

Assessment Framework for Lead Logistics Provider (L.L.P.)

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Summary:

A Lead Logistics Provider carries out functions that are juxtaposed to Third Party Logistics Provider and a Fourth Party Logistics Provider. Research work proposes a strategic assessment framework, supplemented by tools and simulation models that can be used by L.L.P. to carry out logistics performance evaluation of their clients.



Archit Anand received his bachelor's degree in Nautical Technology from BITS, Pilani and worked with NYK Line as Second Officer on Supertankers, planning shipment delivery of crude oil consignments of approx 2.0 Million barrel across geographies.

KEY INSIGHTS

1. The proposed strategic assessment framework can be used for evaluating logistic performance (Transportation and Warehouse) of a company.
2. Performance, Process and Resources forms 3-dimensional approach for assessment framework.
3. Timeline for delivery needs to be added as another dimension to D.R.U.M. model of transportation measure, re-configuring it to T-DRUM
4. Warehouse should be considered as a pipe and goods as water flow through it.

Introduction

Lead Logistics Provider is often considered as 3.5 PL, placed midway of 3 PL and 4 PL. Criteria used to classify a Logistics Provider as an L.L.P. are:-

- a. Company must use expertise to identify inefficiencies in their client's supply chain.
- b. Companies must suggest plans to address those inefficiencies.
- c. Companies must execute the suggested plans to address those inefficiencies on behalf of their clients.

There are many ways to carry out the above mentioned three steps, but most preferred one includes:-

- a. "As is" and "To be" analysis
- b. Benchmarking using SCOR or other industry guidelines.
- c. Strategic alliances or partnership evaluation.
- d. Goals and KPI alignment between the selected partners.
- e. Performance measurement
- f. Continuous Improvement

L.L.P. services are often used by companies so as to outsource activities that are not their core competencies, by doing so they focus more on their core competencies.

The objective of thesis is to provide an assessment framework for Lead Logistics Provider. In pursuit of achieving the objective set forth by sponsor, the assessment framework is supplemented by Performance measurement tool and Process evaluation simulation model.

The research aims to make academic contribution by presenting a study of process and performance measurement of transportation and warehouse in Unisom. On industry contribution front simulation models and performance measurement tools can be used by sponsor to evaluate its clients.

Literature Review

(Vaidyanathan, 2005) provides a framework for evaluation of L.L.P. The framework is divided into sections so as to assess Inventory & Logistics, Customer Service, Transportation and Warehouse capabilities. It outlines two types of flows material and information, but has excluded money flow from it. The framework is not supported by any quantitative tool for carrying out the performance measure.

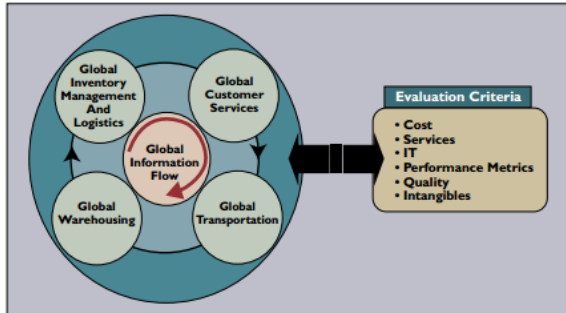


Fig: Ganesh Vaidyanathan L.L.P. Framework

Source: Ganesh Vaidyanathan (2005)

(Tan et. al., 2013) addresses the issues of logistics performance evaluation through a framework for service spare part in automotive industry; this framework in conjunction with that of Vaidyanathan, 2005 is used to design the assessment framework. SCOR version 10.0 and (Sheffi, 2005) are used for adding the risk evaluation section of the framework. D.R.U.M. method from Shagawat, 2005 is re-configured to T-DRUM by adding time dimension to the original concept of DRUM. Books by Laporte and Meindl are used to design the process map. Book by Bartholdi and Hackman on Warehouse distribution science is used as guideline to formulate the process as well as performance measure section of it. Concept of Water flow model mentioned is used as guiding principle throughout the warehouse formulation section. Articles of Vitasek et. al, 2007 & 2011 published in WERC journal presents a detailed study of KPI formulation and benchmarking of warehouse. The Warehouse Management handbook by James Tompkins helped in defining miscellaneous section of warehouse KPI table.

