



Special Report

The Clean Socks Experiment or The Four Elements of Warehouse Optimization



Distribution Group

Within a company, the warehouse typically plays the role of the service provider, while other departments such as sales or purchasing are its clients who decide what the warehouse should do. If we could change the requirements imposed by others, then we could achieve major improvements in the distribution center.

The only way to do this says Jeroen P. van den Berg in his new book *Highly Competitive Warehouse Management* is to align the actions and decisions of all parties with the overall objectives of the company or the supply chain.

Van den Berg notes that most departments consider their own interests first when doing business. These interests may conflict with the interests of the company as a whole. For example, the objective of the sales department is to achieve high sales volumes. At first sight this objective seems logical. However, a sales department with a strong drive to achieve sales volumes is likely to promise special conditions to win orders. These conditions can easily lead to substantial handling requirements or exceptional peak volumes, which ultimately burden the distribution center and make the sales volume highly unprofitable.

We encounter similar effects when the production department wants to run excessively long production batches or the purchasing department wants to buy from a cheap (yet unreliable) supplier. If the distribution center merely copes with the outcomes of these poor decisions, or ironically becomes highly efficient in dealing with these issues, then the inefficiencies will never be resolved. As such, the distribution center has the unique advantage of being able to view the effects of departmental behavior. By making the implications transparent, the distribution center can help to align the various departments in accordance with company objectives.

But doing this requires a new kind of creative thinking. Thus, the Clean Socks Experiment was born. The aim is to free our thinking with this simple exercise and then apply these concepts to real-world issues in the distribution center.

The Clean Socks Experiment

Van den Berg sets the stage, my wife, our two sons and I all wear socks, which need to be washed and returned to our drawers. Our family owns the usual equipment to help us with this chore: a washing machine, a dryer, a washing line and several laundry baskets. We wear various kinds of socks (dress socks, sports socks, cycling socks, hiking socks, etc.) in different colors and styles. We keep our clean socks, nicely folded in pairs, in our individual sock drawers.

Managing our socks can be seen as a straightforward logistics process, so it is an interesting exercise to see if we can find ways to improve it. Personally, I have encountered two major bottlenecks over the years. The first bottleneck is that for no apparent reason socks seem to disappear in the process, which leaves our family with a bunch of single socks without pairs. The second bottleneck is that, although the overall process seems efficient, it is particularly labor-intensive to find matching pairs from among the clean socks.

Change the Process

Following are four solutions to the problem that all involve changing the process:

1. Tie pairs together before you put them in the laundry basket so that pairs stay together. Perhaps you could use the clothes-pins from the washing line to hold them together.
2. Put the dirty socks in separate laundry baskets by person/color group and wash them separately to simplify the sorting process.
3. Move the washing machine and dryer to the master bedroom to reduce travel distances.
4. Keep a registration of the socks in each stage of the process (e.g., dirty laundry basket, washing machine, dryer, washing line, clean laundry basket, closet), so that socks are not lost easily.

If you look at this list, you see that all of the solutions made changes to optimize the laundry process. In general, changes to existing processes may help to eliminate one or more activities (option 1) or to improve activities (options 2, 3 and 4). Such changes contribute to overall efficiency (more efficient sorting) and accuracy (fewer missing socks).

Introduce a Tool

There are still more ways to optimize these activities. Here are some alternative solutions:

5. Attach distinctive markers to identical socks so that you can easily find pairs.
6. Put dirty pairs in separate small bags that keep them together throughout the entire process.
7. Attach waterproof RFID tags to the socks and use automatic tag readers to track them in each stage of the process, so that socks are not lost easily.
8. Introduce an automatic sorting device and automate the process.

Notice that these solutions all use tools. In general, tools are excellent aids to optimize activities. Clearly, the introduction of a new tool or technology creates many opportunities, which may lead to a breakthrough in performance.

