

Developments in Business Simulation and Experiential Learning, Volume 29, 2002
**USE OF EXTERNAL INTERVENTIONS IN A COMPUTER
BASED SIMULATION**

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ABSTRACT

The Graziadio School of Business and Management, Pepperdine University, has used a business-decision simulation in its graduate programs for over twenty-five years. Teams compete with each other in a simulated business environment in an intense weekend experience. At least three faculty members actively participate in the simulation by "playing roles" to enhance the experience for the students. This paper reviews the goals and objectives of the simulation including the interventions used to simulate "real world" experiences. The paper concludes with a discussion of future plans for using the simulation to further integrate the MBA coursework throughout the graduate student's curriculum.

External interventions introduced by a team of faculty members include, for example, natural disasters, labor negotiations and disputes, new technology acquisition, international relations, etc. Each professor has multiple roles assigned including banking, the SEC, insurance agents, international representatives, and labor negotiator, etc. In some cases, the faculty may role-play as the board of directors with the express purpose of requiring of management a periodic report to the board on how their team is performing. This paper will specifically address the various roles professors play, the various interventions that are introduced into the game by the faculty, the goals and objectives of the simulation and the future plans for the simulation in the educational experience of the student.

INTRODUCTION

This paper discusses a unique approach using simulation as part of the MBA capstone strategy course. The objective is to provide students with an integrative experience managing an international company demonstrating knowledge, skills, and abilities acquired throughout the MBA program. The simulation experience includes use of "The Business Policy Game: An International Experience" (Cotter and Fritzsche, 1995) to provide the functional aspects of managing a firm and a host of "external interventions" refined through over twenty-five years of strategy simulation by faculty at the Graziadio School of Business. This combination of computer simulation and external interventions creates a unique environment for the students to experience and demonstrate application of knowledge, skills, and abilities acquired throughout the MBA program.

BACKGROUND

The Graziadio School of Business Professional MBA program is specifically designed for working adults with evening and weekend classes. The overall purpose of the simulation is to provide students with the opportunity to integrate and demonstrate the knowledge, skills, and abilities learned over the course of their studies by experiencing both quantitative and qualitative challenges.

Business simulation games are now a commonplace part of a business school education. Faria's (1998) extensive survey of both academia and business found that more than a quarter of all collegiate business teachers use a simulation in any given term, and more than 60% of large businesses use them in their training programs. He also reports on a survey of AACSB-member business school deans which suggests that close to 98% of all AACSB member schools use at least one simulation game somewhere in their programs.

The fact that the use of these games is widespread does not imply that the way they are used in the classroom is

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uniform on all dimensions, e.g., percentage of class time and effort devoted to the game, the relative impact on the students' grades, the manner in which the game is explained or presented, or the degree to which the experience of the game is integrated into the rest of the class or curriculum material. In fact, barring evidence to the contrary, it is assumed that the opposite is true. It would also seem reasonable that these differences would affect how and what students learn from the experience. Gosen and Washbush point out "there are several ways in which instructor behavior, simulation designs, and the atmospheres surrounding the simulation can differ. We believe that behavior, design, and atmosphere variables, both alone and in combination, probably produce unique and substantial effects on student learning in simulation experiences" (1999, p. 302). They go on to note that it is important to identify the methods and environments that do enhance learning.

THE SIMULATION

The simulation game currently used is "The Business Policy Game" by Cotter and Fritzsche (1995), 4th edition. Through creative revision of game parameters and decision input as well as many unique programmatic modifications made specifically for the Graziadio School by the author, David Fritzsche, each team's quarterly results reflect the impact of the external interventions. These modifications, along with other enhancements, have been included in the 5th Edition of The Business Policy Game that is being released by the author. Economic parameters are manipulated, such as whether the economy will grow or move toward a recession. Teams prepare to handle both types of situations. Some of the parameters with which the teams must deal include GDP and CPI in multiple countries, exchange rates, interest rates, and the stock market. The teams may experience both recessions and or growth in the economies of the countries in which they operate. The students are expected to successfully manage the operational, financial, and marketing aspects of their companies as part of the simulation game, while simultaneously handling the distractions created by the external interventions. While participating in the interventions, the faculty observes the performance of the student teams relative to both the simulation results and their responses to the external interventions.