Methodology

The problem statement presented was open ended as there are large number of functions that can be performed by L.L.P. for there clients, hence it needed to be narrowed down to specific segments.

Interview with CEO of Sponsor Company helped in understanding their requirement. Hence it was decided to focus upon transportation and warehouse section. The research work then aimed at collecting data from these individual sections and collating into the framework. Interview with experts in logistics field was helpful in understanding various dimensions of evaluation for each of the section. Interview with managers and executives of companies were used to understand the practical aspect of each of the sections. The results of the interviews with managers and executives helped in defining the KPI's for transportation and warehouse.

Industry visit to Sponsor's warehouse, UPS and AB Inbev facility was used as opportunity to understand process flow and resources required for successful execution of process flow maps.

Data used for analysis was collected during interview with Sponsor's managers. Data for analysis was also collected from extensive literature review and interviews that were carried out.

Some of the free versions of software tools such as Bizagi and trip generation were used to model process flow map of the two sections. Due to time constraint and vast extent of framework, a sub-section of warehouse process evaluation section is validated. Steps required to carry out benchmarking is detailed out.

Results

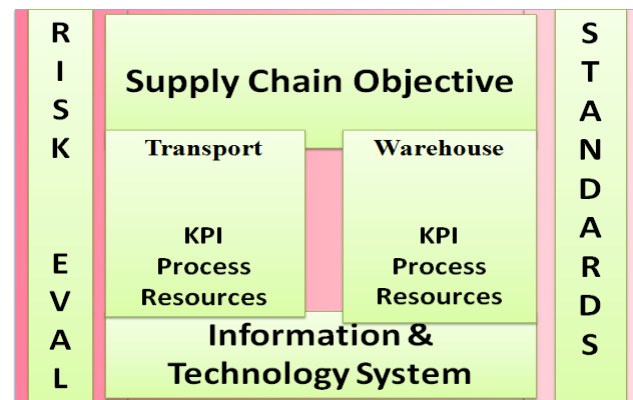


Fig: Proposed Assessment Framework

Description of framework

The above framework is of Roof, Pillar, Body and Foundation format, where Roof is the Supply Chain objective for which the framework will be used, in present context it can be used for two purposes i.e. body.

Body consists of two parts:-

- a. Transportation
- b. Warehouse

The sub Sections for each of the parts consists of:-

- a. Key Performing Index (KPI)
- b. Process
- c. Resources

Two pillars for the framework are:-

- a. Risk Evaluation
- b. Standards requirement

Information and Technology i.e. Enablers constitute the foundation of the framework.

Guide to Use the new framework

It is important to understand the correct way in which framework should be used. Hence below is demonstration to correctly use the framework.

Consider a Company X is to be evaluated using the above mentioned framework.

Supply Chain Objective: Evaluate the transportation performance of company X or evaluate the warehouse performance of company X. The evaluation will be done on the basis of KPI's Process and Resources used by company X so as to complete the activity of transportation or warehouse for its client. Risk Evaluation and Standard's requirement should be used to evaluate the company as a whole in delivery of services. It should not be used separately for each of the two sections i.e. transportation and warehouse. Enablers are considered to be out of scope for the thesis, however while using the framework to evaluate the clients it must be used specifically in conjunction with each of the activities i.e. transportation and warehouse.

Transportation KPI

Transportation section uses the T-DRUM technique for formulation of performance and process measurements. Research work proposes a 3 – dimensional model for transportation performance evaluation.

