

IMPROVEMENT IN SUPPLIER SELECTION MECHANISM IN INDIAN ELECTRONICS & TELECOMMUNICATION SUPPLY CHAIN

Parul Goyal*

Abstract- Strategic sourcing refers to a set of activities to discover, evaluate, select, develop, and manage a viable supply base. Supplier base reduction, their location, cost reduction, technology development, quality consciousness improvement, cycle time reduction, and relationship management, and delivery capabilities enhancement for the purpose of gaining competitive advantage. While selecting potential Suppliers, firms need to adapt a repeatable evaluation process to develop a strategic system incorporating a number of selection criteria. One of the major criteria for selection of a potential Supplier was cost of the product or service in question. This paper describes the critical success factors in selecting the supplier for a major E&TC service provider in India. The selection criteria's are product, quality, price and cost management, delivery, supplier relationship management, decision-making, government policies and business ethics. The methodology proposed in this paper includes an investigation and analytical review of all variables and factors influencing the supplier selection strategy. The ordinary analytical data are based on the literature review while the primary data are based on survey questionnaire process. The data were collected from 5 major Electronics & Telecommunication service providers in India. The questionnaire was developed after going through few stages of process. First stage was a content validity which involves the expert opinion and comments. This paper focuses onto develop a conceptual model framework, examine and test the model for supplier selection for the Electronics & Telecommunications industry in India.

Keywords- Delivery, E&TC, Hypothesis, Place, Price, Product, Promotion, Quality, Selection, Sourcing, Supplier, Technology

* Department of Electronics & Communication Engineering, Dev Bhoomi Institute of Technology, Dehradun

1. Introduction

The Electronics & Telecommunication industry in India has grown rapidly with supply chain management becoming important within the sector. A multitude of providers and part owned Indian government industries; many suppliers are involved in providing services within this sector. Strategic sourcing refers to a set of activities to discover, evaluate, select, develop, and manage a viable supply base. It is a cross-functional process of the firm's various activities. Strategic sourcing and Supplier management include: Leveraging sourcing, Supplier identification, Supplier evaluation and selection, Supplier development and improvement, Supplier integration into processes

1.1 Strategic sourcing

Strategic sourcing refers to a set of activities to discover, evaluate, select, develop, and manage a viable supply base. It is a cross-functional process of the firm's various activities. Strategic sourcing and vendor management include:

- Leveraging sourcing
- Vendor identification
- Vendor evaluation and selection
- Vendor development and improvement
- Vendor integration into processes

1.2 Strategic issues in sourcing

The strategic focus of sourcing management involves: Integration of vendor capabilities into organizational processes, Vendor base reduction, their location, cost reduction, technology development, quality consciousness improvement, cycle time reduction, and relationship management, and delivery capabilities enhancement for the purpose of gaining competitive advantage in the literature (Cousins, P.D. & Lawson, B. 2007) et. al. [1]. Strategic issues in the area of sourcing and vendor management:

- Vendor Involvement in Product Development
- Vendor Base Rationalization
- Single versus Multiple Sourcing
- Vendor Location
- Quality Sensitive Vendors
- Creating and Maintaining Vendor Relationship

2. Supplier Selection Success Factors

2.1 Vendor risk portfolio

Vendor risk portfolio is a strategic framework for the assessment of dependency of the firm on vendors based on two factors namely, vendor's contribution on financial results, and supply risk associated with each vendor

2.1.1 Vendor's contribution on financial results:

The higher the volume or amount of money involved, the higher vendor's impact on financial results. Vendor's contribution on financial results deals with the measurement of the profit impact of contribution of a given vendor.

2.1.2 Supply risk associated with each vendor:

Supply risk associated with each vendor refers to measurement of risk of supply associated with each vendor is shown in Figure 1.

		SUPPLY RISK ASSOCIATED WITH EACH VECTOR	
		HIGH	LOW
Vendor's contribution on financial results	HIGH	Strategic Vendors	Leverage Vendor
	LOW	Bottleneck Vendors	Routine Vendors

Figure 1. Vendor risk portfolio

2.1.3 The strategic analysis helps to establish relationships between vendors.

2.1.3.1 Strategic vendors

Strategic vendors are those vendors who have high contributions on financial results of the firm as well as high supply risk associated with those vendors.

2.1.3.2 Bottleneck vendors

Bottleneck vendors are those vendors who have low contributions on financial results of the firm but supply risk associated with such vendors is high.

2.1.3.3 Leverage vendors

Leverage vendors have high contributions in the financial results of the firm at the same time, supply risk associated with such vendors is low.

