

SIMULATION OF MANUFACTURING SYSTEMS

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Simulation is the most widely used technique for designing and analyzing manufacturing systems. However, there is an unfortunate impression that simulation is just a complicated exercise in computer programming. Consequently, many "studies" have been composed of heuristic model building, coding, and a single run of the program to produce the "answers." This attitude, which neglects the important issues of how to build a valid model and how to draw correct statistical inferences from a properly coded model, has led to erroneous conclusions being drawn from many simulation studies.

In this tutorial, we discuss how simulation can be used in a manufacturing context and also the steps in a sound simulation study. In particular, the following topics will be discussed:

1. Manufacturing issues which can be investigated using simulation,
2. Manufacturing measures of performance which can be estimated using simulation,
3. Techniques for building valid and credible models of manufacturing systems,
4. Simulation languages for manufacturing modeling,
5. Statistics aspects of manufacturing simulation,
6. Common pitfalls in simulation modeling.

AVERILL M. LAW is the President of Simulation Modeling and Analysis Company and a Professor at the University of Arizona. He is the author of numerous publications on simulation and statistics. His book, Simulation Modeling and Analysis (coauthored with David Kelton), is widely adopted by universities and industry. He has been a consultant to more than thirty organizations including IBM, Xerox, Monsanto, National Cash Register, Bendix, 3M, NASA, the Army, the Navy, and the Air Force. His seminar, "Simulation Modeling and Analysis," has been attended by more than 1500 participants from industry, government, the military, and universities. He received his Ph.D. in Industrial Engineering and Operations Research from the University of California at Berkeley.

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