

**THE RELATIONSHIP BETWEEN PROCESS AND
MANUFACTURING PLANT PERFORMANCE: A GOAL
PROGRAMMING DATA ENVELOPEMENT ANALYSIS
APPROACH**

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(ABSTRACT)

There are three interrelated objectives in a manufacturing facility that are important for the planning and control of a technology comprised of serial production processes. These objectives include plant effectiveness, process effectiveness and a production line-balance between consecutive stages. Plant effectiveness is the degree to which the facility meets its pre-determined plant-level targets. Process effectiveness is the degree to which the production processes meets their pre-determined resource (input) and output targets. The concept of balance exemplifies the degree to which the serial processes exhibit bottlenecks. In this research, all the above three objectives are modeled using a serial-manufacturing goal-programming (*SMGP*) approach. The results obtained from the *SMGP* approach are used in conjunction with the traditional *DEA* analysis to evaluate the overall performance of the plant. This approach is applied to a printed circuit board manufacturing firm for which data has been accumulated for a two-year period.

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