

# Analysis of Supplier Selection Process on Product Quality

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**Abstract:** *This work presents a development of supplier selection processes in Construction Equipment manufacturing company using various quality improvement techniques and the ISO 9001 standard. Construction Equipment manufacturing industry mainly a still unorganized sector and their suppliers are very small units. This research indicates that the supplier performance measurement criteria most commonly used by these industries are quality, delivery and service. Also, depending on the corporate environment of these industries, the importance of these performance metrics can vary. In general, quality is the most important criterion in the organization studied. Delivery is a critical supplier's performance measure, since the reliability of the suppliers is affected in case of delivery failure in this sensitive market. Finally, need of development of basic but effective supplier selection method and its implementation is required to improve the product quality and delivery performance, which in turns increases the customer satisfaction.*

**Keywords:** Supplier Selection, Quality Improvement, Drum mix plant

## 1. Introduction

A basic part of business management is the purchasing function which has the prime responsibility of supplier selection. This is valid for both types of business enterprises, manufacturing and service firms, and for the acquisition of all types of products and services, including major materials and equipment. In highly competitive global operating environment, it is impossible to produce low cost and high quality products successfully without competent suppliers. (Weber *et al.*, 1991)

The current competitive environment in global marketplace is continuously changing. To be successful in this uncertain environment, all the players in supply chain should respond quickly to the market demand. A supplier plays an important role in supply chain in term of production cost and product quality. Consequently, supplier selection becomes even more critical for most organizations to develop a closer and long term relationship with their supplier to build an effective supply chain. (Xiao Xia *et al.*, 2008)

Traditionally organizations have been divided in operative functions such as marketing, planning, production, purchasing, finance, etc. Supply chain is a strategy that integrates these functions creating a general plan for the organization, which satisfies the service policy, maintaining the lowest possible cost level due the incredible competition environment that they are exposed to. A supply chain is a network of departments, which is involved in the manufacturing of a product from the procurement of raw materials to the distribution of the final products to the customer. Purchasing commands a significant position in most organizations since purchased parts, components, and

supplies typically represent 40 to 60 percent of the sales (Ballow, 1999) of its end products. This means that relatively small cost reductions gained in the acquisition of materials can have a greater impact on profits than equal improvements in other cost-sales areas of the organization.

In general, this research intends to provide empirical evidence of the criteria and the procedures for the supplier selection process which can improve the product quality and customer satisfaction. Also, it plans to evaluate if these processes follow rigorous regulations as the ISO 9000 standards.

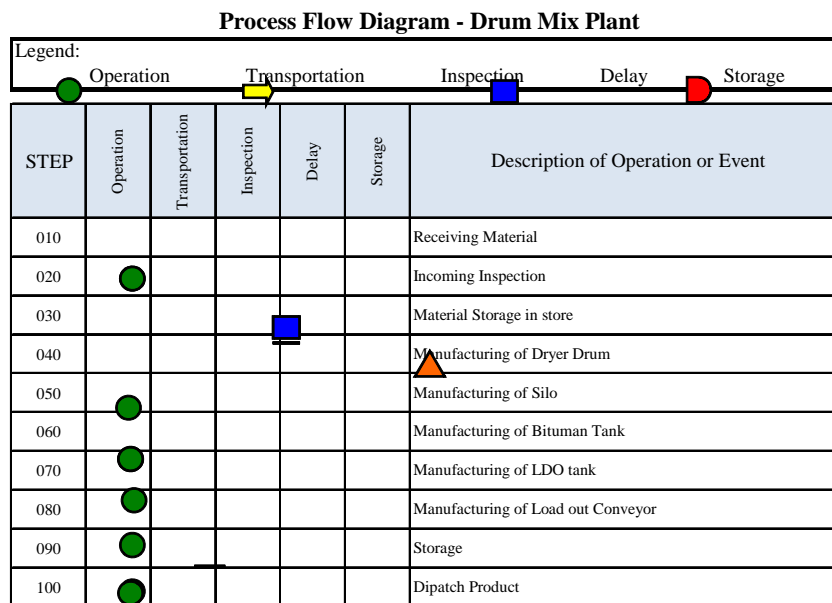
## 2. Drum Mix Plant - Manufacturing Process Study

Asphalt plant is also known as asphalt drum mix plant, hot mix plant, continuous asphalt type plant, parallel flow type etc.

