Outline Solutions to Case Studies

13

13.1 Solution to Case Study 6-1

a

	Pallet shelving	Live storage shelving	Block storage
Base area of Euro pallet 1.2 x 0.8 m = 0.96 m²	Requirement for 6,000 pallets 5,760 m²	5,760 m²	5,760 m²
Number of storage levels possible with 13 m clearance height given	1m+0.5 m clearance 13 m : 1.5 m = 8.6 = 8 levels	= 8 levels	= 1 level
Space requirements	5,760 m² : 8 levels = 720 m²	5,760 m² : 8 levels = 720 m²	= 5,760 m²
Allowance for the level of storage space utilization	45 % Additional space for structures, aisles etc. needs to be taken into consideration = 1,600 m²	65 % = 1,108 m²	80 % = 7,200 m²
Alternative with the least space requirements		X	

b

Due to the broadrange of products and since items are stocked on and retrieved from opened pallets, pallet shelving is the most advisable option. This is also true since pallet shelving has only marginally higher space requirements than live storage shelving.

H. Gleissner and J.C. Femerling, *Logistics*, Springer Texts in Business and Economics,
DOI 10.1007/978-3-319-01769-3_13,

13.2 Solution to Case Study 6-2

Time required per pallet: 311 m/2 m/s = 155.5 s

Net time required for transport = 155.5 s × 5,190 pallets = 807,045 s

Utilization time per forklift truck per week = 15 h × 5 days = 75 Std.

Conveying capacity utilization = 40 %

Net time available for pallet transport = 75 h × 40 % = 30 h

Net time = 30 h = 30 × 3,600 s = 108,000 s

Number of forklift trucks: 807,045 s/108,000 s = 7.5 i.e. approximately 8 forklift trucks are required

13.3 Solution to Case Study 6-6

(a) 2 × 3 storages spaces when minimum stock quantity is reached + 2 × 6 storages spaces for replenishment = 18

(b) 2 × average stock quantity ((3 + 9)/2 = 6) = 12

An average stock quantity is used for the calculation within a chaotic storage strategy since it is assumed that not all articles of a warehouse are re-ordered at the same time.

13.4 Solution to Case Study 8-2

In the case of hub-and spoke systems: 10 connections (with n = 10 depots plus 1 hub)

Point-to-point: 9 + 8 + . . . + 2 + 1 = 45 connections (with n = 10 depots without hub)

or: [10 * (9)]/2 = 45 (with n = 10 depots without hub).

Investments in a hub must amortize within the operating life and the structure must be expandable, i.e. integration of additional depots must be possible.

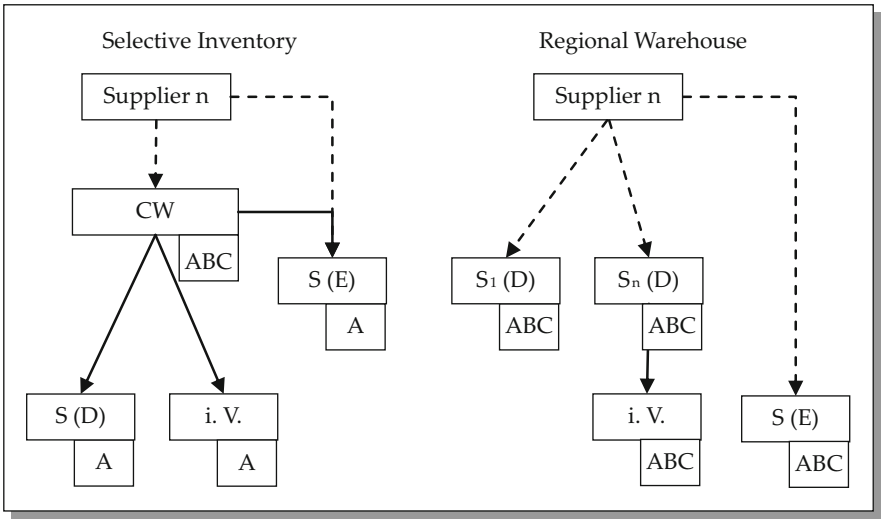
13.5 Solution to Case Study 8-5

13.5.1 Selective Inventory

Decentralized storage of fast-moving goods at subsidiaries and customized delivery with slow-moving goods from the central warehouse. This results in a reduction of inventory within the distribution network while the number of regional warehouses stays the same and transport costs may increase.

13.5.2 Regional Warehouses

The subsidiaries in Germany and Spain are directly supplied by the suppliers while the independent vendors are supplied by the subsidiaries. Interim storage in the central warehouse is thus eliminated and the product range can be adjusted to the individual subsidiaries. A decrease of inventory within the distribution network is counterbalanced by an increase in transport costs.

