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**Strategic Sourcing: Trends and Emerging Issues for
Research**

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Abstract

The objective of this paper is to understand the nature of research undertaken in the area of Strategic sourcing using a structured framework and use it as a basis for projecting some future areas for research. In this paper, the contributions of the literature are analyzed at two levels; research agenda and data and analysis framework. Using this, the research contributions of 154 papers published over a ten-year time period was assessed and some possible areas for further work identified.

Our analysis of the literature points to a few areas of research pertaining to strategic sourcing. There is a need for studying several aspects related to global sourcing. Further, important issues such as reliability of global supply chain networks, development of strategies for responding effectively to major disruptions in the supply network and understanding the behavioral issues related to supply chains are some of the other areas worth researching in the future. Our study also pointed out the need for developing hybrid solution methodologies to improve the solution quality.

Keywords: Strategic Sourcing, Literature Review

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1. Introduction

One of the important activities in any organization today pertains to procurement of materials and services that it requires in order to convert raw material into finished products that are useful for the customers. Sourcing has become strategic on two counts; *operational and economic*. Operationally there is a growing importance of sourcing due to several developments. An analysis of the cost structure of manufactured goods over the last 30 years reveals that increasingly organizations spend over 70% on raw materials and purchased components and services. This puts a special emphasis on procurement and sourcing. Further there is a significant change in the trading partner relationships. From an era of “independence” between the supplier and the buyer, we have transformed into an era of “mutual dependence” and even further into a “state of interdependence”. Finally, the increasing cost pressure that organizations face translate directly into reducing the input cost of materials and components even while increasing the quality and performance of these components. Clearly these operational considerations have pushed the importance of sourcing in organizations.

Strategic sourcing consists of processes of planning, evaluating, implementing and controlling all sourcing activities undertaken by an organization to achieve its long-term goals (Carr and Smeltzer 1997). The principal objective of strategic sourcing is to effectively handle situations when faced with supply, competitive, and demand uncertainties (Milliken, 1987; Johnson & Johnson, 1991). It is achieved by developing a set of practices through which certain flexibilities could be obtained to face these uncertainties. Strategic Sourcing enables an organization to identify and select suppliers through strategic long term partnerships, by providing benchmarks, laying emphasis on supplier performance and providing feedback to suppliers. Moreover, in today’s business context organizations compete in a global environment and operate in multiple markets and geographical locations. This provides additional dimensions to strategic sourcing.

With the advent of the Internet, new market mechanisms have sprung in the electronic space enabling the buyers and the sellers to locate each other, discover products and prices efficiently and conduct business in a cost effective manner. A case in point is Alibaba.com, a global leader in business-to-business (B2B) e-commerce. Alibaba has a user community in excess of 42 million from more than 240 countries and regions (Alibaba, 2009). These users transact a number of trade leads with one another through its portal. Such electronic marketplaces help the buyers and the sellers reduce the transaction costs and the time in the entire procurement

process. On account of these developments, practices such as outsourcing, global sourcing and e-procurement have become key aspects of strategic sourcing. The specific comparative advantages of different locations, countries and regions have led to an emerging trend in global production and sourcing systems. In such a scenario, the procurement and production process is typically organized with multiple country affiliations. A product may be designed in one country, manufactured in another and parts/components sourced in yet another (Pham and Quoc, 2006). This has introduced new dimensions in global sourcing as there are marked differences in performance and procurement practices in different regions of the world (Ruamsook et al. 2007).

Strategic sourcing requires certain planning and operational changes in the manner the procurement and supply management functions are managed. Internally in an organization, the status of purchasing within the organization and the nature of internal coordination required undergoes significant changes. Further there is a greater need for information sharing with the suppliers (Kocabasoglu and Suresh, 2006).

In view of these developments in the sourcing landscape we are motivated to understand the manner in which research and literature development has taken place in the area of strategic sourcing and provide some useful directions for further work in the area. Specifically, we have analyzed 154 papers published during 1997 – 2007 in the area of strategic sourcing and proposed a classification scheme to position the research efforts in the area of strategic sourcing. We use it to identify specific areas where more focused research will help both the practitioners and the researchers.

