

Developments in Business Simulation & Experiential Exercises, Volume 13, 1986

THE MANAGEMENT DECISION LABORATORY AT NEW YORK UNIVERSITY

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Abstract

The New York University Management Decision Laboratory was originally intended as a computer-oriented business game. This situation has changed. It has evolved into a unique combination of organization processes, and business community relationships, with the computer acting as only one element. The simulation now reflects complex corporate issues and close working relationships with the surrounding business community. The environment has many parallels with the real world: an analytical framework; a need for intensive training; opportunities for innovation in the face of structure; and a dependence on critical interpersonal networks.

Introduction

This paper describes the Management Decision Laboratory (MDL) at New York University. We first provide some background on the MDL at NYU. Then, using some of the materials given to students, we describe how MDL's simulated business environment operates.

Background

MDL was created in 1970 and was called the NYU Management Game. It was essentially, based on the Carnegie Tech Mark 1.75 Business Game. Although the Carnegie game provided an integrative experience, we believed that changes were needed to make it more realistic.

The revisions to the original model fell into three broad categories. First, we made changes to the underlying computer model. Second, we added a large number of experienced people as role players within the simulation. The two sets of changes are related. For example, we frequently deleted computer segments and replaced them with role players. Third, we developed formal scenarios to introduce critical events within the simulation.

The initial computer model changes fell into the following general categories:

- o Trade credit, and a variety of other financing alternatives, have been added to increase the financing options available to the students
- o A capital replacement model was integrated into the production routines to introduce capital budgeting, facilities planning, and simplified plant layout problems.
- o A multi characteristic labor force was created to introduce problems associated with differential labor efficiency and a variety of other labor related issues.

- o An employee compensation module was developed to permit establishment of widely varying forms of employee and executive compensation programs.

These and other changes provide student participants a greater opportunity to exercise their functional skills and integrate them as a part of their simulated companies' senior management team.

Role players were introduced into the formal simulation to accomplish several objectives. On one level, they made the simulation feel much more realistic. More substantively, they provided two additional capabilities: (1) they made it possible to introduce new factors without a need to develop extensive computer models; and (2) they provided an opportunity to represent interpersonal business relationships in a realistic and meaningful manner.

Among those business-community activities that have been integrated into MDL's simulation are

- o operational aspects of finance such as loans or equity funding by means of actual bank officers, insurance company long-term lenders or underwriters;
- o board of directors for each simulation company (played by high-level executives who are often found on the boards of publicly held companies);
- o consultants for business plan preparation;
- o attorneys to provide consultations or representation in litigation;
- o labor union negotiators and labor-management consultants for purposes of collective bargaining and other labor related decision-making;
- o external auditors that review managements' submissions;

One of the richest, and most complex innovations has been the formal introduction of scenarios. We wanted the students to deal with situations, such as, recessions, pollution, workplace safety and toxic waste disposal. These are complex problems. They do not suddenly appear, nor are there clear cut quantitative solutions. Early recognition of the potential problem may be as important as the ultimate resolution itself. Similarly, one can argue that a major educational benefit is achieved as a by-product of discussions taking place between the students and the experienced business people. The scenarios thus set forth the sequence of events that we will trigger, together with the methods that will be used for initiating them. They involve such activities as planting newspaper articles and modifying parameters in the underlying computer model.

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Materials Given to Students

We feel that a good understanding of the simulation and the process can be obtained by examining the materials that are given to the students at the beginning of the semester. The materials fall into three categories: (1) the Orientation Kit; (2) a manual with process information; and (3) company related information.

The Orientation Kit is the primary basis for this paper.

The manual helps the students to carry out the activities that are taking place within the simulation. It includes:

- a description of the available decisions, together with constraints that might be present.
- Computer interface information
- Activities descriptions.

The company information contains background data on the companies that the teams will operate. The following information falls within this category.

- Company files containing everything from memoranda to policy statements to budgets that they must work within at the start of the simulation.
- Twenty months of detailed, and lengthy, operating reports.
- Lotus templates to force some of the early record keeping and analyses activities.

