



# Multi-Fold Productivity in After Market Parts DC - The MSQ Approach



LOGISTICS & WAREHOUSE ADVISORY

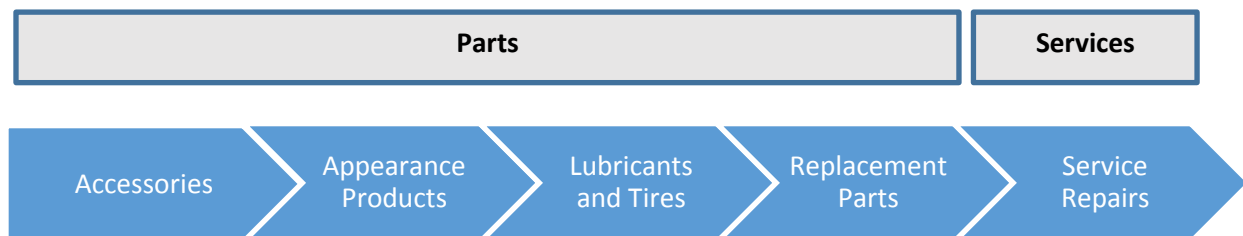
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# Overview of Multi-fold Productivity Improvement in After Market Parts DC – The MSQ Approach

## Introduction

Aftermarket operations in auto sector have a very broad scope and contain all activities related to maintaining an automobile after its initial sale and until the end of its lifecycle. It includes all parts and services purchased for light- and heavy-duty vehicles after the original sale, including replacement parts, accessories, lubricants, appearance products and service repairs.



This industry is characterized by large operations, high number of lines, large number of parts and complex material movement. It has several unique warehousing and distribution challenges:

1. Sub-optimal usage of warehouse space
2. Ensuring inventory turnover is in alignment with sales order
3. Low inbound visibility of parts ordered.
4. Priority order handling
5. End of day inventory reconciliation
6. High value parts inspection management

Warehousing in this industry is no longer viewed as a mundane process for storage, but an activity which can redefine the supply chain through innovative practices, creating value for the stakeholders. As the industry strives to reduce order processing lead time, improve productivity and storage, balance inventory at optimal cost at the same time, it finds itself pressed for margin, seriously affecting profitability.

The diagram below shows the relative OEM/OES margin on the auto parts<sup>1</sup>

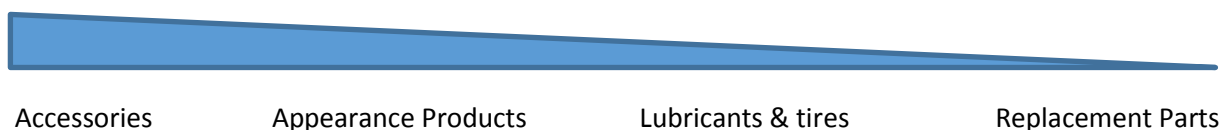


Figure 1: Relative OEM/OES margin on auto parts

<sup>1</sup> The After Market in the Auto Industry – <https://www.capgemini.com/resource-file-access/resource/pdf/tl-The-Aftermarket-in-the-Automotive-Industry.pdf>

The margin on low value products like replacement parts is thin which too is not realized when picking process is sub optimal. In fact, if the picking effort in the warehouse were to be monetized, it would exceed the unit cost of such parts resulting in loss.

Stellium Inc. analyzed the impact of **Minimum Sales Quantity (MSQ)** on the **productivity of picking and overall efficiency of warehouse**. This whitepaper captures the essence of this analysis and the manner in which it aids in realizing profit on low value parts.

## Scope

The client is a relatively young entrant in Indian Heavy Commercial Vehicle OE market and offers a premium range of tippers, trailers and haulage trucks. They required a scalable model for in-plant logistics that could suffice the different phases of volume ramp-up.

The engagement resulted in identification of multiple areas of improvement which included order management processes, warehouse processes, order fulfillment, inventory planning and logistics.

Minimum Sales Quantity (MSQ) was identified as one such area in warehouse processes. The following section introduces this concept and the benefits of introducing it in warehouses/ parts distribution center.

