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WAREHOUSE DESIGN

Warehousing (/supply-chain-blog/category/Warehousing)

Warehouse Design in the Real World (/supply-chain-blog/warehouse-design-real-world)

Hakan Andersson discusses warehouse design in the real world

1. Separate flows, inbound flows from outbound flows.
2. Automate where the flows are big enough.
3. Abundance of dock doors to enable live loading into drop trailers.
4. When you have high enough volumes, don't be shy from using the floor stacking.

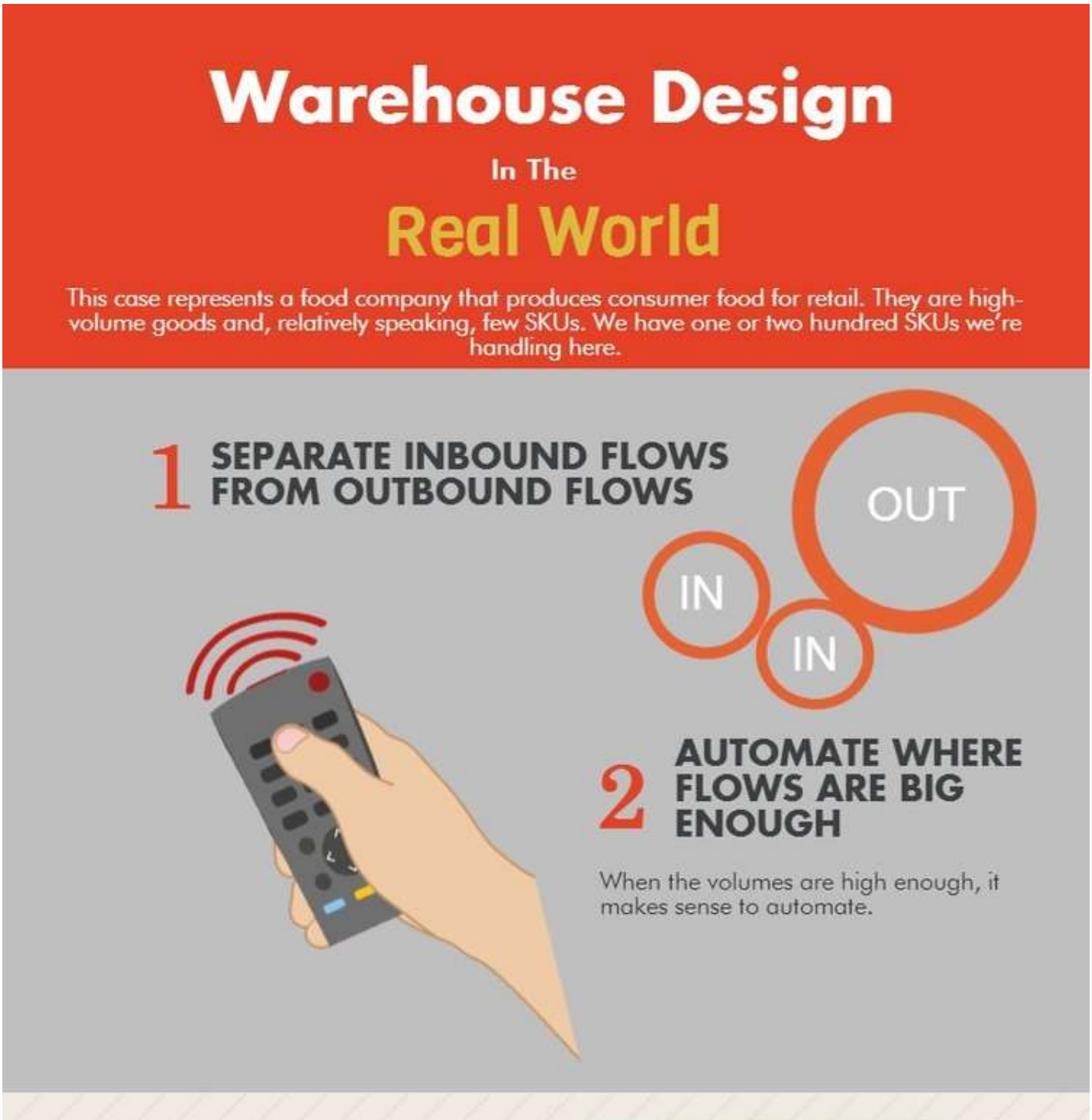
Project Background

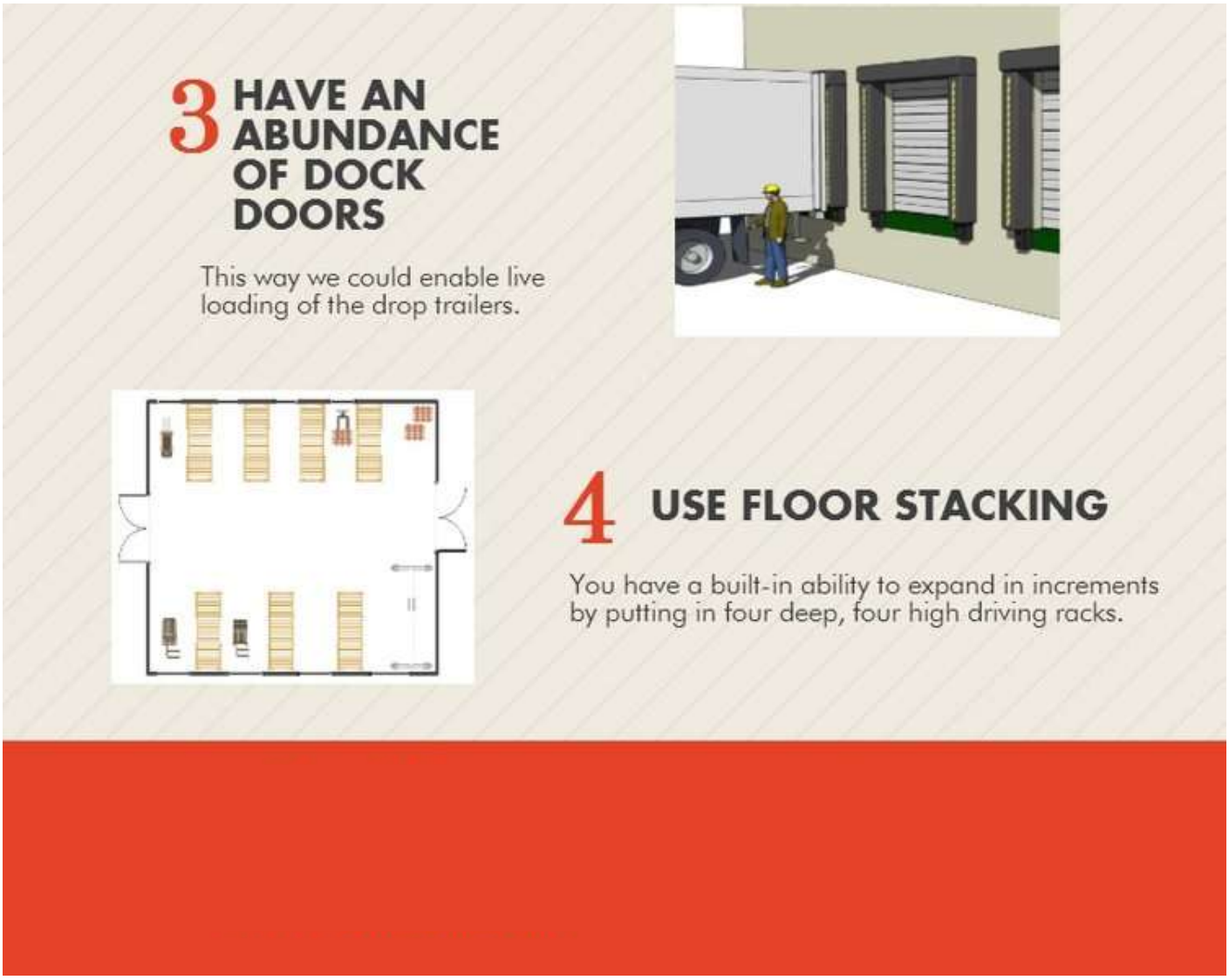
Just a short background. This company is a food company; they produce consumer food for retail. It's high-volume goods and, relatively speaking, few SKUs. We have one or two hundred SKUs we're handling here.

The Challenge

The challenge in this project was they just acquired a new brand, so they wanted to host double the production volumes; the facility should host that. We would like to do this, and this is then the outcome as well, because we succeeded in having very low investments. It turned out that we could handle double the production volumes with just marginally expanded workforce when it comes to material handling.

Then, as is for most companies, there was an urge to have this be very flexible.





Lessons Learned

1. Separate inbound flows from outbound flows

The first major lesson here was when we did all the analysis and we tried out a lot of different scenarios.

What made a huge impact was to separate the flows, inbound from outbound. With the original layout, there was plenty of dock doors but they were all at the same place. In this instance we made a design where we opened up doors that were coming in directly to the production line.

The reason we did that is we wanted to minimize the crossing traffic. When you have that high volumes as we have in this case, when you have a production, you have all the packaging material, the driving distance quickly adds up to be very much.

2. Automate where the flows are big enough

The second takeaway here was that when the volumes are high enough, it makes sense to automate. In this case this is true for the inbound material, packaging material.

We have very high, repetitive flows. We put dock doors close to where you feed the production lines.

