

## INTISARI

Industri batik kombinasi menghadapi tantangan efisiensi akibat adanya *waste* dalam proses produksinya. *Lean manufacturing* merupakan metode yang secara sistematis mengidentifikasi dan meminimasi *waste* dalam proses produksi. Namun, validasi usulan perbaikan *lean manufacturing* masih menjadi tantangan karena harus mempertimbangkan *trade-off* antara akurasi dan penggunaan sumber daya sehingga penelitian ini bertujuan untuk mengidentifikasi *waste* pada proses produksi batik kombinasi di IKM Omah Batik Sekar Turi dengan menggunakan kombinasi metode validasi *Discrete Event Simulation* (DES), *expert judgement*, dan eksperimen sederhana.

Proses identifikasi *waste* dilakukan dengan menggunakan *Value Stream Mapping* (VSM), *Process Activity Mapping* (PAM), *Pareto Diagram*, dan *Fishbone Diagram*. Hasil analisis menunjukkan bahwa *waste* yang mendominasi proses produksi yaitu *waiting*, *overprocessing*, dan *motion*. Usulan perbaikan berupa mengalokasikan satu operator lorod ke pengecapan 3, menghilangkan proses pelipatan kain setelah pengecapan & pembatikan, menambah gawangan di dekat pengecapan menjadi tiga, menerapkan sistem *reward & punishment* keterlambatan pekerja, operator lorod melakukan pengecekan canting cap saat tidak bertugas, dan menambahkan pembatas vertikal pada sisi samping meja pengecapan disusun dan diprioritaskan berdasarkan identifikasi akar masalah dan divalidasi menggunakan kombinasi ketiga metode.

Implementasi usulan dapat mengurangi *lead time* produksi batik kombinasi dalam 1 *batch* yang berisi 30 kain sebesar 2,01 hari (24,54%) dan total jam kerja sebesar 12,27 jam (22,82%), yang mengindikasikan bahwa usulan perbaikan dapat mengurangi *waste* dan meningkatkan efisiensi produksi. Penelitian ini memberikan kontribusi dalam penyusunan strategi peningkatan produktivitas di industri batik kombinasi melalui pendekatan yang sistematis, terukur, dan berbasis data.

**Kata kunci:** Batik kombinasi, *Lean Manufacturing*, *Discrete Event Simulation*

## **ABSTRACT**

*The combination batik industry faces efficiency challenges due to waste within its production processes. Lean manufacturing is a method that systematically identifies and minimizes this waste. However, the validation of lean improvement proposals remains a challenge due to the trade-off between accuracy and resource utilization. Therefore, this research aims to identify waste in the combination batik production process at the SME (IKM) Omah Batik Sekar Turi by employing a combined validation methodology of Discrete Event Simulation (DES), expert judgement, and simple experiments.*

*The waste identification process was conducted using Value Stream Mapping (VSM), Process Activity Mapping (PAM), Pareto Diagrams, and Fishbone Diagrams. The analysis revealed that the dominant wastes in the production process are waiting, overprocessing, and motion. A series of improvement proposals—such as reallocating a wax removal (lorod) operator to the third stamping station, eliminating the cloth folding process after stamping and hand-drawing, increasing the number of drying racks (gawangan) near the stamping area to three, implementing a reward & punishment system for worker tardiness, having the lorod operator inspect the stamping tools (canting cap) during idle time, and adding vertical dividers to the sides of the stamping table—were formulated and prioritized based on root cause analysis and subsequently validated using the combination of the three methods.*

*The implementation of these proposals can reduce the production lead time for one batch of 30 cloths by 2.01 days (24.54%) and the total work hours by 12.27 hours (22.82%), indicating that the proposed improvements can effectively reduce waste and enhance production system efficiency. This research contributes to the formulation of productivity improvement strategies in the combination batik industry through a systematic, measurable, and data-driven approach.*

**Keywords:** *Combination Batik, Lean Manufacturing, Discrete Event Simulation*