

ABSTRACT

PT. XYZ is a company who engaged in distribution business line with PT. ABC to supplies FMCG product. In order to facilitate product distribution to Bandung area customer, PT. XYZ built a warehouse for storing all PT. ABC finished product before being supplied to the customer. Recently, the warehouse which using block stacking system cannot be used anymore since these methods cannot accommodate all incoming products. It can be seen on a gap between pallet capacity with the product stock on pallet per unit and it makes the employee had to stacked the product above the other product until exceeding the height limitation which could be effected to product damaging and inconvenience environment for warehouse operator when they want to do their job. Based on utilization estimation shows that actually PT. XYZ only use about 37% of the warehouse for storing. Meanwhile based on Tompkins's book that the ideal of warehouse utilization should be use at least 80% of warehouse capacity. Therefore this research is done to propose new system named racking system and estimating effective rack combination to increase storage capacity with minimum total design cost.

The first step is calculating the number of pallets based on the warehouse need based on stock data, after that is choosing the type of rack according to the product criteria and designing the dimensions of the pallet. then picking the most suitable material handling equipment to obtain the width of the aisle on proposed warehouse layout. At last, calculating the amount of pallet combinations using Multiple Knapsack Problem with Linear Programming Mathematics Model Based on the calculation above shows that warehouse utility increased about 13% and Warehouse Capacity increased in to 216% pallets.

Keywords : warehouse, racking system, multiple knapsack problem, linear programming