All of this information is closely tied to the scenarios that are being implemented. This point can be illustrated in the following manner: Assume that we are trying to introduce a capital budgeting situation. The company files may contain a combination of memos and operating reports that encourage consideration of new machinery.

The Orientation Kit

The Orientation Kit sets the stage for student participation in MDL. Students receive it about two weeks before their scheduled on-site orientation. It provides an overview of the simulation's framework and process.

The kit includes a description of Administrative Information and supports; an overview titled "The Simulated World of MDL's"; and detailed suggestions for "Getting Started" which covers a company's organizational process as well as MDL procedures.

Administrative

This section will not be elaborated upon but it includes such items as:

- o simulation calendar;
- o participant lists;
- o organizational chart and with descriptions;
- o job applications; and
- o information regarding available office equipment and services.

The Simulated World of MDL

This section is, essentially, unchanged from the document presented to new student participants. In reading it, you can do so from the same perspective as the students. We use this format to illustrate our efforts at explaining-up front a rather complex process that is very different from students' classroom environment

Introduction

M.D.L. creates a simulated business environment in which you will be assisting company management teams competing against other firms in the same industry. Such competition focuses on bottom-line results.

In the process, you will need to exercise specific management skills; function as part of an integrated organization; establish timely and effective company policy; and respond to a variety of external as well as internal issues.

Beyond bottom-line results, the teams' performance will be evaluated in a number of designated, management-oriented activities. The use of a business plan in running the company is a primary component of such evaluation.

Students' individual performance will also be reviewed and rated according to a structured evaluation system. It is designed to encourage personal growth and includes observations by such business community participants as bankers, long-term lenders, auditors, labor-management consultants and labor leaders.

Understanding the Simulated World of M.D.L.

The accompanying charts and comments provide an overview for your entry into M.D.L.'s simulated business environment. As seen in Figure 1, students' involvement begins prior to the start of operations of their company. The management team is introduced to the simulation by means of a "pre-entry" program and prepared to take over company operations by means of an "organizational phase".

Although management will be very busy with these critical orientation and preparatory activities, operation of the company will not start until about three weeks after your arrival at M.D.L. Then, during a period of about twelve weeks of actual time, you will be operating your company over a period of sixteen months of simulated time.

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Pre-Entry and Organizational Activities

As shown in Figure 2, the "pre-entry" program begins with an Orientation Kit that includes this overview of M.D.L.'s Simulated World. It has been mailed to your home two weeks prior to your arrival to facilitate your early understanding of the nature of the simulation, and to enable you to make appropriate calendar arrangements.

The "On-Site Orientation" is given the day of your scheduled arrival. During this Orientation you will be advised of your assignment to a particular company as a member of its management team.

The "Organizational Phase" gives each team time for: familiarization with the organization and history of the "existing" company that it is to operate; starting a relationship with its board of directors; filling operating positions; reviewing the skills that will be employed; and attending seminar sessions to help prepare for company operations. In addition, each team makes a competitive dry run of its first month's decisions.

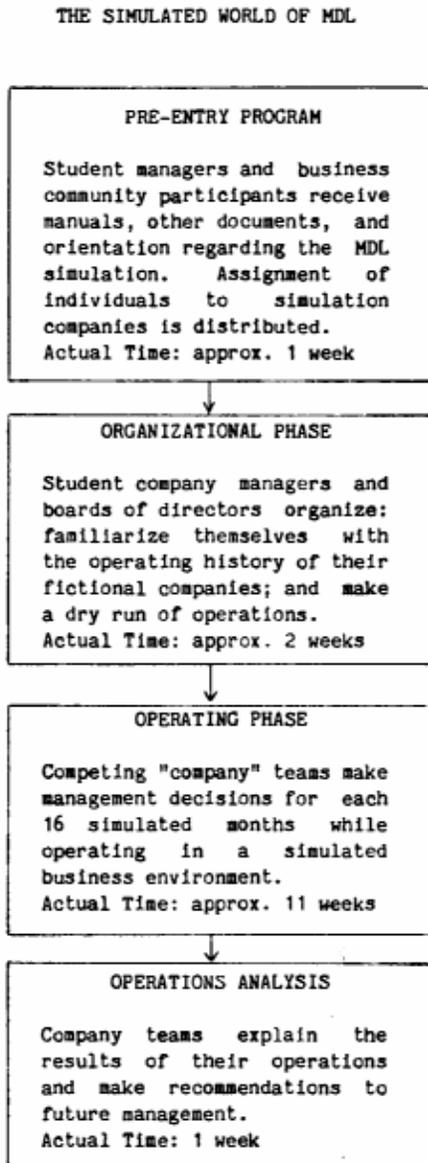
During this organizational period, each company's board of directors (comprised of real world executives) will hire one member of the team to serve as its company president. Procedure for such hiring--including applications which must be submitted prior to the board meeting--are described elsewhere in the orientation documents.