The simulation is executed late in the trimester using a weekend format including Friday evening and all day Saturday. Teams of four to six students prepare for the simulation by reading the manual, preparing a strategic plan, and developing decision models to aid them during the weekend activities. The weekend implementation requires:

- An Administrator team consisting of 3-4 professors with the class strategy professor acting as the lead and a computer technician who sets up the computers and software, runs decisions when submitted, and troubleshoots hardware and software problems.

- Rooms, including one for each student team (between 3-8 per simulation, usually 4-5), one for the administrative team, and one for specific interventions such as labor negotiations or the trade show.
- Computers: one in each room with the game software loaded and an email client for communication. Networked computers are used during the weekend activity, but diskettes may also be used.

At the start of the simulation weekend, an industry wide (all teams) briefing is held. Each team submits its strategic plan for their company and the teams are trained on how to input their decisions into the computer. This is an attempt to cut down on the number of input errors that are made by the team. Decisions are input into a computer located in each room and transferred to the central administration room through a LAN (local area network). Several of the typical interventions are described, along with the objective of the intervention and the methodology for its implementation. Teams must be organized to handle the various tasks and responsibilities of the simulation. Generally, teams are organized along functional lines in order to deal with the routine operations of the simulation such as marketing, advertising, operations, finance, research and development, sales office orders, insurance, and inventory management. In addition, team members develop their own procedures for handling the external transactions and interventions provided by the professors. Interventions by the faculty add an additional degree of reality to the simulation, provide students with a richer experience, and integrate "non-operational" MBA content.

EXTERNAL INTERVENTIONS

Students participate in a number of external interventions. These interventions are used to integrate MBA content that is not a functional aspect of the simulation program. For example, one of the early interventions is negotiating labor costs by each team. Described below, its goal is to determine the team's understanding of their labor and material costs, the impact of these costs on their operations, whether the position they take on labor is consistent with their strategic plan, and finally, to create a somewhat hostile situation for the faculty to assess their reaction and behavior. The major interventions are described in this section. Each strategy (lead) professor has the flexibility to determine the number and extent of these interventions. In addition, faculty teams change each weekend and, hence, take on a different personality through diversity. What appears to be a potential quality issue is actually an opportunity to develop and refine interventions through trial and error.

INTERVENTION #1: LABOR NEGOTIATIONS

This is one of the first interventions in the game done by the faculty. The purpose of labor negotiations is to

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provide a realistic opportunity to meet with union representatives and negotiate a contract. Students are encouraged to understand their costs of operation and the difficulty that could be encountered by a workforce that believes management is not bargaining in “good faith”. At the beginning of the simulation weekend, each team is advised that labor has not had a contract for two years and it has agreed to use the next four quarters to arrive at a contract. The options that a team might encounter should they not reach a settlement include a production slowdown, increased material costs due to poor quality, or, ultimately, a strike. Teams are encouraged to be creative in their bargaining and include significant increases in wages, provision for benefits such as childcare facilities, and bonuses in exchange for up to a three-year contract and increased productivity by labor. Increased productivity is modeled in the game by decreasing material costs. The rationale for decreasing material costs is that labor is more efficient in its use of material and there is less waste.

Students generally spend 10 to 15 minutes with the union representative in a “fact-finding” discussion and then return for final negotiations. In the event that a team appears to be resisting the labor union’s requests, a “slow-down” may be ordered by advising workers to work within work rules. This results in increased costs for production. Through this process, students experience the process of negotiating with labor and have the opportunity of exploring “win-win” versus “win-lose” situations. The first team to settle their contract often receives a “sweetheart” contract, while those teams that settle later will not receive the same consideration.

INTERVENTION #2: INSURANCE

Comprehensive insurance is offered to each team providing the opportunity for the team to evaluate business risks including protection from Property Damage (all risk of loss – except loss due to war and natural disasters), Boiler and Machinery (loss due to external causes not mechanical failure), Inland Marine (coverage on important papers, receivables, cargo in transit, warehouse), Earthquake, Strike, Crime, Vehicle Third Party Liability, and General Liability. Teams may elect coverage at the 50%, 75%, or 100% level or they may choose not to be covered and therefore be “self-insured”. A form is provided describing the various coverages available and associated cost at each level. The costs have been adjusted to be substantial, while not significant, so the teams must at least consider their options. An Excel spreadsheet is available for the Insurance Representative (faculty) to calculate premiums and keep track of insurance policy claims.

