015) where a new SCM definitional construct – the Four Fundamentals – was proposed. The work presented in this article refines the previous study but adopts the same three-phase approach: focussed interviews, a questionnaire survey, and focus groups. This article covers the second phase of the refined replication study and describes an integrated research design of a questionnaire research to be undertaken in Britain.

Findings and Originality: The article presents an integrated research design of a questionnaire research with emphases on the refined replication of previous work of Sweeney et al. (2015) carried out in Ireland and adapting it to the British context.

Research Impact: The authors introduce the concept of refined replication in SCM research. This allows previous research to be built upon in order to test understanding of SCM theory and its practical implementation - based on the Four Fundamentals construct - among SCM professionals in Britain.

Practical Impact: The article presents the integrated research design of a questionnaire research that may be used in similar studies.

Introduction

A plethora of supply chain management (SCM) and logistics definitions have been developed over the years (Stock and Boyer, 2009), which may limit management's understanding of the concept and the practical effectiveness of its application (Ross, 1998). Researchers note a great deal of confusion regarding exactly what SCM involves, lack of consensus on SCM definition, and highlight the necessity for clear definitional constructs (Burgess et al., 2006). There is less debate in the extant literature about the meaning of the word logistics. Nonetheless, given that one of the principal antecedents of SCM is the field of logistics, this paper explores practitioner perspectives in relation to both (i.e. SCM and logistics). It does so with particular reference to the relationship between the two terms.

Following this introduction, the authors' literature review provides an overview of the evolution of SCM and logistics and the relationship between them. Then the rational of the current study is explained and the authors' specific objective is set out. Next, the methodology employed by the authors is described. Then authors discuss the next stage of this research and highlight some of the limitations and contributions of the paper.

Literature Review

Evolution and definitions of supply chain management

The term SCM was originally introduced by management consultants in the early 1980s (Oliver and Webber, 1992). Since then a plethora of SCM definitions were developed and were subject to comprehensive reviews with a work by Stock and Bowyer (2009) examining 173 definitions of SCM that have appeared in the literature.

Evolution and definitions of logistics

Clearly, one of the principal antecedents of SCM is the field of logistics. Dictionary definitions of logistics tend to emphasise its military context (Lummus et al., 2001). Over time the application of logistics has moved into the mainstream business arena and numerous definitions have been proposed. A popular definition of logistics by the Council of Supply Chain Management Professionals (CSCMP 2013) explicitly places logistics as a subset of SCM. However, other authors have noted different approaches to this in practice. The next subsection explores different perspectives on the relationship between SCM and logistics.

The relationship between SCM and logistics

There are a number of different schools of thought regarding relationship between SCM and logistics. Larson and Halldorsson (2004) identified four conceptual perspectives on SCM versus logistics. The traditionalist school positions SCM in logistics. The re-labelling perspective simply renames logistics to SCM. The unionist perspective treats logistics as a part of SCM. Finally, the intersectionist perspective is described as follows by Larson and Halldorsson (2004, p. 21): "The intersection concept suggests SCM is not the union of logistics, marketing, operations management, purchasing and other functional areas. Rather, it includes strategic, integrative elements from all of these disciplines." While each of these approaches is valid in its own way, a scan of other literature indicates that the unionist view is the most widely adopted by scholars. The empirical evidence of Lummus et al. (2001) and Sweeney and Bahr (2015) suggests a similar perspective amongst practitioners.

Divergence of theory and practice

Confusion and ambiguity in relation to definitional constructs in SCM and logistics fields may be related to the lack of a robust theoretical foundation (Fawcett and Waller, 2011) and raises questions about the divergence between theory and practice. At present there is certainly no universally agreed upon unified theory of SCM (Halldorsson et al. 2007). This may be due to the fact that the development of the SCM field has been largely practitioner-led, with theory largely following practice (Voss et al., 2002). The comprehensive literature review of Chen and Paulraj (2004, p. 150) noted that "practitioners are far from mastering SCM". In short, there is evidence to suggest that there are "substantial gaps between theory and practice" (Storey at al., 2006, p. 769). This raises important questions concerning the impact of SCM theory in practice. The focus of this paper is on an integrated research design of a questionnaire research that will lead to gaining deep and rich insights into practice, particularly in relation to the fundamental issue of how practitioners in Britain define the key terms and phrases.

