

ABSTRACT

PT XYZ, which was established in 1993 in Kuningan, West Java, focuses on the processed sweet potato food industry. With international quality standards, the company has successfully exported sweet potato paste to the Japanese and Korean markets. There are problems that exist at PT. XYZ is the non-achievement of production demand from March 2023 – July 2023 and caused a loss of revenue of IDR 3,230,681,250, which was influenced by four factors, namely man, method, machine, and material factors. First, the man factor is caused by lack of operational management. The second is due to two factors, the first is due to the lack of production due to lack of processing capacity and the second is caused by the accumulation of a lot of materials. Third, for the machine factor, it is caused by the regulation of the number of machine capacity that is not optimal. Fourth, for material factors, due to the many findings of black spots on products and due to the large amount of damage to raw materials caused by many materials that are not directly produced. Based on these problems, solutions are carried out using the discrete event simulation method to make improvements to the sweet potato paste production system to increase the number of production by creating a conceptual model based on the real system and then translated into a simulation model with simulation model input components using process time data, batch number data, work time and production process flow. Based on the results of the existing simulation model, it was found that the simulation model was verified and validated so that the simulation model was said to be able to represent the real system. Furthermore, an analysis of the problems contained in the existing simulation model was carried out and developed into a scenario model with the aim of significantly increasing the number of production. A total of 20 scenario models were obtained with the general type of scenario being carried out, namely increasing the capacity of the production process, adding and replacing machines, adding working hours and adding work shifts. Of the 20 scenario models, there are 17 scenario models that can significantly increase the amount of sweet potato paste production. Furthermore, a cost analysis was carried out using gross profit and marginal profit analysis and 3 best scenario models were implemented such as scenario models 13, 16 and 19. From the three scenario

models, a comparison was carried out through the aspect of significant number of outputs, gross profit analysis, marginal cost analysis and validation through problem owners and the optimal scenario results were obtained, namely in the scenario 13 model by making changes to add 1 shift to the entire production process, namely from the sorting process to the outer packing process with the addition of 105 workers with the number of outputs produced by running simulation for 10 months of 1,274,527 kg, the average output per period is 127,452.7 kg, the additional cost of direct work is Rp2,199,145,960.00, the investment cost is Rp0, the gross profit value is Rp4,016,084,955.50 and the marginal profit value is Rp778.82. Therefore, the 13 discrete event simulation scenario model can be used to optimize the production system and can significantly increase the production volume.

Keywords: *Sweet Potato Paste Production Process, System Modeling, Discrete Event Simulation, Gross Profit Analysis, Marginal Profit*