Various problems may occur throughout the simulation including events such as power grid failures, earthquakes, fires, or employee theft. The intervention may result in increased production costs, the layoff of one or more

production lines or the deactivation of a production line. Failure to maintain adequate insurance coverage is risky to the team that does not keep its policy current. Policies generally run for a period of one to two years and then must be renewed. It is the responsibility of management to make sure that the organization is not subject to undue risk. It then becomes imperative that the team remains insured. Good insurance customers with very few claims may bargain for better rates. In the event of an incident, teams may make a claim against their policy; however, it is necessary for the team to demonstrate its actual loss to the satisfaction of the insurance adjuster. This provides the opportunity for students to understand their financial and operating statements, to present factual claims and to test their negotiating skills.

INTERVENTION #3: FINANCE, TAXES, AND SECURITIES AND EXCHANGE COMMISSION

The purpose of the finance role is to help students put into practice the things that they learned in their finance classes. Various options are used to work with teams on financial issues. For example, in order to issue or retire long-term debt (bonds) or issue or buy back common stock, assistance from the financial community is needed in the form of SEC clearance, underwriting fees, set-up fees, etc. Interest rates are negotiable depending on the financial position of the company and the team’s presentation regarding its financial needs. In addition, short-term loans are available, when appropriate. Teams have the opportunity to demonstrate their understanding of financial markets and requirements needed for securing financing, including providing reasonable financial projections and pro forma statements. At times, formal authorizing authority is needed from the team’s board of directors.

One role played by the faculty is to act as the agent of the Securities Exchange Commission in the approval process of the purchase or sale of bonds and stocks. The teams must obtain approval for this activity by having the SEC representative review their financial statements and render a decision. This activity has two main outcomes. First, the team must correctly analyze why and how they are going to use the funds. Second, the faculty can investigate their understanding of what they are doing and the expected impact. For example, some teams cannot satisfactorily explain the business reason for why they want to exchange these instruments. This intervention allows the SEC to “teach” the students the correct approach.

Students are exposed to the role of the government in taxation, including the role that businesses play in supporting the government. The simulation game automatically deducts taxes quarterly. This intervention requires annual filing of tax returns. Although viewed as a “compliance” issue, audits may be conducted. The audit provides the team an opportunity to demonstrate its understanding of relevant information from their financial

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statements. It is not uncommon for students to have difficulty in calculating their taxes. Late or erroneous returns incur fines.

INTERVENTION #4: TRADE SHOWS

All teams participate in a trade show of about 30-45 minutes in length. Teams are charged a flat fee of \$50,000 to participate in the trade show. They then negotiate a premium (usually \$20,000-\$100,000) for a desirable physical location in the room. The premium they elect to pay should be consistent with their marketing strategy and desire for improved "advertising effectiveness." Trade shows generally are held during the second day. Quarterly decisions continue as this intervention unfolds. The purpose of the trade show is to allow teams to both attract customers and then provide sufficient information to entice participants to buy their product. The team's customers are retailers, so the trade show focuses on business-to-business relationships. Other professors conducting classes during the weekend are asked to allow their students to attend the trade show and then vote on the booth they felt is the best prepared in terms of both attracting customers to their booth and delivering a relevant marketing message. Since the Strategy course is the final course in the MBA program, students from other classes are interested, as they will participate in the simulation some time in the future. After the vote and ranking of the trade show exhibits is finalized, adjustments are made to the effectiveness of each team's advertising dollars and the results become apparent in subsequent quarters of the simulation.

INTERVENTION #5: MEDICAL PROBLEMS

The professors monitor each team and the members of the teams to ensure teams have prepared to run their companies. At times it is apparent that there is a dominant member upon whom the entire team relies for decisions, decision support systems, or leadership. Clearly, teams must have the ability to function without any team member; therefore, a medical emergency may develop that causes a team member to be removed from the team for some period of time. This provides the opportunity for team members to run their companies "short-handed." Group and team behavior are observed to determine the redundancy that a team has developed.

