SETTING UP CENTRALISED DISTRIBUTION

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Abstract: Supplying of customers represents fundamental driving force for every region and has strategic importance for all participants along supply chain. Due to non optimised routes, poor planning and coordination among all parties involved in supply chain increased transportation costs are very likely to occur. In order to avoid unnecessary expenses and deterioration of overall logistics service level many different solutions can be applied. This paper describes in short advantages and disadvantages of centralised distribution strategy and its impact on logistics service level. Also practical examples for getting through the process of setting up this strategy in both supplier and retailers organization will be explained.

Keywords: centralised distribution, logistics costs, logistics collaboration.

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1. TYPES OF DISTRIBUTION

The most common classification of distribution strategies is into:

- Decentralised
- Centralised
- Combined

Centralised strategy represents organising delivery of product from suppliers to a central location, usually in full load quantities, rather than to each store. After receiving, products can be stored again, processed (VAL) or picked and consolidated from a number of suppliers and delivered to the stores, usually in a single full load.

Decentralised distribution is a mean of organising delivery to each store individually. [1]

Combined distribution is rare but can be determined as partially centralised and decentralised. This special type can evolve from retailer's need to deliver specific group of products from central warehouse, or to receive products in stores based on their size (small ones) directly from supplier. Sometimes it just represents compromise between supplier and retailer.

1.1 Centralised distribution

Centralised distribution is dominant strategy in majority of developed supply chains. The process involves entire warehousing system as an additional participant in the supply chain which adds more complexity (Figure 2). Nevertheless Figure 1 shows that the supply chain in centralised distribution is much more simple and therefore more efficient than decentralised distribution (for both supplier and stores it brings a significant reduction of workload and costs). The reduction of costs is caused by the reduction of cost drivers (number of orders, executors etc.) as well as by the fact that the larger quantity of goods transported to and from the warehouse induces the reduction of transportation costs. That is optimal for large-volume and fast-turnover products.

Due to summing of picking demands in suppliers/distributor warehouse, other logistics cost are also decreased. First of all manipulation and labor cost because redundant process of picking lines, quality and quantity control, consolidation and loading is eliminated. Administrative costs related to order processing are dramatically cut and reverse logistics can be simplified by gathering returns from retailer's central warehouse. [2]

If centralised strategy is implemented, retailer will have increased logistics cost (breaking loads for stores and transport to each store) and overall stock level (including every store and central warehouse) will be larger but better monitored. If stock is not efficiently monitored, „out of stock" situations can be everyday challenge that will lead to investment in increasing stock level.
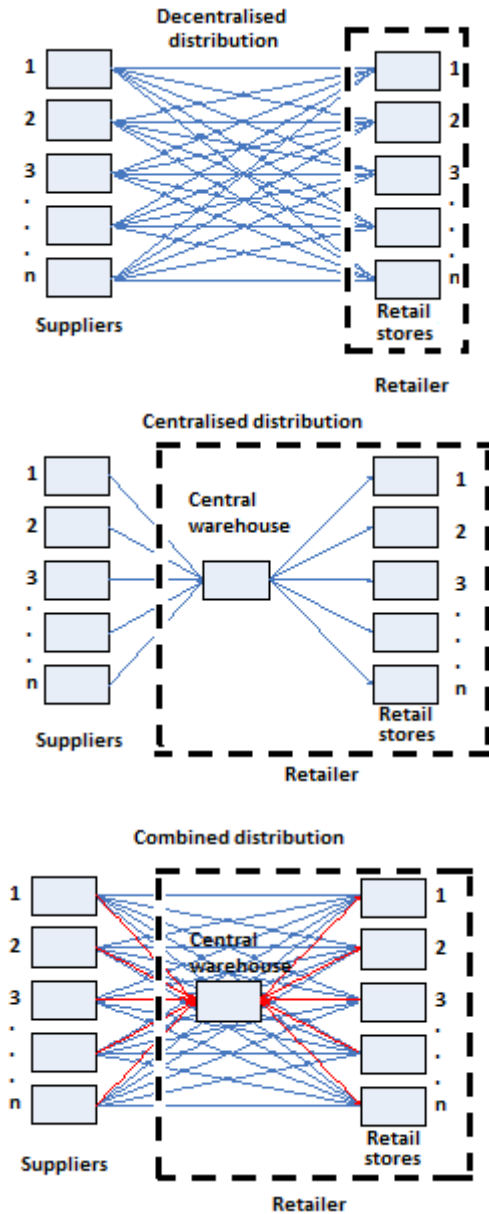
Figure 1. Schematic representations (decentralised, centralised end combined distribution)
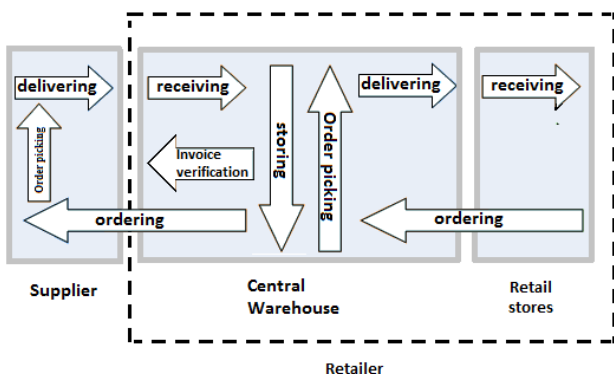