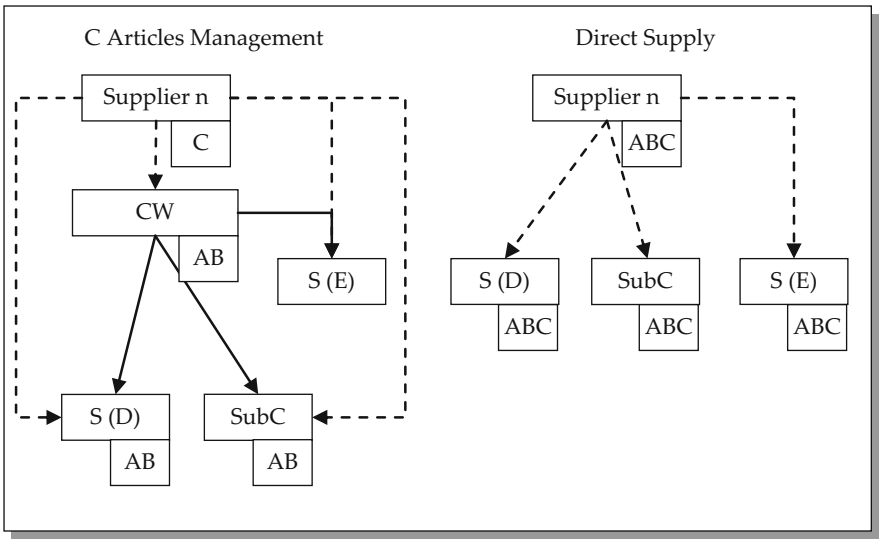


13.5.3 C Articles Management

The central warehouse only stores fast-moving goods. Slow moving goods are stored by the suppliers until they are requested by the subsidiaries to which they are then supplied directly. A significant reduction in inventory thus results for a large portion of C articles while transport costs only increase slightly.

13.5.4 Direct Supply

All suppliers directly supply the subsidiaries. Only small-sized trucks can be used to ensure their maximum capacity utilization. The average distance of transport increases in comparison to the use of a central warehouse.



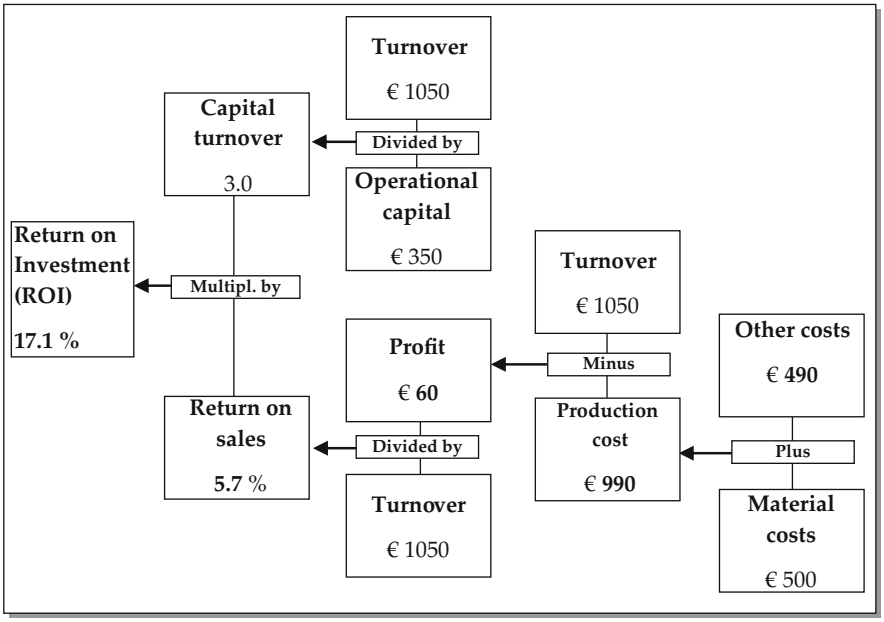
In order to assess these different options and to opt for the most favorable alternative, a use-value analysis can often be applied. To this end, specific assessment criteria are defined which are then given a certain amount of points. Furthermore, the criteria may be weighted by means of certain factors. The most suitable criteria for the problem at hand are:

- Market (Service level, Speed of service, subcontractors are supplied separately),
- Internal processes (Improved warehouse operations, capacity utilization reserves),
- Monetary aspects (transport costs, handling and warehousing costs, inventory costs).

Selective inventory or introducing a separate C article management system appears to be a reasonable solution here. Combining both principles should also be considered. Due to the high amount of direct supply to Spain, special consideration should be given to the location of the central warehouse.