INTERVENTION #6: INTERNATIONAL OPERATIONS

Students are exposed to international business, culture and doing business in another country. For a team to build a factory in a foreign country, they are required to negotiate with representatives from that country, the labor from that country, and the labor from their domestic operations. Most

students see the "cheap" labor available using international production, but do not fully appreciate the complexity of setting up such an operation. The simulation provides teams with the opportunity of experiencing the nuances of both importing and exporting their products. They have sales offices and the option of building a production facility in another country. This involves understanding negotiations with foreign governments, exchange rates, labor issues, laws, culture, transportation and the cost of business differences. Exchange rates may be changed due to external events such as a "freeze" or "official" rate authorized by the government. Delays in shipping across the border may occur due to problems with unions or government intervention. Students must be aware of both problems and opportunities in working in other countries.

INTERVENTION #7: TECHNOLOGY ACQUISITION

Frequently, technology is developed that will reduce production costs. Once again, teams have to decide the value of the technology in their operations. For example, the technology may guarantee a 25% reduction in labor and material costs and is available to one team only based on a sealed bid. Generally, the technology is licensed and teams are encouraged to offer both an initial payment and a quarterly payment for the license. In order to be successful, teams must understand their costs and the demand for their product in order to conduct a cost-benefit analysis and make a competitive bid for the technology. The faculty do not necessarily award the reduced cost structure to the highest bid, rather to the bid that best outlines the cost and effect the reduction will have on its operations.

FACULTY CONSULTATION:

The faculty may act as consultants to any of the teams helping them with their financial concerns, their production model or behavioral concerns. A substantial fee is assessed to the team for the consultation. The fee is sufficient enough to cause the team to consider their options before paying high consulting fees. The faculty members are observers on how the teams work together socially and functionally. Feedback is then given to each team at the end of the game.

MESSAGES, NEWS ITEMS, INFORMATION BLIPS

Messages, such as those listed in Exhibit I, are sent from the administrators or faculty at infrequent times to the teams keeping them advised of activities, problems, or concerns that they should be following and controlling. Some of the messages are standard, but others will be written at the time to deal with a specific problem or concern. It is expected that the students will keep track of their messages. On the other hand, since the faculty wear so

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many different hats and are so busy, the students should not expect that the faculty has received or read each and every message that they have sent to the faculty.

FUTURE PLANS

A new, integrated MBA curriculum has been implemented in one of the school's educational centers. The courses are divided into three blocks each of which have four courses. In order to move from the first block to the second block or from the second block to the third block, students must successfully complete an integration module titled "Simulation in Business Operation". At the conclusion of the coursework, students must successfully complete the final simulation in conjunction with their Strategy course. The first integration module focuses on "Core Operations" of a business, the second integration module considers "Competitive Factors" and the emphasis on the final module is on "Integrated Strategic Management". Although each module places emphases on those courses included in the particular block, the design is to make the learning experience cumulative in nature.

The course description for each module is similar in nature; however, it is modified to consider the additional coursework. In the first module, the course description is as follows:

Module A covers behavior in organizations; financial and managerial information systems; political, regulatory, ethical, and legal issues of business; and information and process systems. The focus of this module is on the internal operating decisions. The faculty stewards in charge of the simulation form four-to-five students into teams. Each team is in control of the internal operating decisions for a business firm operating in a simulated economy. Firms compete against each other in the same industry. Faculty stewards introduce situations to be addressed by individuals and by teams. There is one steward representing each discipline in the module. The stewards' interventions reflect situations that may arise during the conduct of business. Resolution of these interventions often requires multi-disciplinary considerations.

The objectives of the integration module are explicit to the student. In the first module, the objectives and design of the course are defined in the syllabus as follows:

The integration module is designed to have students run a business successfully. They will act as middle-to-upper management team in operating a business faced with interdisciplinary issues and non-deterministic consequences. Students take over a firm that has been profitably operated by a prior

management group. The new management team must organize: communicate sufficiently to delineate duties, authority and responsibility. They must prepare for decision making: read the manual; read and understand the historic financial and non-financial data; draft decision support systems (i.e., graphs, tables, or models) that assist understanding the value chain of the business; plan output production and material purchases; draft a cash budget; evaluate the effectiveness of marketing areas and sales representatives. The new team should also assess the domestic economy, industry, and competitors.

