APPLICATION OF AGGLOMERATIVE HIERARCHICAL CLUSTERING AND SINGLE MINUTE EXCHANGE OF DIES (SMED) TO REDUCE AND OPTIMIZE CHANGEOVER LAYOUT

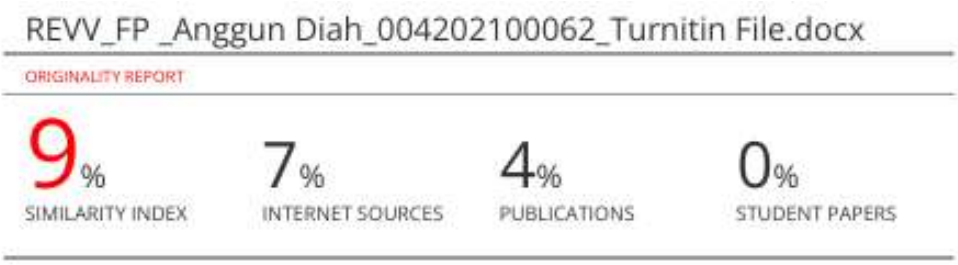
UNDERGRADUATE FINAL PROJECT

Submitted as one of the requirements to obtain Sarjana Teknik (S.T.)

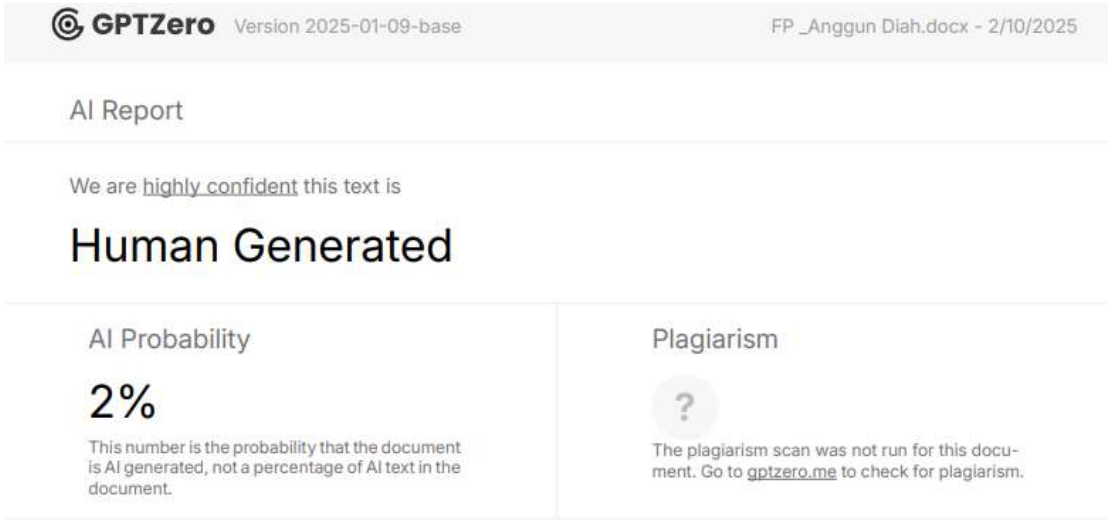
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FACULTY OF ENGINEERING
INDUSTRIAL ENGINEERING STUDY PROGRAM
CIKARANG
FEBRUARY, 2025

SIMILARITY CHECKING RESULT TURNITIN DETECTOR



SIMILARITY CHECKING RESULT AI DETECTOR



ABSTRACT

PT ABC, a toy manufacturing company, is confronting generation challenges due to the developing variety of products and expanding market demand. This challenge caused various alterations to the production layout, driving to a rise in setup time from 20 minutes to 40-60 minutes, with an normal of 800 changeovers per week. This condition essentially impacts Manufacturing Lead Time (MLT). The first hour of production results showed a non-achievement of the target production caused by several issues such as frequent machine changes, material shortages, and related workers. To handle these issues, Agglomerative Hierarchical Clustering (AHC) was connected to group production lines based on machine usage, pointing to streamline moves and progress asset dispersion. Utilizing XLStat program, 100 products were analyzed, coming about in five clusters assigned to five separate production lines. A trial conducted in August on Line G showed a decrease within the changeover layout ratio by evaluating total changeover and total sku per line from 2.7 to 1.7 driving to a decrease in week after week changeovers from 800 to around 400 in November. Moreover, the usage of the Single Minute Exchange of Dies (SMED) strategy made a difference refine the changeover process, cutting setup time by roughly two minutes. These comes about highlight that AHC and SMED can effectively reduce setup time and improve production flow despite increasing product complexity.

Keywords: *Agglomerative Hierarchical Clustering, Changeover Layout, Manufacturing Lead Time, Single Minute Exchange of Dies, Production Improvement.*

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