

## ABSTRACT

*Adorable Projects is a local fashion brand from Bandung, established in 2008. Over the years, Adorable Projects has expanded its product range to include bags, accessories, clothing, and footwear. Footwear remains the dominant product in the company's sales. To support its operations, Adorable Projects owns a warehouse with an area of 712.5 m<sup>2</sup>, equipped with five-level multilevel footwear racks. Each rack measures 150 cm x 75 cm x 485 cm, with a capacity to hold 96 boxes of footwear per level, totaling a maximum rack capacity of 78,720 products. The packaging dimensions are 32 cm x 32 cm x 11 cm for shoes and 32 cm x 16 cm x 11 cm for sandals.*

*Currently, Adorable Projects faces an overcapacity issue in its storage racks. This issue is evident from products stacked haphazardly on the floor (floor stacking) due to insufficient rack capacity and items being overstacked beyond the normal limits of the racks. This overcapacity leads to several problems, including damaged packaging, delays in the picking process, obstructed distribution paths due to blocked walkways, and other inefficiencies.*

*The condition is supported by stock data showing storage exceeding rack capacity, with the highest levels recorded in September 2023, and an inventory turnover (ITO) value of 4, which indicates a relatively slow inventory rotation. This slow turnover highlights the accumulation of goods in Adorable Projects' warehouse.*

*The objective of this study is to minimize overcapacity in the Adorable Projects warehouse by implementing a heuristic model of the Rack Cell Configuration Problem to determine and propose optimal racks to address the overcapacity issue.*

*The heuristic model successfully designed optimal rack dimensions capable of storing boxed products in the Adorable Projects warehouse. The proposed racks measure 305 cm in length, 160 cm in depth, and 112 cm in height. These racks allow all items previously stored on the warehouse floor to be systematically organized on the racks, eliminating the average overcapacity risk of 13.9% in the previous storage system.*

*Optimizing warehouse capacity and improving layout have proven effective in reducing product damage, accelerating the picking process, and enhancing overall warehouse operational efficiency. Thus, this study not only provides a technical solution to minimize overcapacity but also contributes to improving the company's overall logistics efficiency.*

*Additionally, the optimized warehouse capacity and layout significantly reduced product damage, expedited picking times, and improved operational efficiency. The company can now conduct more precise planning and regular evaluations to ensure the system operates effectively and efficiently, allowing it to adapt to future changes in product volume. Future studies can further build on these findings to maximize results and develop storage systems that respond flexibly to fluctuating demands.*

***Keywords: Rack Cell Configuration Problem, Warehouse Management System, Warehouse, Overcapacity***