A business analysis paper shall be drafted, maximum length of 10 pages. The paper shall (1) describe each team's student membership and organizational duties and (2) preparatory assessments of economy, industry, competitors, product market, sales representative effectiveness, units to be produced, materials to be purchased, scheduling of labor in regular, second shift or overtime, adequacy of plant-and-line capacity, and cash surplus-or-deficiency. The paper should conclude with a description of this management team's goals over the next two years (8 quarters of decisions) and the manner by which the team intends to achieve these goals

The integration module weekend also requires students to execute and control business activities on an integrated, continuous basis. The focus in module A is on internal operating decisions: the legal and ethical choices for product development, production, marketing, and financing that result in liquidity and profitability. Faculty stewards constitute each firm's board of directors. Strategic decisions will need to be approved by the board prior to implementation, whereas, operating decisions are left to management without board approval. Strategic decisions include (1) the marketing of a new product, (2) all changes in executive or production compensation agreements, (3) the expansion of production capacity, (4) all changes in current financing agreements, and (5) all changes in the drafted, competitive strategy. All internal operating decisions are left to the management team: product development, production volume, production staffing, pricing, market staffing, advertising, collecting sales, paying expenses, borrowing under prevailing agreements, etc.

Faculty will introduce situations that may arise in a normal operating environment, and evaluate how well both individuals and teams address the situation(s). The situations will arise from the four

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primary topics introduced in each class of module A: behavior in organizations; financial and managerial information systems; political, regulatory, ethical, and legal issues in business; and information and process systems. Faculty may assess individual and team responses by direct observation (visual or audio) or by communication (e-mail, memo, report). The propriety of a response is evaluated contextually: (1) was the situation (and its implications) understood? (2) were appropriate reasons (practical as well as theoretical) used to filter potential courses of action? and (3) was the decision/action consistent with the reasoning and circumstance? In all, we seek to develop the student's ability to recognize, reason, and behave in a manner that enhances the value of a business and themselves, as individuals and as members of teams.

CONCLUSIONS

The simulation was adopted by the faculty to give students a simulated real world experience working together in teams and making decisions in a competitive environment within their own organization. The intent is to draw on the explicit educational knowledge of the student as well as tacit knowledge gained through work experience.

This paper reviewed the role of the faculty in enhancing the simulation experience through active intervention. As more experience and knowledge is gained in the simulation experience, the better it will become as an educational tool and the more value the experience will have to the student. The role of the faculty is very labor-intensive, but pays dividends as far as the simulation game is concerned. As the faculty takes a more active role, learning is enhanced. It has been documented that the simulation performance improves with increased active guidance on the part of the faculty members.

The faculty functioning in their various roles and with the many interventions that they make to the simulation enhances the experience for the students. We have attempted to explain that role and to show how it fits with the simulation game itself and how it assists the students. However, we have observed that no two simulations are identical since teams react differently to a myriad of situations. Faculty must be involved throughout the process to insure that students have the optimum learning experience. We have also shown how the simulation will play a critical role in the new curriculum design for those of our MBA students who are enrolled in our existing as well as our new curriculum.

