

# SUPPLIER EVALUATION, RISK ANALYSIS AND SUPPLIER SELECTION APPROACHES IN SUPPLY CHAIN OF MANUFACTURING INDUSTRY

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## ABSTRACT

Supplier evaluation and management is a very strong concept in manufacturing industry to analyze, identify, calculate and prioritize the overall progress of Supplier's and best future business opportunities across the inbound supply chain and to map, track and ensure the risk condition, performance, progress and rating of the individual supplier at a international level. In projects, especially in India, it is considered as a part of the unorganized sector. While developing a supplier survey for the purchaser it is to be decided which performance categories to include. The primary criteria are cost/price, quality and delivery, which are generally the most obvious and most critical areas that affect the buyer. For many items, these three performance areas would be enough, however for critical items needing an in-depth analysis of the supplier's capabilities, a more detailed supplier evaluation study is required. This paper reviews the literature of various approaches for supplier evaluation to Analyze Supplier Overall Progress (SOP) and selection. Supplier evaluation and management initiates them to adopt the most efficient approaches in order to ensure the smooth flow of the execution of the project. Study puts efforts in effectiveness in selection of vendors and their evaluation to monitor Supplier Overall Progress (SOP).

**Keyword :** - Supplier evaluation, Supplier performance management, Supplier risk analysis, and Supply chain management etc....

## 1. INTRODUCTION

In today's highly competitive but also interrelated business environment, each of the companies vision to reach a no 1 position in business. Actually it is not only difficult but also challenging. For the reason, companies face a stiff competition which forces them to focus on the improved quality, cost reduction activities, and improved lead time. Therefore they need to be very efficient to selecting the right suppliers and their evaluation that fit companies strategy needs brings drastic savings.

Most of the time vendors are being selected by companies based on three basic factors, their ability to meet some quality standards, their delivery schedule and the price they offer. However in modern management, one must take into consideration numerous other factors in order to succeed and establish a long-term relationship with its vendors and in order to consider suppliers as the best intangible assets of the organization [4]. In general no importance is given to evaluation and development process of vendor. While developing a supplier survey for the purchaser it is to be decided which performance categories to include. The primary criteria are cost/price, quality and delivery, which are generally the most obvious and most critical areas that affect the buyer [6]. For many items, these three performance areas would be enough, however for critical items needing an in-depth analysis of the supplier's capabilities, a more detailed supplier evaluation study is required. Supplier evaluation and management is a very strong concept in manufacturing industry. So we analyze two more things for supplier evaluation- partnership and

Risk. This study would be a paramount approach towards integrating vendors in the supply chain management and ameliorates its deliverable. Supply chain management makes a familiar relation with supplier and that is very profitable for company to do a good business with Supplier and their evaluation. Now a day's more than ever, businesses are depending on strategic relations with their customers and suppliers in order to create value-added systems that will give them a competitive edge in the market [5].

### 1.1 Literature Review

**Mohammed Saada [3]** The author examines the early progress towards the adoption of supply chain management (SCM) relationships in construction. It was based on a literature review and survey of the views of construction practitioners. He contends that SCM has many of the features associated with a fifth generation innovation'. The author suggests that although construction practitioners have some knowledge of SCM they need a better conceptual understanding of it and new and more systematic approaches to its implementation.

**Akintola Akintoye [1]** The author mention details the results of a questionnaire survey of supply chain collaboration and management in the top the UK construction industry contractors. The results indicate the formation of a significant number of partnerships/ collaborative agreements between contractors, suppliers and clients following the publication of the Latham (1994) and Egan (1997) reports. It appears that construction supply chain management (SCM) is still at its infancy but some awareness of the philosophy is evident. Contractors identified improved production planning and purchasing as key targets for the application of SCM in construction. Barriers to success included: workplace culture, lack of senior management commitment, inappropriate support structures and a lack of knowledge of SCM philosophy. Training and education at all levels in the industry are necessary to overcome these barriers.

**William Ho [2]** Supplier evaluation and selection problem has been studied extensively. Various decision making approaches have been proposed to tackle the problem. In contemporary supply chain management, the performance of potential suppliers was evaluated against multiple criteria rather than considering a single factor-cost. The author reviews the literature of the multi-criteria decision making approaches for supplier evaluation and selection. Related articles appearing in the international journals from 2000 to 2008 are gathered and analyzed so that the following three questions can be answered:

(i) Which approaches was relevantly applied?