The paper is organized as follows. In the next section we develop a framework for analyzing the past work in the area of strategic sourcing. Using the developed framework we study the literature in sections 3 and 4. In section 5 we provide some directions for future research in the area of strategic sourcing and we conclude the paper in section 6. Our analysis of the literature points to a few areas of research pertaining to strategic sourcing. There is a need for studying several aspects related to global sourcing. Further, important issues such as reliability of global supply chain networks, development of strategies for responding effectively to major disruptions in the supply network and understanding the behavioral issues related to supply chains are some of the other areas worth researching in the future. Our study also pointed out the need for developing hybrid solution methodologies to improve the solution quality.

2. A framework for analyzing the literature in Strategic Sourcing

Since our work is one of developing a framework for reviewing the literature in strategic sourcing it will be useful to first understand the methodology and the steps adopted in developing the framework. Figure 1 depicts the various steps in this process. The first step was to identify the period of study. Advent of the Internet into B2B applications began in 1996. Further, the global economic trends and emergence of newly industrialized economies including BRIC countries began to be noticed around the turn of the new millennium. In view of these the period of study was chosen to be 1997 – 2007. The second step was to collect relevant literature. In order to do this, appropriate keywords were identified and well known electronic databases (EBSCO, Proquest and other published databases) were searched using these keywords. The selected articles were further analyzed from a content perspective and relevance for the current study. Based on these a final short list of 154 articles was made for further analysis using a classification scheme. Table 1 has details pertaining to the articles selected and the journals. Figure 2 provides a graphical representation of the number of papers published in the area of Strategic Sourcing for the different years 1997-2007. There has been steady increase in the number of published papers.

The next step in the process was to identify factors for classification of the selected articles. During the time period of our study (1997 – 2007), we identified 11 review topics/papers. The review papers covered areas such as supplier selection, procurement auctions, state of procurement and contracting, green supply chain and analysis of the supply chain management framework. Vidal and Goetschalckx (1998) reviewed strategic production – distribution models, examining the identification of relevant factors included in the formulations and specific characteristics of selected models found in the literature. De Boe, Labro and Morlacchi, (2001) reviewed decision models for supporting supplier selection process, the final phase of supplier selection process and also several other decisions. They classified them based on supplier selection methods and phases in supplier selection process. Germer et al. (2004) reviewed research on online reverse auctions in industrial purchasing by presenting a detailed review on purchasing auctions. Issues covered include mathematical optimization to study the auction aspects and classification methods to examine players participating in an auction and their role. Croom et al. (2001) reviewed supply chain literature using a two-part classification scheme; content and methodology. Using the methodological classification research work was identified as descriptive or prescriptive.

Aissaoui, et al (2006) presented a literature review that covered the entire purchasing process for parts and services and outsourcing activities. It also covered the Internet based procurement environments such as electronic marketplace auctions. Main emphasis was on papers that employed operations research and computational models. This paper adopted a technique and method based classification. Srivastav (2007) reviewed the area of Green supply chain management. Literature on Green Supply Chain was classified on the basis of problem context in supply chain's major influential areas and on the basis of

methodology and approach adopted. Krishnan, Ulrich (2001) reviewed research in product development and focused on product development and decision making within a single firm. Content development, supply chain design, product design and product ramp up and launch were the dimensions considered for classification.

All review papers used a scheme of classification using dimensions such as content, techniques and methods adopted in the study. Classification methods were also used to critically analyze contributions made to the respective fields. In this paper, the contributions of the literature are analyzed at two levels; research agenda and data and analysis framework. Research agenda pertains to choice of focus area of research and the type of research. On the other hand, data and analysis framework points to the type of data collected and the manner in which it is analyzed.

Research agenda is an important aspect for assessing the contributions in the field. This is primarily due to the broad set of topics that could be covered under strategic sourcing. Therefore, we use *focus area of research* as a dimension to classify the papers. An analysis of this will help us identify under-researched areas of work and the need for focusing on new areas. Further, since there are newer developments in the field, the manner in which the research agenda is proposed to be studied can also point to nature of contributions. In an area where rapid changes happen (such as e-procurement) or where the issues are too complex to comprehend and analyze (such as global sourcing and trans-national supply chain management) studies involving practitioners could help us develop better research propositions for future research. Therefore, *type of research* is used as another dimension to assess the contributions.

