# A STUDY ON PERFORMANCE MEASUREMENT OF SUPPLY CHAIN MANAGEMENT PRACTICES IN MSMEs, TIRUCHIRAPPALLI.

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***ABSTRACT:***

*Supply chain have gained important focus after 1990's due to not only the chances it provides but also the difficulty involved in its management. Interest in this topic of supply chain performance measurement has augmented in the last two decades and frequent research has been conducted in this area. The change in one part of the supply chain performance can disturb other participants in the supply chain. Thus this study explains the significant variables related to the supply chain performance measurements. This measurement of performance is essential to avoid lost in the sea of the data. This paper aims to present the results and various model used to analyze the performance of supply chain management performs in MSMEs. The result of the study can help the managers and other experts of the supply chain for measuring their effectiveness, productivity, profitability of their supply chain. This study also helps to researchers resonant out further study in the field of supply chain.*

*Keywords: Supply chain practices, performance measurements, supply chain management.*

## INTRODUCTION:

Performance measurement systems plan an energetic role in managing complexity in supply chain. Overall customer service level as well as enthusiasm and viability gets increased. Measurement of performance of supply chain can be approximately divided into financial, time, quality, quantity, flexibility of product, overall presentation and various innovation.

Various performance metrics are used to manipulative the effectiveness of SC. Performance of supply chain is described by its ability to remain consciousness without losing the integration through its supply chain. Performance measurement is an essential facets of successive supply chain management. The possible synergies between the companies, members of same supply chain, entail the development of new framework, methods and techniques. It is important to portion each stages of supply chain which affects various other parts of the supply chain

management practices. Effective supply chain management has been related with a variety of advantages which includes increased customer value, increased profitability, reduced lead time, product quality and product design. This paper clarifies various variables which improve the measurement of supply chain performance.

Although it is supposed that service can welfares by applying some best practices from manufacturing, the difference between manufacturing businesses and some service makes various specific hypothesis and reflecting service supply chain practices.

## STATEMENT OF THE PROBLEM:

MSMEs, are major sources of dynamism, innovation in industry, where its supply chain is a major contest for its survival and growth. The issues in supply chain are augmented inventory cost, expedited consignment and additional overheads caused by incompetent process in supply chain practices. To overcome the issues we assess performance measurement in MSMEs supply chain which helps to improve the complete performance of the supply chain in various industries.

## OBJECTIVES OF THE STUDY:

1. To study MSMEs perception towards adopting supply chain management practices.
2. To identify the performance measurement factors of supply chain practices.
3. To analyze how the factors influence the supply chain practices in MSMEs.
4. To assist the firm to evaluate resource utilization for continuous control in achieving firms objectives.
5. To suggest measures to improve the weaker area in supply chain.

## RESEARCH METHODOLOGY

**Research Design**

An empirical study conducted pilot study and Cronbach Alpha & validity data collected.

**Data Collection Sources**

The study was conducted with primary data which was collected through the structured questionnaire consists of various types of questions like Likers scale questions and ranking.

**Sampling Design**

The sampling design used was the Snowball Sampling. Snowball sampling is the one in which the research participants rookie other participants for a test or study. It is used where probable contestants are very rare to find. Snowball sampling is a non-probability sampling method.

## SNOWBALL SAMPLING:

1. Identify potential subjects in the population. Often, merely one or two subjects can be found initially.
2. By asking those subjects to recruit other participant. Participants should be made aware that they do not have to provide any other names.

The step2 is repeated until the needed sample size is found. Ethically, the study participants should not be asked to identify other potential participants. Rather, they should be asked to encourage others to come forward.

Major advantage of snowball sampling is the chain referral process allows the researcher to reach populations that are difficult to sample when using other sampling methods.

The process is cheap, simple and cost efficient. This sampling technique needs little planning and fewer workforce when compare to other sampling techniques.

## REVIEW OF LITERATURE:

**Supply chain council,** based on four process of supply chain processes SCOR model (planning, source, production, delivery). Follows the characteristics of responsiveness, agility, reliability, costs and resources.