2.1.3.4 Routine vendors

With Routine vendors, firms have low supply risks and their contributions on financial results of firms are also low.

2.2 Vendor Selection Process

While selecting potential vendors, firms need to adapt a repeatable evaluation process to develop a strategic system incorporating a number of selection criteria. One of the major criteria for selection of a potential vendor was cost of the product or service in question. Selecting supplier involves the end to end process. In the literature (Degraeve, Z., Labro, E. & Roodhooft, F. 2000) et. al. [2] several dimensions are categorized as the main elements and critical factors of supplier selection decision. These include quality, price, delivery, communication system, supplier relationship management, service, financial capability, geographical location and etc. This research intends to focus on posing and answering questions relating to the critical success factors and impact of the supplier selection on industry overall performance. In this context, it will look into what is the relationship, if any between the critical factors and supplier selection which finally impact to industry performance. Of principal interest to the authors is the identification of how does Government policy and business ethics influences and determines the supplier selection process. Hence the aim of the study is to develop a conceptual framework that explains the major criteria or success factors for supplier selection that affects the industry performance and finally test the model. Vendor Selection Process is shown in Figure 2.

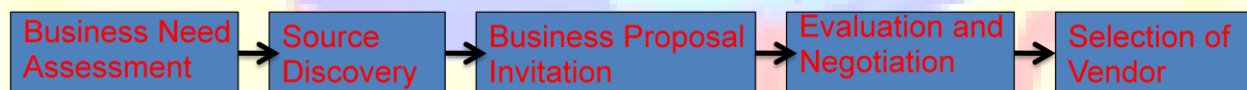


Figure 2. Vendor Selection Process

2.2.1 Technology and Quality

Selecting and evaluating suppliers grounded in the criteria of product technology, quality, reliability and product performance enhances customer satisfaction and industry performance. Whilst product technology and quality is perceived to be most important attribute followed by cost and delivery performance. As commonly shared among the SCM scholars, Technological capability management is included in changes is high and evolves. Therefore in this era characterized by rapid technological and product developments, selecting the supplier need to be

measured based on their technological capability for coping with the short and medium term of product development life cycle. Quality has always been one of the most important performance criteria with a conventional purchasing strategy. The most critical determinant in choosing suppliers is as under:

- The ability to meet quality standards
- The ability to deliver the product on time
- The performance history

2.2.2 Price

Numerous studies have addressed the price factors play an important role in selecting the supplier. Purchasing and procurement function which involve in supplier selection function is not only the mechanism for achieving cost savings, but also a mechanism for sustaining competitive advantage through technology acquisition, developing inter-firm relationship and configuring of the supplier base. This would suggest that firms that selecting suppliers with appropriate pricing will gain and increase business performances in term of improve cash flow, high cost reduction and cost efficiency. The problem of choosing right supplier with the right price and cost, so that profits can be maximized has become increasingly critical to industries survival due to keen competition in the micro-profit era.

2.2.3 Delivery

Centre to most procurement processes especially those industry who concern about meeting the ready for service date in their operations priority, is the timely delivery of the products, services or equipments. Poor delivery performance disrupts the production operations and result in poor sales performance and poor customer satisfaction index. If the suppliers steadily and always make the deliver on time, such delivery capability is help to planning and implementation team to meet the ready for service date which finally meet customer demand requirement. Thus managers should not select suppliers based only on low cost but should consider delivery performance and other attributes.

2.2.4 Supplier Relationship Management

Supplier relationship management and selection is a critical issue in any supply chain partnership. In this vein, the literature has tended to focus on the general construct of trust and level of interaction between the parties and the commitment of the parties to the relationship. Supplier relationship management became more strategic and recognized as major contribution factor to the competitive advantage for the firm. For example, improve supplier management through careful supplier selection would enhance the firm strategic position. In the literature (Tracey, M. & Chong, L.T. 2001) et. al. [4]. An emphasis on building the buyer-seller and developing long term relationships may necessitate an improvement of not just the operations and business process but also will highlight the need to develop an effective communications process to be a key element of the supplier selection process.

2.2.5 Decision-Making

Decision-making in order to select the right supplier usually requires strategic thinking and is time consuming. The selection of suppliers is a complicated by the fact that numerous criteria must be considered in the decision-making and hence selection process. In the literature (Verma, R. & Pullman Madeleine, E. 1998) et. al. [5] in of the early works on supplier selection, identified over twenty suppliers attributes which purchasing managers trade off when choosing suppliers. The real challenge here is whether to “go or no go” when selecting the best available supplier. The approach often goes beyond price, and consideration is typically given to the whole cost related to item, services, quantity, delivery and maintenance.