Data and Analysis framework provides vital clues about the substantive part of research. It also informs the challenges faced by the researcher and the potential limitations of the current work. Data structure is a defining aspect of analysis for the researcher. Further, the type of data used also points to the challenges in collection and analysis. Therefore, *data collection method* is used as dimension to classify papers. The other aspect is the method of analysis of the data. Specific solution methodologies are valuable pointers to other researchers and help avoid reinventing the wheel. It also promotes further improvement of tools and technique employed in some future research. Therefore, *tools used for analysis* is another dimension to assess research contributions.

In the rest of the paper we use this classification framework to assess the contributions to the literature and identify some areas for further work.

3. The research agenda in Strategic Sourcing

3.1 Focus Areas of Research

Five major areas of research emerged based on the analysis of the papers selected. These include strategic issues related to sourcing, supplier selection, evaluation methods and decision tools, purchasing method, buyer-supplier relationships and e-Procurement. Outsourcing is one of the frequently addressed issues in strategic

issues related to sourcing. Outsourcing occurs when a company purchases products or services from an outside supplier, rather than performing the same work within its own facilities, in order to cut costs. The decision to outsource is strategic one for most companies, since it involves weighing the potential cost savings against the consequences of a loss of control over the item or service. Supplier selection is a multi criteria problem that involves both qualitative and quantitative factors. It is a pre-procurement process carried out to understand a supplier's suitability towards an organization's sourcing needs.

On the other hand, purchasing methods include the entire set of activities carried out for purchasing decision. Buyer-supplier relationship deals with the post-procurement process. Earlier majority of business transactions were done at arms length, now companies are embracing each other and working together towards a mutually beneficial goal. In the present scenario both buyers and suppliers are beginning to work with each other to form supply networks. e-Procurement refers to purchase and sale of supplies and services through the Internet and other information and communication technologies (ICT). e-Sourcing is a branch of e-Procurement whose task is to locate and select suppliers. Based on further analysis of the papers major sub-themes addressed under each of the focus areas of research have been identified. Table 2 has details on this.

3.2 Type of research in Strategic Sourcing

Type refers to the approach or the strategy used by the researchers to setup the overall study. Qualitative research and quantitative research are the two main methods of research. Five sub-classifications have been done under type of research; Analytical, Empirical, Conceptual, Review and Best Practice. Most of the papers classified as analytical research develop sophisticated relationships formulating or developing new mathematical relationships. They use them to study how the models behave under different conditions. Empirical research generally involved theory building that emerges from both collection and analysis of data. Conceptual papers consist of qualitative research papers that investigate complex phenomena or events. A literature review is an account of what has been published on a topic by accredited scholars and researchers. In addition to research based papers, ten papers described specific situations, practices developed in leading companies. These are grouped under best practices.

Analytical papers can further be classified into papers using a modeling approach and other specific tools for analysis. Teich et al. (2006) described a multi attribute e-auction mechanism in their paper. The paper emphasized on multiple unit and several algorithms for such auctions were outlined. Miles (2000) provided a detailed analysis of the costs and benefits associated with the dual source strategy associated with suppliers. The study provided a quantitative analysis of the practice to understand the actual economic benefit. Schummer and Vohra (2002) examined the issue of efficient procurement auctions. Marshall Miles (2000) studied the dual source strategies utilized in the power supply industry. A Modeling method is used to determine what additional price leverage would be required to make a dual vendor scenario a breakeven proposition. Hazra et al. (2004) analyzed the costs and

risks faced by suppliers in the open and electronic market and derived the price capacity function for the supplier. Kishore, Manish and Rao (2004) investigated determinants of e-commerce-sourcing during technology growth and maturity phases.