**Cumbo, Kline and Bumgardner, 2006** suggested following actions for performance: ordering delivery lead time, the skill to when it is actually needed, timely shipment, reduction in inventory costs, productivity, and costs. Moreover they permitted that cost is the best method to measure the impacts of lean paradigm, on the manufacturing organizations performance. The correlations between practices of supply chain management and performance have been inspected from the environmental perspectives.

**Dickson (2012),** reports 23 different criteria for vendor's estimation. Of these criteria, he states that cost, quality and delivery times are among the most important performance measures in the assortment of vendor's. Since that time, frequent papers have cited his work approaching the vendor selection problem mainly from three perspective, conceptual, empirical and mathematical and conclude with seven performance measures as the key component of vendor selection.

**Holmberg (2014),** attempted to find how problems are a result of insufficient use of system methodology to further understand the vitality. The data was collected from various firms in the home furnishing business in Sweden to analyze its supply chain. This was completed with extensive review of management, quality and logistics function. The study exhibited the presence of a weak relationship between strategy and action; firms are still putting greater emphasis on financial measures ignoring other variables which cause opposition by some of its employees.

**Stephens, 2001; Huang et al., (2004),** suggested the first version was developed in 1996. It is a framework for analytical the supply chain in detail through defining and ordering the processes that make up the supply chain. It is the only combined cross functional framework that links performance measures, best performs and software requirements to detailed business process model.

**Tam and Tummala (2001),** discussed the vendor selection for the telecommunication systems and based on the planned model the time taken to select the vendor has been reduced. Based on the above literature, most of the researchers have painstaking only few factors are commonly used for the selection of vendors.

## HYPOTHESIS SETTING

**Hypothesis 1**

$H_0$ (Null Hypothesis): There is no significance association between on time delivery and reduction in inventory cost.

**Hypothesis 2**

$H_0$ (Null Hypothesis): There is no significance difference between cost effectiveness improved by partners and obsolete inventory.

**Hypothesis 3**

$H_0$ (Null Hypothesis): There is no significance between cost effectiveness improved by partners and safety stock inventory level.

**Hypothesis 4**

$H_0$ (Null Hypothesis): There is no significant different between number of full order delivery and lead time reduction.

**Hypothesis 5**

$H_0$ (Null Hypothesis): There is no significant different between organization rely on quality suppliers and productivity are target of capacity utilization.

## RESULT AND DISCUSSION:

**CHI-SQUARE TEST**

**Hypothesis I**

**Null Hypothesis ($H_0$):** There is no significant difference between on time delivery and reduction in inventory cost.

**Alternate Hypothesis (H1):** There is significant difference between on time delivery and reduction in inventory cost.

**Chi-Square Tests**

| | Value | df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 24.126[a] | 12 | .020 |
| Likelihood Ratio | 26.513 | 12 | .009 |
| Linear-by-Linear Association | 10.363 | 1 | .001 |
| N of Valid Cases | 43 | | |

19 cells (95.0%) have expected count less than 5. The minimum expected count is .07

Calculated value = 24.126, Table value = 11.340
Significance level = 5% Calculated value > Table value,
Hence H1 accepted
Therefore there is significance association between on time delivery and reduction in inventory.

**Hypothesis II**

**Null Hypothesis ($H_0$):** There is no significant difference between cost effectiveness improved by partners and obsolete inventory.

**Alternate Hypothesis ($H_1$):** There is significant difference between cost effectiveness improved by partners and obsolete inventory.

**Chi-Square Tests**

| | Value | Df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 13.284[a] | 9 | .150 |
| Likelihood Ratio | 18.113 | 9 | .034 |
| Linear-by-Linear Association | .300 | 1 | .584 |
| N of Valid Cases | 43 | | |

a. 13 cells (81.3%) have expected count less than5. The minimum expected count is .37.

Calculated value = 13.284, Table value = 11.340
Significance level = 5% Calculated value > Table value, Hence $H_1$ accepted
Therefore there is significance between cost effectiveness improved by partners and obsolete inventory.

