SUPPLY CHAIN MANAGEMENT KPIS

INTRODUCTION

Performance measurement of SCM helps organizations to improve their internal and external functions of business and create more value for their stakeholders.

In addition, it can improve all areas in the supply chain such as quality, price, delivery, customer satisfaction, etc., in this file, you can find some of the most important KPIs focused on creating value, mentioned by their definitions, the way to calculate them, their purpose, their limitation, and their BSC perspective.

ORDER CYCLE TIME / FULFILLMENT CYCLE LEAD TIME

<table>
<tr><td>Definition</td><td>Measures the total time required for the order process to be completed, from customer order origination to customer order receipt</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>Ai = # Time between order 'i' is authorized by C2C order receipt, where i=1 to n n = # Orders

Formula = <u>(A1+A2...+An)/n</u>
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To evaluate the time efficiency of order Fulfillment, thus indicating the efficiency of the supply chain.
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Duration</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Limitations may appear when the processing procedure involves a third party</td></tr>
</table>

LINES PER ORDER

<table>
<tr><td>Definition</td><td>Measures the average number of lines per order by dividing the total lines to total orders.</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>Ai= # Lines per order "i", where i=1 to n n= # Orders delivered

Formula = (A1+A2+...An)/n
The trend is good when Increasing</td></tr>
<tr><td>Purpose</td><td>To monitor the quantity of order lines that are covered in each order
<table><tr><td>BSC perspective</td><td>Measurement focus</td></tr><tr><td>Internal Process</td><td>Volume</td></tr><tr><td>Level</td><td>Measurement type</td></tr><tr><td>Operational</td><td>Quantitative</td></tr></table></td></tr>
<tr><td>Limitation</td><td>Accurate reporting on this KPI requires a well-maintained functional system to keep track of the relevant data.</td></tr>
</table>

ORDER PROCESSING TIME

<table>
<tr><td>Definition</td><td colspan="2">Measures the required time from order entry until release to the warehouse for order picking</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td colspan="2">Ai = # Processing time for order 'i',where i=1 to n
n = # Orders

Formula = <u>(A1+A2...+An)/n</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To evaluate the time efficiency of order processing, thus indicating the efficiency of supply chain</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Processes</td><td>Duration</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Limitations may appear when processing procedures involve a third party</td></tr>
</table>

PROCESSING TIME IN DAYS

<table>
<tr><td>Definition</td><td colspan="2">Measures the average time is taken for an order to be processed and ready to be shipped, from the moment the order is placed</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td colspan="2">A = # Order processing time in days B = # Orders

Formula = <u>(A/B)*100</u>
(The trend is good when <u>Decreasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To evaluate the time efficiency of order processing, thus indicating the efficiency of supply chain.</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Duration</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Limitations may appear when processing procedure involves a third party</td></tr>
</table>

% ORDER ENTRY ACCURACY

<table>
<tr><td>Definition</td><td colspan="2">Measures the percentage of orders entered exactly as specified by the customer, out of total orders</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td colspan="2">A = # Orders entered exactly as specified by the customer
B = # Total orders

Formula = <u>(A/B)*100</u>
(The trend is good when <u>Increasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To evaluate the time efficiency of order processing, thus indicating the efficiency of supply chain.</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Quality</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">In order to monitor this KPI an order recording system needs to be functional.</td></tr>
</table>

% ORDER FILL RATE

<table>
<tr><td>Definition</td><td>Measures the percentage of orders shipped according to customer demand from stock, from total orders shipped</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>A = # Filled from stock shipped within 24 hours or order release
B = # Orders shipped

Formula = <u>(A/B)*100</u>
<u>(The trend is good when Increasing)</u></td></tr>
<tr><td>Purpose</td><td>To reflect the effectiveness of filling and delivering customer orders
<table><tr><td>BSC perspective</td><td>Measurement focus</td></tr><tr><td>Internal Process</td><td>Volume</td></tr><tr><td>Level</td><td>Measurement type</td></tr><tr><td>Operational</td><td>Quantitative</td></tr></table></td></tr>
<tr><td>Limitation</td><td>Accurate reporting on this KPI requires a tracking system capturing the status of orders</td></tr>
</table>

% PRODUCT RETURN RATE

<table>
<tr><td>Definition</td><td>Measures the percentage of units returned by the customer from total delivered / shipped units</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>A = # Products returned
B = # Products distributed to customers

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To analyze the customer's satisfaction with the delivered products, as this influences the retention rate of customers and the reputation of a product
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Customer</td><td>Satisfaction</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>The return rate has no indication of the reason for return, so it does not provide a clear perspective for what measures are needed to improve this KPI</td></tr>
</table>