Empirical approaches utilized *single and multiple case studies*. Kulp et al. (2006) and Cicmil and Marshall (2005) studied the effectiveness of e-Procurement at the project level using a case study. In some papers *event studies* were utilized for the study. Agarwal et al. (2006) presented the results of an event study that examined the stock market reactions to publicly announced E-Business Projects. The study used cumulative abnormal returns as a dependent variable to provide an objective firm level performance measure to evaluate the appropriateness of the outsourcing decision. Hoffmann (2003) used a longitudinal study to explain the development paths and patterns in the evolution of an alliance portfolio from 1990-1999. Hadfield used a field study to determine the performance measures that distinguished JIT from non-JIT firms for made-to-order and assemble-to-order products. Arnold et al. (1999) discussed the role of reverse auctions on transaction costs pertaining to procurement.

We have presented in the previous section some of the review papers. Aissaoui et al. (2006) presented an up-to-date comprehensive literature review of supplier selection. Balakrishnan and Cheng (2005) focused on tactical issues in the make or buy decision; this study was a review and an update on a previous study carried out on the same topic. McIver, Humphreys and McAleer (1997) used published literature to investigate the major changes that have taken place in the role of purchasing function in organizations over the last two decades. Markatsoris and Richards (2004) described reference, design architecture, workflow and practical issue for an e-Procurement system and introduce a design process of B2B enabled e-Procurement system.

Table 3 provides a cross-tabulation of the focus areas and type of research. Maximum number of research papers were in the area of strategic issues related to sourcing (36%), followed by e-Procurement (21%). Over three fourths of the papers employed either empirical or analytical types of research. It is also pertinent to note that 48% of the papers employed empirical methods to address strategic issues related to sourcing. On the other hand, in the area e-Procurement, analytical (44%) and empirical (38%) were the principal research types. Clearly, these are current topics and several organizations have been addressing some of these issues in different ways. On the other hand, fewer papers addressed the issues such as supplier selection evaluation methods and decision tools (14%) and buyer-supplier relationships (9%).

4. Data & Analysis framework in Strategic Sourcing

4.1 Data collection method

Although the type of research to an extent determines the data collection method, researchers have adopted different methods to carry out the next steps of data

collection leading to theory building and model formulation. Several methods of data collection were used by the researchers in the papers that we have studied. These included action research, survey, case studies, use of published data, interviews and others including analytical induction.

Rothaermel et al. (2006) made use of **published data** to focus on simultaneous pursuit of vertical integration and strategic outsourcing. Kakabadse and Kakabadse (2002) explored the differences in outsourcing between US and European companies using a case study. Padillo et al. (1999) developed a multiple criteria decision model of “make or buy” problem and used a case study to illustrate the implementation of the methodology in manufacturing organisations. Momme (2002) developed a model of the process of outsourcing manufacturing using theoretical approach while simultaneously using secondary methods of action research and longitudinal case study.

Action research included papers where the researcher was participating in what was happening. Jennings (2002) developed a method to structure the contextual factors, capability, cost, technology, supply and product market conditions. Gulati et al. (2000) discussed how incorporating a heightened awareness of strategic networks helped to gain insights into firm conduct and performance.

Surveys were either cross-country or longitudinal depending upon the unique feature of the survey. Nassimbeni (2006) studies the concept of international sourcing using a survey of Italian firms across various sectors. Li et al. (2006) highlighted the role of a purchasing firm’s switching inertia in the supplier selection process using data from a cross section of industries. Lancot and Swan (2000) analyzed the multinationals and their technology strategy from a resource perspective and attempted some theory development in technology reliance strategy. The sample included practitioners from US, Germany, Japan and Taiwan. Trent and Monezka (1998) adopted a longitudinal survey across a ten year period to study the real and projected changes and trends that have affected purchasing and sourcing professionals. Lowson (2001) carried out a cross-country survey of 78 UK and North American retailers in the consumer good sectors to examine the nature of operational strategies in retail communities. Monezka, Peterson and Handfield (1998) used a cross country survey across United States, Canada, Mexico, Western Europe and Australia to study strategic supplier alliances.

