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An integrated approach for facilities planning by ELECTRE method (Conference Paper) [\(Open Access\)](#)

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Abstract

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Facility planning is concerned with the design, layout, and accommodation of people, machines and activities of a system. Most of the researchers try to investigate the production area layout and the related facilities. However, few of them try to investigate the relationship between the production space and its relationship with service departments. The aim of this research is to integrate different approaches in order to evaluate, analyse and select the best facilities planning method that able to explain the relationship between the production area and other supporting departments and its effect on human efforts. To achieve the objective of this research two different approaches have been integrated: Apple's layout procedure as one of the effective tools in planning factories, ELECTRE method as one of the Multi Criteria Decision Making methods (MCDM) to minimize the risk of getting poor facilities planning. Dalia industries have been selected as a case study to implement our integration the factory have been divided two main different area: the whole facility (layout A), and the manufacturing area (layout B). This article will be concerned with the manufacturing area layout (Layout B). After analysing the data gathered, the manufacturing area was divided into 10 activities. There are five factors that the alternative were compared upon which are: Inter department satisfactory level, total distance travelled for workers, total distance travelled for the product, total time travelled for the workers, and total time travelled for the product. Three different layout alternatives have been developed in addition to the original layouts. Apple's layout procedure was used to study and evaluate the different alternatives layouts, the study and evaluation of the layouts was done by calculating scores for each of the factors. After obtaining the scores from evaluating the layouts, ELECTRE method was used to compare the proposed alternatives with each other and with the existing layout; ELECTRE compares the alternatives based on their concordance and discordance indices. The alternatives were ranked from best to worst where regarding to the layouts concerned with the manufacturing area B.4 is the best alternative. © Published under licence by IOP Publishing Ltd.

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