Refined replication

The concept of refined replication was used by Sweeney and Bahr (2015) in supply chain research as a way to replicate research by Lummus et al. (2001), but with more clearly defined methodological approach and attention to the research design. This paper replicates the work of Sweeney et al. (2015) and refines the methodological approach to the British context.

Development of research objectives

To gain some insights into the use of the phrase 'supply chain management' and the term 'logistics', the authors will conduct a questionnaire survey among a carefully selected population of British companies. This approach adopts the lesson of Geertz (1973, p. 5) who stated that "if you want to understand what a science is, you should look in the first instance not at its theories or its findings ...you should look at what the practitioners do". It also responds to the calls in the literature for the generation of deep and rich insights into phenomena associated with the adoption of SCM and logistics practices through the use of more qualitative research designs (Mangan et al., 2004). As a refined replication of the work of Sweeney et al. (2015) it reflects calls for more replication studies (Neuliep 1991, Evanschitzky et al., 2007). At this stage the specific objective of this paper is to outline the integrated research design of a questionnaire research that will be carried out in Britain.

Methodology

Processes in the survey questionnaire research are based on guidance adapted from Robson (2002) and Collins and Hussey (2009) and are shown in Figure 1. Next sections describe in detail the approach adopted by authors.
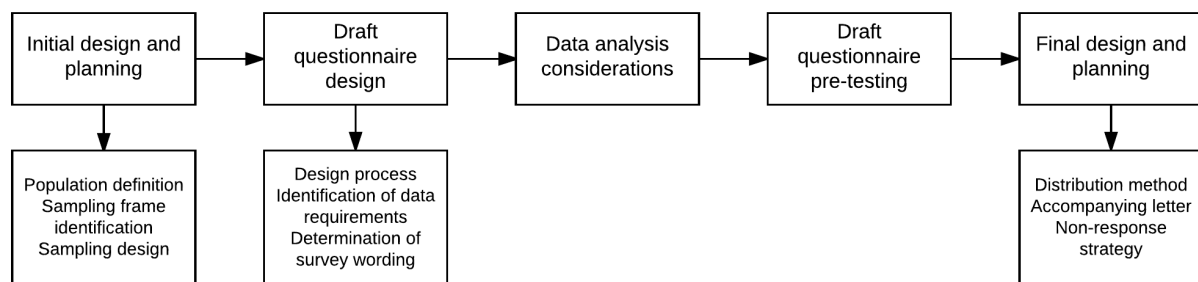

Figure 1: Main stages in carrying out a questionnaire survey

Initial design and planning

Design and planning of a survey questionnaire research should be linked to the research questions and back to the literature review as emphasised by Robson (2002, p. 240): "The importance of a theoretical framework for surveys seeking to move beyond description to explanation can not be over-estimated." The survey design is therefore linked to the four fundamentals of SCM proposed by Sweeney et al (2015): setting SCM objectives, SCM philosophy: integration, Managing SC flows, and SC relationships. Other considerations such as: population, sampling frame, and sampling design are discussed in the following subsections.

