

ABSTRACT

The Faculty of Industrial Engineering is an educational institution that has five study programs that have national accreditation. The Faculty of Industrial Engineering conducts lecture activities with the application of theory and practicum. As a form of supporting lecture activities, the Faculty of Industrial Engineering provides facilities in the form of laboratories and classrooms. In the management of the laboratory room, of course, it is carried out by laboratory staff whose job is to manage asset goods in the laboratory, check and record goods. In addition to management by laboratory staff, the Faculty of Industrial Engineering also provides facilities in the form of a warehouse for storing inventory items from the laboratory, namely the Consumable Goods Warehouse.

The current condition faced by the consumables warehouse is that there are no rules regarding the allocation of goods storage because the products stored in the warehouse are carried out randomly. This causes problems in the BHP warehouse, where the time to pick goods becomes long, this is indicated by the time of order picking activities that exceed the standard time of the company. Based on the problems that occur, improvements are needed that can reduce the time of picking goods. The proposal made in this research is to design storage allocation in the forward pick area or fast pick area by correlating requests based on picklist data that has been obtained previously.

This research uses a mathematical model, namely mixed integer linear programming (MILP) with the python programming language and the help of the gurobi optimization solver. The results of solving the MILP model show the optimal distance traveled which is then converted into time and storage allocation in the optimal forward pick area. In the calculation results using a mathematical model that has been formulated previously, the optimal distance results are 144 meters where there is a decrease from the existing conditions by 60%. Then the conversion is made into time with a decrease in time from 9.76354 seconds to 1.13545 seconds or 88%.

Keywords— Warehouse, Mixed Integer Linear Programming (MILP), Picking Time, Forward Pick Area, Demand Correlation