Effective supply chain management: theory and practice.

M. Simpson and P. D. Long#.*
** Sheffield University Management School, 9, Mappin Street, Sheffield. S1 4DT, UK.*
Tel: (0114) 222 2000 ext. 23450 or (0114) 222 3450 (direct line), Fax: (0114) 222 3348.
e-mail: M.Simpson@sheffield.ac.uk
 # Sheffield Business School, Business and Information Technology Centre, City Campus, Pond Street, Sheffield, S1 1WB, UK.
Tel: (0114) 253 3157, Fax: (0114) 253 5268, e-mail: P.D.Long@shu.ac.uk

Abstract

This paper describes an attempt to build an analytical tool/model of the supply chain which can assist companies managing their supply chain. Some new techniques of representing the supply chain are presented. The paper also reports the results of testing the new model in a small company's supply chain.

Keywords

Supply Chain Management, model, analysis, case study.

The original version of this chapter was revised: The copyright line was incorrect. This has been corrected. The Erratum to this chapter is available at DOI: 10.1007/978-0-387-35321-0_72

U. S. Bititci et al. (eds.), *Strategic Management of the Manufacturing Value Chain*

1 INTRODUCTION

Supply chain management is of strategic importance to all organisations delivering a product or service to a customer (Christopher, 1992; Guinipero and Brand, 1996; Hines, 1994). However, even though there are many structural models (Johnson, 1995; Scott and Westbrook, 1991), few approaches offer a clear way of analysing the supply chain of a company so that both strategic and operational opportunities and benefits can be easily identified.

Traditionally relationships between companies in the supply chain were through the functions of purchasing and sales (Stevens, 1990). Often purchasing was within the remit of the operations director/manager but sales was within the sphere of marketing. The lack of cross-functional co-operation and trust and the traditional adversarial links between sales and operations management made the operational and strategic benefits of good supply chain management difficult to achieve and the potential competitive advantages were lost. Today, supply chain management has achieved greater influence and acceptance among practitioners and academics (Lamming, 1994; Lambert et al, 1996).

Despite the progress in understanding supply chain management methods and approaches there is no simple, practical analytical tool or technique which draws together information within an organisation so that management can make better decisions in this area. Any such models or techniques should also attempt to compare the organisation's attitudes and cultures with those of its suppliers and its customers so that opportunities for co-operation and joint ventures can be identified (Macbeth and Ferguson, 1994). This paper describes an attempt to build an analytical tool/model of the supply chain which can allow companies, academic researchers and consultants to make suitable recommendations to management. The aims of the project were to develop, test and implement a practical analytical tool which would enable a manager, consultant or academic researcher to identify companies in the supply chain where partnerships and collaborative projects could be developed in order to improve an organisation's supply chain.

2 THE MODEL

A theoretical model, based on prevailing concepts from the literature (Brabett and Klemm, 1994; Carr and Truesdale, 1992; Christopher, 1992; Galt and Dale, 1990; Handy, 1985; Quayle, 1993; Stevens, 1990), used a new concept of a "Bar Magnet model" of the supply chain. The analogy of a bar magnet allows the interactions (the magnetic flux) of the organisations in the supply chain to be clarified and analysed in a systematic way. Figure 1 shows eight factors on which the interactions between organisations might rely.

