

Developments in Business Simulation & Experiential Exercises, Volume 14, 1987

HOW TO MULTIPLY YOUR MANAGEMENT GAME

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ABSTRACT

This paper describes a method for expanding the simulation flexibility inherent in some management games. This method allows multiple runs of the game, each run with different industry and market characteristics, yet all runs are combined into a single consolidated company report. Each separate run uses common production and financial resources.

INTRODUCTION

Some simulation gaining situations may give rise to the desire or need to represent more than the one or two products contemplated by the game model. One such situation is the use of a management game in in-house executive development programs. It is often desired that the simulation give the appearance of the sponsoring company. For sponsoring companies with diverse divisions or subsidiaries, a single management game may not reflect the diverse structure and the rich variety of the decisions to be made. Where divisions or subsidiaries are foreign companies, the usual management game approach may not provide the best conceptual environment for bringing together executives from around the world. One value of executive development gaming programs that give the appearance of the employer company is the learning experience of executives as they play company roles other than their own, or as they play the roles of competitors. This paper describes a method for "multiplying," so to speak, a management game to represent diverse divisions, yet preserving a single company orientation.

Simulation Design Alternatives

To accomplish the objective of diverse experience in a single company orientation using an existing management game, several strategies are available.

The game administrator could have participants play two or three different simulations one after the other with instructions to imagine each simulated company is a subsidiary paying dividends to a parent.

The administrator could have participants play different simulations concurrently and in separate computations sum up financial variable values to represent parent companies. Each player team in this design strategy would manage two or three companies in different industries and be evaluated not only on individual company performance but also on results achieved by the parent company.

A more elaborate strategy would be to create a whole new simulation for conglomerates. In this approach, existing simulations of industries would pass financial data to the conglomerate model, which in turn would create consolidated statements. The simulated conglomerate would be managed by a team of players, as would the individual companies held by the conglomerate. Conglomerate managers would make financial and resource allocation decisions and would also be capable of acquiring and divesting companies. This approach, which simulates conglomerate portfolio management, has been previously

reported to ABSEL [2].

An approach that lies between the first "just imagine you are a subsidiary" approach and the latter rather elaborate conglomerate model approach is described in this paper. In this simulation design, separate divisions make and market diverse products (possibly in different geographical areas), but each division remains an integral part of a single company. These divisions do not make financial decisions at the corporate level. The design does not include acquisition or divestiture features, but does include new product start-up.

Illustrative Example

To illustrate this method for multiplying a management game, an example game will be described. The multiplying method has been implemented for this game. The example game is THE IMAGINIT MANAGEMENT GAME [1]. A sample company report of this game is shown in Figure 1. Several popular management games follow similar formats. In Figure 1, the totals column is not the sum of the product columns because it includes values for divisions making and marketing products in addition to the products shown in Figure 1.

THE IMAGINIT MANAGEMENT GAME is a long-established simulation game usually used in business policy teaching contexts. It is extremely flexible due to high external parameterization and data manipulation completely independent of the computer program. This flexibility enables IMAGINIT to simulate almost any manufacturing industry from small unit manufacture such as breakfast cereals to big unit large price products such as automobiles. This same flexibility also allows versions of IMAGINIT to be tailored to resemble particular companies. Usually this implementation takes the form of two to five clones of the simulated company competing with each other, (called the equal start condition), although with IMAGINIT it is possible to establish unequal starts so that a competing company may resemble an actual competitor of a company sponsoring an executive development program.

The IMAGINIT markets contain one market of up to two products for each competing firm (Market A with Products A-1 and A-2) and a second market of a single product for each firm (Market B with Product B-1). What Products A-1, A-2, and B-1 represent depends on values set for the external parameters and data. Usually, a play of IMAGINIT begins with an existing Product A-1 in Market A, and player managers may start up another product in Market A (Product A-2), which will compete with Product A-1, or they may bring out a Product B-1, which will compete only with competitors' Products B-1. Of course, all Products A-1 and A-2 for all firms compete with each other. There is a maximum of five competing firms and hence a maximum of ten products in Market A and five in Market B. IMAGINIT will also simulate monopolies.