Thereafter, each firm's management team, under the direction of its president, will prepare for integrated operations along existing functional lines. Among the organizational problems likely to be encountered are an imbalance in the availability of required skills; conflicting personal goals of team members; and differences in individual attitudes.

In the process of organizing, each company's management team will review the files of its "existing" company and become familiar with its contents. This review should provide insights regarding policy issues which confronted your predecessors; policies and plans established by them; and twenty months of operating results under these plans. Each company's history is the same so as to provide an even starting position.

The historical review is designed to facilitate an understanding by "new management" of what makes its company tick; the nature of its business environment, in quantified terms; and problems that require early attention. In addition, an existing corporate structure is provided that serves as a preliminary framework for the dynamic organizational activities of each company team. Obviously M.D.L.'s Simulated World is not a conventional course. Indeed, there is no traditional

Figure 1



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Figure 2

PRE-ENTRY AND ORGANIZATIONAL ACTIVITIES

PRE-ENTRY PROGRAM

Orientation Kit Hailed

- Director's Welcome
- Simulation overview (Simulated World of MDL)
- Participants' calendar
- Guide to getting started

On-site Orientation

- Director's remarks
- Distribution of binder describing operational environment and decision-making constraints.

Model Interface and Administrative

Communications Orientation

- Explanation of contents of operations binder
- Explanation of I/O process
- Distribution and explanation of I/O forms
- Review of annotated sample of monthly company operations printout
- Use of computer for input
- Use of computer for communications
- Use of computer for access to data-base, statistical and analytical programs.

ORGANIZATIONAL PHASE

Organizational Board Meeting

- President hired
- Board/management relationship established
- Set objectives for Bd meeting •1
- Start company organizational process

Company files accessed by .ew mgmt

- Company's organizational history
- Company's financial history
- Selected items from company files

Presidents' Seminar

- Function and responsibility of President
- Relationship of management to Board

Dry-Run for Month 21

- List of team members with positions filed.

Functional Seminars

- Marketing
- Production
- Finance/Accounting

Organizational Chart filed with MDL

text. Instead, students will receive -- during these "Pre-Entry" and "Organizational" periods -- a manual of operations and an extensive variety of documents which are akin to many which exist in real-world business environments. Among such documents are prior months' operating reports, an earlier business plan, legal papers and contracts, and inter-office memos.

There is also a range of informational material that you will receive during the simulation that have real world counterparts. Included are the Trinity Place Journal -- a business-oriented newspaper --and simulation-based correspondence. Even the use of computers for communications and computer input/output forms have real-world counterparts.

Elapsed time for the intensive on-site "Pre-Entry" and "Organizational" activities is about three weeks. Upon completion, management moves directly into company operations where, for an actual time of twelve weeks, you will be senior managers for a simulated period of sixteen months.