Asphalt plant works on the principal of mixing aggregate with bitumen/asphalt at certain temperature to give a proper mix for paving.

An Asphalt plant is an intelligent assembly of mechanical and electronic equipment where aggregates & minerals are blended, dried, heated, and mixed with asphalt to produce hot mix asphalt (HMA) meeting specified requirements of road building.

Process flow of manufacturing Drum Mix Plant is as explained below:



The manufacturing of Drum Mix plan is started as soon as the Order received from the marketing department with customer specific requirements. Once the order received, the director plans the manufacturing. Drum Mix plant consists of various sub unit like Dyer Drum unit, Silo, Bitumen Tank, LDO Tank, Load out conveyor. The four manufacturing teams are prepared to produce the Drum Mix Plant. Once the planning done, Different units are allocated to different team and their simultaneous manufacturing work started. The above process flow indicates the various steps in manufacturing of Drum Mix Plant.

### 3. Problem Discussion

Road construction equipment industry is considered as an intensive supplier based industry. Its manufacturing involves several types of suppliers ranging from general utilities to large plant equipments. Supply chain performance is also a significant topic in many organizations.

The competitive environment of today’s global marketplace is undergoing changes. Customers demand more variety, better quality, and greater service in terms of reliability and response time. The success in this environment is very much determined by how a company forms the whole supply chain. A supplier plays very important role as the production cost and product quality are highly dependent on the supplier. Besides cost and quality, an efficient delivery that can respond quickly to the customer demand is also an important issue in the customer-oriented economics nowadays.

The organization in which case study is done is in the manufacturing and installation of road construction equipments, they faces huge competition and into much unorganized sector. The current scenario is such that many customer complaints and rejections observed which ultimately reduces the company’s reputation. The past data shows that many rejections are because of improper supplier management.

Sr. no	Problems	Unit	Sept-12	Oct-12	Nov-12	Average
1	Final Rejection (customer end)	%	8.1%	7.2%	5.2%	6.8%
2	Delay in Production due to Supplier delay	%	25.2%	20.3%	18%	21.2%

### 4. Problem with existing Supplier Process

From the above process study and past experience of Director, The following problems are identified.

1. Delay in Production due to delay in receipt of purchased material
2. In process / final rejection due to bought out items

### 5. Development of New Supplier Selection Method

Supplier evaluations often follow a rigorous, structured approach through the use of a survey. An effective supplier survey should have certain characteristics such as comprehensiveness, objectiveness, reliability, flexibility and finally, has to be mathematically straightforward. To ensure that a supplier survey has these characteristics is recommended a step-by-step process when creating this tool. Figure presents the steps to follow when developing such a system

Considering the product characteristics, nature of the business and following above mentioned process, the new supplier selection process is developed the organization. Below figure-2 represents the newly developed supplier selection process.

