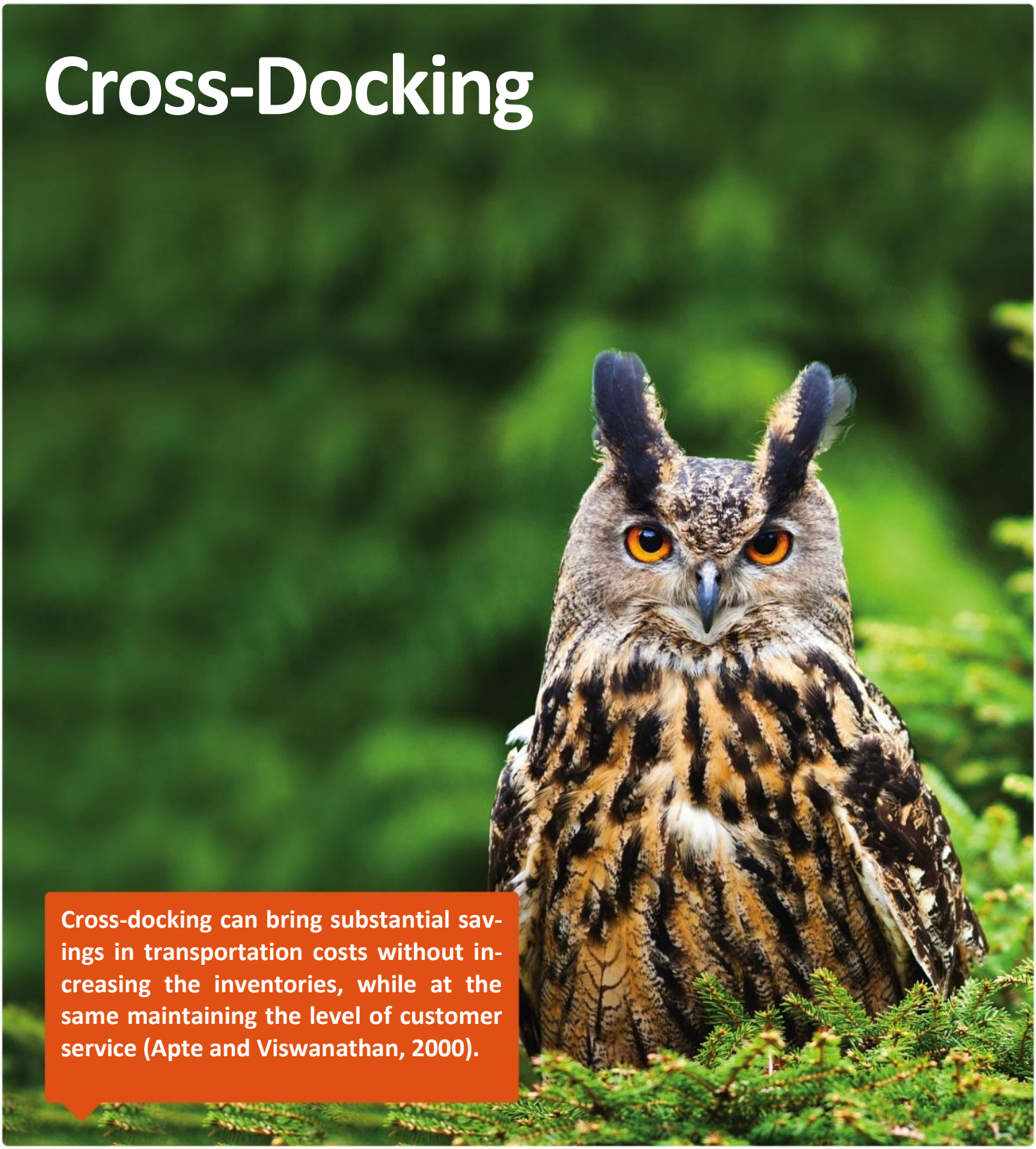
CIPS Procurement topic

Cross-Docking



Cross-docking can bring substantial savings in transportation costs without increasing the inventories, while at the same maintaining the level of customer service (Apte and Viswanathan, 2000).

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Introduction

Cross-docking is a powerful strategy for supply chain management, as it helps to achieve some of its key objectives: inventory reduction, fixed resource reduction and more flexible and responsive operating systems.

The objective of cross-docking is to combine inventory from different suppliers into one assortment for a specific customer. The strategy is used extensively by retailers for replenishment of fast-moving products and represents an application of the 'active storage' concept. Cross-docking is most appropriate for high-volume, fast-moving products with easily predictable quantities (Bowersox et al., 2007). It is also an appropriate response to another trend in logistics and distribution - the increased product proliferation. Increased product proliferation leads to the decreasing demand for the individual product and increasing variability in individual demand. In such cases, the potential of cross-docking for controlling the logistics and distribution costs, while at the same time maintaining the level of customer service, is particularly useful (Apte and Viswanathan, 2000).

Cross-docking involves moving products through distribution centres without storing them. This allows organisations to achieve economies of scale in transportation as goods are only distributed in full truck loads (FTL). Conceptually, cross-docking is most similar to the traditional mixed warehouse as in both incoming shipments from several vendors are broken up and then consolidated again to create several multi-product FTL shipments. With cross-docking, however, the goods spend no (or very little) time in storage (Apte and Viswanathan, 2000).

Most warehouses that operate cross-docking do not actually use it in its pure form, but rather operate 'hybrid' warehouses. In the latter the cross-docking is used in combination with some of the traditional warehousing strategies. Often cross-docking is used for some items, while there are still inventories for others. This especially applies to inventories that require some additional pre-processing (eg. specialty items that need some pre-processing before they are shopfloor-ready, such as clothing) (Apte and Viswanathan, 2000).