Figure 2. Schematic representations of centralised distribution processes

To sum up, the advantages of the centralised distribution are:

- Increased utilisation of truck loads, which leads to
- Decreased transportation cost per transported unit
- Decreased total number of vehicles used
- Decreased kilometres travelled in total
- Decreased number of documents and claims
- Increased reliability
- Decreased time for receiving products in total (one reception vs. multiple receptions)
- Decreased total route time
- Increased vehicle turnover
- Significantly decreased transportation costs
- Increased product availability and at the same time decreased stock in retail stores (short replacement time)
- Decreased stock level in retail stores (Total stock is increased) – shown in Figure 3
- Decreased „out of stock" level in retail stores – shown in Figure 4.
- Decreased handling work in the store (net capacity in the stores)
- Decreased costs (reduction of buying price – logistics discount – vs. in-house logistics costs)
- Decreased complexity of the logistics in general
- Decreased administrative workload (invoices, packing lists, credit notes)
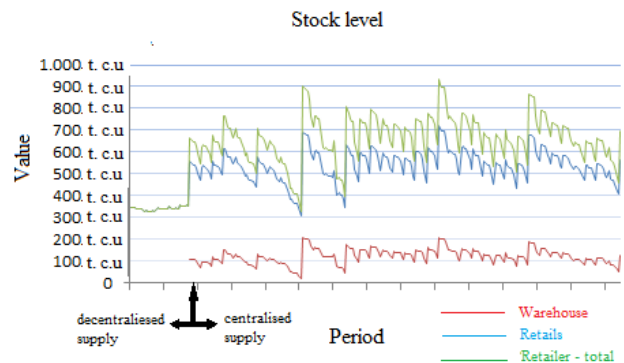

Figure 3. Chart of the stock lever before and after centralisation in the company dm-drogeriemarkt

From transporter's point of view (if there is subcontracting party involved) centralised distribution brings less income but it can be compensated through greater vehicle turnover (more routes with the same vehicle).
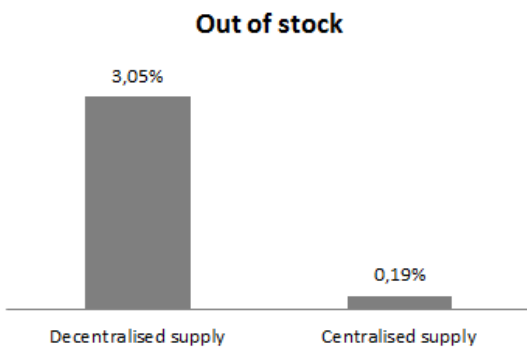
Out of stock

Figure 4. Chart of the OOS-level before and after centralisation in the company dm-drogeriemarkt

1.2 Decentralised distribution

The characteristic of this alternative is the simplicity of the process. The few process steps are easy to perform. However, sales increase in retailer's chain and diversification of goods induce the rapid cost increase (ordering/receiving by retailers and transportation costs by suppliers). For the suppliers it is difficult to process „many small" orders, as well. This alternative is optimal for low-volume and slow-turnover products.
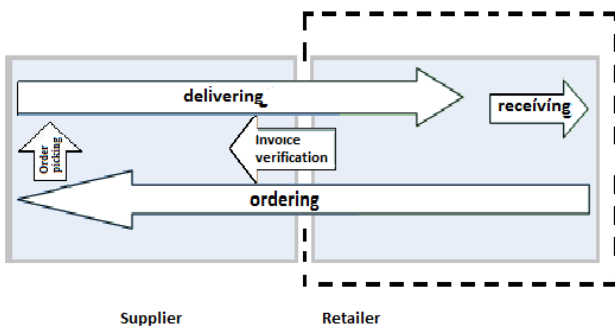

Figure 5. Schematic representations of decentralised distribution processes

Decentralised distribution can be seen in retail supply-chains where retailers have neither enough warehouse space nor the capacity for adequate stock control in their objects. In these cases decentralised distribution is only feasible. On the other hand, it is not uncommon for distributors to insist on decentralisation because of their insecurity about the benefits of centralisation and because they fear losing their presence/on site control in the distribution channels, while their sales force, and turnover diminishes. This misconception is huge obstacle for setting up centralisation and is dealt through detail calculation and cost benefit analysis.