Platts et al. (2002) proposed an **interview** mechanism to collect data for studying the make or buy decisions. To gather data in a structured manner a workshop was conducted which enabled people from different areas to share and exchange views and have a better understanding of make or buy decision. **Analytical induction** is a method used in most of the theory building and qualitative research. Ulrich and Ellison (2005) developed a theoretical argument and conceptual framework to investigate the relationship between design and production of an organization by developing a theoretical approach. Schiele (2006) focused on a conceptual bias and derived propositions on the nature of innovative suppliers. The paper briefly established the theoretical link between purchasing and innovation and provided a general conclusion. Kakabadse and Kakabadse (2000) invoked conceptual knowledge to shed light on the increasingly complex and sophisticated forms of sourcing found in today’s organizations.

Table 4 provides a cross-tabulation of the data collection methods and research types. Mathematical modeling, surveys and case studies accounted for nearly 77% of the total papers. Conceptual type of papers adopting qualitative research used methods such as analytical induction, action research, modeling and multiple case studies. As is evident from table 4, surveys and case studies are primarily employed to gather data for research using the empirical approach. Increased use of action research and interviews could bring the research effort closer to practice. This will be a desirable transformation in the future.

4.2. Tools used for analysis

We further provide a scheme of classification based on the tools used for analysis after the data collection process was completed. Prominently four categories of tools were used for analysis by the researchers. This includes statistical analysis, Multi Criteria Decision Modeling (**MCDM**), AHP/Heuristics and others. Tools such as Markov Decision Process, simulation, game theory and queuing theory were clubbed together under others.

Goyal et al. (1990) proposed a LP model for multistage batch environment that interfaced with the-Procurement and production decisions. Lejeune and Ruszc (2007) investigated a supply chain operating in an uncertain environment using an integer programming formulation to study a multi-period inventory production distribution plan that aims at minimizing the total cost of the supply chain. Gans (2002) used a Bayesian Bandit model to analyze how suppliers should set quality levels in markets characterized by unavoidable random variation. Integer Programming models have been used by Talluri, et al. (2006) and Jayaraman et al. (1999) to arrive at an optimal set of suppliers. Romeijn et al. (2002) studied a multi-period single-sourcing problem that took into account transportation and inventory costs. This was suitable for evaluating the performance of a logistics distribution network in a dynamic environment. An LP tool was developed to solve the pricing problem efficiently.

Some of the complexities of real life have been captured by papers using **MCDM**. Shyur and Shih (2005) proposed a hybrid model for vendor evaluation using a MCDM that incorporates an Analytical Network Process. Sharp (2006) developed a modeling based SMART process that is based on MCDM technique to decide what products need to be in-sourced and which need to be outsourced. Platts et al. (2002) presented the results of an ongoing study investigating factors affecting Make versus Buy Decision using MCDM. Teich et al (2006) used MCDM to study some of the decisions in an E-Procurement scenario. Similarly, Raghavan and Prabhu (2004) developed a MCDM for the e-Procurement process. Wadhwa and Ravindran (2007) posed the vendor selection problem as a multi objective optimization problem and arrived at a pricing model. They analyzed a situation in which one or more buyers order multiple products from different vendors in a multiple sourcing network. Make Vs Buy decision has undergone significant changes in the way it is seen by companies, earlier these decisions were made primarily on the basis of cost; in recent years there has been a greater implication of the strategic implication of these decisions. Narasimhan et al. (2006) proposed a mathematical model that

efficiently addressed this issue. They developed an approach for optimally selecting suppliers using multiple-criteria across multiple products over their product life cycle.

A small number of studies utilized the **AHP/Heuristics** for modeling. Sucky (2007) used a hierarchical Approach and studies the dynamic strategic vendor selection. Buke et al (2008) highlighted the importance of supplier scale on buying firm's sourcing decision. Ding et al. (2005) studied the supplier selection problem using a simulation optimization method. Three basic modules of Generic Algorithm, discrete event simulator and a supply chain modeling framework were utilized to analyze the problem. Burke et al. (2008) analyzed the impact of supplier pricing and supplier capacity limitations on optimal sourcing policy for a single firm. Heuristics were developed to identify a quantity allocation decision for the firm. Milner and Kouvelis (2007) also employed a heuristic approach to study how online exchanges affect the sourcing strategy of firms.