% DELIVERED IN-FULL, ON-TIME (DIFOT)

<table>
<tr><td>Definition</td><td>The percentage of orders delivered to the customer, which are both complete and on time</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>A = # Actual orders In Full & On time
B = # Total orders delivered to the customer

Formula = (A/B)*100
(The trend is good when Increasing)</td></tr>
<tr><td>Purpose</td><td>To provide an indication of the service delivery performance in terms of quality, by referring to how often the customers get what they want, at the time they want it
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Customer</td><td>Satisfaction</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>A tracking system needs to be implemented to have the data accurate</td></tr>
</table>

% DELIVERY TO COMMIT DATE

<table>
<tr><td>Definition</td><td colspan="2">The percentage of orders that where delivered at, or before the internal commit date</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Orders delivered to internal commit date
B = # Orders delivered

Formula = (A/B)*100
(The trend is good when Increasing)</td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To indicate the service delivery performance according to the internal standards and commitment.</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Quality</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Tracking system needs to be functional for knowing the commit data for delivery and the actual delivery date</td></tr>
</table>

$ DELIVERY COST PER ORDER/LINE

<table>
<tr><td>Definition</td><td>The average cost of delivering one order/line of product to the customer, by dividing the total delivery cost by the total orders/lines dispatched</td></tr>
<tr><td>Calculation</td><td>Ai = $ Delivery cost per order/line 'i', where i=1 to n
n = # Orders/Lines dispatched

Formula = (A1+...An)/n
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To monitor the cost efficiency of dispatching products for customers in the logistics and distribution
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Data regarding the number of orders and the delivery costs, needs to be collected periodically</td></tr>
</table>

$ FREIGHT COST PER UNIT/TON SHIPPED

<table>
<tr><td>Definition</td><td>Measures the average freight cost incurred for every unit/ton shipped during the reporting period</td></tr>
<tr><td>Calculation</td><td>A = $ Costs with freight transportation
B = # Tons or units shipped

Formula = <u>A/B</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td>Purpose</td><td>To provide an indication of the freight transportation cost efficiency, as it is an important element in determining the shipping company level of profitability
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Strategic</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>It might not be easy to accurately calculate the costs incurred with freight shipping, as many cost elements are involved.</td></tr>
</table>

UPSIDE SUPPLY CHAIN FLEXIBILITY

<table>
<tr><td>Definition</td><td>Measures the time it takes a supply chain to respond to an unplanned %ge of increase in demand, without service or cost</td></tr>
<tr><td>Calculation</td><td>A = # Time it takes a supply chain to respond to an unplanned percentage of increase in demand, without service or cost penalty

Formula = A
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To evaluate the time efficiency of order processing, thus indicating the efficiency of supply chain.
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Duration</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Accurate reporting on this KPI relies on a well-maintained functional system that keeps tracking integrated information of the whole supply chain</td></tr>
</table>

INTERRUPTIONS IN RAW MATERIAL SUPPLY

<table>
<tr><td>Definition</td><td colspan="2">Measures the number of situations that occur in raw material supply processes and produce an interruption within the manufacturing process</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Interruptions in raw material supply

Formula = <u>A</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To monitor the reliability of raw material supply</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Risk</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Accurate reporting on this KPI relies on a well-maintained system that keeps track of the availability of raw material supply.</td></tr>
</table>

% COST OF GOODS SOLD (COGS)

<table>
<tr><td>Definition</td><td colspan="2">Measures the percentage of cost of goods sold from total revenue</td></tr>
<tr><td>Calculation</td><td colspan="2">A = $ Cost of goods sold
B = $ Revenue

Formula = <u>(A/B)*100</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To indicate the profitability level regarding supply chain management processes.</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Risk</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">In order to monitor this KPI financial accounting terms (COGS and revenue) need to be tracked periodically.</td></tr>
</table>

DAYS SALES OUTSTANDING (DSO)

<table>
<tr><td>Definition</td><td>The average collection period in days from invoicing to cash receipt</td></tr>
<tr><td>Calculation</td><td>A = $ Annual gross accounts receivables
B = $ Total annual sales
C = # 365 Days

Formula = <u>A/B/C</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td>Purpose</td><td>To monitor the efficiency and effectiveness of the cash collection process
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Data must be collected periodically and accurately to be monitored effectively</td></tr>
</table>

