

Developments in Business Simulation & Experiential Exercises, Volume 11, 1984

STRATEGIC MANAGEMENT DECISION MAKING RESEARCHED VIA SIMULATION GAMING

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ABSTRACT

The authors conducted a two-year exploratory study using STRATSIM, a corporate strategy simulation game, in an attempt to generate hypotheses and develop insights about the nature of the strategic management decision-making process. Results were obtained in three major areas: the perception and evaluation of team decision-making; the effects of time taken to make strategic decisions; and the individual allocation of team rewards. This paper provides a discussion of the results with implications noted and suggestions for further application of business simulation games in managerial training and development suggested.

INTRODUCTION

March and Simon's Organizations, Thompson's Organizations in Action, and Mintzberg's The Nature of Managerial Work have become classics in the management literature because the hypotheses they contained concerning the managerial process have spurred so much empirical research. The vast majority of this research has been conducted using the traditional methodologies of questionnaires, interviews, or case studies. Relatively little research has been conducted using business simulation gaming. The modest research that has been conducted using simulation games has generally been directed at answering rather narrow research questions.

This study involved a large scale attempt to use a business simulation game as a research vehicle. The intent was not to answer any given question, but to generate hypotheses about and develop insight concerning the strategic management decision-making process. In this sense, it follows the tradition of Thompson, Mintzberg, and March and Simon. It is an exploratory study (Selltiz, et al, 1959) in which an attempt was made to gain new insights in order to develop a set of hypotheses as well as to examine the frequency of various occurrences and portray the characteristics of the phenomena being examined.

As a result of the authors' familiarity with and prior usage of STRATSIM, this simulation was used in the study.

METHODOLOGY

STRATSIM is a complex, interactive corporate strategy simulation. It can be used with six to eight teams of variable size for up to 16 simulated quarters of corporate performance with each quarter's decision involving up to 63 sub-decisions. STRATSIM incorporates three general indices of managerial performance, a Management Skill Index (MSI), a Social Responsibility Index (SRI), and an Estimated Stock Value (ESV). The MSI consists of traditional economic/financial measures of a firm's performance, such as return on sales, return on assets, earnings per share, market share, dividends paid, cash balances, and changes in those measures.

Data on the MSI attained by teams each quarter was

collected for one year prior to the study. When plotted, the MSI's attained by 48 teams for 12 quarters (576 results) closely approximated the normal bell-shaped curve skewed slightly to the right with a MSI of 50 being the mean. MSI's fell in the following ranges:

less than 44.0 = 10%, 44.0 to 46.9 15%, 47.0 to 52.9 40%, 53.0 to 55.9 = 20%, and greater than 56.0 = 15%.

Participants in the study were simply told that an "average" decision in STRATSIM was about 50.0 on the MSI. They were not given any indications as to what constituted a "very good," "excellent," "poor," or "very poor" decision. However, every team received each quarter a print-out containing the MSI achieved by every other team in the game. In total, 148 MBA and undergraduate seniors, comprising 44 teams in six industries (classes) participated in the study.

This paper reports the results obtained by two Business Policy classes, one an MBA section and the other an undergraduate section. Both classes were divided into eight teams. The MBA teams typically had four (4) members and the undergraduate teams had three (3) members. No attempt was made to conduct a "controlled" experiment, since the objective was to generate new insights in an exploratory fashion.

Each participant anonymously completed a Decision Analysis Sheet (Exhibit 1.) prior to and following each quarter's decision. At the end of the game, the scores, total team points, were announced. Then each team turned in a consensus form signed by all team members allocating the team's points. Each participant also turned in a confidential individual allocation of team points. The participants were asked to be conscientious and accurate in completing the Decision Analysis Sheets and the Points Allocation Sheet, but no mention was made of how the information would be used except that it would not be used for grading purposes.

(See Exhibit 1)

The pre-decision quality ratings, the post-decision quality ratings and the actual MSI's were converted to a common numerical scale by using the following decision rule: A=4=MSI greater than 56.0, B=3=MSI from 53.0 to 55.9, C=2=MSI from 47.0 to 52.9, D=1=MSI from 44.0 to 46.9, and F=0=MSI less than 44.0. The total points allocated to each team were based on each team's performance on the three general measures in the following proportions: MSI=40% SRI=30%, and ESV=30%. Both classes had agreed to this evaluation format prior to playing the game.