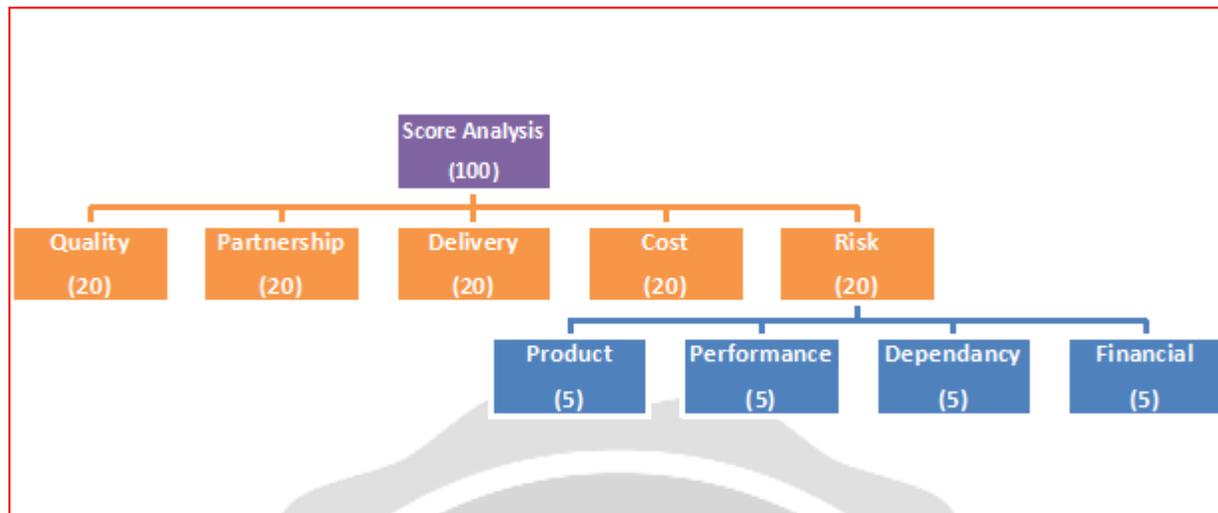
(ii) Which evaluating criteria were paid more attention to?

(iii) Is there any inadequacy of the approaches?

Based on the inadequacy, if any, some improvements and possible future work are recommended. This research not only provides evidence that the multi-criteria decision making approaches are better than the traditional cost based approach, but also aids the researchers and decision makers in applying the approaches effectively.

The literature review is based on the basis for selecting the appropriate research methodology and will assist in achieving the research objectives.

In the process of reviewing the literature, focused to analyze, identify, calculate and prioritize the overall progress of supplier's and future business opportunities across the inbound supply chain and to map, track and ensure the risk condition, performance, progress and rating of the individual Supplier at an international level. Supply overall performance analysis see following in diagnostically.



**Fig :** Scoring Analysis

## 2. SUPPLY CHAIN MANAGEMENT IN MANUFACTURING INDUSTRY

The supplier evaluation especially taken by supply chain management. According to, the term “Supply chain management”, which has been used by academics and practitioners for over 20 years, is defined as the integration of all activities needed in order to procure materials, transform them into intermediate goods and final products, and deliver them to customers. In other words, supply chains consists of all those links that are needed in order for a product to reach the final customer, with suppliers forming the key links between the raw materials to final product design and delivery . It can be deduced therefore that vendor selection, evaluation, and their involvement is one of the most critical activities a firm should focus on. On the other hand, the selection of inappropriate or unsatisfactory suppliers has the potential to unbalance a company’s often delicate financial position (i.e. high cost) and upset it’s operational (low product quality) infrastructure. Therefore, several researchers have highlighted the important role of supplier selection, and supplier’s involvement in strategic decision making process and to achieve effective supply chain. It is important to understand that the supply chain is a network trying to utilize fully the available resources in the best possible way.

