

ABSTRACT

PT XYZ is a manufacturing company that produces fertilizer with the aim of meeting the needs of farmers in Indonesia. In its operational activities, PT XYZ is assisted by the spare parts warehousing department to prepare for maintenance in case of breakdowns. When breakdown maintenance occurs, PT XYZ will request goods from the spare parts warehousing department. In the existing condition, the order Picking time does not meet PT XYZ's standard time because there is no spare parts placement method, and the spare parts warehouse uses a Last-In-First-Out (LIFO) layout, while the operation is based on First-In-First-Out (FIFO).

To achieve optimal timing, the proposed solution is to allocate spare parts based on product categories and the total spare parts activity level, and to rearrange the spare parts warehouse layout to match FIFO operations. The final step is to perform a Monte Carlo simulation to determine the travel distance and time for order Picking activities in the proposed condition.

The initial step to identify the details of each activity in the warehouse involves creating a Value Stream Mapping (VSM) and Process Activity Mapping (PAM). The cause of the timing discrepancy with the standard time is the occurrence of double handling in the process of Picking goods due to PT XYZ's spare parts warehouse layout using LIFO. Once the problems are identified, the next step is to calculate the space requirements to obtain an optimal solution for pallet placement. The next step is to place goods using the dedicated Storage method to determine the total activity sequence for each spare part. After obtaining the space requirements and total activity for each spare part, a layout rearrangement is performed according to FIFO operations. Subsequently, a simulation is conducted to calculate the distance and time for the order Picking process using the proposed layout.

The results of the proposed improvements in the order Picking activity show a reduction in time by 1102,48 seconds.

Keywords: Order Picking, Dedicated Storage, Monte Carlo.