



Study of Performance Measurement in Logistics management

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ABSTRACT

Due to slower economic growth and increased competition, the organizations are motivated to create and maintain competitive advantage by efficient and effective deployment of logistics resources, for which performance measures are important because this ensures proper analysis, effective control and overall improvement of the entire process.

Some of the logistics performance indicators are: Production Costs, Manufacturing and Inventory Costs, Transportation Costs, Distribution and Logistics Cost, Supply Chain and Customer Service Costs.

There are three aspects that should be considered in logistics performance measurement: Firstly, internal performance measurement; secondly, external performance measurement; integrated supply chain performance measurement is the third one.

A performance measurement system's main goal is to give important information, at the right time, to the right person. An important point to remember is that the performance measurement systems must be designed in such a way that information is easily retrieved usefully presented and easily understood by those whose performance is being evaluated.

Keywords : performance measurement indicators, logistics management, performance measurement systems models

Introduction:

If I can define it, I can measure it

If I can measure it, I can analyse it

If I can analyse it, I can control it

If I can control it, I can improve it.

"If we cannot measure it, we cannot manage it", the famous management adage emphasizes if we really do not know how good we are and what buttons to push to make significant improvement, then we are not in real good position. All organizations need to be more precise about where they are and where they have to be.

Due to slower economic growth and increased competition, the organizations are motivated to create and maintain competitive advantage by efficient and effective deployment of logistics resources, for which performance measures are important because this ensures proper analysis, effective control and overall improvement of the entire process.

It has been confirmed by number of studies that there is correlation between measurement system and improved performance level. A research at Michigan State University Global Research revealed that executives preferred performance measurement system and ranked it as third with regards to other areas of organizational management like environmental issue, globalization, IT etc.

Performance Measurement indicators

Indicators are defined as numbers that inform about relevant criteria in a clearly defined way. (Horv'ath, P. (2006) *Controlling*, Vahlen, M'unchen, 10th ed.). Performance indicators (measures, metrics) are utilized in a wide range of operations. Their primary application is in *operational controlling*. Hardly a controlling system is imaginable that does not make use of performance measures regularly. In fact, the utilization of a

wide variety of measures (as necessary) to model all business processes of a company enables the company to run its business according to management by- exception.

Three functions can be attributed to indicators:

Informing. Their main purpose is to inform management. In this function, indicators are applied to support decision-making and to identify problem areas. Indicators can therefore be compared with standard or target values.

Steering. Indicators are the basis for target setting. These targets guide those responsible for the process considered to accomplish the desired outcome.

Controlling. Indicators are also well suited for the supervision of operations and processes.

Some of the logistics indicators are: Production Costs, Manufacturing and Inventory Costs, Transportation Costs, Distribution and Logistics Cost, Supply Chain and Customer Service Costs. (Council Of Logistics Management 1999)

Definition and Objectives of Logistics Performance Measurement System (LPMS)

Neely, A., (2002) defined Performance Measurement System (PMS) as a balanced and dynamic system that enables support of decision-making processes by gathering, elaborating and analyzing information. Taticchi, P., Tonelli, F., and Cagnazzo, L., (2010) further elaborated this definition by commenting on the concept of 'balance' and 'dynamicity'. 'Balance' refers to the need of using different measures and perspectives that tied together give a holistic view of the organization. The concept of 'dynamicity' refers instead to the need of developing a system that continuously monitors the internal and external context and reviews objectives and priorities.

The three **objectives** for developing and implementing performance measurement systems include **monitoring, controlling, and directing** logistics operations. **Monitoring**

measures track historical logistics system performance for reporting to management and customer. **Controlling** measures track ongoing performance and are used to refine a logistics process in order to bring it into compliance when it exceeds control standards. **Directing** measures are design to motivate personnel (Donald & David 1996, 670).

Also it supports management to measure business performance, analyze and improve business operational efficiency through better decision-making processes.

Classification of Performance Management Literature

The literature related to **LPMS** belongs to two major orientations. They are: (i). Conceptual articles and (ii). Empirical articles.

The conceptual works tend to focus on measurement constructs and prescriptive methodologies. Topics normally covered in conceptual articles are related to performance definition, theoretical evaluation criteria, models and issues with measures. The empirical works tend to focus more on performance content than on measurement process. Empirical articles include descriptive studies, methods, taxonomies, benchmarking and prescriptive performance improvement activities. (Keebler, 2001)

Performance measurement systems models

A basic classification offered by Cagnazzo et al. (2010) consists of grouping PMS models into: (i). **Balanced models**; 2. **Quality models**; 3. **Questionnaire-based models**; 4. **Hierarchical models**; and 4. **Support models**.

1 Balanced Model: Balanced models consider the presence of both financial and non-financial indicators. In these models several separate performance measures which correspond to diverse perspectives (financial, customer, etc.) are considered independently. Some of the important existing models are (i). Performance Measurement Matrix; (ii). Balanced Scorecard (BSC); and (iii). Performance Prism.

2 Quality Models: These are frameworks in which a great importance is attributed to Quality. An example of quality model is the Business Excellence Model (EFQM-Model) (EFQM, 1999).

3 Questionnaire-based Models: These are frameworks based on questionnaire. The Performance Measurement Questionnaire (PMQ) and TOPP System (a research program studying productivity issues in Norwegian manufacturing industry) (Rolstadås, 1998) are examples.