Every benefit cited earlier considering centralised distribution can be seen as drawback for decentralisation. Transportation costs are much higher, as well as number of used vehicles, kilometres travelled, total receiving time. Transport utilisation is diminished, uncertainty of delivery is greater, as well as manipulation costs, labor and reverse logistics. Conditional advantage can be shorter lead time and less stockouts (not likely in real terms). Decentralisation costs more but it can be managed to acceptable level through collective transport.

2. DECIDING ON DISTRIBUTION STRATEGY

For evaluation of each mentioned strategy it is necessary to determine all relevant factors such as:

- Users demands
- Locations of users
- Demanded service level
- Overall cost and distribution cost [3]

Detailed analysis needs to be taken from the perspective of every participant in the supply chain – supplier, retailer and logistics provider if there is one [4]. The retailer usually demands to split the increased costs with the supplier, who, on the other hand, debates with the logistics provider to review the price of his service.

In this complex relation a high-class collaboration is needed. Collaboration can be defined as " the means by which companies within the supply chain work together toward mutual objectives through the sharing of ideas, information, knowledge, risks, and rewards". Technology and relationship building are critical components, and companies with effective collaboration skills are likely to have a competitive edge. [5]

The result of this collaboration will enable the transfer of decreased costs to the end price of the product (trade discount). In that way the retailer can compensate his increased costs. The trade discount is a subject of a detailed analysis, which is primarily comparison the costs of the current supply strategy (decentralised) with the possible variants (centralised, combined). The trade discount is usually equal to savings made from the decreased logistics costs of the supplier (transportation costs, order processing, picking, reverse logistics etc.).
Arguments for the choice of strategy lie in two criteria:

- Costs - The cost analysis should show the difference in logistics costs between the compared strategies, considering the costs in the retail sector based on the net performance trend in the process of ordering, receiving etc.

- Service quality - The primary effect is the increase in the service level in the stores as well as the increase in the presence of products for the end-consumer.

Every process of every strategy needs to be indentified and analysed. Related processes considered for the analysis can be shown as follows (Table 1):

Table 1. Defining the process for supply strategy [6]

process/strategies	Deccentr.	Combin.	Central.
Ordering (Retail store)	x	x	x
Order processing (Central warehouse)			x
Ordering from the supplier (Central warehouse)			x
Order processing (Supplier)	x	x	x
Order picking (Supplier)	x	x	x
Transport to the Central warehouse		x	x
Transport to the retail stores	x	x	x
Receiving (Central warehouse)			x
Storing (Central warehouse)			x
Order picking (Central warehouse)		x	x
Receiving (Retail store)	x	x	x
Invoice verification	x	x	x

Legend:

Retailer costs	x	
Supplier costs		x

After the cost identification, a cost analysis has to be performed, which involves following:

- Definition and description of cost factors and cost drivers
- Calculation of cost rates
- Calculation of costs for each strategy
- Calculation of the minimal discount for each strategy

The cost factor (CF) represents all costs with the significant influence on total costs in a certain process phase - employee salaries, transportation costs (fuel, maintenance, amortizations, labor, insurance, registration), warehouse costs (rent, manipulation, insurance, labor, amortization of warehouse and equipment, auxiliary goods, maintenance of forklift and other equipment), administration costs, etc.

Cost drivers (CD) are factors which influence total costs quantitatively. Example: Transportation costs grow with the number of transported pallets. In this case, the number of pallets is the cost driver. In the receiving process the costs depend mostly on the number of received items (orderliner). In this case, the number of received items represents the cost driver.

The cost rate (CR) is the number expressed as monetary value and represents the costs per cost driver and calculated cost rate for each process (presented in Table 1). In the receiving example the cost drive would be the price per received item.

$$CR = \frac{CF}{CD} \qquad (1)$$

Financial analysis include actual costs through certain period of time (month, quartal, year):
Core and dynamic data:

- Turnover (financial value, weight, volume, pieces, products/positions, cartons, pallets etc.)
- Number of retails orders
- Number of actual routes
- Number of delivered shops (points)
- Parameters (assumptions):
- planned number of retail stores
- growth of market share (business plan)
- retailer's desired range of storage
- retailer's order and delivery plan
- number of working days etc.