RESULTS

Table 1 summarizes the results obtained by the two classes. Table 2 shows the time taken by each MBA team to make each decision; Table 3 shows the same data for the undergraduate teams. Table 4 presents a summary of each teams decision-making efforts. The results are discussed in three (3) general areas,

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- (1) the perception and evaluation of team decision-making,
- (2) the effects of time taken to make strategic decision, and
- (3) the individual allocation of team rewards (points).

(See Tables 1, 2, 3, and 4)

Perceptions and Evaluations of Team Decision Making:

Both the MBA teams and the undergraduate teams rated their decisions optimistically, both before and after seeing the results of those decisions. Interestingly, the MBA teams were about 50% more optimistic than the undergraduate teams, both before and after a decision. In fact, MBA teams almost always perceived their performance as being "very good" or "excellent," even when the MSI indicated otherwise. The undergraduate teams, in this sense, rated their performance more realistically. One MBA team, (H), was very realistic in its evaluation of its decisions over the 12 simulated quarters. Three undergraduate teams, (C, D, and G), were relatively realistic in their evaluations. As might be expected, the post-decision evaluations were considerably more accurate, although still quite optimistic.

We might hypothesize this behavior as fitting the self-perception of aggressive, intelligent MBA's. Certainly, they might not wish to see themselves as merely "average." Another possibility may be that the rating scheme used is inadequate. Nevertheless, the trend is quite obvious. Even when a MBA team's MSI was consistently low, they would not or could not bring themselves to lower their evaluations of their performance.

The MBA teams exhibited little variation in their average MSI, ranging from 1.83 to 2.17 (excluding Team H's 2.75). The undergraduate teams' MSI ranged from 1.25 to 2.75, the high value achieved by two different teams. This would seem to indicate the undergraduate's greater willingness to make a riskier decision, but which offered greater payoffs. This would help explain the wider range of MSI's achieved.

Time Effects: The most striking result is the rapid decrease in time taken to make a decision, especially from the first to the second decision. Then, during the middle stages of the game, decision times declined gradually. At the end of the game, they were relatively stable. The MBA teams took about 50% longer to make their decisions.

Again, there are significant differences within each class, as can readily be seen in Tables 2 and 3. The top-ranked team in both classes also took the most time to make a decision; in the undergraduate class, the 2nd and 3rd teams ranked 3rd and 2nd in the amount of time taken. Beyond that, there was little correlation between time taken and performance levels.

Reward Allocation: The most striking result here is the unwillingness of the MBA team members to divide the team's points unequally (in particular, the two teams that would have divided points unequally actually would have had a difference of 10 or less points per person overall). The undergraduate teams invariably wanted the rewards (points) to be divided unequally, that is, on the basis of who did the most work or the best work or some other criterion.

This result was the most surprising to the researchers. It may be that the MBA students have more "real life" organizational experience in which teamwork (or the

perception of teamwork) is deemed very important to organizational experience performance. Another possible interpretation is that the MBA teams really were more teamwork-oriented than the undergraduate teams.

Interestingly, on the team consensus allocation of points, that is, the "public" allocation, only two of the undergraduate teams divided their points unequally versus one of the MBA teams. This difference illustrates the effect of public acknowledgement of performance evaluation. Rather than risk possible controversy, hurt feelings, or other behavioral conflict, teams would compromise. However, if it were entirely up to the individuals, there is no doubt that the rewards would not be distributed equally at the undergraduate level.

SOME CONCLUSIONS AND IMPLICATIONS

This research has been exploratory in nature. It is probably hindered by the research constraint of the "student participant" problem quite often found in many such organizational behavior research efforts. However, the inclusion of the more mature MBA students; the importance given to STRATSIM within the Business Policy course (30% of total grade); the long-term nature of the study (each participant involved for 10 weeks); and the disassociation of the research from the course (or grade) itself; would all argue strongly for validity of the research results. While the data was collected during the teaching of the Business Policy course, it was not analyzed in any way during that period.

Quite possibly, building on the results of this study; the use of complex simulation games, such as STRATSIM, in real organizations might offer insight into the value systems, decision-making processes, performance evaluation policies, and rewards allocation procedures in those real organizations. Game participants quickly become intimately involved with the "playing" of the game which would suggest that their true values, sentiments, and behaviors would quickly manifest themselves undisguised by "desired" or "appropriate" behavior. In effect, the authors are suggesting that the game is not as important as the behavior, socialization, and learning that the game evokes. It is possible to envisage simulation games being used for comprehensive management training and development purposes, such as the identification of strategic management decision-making ability, performance evaluation sensitivity, practice, and implementation, and interpersonal relationship skills. This frontier is a new and exciting one for business simulation gaming.