Population definition

Although it is possible to define research population as all companies operating in Britain there is a justification to limit certain sectors on the basis of their limited exposure to SCM thinking and/or limited relevance of SCM in these sectors. Sweeney et al (2015) focused their population on selected

sectors based on NACE codes, which is the EU statistical classification of economic activities. The British equivalent of NACE codes are UK SIC codes (SIC, 2007) and each category was considered on case by case basis and converted from NACE codes to SIC codes. Eight NACE level one categories have been proposed for inclusion (B, C, D, E, G, H, J, S), twelve for exclusion (A, F, I, K, L, M, N, O, P, R, T, U), and one (Q: "human health and social work activities") for partial inclusion based on the fact that the NHS (National Health Service) in Britain is a major buyer of a wide range of medical and non-medical products and services and employs a large number of purchasing and materials management professionals. Specific UK SIC code used for this category is "86 : Human health activities". According to the British Office of National Statistics (ONS, 2015) there are 2,449,415 companies registered in Britain of which only 266,710 companies have more than 10 employees. Exclusion of micro-enterprises (less than 10 employees) is justified on the basis that the great majority of such firms are unlikely to have had exposure to SCM thinking. Figure 2 presents number of firms with 10 or more employees in the population by NACE category.

NACE	Count	%
B - Mining and quarrying	290	0.25%
C - Manufacturing	28400	24.50%
D - Electricity, gas, steam and air conditioning supply	305	0.26%
E - Water supply; sewerage; waste management and remediation activities	1505	1.30%
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	43730	37.73%
H - Transporting and storage	9090	7.84%
J - Information and communication	10360	8.94%
Q - Human health and social work activities	12800	11.04%
S - Other services activities	9435	8.14%
Total:	115915	100.00%

Figure 2: Number of firms in the population by NACE category (Source: ONS, 2015)

Sampling frame identification

Sampling frame is defined as "a list of all those eligible to be included in the sample" (Easterby-Smith et al. 2008, p. 332). In many cases it may not be possible to generate a complete and accurate database of the total population hence a sampling frame is of great importance (Robson, 2002). In the context of this research there is no single reliable database that provides contact details of all firms in the population hence a commercial database KOMPASS was used. A similar approach was adopted by Kinsella (2009) in their study of all companies in Ireland across all NACE codes. Database obtained from KOMPASS had to be genuinely representative of the total population under consideration and was codified with NACE and UK SIC codes so that a stratified sample can be drawn from the wider database reflecting breakdown of the population.

Sampling design

The chosen sampling technique is stratified random sampling defined as: "probability sampling procedure in which population is divided into two or more relevant strata and a random sample is drawn from each strata" (Saunders et al. 2009, p. 601). Stratification variable was chosen based on the NACE and UK SIC codes as previously discussed. A random sample was selected by KOMPASS (provider of the database) ensuring that each of the strata was represented proportionally. Number

of companies in each strata was proportional to the number of companies in the population for each NACE/SIC category. Figure 3 presents sampling strata based on NACE categories.

NACE	Number of firms	% of total
B - Mining and quarrying	10	0.33%
C - Manufacturing	746	24.67%
D - Electricity, gas, steam and air conditioning supply	8	0.26%
E - Water supply; sewerage; waste management and remediation activities	41	1.36%
G - Wholesale and retail trade; repair of motor vehicles and motorcycles	1133	37.47%
H - Transporting and storage	237	7.84%
J - Information and communication	272	8.99%
Q - Human health and social work activities	332	10.98%
S - Other services activities	245	8.10%
Total:	3024	100.00%

Figure 3: Sampling strata based on NACE categories.

Questionnaire design process

Data requirements and questions are informed by the literature review and overall research project aims as it is emphasised by Robson (2002). The questionnaire design used in this study refined and replicated one used in Sweeney et al. (2015) for purpose of comparability of results and followed the outline of four fundamentals of SCM. Refinements in questionnaire were done in order to further improve questions based on principles outlined by Easterby-Smith et al. (2008): one idea, avoid jargon, simplicity, avoid negatives, and avoid leading questions. Overall, the survey comprises of 31 questions divided into six sections, as well a section on respondent demographics and control information.

Data analysis considerations

Collis and Hussey (2009, p. 207) note that "it is important to consider at this stage how you will analyse your research data". Each question was analysed individually in this regard.