## Minimum Sale Quantity (MSQ)

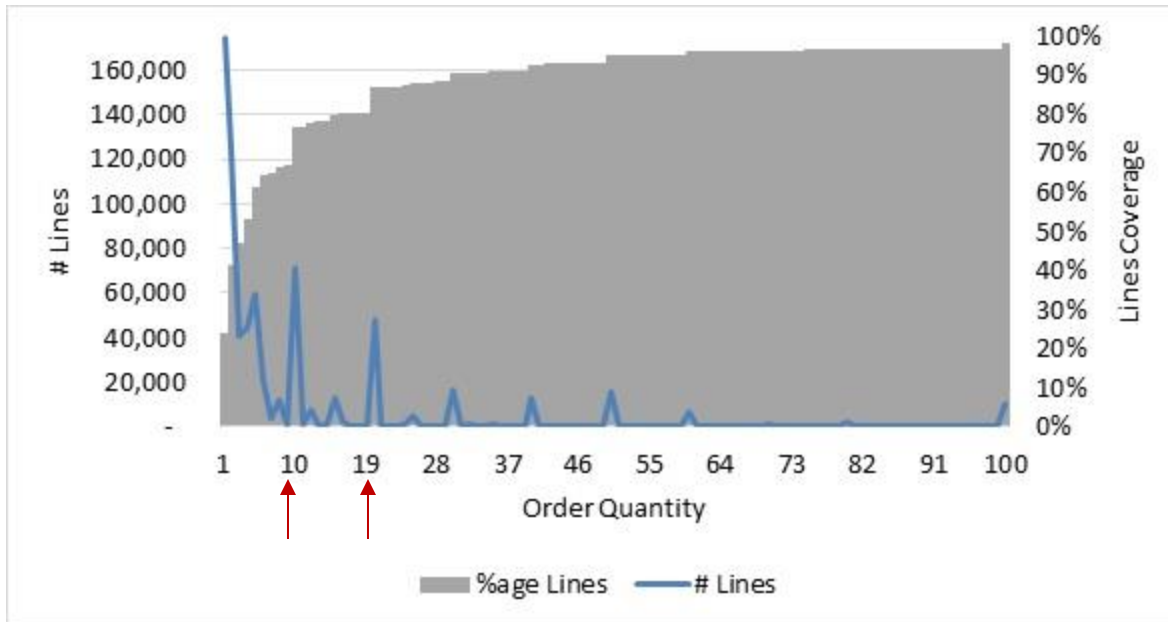
Stellium performed SKU classification where it categorized the various parts in the warehouse along the following dimensions

- a) FMS – On the basis of rate at which the SKUs are turned over (Fast-Medium-Slow)
- b) HIL - On the basis of Unit cost (High-Intermediate-Low)
- c) RIS – On the basis of frequency of orders (Regular-Irregular-Sporadic)

SKU Classification	Fast	Medium	Slow	
High				Regular
Intermediate				Irregular
Low				Sporadic

Data was collected from warehouse management systems over a period of time and analyzed. The plot of number of lines versus order quantity for **low unit cost, fast moving** items with **regular order pattern** revealed

- 1) Dealers ordered in specific quantities which corresponds to the first spike in the plot at order quantity = 10
- 2) The subsequent spikes were at integral multiples of order quantity in the first spike.
- 3) 77% of the lines had order quantity less than 10.
- 4) In 20% of the cases, the dealer placed order for a single unit.



\* The numbers are indicative

Figure 2: Plot of #Lines versus Order Quantity for fast moving, low unit cost items with regular order pattern

The study revealed that many SKUs were being ordered at frequent intervals in single quantity. This provides an opportunity to aggregate them leading to **Minimum Sales Quantity (MSQ)**.

Minimum Sales Quantity (MSQ) is the minimum number of items/parts that is to be sold to the dealer whenever an order is placed. It is an integral multiple of **Minimum Pack Quantity (MPQ)**. MPQ is the total number units packed in a pack or a box.

MSQ would be the least common multiple of this order quantity corresponding to the first spike (order quantity = 10) and Minimum Pack Quantity.

**Illustration:** Let us consider 8 pairs of nuts and bolts in a pack, then minimum pack quantity would be 8. We also observe that the dealers have ordered in specific quantities frequently (10 units).

Then MSQ would be

*Least common multiple of (8, 10) = 40 units.*

This implies that at least 5 packs (40 units) have to be sold whenever there is an order placed for this particular item.

MSQ results in the following benefits –

### 1. Reduction in order processing and order execution costs

If an order of 10 units was placed 5 times in as many weeks, MSQ would ensure the number of orders and the associated order processing and execution costs would be reduced by a factor of 5. The savings are more pronounced in cases where the dealer places order for single unit. Owing to the low cost and fast moving

nature of SKUs, there is no additional cost incurred by dealers whenever they purchase in quantities greater than what is required

## **2. Improvement in picking efficiency**

If the dealer places an order for non-integral multiple of minimum packing quantity (MPQ), the time spent for picking fraction of MPQ is saved thus improving the efficiency. For example - If the dealer places an order for 20 units (2.5 packs), the picker does not spend time in selecting 4 pairs of nuts and bolts to account for the 0.5 packs.

## **3. Faster sale realization without incremental costs**

MSQ results in increased sales as more number of units are sold. There is no impact on the pack sold to the end customer – the average ticket size would increase without modifications to packaging. Also, there are no costs involved with marketing to enhance the sales.

## **4. Reduction in Vehicle Off Road (VOR) orders**

The dealers are benefitted through MSQ as possibility of stock outs reduce significantly. Consequently, proportion of VOR orders decrease which in turn reduces the costs involved with expediting the processes to process these orders.

Thus, MSQ enables OEMs to realize a number of benefits by making modifications to their Order Management System (OMS).

This calls for the redefinition of KPIs for benchmarking performance of warehouse in this industry. Considering the nature of the components, '**number of lines per person per hour**' is no longer the correct metric to measure productivity. The KPI has to take into consideration the throughput with the value of components processed in unit time – '**Value of components processed per person per hour**'