ABSTRACT

CV. Trisno Adi, based in Sekar Putih Bondowoso, is a company that processes tobacco as the main raw material for cigarettes, apart from products related to cigarettes, such as cloves and sauce. This company was founded in 1990 and still exists today. Its business fields include processing tobacco (raw materials) into semi-finished products (primary processing). CV. Trisno Adi implemented a semi-automated system that still combines machines with humans as a substitute for conventional systems. CV. Trisno Adi uses make to order, order according to customer. The customer determines the number of orders from 7 types of blend packing, namely MR4, CF2, XL4, MOR, AB, BC, and CD of 2 different raw materials namely Daun Tembakau and Rajangan. Each packing blend has different specifications depending on the nicotine and sugar content which will determine the product of the company that ordered it. On the production data from August 2022 to November 2022 there has been a lateness in the production of the packing blend and CV. Trisno Adi could not fulfill the amount production order from other companies. Factor that can cause this issue is the production system was running out of raw material during production that also causes the feeding machine to be 73.15% empty, the conditioning machine 48.22%, the trashing and classifying machine to be 54.28% empty, the drying machine to be 32.90% empty, the flavoring machine to be 53.11% empty, the storage to be 69.66% empty during production in one day

In solving the issues that raises on the CV. Trisno Adi production line, this final project uses simulation approach on the problem. This method was chosen because this final project involves designing an inventory policy for CV. Trisno Adi that has system of make-to-order and an ever-changing production system because the production system is still in its early stage of production, so it needs a model of inventory policy that’s flexible to change the variables of the production system and represent the real production system.

The simulation approach requires the structural data that consists of 13 locations (Raw_Material, Feeding, Loc1, Conditioning, Loc2, Trash_Classify, Loc3, Drying, Loc4, Flavoring, Loc5, Packaging, and Storage), 6 entities (Rajangan,

Rajangan_2, Rajangan_3, Rajangan_4, Rajangan_5, Rajangan_7), 2 paths, 2 resources, and numerical data that consists of the processing time and output data. Before the input can be inserted into the simulation model, it first needs to be processed using data independence test. The independence tests were done to the processes processing time data to the to determine whether the value of each of the 30-observation data are independent or not. After that normality tests were done to the processes processing time to determine whether the value of the processes processing time has normal distribution or not. Then the data would be processed using the randomness test to determine whether the value of processes processing time of the were random or not. Finally, distribution fitting was done to the processes processing time to determine the probability distribution that best fits a given set of the processes processing time. The simulation model was built according to the real production system that includes the location entities path networks resources processing arrivals and work hours. The simulation model would be verified by comparing the production flow of real system and simulation model system and it would be validated using Welch test based on the replication calculation. After the simulation model is verified and validated the scenarios were calculated and compared to the existing system.

After comparing the existing system with the scenarios, the best result was obtained where the production line has an increase of output of 998,75 and profit of Rp 49,466,370.25 from the existing system. It also decreases the %empty on each machine by 3.03% on Feeding machine, 5.59% on Conditioning machine, 5.25% on Trashing and Classifying machine, 1.1% on Flavoring machine, and 4.44% on Storage. A decrease in %empty would also mean an increase in the %part occupied on machine by 3.03% on Feeding machine, 5.59% on Conditioning machine, 5.25% on Trashing and Classifying machine, 1.1% on Flavoring machine, and 4.44% on Storage.

Keywords: Inventory Policy, Lateness, Simulation Approach, Make-to-Order