

ABSTRACT

Production process efficiency is a critical factor in maintaining competitiveness and ensuring on-time delivery in the manufacturing industry, particularly in the aerospace sector, which is subject to layered inspection and certification requirements. This study aimed to analyze the production efficiency of the Nose Cap Outboard A321 component at PT Dirgantara Indonesia using the Value Stream Mapping (VSM) approach. Production order data were obtained from the company's SAP system for the period of July 2025-July 2026, with 76 orders meeting the inclusion criteria used as the analysis sample out of 221 identified orders. The results showed that the production process consisted of 29 steps, with a median lead time of 78.07 days and a Process Cycle Efficiency (PCE) of only 0.545%, indicating that 99.401% of the lead time consisted of non-value-adding waiting time. The dominant waste identified was waiting, with three transitions in the forming process cluster contributing 45.61% of the total lead time, primarily caused by the Stretch Forming (Cyril Bath) machine being shared between the Outboard and Inboard product lines. The proposed improvement in the form of a future-state VSM, which designates Stretch Forming as the pacemaker process and implements controlled release at Material Inspection, is projected to reduce lead time by 47.7% to 40.84 days and increase PCE to 1.041%. This study demonstrates that VSM is effective as a diagnostic tool for identifying sources of inefficiency and formulating measurable improvement proposals in aerostructure component production processes.

Keywords: Lean Manufacturing, Lead Time, Process Cycle Efficiency, Production Efficiency, Value Stream Mapping