Definition

Cross-docking is a warehousing strategy of moving of goods directly from the receiving dock to the shipping dock, reducing the handling and storage steps in between to a minimum (Apte and Viswanathan, 2000; Van Weele, 2010). The term has a maritime and railway background - originally it was used to describe a process of discharging cargo by ships 'over the dock' to smaller ships (Kinnear, 1997).

Successful Application

Many large organisations have reduced their number of warehouses and moved towards a small number of distribution centres. Each centre usually serves a particular geographical area: eg. Central Europe, Western Europe and Northern Europe. All centres are usually supported by a system of cross-dock platforms (SupplyManagement.com, 2000). In pure cross-docking, the items do not even enter inventory records in the warehouse management system, and all the packaging and labelling activities have already been completed before the goods even enter the warehouse (Apte and Viswanathan, 2000).

Steps to Successful Application

- Unload products arriving from multiple suppliers at a designated time at the handling facility.
- Sort products by destination.
- Sort Inventory receipts across the dock.
- Move products across the dock into lorries for transportation.
- Consolidate inventory receipts into outbound trailers for direct destination delivery.
- Release lorries for transportation to destination.

Bowersox et al. (2007)

Hints and Tips

- It is important to choose the right location, taking into account distance to points of production and consumption, traffic, road links, etc. (SupplyManagement.com, 2000).
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- Complexity of the networks (the number of points of production and consumption) need to be taken into account (SupplyManagement.com, 2000).
- Storage and materials handling should be avoided (Bowersox et al., 2007).
- Reliability of manufacturers to deliver the goods at the designated time is essential for the success of cross-docking (Bowersox et al., 2007).
- High degree of precision is required for effective cross-docking (Bowersox et al., 2007).

Potential Advantages

- Cross-docking can bring substantial savings in transportation costs without increasing inventories, while at the same maintaining the level of customer service (Apte and Viswanathan, 2000).
- Cross-docking can reduce cycle times, thus improving the flexibility and responsiveness of the distribution network (Apte and Viswanathan, 2000).
- Cross-docking can eliminate a whole number of steps of handling and storage in the distribution process, thus reducing the number human errors (Van Weele, 2010).

Potential Disadvantages

- Cross-docking is not suitable in all cases, as there are distribution processes in which it is not possible or appropriate to completely eliminate storage and materials handling (Bowersox et al., 2007).
- Cross-docking requires exact on-time delivery from each manufacturer which is hard to achieve (Bowersox et al., 2007)
- Cross-docking requires that products be very quickly unloaded, grouped and assigned to customer assortments, and hence places very high demands on materials handling (Bowersox et al., 2007).

Performance Monitoring

- Transport costs (SupplyManagement.com, 2000).
- Customer service levels (Apte and Viswanathan, 2000).
- Inventory levels (Apte and Viswanathan, 2000).
- Storage days (Apte and Viswanathan, 2000).

- Full-truck-loads (FTL) (Apte and Viswanathan, 2000).

Case Studies

- In the early 2000s Sainsbury's successfully introduced cross-docking as an important element in the revamping of its supply chain. 170 docking stations were sending products to regional warehouses costing £400m each, some of which were completely automated. The products were placed on automated conveyor belts, sorted, checked and the information was fed directly into the warehouse management system. By implementing more automation, Sainsbury's eliminated all activities that did not add value (Campbell, 2003).
- Switching from the traditional stock-holding supply chain operations to cross-docking techniques in the 1990s allowed Goodyear GB Ltd achieve increases of service levels from 87% to 96%, inventory reduction of 16%, improvement of stock return of 14%, cancellation of more than 135,000 square ft. of warehousing, cancellation of all hired vehicles and a reduction of operating costs in real terms of over 12% (Kinnear, 1997).
- By placing a strategic importance on cross-docking, within six years Office Depot was able to expand the retail portion of its cross-docking programme to more than 400 vendors and 55% of its stock keeping units, representing 75% of dollar volume (Apte and Viswanathan, 2000).

Further Reading/References

Web Resources

- Brief overview of the technique http://www.supplychainlogistics-consulting.co.uk/cross-docking.html
- Cross-Docking: The Need for Speed http://www.thesupplychainlab.com/blog/transportation-management/cross-docking-the-need-for-speed-2/
- Cross-docking case example: Fashion retailer Dots http://www.logisticsmgmt.com/article/cross_dock_fuels_growth_at_dots/
- Article on cross-docking by Packaging World: http://www.packworld.com/contract-packaging/contract-packaging-news-amp-trends/resurgence-cross-docking-drives-efficiency
- What is Cross-docking – Understanding the concept & definition http://www.aalhysterforklifts.com.au/index.php/about/blog-post/what_is_cross_docking_understanding_the_concept_definition

Books

- The Handbook of Logistics and Distribution Management, Rushton, Croucher, Baker, CIL & CILT, ISBN 978-0749457143
- Excellence in Warehouse Management, Emmett, ISBN 978-0470015315
- World Class Warehousing and Material Handling, Frazelle, ISBN 978-0071376006
- Warehouse Management, Richards, ISBN 978-0749460747
- A Supply Chain Logistics Program for Warehouse Management, Mulcahy & Sydow, ISBN 978-0849305757

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- Van Weele, A.J. (2010) Purchasing and Supply Chain Management. 5th ed. Cengage Learning EMEA: Andover.

Video

Animation of the cross-docking process
https://www.youtube.com/watch?feature=player_embedded&v=wevJ7GkAHqQ

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