Lejeune and Raszczynski (2007) studied a supply chain operating in an uncertain environment. A multi-period inventory production distribution plan was considered with the objective of minimizing the total cost of the supply chain. A probabilistic approach was adopted for constructing the inventory production and distribution plan.

Other studies emphasized tools such as Markov Process, game theory, dynamic programming, queuing theory and simulation for analysis. Cheung et al. (2004) presented an agent-oriented knowledge based system for strategic e-Procurement. Ding et al. (2004) developed a genetic algorithm based multi-objective optimization for joint decision making on strategic sourcing and inventory replenishment. The model enabled the decision maker to simultaneously optimize decisions at both strategic and operational levels. Teich et al. (2005) designed a mechanism to auction multiple units of a good in B2B transactions using a multi-criteria e-auction mechanism. Chatain and Zemsky (2007) showed how biform games that introduce unstructured negotiations into game theory analysis can be used to study buyer-supplier relationships.

Robinson (Jr.) et al. (2005) proposed a simulation based experimental framework to mathematically characterize system costs in both decentralized and coordinated supply chain structures under alternative e-replenishment technologies. Cardi et al. (2004) demonstrated that adoption of simulation helped the project team in evaluating the dynamic behavior resulting from the implementation of e-procurement platform better. Yang et al. (2005) studied the optimal production inventory outsourcing policy for a firm with Markovian in house production capacity that faces independent stochastic demand and has the option to outsource. The paper aimed at offering a better understanding of tactical outsourcing. Bradley (2004) used queueing theory to study inventory management with replenishment from two sources. Dai et al. (2005) used queueing techniques based model that captures fundamental trade-offs in a firm's purchasing preparation process.

Table 5 shows a cross-tabulation of data collection methods and tools adopted for analysis of data. Prominently four different tools for analysis were used by the

researchers. These are Statistical Analysis (35 nos), MCDM (19 nos) others (13 nos), Analytical Hierarchy Programming/Heuristics (11 nos)

Miscellaneous tools of analysis such as Markov Decision Process, Simulation, Game Theory and Queuing Theory were clubbed together under others. Statistical Analysis (38%) was the most popular tool; by Multi Criteria decision Model and others.

5. Future Research Directions

The two part framework that we have developed provides us a basis for addressing the potential direction for the strategic sourcing research. We discuss these at two levels; research agenda and data & analysis framework.

5.1 Towards newer research agenda

Tables 2 and 3 provide us data pertaining to the current research agenda. As is evident from table 2, researchers are mostly addressing areas such as outsourcing, supplier selection and strategic sourcing practices and design and implementation of e-procurement systems. These are clearly the current issues of concern to practice. However, research is characterized by a certain element of look ahead. In this context there are several areas that require better understanding of both the researchers and the practitioners. We identify some areas for consideration.

Global sourcing is not a temporary phenomenon and is here to stay. Our review of literature reveals that a large part of the literature has focused on the strategic side of global sourcing, covering the aspects of discussing the effect of global competition on the need for firms to seek international suppliers (Bozarth et al. 1998), local content purchasing rules established by governments, in the case of multi plant global sourcing decisions (Munson and Rosenblatt, 2001), using strategic alliances to carry out global sourcing to gain a competitive advantage (Murray, 2001) and competitive technology market affecting the firm's technological diversification strategies (Cesaroni, 2004). Though the papers addressed the strategic importance of global sourcing there is scope to address the processes and challenges pertaining to global sourcing.

Global sourcing is far more complex than what is being currently studied in the literature. In truly global supply chain multi-currency and exchange rate fluctuations create uncertainties that require better approaches to model. For instance, EADS sources a majority of its components in euro markets and sells its products in dollar markets. This causes significant fluctuations in its profitability and costs of operations. Global supply chains are also characterized by cultural, behavioral and economic differences. Further, the interactions between the transportation and plant location costs and other relevant costs have not been well understood yet. Similarly, global supply chains have also opened up the possibility of having highly cost-heterogeneous supply base. In such a scenario, how are procurement decisions likely to be made and what will be the nature of impact on procurement costs? These issues have not been addressed adequately in the literature.

