ANALYSIS OF SHIP TO USE PROGRAM (STU): A CASE STUDY TO INVESTIGATE THE EFFECTIVENESS OF SUPPLIER CERTIFICATION PROGRAM

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ABSTRACT

The supplier certification programs has been expanding in recent years in industries, as they attempt to gain the competitive advantages such as reduced material cost, improved material quality, lower total levels of inventory, and improved responsiveness of the supply chain. Ship To Use program (STU) is supplier certification program of the case company through which company implements quality management system at supplier side. At this point, however, this certification program has not undergone a thorough evaluation of its effectiveness by the company. The objective of this study is to make the analysis of STU program in which the efforts are taken to investigate the effectiveness of STU program. For this purpose methodology for finding the effectiveness is proposed and the effectiveness is found out. The SAP data of 196 suppliers is collected and analyzed for this purpose.

Keywords: Supply Chain Management, Supplier Development, Supplier Certification, Supplier Development Activities, Ship To Use.

1. INTRODUCTION

In recent years, the supplier certification programs have been expanding in industries, as they attempt to gain a competitive advantage in the world market. A firm’s supplier certification program typically is used as a means of measuring and then qualifying suppliers [14]. Supplier certification programs consist of detailed examination of all dimensions of a
supplier’s performance, so that the supplier will consistently meet required specifications of product performance. The benefits commonly obtained by certification programs are lower component cost, lower total levels of inventory, improved material quality, improved delivery performance, increased reliability and improved responsiveness of the supply chain.[16], [10], [9].

Many researchers have studied about the benefits of supplier certification programs [16], [9], [8], [15]. There are many studies on supplier development activities which predominantly investigated the areas such as supplier evaluations and communication strategies, supplier training, involvement of suppliers in new product development, impact of supplier development activities. There is lack of studies, in analyzing the effectiveness of supplier certification programs. This research gap is filled by conducting an empirical study that investigates the effectiveness of Ship To Use Program (STU).

The remainder of this paper is structured as follows: Section 2 reviews pertinent literature on supplier development activities and supplier certification program. Section 3 presents, the present practices of the case company regarding STU program. Section 4 firstly introduces the methodology and then provides in-depth descriptions of the methodology adopted to collect and analyze the data in order to find out the effectiveness of STU program. Section 5 presents the results of the data analysis. Section 6 concludes with a discussion of the results and with some suggestions for future research.

2. LITERATURE REVIEW

2.1 Introduction

This point reviews the past research that serves as the foundation for this work. The research cited identifies factors associated with the supplier development activities. Following will be the review of literature on supplier evaluations and communication strategies, supplier training, impact of supplier development activities.

2.2 Review of Past Literature

V.C. Arumugam et.al. [1] reviewed the literature relating to the supplier development activities and implementation of these activities in manufacturing firms. They proposed a conceptual model which not only explain the linkages among supplier development factors but also illustrates how these activities end in high quality products for manufacturing firms. Carol Prahinski et.al. [2] studied supplier evaluations and communication strategies to improve supplier performance. They found out that the supplier evaluation communication process does not ensure improved supplier performance without supplier commitment. Their results also indicate that when a buying firm utilizes collaborative communication, the supplier perceives a positive influence on the buyer–supplier relationship. Daniel R. Krause et.al. [3] developed a process model for supplier development. Their research shows that the strategic effort increases the buying company’s involvement in suppliers’ processes. Shokri A. et.al. [4] studied the impact of the supplier development on reducing the defects in supplier quality for a food distribution Small – Medium sized Enterprise (SME). During the research they found that supplier development practices have impact on the supplier’s performance in providing very good service and product quality for the end consumer. Kadzrina Abdul Kadir et.al. [5] studied the patterns of learning for local dependent suppliers. They present a model to describe the varying levels of training needs for dependent suppliers. Their model highlights the need for suppliers to develop their capabilities at different levels.
S. M. Wagner [6] focused on supplier development activities, goals, and the relationships among them. The author tried to obtain a meaningful structure of supplier development goals and supplier development activities. The author proves that supplier development goals are independent of supplier’s evaluation and feedback. S. M. Wagner [7] studied the relationship between supplier development, improvements and the support of the customer firm's competitive strategy from resource-based view as well as relational view. The results show that direct supplier development activities neither result in an upgrade of the supplier's product and delivery performance nor the buyer–supplier relationship. The results also show that improved product and delivery performance has no dramatic impact on cost leadership. S. M. Wagner et al. [11] developed a strategic supplier portfolio management framework which is helpful to gain competitive advantage. The processes which are used by firms to plan, implement, and monitor strategic supplier portfolios are explored by the authors. This work shows that, to gain competitive advantage there is need of developing suppliers, assembling superior suppliers, and integrating them into product development and manufacturing. Muddassir Ahmed et al. [12] developed supplier development literature framework and identified the main focus areas in supplier development. Authors classified research articles that are a source of scientifically generated knowledge about various problems and opportunities with respect to supplier development, predominantly in the context of a manufacturing environment. Rajendra Chavhan et al. [13] found out the current supplier development practices employed by different organizations. Authors mainly focused on critical elements, programs and activities of supplier development.