## 3. DATA COLLECTION AND ANALYSIS

Data collection is the most critical part of study since the precision of the data will determine the prosperity or failure of the research. Data obtained through these questionnaires will be analyzed accordingly utilizing opportune analysis techniques. Replications from questionnaires will then be compiled and analyzed. Data amassed from different question will be accumulated to answer different objective. Supplier overall progress analysis criterion is as follows

### 3.1. Quality

- 3.1.1. PPM (Parts Per Million)
- 3.1.2. Incidents
- 3.1.3. IPM (Inches Per Million)
- 3.1.4 Tier 2-3 Supplier Quality Management
- 3.1.5. APQP (Advanced Product Quality Planning) and Program Management

### 3.2. Partnership

- 3.2.1.Top Management Commitment
- 3.2.2. Supply Footprint
- 3.2.3. VA/VE Commitment (Value Analysis/Value Engineering) `
- 3.2.4. R&D Capability
- 3.2.5. Brings Advanced Technology in Manufacturing
- 3.2.6. Flexibility in Negotiation

- 3.2.7. Ease of Working with Culture
- 3.2.8. LTA (Long Term Agreement) with Supplier

### 3.3. Cost :

- 3.3.1. Payment Terms
- 3.3.2. Price Competitiveness
- 3.3.3. AIF ( Annual Incentive Factor ) with Supplier
- 3.3.4. Cost Savings Record

### 3.4. Delivery :

- 3.4.1. On Time Delivery
- 3.4.2. Lean Practices
- 3.4.3. Response to Urgent Delivery Request

### 3.5. Risk :

#### 3.5.1. Product

- 3.5.1.1. Material Lead Time (days)
- 3.5.1.2. Raw Material Constraints
- 3.5.1.3. Operational Instability
- 3.5.1.4. Labor Force Issues
- 3.5.1.5. Intellectual Property
- 3.5.1.6. Resourcing Difficulty
- 3.5.1.7. Single Source

#### 3.5.2. Dependency

- 3.5.2.1. # of Parts Supplied
- 3.5.2.2. Single Source
- 3.5.2.3. % of Business
- 3.5.2.4. Union Affiliation
- 3.5.2.5. Cost to Retool Supplier

#### 3.5.3. Performance

- 3.5.3.1. PPM (Parts Per Million)
- 3.5.3.2. Incidents
- 3.5.3.3. IPM (Inches Per Million)
- 3.5.3.4. Delivery

#### 3.5.4. Financial

- 3.5.4.1. Current Ratio
- 3.5.4.2. Quick Ratio
- 3.5.4.3. Debt-to-Equity Ratio
- 3.5.4.4. Financial Score
- 3.5.4.5. Risk Status (Reported)

## 4. SUPPLIER SELECTION PROCESS

Below Mentioned Supplier Selection Process is the research part of my training work period in industry. There is no best way subsists to evaluate and cull suppliers, and thus organizations utilize a variety of approaches. The overall objective of the supplier evaluation process is to reduce risk and maximize overall value to the purchaser. It's also very helpful to system development while analyze supplier evaluation at international level.

**Table -1:** Supplier Selection Process

Sr. No	Input	Activity	Output
1	Customer References, Project Inputs/Kick of meeting Output	Identify Potential New Supplier	Potential Supplier
2	Potential Supplier Details	Selection & Sending Inquiry on the basis of following criterion	Potential Supplier Audit Form
		1. Customer Approved Supplier	
		2. Brand Leadership	
		3. Monopoly	
		4. Supplying to Competitor	
		5. ISO or Other Certification	
6. Lesser Price			
3	Identify Supplier	Registration of Supplier on System	Registration Supplier Allotted its Vendor Code
4	Duly Filled Self Audit Form	Conduct and Review of audit form (Preferably as per Company Approval System Procedure)	Decision to Sourcing
5	Audit Result	Include Supplier Into Approval List	Update List Of Supplier

## 5. CONCLUSIONS

This paper has proposed a model framework for supplier Overall Progress Analysis .One of the major benefits that can be achieved is that the company performing suppliers' evaluation gets to know the suppliers in a more profound way, creating a good basis for future cooperation. The main aim of the work is to conclude that which supplier's as a potential supplier's and we can monitor their performance any time for future. One of its most benefits to have all suppliers in one platform and performance evaluation system to make a good & safe business.

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