With packaging material, we put drop trailers and used them as storage. The ingredients would come in through pipelines, so we didn't have to handle that at all; pipelines and conveyors. By having the drop trailers with the packaging material, we could then unload them directly from the trailers. One touch on to gravitating conveyor belts that were feeding the packaging machines.
This took away a lot of handling, and it also helped a lot with disconnecting the feeding of the production line from material handling. Then we had a robot that was emptying the totes in the production lot.

3. Abundance of dock doors to enable live loading into drop trailers

The third takeaway here was that it made a lot of sense to install an abundance of dock doors. This way we could enable live loading of the drop trailers—again, one touch—and we would also reduce the need for staging space, which is very space-consuming in normal warehouse design and a very critical part of it too.

And we then set up routines to direct the trailers to the doors that were nearest to where the majority of the products were stored. This made a huge difference when it came to the staffing requirements.

4. Use floor stacking when volumes are high enough

The fourth major takeaway here is regarding storage equipment. In this case, as always I would say, the 80/20 rule is very applicable, which meant that we had a lot of products with less than five pallets an average storage volume. For them, we set up pallet racking, but that would leave us, then, with very few SKUs.

We started out with, say, 150 to say that we had 25 to 30 SKUs that were produced in very high volumes.

For those, it made a lot of sense to floor stack them; we would floor stack them two high and nine deep. No investment at all and racking for them, very space-efficient; just so deep, you could stack them too high that without the aisles that you would have with a racking solution, it's actually surprisingly space-efficient, and it's a very flexible solution.

It also means that you have a built-in ability to expand in increments by putting in four deep, four high driving racks.

Summary

The main takeaways here that are making it very efficient and low investment for high-volume goods with few SKUs:

1. Separate flows, inbound flows from outbound flows.
2. Automate where the flows are big enough.
3. Abundance of dock doors to enable live loading into drop trailers.
4. When you have high enough volumes, don't be shy from using the floor stacking.

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