ABSTRACT

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INTEGRATION OF E-WASTE REVERSE LOGISTICS NETWORK SIMULATION MODELING BY DROP-OFF METHOD ON COST ANALYSIS OF COLLECTED E-WASTE RECYCLING FACILITY IN DKI JAKARTA

(xviii + 147 pages, 63 tables, 29 figures, 4 appendix)

The discovery of new technology triggers electronic waste buildup becomes increasingly faster. It required an effort to overcome these problems. One attempt is by designing reverse logistics network, which is a strategy to simulate the reverse logistics activities. In this study, reverse logistics network is realized by making an electronic waste collection activities in the areas of DKI Jakarta with the help of software ProModel version 4.5. Simulation model is built using data and associated assumptions which are derived from various sources.

Electronic waste is classified into three based on its size, large, medium, and small. Freight carried by a truck with one driver and one porter. In this collection simulation there are three kinds of scenarios applied to each size of electronic waste. Such scenarios are distinguished by types of transportation routes. Those three scenarios are 1 route with 22 locations, 5 routes with 22 locations, and 1 route with 5 locations. The indicator used to select the best scenario is cost per unit. Results obtained from the simulation model is the best route for any size of electronic waste, the amount collected per year, the transportation cost per unit, total cost per unit, and the price per unit. Having obtained the results from the run of the simulation model, and then continued with the creation of cash flow as well as identification of the IRR and NPV for the development of collected e-waste recycling facility.

Cash flow is made only on the best scenarios for each size of electronic waste. The data is entered for the manufacture of cash flow, among others: the amount collected per year, the percentage increase in the supply of electronic waste, the weight of PCBs in each size of electronic waste, and the price per unit. Once created cash flow for a period of 10 years and then continued with the search value of IRR and NPV of the business development of the facility. The result is the development of collected e-waste recycling facility of any sizes of e-waste is beneficial.

Key words: Electronic waste, Reverse logistics, Simulation modeling, Cost analysis