Overview of Each Company's Operating Activities

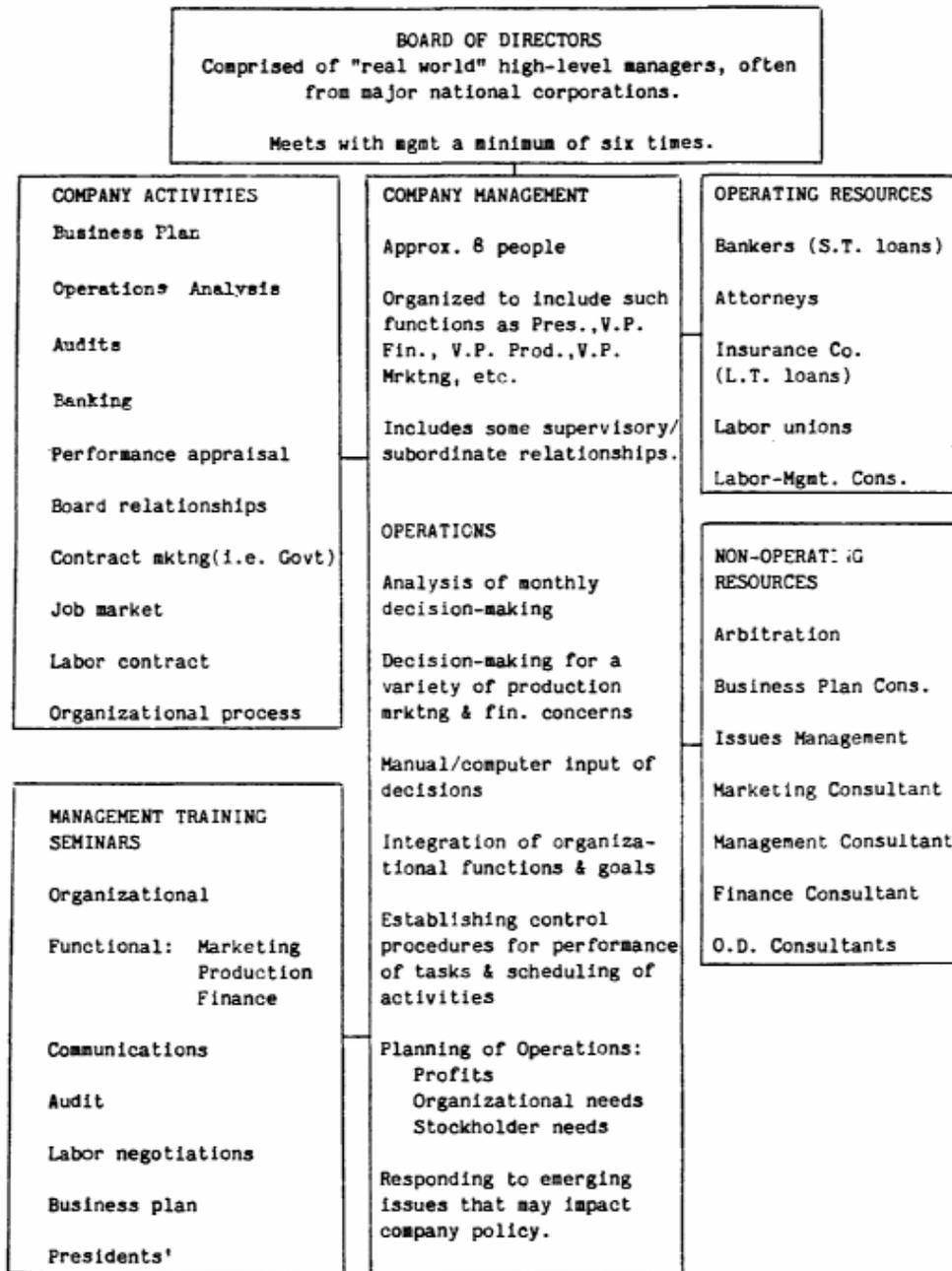
The overview of Figure 3 outlines individual and company activities within the simulation. It shows the management team reporting to its board of directors, indicates the scope of operational concerns, and cites a number of optional and required activities.