From the literature review, it is observed that there is dearth of literature available on supplier development activities. The review of articles regarding supplier development activities predominantly investigated the areas such as supplier evaluations and communication strategies, supplier training, impact of supplier development activities. But there are still some gaps which can be taken forward for further research like, supplier certification programs and effectiveness of certification programs. Therefore, certification programs and their effectiveness need to be evaluated and investigated for the industries for future directions.

3. SHIP TO USE PROGRAM (STU): SUPPLIER CERTIFICATION PROGRAM OF THE CASE COMPANY

STU is the supplier certification program being undertaken by one of the OEM Company (Original Equipment Manufacturer) in Pune. It is ISO/TS – 16949 certified company by TUV India on 2006. Company stands on the threshold of a new era in the automobile industry in India, with a stake in five product segments namely Small Commercial Vehicles (SCV), Multi Utility Vehicles (MUV), Light Commercial Vehicles (LCV), Tractors, and Sports Utility Vehicle (SUV). Company exports their complete range of world class products to various countries in Middle East, Asia Latin America and Africa. The name of the company is kept anonymous.

The STU program is a direct-on- line program in which the parts having “STU” status will be directed towards the assembly line instead of going via receipt inspection. This means that there will be virtually no inventory for STU parts at the receipt inspection of case company and there will be no lot by lot inspection for the entire validity period of the STU parts. STU validity varies from 1-3 years depending upon the criticality of the part and class of suppliers defined by the requirements of case company.
3.1 Benefits of STU status to Supplier And Company

Many researchers point to the benefits and outcomes of supplier certification programs. The benefits commonly offered up include lower component cost, lower total levels of inventory, improved material quality, improved delivery performance, increased reliability and improved responsiveness of the supply chain [16], [10],[9], [8], [15]. Supplier certification improves performance of suppliers along with supply chain. Supplier certification surely accomplishes beneficial outcomes for buyer and supplier. There are several benefits associated with STU status for suppliers and for company. The benefits of STU status for suppliers as well as for company are abridged in Table 1.

<table>
<thead>
<tr>
<th>Benefits of STU Status To Suppliers</th>
<th>Benefits of STU Status To Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 STU accredited suppliers will get company excellence award from buyer organization</td>
<td>1 Prevention of entering of non-conformities at input level of the company</td>
</tr>
<tr>
<td>2 Only STU accredited suppliers will be considered for New Product Development and Outsourcing.</td>
<td>2 Company will get parts of required quality, required quantity and at required time</td>
</tr>
<tr>
<td>3 “No receipt inspection from company” for STU parts and suppliers</td>
<td>3 Minimum inspection time required at receipt inspection stage</td>
</tr>
<tr>
<td>4 Publicity and Advertising Privilege</td>
<td>4 Minimum inspection cost</td>
</tr>
<tr>
<td>5 Improved quality, productivity at supplier side</td>
<td>5 Competitive supplier base</td>
</tr>
</tbody>
</table>

3.2 Process to award STU status

The process to award STU status is presented in Fig 1. The suppliers having ISO 9001-2000 or ISO/TS 16949 certification are considered for STU program. These suppliers are then audited in line with the specially designed check-sheets focusing on quality management system, process controls & quality planning. After passing the qualification criteria (Audit Score ≥80%), the parts of supplier with the quality score 100% for previous six months from the date of audit are recommended for “STU Status”. The final STU status is given after Production Part Approval Process (PPAP) documentation and signing the file by Top Management of the company.
4. PROPOSED METHODOLOGY FOR FINDING THE EFFECTIVENESS OF STU PROGRAM

This point discusses the methodology, developed to find out the effectiveness of STU program. The Fig. 2 represents the steps in the methodology adopted to collect and analyze the data in order to find out the Effectiveness of STU program.

Figure 1: Process to award STU status
Figure 2: Proposed methodology for finding the Effectiveness of STU Program

First collect the data from SAP system. Once the data collection part is over, identify the STU parts for Previous and Current Year by using the criteria for giving STU status. After that by comparing the data of STU parts of Previous and Current Year, find out the STU parts which are withdrawn because of quality issues in Current Year. Based on these parts define the effectiveness and then find out the effectiveness of STU program.

**Effectiveness (E) of STU Program:**
Based on the STU parts of Previous Year which are withdrawn because of quality issues in Current Year, Effectiveness (E) is defined as follows

\[
E = \frac{\text{STU Parts of Previous Year withdrawn because of quality issues in Current Year}}{\text{Total STU parts of Previous Year}} \times 100
\]
5. DATA COLLECTION AND DATA ANALYSIS

The company has 250 suppliers for the components and aggregate supplies. Out of these suppliers, only ISO 9001-2000 or ISO/TS 16949 certified suppliers were selected for this study. From the initial frame of 250 suppliers, 54 suppliers were removed from the sample as they did not have ISO 9001-2000 or ISO/TS 16949 certification. For the remaining 196 suppliers having ISO 9001-2000 or ISO/TS 16949 certification, the SAP data was collected from the SAP system of the company. SAP data gives the key information of supplier’s performance of past 6 months regarding number of lots, total quantity supplied, total quantity accepted and rejected, reason for rejection quality score, of each component supplied by supplier to the company. The Table 2 represents sample SAP data of a supplier with analysis.