Draft questionnaire pre-testing

The next step of questionnaire design is pilot testing to ensure that respondents will not have any problems in answering the questions. Robson (2002, p. 254) suggests that "the draft questionnaire is best pre-tested informally, initially concentrating on individual questions". Questions testing the understanding of the SCM and logistics term were tested during a previous phase of the research: interviews (Sweeney and Bahr, 2015). Further refinement of questionnaire was based on a strategy provided by Robson (2002): informal pre-test, focus group, and a formal pre-test. Refinement process resulted in minor amendments in wording of some questions.

Final design and planning

This stage is mainly editorial with final decisions to be made about: distribution method, the accompanying letter, and handling non-response bias (Robson, 2002).

Distribution method

The selected method of distributing the questionnaire is by email, which corroborates with choice made by Sweeney et al. (2015). The refinement comes in the element of using personalised

messages due to capabilities of database and a specialised marketing software MailChimp. The selected online software for survey is Boston Online Survey (BOS), which according to its producers is used by "approximately 130 UK universities plus other public bodies and companies" (BOS, 2016).

Accompanying letter

The role of the accompanying letter is to sending the URL (address) of the survey, but also to establish research credibility, provide some background to the research project, set out the response deadline, assure respondent confidentiality, and offer to send participants a copy of survey results as an incentive. Accompanying letter was firstly went through several phases of rewriting including an input from the marketing specialist who suggested use of short sentences, bullet points, and including enticing graphics. This constituted a refinement on the approach used by Sweeney et al. (2015) where accompanying letter was more academically oriented.

Non-response strategy

There are some well established techniques for assessing the impact of non-response bias suggested by Easterby-Smith et al. (2008). In order to boost response rates a marketing software MailChimp will be used which allows tracking the clicks in survey URL and contacting those who did not respond with reminders.

Research limitations and future work

In reflecting on the validity and reliability of this research design, the four qualitative criteria recommended by Lincoln and Guba (1985) have been adopted – credibility, transferability, dependability and confirmability. The credibility criterion involves establishing that the results of qualitative research are credible from the perspective of the participants in the research. This issue will be addressed by inviting selected respondents to comment on summaries of the survey findings. The sample used in the current research is not intended to be definitive and transferability may be difficult. However, the process of relating the empirical findings back to the literature will help in this regard. Dependability emphasizes the need for the researcher to account for the changing context within which research occurs. In this regard, the authors fully documented the whole survey questionnaire design process. Confirmability refers to the degree to which the results could be confirmed by others. Future work should build on the findings of this research using a combined inductive/deductive approach based on methodological triangulation. The next stage of the work is to conduct a large survey of firms based on the integrated research methodology outlined in this paper.

Conclusions

The objective of the research described in this paper was to develop an integrated research methodology in order to gain new insights into the use of the phrase 'supply chain management' and the term 'logistics' in practice. Process of creating questionnaire was thoroughly described with special emphases on population sample and selecting a stratified sample. The next step of this work is to conduct the empirical research based on proposed methodology and by relating findings back to the literature discover if there is a divergence between theory and practice, and if this variation mirrors the differing orientations and emphases evident in the many theoretical definitions that have been proposed in recent decades. Findings from the next stage of this work may open up some potentially fruitful avenues for future research.