Business community participants, you should note, are classified into three major categories: those who serve as company board members; operating resources and external consultants. They provide the same kinds of services within the simulation that they provide in their own real-world activities. Each board of directors, for example, is composed of experienced managers, many of whom are at the top levels of their real-world company's management teams. Some are also board members of major corporations or successful entrepreneurs. As members of your board, you have the same fiduciary responsibilities to simulation shareholders that you would as real-world board members.

Company management will be presenting reports regarding company performance; plans for future operations; and recommended strategies and policies. Board members will provide some general guidance; approval, rejection or modification of your recommendations; and evaluation of your performance. However, the primary responsibility for creating, communicating, and executing policies is the students'. Your effectiveness with the Company's board will be directly influenced by the team's ability to organize as a smoothly functioning unit with each member exercising the necessary functional, analytical and communications skills.

Figure 3

COMPANY ACTIVITIES OVERVIEW.



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Activities listed have been selected to broaden the student's perspective of the management process; to provide a framework for integrating diverse functional skills; and to help bridge the gap between theory and practice.

In some cases, like audit preparation and presentation, only some of the team will be involved. In other cases, such as the business plan, most of company management will have a role. In virtually all cases, the ability to function as part of an integrated team will have a significant impact on your own performance as well as what you take away from the experience. In such a complex and demanding environment, effective management of time becomes a critical factor.

This is especially so because of the extensive list of activities and large number of business community participants. Thus, like the real-world, contacts with these resources -- whether they represent a special interest like labor, or offer a special service like banking -- should be carefully planned and prepared. Otherwise, the result may have a negative impact upon you and your company. Even irregularly used consultants who are paid a simulated fee for their services may refuse to meet with clients who are unprepared.

As indicated by Figure 3, management training is conducted by seminars in a manner that is comparable to those presented in the outside business community. Sometimes these seminars are given "in-house" by M.D.L. Other times, they are given by external specialists. The seminar content ranges from those which are applicable to your special needs within the simulation to those which supplement your earlier skills-oriented course work, but they are not intended to be substitutes for gaps in earlier course work.

The Competitive Decision-Making Environment of M.D.L.'s Simulated World.

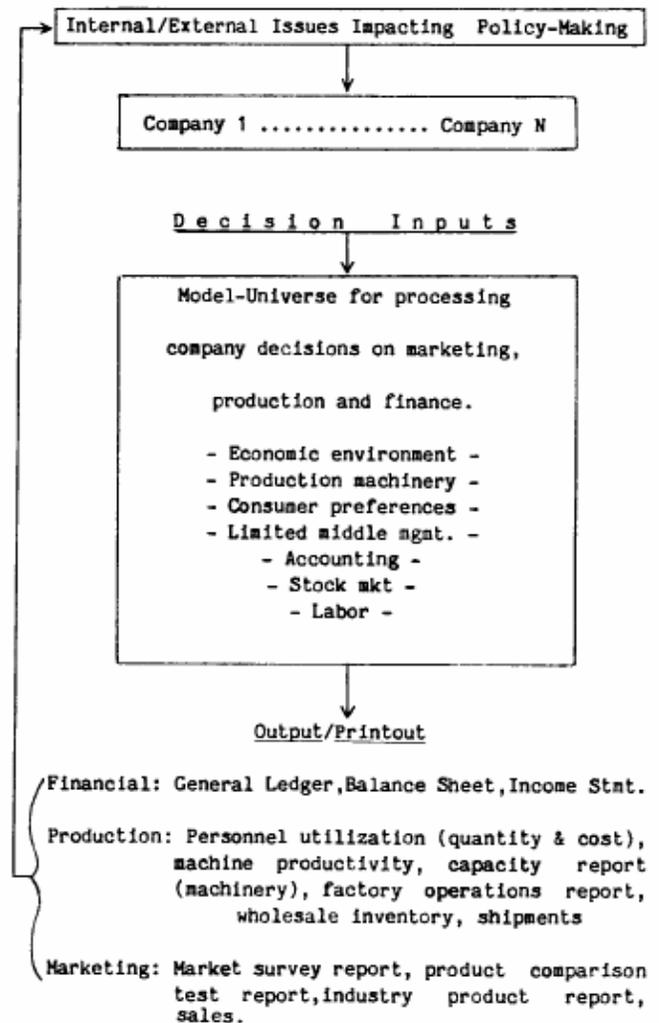
The general focus of such diverse activities is the company's decision-making process. It is a competitive environment which is portrayed schematically in Figure 14. While there are many companies within the simulation, they are assembled into separate industries. Each industry is comprised of five companies and serves as a separate universe for interactive company decisions. Thus, Figure 14 is representative of each industry.

