

# Performance measurement system for warehouse activities based on the SCOR® model

A research study in collaboration with Consafe Logistics AB, Sweden

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## **Abstract**

This article is based on a master thesis conducted at Consafe Logistics during the spring of 2014. The purpose was to develop a performance measurement system (PMS) for warehouse activities based on the Supply Chain Operations Reference (SCOR) model. Apart from an extensive literature review about performance measurement, warehouse management, and the SCOR model the source of information for this study were interviews with five different companies and a survey to all of Consafe Logistics's customers with a warehouse management system (WMS). To summarize, this study have reached its purpose to develop a performance measurement, the system is focused on the operational tasks within warehousing. If Consafe Logistics implements the new warehouse process model in their services, a relevant set of metrics can easily be achieved for each new customer. In this way Consafe Logistics would save a lot of resources in trying to figure out what the clients want to measure.

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## **Background**

Consafe Logistics, which is globally one of the leading providers of WMS solutions based in the south of Sweden, wanted to know if a PMS for warehouse activities could be based on the SCOR model. They also wanted to know how it could be applied in their organization to offer enhanced customer satisfaction for their WMS customers.

SCOR is a worldwide accepted and well-known process reference model that is developed and endorsed by the global non-profit association Supply Chain Council (SCC). It's a cross-industry diagnostic tool for supply chain management. (SCC, 2014) The SCC's tools support organizations to conduct fast and dramatic improvements in supply chain processes (SCC, 2012).

## **Problem**

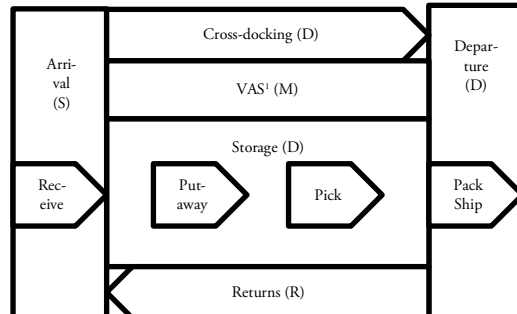
Consafe Logistics wants to operate in a more standardized way when it comes to metrics for warehouse processes, the authors was therefore to investigate if SCOR could fit their work in warehouse management. In the study the SCOR framework, consisting of processes and suggested metrics (Lepori, Damand, & Barth, 2013), and to what extent the model could be applied to the company's services within warehouse management was to be evaluated.

Furthermore, Consafe Logistics wanted to gain a comprehensive picture of what types of metrics their customers currently measure in order to identify if there was a consistency towards SCOR. This was done in a web-based survey that was sent to all Consafe Logistics' WMS customers.

## Main conclusions

The main conclusions from the thesis were that a PMS based on SCOR for warehouse activities should originate from a model where warehouse activities can be aligned to SCOR processes rather than a general set of metrics. The reason is that the analysis of the survey showed that almost 90% of the customers' metrics could be linked to SCOR processes, but only 61% could be connected to SCOR metrics. The new warehouse performance system was therefore structured based on a process model.

The process model was constructed during a workshop with Lars Magnusson, Member of the Board of directors in the SCC as well as a Manager within Supply Development at Ericsson AB. His help gave the authors invaluable support when the PMS was developed. The illustration of the PMS is shown in Figure 1.



**Figure 1 The Warehouse Process Model (PMS) based on SCOR**

The PMS was divided into common warehouse areas and should enable the recognition of the execution processes in SCOR, i.e. Source (S), Make (M) and Deliver (D). The value-adding service (VAS) area is complementary to fit organizations with additional activities such as: Assembly, Changing from pallet to store display or Repairs.

## Usage of the results / recommendations

Consafe Logistics customers are typically companies that distribute large volumes of goods and products through their warehouses, therefore they also find warehouse logistics as an opportunity to create competitive advantages. The model developed should work as support to match warehouse activities against correct SCOR processes. This enables SCOR to provide a set of metrics suited for the supply chain. In this way Consafe Logistics would save a lot of resources in trying to figure out what the clients want to measure.

Since the study showed that customers' warehouse metrics were best applicable to SCOR processes, and since metrics should be aligned to an organizations' strategy (Elrod, PE Murray, & Bande, 2013) (Holmberg, 2000), the new warehouse performance system was therefore structured based on a process model and didn't include metrics. This ensures that all customers no matter industry, country or strategy can use the PMS.

In order for Consafe Logistics and their WMS' s customers to fully take part of the PMS, a guide for finding metrics aligned to the SCOR model was developed.

1. Map and define processes, material and data flows according to the warehouse process model
2. Select which performance attributes to focus on in SCOR
3. Profile and measure current performance in the warehouse
4. Establish performance targets
5. Identify opportunities in SCOR, enable best practices
6. Continuously improve processes and the performance system

## Analysis

As only 61% of customers' metrics could be translated to metrics as defined in SCOR, the study needed to assure that metrics could be linked to processes instead in order to find a consistency towards SCOR. And as SCOR lists processes that influence the performance of metrics (SCC, 2010), the processes of the 61% could easily be found.

In regards to the metrics where no direct SCOR metrics could be identified (39%), an investigation whether they could be matched against a SCOR process instead had to be made. As an example, a customer responded that "Amount of wrong picks" was measured in their warehouse. Such metric couldn't be translated into a direct SCOR metric. However, there was no doubt that the metric can be linked to the process "Pick Product", which is a level 3 deliver process in SCOR. This procedure was repeated for all of the metrics. The overall summary of customer metrics and the linkage to SCOR processes are summarized in Table 1 below.

**Table 1 Summary of customer metrics that can be linked to SCOR processes**

	%
Metrics with direct linkage to SCOR metrics (the 61%)	61%
Metrics with no direct linkage to SCOR metrics (the 39%)	29%
<b>Sum, within the scope of SCOR processes</b>	<b>90%</b>
<b>Sum, not within the scope of SCOR processes</b>	<b>10%</b>
Total	100%

## Contribution to academia

The researched could contribute to academia since not much research has been conducted in regards to SCOR and warehouse management earlier. Additionally, the PMS developed could

therefore be interesting for both further research and practitioners that are thinking about implementing the SCOR model in their warehouse operations.

## References

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