Abstract

"Minimising wasted space between racks in a high-bay warehouse"

Area

Logistics, warehouse logistics

Keywords

High bay, optimisation, wasted space between racks, use of space, renovation amortisation calculation, capacity utilisation, filling level
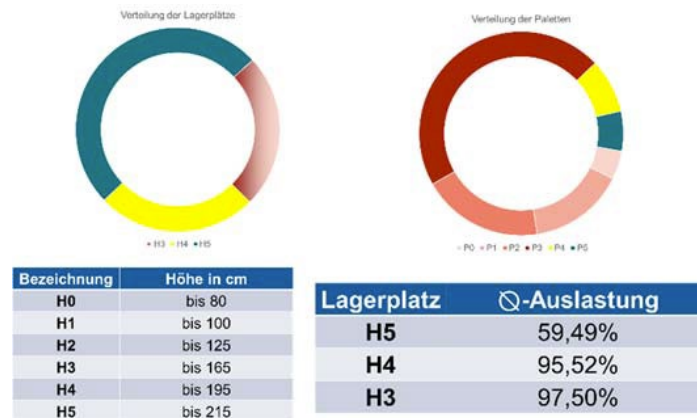
Study/project

Project, part of the "Retail Management Projects" module

Starting point/project assignment/objective

Automated high-bay warehouses form the backbone of many retailers' warehouse logistics. Their layout is planned based on the specific product groups and associated storage space height. Customer demands and therefore storage structure requirements change over time. A suboptimal (outdated) layout makes it difficult to efficiently use the existing infrastructure, resulting in wasted space between racks.

The assignment involved showing the potential for using space in an automated high-bay warehouse (optimisation of the height distances between crossbeams) so as to avoid this wasted space as much as possible to allow for optimal use of the freed-up space through additional storage spaces.

Bezeichnung	Höhe in cm
H0	bis 80
H1	bis 100
H2	bis 125
H3	bis 165
H4	bis 195
H5	bis 215

| Lagerplatz	⊘-Auslastung
H5	59,49%
H4	95,52%
H3	97,50%

Procedure

- Analyse the current situation, calculate capacity utilisation
- Create scenarios
- Simulate the capacity utilisation of the scenarios, under consideration of the future pallet height/structure
- Renovation amortisation calculation
- Evaluation of the scenarios
- Recommended actions

Results/findings

Renovation work would significantly improve the degree of utilisation. As a sprinkler system is essential in a high-bay warehouse, the conversion of this must be considered in the amortisation calculation. With this in mind, the amortisation duration in the most favourable scenario would no longer satisfy the commercial requirements.
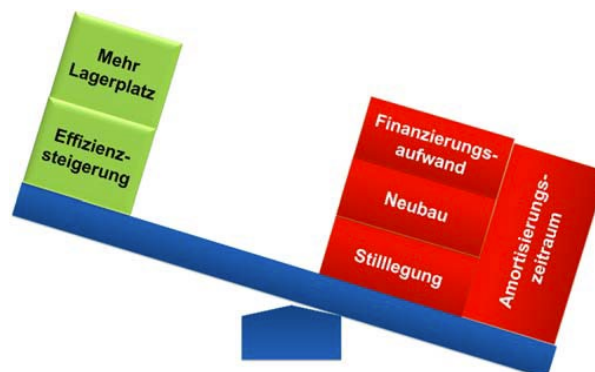
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