Decisions in THE IMAGINIT MANAGEMENT GAME are made both for products and for the company as a whole. The decisions to be made for each product are:

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FIGURE 1
COMPANY IMAGINIT REPORT

THE IMAGINIT MANAGEMENT GAME THE IMAGINIT AUTO AND COMPUTER INDUSTRY		YEAR 1 LOW PRICE	QUARTER 0 LUXURY	MONTH 0
COMPANY REPORT FOR FIRM 52		A-1	A-2	TOTALS
INCOME STATEMENT				
SHIPMENTS IN UNITS OF PRODUCT		2100.	0.	0.
NET SALES REVENUE		7350000.	0.	25200000.
COST OF GOODS SOLD				
DIRECT LABOR (\$)		1800000.	0.	3453600.
DIRECT MATERIALS		3000000.	0.	12000000.
STORAGE				171000.
FACTORY DEPRECIATION				200000.
OTHER FACTORY OVERHEAD				1760000.
COST TO MANUFACTURE				17584600.
CHANGE IN FINISHED GOODS ON HAND (\$)		255000.	0.	255000.
COST OF GOODS SOLD				17839600.
GROSS PROFIT ON SALES				7360400.
SALESMEN (\$)		40000.	0.	640000.
ADVERTISING		210000.	0.	510000.
RESEARCH AND DEVELOPMENT		0.	0.	0.
EMPLOYEE FRINGE BENEFITS		300000.	0.	800000.
OPERATIONS RESEARCH				0.
ADMINISTRATIVE OVERHEAD				444000.
INTEREST				32000.
PROFIT BEFORE INCOME TAX				4934400.
INCOME TAX				2269824.
NET EARNINGS				2664576.
DIVIDENDS PER SHARE	2.00		200000.	
SHARES SOLD	0.		0.	
TOTAL PAYOUT PROCEEDS				2464576.
CHANGE IN STOCKHOLDERS EQUITY				
BALANCE SHEET				
CASH	1484446.			2064000.
ACCOUNTS RECEIVABLE	2016000.			100000.
MATERIALS	1900000.			250000.
FINISHED GOODS	0.			2100000.
NET PLANT	2000000.			2886446.
TOTAL ASSETS	7400446.			7400446.
COMMON SHARES	100000.			
MARKET QUOTE		73.42		
BOOK VALUE				49.86
CURRENT POLICY AND ENVIRONMENT				
AVERAGE INDUSTRY PRICES THIS PERIOD		3500.00	0.00	
CURRENT TOTAL MARKET DEMAND (UNITS)		8400.	0.	
SHARE OF MARKET THIS PERIOD		0.250	0.000	
POTENTIAL SHIPMENTS NEXT PERIOD		2205.	0.	
PRICES		3500.00	0.00	
MATERIALS INPUTS PER UNIT (\$)		1500.00	0.00	
MATERIALS ON HAND (\$)		400000.	0.	1900000.
MATERIALS ON ORDER (\$)		0.	0.	0.
MONTHS UNTIL MATERIALS ARRIVE		0.0	0.0	0.0
PRODUCTION LEVELS (UNITS)		2000.	0.	0.
NUMBER OF FINISHED UNITS ON HAND		0.	0.	0.
DISTRIBUTION CHANNEL INVENTORIES		175.	0.	0.
PURCHASE OR SALE OF FACTORY CAPACITY				200000.
LOANS MADE OR REPAY	0.			0.
QUARTERS DIVIDENDS TOO LOW	0.			200000.
FIRM LABOR RATE	6.00			800000.
FRINGE BENEFITS PER HOUR	1.00			0.05
CURRENT NUMBER OF LABOR SHIFTS	3.			160.