Redefine the Problem

It may be that there still are more solutions. So, let us consider a third selection of options:

9. Accept that you wear non-matching socks and eliminate the sorting process.
10. Buy many identical socks and eliminate the sorting process.
11. Use disposable socks and eliminate the entire laundry process. However, purchasing and disposal processes are introduced instead.
12. Stop wearing socks and eliminate the entire laundry process.

Notice that these four options do not attempt to optimize the solution. Instead they redefine the problem. This is fundamentally different. To explain, we must first distinguish between two roles: the client and the service provider, each with distinct responsibilities. On the one hand there are the people who wear the socks, we will refer to them as clients. On the other hand there are those who clean and sort the socks, we will refer to them as the service providers. In this example, a person could be both client and service provider.

In general terms, the client provides the input and defines the output of the process, while the service provider executes the process. Note that in solutions 9 to 12, the client has relaxed the requirements that are imposed on the laundry process, which makes it easier for the service provider to execute the task. In particular, in option 9 the client slackens the requirements on the output of the process, in option 10 the client alters the input to the process and in options 11 and 12 the client eliminates the input altogether. In general, solutions that redefine a problem can be highly effective. Think of teleconferencing instead of meeting in person or downloading instead of buying music, movies or literature.

Persist in the Old Way

It may be that there are also solutions that do not change the process, do not introduce tools and do not redefine the problem. Here are some examples:

13. Practice extensively and become a highly-skilled socks sorter.
14. Pay the kids to do the laundry.
15. Hire a maid with outstanding household skills.
16. Outsource the laundry process to a low-wage country (off-shoring).

In these examples, we persist in the old way of working, only we train to do it more efficiently or we use cheaper labor to do the job.

The final solution: I persisted for many years in the frustration of sorting socks. For my 42nd birthday I threw away all my socks and bought 30 pairs of identical black socks. This not only eliminated the sorting process, it also helped to mitigate the missing socks issue: each time I lose a sock, I do not have to discard the whole pair. Furthermore, we no longer fold socks into pairs. Instead, we just drop the loose socks in the drawer. My wife often wears boots so she also threw away her socks and now wears the black socks from my drawer. For our two sons we did the same. We bought 30 gray pairs, which they both can wear.

From socks to the distribution center

From the “clean socks experiment” we concluded that the ultimate solution may be to redefine the problem. Within a company, the warehouse typically plays the role of the service provider, while other departments such as sales or purchasing are its clients who decide what the warehouse should do. Thus if we could change the requirements imposed by others upon the warehouse operation, then we could achieve major benefits in the distribution center. The challenge is to align the various parties involved. This implies that their actions and decisions should be aimed at achieving the overall objective of the company or the supply chain rather than their individual objectives.

Supply chain management (SCM) has been widely accepted in recent decades as industry's leading paradigm. SCM is defined as the management of upstream and downstream relationships with suppliers and customers with the objective of serving the customer as well as possible, while achieving the lowest possible costs for the entire supply chain.

Despite the apparent successes, progress in SCM is slow. In particular, the barriers between companies or even between internal departments are hard to overcome. Collaborating in joint efforts, developing mutual trust and sharing revenues are all challenges. Looking to solutions in the categories of people, process, technology and problem-solving is at the heart of the highly effective warehouse management paradigm and suggests the next approach to breakthrough warehouse optimization.

About the Author

Dr. Jeroen P. van den Berg is a well-known expert in warehouse management. In his work as a consultant, author, teacher, speaker and researcher, he challenges people to see the big picture and overcome the obstacles that prevent progress.

He has a unique talent for giving structure to complex issues so that they become easy to understand.

Dr. van den Berg earned a Ph.D. from the University of Twente in The Netherlands with his thesis Planning and Control of Warehousing Systems. He holds a master's degree in Applied Mathematics from the same university.

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About the Publisher

The Distribution Group is committed to providing the highest quality management information on warehousing and distribution through its newsletters and books. The Distribution Group is the publisher of Dr. van den Berg's groundbreaking book, *Highly Competitive Warehouse Management*.



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