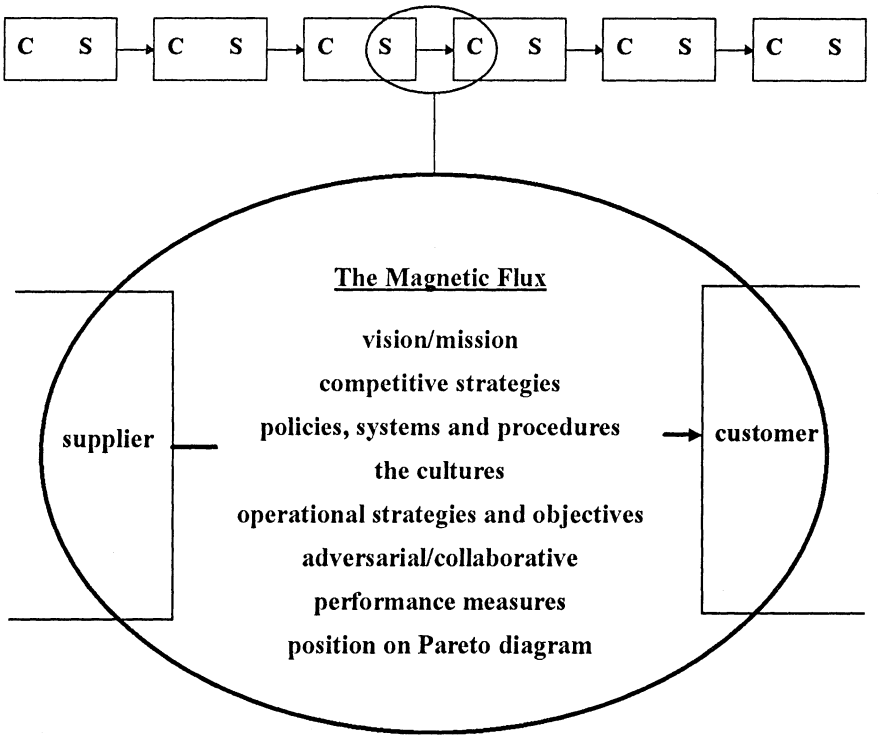

Figure 1 The bar magnet model of the supply chain.

3 THE CASE STUDY COMPANY

In order to test the model, the supply chain of the case study company, Eurotec Fibre Optics Limited, Doncaster (see also Sykes et al, 1997) was analysed. This company was formed in 1979 by two of Rank's ex-employees together with their spouses following the demise of Rank Fibre Optics Limited based in Leeds. Eurotec employs about 120 staff and manufactures fibre optic components for road and rail signs, museum and show-case illumination, decorative backdrops for theatres, opto-electronic sensors and medical applications. Eurotec were able to provide detailed lists of both suppliers and customers and the values of the transactions for one year which allowed the Pareto analysis to be completed. From this analysis the main suppliers and customers were identified and these were issued with a questionnaire. So far, only the first tier suppliers and customers have been examined in Eurotec's supply chain. Several of the main suppliers were investigated in greater depth by interview and factory visits.

4 METHODOLOGY

Data were collected via interviews and a questionnaire survey with the case study company management team. Secondary data were provided by the case study company in the form of reports, lists of customers and suppliers (including costs of purchases and sales with each company) and accounts. A Pareto analysis was used to select the five major suppliers and customers who were sent the same questionnaire as the case study company and some of these companies were interviewed.

The Questionnaire

The questionnaire was designed in three sections to assess the degree of collaborative/adversarial attitudes at each company while collecting other data on aspects of the model being investigated. The data collection method used was aimed to reduce bias by providing multiple measures of the same phenomenon and hence reduce problems with construct validity and reliability. The questionnaire covered the following areas:

Section 1. of the questionnaire asked if the organisation had formed policies, made statements or had procedures on various issues (e.g. on Vision, mission, customer service, supplier development, supplier accreditation, total customer satisfaction, quality commitment, staff training and development). This section was a yes/no answer with a request to enclose a copy of any relevant documents.

Section 2. of the questionnaire explored the nature of the relationship (adversarial or collaborative) between the organisation and its customers and suppliers. The dimensions explored included issues about quality, use of information, joint investment with suppliers and customers, collaboration and cooperation, price and the role of stocks. A five point Likert scale was used with answers which could range from least important (1), neutral (3), to most important (5) in some cases a high score indicated a positive response and in other cases a negative response depending on the wording of the question. The scores were then deconvoluted, an individual scorecard was produced and a cumulative score was calculated for each company.

Section 3. of the questionnaire asked questions to assess the extent to which systems of quality assurance and production control operated and investigated measures used to assess supplier performance.

The Interviews

The interviews were carried out using a semi-structured form. The questions were designed to compare the relationship the company actually had and would prefer to have with both customers and suppliers. The questions also examined the purchasing strategy and the marketing strategy.

5 RESULTS AND DISCUSSION

The results of the analysis of the questionnaires, Pareto analysis, financial analysis and interviews were compared in various ways. Figure 2 summarises the relationships of customers and suppliers with Eurotec. It shows both the importance of the relationships in cash terms and the scores for the relationships resulting from the analysis of the questionnaire. A positive score indicates a company is interested in collaboration or cooperation and is approachable and friendly. A negative score indicates an adversarial, uncooperative and unfriendly approach.