The Model-Universe portrayed in Figure 14 is programmed with such diverse factors as economic environment, production process, consumer preferences and accounting. After the decisions of competing companies have been entered (sometimes as many as three-hundred for a given simulation month), operating reports -- as noted -- are printed out.

Figure 4

THE COMPETITIVE DECISION-MAKING ENVIRONMENT OF MDL'S SIMULATED WORLD

(typical for each industry)



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Each company starts off with essentially the same history of operations and financial condition. Each is confronted with the same set of fundamental policy issues and external issues that affect company policy. But as each simulated month's decisions are made, competing companies are soon differentiated by their bottom-line performance.

Many of the decision categories that the management team will be making and then communicating to the computer model are listed in Figure 5. Prior to entering decisions on the computer, you will be stating these decisions on special input forms according to procedures established by MDL. Team members are responsible for the accuracy of information on such forms, as well as their error-free entry into the computer model. As in the real world, errors -- however simple they may be -- can have a significant impact on results. They can seriously affect the performance of the company.

You should note that the computer model also includes functions which are often performed by subordinates in real world companies. Entering certain kinds of decisions into the model is considered, therefore, to be the same as providing instructions to these subordinates.

The response of each management team and the decisions that are made for each month soon separate the competing companies. This will become evident by the printouts generated by the computer in response to the company's inputs to the model. Decisions by companies within the same industry -- as communicated by input data -- interact with each other and the characteristics of the model.

While the model is patterned after selected aspects of the real world, its scope is necessarily constrained. Yet, there is a complexity which merits the team's thorough familiarity if you are to effectively measure its impact upon your decisions. This means -- among other things -- analysis of the relationship between specific inputs and outputs.

Fortunately, the model also functions as the accounting department and provides detailed reports of operations, including monthly balance sheets and income statements. Thus, there is a critical feedback which, as shown in Figure 14, helps maintain a continuous loop between decisions, and outputs.

Remember, however, that even good decisions that seem to be based upon sound planning face an uncertain environment in the real-world as well as in M.D.L.'s Simulated World. You can never be sure, for example, what action may be taken by the competition or whether the team itself may "screw things up". But the odds are on your side if you establish effective controls. Some of these controls may be evident from Fig. 6, a summary of the MDL framework for company decision making.

Figure 5

REPRESENTATIVE INPUT DECISIONS

MARKETING	- Pricing
	- Advertising
	- Sales people
	- Market research
	- Product R&D
	- Product selection
PRODUCTION	- Labor force (numbers)
	- Personnel policies
	- Work environment
	- Quantities scheduled
	- Raw materials ordered
	- Shipping & storage quantities
	- Manufacturing equipment
FINANCIAL	- Construction
	- Payments (cash flow)
	- Accounting process
	- Use of capital
	- Banking arrangements
	- Budgets
- Profit planning	

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Fig.6

THE SIMULATED WORLD'S FRAMEWORK FOR COMPANY DECISION-MAKING

Outline of Process

- * A variety of data available to functional and general managers.
- * Analysis and integration of such data for determination of relevance and impact on company.
- * Selection of objectives and programs for achieving those objectives.
- * Establishing and utilizing a process of control: monitoring actual performance compared to projections; reviewing results and consequences; confirming prior plans or adjusting programs or goals.
- * Review by board of results and planning for the future by management

Sources of Information

Internal: Current operating reports, company files (including operating history), team members ,board.

External: Trinity Place Journal , seminars, external resources, correspondence*, reports.

