

**THE VALIDITY AND USEFULNESS OF PACKAGED  
MODELS IN GAME PLAY**

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Business simulation gaming provides a fertile area for teaching the application and use of models in the business environment. In traditional modeling courses which include gaming as a teaching vehicle, major emphasis has been placed on the mathematical/statistical process of building models of the competitive environment. Usually the topic coverage is limited to a few model types which are felt to be of utmost importance, are easiest to teach, and/or form the basic framework upon which other model types can be taught or learned in the future. Within the limited viewpoint of the models included in the course, other areas of the modeling process are discussed at a somewhat cursory level: identifying goals and alternative courses of action for attainment of those goals, obtaining data required in the model or use of surrogate variables, translating the output of the model into a decision or action, evaluating the effectiveness and usefulness of the model information, modifying the model to “better” reflect the competitive environment, and so forth.

The idea that seems to pervade this traditional modeling course is the importance of being able to build a mathematical/statistical model and to keep the model operational. For a program which stresses modeling and whose objective is to develop students’ ability to build models, this type of course is fine. But what about the students in programs similar to the Master of Business Administration or businessmen attending continuing education seminars? Their needs and objectives are different from the students in programs such as the Master of Actuarial Science, Master of Public Accountancy, and Master of Decision Sciences. The MBA-type student needs to appreciate the full range of models available for understanding and evaluating the business environment; he will (probably) never be expected to build “quantitative” models for the firm. Most often, he will be required to make decisions based on his experience and the information he can gather about the decision situation. Models will usually be provided by the “systems” people in the firm or by consultants to the firm. There will be models available, but the student will be a user of models rather than a builder of models. Therefore, it would seem prudent to place emphasis on the use of models and the information models can provide for a decision maker to use in a logical manner.

A modeling course from a user’s point of view should concentrate on such issues as:

- (1) evaluation of the reliability and validity of models,
- (2) establishment of the type of data and limits of the data used to build each model,

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- (3) identification or establishment of goals for the decision situation,
- (4) identification of alternative courses of action for attaining specified goals,
- (5) translation and modification of the information provided by each model depending upon the environment at any particular time, and
- (6) evaluation of the effectiveness and usefulness of each model for the decision situation.

In other words, once goals and alternative courses of action have been established, the student needs to be aware of methods for obtaining the most information from a relatively static model provided to him and for applying the information to the decision situation in a logical manner.

Packaged computer models of the competitive environment can be developed and made available to each student team to use as they deem most appropriate. The different types of models, their assumptions and their limitations, should be discussed. But the problem of intelligently using static models will be brought out when the students try to use the information from these models both correctly and incorrectly. A debriefing session with each team or with all teams, depending upon the competitiveness of the student firms, is the best time for discussing the use and modification of the model information, and how that information affected the decision making process of the firm, and how the decision affected the competitive environment. Soon the student becomes aware of the need for sensitivity analysis with each model -- how much does the output of the model change with different values of input to the model and how would these changes affect the decision situation.

Development of a "feel" for the competitive environment as well as the intelligent use of all available information, both quantitative and nonquantitative, are key issues for the type of course under discussion. In addition to the topics previously discussed, the student should become more adept at communication with "systems" people or consultants. He should recognize his information needs, what is possible in terms of modeling, the costs involved in modeling, and the usefulness of models designed for sensitivity analysis.

The combination of gaming and computerized packaged models as a learning vehicle for the types of issues previously listed has been successfully used in the classroom and in continuing education programs at Georgia State University for several years. The students and businessmen are introduced to as wide a range of models as possible and are provided with a set of packaged models. They learn to use the information from quantitative models as another input into the decision making process. The more reliable the information provided by the model appears to be, the more weight is placed on the value of that information. Often they learn

to modify the model output both mathematically and subjectively. Basically, they learn a respect for modeling and the information that modeling can provide to the decision making process. Most students and businessmen leave the course no longer afraid of the quantitative aspects of modeling, and with a true understanding of that modeling is just another tool which should be used during the decision making process.