

# **Simulation Games and Experiential Learning in Action, Volume 2, 1975**

## **CRISIS VERSUS NON-CRISIS SIMULATION GAMING**

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### **INTRODUCTION**

The widespread use of simulation models is an outgrowth of the Operations Research and/or Management Science eras. Simulation has widespread application in business, education, health-care, government, and many other organizations. The process of objective and quantitative decision making, the representation of endogenous and exogenous variables, and the ability to allocate resources toward the accomplishment of specific objectives would not be developed to the degree that it is today without simulation techniques and simulation learning tools.

Without simulation, the space program would not have been possible and man would not have landed on the moon. Nor would scientific research have progressed as rapidly as it has. Furthermore, the education and training of people such as airline pilots, engineers, medical students, and business students [1, pp. 26-27], to name a few, has reached a higher plateau due to simulation.

Simulations, as educational tools, can range from highly sophisticated and complex multi-variable computer simulation models to those that are relatively simplistic, to non-computer simulations such as role-playing. Computer simulations can assist in the accomplishment of many educational objectives such as: (1) developing an understanding of the decision making process [5, p. 3]; (2) putting into practice the theoretical concepts of dynamic group and firm interaction; (3) emphasizing and sharpening the student's skills in the various functional areas of business; (4) requiring the use of those forecasting tools which will aid in effective strategy formulation; (5) encouraging advance planning to improve the coordination of activities; and (6) offering a dynamic setting in which students can more fully understand the interdisciplinary mix which is required to successfully operate a profitable business organization [3, pp. 2-5].

### **PURPOSE**

Although much debate has existed pertaining to the sophistication level of business simulation models, our purpose is to report on the use of two computer oriented simulations in different decision-making settings. Simulation A involved decision-making under crisis conditions while simulation B was used under non-crisis conditions.

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### **Simulation A (Crisis)**

Simulation A was a multi-variable multiple firm simulation which involved decision making relative to the production, pricing, and marketing of a particular product in four market areas [4]. The reports available to the participants were (1) a cash flow statement, (2) an income statement, (3) a decision worksheet, and (4) a forecasting form. The variables involved were (a) the unit selling price of the product, (b) marketing expenditures, (c) the research and development expenditures, and (d) the production levels and depreciation coverage.

### **Simulation B (Non-Crisis)**

Simulation B was more complex. It was a multi-variable multiple firm simulation which involved the manufacturing and selling of a product in three market areas [2]. The reports available to the participants were (1) a warehouse operations report, (2) a manufacturing report, (3) a balance sheet, (4) an income statement, (5) a cash flow statement, (6) a selling expense report, (7) the sales activity report, and (8) an over-all industry report. The variables involved were (a) independent pricing in three market areas, (b) the determination of advertising expenditures by market areas, (c) the determination and allocation of salesmen, and (d) the expenditures of R & D funds. In addition, (e) production options consisted of straight and overtime production along with increasing the efficiency of existing plant. Further, variables such as (f) the selling of stock, (g) the issuance of bonds, and (h) labor contract negotiations were present.

## **IMPLEMENTATION**

### **Simulation A (Crisis)**

Simulation A was implemented at Saint Louis University by two of the writers. It was also used by one of the writers at The University of Akron in both undergraduate and graduate courses. In both instances experiments were conducted using the simulation as an exercise in decision making under crisis. Students who were pre-oriented toward simulation A generated eight sets of decisions (each representing one business quarter), during an eight hour period on a given day. Decision time was  $\frac{1}{2}$  hour with  $\frac{1}{2}$  hour turn around time from the computer center.

In that only one half hour was allowed for the evaluation of data, observation of competing firms, and the actual decision-making, this simulation represented decision-making under crisis without the ability to derive as "full information" through data analysis as would otherwise be possible under normal circumstances.

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### **Simulation B (Non-Crisis)**

Simulation B was implemented by one of the writers at The University of Detroit and also at The University of Akron for use in both undergraduate and graduate Business Policy courses. The primary objective of this business simulation was to foster the integration of the business functional areas. Additional objectives were to force the establishment of objectives and strategies. APL computer terminals were made available to the students so that they could analyze their output reports in detail through the use of canned statistical packages. A sales forecast was provided giving the students rather full information of the future. The logistics consisted of each firm's decision being submitted on Friday during each week of the term with output being distributed the following Monday morning. As a result, a four day interval was available for the data analysis and evaluation.

### **OBSERVATIONS**

There are several observations that were made from the use of business simulation models under crisis and non-crisis conditions. Under "crisis conditions" some observable effects were (1) participant frustration, (2) clerical errors, (3) lack of clear objective formulation, (4) inconsistent strategies within individual firms, and (5) reactive decision-making versus overt well planned decision-making based upon data analysis.

Observations made of the simulation under "non-crisis conditions" were (1) initial participant frustration which eventually channeled itself to intense competition, (2) specific delineation of objectives and strategies along with using the appropriate decision variables to implement strategy, (3) extensive data analysis with canned statistical packages, (4) team member cohesiveness and knowledge dissemination, and (5) overt versus reactive decision-making.

### **IMPLICATIONS**

The implications drawn from comparing Simulation A (Crisis) with Simulation B (Non-Crisis) were varied. As pedagogical tools both Simulation A (Crisis) and B (Non-Crisis) had advantages and disadvantages.

#### **Advantages of Crisis Condition**

1. Forces teams to use their time and talents efficiently
2. Forces rapid decision making within an atmosphere of crisis with no time for "dilly dallying"
3. Encourages team members to compromise or "go along" with decisions--i.e., forces consensus
4. Creates a strongly competitive atmosphere internal to the firm
5. Virtually no logistical problems relative to group meetings.

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### Disadvantages of Crisis Condition

1. Does not allow sufficient time for calm and rational data analysis to determine effectiveness of strategies and whether or not changes in strategy are in order
2. Artificially or falsely represents the normal pace of real world decision making processes--i.e., emphasis is on acceleration or speed of decision making
3. Tends to lead to hastily developed reactive decisions unsupported by objective analysis and evaluation--i.e., tends to be mechanical rather than interactive
4. The integrative process is almost totally internal to the firm to the general exclusion of competing firms-- i.e., tends to be internalized to the team efforts with little concern for external factors in the overall market
5. Results in intense anxiety and frustration of team participants who lean toward "seat of the pants" hunches in making decisions in haste
6. Does not allow participants sufficient time to reflect upon their individual and team behavior (or to synthesize their experience) as they progress through the simulation from quarter to quarter.

### Advantages of Non-Crisis Condition

1. There is sufficient time to evaluate internal and external data and, if necessary, re-formulate strategy
2. Integration of functional areas appeared to be deeply reinforced
3. Full discussion of options discussed by team members and less pressure to make a quick decision or go along because of time constraints
4. Frustration appeared to be relatively low.

### Disadvantages of Non-Crisis Condition

1. Time and talents not always efficiently utilized
2. Interest in the last several weeks appeared to diminish.

It is conceivable that the conditions of Simulation A (Crisis) would sharpen the acuity of some team participants by accelerating the decision or strategy formulation process. And it is arguable that the above average or "better" student may benefit from experience under crisis conditions. But, by and large, the crisis approach exaggerates actual business practice and to this extent distorts rather than depicts reality. Furthermore, if this goal of business simulation is to simulate the real world and to provide a vehicle for integrative learning, our experience indicates that the crisis approach as used, leaves much to be desired.

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