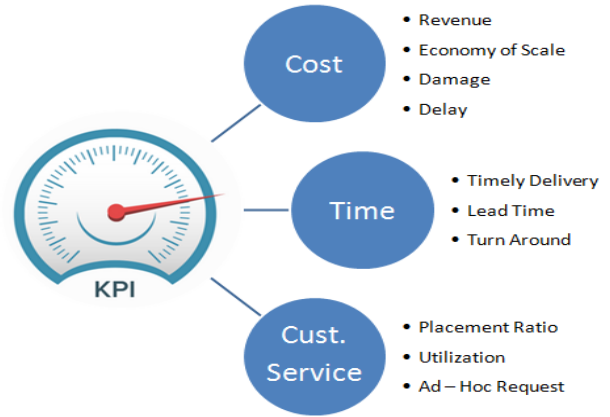


Fig: Transportation KPI

Note:

1. Timely Delivery and Lead Time are used to evaluate two different aspects. Timely Delivery can be used to study timelines for delivery of complete consignment including pickup and delivery. Whereas Lead time can be used to compare actual lead time with that of agreed on each leg of shipment delivery.
2. Ad-Hoc request factor helps to understand number of emergency (last minute) transport request fulfilled by the carrier. Hence it can be used to understand agility in transportation of the client.
3. Turn around factor helps to evaluate the flexibility in transportation of the client.

Transportation Process:-

Flowchart for Transportation Processes: -

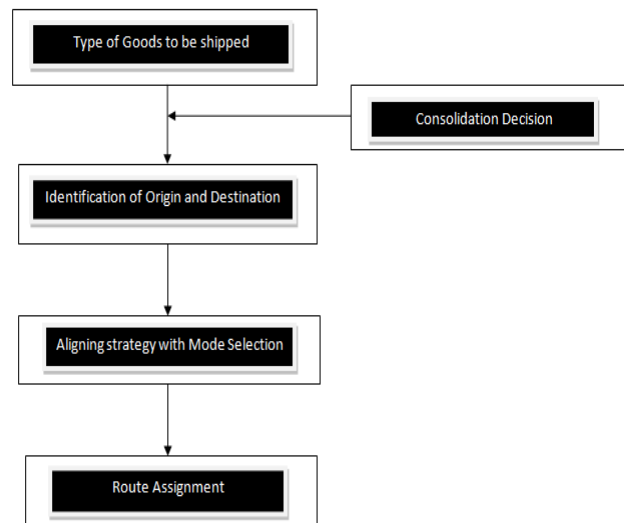


Fig: Transportation Process

Warehouse KPI

Warehouse sections uses Water flow model for formulation of performance and process measurements. Research work proposes a multi-dimensional model for warehouse performance evaluation.

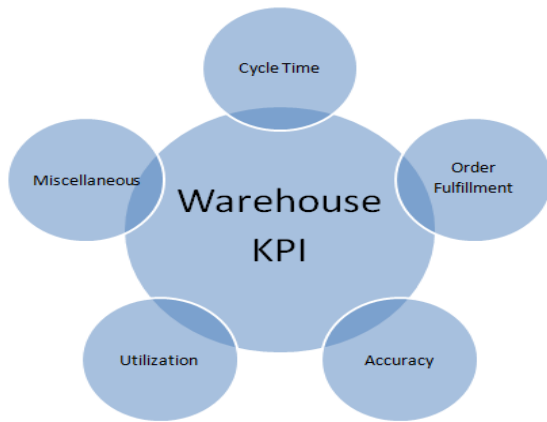


Fig: Warehouse KPI

Note:

1. Utilization factor accounts for evaluation of optimal utilization of warehouse, equipment and labors.
2. Accuracy factor can be used to evaluate accuracy in handling of goods in warehouse. It can also be used to calculate the error correction factor.
3. Miscellaneous section is the qualitative assessment section accounting for Safety, Security and House-Keeping factors of the warehouse.

Warehouse Process

Principal used for designing warehouse process is Water Flow Model.

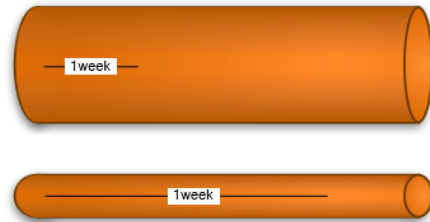


Figure 2.1: If two pipes have the same rates of flow, the narrower pipe holds less fluid. In the same way, faster flow of inventory means less inventory in the pipeline and so reduced inventory costs.

Source: Bartholdi & Hackman (2011)

Goods flowing through warehouse should pass through below steps:-

1. Receiving
2. Staging
3. Put away
4. Picking
5. Shipping

A good may not pass through above steps only in case when it is required to be urgently shipped after receiving.

