

Opportunities for the implementation of a milk run system

– A case study at Haldex Traction

Andreas Nilsson

Department of Industrial Management and Logistics
Division of Engineering Logistics
Lund Institute of Technology
Box 118
221 00 Lund, Sweden

Abstract

Today more and more companies outsource their transport services to third party logistic providers. These providers then integrate all transports in their own network and throe synergy effects, when it comes to administration and utilization rates, manage to do them more cost efficient [1]. The problem with this system is that the transport company can not prioritize all their transports and this will cause problems for companies that has shipments that is less than a full truck load. The study will focus on Haldex Traction and how efficient a milk run distribution system, based from a hub in Hamburg, will be compared to today's distribution system that is run by DHL and consists of several hubs allover Europe. The suppliers in Germany and Austria would be divided into different routes. The route would start in Hamburg loaded with return packages and pallets that are to be returned to the different suppliers. At the same time as the truck return the pallets new products, that are to be delivered to Landskrona, would be loaded on the trucks. Another truck would then go in a similar manner between Hamburg and Landskrona.

Keywords

Milk-run, Distribution, Supply chain, Car industry, Just-in-time, Reversed logistics.

1. Background

Haldex traction is a company situated in Landskrona that manufacture and develop four wheel drives for personal cars. They supply their system to for example Volvo, Saab and the different brands in the Volkswagen group. They also have a factory in Hungary and one in Mexico. The origin af this article is that Haldex Traction experienced that today's distribution system did not satisfy there high demand on delivery precision. They always felt that DHL, that currently is the preferred provider of their transports services, always prioritized their own utilization rates instead of delivery precision. And when the deliveries did

not arrive on time it was always hard to track when they would arrive. A milk-run network for all their suppliers in Europe might solve these problems. The European suppliers where selected because the biggest delivery problems originated from these routes. The benefits with a milk-run system is that its easier to keep track on where all the gods are in the transport system. The biggest problem with the system is that trucks would not be fully loaded until the last stop of the route. Half loaded trucks are a problem both from an economical and environmental point of view [2].

The transport companies has to focus more and more on cutting cost because of the increased competition in the field. This leads to more efficient distribution systems from an economical point of view but it may also lead to decreased delivery precision when different goods to different locations are loaded together. This is especially a problem for smaller companies that do not order full truck loads of goods. [3]

2. Problem discussion and purpose

The problem formulation that this thesis is trying to answer is if Haldex Tractions distributions system can be improved both according to costs and delivery certainty if a milk-run system is implemented. The findings could also provide useful information for other companies in the same situation as Haldex Traction when it comes to the design of their distribution network.

3. Methodology

The current material flow was mapped to have something to base the different routes on. This was accomplished by looking at the material demands for the next four months. Based on these numbers the weekly material flow from each supplier is calculated. The transportation cost was calculated in the same way. The optimal routes for the different milk-runs where calculated with the help of a vehicle routing formula that optimized the different routs based on distance traveled and utilization rate [4]. Three different transport providers where asked to leave quotations for the

different routes that had been calculated on the previously gained data.

4. Empirical findings

Haldex ordering system is optimized to keep as low stock levels as possible. A certain products stock time starts counting as soon as it leaves the suppliers factory. An estimate is calculated weekly for how much that will be produced the following year and based on this estimate a order is placed for the necessary goods from the different suppliers. This system take no consideration if the order is a hole pallet or just a half. The same supplier can also deliver more than one time a week. Because these orders change a lot and DHL has a sometime long lead time for single pallets a lot of express deliveries are necessary to keep the production going. These express deliveries are expensive and not very efficient when a truck only carries a single pallet or two. But i would cost more if the production had to stop from a shortage of materials. Haldex has the demand on their inbound material that it is only allowed to arrive two days early and never to late from the planed date. If more than 10 % of the deliveries from a supplier fail to make this time window a warning is issued. This is all handled by the purchasing department. If a supplier is to blame for a missed delivery they may have to pay a penalty fee to Haldex but if DHL is to blame then no compensation will be paid.

