

A simulation program is often designed in the form of a large loop. On this particular diagram one of the links in the loop that closes it, got left out. Up at the top there should be an arrow. So, this is not a loop. All elements of the model are examined in a single circuit of the loop and their conditions or states are modified wherever necessary in accordance with the given rules of behavior. Each circuit of the loop simulates the operation of the whole system during one small increment of time. Everything that goes on within that small time is in terms of modifying the elements as considered.

As the computation proceeds the computer acts as nothing more than a large, high-speed bookkeeping machine making and storing all changes in the simulated operation from one time increment to the next, and periodically reading out certain desired information about what is happening. As I have mentioned, the usual purpose in studying a system is to determine whether it can be modified in some way to improve its effectiveness or reduce its cost of operation. This purpose implies the existence of alternative ways of operating, organizing or equipping the system. Therefore, if a computer simulation model is to be used it should be designed to accept all of the various element configurations and characteristics, and all of the operating rules that one might conceivably wish to evaluate.

Furthermore, with the possibility of studying a large number of options, very careful thought should be given to the plan for using the model. For instance, use could be made of experimental design techniques. A pure trial and error approach can turn out to be rather expensive where computer simulation models are involved.

In closing, I'd like to say that the techniques that have been described this morning are only a few examples of what has been and is being accomplished in this field. I hope that these examples, together with the discussion of model-building, in general, have helped you to gain a better practical understanding of the way in which mathematical analysis can assist management in its decision-making role.