Risk Evaluation

As per SCOR Version 10.0, it consists of three sub-sections:

- a. Identification
- b. Assessment
- c. Mitigation

There are many methods for risk identification, however SCOR version 10.0 has list of processes that provide template for risk monitoring. Below mentioned templates can be use to assess the client's current risk monitoring processes.

sEP.9, sES.9, sEM.9, sED.9, sER.9

There are several methods used to do risk assessment, such as:-

- a. Summary risk Score
- b. Failure mode effect analysis
- c. Fault tree analysis
- d. Event tree analysis

Above mentioned templates from SCOR can also be used for risk assessment.

Sheffi (2005) through Resilient Enterprise has identified and explained tools that can be used for risk assessment and also for risk mitigation.

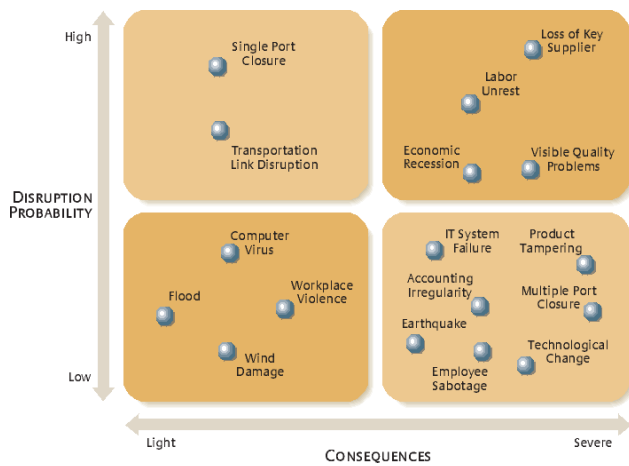


Fig: Tool for risk assessment

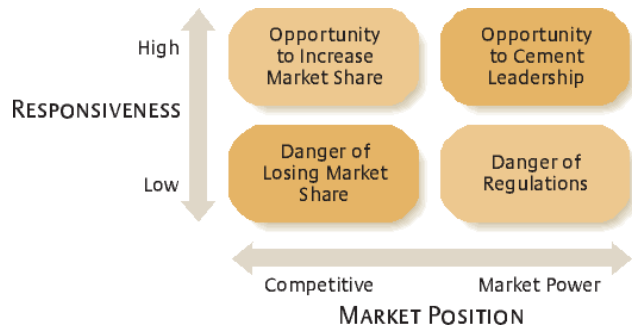


Fig: Tool for Risk Mitigation

Conclusion

The assessment framework supplemented by process and performance evaluating tools can be used to assess the logistics performance (Transportation & Warehouse) of the client.

Research work attempts to present the evaluation of transportation and warehouse in Unisom. Analogies drawn from urban transportation planning (Trip Generation, Distribution and Scheduling) helped in formulation of robust transportation framework formulation.

Interview results, industry visits and literature review provided substantial data for warehouse process flow map.

It is important to use the framework, software and excel tools as per the guideline described so as to prevent any anomalies in the result.

References:

Vaidyanathan, G. (2005). A framework for evaluating third-party logistics. *Communication of the ACM*, 48(1) 89-94.

de Souza, R., Tan, A., Othman, H., & Garg, M. (2011). A proposed framework for managing service parts in automotive and aerospace industries. *Benchmarking: An International Journal*, 18(6), 769-782.

Shagawat, R. (2005) Thinking about Metrics. *Supply Chain Digest: Consultant's Corner Feature*.

Bartholdi, J.J. & Hackman, S.T. (2011). *Warehouse & distribution Science* release 0.95.

Vitasek, K., Donoghue, K., Symme, S., & Harrity, H. (2007). *Warehousing and Fulfillment process benchmarking & best practices*, Warehouse Education and Research Council ISBN 1-892-663-39-2.

Tompkins, J. & Smith, J. (1998). *The Warehouse Management Handbook*.

Sheffi, Y (2005). *A Supply Chain View of Resilient Enterprise*, MIT Sloan Management Review.

SCOR Version 10.0