

# Development of a Suitable Layout for Packaging Plant of a Sugar Industry

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## ABSTRACT

The technology behind plant layout design is very important in this modern world where countries are dramatically industrialized due to advancement in technology. This technology is helpful to the world of industrial business. The arrangement of different departments of an industry is very important because the economic activity of the industry depends on the operation of the industry according to its layout design. There are different types of plant layout and the most common ones that are covered in this paper are the process layout, product layout, fixed position layout and combination layout. There are two types of design methods of these layouts and they are manual method and computerised method. The computerized methods are of two types, constructive and improvement algorithm. CRAFT is an improvement type algorithm and it uses the initial data of a layout and improves it by pairwise exchanging the departments based on which that have equal areas or sharing common borders. The case study has been conducted to design a layout of the sugar packing section of the factory department of the case industry. The packing section layout was a typical product layout in which all the vertical packing machines (VPM), a controlled packing machine (CPM) and a new packing machine are arranged in straight line in four different rows. The sugar (material) moves from one department to another for packaging purpose. We have collected the layout plan of the sugar packing section and using these data to implement CRAFT algorithm and have calculated that the initial layout would improve by saving 26% of the initial total cost of the layout by switching department 4 (VPM 4) and department 9 (VPM 9). The initial cost as was calculated is K5, 519.80 on unit cost per ton bases and reduced this by 26% gives K4, 082.10. That means it saves K1, 437.70 for the industry by the new layout. We have also calculated the target production of the industry to be 301.68 tons per day. The total cost in that wise was K1, 665, 213. 30 and this would be reduced by 26% to K1, 232, 257.80. This means that the company can save K432, 955.50 a day. This is an effective layout that is recommendable to be implemented by the company to improve its economic activity.

**Keywords:** Plant Layout, CRAFT, Agri Food Industry