CASH-TO-CASH CYCLE TIME / CASH TURNOVER RATIO

<table>
<tr><td>Definition</td><td colspan="2">The time it takes for the cash to flow back into the company after being spent on a raw material purchase</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Inventory days of supply
B = # Days of sales outstanding
C = # Payment period for material in days

Formula = <u>A+B-C</u>
<u>(The trend is good when Decreasing)</u></td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To reflect the liquidity risk and the effectiveness of cash flows</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Duration</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Accurate reporting on this KPI relies on a well-maintained functional system that captures the relevant data</td></tr>
</table>

% UNSALEABLE STOCK

<table>
<tr><td>Definition</td><td colspan="2">The percentage of stock that due to different reasons, such as being out-of-date, became unsaleable, from the total stock</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Unsaleable items in stock
B = # Items in stock

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To reflect the saleability and revenue generation ability of the stock</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Quality</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">Accurate reporting on this KPI relies on a clear definition of "unsaleable stock". This KPI does not provide information on the reasons for unsaleable stock</td></tr>
</table>

$ TOTAL SUPPLY CHAIN MANAGEMENT COST

<table>
<tr><td>Definition</td><td>The total costs involved with the supply chain management process, including order management, material acquisition, inventory carrying, planning, and IT support</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>A = $ Order management cost
B = $ Material acquisition cost
C = $ Planning cost
D = $ Inventory carrying cost
E = $ IT cost for supply chain

Formula = A+B+C+D+E (The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To provide an indication of the financial investment within the supply chain management activities, as its optimization increases profitability

<table>
<tr><th>BSC perspective</th><th>Measurement focus</th></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><th>Level</th><th>Measurement type</th></tr>
<tr><td>Strategic</td><td>Quantitative</td></tr>
</table>
</td></tr>
<tr><td>Limitation</td><td>All the subordinate calculation measures need to be accurate, available, and collected periodically.</td></tr>
</table>

% ORDER MANAGEMENT COST

<table>
<tr><td>Definition</td><td>How much of the total supply management cost is represented by the order management cost</td></tr>
<tr><td>Calculation

Functions Area:
• Procurement
• Distribution</td><td>A = $ Cost with order management
B = $ Supply chain cost

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To indicate the order management efficiency by optimizing the operating cost of order processing activities.
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Accurate reporting on this KPI relies on a reliable functional system that captures the relevant data</td></tr>
</table>

% RETURNS MANAGEMENT COSTS

<table>
<tr><td>Definition</td><td>The percentage of total returns management costs from the company revenue</td></tr>
<tr><td>Calculation</td><td>A = $ Returns management costs
B = $ Revenue

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td>Purpose</td><td>To indicate the effectiveness in supply chain network optimization, as high costs with the return management decrease the SCM profitability
<table>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Financial</td><td>Money</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
</table></td></tr>
<tr><td>Limitation</td><td>Difficulties can occur if the return management costs are not well defined.</td></tr>
</table>

% EMPTY RUNNING

<table>
<tr><td>Definition</td><td colspan="2">The distance has driven empty, with no goods of freight, as a percentage of total kilometres</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Empty driven distance
B = # Total driven distance

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td rowspan="5">Purpose</td><td colspan="2">To assess the optimization of the distribution process and the efficacy of supply chain planning and management.</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Internal Process</td><td>Volume</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Operational</td><td>Quantitative</td></tr>
<tr><td>Limitation</td><td colspan="2">The exact number of kilometres is harder to track, therefore some companies measure the percentage of trips. This is not so relevant, due to the difference in lengths of trips.</td></tr>
</table>

% FTE ALLOCATED TO ORDER FULFILLMENT

<table>
<tr><td>Definition</td><td colspan="2">The percentage of employees that are working on entering, processing and tracking orders</td></tr>
<tr><td>Calculation</td><td colspan="2">A = # Employees allocated to enter, process and track orders
B = # Employees

Formula = (A/B)*100
(The trend is good when Decreasing)</td></tr>
<tr><td rowspan="4">Purpose</td><td colspan="2">To indicate the internal manpower capacity for processing orders</td></tr>
<tr><td>BSC perspective</td><td>Measurement focus</td></tr>
<tr><td>Learning and Growth</td><td>Volume</td></tr>
<tr><td>Level</td><td>Measurement type</td></tr>
<tr><td>Limitation</td><td colspan="2">In order to monitor this KPI consider employees as full-time equivalents (FTE).
An FTE of 1.0 is equivalent to a full-time worker.</td></tr>
</table>

Thanks!

Any questions?

I Like to share knowledge, and information related to Supply Chain Management