Today Haldex and DHL have a contract that states that DHL will be the preferred transport provider. This deal is about to expire and negotiations for a renewed contract is under way. These new negotiations will probably lead to an increase in the transport price because of the increased fuel prices and stronger environmental regulations. Today all deliveries to and from Landskrona are handled by DHL except the deliveries from and to Magna Powertrain in Austria. These transports are organized by Magna itself. Haldex also pay themself for all transports except the ones to Magna Powertrain and Continental Automotive Systems. DHLs system today is based on a number of hubs strategically placed over Europe. Goods will be delivered to the closest hub by a feeder truck. Here the goods will be sorted and sent to the hub nearest the final destination, from where it is distributed to the final location. By organising the transports this way the trucks will have a high utilization rate on the long journeys between the big hubs but have the downside that the lead times will increase compared to a system based on direct deliveries. The closest hub for the factory in Landskrona is situated in Malmö and Helsingborg.

The biggest problem that Haldex experience today is that they do not know what time a certain transport will arrive. It also depends very much on

who they talk to on DHL how precise an answer they will get. Normally it takes a delivery from Germany 3-7 days to reach Landskrona.

All goods are delivered on EUR-pallets or other special made packages based on the EUR standard. This makes the material handling easier and the same handling equipment can be used all the time. There are two different packages for finished products depending on to witch car manufacturer they as sold. The one used by Volvo takes up less space when its empty that when there are finished for wheel drives in then but the packaging used by Magna will always take up the same amount of space.

Based on the production predictions the necessary daily deliveries where calculated for each supplier. The transportation cost where calculated based on both weight and space requirements.

The suppliers where dividend into different routes on according to where they where situated and it tock six different routes to build up the whole network. Some of the routes were run daily and some just once a week. The routes were planed so that one single truck would be able to handle all the stops on it. The whole system will originate from a hub in Hamburg that already is in use by Haldex for all material bound for the Mexican factory.

When de routes where decided the three transport companies DHL, Schenker and Schneider where asked to leave quotations for each different route. They were also asked how long time each route would take.

5. Results of the analysis

The many single pallet deliveries is a big problem for Haldex. But it is also a necessity for keeping the inventory value low. The transfer to a milk-run system demands that more deliveries from one single producer are consolidated together. This will not automatically increase the storage days for a single item if the delivery time could be decreased. A milk run system should be able to lower the delivery time with approximately 1-2 days depending on if two drivers are used in each truck or if the loading and unloading can be handled at off hours.

One of the biggest positive effects of a milk-run system is that it is easier to keep track on where the different transports are at each time. Just a short phone call to the driver could make the work for the material planers at Haldex Traction a lot easier. This is based on that it is the same driver that drives each route every week.

It also lowers the chance for transportation injuries on the goods if the trucks only carry goods for one single destination. It also decreases the chance that goods will be lost at some redistribution hub.

The cons with a milk-run system are that it tends to become static when all the suppliers only have one shipment day. When there are disturbances in the production this will force the supplier to use express deliveries. This will also lower the utilization rates on the truck running the normal route.

When the quotations for the routes were compared towards each other it is discovered that no provider are cheaper on all routes, They all have some routes where they are cheaper on but when it is added to the calculations how often the routes will be used it seems that DHL left the best offer. Schenker were 15 % more expensive and Schneider 7 % more expensive.

When the costs for the milk-run system is compared with the cost for the current distribution system handled by DHL it shows that the new system will be 63 % more expensive if DHL handles all the routes and 60 % more expensive if the cheapest provider for each route is chosen.

6. Recommendations

As seen earlier in the article the prices for the milk-run system is higher than the current transportation costs and it is hard to motivate a cost increase with 60 % just to get a better delivery precision. Not

even the shorter lead time will motivate the switch to a milk-run system.

But there are still some small changes that can save some money for the company. For example the ordering system that only optimise after keeping the stock levels as low as possible. Costs could be cut if it also took into account not to place orders under the minimum weight that has to be paid for for each transport. The current minimum payment weight is 150 kg.

Another way to cut costs is to introduce a new packaging for finished products that can be stored and transported more efficiently when they are empty. This is especially needed for the transports to Magna Powertrain in Austria.

Acknowledgement

I would like to thank my two supervisors on this thesis, Arben Mullai at the department for logistics at LTH and Anders Pålsson at Haldex Traction.

References

- [1] Schary Philip B & Skjott-Larsen Tage, 2003, Managing the Global Supply Chain
- [2] Lumsden Kenth, 2006, *Logistikens grunder*
- [3] Wieberneit Nicole, 2007, Service network design for freight transportation: a review Springer-Verlag
- [4] MIT, Single-Depot VRP, http://web.mit.edu/urban_or_book/www/book/chapter6/6.4.12.html 2007-02-18