



Financial Simulator for Multi-Period Production

Product: Financial simulator program for multi-run, manufacturing analysis

Development Stage: Proof of Concept Completed

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Scientific Publication: Meade & Kumar, 2006, Transactions of the NAMRI/SME, 34, 477-484

License Status: License Available

Patent Status: Published, UA2011/0246257A1

Reference: 2006-006

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To facilitate the planning necessary for a successful manufacturing business, many manufacturers utilize a business planning technique known as Material Requirements Planning (MRP). A MRP system analyzes manufacturing inputs and outputs to facilitate day-to-day

operations by generating production schedules, and materials and parts inventory requirements.

Unlike MRP, Discrete Event Simulators (DES) analyze the actual manufacturing process, by simulating the behavior of the series of process steps. DES systems assess manufacturing capacity, single manufacturing cycle process effectiveness and alternative approaches for process improvement. They provide no insight on how process changes affect the financials of the business, and their output is the result of a single simulation of the process

Technology Description

Dr. David Meade at Western Michigan University has developed a computer-based, Multi-Period Financial Simulator program that predicts the financial impact of a manufacturing process by utilizing a discrete event simulator (DES) in communication with a financial forecasting system (FFS). The DES simulates the manufacturing process and communicates updated operational output to the FFS. The FFS updates the corresponding financial

information for the operational output.

The program produces manufacturing efficiency results, inventory tracking, a production schedule, monthly sales and month end profits and losses. The DES can then repeat the process simulation, based on the updated operational and financial output from a previous simulation and the FFS updates its original financial output based on the second DES simulation output. The program can be directed to repeat the simulations multiple times, using the updated outputs from each simulation round, analyzing multiple manufacturing runs or time periods (days, weeks or months). The user can also specify changes to input parameters during the specified time period, determining the financial impact of different manufacturing scenarios, like material inventory levels.

In addition, the program can determine a statistical confidence interval/ level for the output results. Alternatively, it can continuously replicate the simulations until a desired confidence level is obtained.

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Potential Benefits

- Financial & efficiency results from simulation of a manufacturing process
- Results derived from multiple process runs or time periods
- Changing input parameters analyzed during multiple runs
- Confidence levels determined for simulation results.