References

- BOS. 2016. About BOS. [ONLINE] Available at: https://www.onlinesurveys.ac.uk/about/. [Accessed 10 June 2016].
- Burgess, K., Singh, P.K. and Koroglu, R. (2006), 'Supply chain management: a structured literature review and implications for future research', International Journal of Operations and Production Management, 26(7), 703-729.
- Chen, I.J. and Paulraj, A. (2004), 'Towards a theory of supply chain management: the constructs and measurements', Journal of Operations Management, 22(2), 119-150.
- Collis, J. and Hussey, R. (2009), Business Research: a practical guide for undergraduate and postgraduate students (3 rd edition), London: Palgrave Macmillan.
- Collis, J. and Hussey, R. (2009), Business Research: a practical guide for undergraduate and postgraduate students (3 rd edition), London: Palgrave Macmillan.
- CSCMP (2013), Council of Supply Chain Management Professionals, http://cscmp.org/about-us/supply-chain-management-definitions [date accessed: July 1st 2013].
- Easterby-Smith, M., Thorpe, R. and Jackson P.R. (2008), Management Research: an introduction, (3 rd edition), London: Sage Publications.
- Evanschitzky, H., Baumgaarth, C., Hubbard, R. and Armstrong, J.S. (2007) Replication research's disturbing trend, Journal of Business Research, 60, 411-415.
- Fawcett, S.E., and Waller, M.A. (2011), 'Making Sense Out of Chaos: Why Theory is Relevant to Supply Chain Research', Journal of Business Logistics, 32(1), 1-5.
- Geertz, C. (1973), The Interpretation of Cultures, New York: Basic Books.
- Halldorsson, A., Kotzab, H., Mikkola, J. H. and Skjott-Larsen, T. (2007), 'Complementary theories to supply chain management', Supply Chain Management: An International Journal, 12(4), 284-296.
- Kinsella, S. (2009), The Age Distribution of Firms in Ireland, 1961–2009. Department of Economics, University of Limerick, Ireland.
- Larson, P.D. and Halldorsson, A. (2004), 'Logistics versus Supply Chain Management: An International Survey', International Journal of Logistics: Research and Applications, 7(1), 17-31.
- Lincoln,Y. and Guba, E., 1985. Naturalistic Inquiry. NewYork, NY: Sage.
- Lummus, R.R., Krumwiede, D.W. and Vokurka, R.J. (2001), 'The Relationship of Logistics to Supply Chain Management: Developing a Common Industry Definition', Industrial Management and Data Systems, 101(8), 426–432.
- Mangan, J., Lalwani, C. and Gandner, B. (2004), 'Combining quantitative and qualitative methodologies in logistics research', International Journal of Physical Distribution & Logistics Management 34(7), 565-78.
- Neuliep, W. (1991) Replication Research in the Social Sciences, Sage.
- Oliver, R.K. and Webber, M.D. (1992), 'Supply-Chain Management: Logistics Catches Up with Strategy', in: M. Christopher (Ed.) Logistics: The Strategic Issues, Chapman and Hall, 63–75.

- ONS. 2015. UK Business - Activity, Size and Location. [ONLINE] Available at: http://www.ons.gov.uk/businessindustryandtrade/business/activitysizeandlocation/datasets/ukbusinessactivitysizeandlocation. [Accessed 10 June 2016].
- Robson, C. (2002), Real World Research (2 nd edition), Oxford: Blackwell Publishing.
- Ross, D.F. (1998), Competing Through Supply Chain Management, New York: Chapman and Hall.
- Saunders, M., Lewis, P. and Thornhill, A., (2009), Research Methods for Business Students (5 th edition), Harlow: Pearson Education.
- SIC. 2007. Standard industrial classification of economic activities (SIC) 2007. [ONLINE] Available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/455263/SIC_codes_V2.pdf. [Accessed 10 June 2016].
- Stock, J.R. and Boyer, S.L. (2009), 'Developing a consensus definition of supply chain management: a qualitative study', International Journal of Physical Distribution & Logistics Management, 39(8), 690-711.
- Storey, J, Emberson, C., Godsell, J and Harrison, A. (2006), 'Supply Chain Management: Theory, Practice and Future Challenges', International Journal of Operations & Production Management, 26(7), 754-74.
- Sweeney, E. and Bahr, W., 2015. Practitioner perspectives on supply chain management and logistics: a study from the United Kingdom.
- Sweeney, E., Grant, D.B. and Mangan, D.J., 2015. The implementation of supply chain management theory in practice: an empirical investigation. Supply Chain Management: An International Journal, 20(1), pp.56-70.
- Voss, C., Tsikriktsis and Frohlich, M. (2002) Case research in operations management. International Journal of Operations and Production Management 22(2), 195-219.