Price
Materials inputs per unit
Salesmen
Advertising
Product research and development
Materials to be ordered
Units to be produced

Decisions to be made for the company as whole are:

Employee fringe benefits per hour
Dividends per share to be paid
Operations research
Short-term loans (borrow or repay)
Bonds (issue or redeem)
Shares of stock to be offered
Factory capacity (purchase or sell)

The implementation of the approach described in this paper makes use of the full set of IMAGINIT decisions for managing the original, parent, or main company of the simulation. This company makes and markets in its own Markets A and B. Then for divisions that make and market diverse products in different markets, only the decisions for

the product variables are used. There can be as many of these different divisions doing business in different Markets A and B as desired. Decisions dealing with finances, company-wide production capacity, and employee benefits are made only by the main company. This variation of the original game is called MULTIPLE IMAGINIT.

Games other than IMAGINIT that contain flexibility in setting parameters and data are also suitable for this method of "multiplying your management game."

MULTIPLE IMAGINIT

MULTIPLE IMAGINIT is an extension of THE IMAGINIT MANAGEMENT GAME to more than two markets and three products. The additional products are manufactured and sold using company-wide production and financial resources yet separate marketing decisions. These products have separate direct revenues, costs, and inventories, which are added into the totals column and the balance sheet of an otherwise regular IMAGINIT run. Any number of additional Market A's with their Products A-i and A-2 and Market B's with their

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the corresponding product data generated by the Company IMAGINIT run before production and financial details are simulated and the income statement and balance sheet are computed. Hence, the Company IMAGINIT report reflects performance of the total firm including all additional products. For example, total labor hours on the company report is for the total firm while on the product reports, it is only for the products on these reports.

Simulated variations, if turned on, operate separately in each product or company run. Interestingly, it is possible to set parameters so separate labor strikes may occur in the product runs, or parameters may be set so that strikes occur only in the company runs.

Data is passed via a matrix PASS(I, J) that contains 14 variables for each product division. They are written in FORONN in two records of seven each for each firm in a product run. The variables are:

	Game number of the run
Firm number	Total net sales revenue
	Total direct labor
	Total direct materials
	Storage
	Total salesmen (\$)
	Total advertising
Total R & D	Materials ordering costs
	Materials (balance sheet)
	Finished goods (balance sheet)
	Actual labor hours
	Total materials received

Participant Organization

Of course, one team of players manages the main or original company including its up to three products. This team also records the company-wide decisions regarding fringe benefits, finances, and production capacity.

With one additional division making and marketing products in up to two entirely different markets, the main or original team may also manage these products. Another possibility is two teams each managing separate product simulations but becoming a single group to make the company-wide decisions. With two or more additional divisions, such a company-wide group becomes too large so that company-wide decisions are made by a subgroup of the total number of participants. Beyond this point, numerous combinations of product-market management teams are possible.

IMPLEMENTATION

As of this writing, MULTIPLE IMAGINIT has been implemented in batch mode on VAX supermini computers in the FORTRAN source language using standard FORTRAN file numbering conventions. A future implementation step at this computer site is to replace Original IMAGINIT now servicing policy-type courses in an interactive environment with MULTIPLE IMAGINIT.

A NOTE

Should a game administrator wish to represent divisions that manage their own production capacity but not their financing, a MULTIPLE IMAGINIT type model could easily be programmed by modifying division decision variables to include factory capacity and operations research and output variables to include plant size, shifts, and overtime, and adding appropriate variables to the matrix that passes data from product to original runs. Should the administrator wish to represent divisions or subsidiaries that manage both production and local financing, the conglomerate portfolio model described in [2] would be more appropriate.

REFERENCES

- [1] Barton, Richard F., THE IMAGINIT MANAGEMENT GAME (Lubbock, Texas: Active Learning, 1978).
- [2] _____, "A Simulation Game Model for Conglomerates," Proceedings of the Eleventh Annual Conference of the Association for Business Simulation and Experiential Learning, Honolulu, January, 1984, pp. 189-193.