Recent events such as 9/11 and Tsunami in the Asia-pacific region has brought to limelight the issue of reliability of supply chain networks. Global supply chain disruptions and mechanisms to protect businesses could be modeled for obtaining better insights. For instance, what is the value of having a highly reliable network that also is of high cost? How to arrive at threshold values to make these decisions? What are the viable strategies for building reliable network structures in global supply chains?

5.2 Opportunities for newer data & analysis framework

Qualitative research enables the researcher to address complex issues that are outside the purview of mathematical modeling. It also enables the researcher to forecast future directions through empirical studies and surveys that relies critically on practitioner insights and executive judgments. In our study of literature, a number of surveys have confined themselves to evaluating the efficacy of a policy or practice in vogue and helps improve some of these. On the other hand, projecting future directions could help in setting up newer agendas for both practice and research. What are the future trends in procurement and possible trajectories for the organizations to take? How will the Internet as a dominant technology shape the emerging procurement landscape? Currently, some of these questions are answered by simple surveys conducted by trade journals and industry associations. Some academic perspectives could be brought through such surveys.

There are softer issues in supply chain and sourcing that calls for more attention. This includes a host of behavioral issues among supply chain partners leading to alignment of supply chain goals, strategies and incentives. Furthermore, the existing analytical models on value of information in the SCM network can be supplemented by empirical work. Reliability of networks in the context of major disasters (manmade as well as natural) could also be empirically assessed. A host of surveys covering these will be valuable.

In our study of the literature, hybrid modeling approaches are far and few between. It will be worthwhile to develop analytical frameworks that combine analytical and empirical work. While empirical work can bring practical insights into the analysis, analytical models couples with the empirical findings can provide generalization of ideas suggested. Similarly, hybrid modeling approach combining analytical and simulation models have been advocated early by researchers (Shantikumar, 1983). Such hybrid models combine the power of both simulation and analytical modeling and provide better solution frameworks. We do not see much work of this nature in sourcing literature. It will be desirable to explore these areas for improving the solution quality.

6. Conclusions

This study has focused on the literature development in the area of strategic sourcing during a ten year period. Based on a scrutiny of review papers we have developed a two part framework to assess the contributions of the literature. A careful study of about 154 papers using this framework shows how various issues

have been addressed in the area of strategic sourcing. Global sourcing is an important aspect of strategic sourcing. Our study has pointed out the need to focus on this aspect more in the future. Further, important issues such as reliability of global supply chain networks, development of strategies for responding effectively to major disruptions in the network and understanding the behavioral issues related to supply chains are some of the other areas worth researching in the future. Our study also pointed out the need for developing hybrid solution methodologies to improve the solution quality.

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Table 1
Details of articles selected for the study

List of Journals Reviewed	No. of Articles
Decision Science	10
European Journal of Operations Research	5
European Journal of Purchasing & Supply Management	6
IEEE	6
Interfaces	7
International Journal of Production Economics	5
Journal of Purchasing & Supply Management	7
Journal of Supply Chain Management	16
Manufacturing & Service Operations Management	5
Operations Research	8
Production Planning and Control	7
Strategic Management Journal	13
Other Journals	59
Total	154

Table 2**Sub Categories of research topics under each focus area**

Focus Area	Topics	No. of Papers
Strategic Issues Related to Sourcing	✓ Make or Buy	11
	✓ Centralization Vs Decentralization	3
	✓ Outsourcing/Global Sourcing	20
	✓ Networks & Alliances in Strategic Sourcing	11
	✓ Supply Chain Strategies	10
Supplier Selection & Evaluation Methods and Decision Models	✓ Supplier Selection Criteria	17
	✓ Decision Support Tools	5
Purchasing Methods	✓ Single Vs Multiple-Sourcing	4
	✓ Strategic Sourcing Practices	15
	✓ How much to Procure from each Supplier	5
	✓ Adapting to production/ market conditions/ Replenishment Strategies	2
	✓ Negotiation Planning	3
	✓ Supply Base Reduction	1
Buyer Supplier Relationships	✓ Supplier Development	1
	✓ Supplier Switching	2
	✓ Structuring Supplier Relationships	11
	✓ Retention of Suppliers	1
e-Procurement	✓ Auctions/Reverse Auctions	8
	✓ Knowledge Based System	2
	✓ Strategic Perception	10
	✓ Design and Implementation/Technology	12