Table 2. Calculation of supply strategy analysed in dm-drogeriemarkt - part I

Core, dynamic data and assumptions:			
Period:		1.2.2012-31.1.2013	
Financial value of turnover (c.u.):		100.000	
Number of active products:		69	
Planned number of retail stores:		69	
Retailer's desired range of storage:	stores	15 days	
	warehouse	30 days	
Strategy: decentralised distribution			
Processes	cost rate (c.u.)	cost driver	core and dynamic data (c.u.)	total costs (c.u.)
Ordering (Retail store)	0,02	orders	3.588	56
	0,01	positions	49.514	583
Order processing (Supplier)	0,09	positions	49.514	4.352
Order picking (Supplier)	0,02	positions	49.514	1.168
Transport to the Central warehouse	28,00	pallets	14	397
Receiving (Retail store)	0,09	deliver	3.588	340
	0,02	positions	49.514	1.167
Invoice verification	0,22	invoice	3.588	788
Total costs:				**8.852**

The minimal discount expected by the retailer is the percentage of increased costs for the given supply strategy in sales generated in the given period. It represents the base for supplier's decision about which strategy will be implemented. Supplier's first simulation of new cost for centralised distribution and warehousing is taking in

consideration the same amount of volume transported with bigger vehicles less frequently, with less number of orders, less picked lines, goods control and loads. Then two calculations (actual cost vs. simulated cost) are compared. If centralised distribution brings the reduction of costs for the supplier, it is clear that centralised distribution will be set up. However, in practice this supply strategy is sometimes chosen for other reasons than cost reduction – because the participants in the supply chain see their benefit in better availability of goods in retail stores, OOS reduction, process simplification etc.

3. STEPS FOR SETTING UP CENTRALISATION

The first step is always the difficult one. Initiatives for centralisation are in most cases initiated from retailer's side. The first step is to get support and positive feedback from every party involved. This is where supply chain specialist's role is crucial. Initial meetings are taking place where all benefits for the company from centralisation are being explained. In start this idea usually will not be accepted with the distributors side but then calculation is needed to be done. After calculation of savings is finished sales representative is getting used to the fact of centralisation. Negotiations are being held with retailer.

A lot of details are discussed. Collaboration with IT department, sales and logistics from both sides is necessary. After several iterations a formal agreement will be signed in which:

- Ordering/delivery cycle is defined
- Ordering channel is defined (EDI, HH, fax, phone…)
- Order information is defined
- Minimum order quantity is defined
- Master data is being inspected and shared with retailer
- Updating of master data protocol is defined
- Logistics requirements for consolidation of full loads are being instructed
- Details for receiving goods in central location are defined
- Returns policy is defined
- Logistics service level is defined (KPI)
- Conditions for changing agreement are defined
- Commercial terms are defined

Table 3. Calculation of supply strategy analysed in dm-drogeriemarkt - part II

Strategy: centralised distribution				
Processes	cost rate (c.u.)	cost driver	core and dynamic data (c.u.)	total costs (c.u.)
Ordering (Retail store)	0,02	orders	3.588	56
	0,01	positions	49.514	583
Order processing (Central warehouse)	0,30	orders	3.588	1.076
Ordering from the supplier (Central warehouse)	0,18	positions	1.196	221
Order processing (Supplier)	0,09	positions	1.196	107
Order picking (Supplier)	0,02	positions	1.196	29
Transport to the Central warehouse	6,00	pallets	14	85
Receiving (Central warehouse)	0,23	positions	1.196	279
Order picking (Central warehouse)	0,03	positions	49.514	1.485
Storing (Central warehouse)	19,64	pallets	14	278
Transport to the retail stores	30,00	pallets	14	425
Receiving (Retail store)	0,09	deliver	3.588	340
	0,02	positions	49.514	1.167
Invoice verification	0,22	invoice	52	12
Total costs:				**6.145**

Compare costs of decentralised supply			
Participants	percentage of turnover	percentage of total costs	currency unit (c. u.)
Supplier	8,58%	66,84%	5.917
Retailer	4,25%	33,16%	2.935
Total	12,83%	100,00%	8.852

Compare costs of centralised supply			
Participant	Percentage of turnover	Percentage of total costs	currency unit (c. u.)
Supplier	0,32%	5,16%	221
Retailer	8,58%	94,84%	5.924
Total	8,91%	100,00%	6.145

Sumarry	
Increased costs for retailer (c.u.)	2.988
Increased costs for retailer (%)	2,99
Decreased costs for supplier (c.u.)	5.696
Decreased costs for supplier (%)	5,70
Decreased in total supply (c.u.)	2.707
Decreased in total supply (%)	2,71

There are many participants in the supply chain who need to adopt the new way of doing things so all details must be clarified and set up before getting started. If some of the above-named steps are not clear, the end result will not be the best, and even

more costs will be generated in order to adjust logistics operations on both sides.

4. CONCLUSION

Centralised distribution is a proven method for increasing product availability in retail stores and making considerable saving through reduced number of deliveries of full loads made up from a multiple supplier's products. Before implementation every party involved needs to be careful and prepare their organizations for dramatic change. If the setup is done correctly, overall service level will be improved.

Further impact of centralisation will consider social and environmental perspectives. Due to minimisation of workers, regions with high number of warehousing facilities will be affected the most. Not to forget that centralised distribution also has

benefits to the environment via reducing traffic congestion and noise reduction in urban areas.

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