FACILITY LAYOUT IMPROVEMENT USING SYSTEMATIC LAYOUT PLANNING (SLP) AND ARENA

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ABSTRACT

The objective of this thesis is to improve the production floor layout of the MTA department and to evaluate the proposed alternative layouts using ARENA simulation. This project is conducted at Agilent Technologies, Inc., an Electronics Manufacturing company located in Bayan Lepas, Penang. The major problem faced by the company is high cross-over frequency for E-Cal and Coaxial Waveguide Adapter products between two buildings. There is high flow intensity between departments which have high interrelationship. This leads to high travelling time and high travelling cost. Two alternative layouts are proposed using the 11 steps in Systematic Layout Planning, which is a systematic way of generating layout alternatives. The proposed alternative layout involves transferring the departments which have high interrelationship close to each other. The proposed alternative layouts are evaluated using ARENA simulation student version. The best alternative is chosen based on the performance measures which have the most significant improvement, which are total travel distance, total travel time, total travel cost, number of cross-over, output, average resource utilization, total average WIP level, total average waiting time and total time spent in the system. The best alternative layout is Layout Design 2, which does not need extra space for re-layout. Total travel distance for Coaxial Waveguide Adapter will reduce significantly by 78.1% and for E-Cal the total travel distance will reduce by 62.87%. Total travel time for coaxial waveguide adapter is reduced by 86.42 % while for e-cal is reduced by 75.17%. This will subsequently reduce cost of travel for coaxial waveguide adapter by 86.42% and for E-cal is reduce by 68.09%. The output for coaxial waveguide adapter will increase 55.30 % as well. For e-cal the output will increase by 9.05 %.
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