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## **Review of Multiple Approaches in Risk Analysis for a Facility Layout Plan**

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**Abstract:** The main characteristic of a facility layout is to maintain its efficiency while coping with uncertainty in product demand. In a traditional facility layout design problem, the layout is governed by flow intensity between departments. Two fundamental issues must be addressed when dealing with uncertainty of product demands. (a) Determining the best layout for the project demand. (b) The assessment of risk associated with the layout with respect to variability in product demands. In this research facility layout problem approaches which can deal with uncertainty of each product demand have been reviewed. Those methods are: (1) simulation and optimization with advanced quality and decision making tools. (2) Machine cell formation technique. (3) Mitigation of risk for single and multiple periods. The objective of this paper is to explore these approaches so that decision makers understand which method should be used based on the risk and facility layout. Furthermore, improvements and possible future work are recommended for handling uncertainty that may lead to huge financial consequences because of demand and facility layout configuration.

*Keywords:* Risk, Facility Layout Plan, Simulation