Table 3
Focus Areas and Type of Research

Focus Area→ Type ↓	Strategic Issues related to sourcing	Supplier Selection Evaluation Methods and Decision Tools	Purchasing Methods	Buyer Supplier Relationship	e-Procurement	Total
Analytical	13	13	9	2	14	51
Best Practice	1	2	3		4	10
Conceptual	13	1	5	2	2	23
Empirical	27	4	12	10	12	65
Review	2	2	1			5
Total	56	22	30	14	32	154

Table 4
Research Type and Data Collection Methods

Method	Empirical	Analytical	Conceptual	Best Practice	Review	Total
Action Research			4			4
Case Study	25		6	10		42
Interviews	1					1
Published Data	5		2		5	12
Survey	34					34
Others		50	5			55
Analytical Induction			6			6
Total	65	51	23	10	5	154

Table 5
Tools for Analysis

Method	Multi Criteria Decision Model	Statistical Analysis	Others	AHP/ Heuristics	Total
Case Study	1	2	1		4
Model	16	1	12	11	40
Survey and Interviews	2	28			30
Total	19	31	13	11	74

Figure 1

A framework for analyzing the literature in Strategic Sourcing
- methodology and steps

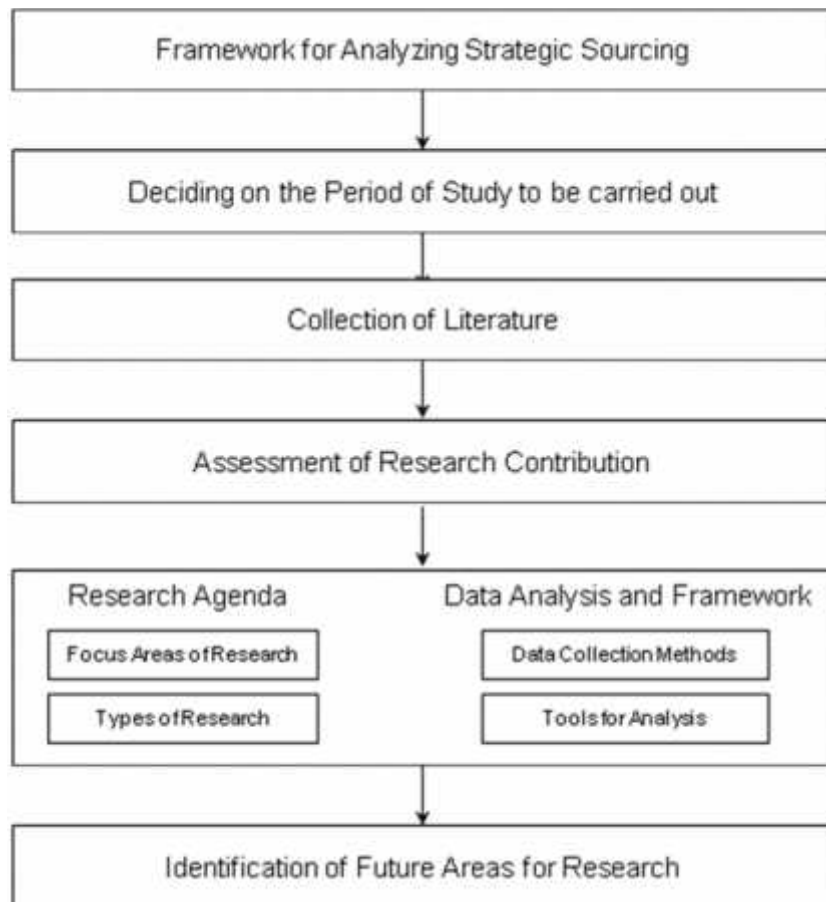


Figure 2
Articles Published in Strategic Sourcing during 1997-2007