* Built into the simulation by MDL -- along with portions of T.P.J. and contents of the historical files as parts of unfolding scenarios.

Issues Affecting Company Policy Making

Some of the issues which confront students emerge out of the fundamental process of organizing and managing a business. Others emerge out of circumstances that mirror conditions in the real world's business environment. In part, such conditions are structured by MDL into unfolding scenarios. The awareness, understanding, and response to these issues may vary from company to company. And, just as in the real world, the do-nothing or do-something responses have an impact on the company's performance.

Scanning the environment for relevant clues is an important activity that may heighten awareness and facilitate effective responses to key issues. Beyond the monthly reports and team interaction, it will be useful to monitor such other sources of information as the Trinity Place Journal; on-going company correspondence; and attitudes or action of major "stakeholders" like suppliers, consumers and regulatory agencies. Further, individual members of the team will find it necessary to be familiar with appropriate historical file memos, file correspondence, and company agreements.

The MDL Environment

The importance of input/output relationships in Figures 3 and 14 notwithstanding, it would be a mistake to consider the MDL's Simulated World a "computerized game." The computer model is only one important component, providing a qualified response to decisions of competing companies. It is the focus for exercising functional skills like marketing, production, and finance. But, it is no substitute for such basic skills, or for the effort to integrate them into a unified company operation.

Mechanical facility with the input/output process cannot overcome a critical inability of team members to work with each other or to function within an effective organizational matrix. Because so much of the environment of MDL's simulated world is planning oriented and people dependent, it more closely approximates actual work experience than could be expected of a mere "computer game." ("Computer games", of course, are useful for other teaching objectives)

Since so many roles within M.D.L.'s Simulated World are played by members of the business community who perform the same functions in their real-world jobs, the student experience can be much more realistic and relevant than traditional simulations. In addition, because it is virtually a "hands-on" experience, it helps to bridge the gap between theory and practice -- perhaps much more than could be realized through a conventional "case study" approach.

It is a dynamic environment. Some of the changes are structured by MDL administrators. Much of it is

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determined by the decisions being made by the competing company managers.

Each simulation is a testing ground for ideas and provides feedback to MDL for further changes in later simulations, much of it coming from participants (students as well as business community participants). In addition, the evolving real world is monitored for situations to be included in future scenario designs.

In the process, like your real world counterparts, you will sometimes face the trauma of dealing with extreme demands upon your time while at the same time making the necessary daily decisions in fulfillment of company organizational goals.

Under such circumstances, some of you--on occasion--may seek to retreat into the more dependent student-professor relationship. Or, you may seek solace in the belief that MDL is manipulating the "game" against you. We suggest -- right from the start -- that your performance and the benefit you derive from the learning experience of MDL depends upon yourself and the other members of the management team. Good Luck !

Special Caveats

- Within the simulation students are no longer "Students", -- but are managers who must take full responsibility for decisions made.

- MDL designs and creates this world, and plays the role of FACILITATOR. MDL does not intrude upon the process or manipulate the scenarios once they have been built into the simulation. Scenario placement occurs prior to your entry.

Summary

The world created within the Management Decision Laboratory has many parallels with the real world. It is highly complex and quantified, albeit with many ambiguities. It has a structure, It has the mark of a good manager is, in part, his ability to be creative within the bounds of this structure. It involves many aspects of the business community, and it provides managers with the opportunity to take advantage of the personal relationships that it establishes.

The organization of a semester has many parallels with organization life within an actual business. Students go through an orientation process that involves preliminary reading, as well as organized seminars. They get an opportunity to orient themselves to the company and its background. Operations of the company start out within constraints established by a prior management. As the new management gains experience, they establish their own plan and decision-making framework. And finally, there is a formal review period, in which management must determine whether their expectations were met, and set plans for the future.

The formal structure also provides an opportunity for students to deal with the complex (frequently unquantifiable) issues facing management. The active involvement of the business community provides the kind of experience base that managers must learn to call upon. In summary, we feel that we have provided an effective on-the-job training environment, but that permits us to control the kinds of experiences, according to curriculum objectives.