Table 2: Sample SAP data of a supplier

<table>
<thead>
<tr>
<th>Material</th>
<th>Material Description</th>
<th>Plant</th>
<th>Avg. Score</th>
<th>No. Of Lots</th>
<th>Qty. Received</th>
<th>Qty. Accepted</th>
<th>Qty. Rejected</th>
<th>Line Rejection Qty</th>
<th>STU Status</th>
<th>11-12 STU Status</th>
<th>12-13 STU Status</th>
<th>Remark</th>
<th>Reason For Rejection</th>
</tr>
</thead>
<tbody>
<tr>
<td>A000040140142</td>
<td>FUEL HOSE FILTER TO F</td>
<td>1070</td>
<td>96.67</td>
<td>1.00</td>
<td>300.00</td>
<td>300.00</td>
<td>0.00</td>
<td>10.00</td>
<td>Q</td>
<td>Q</td>
<td>Q</td>
<td>STU</td>
<td>Wrong supply</td>
</tr>
<tr>
<td>B00852480135</td>
<td>Brake hose made from imported tube</td>
<td>1061</td>
<td>99.95</td>
<td>5.00</td>
<td>2150.00</td>
<td>2150.00</td>
<td>0.00</td>
<td>1.00</td>
<td>STU</td>
<td>Q</td>
<td>W</td>
<td>Outer Diameter</td>
<td>Oversize</td>
</tr>
<tr>
<td>B008544580235</td>
<td>Brake hose rigid fr axle</td>
<td>2065</td>
<td>100.00</td>
<td>16.00</td>
<td>29315.00</td>
<td>29315.00</td>
<td>0.00</td>
<td>0.00</td>
<td>STU</td>
<td>STU</td>
<td>STU</td>
<td>C</td>
<td></td>
</tr>
<tr>
<td>B008582950035</td>
<td>Clutch hose made from imported tube</td>
<td>2065</td>
<td>0.00</td>
<td>2.00</td>
<td>1400.00</td>
<td>1400.00</td>
<td>0.00</td>
<td>0.00</td>
<td></td>
<td>STU</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B008582950035</td>
<td>Clutch hose made from imported tube</td>
<td>2064</td>
<td>0.00</td>
<td>6.00</td>
<td>3800.00</td>
<td>3800.00</td>
<td>0.00</td>
<td>0.00</td>
<td>STU</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B008582950035</td>
<td>Clutch hose made from imported tube</td>
<td>1061</td>
<td>100.00</td>
<td>5.00</td>
<td>1400.00</td>
<td>1400.00</td>
<td>0.00</td>
<td>0.00</td>
<td>STU</td>
<td>STU</td>
<td></td>
<td>N</td>
<td></td>
</tr>
</tbody>
</table>

The parts of supplier with the quality score 100% for previous six months were identified and recommended for “STU Status” for Previous and Current year. Then by comparing the data of STU parts of Previous and Current Year, the STU parts which are withdrawn because of quality issues in Current Year were identified. Based on these parts the effectiveness of STU program is found out.

6. RESULTS

The goal of the current study was to investigate the effectiveness of STU program through SAP data analysis. The Table 3 summarizes the major findings obtained from SAP data analysis of 196 suppliers.
Table 3: Findings from the SAP Data Analysis of 196 Suppliers

<table>
<thead>
<tr>
<th>Summary of 196 Suppliers</th>
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<tbody>
<tr>
<td>STU parts in Previous Year</td>
</tr>
<tr>
<td>STU parts in Current Year</td>
</tr>
<tr>
<td>Parts of Previous Year Continued in Current Year</td>
</tr>
<tr>
<td>Withdrawn parts because of other issues in Current Year</td>
</tr>
<tr>
<td>Withdrawn parts because of quality issues in Current Year</td>
</tr>
<tr>
<td>Newly added parts in Current Year</td>
</tr>
</tbody>
</table>

The results of the analysis shows that 196 suppliers had 3149 STU parts in previous year out of which 734 parts (23.31%) fails to maintain STU status because of the non-quality issues like less lot, less quantity, non-live. 308 parts (9.78%) fails to maintain STU status because of quality issues. That means the Effectiveness of STU Program is 90.22%.

7. CONCLUSIONS

The paper has focused on two objectives. First we attempted to develop a guideline for making the analysis of effectiveness of certification program. Second we attempted to find out whether the supplier certification program is effective or not. To achieve the first objective, four step procedures is prepared which will provide systematic guidelines to the company for analyzing the effectiveness of STU program. By using this procedure an attempt is made to achieve the second objective, i.e. Analysis for the effectiveness of STU program. To make the analysis, SAP data of 196 suppliers is collected and analyzed using the criteria’s adopted to give STU status based on last six months performance of supplier (considering quality score, lot size, lot quantity, quality issues and previous SAP status of the part). The results empirically show that the effectiveness of STU program is 90.22% (i.e. STU program is 90.22% Effective).

8. ACKNOWLEDGEMENTS

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REFERENCES