2.2.6 Government Policy

Industries from different national backgrounds have different considerations in making supplier selections strategy due to national agenda, government policy, political, economic, social and cultural context. Therefore it is hypothesized that industries from different national background have different considerations in making supplier selection process ad strategies.

2.2.7 Business Ethics

Ethics is generally emphasized on the 'right' or 'wrong' behaviors. In this research context the business ethics is mainly how ethical the suppliers and the industry doing the business transactions. In the main though, different ways of doing business are primarily important for industry's dealing with their suppliers, particularly in relation to gift giving, bribery, canvassing and corruption. Apart from direct bribery, favors and gifts, there are also other areas in which the purchaser may be guilty of unethical behavior. Different countries and cultures tend to exhibit differing attitudes towards the appropriate business ethics practice between customers and suppliers.

3. Supplier Selection Impact

3.1 Vendor Rating

- Some type of vehicle is needed to determine which vendors are capable of coming satisfactorily close to this and, thus, to be retained as current vendors. One such vehicle is the vendor rating.
- Vendor ratings systems provide a process for measuring those factors that add value to the buying firm through value addition or decreased cost
- It is the result of a formal vendor evaluation system

3.1.1 Benefits of Vendor Rating

- Helping in minimizing subjectivity in judgment and making it possible to consider all relevant criteria in assessing vendors.
- Providing feedback from all areas in one package.
- Facilitating better communication with vendors.
- Providing overall control of the vendor base.
- Requiring specific action to correct identified performance weaknesses.
- Establishing continuous review standards for vendors, thus, ensuring continuous improvement of vendor performance.

- Building vendor partnerships, especially with vendors having strategic links.
- Developing a performance based culture.

3.2 Evaluation and Rating Criteria

3.2.1 Seven C's framework

- Competency
- Capacity
- Commitment
- Control
- Cash resources
- Cost
- Consistency

3.2.2 Pricing Factors

- Competitive pricing
- Price stability
- Price accuracy
- Advance notice of price changes
- Sensitive to costs
- Billing

3.2.3 Quality Factors

- Compliance with purchase order
- Conformity to specifications
- Reliability
- Durability

- Support
- Warranty
- State-of-the-art product or service

3.2.4 Delivery Factors

- Time
- Quantity
- Lead time
- Packaging
- Documentation
- Emergency delivery

3.2.5 Service Factors

- Good vendor representatives with sincere desire to serve
- Information sharing
- Technical support services
- Extending emergency support
- Providing problem resolution

3.3 Vendor development

Vendor development can be defined as any activity that a firm undertakes to improve a vendor's performance and capabilities to meet the supply need in more efficient way. Selecting the right supplier and developing the infrastructure has an increasing impact upon firm performance as in the literature (Kannan Vijay, R. & Choon Keah, T. 2006) et. al.[3]. In contrast to this though, some researchers take an opposite view and suggest that sourcing partners may tend to add rather than diminish value to the portfolio of supplier relationships.

4. Hypothesis

From the above, it is proposed that the hypotheses are:

H1: High Quality of product and technology is positively related to the supplier selection process and the more effective this is the greater the relationship will be.

Looking at the inter relationship between the construct and hypothesis it shows that

H1a: There is a positive association between High Quality of product and technology (H1) with price and cost management (H2) in terms of total cost of ownership.

With reference to the factor related to the price for the supplier selection process; it is proposed that;

H2: Price factor is significantly linked to the supplier selection process.

H2a: Price (H2) will have a significant positive effect on supplier delivery and responsiveness (H3). This is due to the price factor reducing product long delivery lead time and improving time delivery relating to supplier inventory management systems.

With regards to the supplier delivery management, it is proposed that:

H3: Supplier delivery performance can have a significant impact on the supplier selection process.

H3a: Supplier delivery performance (H3) has a strong linkage with Supplier relationship management which may lead to the development of long term business relationships between each other.

Also it suggests that:

H4: Supplier relationship management includes knowledge and understanding of the supplier business background experience has a tremendous correlation with the supplier selection process.

This could be relates to the elements of short and long term business relationshi

H4a: A Supplier relationship management (H4) link with High Quality of product and technology (H1) or vice versa enhances the level of commitment and information sharing with each other e.g. supplier early involvement in product development and technology transfer.

In conjunction with the decision making it suggests that:

H5: The decision making process and the techniques utilized have a positive correlation with supplier selection process.

With regards to the Government procurement policy, it suggests that:

H6: Alignment with national government procurement policies strongly influence and affect the supplier selection process and this may have an impact on supplier selection.