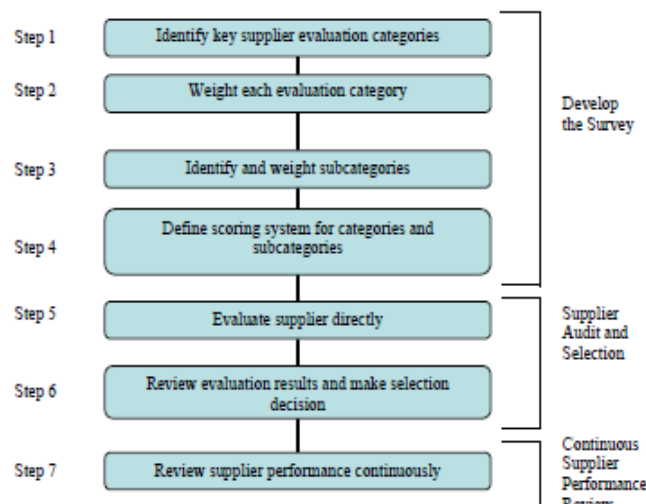


Figure 1: Steps to be followed for development of supplier selection process

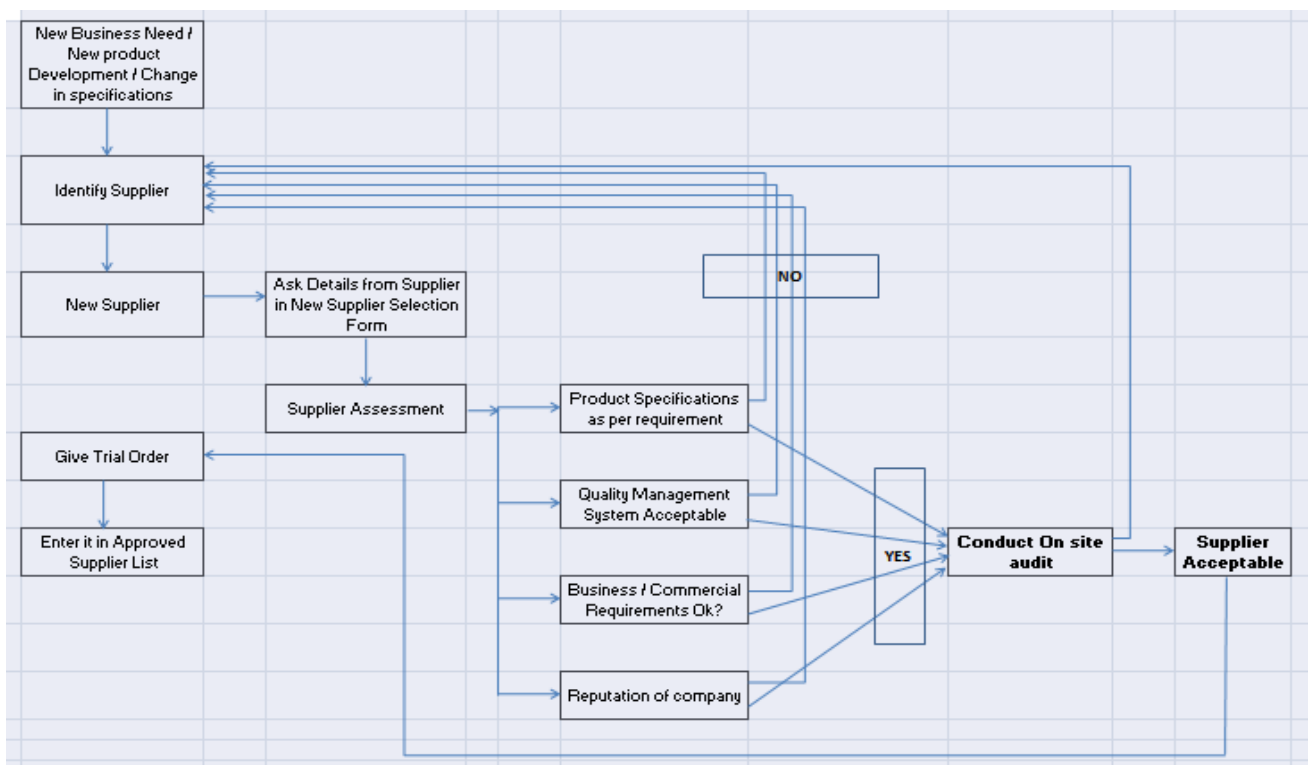


Figure 2: Developed Supplier Selection Process

## 6. Conclusion

Development of the supplier selection process is very important and critical process in supplier management, especially in unorganized sectors. After development of the supplier selection process and its implementation, the performance of the supplier, mainly new suppliers selected is quite impressive and that implies in the product performance. The customer complaints related to supplier product and delivery are reduced. Though supplier selection process is quite effective but it controls the process only at time of selection of suppliers but it doesn't guaranty the performance of the supplier throughout the year and doesn't ensures its improvement. Hence there is future scope of improvement for the organization to implement the supplier performance monitoring system may be developed and implemented. Supplier

performance evaluation at certain interval not only rates the performance, but also provides the means to improve the performance of them.

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### Author Profile



**Maulik Patel** received the B. Tech degree in Mechanical Engineering from Nirma Institute of Technology in 2011, respectively. Now he pursuing is M.E in production engineering During in L.D.R.P Institute of Technology and research 2011-2013.now he is doing his project work on "How supplier management affect on performance of product quality" in drum mix manufacturing company.