4 Hierarchical Models: performance measurement systems models that are strictly hierarchical (or strictly vertical), characterised by cost and non-cost performance on different levels of aggregation are classified as hierarchical models. Frameworks where there is a clear hierarchy of indicators are: (i). Performance Pyramid; (ii). Advanced Manufacturing Business Implementation Tool for Europe (AMBITE); (iii). The European Network for Advanced Performance Study (ENAPS) approach; and (iv). Integrated Dynamic Performance Measurement System (IDPMS).

5 Support Models: Frameworks that do not build a performance measurement system but help in the identification of the factors that influence performance indicator are classified as support models. These models are: (i). Quantitative Model for Performance Measurement System (QMPMS); and (ii). Model for Predictive Performance Measurement System (MPPMS) (Cagnazzo et al. 2010).

Logistics Performance measurement bound

In general, there are three aspects should be considered in logistics performance measurement: Firstly, internal performance measurement; secondly, external performance measurement; integrated supply performance measurement is the third one.

1) Internal performance measurement

Internal performance measure of the logistics is mainly on the evaluation of the performance of the enterprise. There is a common target: Costs, Customer Service, Productivity, Asset **Measurement and Quality**.

2) External performance measurement

External performance measurement is the evaluation of enterprises on the logistics operation. The key indications of external performance are: **Customer Perception Measurement, Best Practice Benchmarking**.

3) Integrated supply chain performance measurement

General logistics performance measurement aspects includes: **Customer Satisfaction, Time, Cost, Asset and etc.**

Characteristics of an ideal Logistics measurement system

It incorporates three characteristics that provide accurate and timely direction for management: **cost/service reconciliation, dynamic knowledge-based reporting, and exception-based reporting**. (Donald & David 1996)

The article 'Measuring the business value of logistics in the supply chain' of University of Tennessee has stated some characteristics of ideal performance measure. It: **is quantitative, is easy to understand, encourages appropriate behavior, is visible, is defined and mutually understood, encompasses both outputs and in puts, measures only what is important, is multidimensional, uses economies of effort, facilitates trust** (Coyle, Bardi. Langley)

Structure of report

A report should rapidly and accurately represent the information so that management can effectively understand and take necessary action. The reports are of three types: status report, trend report and ad hoc report.

Steps be taken when implementing logistics performance improvement and measurement

- ♦ Have executives articulate the strategic logistics vision and company objectives, including the degree of focus to be placed on achieving functional, enterprise-wide integration and extended enterprise integration excellence. For example, the functional excellence portion of the vision might be that "we will reduce our transportation costs over the next two years" and related objectives would be to reduce overall logistics costs.
- Define executive level measures for each objective for their scorecard. The total number of measures used should be limited to up to 20 or so. For example, these might be metrics such as material cost per pound transported.
- Establish managerial level objectives and measures that align to the executive level ones. These should be more tactical and operational, providing diagnostic information on whether executive objectives are being met. Breaking down the higher-level measures typically does this. For example, these might be measures for a particular plant's cost per ton transported for a specific class of material.
- Identify logistics initiatives that specifically address the executive and managerial performance improvement objectives. For example, this might include a core transporter program reducing the number of material suppliers to ones with the lowest cost, meeting quality standards.
- Establish targets for all metrics defined, using a combination of historical performance, external/internal benchmarks, and theoretical estimates (often obtained from operational quantitative analysis of the logistics initiatives). A timeline for achieving the

targets needs to be established for each metric, consistent with the schedules developed for the logistics initiatives. For example, while a program might be expected to ultimately reduce material transportation costs by 3%, targets for its first year of implementation might be only 1%, with an additional 2% improvement the next year.

- Implement new initiatives in concert with a formal measurement system to keep track of performance improvement over time, using a combination of whatever technology makes sense; be it based on spreadsheets, database products or a vendor's suite of packaged applications.

Success Factors

A performance measurement system should be derived from the company's objectives. Otherwise, the performance measurement systems may support actions that have the opposite effect of those implied in the strategy (Tangen, 2004). A performance measurement systems ought to consist of various types of performance measures covering all important aspects agreed as representing the success of a company. A performance measurement systems should be appropriately focused on short- and long-term results, different types of performances (e.g. cost, quality, delivery, flexibility and dependability), various perspectives (e.g. the customer, the shareholder, the competitor, the internal and the innovativeness perspective), and various organisational levels (e.g. global and local performance).

As the performance measures by which employees are evaluated greatly impact their behaviour, an improper set of measurements can lead to dysfunctional or unanticipated behaviour. A performance measurement systems must therefore guard against sub-optimisation, possibly by establishing a clear link from the top of the company all the way to the bottom, to ensure that employee behaviour is consistent with corporate goals. (Tangen, 2004). To create appropriate action it is necessary to use a limited number of performance measures.

A performance measurement system's main goal is to give important information, at the right time, to the right person. An important point to remember is that the performance measurement systems must be designed in such a way that information is easily retrieved, usefully presented and easily understood by those whose performance is being evaluated. (Tangen, 2004). A performance measure should have a clear purpose and be defined in an unambiguous way along with details of who will use the measure (e.g. collect the data, with what frequency, and how to act on the measure).

Conclusion

Effective logistics performance measurement and controlship are necessary to allocate and monitor resources. Substantial effort has been extended to improve the quality of information that logistics manger have at their disposal to measure, compare, and guide logistics performance. Our paper illustrates all parameters of logistics management system in brief and delineates the characteristics of ideal measurement system and success factors for this work.

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