

Raw Material and Inventory Planning for Wooden Pallets Using Material Requirement Planning (MRP) (Case Study at PT Bumi Mandiri Resources Tbk.)

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ABSTRACT

PT Bumi Mandiri Resources is a manufacturing company engaged in the production of wooden pallets using a make-to-order production system, meaning production began only after receiving an order. Wooden pallets are logistic handling tools made from solid wood materials to facilitate transportation and storage operations. The demand for wooden pallets in Indonesia was influenced by manufacturing activity and export-import conditions, resulting in fluctuating and uncertain demand patterns. PT BMR faced challenges in raw material inventory due to the use of conventional and unsystematic planning methods. This study aimed to design a more effective raw material inventory plan for a one-year period using the Single Exponential Smoothing (SES) forecasting method and the Material Requirement Planning (MRP) approach. The MRP calculations were carried out using the Economic Order Quantity (EOQ) and Lot for Lot (LFL) techniques to determine the most efficient inventory planning strategy. The results showed that the SES method with a smoothing constant of 0.09 produced the lowest forecasting error. Furthermore, the MRP method using the EOQ technique demonstrated higher efficiency by reducing inventory costs by 49,54% over one year compared to the LFL technique.

Keywords: *Pallet, Demand, Forecasting, Inventory.*