H6a: Alignment with national government procurement policies (H6) relates positively to a business ethics (H7) in terms of compliance to the government's procurement ethics guidelines.

Also it proposes that:

H7: Business ethics is intrinsically involved in the supplier selection process.

And

H8: Greater knowledge and understanding of the supplier selection process has a significant link to greater operational efficiency and industry performance.

5. Research Methodology

The methodology proposed includes an investigation and analytical review of all variables and factors influencing the supplier selection strategy. The ordinary analytical data are based on the literature review while the primary data will be collected based on survey questionnaire process. A multiple case study methodology has been chosen with an extensive attention to distributing the survey a group of people in few industries involved in Electronics & Telecommunication industry. The data were collected from 5 major Electronics & Telecommunication service providers in India. The questionnaire was developed after went through few stages of process. First stage was a content validity which involves the expert opinion and comments. During this stage the survey questionnaire were distributed to the supply chain management practitioners, consultant's academicians or professionals. Based on their feedback, the items were further refines. The modified version questionnaires were then combined into an overall instrument for

the pilot testing stage. The questionnaires were distributed to a small sample of respondents (50 respondents) and an analysis of the responses was conducted to get an initial indication of the items reliability. Items which did not contribute to the reliability of question were purge out. The questionnaires were further refined and main survey test of the instrument was carried out. The following shows the original number of items in each scale, and the numbers after item reduction.

S. N.	Scale Name(Section)	Code	Items	Alpha	Corrected Item - Total correlation	No. of items dropped	New No. of items for main survey	Remarks
1	Personal Background	A	9		<.40	1	8	Feedback/comment from expert opinion
2	Technology & Quality management	TECH	10	0.891 (<.7)	<.40	0	10	Reliability Test
3	Price & Cost Management	PC	8	0.841 (<.7)	<.40	0	8	Reliability Test
4	Delivery & Responsiveness	DEL	9	0.89 (<.7)	<.40	0	9	Reliability Test
5	Supplier Relationship Management	SRM	9	0.875 (<.7)	0.381	1	8	Reliability Test
6	Decision Making	DM	3	0.76 (<.7)	<.40	0	3	Reliability Test
7	Government Policy	POL	10	0.921 (<.7)	<.40	0	10	Reliability Test

8	Business Ethics	ETC	8	0.78 6 (.7)	(1)0.043, (2)0.178, (3)0.295	3	5	Reliability Test
9	Supplier Selection Impact	SUPSE L	16	0.91 0 (.7)	(1)0.042, (2)0.246, (3)0.363	3	13	Reliability Test

6. Conclusion

Supplier selection strategies play a very crucial role within the E&TC sector in India. This paper describes the critical success factors in selecting the supplier for a major E&TC service provider in India. The selection criteria's are product, quality, price and cost management, delivery, supplier relationship management, decision-making, government policies and business ethics. The methodology proposed in this paper includes an investigation and analytical review of all variables and factors influencing the supplier selection strategy. The ordinary analytical data are based on the literature review while the primary data are based on survey questionnaire process. The data were collected from 5 major Electronics & Telecommunication service providers in India. The questionnaire was developed after going through few stages of process. First stage was a content validity which involves the expert opinion and comments. Government procurement policy and business ethics is included as additional aspects of a supplier selection critical success factor This paper focuses onto develop a conceptual model framework, examine and test the model for supplier selection for the Electronics & Telecommunications industry in India. It is suggested that future research can be used within the selection of procurement suppliers in the Indian E&TC industry.

References

- [1] Cousins, P.D. & Lawson, B. (2007), "Sourcing strategy, supplier relationships and firm Performance: an empirical investigation of UK organizations", *British Journal of Management*, vol. 18, no. 2, pp. 123-138.
- [2] Degraeve, Z., Labro, E. & Roodhooft, F. (2000), "An Evaluation of Supplier Selection models from a total cost of ownership perspective", *Journal of Operation Research*, vol. 125, no. pp. 34-58.
- [3] Kannan Vijay, R. & Choon Keah, T. (2006), "Buyer-Supplier relationship The Impact of Supplier Selection & buyer-supplier engagement on relationship and firm performance", *International Journal of Physical Distribution and Logistics Management*, vol. 36, no. 10, pp. 755-775
- [4] Tracey, M. & Chong, L.T. (2001), "Empirical analysis of supplier selection and involvement, customer satisfaction and firm performance", *Supply Chain Management: An international Journal*, vol. 6, no. 4, pp. 174-188.
- [5] Verma, R. & Pullman Madeleine, E. (1998), "An Analysis of the Supplier Selection Process", *International Journal of Management Science*, vol. 26, no. 6, pp. 739-750.