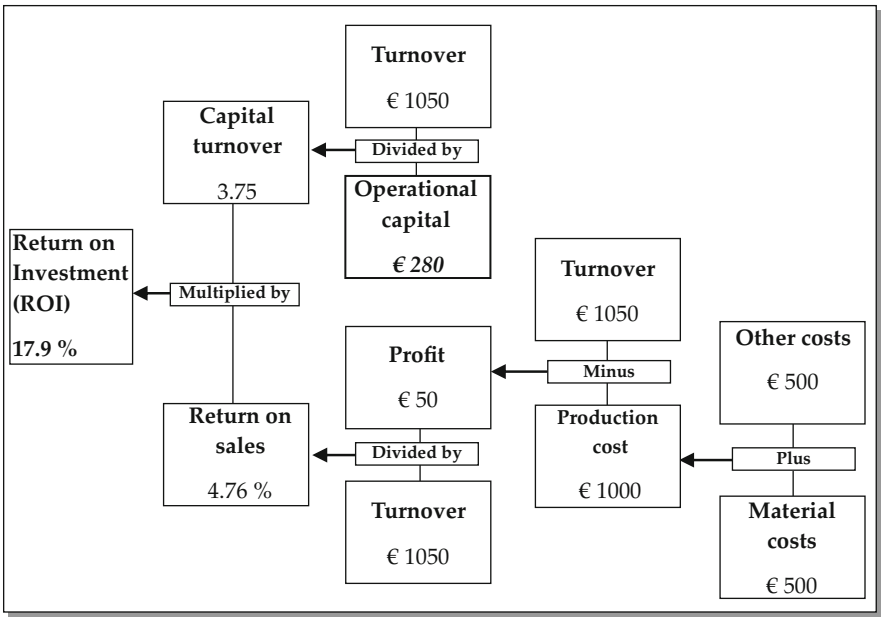
13.6 Solution to Case Study 11-2

(a) Decrease in the operational logistics costs



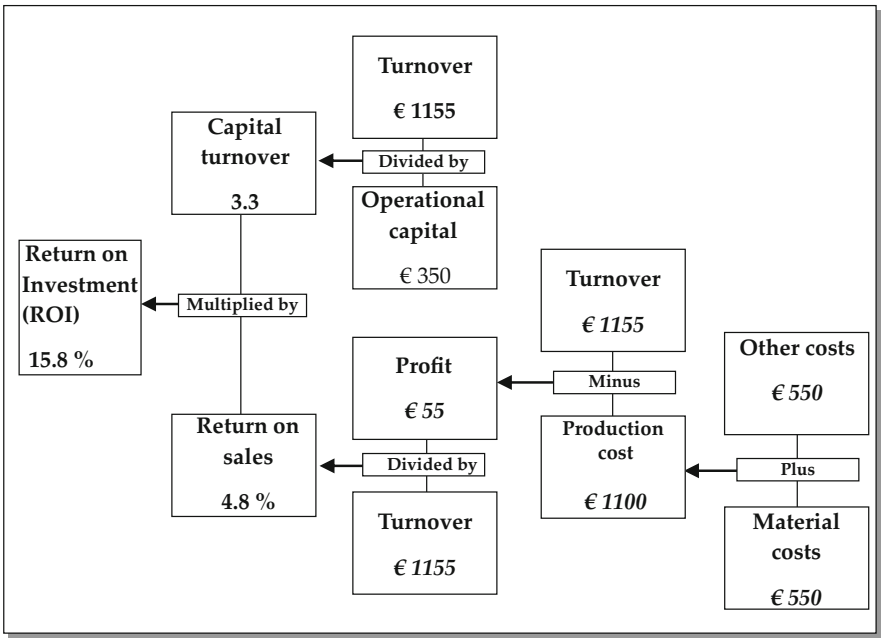
As can be seen, a relatively minimal decrease in logistics costs by 10 % – and thus a decrease of other costs by € 10 units – yields an improved ROI by 2.8 percentage points.

(b) Reduction of inventory



Reducing inventory and thus reducing operational costs by 20 % leads to an increase in ROI by 3.6 percentage points. This demonstrates that measures to decrease inventory can have a significant effect on the overall yields of the company.

(c) Increase in turnover



An increase in turnover by 10 % merely results in an increase in ROI by 1.4 percentage points. This shows that decreasing the logistics costs contributes more to the ROI than an increase in turnover by the same percentage does. Moreover, a decrease in logistics costs is usually more easily achieved within a company than an increase in turnover. Increases in turnover are primarily dependent on market conditions that are rather difficult to influence.