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EXHIBIT I: EXAMPLES OF MESSAGES FROM STEWARDS

1. The National Inquirer reports that disposable cameras and rock singers may cause skin cancer in laboratory rats. The WSJ reports that insurance premiums have begun to climb in response to this news.
2. OSHA reports a rising number of employee complaints regarding plant safety and announced their intention to step up their compliance program. Some firms are contacting OSHA's consulting arm in hopes of averting compliance penalties.
3. The Caltech Seismology Laboratory reports that recent studies indicate a ten-fold increase in the probability of a major earthquake (greater than 6.5 on the Richter Scale) occurring in the industrial region.
4. The U.S. Labor Department has issued an Unfair Labor Practice charge against firm _____ for failing to bargain in good faith with Local Union 86. The hearing will be held at (time) .
5. The disposable camera industry was rocked by an announcement that the Antitrust Division of the U.S. Justice Department caught seven firms colluding in violation of the Robinson-Patman Act and fined them \$50,000 each. Investigators revealed that corporate officers were photographed passing industry data between tables at the California Club.
6. The IRS reminds all corporate taxpayers to file last year's tax returns by March 15 (1st Qtr. of the following year). The corporate CEO must sign all returns.
7. The American Salesman Society released a study today that the correlation between commissions and revenues was stronger in disposable camera companies than any other consumer products category. This apparently came as a complete surprise to many firms.
8. A series of unexplained accidents involving trucks experiencing brake failure was reported yesterday. The replacement cost of the destroyed vehicles equaled \$200,000, and the lost cargo had a market value of \$100,000. The trucks belong to firm _____, who are being struck by their labor union. Union representative Carmine Banano denied any connection between the strike and the accidents.
9. The IRS announced today that the penalty for failure to file corporate tax returns by March 15th is 10% of Net Annual Income. According to agent Sal O. Bate, March 15th ends in 10 minutes.
10. The IRS has fined all firms that failed to file last year's income tax returns. Agent Sal O. Bate announced that the penalty would be increased from 10% of the net annual income to 20% for any firm that does not report to the IRS office immediately.
11. The U.S. Industrial Council concluded its biannual meeting yesterday in Honolulu. The chairman of the council reported that due to the meager advertising of member firms, demand for American-made products has fallen far short of expectations. The Nippon Disposable Camera Company, Ltd., has set up a U.S. distributor and signed a promotional contract with ABC, NBC, and CBS that would exceed American advertising budgets by 50%. The chairman called for a competitive response to this aggressive policy.
12. A power failure in the industrial region required many companies to use sub-contractors in meeting their production needs. While total losses were in the millions of dollars, it appears that most firms lost about \$100,000 each. The Industrial Council recommends that member firms contact their insurance agent to access their business interruption insurance coverage and file their claims.
13. The CEO of each team must report to the Steward's room immediately!!
14. The WSJ reports that Kamikaze International intends to mass-market high-quality disposable cameras in the U.S. in 3 months. The U.S. Industrial Council warns that Japan may capture 50% of the disposable camera market by the end of this year.
15. Cancer victims have settled their class action suit with the producers of disposable cameras of \$3 million. Liability was divided up among member firms according to market shares for the previous quarter.
16. Gloria Steinem, President of the National Organization for Women, has announced their intention to boycott the products of companies that do not have female CEO's.
17. The Japanese Trade Ministry filed information with the U.S. Commerce Department to support their claim that their increased sales in U.S. markets are not the result of price-cutting. Their figures indicate that their products have virtually no competition since U.S. producers are simply not providing items of the quality that U.S. homemakers want.
18. UPI reports the gangland style murder of 18 mafia chieftains. The FBI investigation indicates that the bloodshed was probably caused by the public disclosure of union pension fund embezzlement. In a related incident, the body of Carmine Banano was dragged from the bottom of lake Big Bear. Apparently, he had attempted to swim across the lake while wearing a strange pair of concrete shoes.

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19. The Los Angeles Times reports that an earthquake measuring 6.5 on the Richter Scale has occurred in the industrial region. The loss in plant and equipment has cause a 20% reduction in production capacity and will take three months for repairs to be completed. The tremor will require many companies to use subcontractors in meeting their production needs. While total losses are expected to exceed \$50 million, it is hoped that no one will lose more than \$2 million. The Industrial Council recommends that member firms contact their insurance broker to assess their earthquake coverage for both physical loss and business interruption.
20. The AFL-CIO reported today that it is becoming alarmed about the growing incidence of unrest among their rank and file. There appears to be a strong wave of negative feelings by union members against their local officers who negotiated contracts that were apparently too low in light of current economic conditions. Many firms have reopened discussions on wages, benefits, and productivity in hopes of avoiding costly wildcat strikes.
21. All teams report to the Steward's room immediately after printing out their reports. A penalty of \$10,000 per minute will be assessed against any team failing to comply by _____.
22. The President's Commission on Technology and Competition has focused on the disposable camera industry where substantial sales have been lost to foreign competition. The commission is formulating a plan to establish a sub-committee of industry leaders, preferably chief executive officers, to make recommendations for economic and technological steps that can be taken to improve the U.S. position. The Commission may ask for industry representatives in the forthcoming year.
23. The President, acting at the advice of his commission on Technology and Competition, has requested that the CEO's of the major U.S. Disposable Camera Firms attend a meeting in Room 8 of the White House at 12:00 p.m.

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