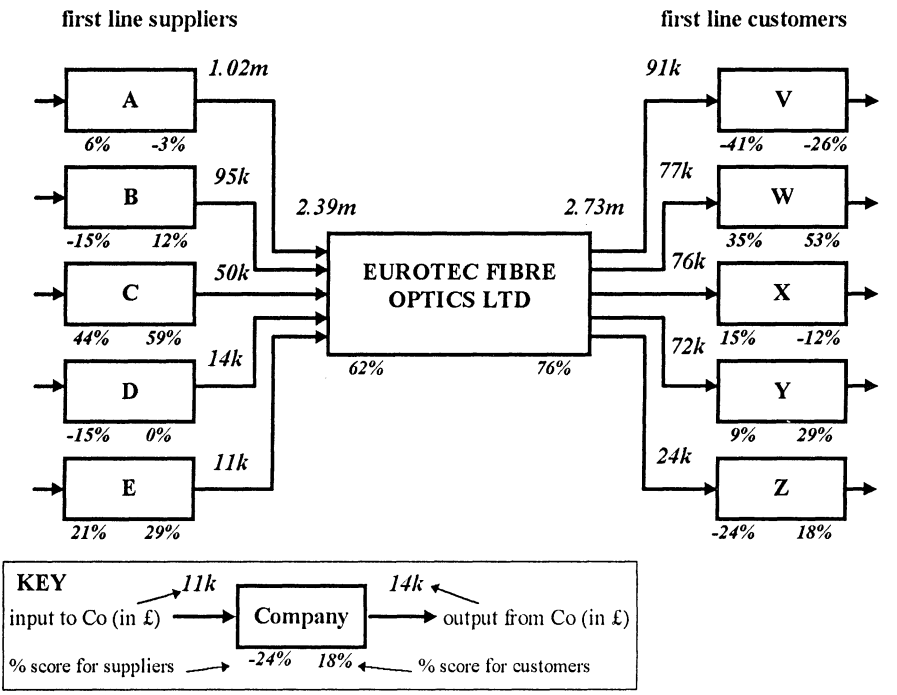

Figure 2 Supply chain flow diagram.

The entire model was assessed in the light of the analysis of individual company score cards, illustrative diagrams and interviews. It was clear that the questionnaires and interviews were an effective method of collecting data. However, four main areas of the model were not adequately explored or at least not adequately responded to. These were policies, systems and procedures, performance measures, competitive strategies and vision and mission.

In addition, further analysis of the questionnaires and interviews from all eleven companies in this supply chain led to some general results. These were that, in the context of dealing with customers and suppliers in the supply chain, the companies were generally

strongly in favour of
- cooperation.
- obtaining the best quality.
- links with suppliers/customers to get better quality.

fairly strongly in favour of
- developing links with suppliers/customers to reduce stocks.
- developing links with suppliers/customers to reduce administration costs.
- joint development of innovations.
- forming links with suppliers/customers to provide or obtain guaranteed business.

neutral concerning
- multiple sourcing.
- links with suppliers/customers to increase or get better prices.
- joint performance targets.
- single sourcing.
- trusting people with sensitive information.
- sharing investment risks with suppliers/customers.

weakly against
- obtaining lowest prices.

very weakly against
- keeping useful information to oneself.

strongly against
- BS5750/ISO9000.
- competitive tenders.

This list of preferences by the SMEs in this supply chain suggests that these companies are very positive about some aspects of supply chain management. This leads to an optimistic view for the future of supply chain management within these companies. However, some of the aspects which they are neutral about or positively against such as trusting people and sharing investment risks would go against the ideas of Hines (1994) and negate some of the positive aspects which they favour, such as joint development of innovations, collaboration to reduce costs and collaboration to reduce stocks.

6 CONCLUSIONS

The general conclusions were that the model, although imperfect, provided useful insights into the management of Eurotec's supply chain which could not have easily been determined in another way. Only four out of the 10 companies (i.e. companies C, E, W and Y) in this supply chain were genuinely interested in collaborating and developing good supply chain management practices with Eurotec. Training for suppliers in supply chain management might have been

beneficial in this case since at least one company (company B) could have been very good if it had tried to improve and develop.

Few companies in this supply chain network were using performance measures. Vision and mission were not significant drivers of strategy in the SMEs in this supply chain. Competitive strategies were not well defined by these companies. These points are not too surprising and it could be argued that since the case study company and the suppliers were SMEs with limited strategic knowledge or direction that vision/mission and competitive strategies would be expected to be less well developed and articulated in any case. It could also be argued that SMEs often take a much more reactive and tactical approach to managing their business. Eurotec does have some larger customers but cooperation from these customers was poor and may have had something to do with the role of power in the relationship (Poole et al, 1995). Therefore, all eight factors in the model were not involved to the same degree in this case and the model needs further testing, perhaps with larger companies, and revision.

Weaknesses in the approach were identified. In particular, the questionnaire seemed inadequate in obtaining some critical information on policies, systems and procedures. It would have been interesting to have extended the application of the model into the supply chain to second tier suppliers and customers.

7 ACKNOWLEDGEMENT

We indebted to Eurotec Fibre Optics, Ltd., Doncaster, for their assistance with this work.

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9 BIOGRAPHIES.

Dr. M. Simpson is a lecturer in Operations Management at the Sheffield University Management School. He has worked in industry in both design and development and research and development. His interests include supply chain management and service operations management.

Dr P.D. Long lectures at Sheffield Business School (at Sheffield Hallam University) in Operational Research and Operations Management. He has worked in industry and local government and has research interests in customer chains in both manufacturing and service industries.