**Hypothesis III**

**Null Hypothesis ($H_0$):** There is no significant difference between cost effectiveness improved by partners and safety stock inventory level.

**Alternate Hypothesis ($H_1$):** There is significant difference between cost effectiveness improved by partners and safety stock inventory level.

| | Value | Df | Asymptotic Significance (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 23.748[a] | 12 | .022 |
| Likelihood Ratio | 24.840 | 12 | .016 |
| Linear-by-Linear Association | .196 | 1 | .658 |
| N of Valid Cases | 43 | | |

a. 18 cells (90.0%) have expected count less than 5. The minimum expected count is .14.

Calculate value = 23.748, Table value = 11.340, Significance level = 5%
Calculated value > Table value Hence $H_1$ accepted
Therefore there is significant difference between cost effectiveness improved by partners and safety stock inventory level.

**RANK CORRELATION**

**Rank Correlation**

| | | Rate delivery Activity of department | Working strategies management department | Uniformity of system | Flexibility in changing variety of product | Number of successful delivery |
|---|---|---|---|---|---|---|
| N | Valid | 43 | 43 | 43 | 43 | 43 |
| | Miss-ing | 0 | 0 | 0 | 0 | 0 |
| Mean | | 2.1860 | 2.1628 | 2.3256 | 2.1395 | 2.2558 |
| Median | | 2.0000 | 2.0000 | 2.0000 | 2.0000 | 2.0000 |
| Mode | | 2.00 | 3.00 | 2.00 | 1.00 | 3.00 |

Rank 1: Uniformity of system
Rank 2: Number of successful delivery
Rank 3: Rate delivery activity of the department
Rank 4: Working strategies management department
Rank 5: Flexibility in changing variety of product

**CORRELATION**

**Hypothesis IV**

**Null Hypothesis ($H_0$):** There is no significant different between number of full order delivery and Lead time reduction.

**Alternate Hypothesis ($H_1$):** There is significant different between numbers of full order delivery and lead time reduction.

**Correlations**

| | | Number of Full order delivery | Lead time reduction |
|---|---|---|---|
| Number of full order delivery increased | Pearson Correlation | 1 | .332* |
| | Sig. (2-tailed) | | .029 |
| | N | 43 | 43 |
| Lead time reduction through training | Pearson Correlation | .332* | 1 |
| | Sig. (2-tailed) | .029 | |
| | N | 43 | 43 |

*. Correlation is significant at the 0.05 level (2-tailed).

Calculated value r (41) = 0.332 Significance value = 0.029

Calculated value > Significant value. Hence $H_1$ accepted

Therefore there is a significant positive correlation between number of full order delivery and lead time reduction.

**Hypothesis V**

**Null Hypothesis ($H_0$):** There is no significant different between organization rely on quality suppliers and productivity of capacity utilization.

**Alternate Hypothesis ($H_1$):** There is significant different between organization rely on quality suppliers and productivity of capacity utilization.

**Correlations**

| | | organization_rely_on_quality_suppliers | efficiency_are_target_of_capacity_utilization |
|---|---|---|---|
| Organization rely_on quality_suppliers | Pearson Correlation | 1 | .305* |
| | Sig. (2-tailed) | | .046 |
| | N | 43 | 43 |
| efficiency_are_target_of_capacity_utilization | Pearson Correlation | .305* | 1 |
| | Sig. (2-tailed) | .046 | |
| | N | 43 | 43 |

*. Correlation is significant at the 0.05 level (2-tailed).

Calculated value r(41) = 0.305, Significant value = 0.046

Calculated value > Significant value

Hence $H_1$ accepted.

Therefore there is a significant positive correlation between organization rely on quality supplier and productivity of capacity utilization.

## CONCLUSION:

One wrong choice in a supply chain can be hazardous to the future of the supply chain in an organization. The performance measurement in supply chain should be used to grade the efficiency and effectiveness of the supply chain in the organization. The suggested approach forms a flexible and systematic decision in each parts of the supply chain. From the study on time delivery, reduction in inventory cost, safety stock inventory level and order in small quantity helps to improve the performance of the supply chain which helps to increase the performance of the organization.

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