REFERENCES

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Exhibit 1. Decision Analysis Sheet

<u>Name</u>	<u>Team</u>	<u>Industry</u> _____
<u>Quarter No.</u>	<u>Pre</u> _____	<u>Post</u> _____
	Name	
Effort Rating	Team Member 1	%
	2	%
	3	%
	4	%
	Name	
Quality Rating	Team Member 1	Scale: A, B, C, D, F
	2	
	3	
	4	

Time spent by you on this decision? _____

TABLE 1. Results Summary

	<u>MBA</u>	<u>UG</u>
1. Pre-decisions Optimistic	81%	74%
2. Post-decisions Optimistic	78%	68%
3. Pre-decisions Pessimistic	11%	18%
4. Post-decisions Pessimistic	2%	16%
5. Pre-decisions more accurate	8%	16%
6. Post-decisions more accurate	67%	58%
7. Average Pre-decision rating	3.48	3.02
8. Average Post-decision rating	3.20	2.69
9. Average MSI actual decision	2.10	2.11
10. Pre-decisions Optimistic by	1.38 (66%)	.91 (43%)
11. Post-decisions Optimistic by	1.10 (52%)	.58 (27%)
12. Average time per decision	208 minutes	140 minutes
13. Distribution of actual MSI's:		
	A 13 (14%)	15 (16%)
	B 17 (18%)	17 (18%)
	C 43 (45%)	35 (36%)
	D 13 (14%)	13 (14%)
	F 10 (10%)	16 (17%)
14. Points Distributed	Equally	Unequally

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TABLE 2. MBA Decision Times (Minutes)

Quarter	A	B	C	D	E	F	G	H	AVG
1	220	360	332	795	690	390	615	540	493
2	120	270	300	420	398	180	330	330	294
3	120	285	225	300	355	220	292	315	264
4	75	202	218	262	180	170	135	255	187
5	120	232	308	270	322	170	195	360	247
6	75	225	180	180	210	140	135	285	191
7	75	210	180	190	178	160	120	270	173
8	60	188	210	101	180	150	82	300	159
9	98	135	71	68	142	140	56	285	124
10	67	180	60	52	188	140	45	240	122
11	124	135	60	52	180	90	34	315	124
12	83	142	71	82	150	140	68	270	124
Total	1237	2564	2215	2772	3172	2090	2107	3765	19922
Avg.	103	214	185	231	264	174	176	314	208

TABLE 3. Undergraduate Decision Times (Minutes)

Quarter	A	B	C	D	E	F	G	H	AVG
1	380	430	550	660	225	290	370	310	402
2	150	220	260	200	185	90	420	150	209
3	145	140	313	260	130	140	360	70	195
4	110	155	150	210	120	70	180	50	131
5	90	125	190	130	85	60	180	60	115
6	90	120	190	150	65	65	90	55	103
7	75	130	70	150	70	50	80	40	83
8	110	100	100	200	80	40	75	45	94
9	70	105	130	220	50	35	110	45	96
10	65	95	130	140	45	50	105	55	86
11	80	80	115	170	30	50	90	55	71
12	180	80	130	110	25	50	80	60	89
Total	1545	1700	2328	2600	1115	990	2140	995	13413
Avg.	129	148	194	217	93	82	178	83	140

TABLE 4. Team Summaries

<u>MBA</u>	A	B	C	D	E	F	G	H
Avg. Pre-decision	3.40	3.58	3.88	3.19	3.77	3.78	3.65	2.58
Avg. Post-decision	3.02	3.21	3.48	3.25	3.40	3.00	3.40	2.83
Avg. MSI	2.17	1.83	2.00	1.92	1.92	2.08	2.17	2.75
Avg. Decision time (Min.)	103	214	185	231	264	194	176	314
Team points/person	240	220	250	270	210	230	260	300
Points Allocation (confidential)	*	*	*	*	*	*	*	*
Points Allocation (public)	*	*	*	*	*	*	*	*

<u>UG</u>	A	B	C	D	E	F	G	H
Avg. Pre-decision	3.06	3.18	3.15	2.98	2.71	3.04	3.02	3.00
Avg. Post-decision	2.63	2.33	2.68	3.07	2.58	3.33	3.05	2.61
Avg. MSI	1.42	1.25	2.25	2.75	1.92	2.42	2.75	2.17
Avg. decision time (min.)	129	148	194	217	93	82	178	83
Team points/person	210	215	260	300	225	245	280	240
Points Allocation (confidential)	*	*	*	*	*	*	*	*
Points Allocation (public)	*	*	*	*	*	*	*	*